# Kansas City PM Characterization Study
# Final Report

# Appendix A & B
# DRI Data

Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

Sponsors:

National Renewable Energy Laboratory, U.S. Department of Energy
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Prepared for EPA by
Eastern Research Group, Incorporated
Austin, TX

Bevilacqua-Knight Incorporated
Oakland, CA

NuStats LLC
Austin, TX

Desert Research Institute
Reno, NV

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| | Field Blanks | | | Dilution Blanks | | | All Vehicle Composites | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Min** | **Avg** | **Max** | **Min** | **Avg** | **Max** | **Min** | **10th%** | **50th%** | **90th%** | **Max** |
| Gravimetric mass | 0.4 | 1.5 | 3.6 | 14.3 | 26.7 | 46.7 | 39.5 | 87.4 | 178.1 | 672.4 | 1009.2 |
| **Carbon fractions by TOR (IMPROVE)** | | | | | | | | | | | |
| Organic Carbon Fraction 1 | 0.7 | 1.5 | 3.1 | 1.1 | 9.7 | 13.9 | 3.2 | 13.8 | 51.4 | 441.5 | 712.4 |
| Organic Carbon Fraction 2 | 0.8 | 1.5 | 3.7 | 3.0 | 11.1 | 20.3 | 6.4 | 10.7 | 40.5 | 174.6 | 537.7 |
| Organic Carbon Fraction 3 | 0.5 | 1.5 | 4.2 | 2.8 | 7.3 | 11.9 | 5.0 | 5.8 | 18.9 | 32.9 | 45.4 |
| Organic Carbon Fraction 4 | 0.5 | 1.5 | 4.5 | 3.0 | 20.2 | 59.6 | 10.9 | 22.3 | 43.5 | 134.0 | 202.4 |
| Pyrolyzed Organic Carbon | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 5.6 | 0.1 | 0.2 | 0.4 | 34.1 | 901.5 |
| Organic Carbon | 0.7 | 1.5 | 4.0 | 2.6 | 9.5 | 14.7 | 5.8 | 10.3 | 34.3 | 108.0 | 245.9 |
| Elemental Carbon Fraction 1 | 0.0 | 0.4 | 2.2 | 0.3 | 18.1 | 56.7 | 23.4 | 42.4 | 148.3 | 586.1 | 847.1 |
| Elemental Carbon Fraction 2 | 0.0 | 0.1 | 0.3 | 3.9 | 27.7 | 73.8 | 21.5 | 68.6 | 234.7 | 1790.3 | 4902.8 |
| Elemental Carbon Fraction 3 | 0.0 | 0.0 | 0.0 | 0.0 | 6.5 | 29.0 | 0.0 | 0.0 | 9.5 | 68.4 | 296.7 |
| Elemental Carbon | 0.0 | 0.3 | 1.6 | 3.3 | 34.4 | 72.7 | 36.4 | 87.4 | 263.9 | 1741.7 | 4205.4 |
| Total Carbon | 0.7 | 1.5 | 4.0 | 2.8 | 10.9 | 17.0 | 9.5 | 17.9 | 50.6 | 151.2 | 427.7 |
| **Elements by XRF** | | | | | | | | | | | |
| Sodium (qualitative only) | 0.0 | 0.6 | 1.0 | 0.0 | 3.3 | 6.6 | 0.3 | 2.0 | 4.6 | 11.0 | 16.9 |
| Magnesium (qualitative only) | 0.5 | 1.5 | 2.8 | 1.6 | 5.0 | 7.3 | 1.1 | 2.0 | 5.7 | 16.6 | 24.2 |
| Aluminum | 0.0 | 1.4 | 3.5 | 1.2 | 5.1 | 11.4 | 1.1 | 1.8 | 5.8 | 19.8 | 35.1 |
| Silicon | 0.0 | 1.5 | 3.4 | 9.8 | 24.7 | 55.6 | 11.6 | 16.7 | 56.4 | 746.8 | 1605.1 |
| Phosphorous | 0.2 | 1.5 | 2.1 | 0.6 | 2.8 | 5.1 | 1.0 | 3.9 | 15.2 | 47.3 | 76.7 |
| Sulfur | 0.0 | 0.9 | 2.4 | 43.9 | 76.9 | 128.9 | 35.6 | 69.3 | 193.4 | 591.4 | 2836.0 |
| Chlorine | 0.0 | 0.6 | 2.3 | 0.2 | 2.2 | 7.8 | 0.9 | 1.3 | 4.7 | 10.5 | 24.4 |
| Potassium | 0.0 | 0.5 | 2.4 | 5.3 | 12.3 | 24.5 | 1.8 | 4.3 | 8.7 | 32.2 | 50.4 |
| Calcium | 0.3 | 1.5 | 4.3 | 28.0 | 63.0 | 125.4 | 16.8 | 26.6 | 106.7 | 195.7 | 425.7 |
| Titanium | 0.0 | 0.0 | 0.1 | 0.2 | 0.5 | 1.2 | 0.0 | 0.0 | 0.4 | 0.6 | 1.9 |
| Vanadium | 0.0 | 0.0 | 0.1 | 0.1 | 0.4 | 0.9 | 0.0 | 0.0 | 0.3 | 1.1 | 5.6 |
| Chromium | 0.0 | 0.2 | 0.5 | 0.4 | 1.4 | 3.2 | 0.2 | 1.0 | 4.1 | 20.5 | 41.1 |
| Manganese | 0.0 | 0.1 | 0.2 | 1.2 | 6.4 | 20.7 | 0.0 | 0.6 | 3.8 | 15.7 | 33.0 |
| Iron | 0.0 | 0.5 | 1.9 | 13.2 | 65.2 | 143.0 | 22.0 | 25.5 | 107.6 | 381.0 | 1367.7 |
| Cobalt | 0.0 | 0.4 | 1.0 | 0.0 | 1.3 | 2.9 | 0.0 | 0.6 | 1.9 | 9.7 | 25.4 |
| Nickel | 0.0 | 0.5 | 2.5 | 1.2 | 2.2 | 3.0 | 1.2 | 1.8 | 6.0 | 27.9 | 74.0 |
| Copper | 0.0 | 1.2 | 3.3 | 3.6 | 12.5 | 24.4 | 5.8 | 9.1 | 40.9 | 97.9 | 209.5 |
| Zinc | 0.0 | 1.1 | 2.4 | 1.8 | 7.5 | 17.3 | 7.4 | 11.3 | 34.7 | 89.7 | 168.9 |
| Gallium | 0.0 | 0.4 | 2.1 | 0.2 | 1.4 | 3.4 | 0.0 | 0.0 | 1.0 | 3.8 | 4.4 |
| Arsenic | 0.0 | 0.1 | 0.3 | 0.0 | 0.4 | 0.9 | 0.0 | 0.0 | 0.7 | 1.8 | 3.3 |
| Selenium | 0.1 | 0.4 | 1.1 | 0.2 | 1.3 | 2.7 | 0.0 | 0.0 | 1.1 | 3.4 | 11.3 |
| Bromine | 0.0 | 0.0 | 0.1 | 0.0 | 1.0 | 1.7 | 0.2 | 0.3 | 4.7 | 29.8 | 47.7 |
| Rubidium | 0.0 | 0.1 | 0.3 | 0.0 | 0.2 | 0.5 | 0.0 | 0.0 | 0.6 | 2.1 | 5.9 |
| Strontium | 0.0 | 0.3 | 0.6 | 0.2 | 1.6 | 3.1 | 0.0 | 0.2 | 0.9 | 4.4 | 13.5 |
| Yttrium | 0.0 | 0.4 | 0.9 | 0.0 | 1.2 | 2.1 | 0.0 | 0.0 | 0.5 | 2.9 | 13.2 |
| Zirconium | 0.0 | 0.2 | 0.8 | 0.6 | 1.6 | 2.6 | 0.0 | 0.5 | 2.3 | 7.6 | 39.4 |
| Molybdenum | 0.0 | 0.3 | 0.5 | 0.4 | 1.4 | 2.4 | 0.0 | 0.2 | 1.9 | 7.9 | 10.6 |
| Palladium | 0.2 | 0.6 | 0.9 | 0.0 | 0.8 | 1.3 | 0.0 | 0.1 | 1.0 | 2.9 | 4.0 |
| Silver | 0.0 | 0.2 | 0.8 | 0.1 | 1.2 | 2.4 | 0.1 | 0.4 | 1.0 | 2.9 | 3.9 |
| Cadmium | 0.0 | 0.2 | 0.9 | 0.2 | 1.3 | 2.8 | 0.0 | 0.0 | 0.6 | 2.0 | 3.5 |
| Indium | 0.0 | 0.3 | 1.5 | 0.0 | 1.1 | 2.1 | 0.0 | 0.0 | 0.8 | 2.9 | 4.4 |
| Tin | 0.0 | 0.3 | 1.4 | 0.0 | 1.1 | 4.0 | 0.0 | 0.1 | 1.4 | 4.3 | 6.0 |
| Antimony | 0.0 | 0.3 | 0.6 | 0.1 | 0.7 | 2.0 | 0.0 | 0.1 | 1.3 | 3.0 | 6.6 |
| Barium | 0.0 | 0.6 | 1.1 | 0.2 | 0.5 | 0.8 | 0.0 | 0.1 | 1.2 | 3.6 | 5.2 |
| Lanthanum | 0.0 | 0.1 | 0.4 | 0.0 | 0.1 | 0.6 | 0.0 | 0.0 | 0.6 | 1.8 | 2.2 |
| Gold | 0.0 | 0.3 | 0.8 | 0.2 | 1.4 | 3.1 | 0.0 | 0.0 | 0.5 | 3.4 | 5.6 |
| Mercury | 0.0 | 0.5 | 1.2 | 0.7 | 1.1 | 1.4 | 0.0 | 0.0 | 0.6 | 3.5 | 10.4 |
| Thallium | 0.0 | 0.1 | 0.3 | 0.0 | 0.3 | 0.6 | 0.0 | 0.0 | 0.2 | 2.3 | 5.8 |
| Lead | 0.0 | 0.3 | 0.8 | 0.9 | 2.1 | 4.5 | 0.0 | 1.3 | 5.4 | 27.2 | 63.4 |
| Uranium | 0.0 | 0.3 | 0.7 | 0.2 | 0.7 | 1.4 | 0.0 | 0.0 | 0.5 | 3.0 | 9.1 |
| **PAH by GC/MS** | | | | | | | | | | | |
| Naphthalene | 0.3 | 1.0 | 2.0 | 1.4 | 2.9 | 4.3 | 2.8 | 8.7 | 21.8 | 48.1 | 59.8 |
| 2-methylnaphthalene | 0.4 | 1.0 | 1.9 | 4.8 | 12.2 | 19.1 | 52.5 | 170.7 | 593.8 | 1925.4 | 2499.9 |
| 1-methylnaphthalene | 0.4 | 1.0 | 1.7 | 4.6 | 11.2 | 17.3 | 44.4 | 150.3 | 513.0 | 2089.9 | 2517.8 |
| Biphenyl | 0.1 | 1.0 | 1.9 | 1.9 | 2.9 | 3.8 | 4.2 | 11.0 | 34.5 | 186.2 | 280.9 |
| 1+2ethylnaphthalene | 0.1 | 1.0 | 2.3 | 2.0 | 3.3 | 4.3 | 2.1 | 6.4 | 21.5 | 72.5 | 92.0 |
| 2,6+2,7-dimethylnaphthalene | 0.2 | 1.0 | 1.6 | 5.3 | 13.8 | 23.1 | 31.1 | 88.4 | 315.5 | 1603.0 | 2633.1 |
| 1,3+1,6+1,7dimethylnaphth | 0.4 | 1.0 | 1.4 | 4.9 | 11.0 | 16.6 | 24.8 | 73.5 | 279.5 | 1389.2 | 2205.4 |
| 1,4+1,5+2,3-dimethylnaphth | 0.4 | 1.0 | 1.5 | 0.4 | 1.2 | 3.7 | 4.0 | 11.3 | 121.3 | 1294.8 | 2716.6 |
| 1,2-dimethylnaphthalene | 0.5 | 1.0 | 1.6 | 3.4 | 9.0 | 14.0 | 25.5 | 64.7 | 415.8 | 5264.7 | 15666.2 |
| 2-Methylbiphenyl | 0.0 | 1.0 | 2.9 | 1.1 | 2.4 | 4.8 | 0.2 | 0.3 | 0.7 | 2.0 | 2.4 |
| 3-Methylbiphenyl | 0.1 | 1.0 | 2.9 | 1.0 | 2.6 | 5.1 | 0.5 | 0.8 | 3.1 | 6.7 | 11.0 |
| 4-Methylbiphenyl | 0.1 | 1.0 | 2.7 | 1.0 | 2.3 | 4.0 | 0.6 | 0.9 | 2.7 | 8.1 | 13.9 |
| Dibenzofuran | 0.3 | 1.0 | 1.6 | 4.2 | 14.6 | 27.6 | 14.7 | 24.2 | 67.5 | 288.0 | 523.5 |
| Bibenzyl | 0.0 | 1.0 | 2.3 | 1.0 | 4.4 | 7.4 | 0.0 | 0.5 | 1.5 | 5.2 | 6.2 |
| A-trimethylnaphthalene | 0.3 | 1.0 | 1.7 | 3.7 | 8.2 | 12.6 | 11.9 | 25.4 | 78.3 | 587.1 | 2005.2 |
| 1-ethyl-2-methylnaphthalene | 0.1 | 1.0 | 1.8 | 2.3 | 3.9 | 6.0 | 4.1 | 9.8 | 39.1 | 224.0 | 796.1 |
| B-trimethylnaphthalene | 0.3 | 1.0 | 1.8 | 3.8 | 4.9 | 6.3 | 5.9 | 17.6 | 52.6 | 401.4 | 1327.1 |

## Appendix A1. Concentrations of Organic Species Normalized to Larger of Mean Field Blank Value or MDL - Round 1

| | Field Blanks | | | Dilution Blanks | | | All Vehicle Composites | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Min** | **Avg** | **Max** | **Min** | **Avg** | **Max** | **Min** | **10th%** | **50th%** | **90th%** | **Max** |
| C-trimethylnaphthalene | 0.2 | 1.0 | 2.0 | 3.8 | 7.7 | 12.2 | 6.7 | 15.6 | 48.3 | 388.3 | 1408.8 |
| 2-ethyl-1-methylnaphthalene | 0.1 | 1.0 | 1.6 | 0.7 | 3.8 | 17.3 | 0.8 | 1.5 | 5.1 | 36.9 | 119.1 |
| E-trimethylnaphthalene | 0.2 | 1.0 | 2.2 | 3.1 | 6.9 | 12.0 | 4.0 | 9.2 | 30.9 | 242.7 | 847.8 |
| F-trimethylnaphthalene | 0.3 | 1.0 | 1.7 | 3.9 | 6.6 | 10.7 | 5.6 | 11.9 | 36.7 | 299.4 | 1403.4 |
| 2,3,5+I-trimethylnaphthalene | 0.2 | 1.0 | 2.0 | 3.0 | 6.9 | 14.5 | 4.3 | 7.5 | 27.9 | 188.9 | 838.3 |
| 2,4,5-trimethylnaphthalene | 0.3 | 1.0 | 2.1 | 2.2 | 3.7 | 5.9 | 0.3 | 3.5 | 13.7 | 143.0 | 651.8 |
| J-trimethylnaphthalene | 0.1 | 1.0 | 2.2 | 1.0 | 2.0 | 3.1 | 2.2 | 3.2 | 11.4 | 104.8 | 399.4 |
| 1,4,5-trimethylnaphthalene | 0.0 | 1.0 | 2.6 | 1.2 | 11.6 | 30.5 | 2.8 | 8.9 | 36.9 | 311.1 | 969.3 |
| Acenaphthylene | 0.4 | 1.0 | 1.7 | 3.8 | 9.6 | 18.6 | 50.8 | 69.0 | 218.6 | 1291.4 | 8409.5 |
| Acenaphthene | 0.3 | 1.0 | 1.6 | 1.0 | 3.1 | 11.2 | 2.3 | 6.0 | 15.4 | 89.5 | 297.5 |
| Fluorene | 0.0 | 1.0 | 4.3 | 1.5 | 6.8 | 16.2 | 5.1 | 19.8 | 70.9 | 562.3 | 2402.6 |
| Dibenzothiophene | 0.3 | 1.0 | 1.9 | 2.3 | 4.7 | 7.4 | 2.7 | 3.5 | 15.8 | 41.5 | 117.8 |
| Phenanthrene | 0.3 | 1.0 | 1.3 | 3.9 | 6.7 | 9.4 | 11.4 | 16.5 | 50.9 | 217.3 | 707.9 |
| Anthracene | 0.2 | 1.0 | 2.1 | 0.2 | 2.6 | 7.0 | 4.2 | 13.3 | 67.8 | 803.2 | 2535.0 |
| A-methylfluorene | 0.1 | 1.0 | 1.9 | 3.0 | 5.5 | 7.8 | 5.9 | 10.4 | 31.3 | 284.5 | 460.3 |
| 1-methylfluorene | 0.2 | 1.0 | 1.6 | 3.1 | 6.4 | 9.9 | 7.7 | 11.7 | 33.4 | 207.2 | 277.2 |
| B-methylfluorene | 0.1 | 1.0 | 1.9 | 1.9 | 3.7 | 5.0 | 5.0 | 9.0 | 29.5 | 181.9 | 334.0 |
| 9-fluorenone | 0.3 | 1.0 | 1.7 | 1.7 | 3.6 | 8.6 | 0.8 | 2.7 | 22.0 | 83.4 | 166.1 |
| Xanthone | 0.1 | 1.0 | 2.0 | 0.6 | 1.6 | 2.9 | 0.0 | 0.1 | 1.6 | 5.3 | 19.5 |
| Acenaphthenequinone | 0.1 | 1.0 | 1.9 | 0.9 | 4.1 | 8.1 | 1.5 | 2.1 | 7.0 | 36.5 | 64.5 |
| Perinaphthenone | 0.1 | 1.0 | 2.6 | 0.1 | 2.3 | 3.3 | 0.4 | 1.2 | 3.1 | 10.6 | 18.1 |
| 2-methylanthracene | 0.3 | 1.0 | 1.3 | 6.6 | 15.8 | 34.8 | 10.3 | 12.6 | 57.5 | 404.8 | 864.9 |
| 3-methylphenanthrene | 0.4 | 1.0 | 1.4 | 4.8 | 8.2 | 11.2 | 8.6 | 15.2 | 44.5 | 243.1 | 380.7 |
| 2-methylphenanthrene | 0.4 | 1.0 | 1.3 | 4.1 | 6.9 | 9.5 | 7.6 | 11.7 | 33.8 | 171.0 | 249.8 |
| 9-methylphenanthrene | 0.2 | 1.0 | 1.5 | 4.6 | 7.1 | 9.9 | 6.0 | 11.4 | 41.4 | 274.1 | 681.3 |
| 4,5-methylenephenanthrene | 0.1 | 1.0 | 1.5 | 8.8 | 26.1 | 44.4 | 7.4 | 12.0 | 41.2 | 290.3 | 688.2 |
| 1-methylphenanthrene | 0.3 | 1.0 | 1.6 | 3.4 | 5.9 | 8.8 | 5.3 | 9.7 | 27.1 | 124.6 | 210.8 |
| Anthrone | 0.0 | 0.7 | 2.2 | 0.8 | 4.4 | 8.8 | 0.0 | 0.9 | 4.2 | 25.8 | 61.3 |
| Anthraquinone | 0.0 | 1.0 | 2.3 | 0.6 | 3.8 | 8.3 | 0.0 | 0.0 | 0.6 | 7.4 | 21.2 |
| 3,6-dimethylphenanthrene | 0.0 | 1.0 | 2.6 | 1.0 | 1.9 | 2.4 | 0.6 | 1.3 | 3.0 | 11.4 | 20.7 |
| A-dimethylphenanthrene | 0.6 | 1.0 | 1.7 | 6.4 | 8.5 | 10.8 | 2.0 | 8.0 | 34.5 | 190.0 | 287.7 |
| B-dimethylphenanthrene | 0.2 | 0.7 | 1.1 | 4.3 | 5.4 | 6.3 | 4.2 | 6.5 | 17.8 | 94.1 | 146.5 |
| C-dimethylphenanthrene | 0.4 | 1.0 | 1.5 | 6.8 | 10.0 | 12.8 | 5.6 | 10.9 | 36.9 | 208.1 | 361.3 |
| D-dimethylphenanthrene | 0.2 | 0.4 | 0.5 | 3.7 | 5.4 | 7.5 | 2.9 | 5.3 | 15.4 | 69.8 | 122.2 |
| 1,7-dimethylphenanthrene | 0.3 | 0.8 | 1.2 | 6.6 | 9.3 | 12.0 | 6.1 | 10.4 | 36.4 | 230.7 | 412.8 |
| E-dimethylphenanthrene | 0.2 | 0.5 | 1.0 | 4.6 | 6.3 | 8.4 | 3.5 | 6.7 | 20.0 | 117.1 | 191.7 |
| 9-methylanthracene | 0.0 | 1.0 | 4.9 | 0.5 | 10.0 | 27.5 | 0.1 | 1.2 | 11.9 | 70.3 | 133.4 |
| Fluoranthene | 0.2 | 1.0 | 2.4 | 4.9 | 8.7 | 11.7 | 6.7 | 9.3 | 29.1 | 165.7 | 500.1 |
| Pyrene | 0.3 | 1.0 | 2.6 | 4.3 | 9.1 | 16.5 | 4.9 | 7.6 | 22.1 | 191.5 | 588.6 |
| 9-Anthraaldehyde | 0.0 | 0.3 | 1.1 | 0.2 | 1.6 | 5.7 | 0.0 | 0.0 | 5.7 | 33.9 | 76.1 |
| Retene | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.0 | 0.0 | 0.1 | 0.3 | 0.7 |
| Benzonaphthothiophene | 0.0 | 0.3 | 0.6 | 1.1 | 1.8 | 2.5 | 0.0 | 0.5 | 2.0 | 4.4 | 16.4 |
| 1+3-methylfluoranthene | 0.2 | 0.6 | 1.2 | 2.8 | 4.8 | 10.8 | 1.9 | 2.5 | 18.9 | 102.9 | 283.4 |
| 1-MeFl+C-MeFl/Py | 0.2 | 0.6 | 0.8 | 7.2 | 10.6 | 12.7 | 1.2 | 4.0 | 19.3 | 72.2 | 125.1 |
| B-MePy/MeFl | 0.0 | 1.0 | 3.5 | 2.9 | 10.7 | 15.0 | 4.0 | 5.8 | 21.2 | 101.4 | 281.0 |
| C-MePy/MeFl | 0.3 | 0.8 | 1.8 | 1.6 | 9.3 | 13.9 | 3.1 | 4.3 | 18.2 | 82.3 | 254.6 |
| D-MePy/MeFl | 0.2 | 0.7 | 2.1 | 4.4 | 9.8 | 13.2 | 1.7 | 4.6 | 14.4 | 61.0 | 147.0 |
| 4-methylpyrene | 0.0 | 0.8 | 2.1 | 5.4 | 9.5 | 11.9 | 2.7 | 3.7 | 10.2 | 56.6 | 216.4 |
| 1-methylpyrene | 0.1 | 1.0 | 3.1 | 0.0 | 7.9 | 11.6 | 0.1 | 1.0 | 9.2 | 37.6 | 124.1 |
| Benzo(c)phenanthrene | 0.0 | 0.1 | 0.5 | 0.9 | 7.0 | 10.2 | 0.7 | 1.9 | 7.1 | 36.8 | 196.1 |
| Benzo(ghi)fluoranthene | 0.0 | 1.0 | 4.7 | 2.9 | 13.9 | 22.0 | 1.5 | 2.8 | 12.5 | 68.0 | 248.3 |
| Cyclopenta(c,d)pyrene | 0.0 | 0.8 | 3.2 | 0.0 | 7.4 | 10.9 | 0.0 | 0.8 | 20.2 | 603.9 | 3149.3 |
| Benz(a)anthracene | 0.2 | 1.0 | 2.7 | 3.4 | 12.1 | 18.5 | 2.7 | 3.5 | 15.0 | 82.9 | 238.0 |
| Triphenylene | 0.5 | 0.9 | 1.7 | 5.3 | 16.8 | 33.6 | 2.3 | 3.3 | 17.1 | 65.1 | 191.1 |
| Chrysene | 0.5 | 1.0 | 2.0 | 3.2 | 12.8 | 23.6 | 1.9 | 2.6 | 11.2 | 38.6 | 128.8 |
| Benzanthrone | 0.0 | 0.2 | 0.5 | 4.5 | 18.1 | 31.5 | 0.0 | 0.0 | 0.0 | 34.9 | 82.4 |
| 7-methylbenz(a)anthracene | 0.0 | 0.5 | 1.6 | 0.1 | 0.4 | 1.0 | 0.0 | 0.0 | 0.3 | 3.1 | 8.8 |
| 3-methylchrysene | 0.1 | 0.2 | 0.4 | 0.6 | 2.8 | 4.7 | 0.7 | 1.0 | 5.4 | 22.8 | 64.2 |
| Benz(a)anthracene-7,12-dione | 0.0 | 0.3 | 0.9 | 0.3 | 5.5 | 10.1 | 0.0 | 0.1 | 4.5 | 20.2 | 52.4 |
| 5+6-methylchrysene | 0.0 | 0.4 | 1.1 | 0.1 | 0.9 | 2.2 | 0.0 | 0.0 | 1.0 | 5.4 | 21.9 |
| Benzo(b+j+k)fluoranthene | 0.0 | 1.0 | 2.7 | 1.6 | 3.3 | 4.9 | 0.5 | 1.2 | 5.4 | 28.5 | 65.9 |
| Benzo(a)fluoranthene | 0.2 | 0.4 | 0.6 | 0.1 | 0.4 | 1.0 | 0.6 | 0.9 | 3.9 | 14.4 | 72.6 |
| BeP | 0.0 | 0.4 | 2.5 | 0.1 | 7.0 | 13.1 | 2.4 | 4.1 | 30.1 | 233.3 | 576.5 |
| BaP | 0.0 | 1.0 | 2.5 | 0.0 | 2.6 | 7.5 | 1.2 | 2.5 | 17.3 | 177.5 | 768.7 |
| Perylene | 0.1 | 0.5 | 0.8 | 0.3 | 1.5 | 2.9 | 0.0 | 0.6 | 6.2 | 58.4 | 160.5 |
| 7-methylbenzo(a)pyrene | 0.2 | 1.0 | 3.6 | 0.3 | 1.2 | 2.8 | 0.5 | 0.8 | 3.1 | 11.9 | 32.4 |
| 9,10-dihydrobenzo(a)pyrene-7(8H)-one | 0.0 | 0.2 | 0.7 | 0.0 | 0.8 | 1.6 | 0.0 | 0.0 | 0.3 | 1.0 | 4.2 |
| Dibenzo(a,j)anthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.4 | 0.0 | 0.0 | 1.3 | 9.8 | 21.9 |
| Indeno[123-cd]pyrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 1.8 | 0.0 | 0.0 | 13.4 | 205.3 | 726.9 |
| Dibenzo(ah+ac)anthracene | 0.0 | 0.2 | 0.9 | 0.0 | 1.5 | 3.4 | 0.0 | 0.0 | 2.2 | 14.6 | 21.9 |
| Benzo(b)chrysene | 0.0 | 0.0 | 0.2 | 0.0 | 0.4 | 1.2 | 0.0 | 0.0 | 1.7 | 6.1 | 10.3 |
| Picene | 0.1 | 0.4 | 1.2 | 0.1 | 0.3 | 0.6 | 0.0 | 0.0 | 1.7 | 11.3 | 17.3 |

## Appendix A1. Concentrations of Organic Species Normalized to Larger of Mean Field Blank Value or MDL - Round 1

| | Field Blanks | | | Dilution Blanks | | | All Vehicle Composites | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Min** | **Avg** | **Max** | **Min** | **Avg** | **Max** | **Min** | **10th%** | **50th%** | **90th%** | **Max** |
| Benzo(ghi)perylene | 0.0 | 1.0 | 5.8 | 0.0 | 1.0 | 3.0 | 2.0 | 8.4 | 31.3 | 518.6 | 1507.1 |
| Anthanthrene | 0.0 | 0.2 | 0.7 | 0.0 | 0.2 | 0.7 | 0.0 | 0.0 | 4.0 | 99.4 | 594.1 |
| Dibenzo(b,k)fluoranthene | 0.6 | 1.0 | 1.2 | 0.5 | 2.0 | 5.2 | 0.2 | 0.3 | 1.2 | 3.6 | 7.4 |
| Dibenzo(a,e)pyrene | 0.0 | 0.1 | 0.3 | 0.0 | 0.2 | 0.8 | 0.0 | 0.0 | 1.2 | 30.4 | 68.7 |
| Coronene | 0.0 | 0.5 | 2.2 | 0.2 | 0.7 | 1.4 | 1.8 | 4.8 | 19.1 | 446.9 | 1021.0 |
| Dibenzo(a,h)pyrene | 0.0 | 0.1 | 0.2 | 0.0 | 0.1 | 0.3 | 0.0 | 0.0 | 0.2 | 5.1 | 12.2 |
| **HOPANES by GC/MS** | | | | | | | | | | | |
| C27-tetracyclic terpane | 0.00 | 0.19 | 0.65 | 0.25 | 1.40 | 4.20 | 0.00 | 0.00 | 1.92 | 16.30 | 24.85 |
| C28-tetracyclic terpane | 0.00 | 0.66 | 1.50 | 0.60 | 1.76 | 3.55 | 0.00 | 0.00 | 1.98 | 10.45 | 13.30 |
| C28-tetracyclic terpane | 0.00 | 0.13 | 0.40 | 0.05 | 0.48 | 1.35 | 0.00 | 0.17 | 1.23 | 5.90 | 11.10 |
| 18a(H),21ß(H)-22,29,30-Trisnorhopane | 0.00 | 1.00 | 2.24 | 1.73 | 4.59 | 8.07 | 0.00 | 2.18 | 7.88 | 44.51 | 79.27 |
| 17a(H),18a(H),21ß(H)-25,28,30-Trisnorhopane | 0.00 | 0.00 | 0.00 | 1.75 | 3.34 | 4.95 | 0.00 | 0.00 | 7.55 | 44.23 | 82.45 |
| 17a(H),21ß(H)-22,29,30-Trisnorhopane | 0.00 | 0.03 | 0.15 | 0.25 | 0.44 | 0.85 | 0.00 | 0.00 | 0.65 | 6.93 | 9.50 |
| 17a(H),18a(H),21ß(H)-28,30-Bisnorhopane | 0.00 | 0.03 | 0.15 | 0.00 | 0.14 | 0.65 | 0.00 | 0.00 | 0.10 | 4.77 | 10.60 |
| 17a(H),21ß(H)-30-Norhopane | 0.58 | 1.00 | 1.91 | 2.75 | 6.54 | 12.50 | 2.41 | 4.01 | 18.24 | 125.48 | 233.56 |
| 18a(H),21ß(H)-30-Norneohopane | 0.00 | 0.01 | 0.05 | 0.00 | 0.16 | 0.35 | 0.00 | 0.00 | 0.72 | 3.85 | 6.95 |
| 17a(H),21ß(H)-Hopane | 0.36 | 1.00 | 2.72 | 2.17 | 5.44 | 12.08 | 0.63 | 2.68 | 18.35 | 120.33 | 267.78 |
| 17ß(H),21a(H)-hopane | 0.00 | 0.13 | 0.40 | 0.00 | 0.33 | 1.25 | 0.00 | 0.00 | 1.43 | 16.00 | 59.60 |
| 22S-17a(H),21ß(H)-30-Homohopane | 0.00 | 1.00 | 1.70 | 2.07 | 3.42 | 5.59 | 0.74 | 1.66 | 9.17 | 75.89 | 165.76 |
| 22R-17a(H),21ß(H)-30-Homohopane | 0.00 | 0.97 | 1.70 | 0.00 | 2.51 | 4.85 | 0.00 | 1.23 | 9.00 | 64.70 | 173.55 |
| 17ß(H),21ß(H)-Hopane | 0.00 | 0.17 | 0.40 | 0.00 | 0.75 | 2.15 | 0.00 | 0.00 | 2.35 | 23.17 | 57.00 |
| 22S-17a(H),21ß(H)-30,31-Bishomohopane | 0.00 | 0.15 | 0.90 | 0.00 | 1.48 | 3.55 | 0.00 | 0.13 | 6.35 | 65.75 | 133.25 |
| 22R-17a(H),21ß(H)-30,31-Bishomohopane | 0.00 | 0.28 | 1.10 | 0.00 | 1.48 | 2.75 | 0.00 | 0.45 | 3.67 | 36.53 | 91.20 |
| 22S-17a(H),21ß(H)-30,31,32-Trisomohopane | 0.00 | 0.24 | 1.45 | 0.00 | 1.08 | 2.35 | 0.00 | 1.03 | 3.25 | 37.28 | 80.00 |
| 22R-17a(H),21ß(H)-30,31,32-Trishomohopane | 0.00 | 0.05 | 0.15 | 0.00 | 0.67 | 1.80 | 0.00 | 0.00 | 2.53 | 24.60 | 50.70 |
| C27-tetracyclic terpane | 0.00 | 0.19 | 0.50 | 0.00 | 0.68 | 2.30 | 0.00 | 0.00 | 1.28 | 10.20 | 16.85 |
| **STERANES by GC/MS** | | | | | | | | | | | |
| C27-20S-13ß(H),17a(H)-diasterane | 0.00 | 0.32 | 0.50 | 1.85 | 2.64 | 4.25 | 0.00 | 0.65 | 2.83 | 17.05 | 29.75 |
| C27-20R-13ß(H),17a(H)-diasterane | 0.00 | 0.25 | 0.85 | 0.95 | 2.08 | 4.45 | 0.00 | 0.20 | 2.35 | 11.23 | 22.60 |
| C27-20S-13a(H),17ß(H)-diasterane | 0.00 | 0.07 | 0.25 | 0.35 | 0.81 | 2.35 | 0.00 | 0.20 | 0.93 | 5.03 | 7.55 |
| C27-20R-13a(H),17ß(H)-diasterane | 0.00 | 0.22 | 0.75 | 0.50 | 1.73 | 4.85 | 0.00 | 0.17 | 1.65 | 10.52 | 14.20 |
| C28-20S-13ß(H),17a(H)-diasterane | 0.00 | 0.15 | 0.50 | 0.00 | 0.87 | 3.25 | 0.00 | 0.00 | 0.52 | 6.82 | 10.25 |
| C29-20R-13a(H),17ß(H)-diasterane | 0.00 | 0.07 | 0.25 | 0.15 | 0.69 | 1.90 | 0.00 | 0.00 | 1.33 | 11.52 | 17.30 |
| C27-20S5a(H),14a(H)-cholestane | 0.00 | 0.23 | 0.90 | 0.25 | 1.12 | 3.60 | 0.00 | 0.00 | 0.98 | 9.33 | 13.90 |
| C27-20R5a(H),14ß(H)-cholestane | 0.05 | 0.38 | 0.75 | 1.70 | 3.17 | 6.15 | 0.00 | 0.72 | 4.55 | 27.87 | 33.65 |
| C27-20S5a(H),14ß(H),17ß(H)-cholestane | 0.00 | 0.26 | 0.80 | 0.85 | 1.77 | 4.25 | 0.00 | 0.32 | 2.45 | 14.00 | 17.30 |
| ster45+40(cholestane) | 0.33 | 1.00 | 2.65 | 1.56 | 4.01 | 10.58 | 0.00 | 0.97 | 5.57 | 28.30 | 34.68 |
| C28-20S5a(H),14a(H),17a(H)-ergostane | 0.00 | 0.04 | 0.25 | 0.00 | 0.22 | 0.95 | 0.00 | 0.00 | 0.50 | 3.53 | 5.05 |
| C28-20R5a(H),14ß(H),17ß(H)-ergostane | 0.00 | 0.61 | 1.15 | 0.15 | 0.93 | 2.85 | 0.00 | 0.00 | 0.58 | 5.95 | 8.40 |
| C28-20S5a(H),14ß(H),17ß(H)-ergostane | 0.00 | 0.23 | 0.90 | 0.10 | 0.93 | 2.95 | 0.00 | 0.00 | 1.05 | 8.73 | 13.95 |
| C28-20R5a(H),14a(H),17a(H)-ergostane | 0.00 | 0.19 | 0.75 | 0.30 | 0.92 | 3.10 | 0.00 | 0.00 | 1.23 | 8.15 | 11.45 |
| C29-20S5a(H),14a(H),17a(H)-stigmastane | 0.00 | 0.12 | 0.50 | 0.25 | 1.10 | 2.65 | 0.00 | 0.25 | 2.18 | 11.40 | 21.85 |
| C29-20R5a(H),14ß(H),17ß(H)-stigmastane | 0.00 | 0.15 | 0.45 | 0.15 | 1.38 | 3.15 | 0.00 | 0.33 | 3.15 | 18.38 | 33.70 |
| C29-20S5a(H),14ß(H),17ß(H)-stigmastane | 0.00 | 0.10 | 0.25 | 0.15 | 0.99 | 2.45 | 0.00 | 0.30 | 2.05 | 11.80 | 22.80 |
| C29-20R5a(H),14a(H),17a(H)-stigmastane | 0.00 | 0.13 | 0.45 | 0.15 | 1.28 | 3.40 | 0.00 | 0.17 | 2.37 | 12.05 | 25.50 |
| **ALKANES by GC/MS** | | | | | | | | | | | |
| Undecane | 0.1 | 1.0 | 2.0 | 0.2 | 1.3 | 2.6 | 0.1 | 0.2 | 0.8 | 3.8 | 11.4 |
| Dodecane | 0.4 | 1.0 | 2.1 | 0.1 | 0.6 | 1.3 | 0.0 | 0.1 | 0.5 | 1.6 | 12.2 |
| Tridecane | 0.3 | 1.0 | 2.7 | 0.3 | 1.4 | 2.3 | 0.0 | 0.0 | 0.9 | 4.4 | 24.7 |
| Norfarnesane | 0.4 | 1.0 | 1.7 | 1.0 | 3.7 | 10.2 | 0.2 | 0.9 | 2.8 | 10.0 | 28.7 |
| Heptylcyclohexane | 0.3 | 1.0 | 2.5 | 0.3 | 2.3 | 6.0 | 0.2 | 0.6 | 1.9 | 6.7 | 22.4 |
| Farnesane | 0.1 | 1.0 | 3.0 | 0.1 | 2.1 | 7.1 | 0.1 | 0.5 | 2.3 | 11.1 | 23.0 |
| Tetradecane | 0.2 | 1.0 | 2.8 | 0.2 | 1.0 | 3.8 | 0.0 | 0.1 | 0.9 | 2.7 | 4.1 |
| Octylcyclohexane | 0.2 | 1.0 | 2.3 | 0.2 | 1.1 | 3.1 | 0.0 | 0.3 | 0.8 | 3.3 | 10.4 |
| Pentadecane | 0.1 | 1.0 | 2.3 | 0.5 | 6.4 | 19.7 | 0.0 | 0.4 | 2.6 | 14.6 | 70.2 |
| Nonylcyclohexane | 0.0 | 1.0 | 3.5 | 0.2 | 0.7 | 1.4 | 0.0 | 0.2 | 1.1 | 2.2 | 4.4 |
| Hexadecane | 0.3 | 1.0 | 1.9 | 0.5 | 1.9 | 4.2 | 0.2 | 0.5 | 1.3 | 3.4 | 4.4 |
| Norpristane | 0.4 | 1.0 | 1.7 | 0.8 | 2.8 | 4.8 | 0.4 | 1.1 | 2.1 | 6.2 | 9.4 |
| Heptadecane | 0.7 | 1.0 | 1.7 | 0.6 | 3.3 | 6.0 | 0.1 | 0.8 | 2.0 | 7.1 | 18.1 |
| Decylcyclohexane | 0.1 | 1.0 | 3.5 | 0.4 | 2.5 | 7.0 | 0.0 | 0.2 | 1.0 | 5.4 | 8.7 |
| Heptadecane_Pristane | 0.1 | 1.0 | 2.1 | 0.7 | 5.0 | 8.6 | 0.1 | 0.9 | 4.9 | 15.7 | 25.9 |
| Undecylcyclohexane | 0.6 | 1.0 | 1.4 | 0.6 | 1.8 | 5.4 | 0.0 | 0.1 | 0.9 | 2.3 | 8.7 |
| Octadecane | 0.5 | 1.0 | 1.7 | 0.5 | 4.7 | 16.8 | 0.0 | 0.9 | 4.1 | 14.0 | 47.7 |
| Phytane | 0.4 | 1.0 | 1.6 | 1.5 | 7.3 | 17.1 | 0.8 | 2.1 | 6.6 | 34.3 | 84.3 |
| Dodecylcyclohexane | 0.1 | 1.0 | 1.9 | 2.8 | 5.9 | 12.2 | 0.4 | 1.3 | 3.0 | 14.3 | 52.6 |
| Nonadecane | 0.5 | 1.0 | 1.5 | 2.5 | 6.2 | 14.7 | 0.7 | 2.0 | 6.9 | 26.6 | 57.6 |
| Tridecylcyclohexane | 0.3 | 1.0 | 2.6 | 0.5 | 1.9 | 7.7 | 0.2 | 0.4 | 1.9 | 5.8 | 12.8 |
| Eicosane | 0.3 | 1.0 | 1.6 | 0.7 | 4.7 | 10.4 | 0.6 | 1.4 | 4.9 | 15.6 | 46.7 |
| Tetradecylcyclohexane | 0.7 | 0.9 | 1.3 | 3.9 | 11.2 | 24.0 | 1.3 | 3.3 | 8.8 | 40.4 | 113.1 |
| Heneicosane | 0.2 | 1.0 | 1.5 | 2.0 | 4.5 | 10.4 | 0.3 | 1.1 | 4.1 | 14.5 | 23.5 |
| Pentadecylcyclohexane | 0.1 | 1.0 | 3.6 | 0.2 | 0.7 | 1.6 | 0.1 | 0.2 | 0.5 | 1.2 | 2.0 |
| Docosane | 0.1 | 1.0 | 2.6 | 1.1 | 2.3 | 4.9 | 0.3 | 0.4 | 1.8 | 5.4 | 10.3 |

## Appendix A1. Concentrations of Organic Species Normalized to Larger of Mean Field Blank Value or MDL - Round 1

| | Field Blanks | | | Dilution Blanks | | | All Vehicle Composites | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Min** | **Avg** | **Max** | **Min** | **Avg** | **Max** | **Min** | **10th%** | **50th%** | **90th%** | **Max** |
| Hexadecylcyclohexane | 0.6 | 1.0 | 2.0 | 1.5 | 7.4 | 31.3 | 0.1 | 0.8 | 4.2 | 20.8 | 31.0 |
| Tricosane | 0.2 | 1.0 | 2.3 | 0.9 | 1.7 | 2.9 | 0.0 | 0.3 | 1.1 | 2.9 | 6.9 |
| Heptadecylcyclohexane | 0.1 | 1.0 | 2.9 | 0.5 | 1.7 | 4.7 | 0.0 | 0.1 | 0.8 | 3.1 | 7.6 |
| Octadecylcyclohexane | 0.1 | 1.0 | 3.1 | 0.2 | 1.2 | 3.1 | 0.1 | 0.1 | 0.3 | 1.5 | 4.5 |
| Tetracosane | 0.1 | 1.0 | 3.1 | 0.6 | 1.4 | 2.9 | 0.1 | 0.1 | 0.6 | 2.1 | 5.5 |
| Pentacosane | 0.1 | 1.0 | 3.1 | 0.5 | 1.5 | 3.8 | 0.1 | 0.1 | 0.5 | 2.9 | 6.5 |
| Nonadecylcyclohexane | 0.1 | 1.0 | 2.9 | 0.4 | 1.2 | 3.5 | 0.1 | 0.1 | 0.5 | 2.6 | 6.4 |
| Hexacosane | 0.1 | 1.0 | 3.2 | 0.4 | 1.3 | 3.6 | 0.0 | 0.1 | 0.4 | 2.4 | 5.4 |
| Eicosylcyclohexane | 0.2 | 0.5 | 1.1 | 0.4 | 1.2 | 3.6 | 0.0 | 0.4 | 2.8 | 17.7 | 164.0 |
| Heptacosane | 0.1 | 1.0 | 3.3 | 0.3 | 1.2 | 3.7 | 0.0 | 0.0 | 0.3 | 2.4 | 4.8 |
| Heneicosylcyclohexane | 0.1 | 0.8 | 2.2 | 0.4 | 2.5 | 7.2 | 0.3 | 0.9 | 3.2 | 25.4 | 51.0 |
| Octacosane | 0.0 | 1.0 | 3.5 | 0.4 | 1.4 | 3.8 | 0.0 | 0.0 | 0.5 | 2.7 | 8.1 |
| Nonacosane | 0.0 | 1.0 | 3.4 | 0.3 | 1.2 | 3.1 | 0.0 | 0.0 | 0.1 | 3.7 | 6.4 |
| Triacontane | 0.0 | 1.0 | 3.5 | 0.3 | 1.5 | 3.7 | 0.0 | 0.0 | 0.4 | 3.3 | 8.8 |
| Hentriacontane | 0.0 | 1.0 | 2.6 | 0.5 | 1.9 | 5.1 | 0.0 | 0.0 | 0.8 | 5.0 | 10.3 |
| Dotriacontane | 0.2 | 1.0 | 3.1 | 0.6 | 2.4 | 6.5 | 0.0 | 0.0 | 0.6 | 5.5 | 14.3 |
| Tritriacontane | 0.0 | 1.0 | 3.8 | 0.7 | 3.6 | 12.8 | 0.0 | 0.0 | 0.1 | 11.5 | 29.9 |
| Tetratriacontane | 0.1 | 1.0 | 3.4 | 0.8 | 3.5 | 12.1 | 0.0 | 0.0 | 0.0 | 9.1 | 28.4 |
| Pentatriacontane | 0.0 | 1.0 | 3.6 | 0.8 | 4.8 | 17.8 | 0.0 | 0.0 | 0.5 | 14.8 | 48.3 |
| Hexatriacontane | 0.0 | 1.0 | 3.3 | 0.7 | 5.4 | 22.9 | 0.0 | 0.0 | 0.0 | 18.6 | 53.6 |
| Heptatriacontane | 0.0 | 1.0 | 3.1 | 0.0 | 6.8 | 26.6 | 0.0 | 0.0 | 0.2 | 32.6 | 84.1 |
| Octatriacontane | 0.0 | 1.0 | 3.5 | 0.9 | 7.2 | 31.3 | 0.0 | 0.0 | 0.0 | 40.5 | 77.6 |
| Nonatriacontane | 0.0 | 0.8 | 2.7 | 0.0 | 19.7 | 116.5 | 0.0 | 0.0 | 0.0 | 16.0 | 701.7 |
| Tetracontane | 0.0 | 0.6 | 2.9 | 0.0 | 8.4 | 42.7 | 0.0 | 0.0 | 0.0 | 66.4 | 120.1 |
| **CARBONYLS by DNPH - HPLC/UV** | | | | | | | | | | | |
| formaldehyde | 0.0 | 1.0 | 3.8 | 33.4 | 107.8 | 251.3 | 9.8 | 66.5 | 305.5 | 1045.6 | 1321.1 |
| acetaldehyde | 0.2 | 1.0 | 2.3 | 0.2 | 1.4 | 3.6 | 0.0 | 0.9 | 4.8 | 11.8 | 13.3 |
| acetone | 0.1 | 1.0 | 2.2 | 0.2 | 1.2 | 2.7 | 0.0 | 0.0 | 1.6 | 3.0 | 3.5 |
| acrolein | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 9.2 | 19.6 |
| propionaldehyde | 0.0 | 1.0 | 2.7 | 5.0 | 8.1 | 11.7 | 1.3 | 5.7 | 18.5 | 52.3 | 62.7 |
| crotonaldehyde | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 2.0 | 0.0 | 0.0 | 4.0 | 24.6 | 44.4 |
| methyl ethyl ketone | 0.0 | 1.0 | 3.8 | 3.4 | 8.4 | 14.1 | 0.9 | 2.3 | 9.6 | 15.3 | 16.7 |
| Methacrolein | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 4.0 | 0.0 | 3.4 | 14.8 | 59.6 | 76.4 |
| butyraldehyde | 0.0 | 1.0 | 3.1 | 2.7 | 9.0 | 21.1 | 0.0 | 4.7 | 42.2 | 131.2 | 218.7 |
| benzaldehyde | 0.0 | 0.0 | 0.0 | 4.0 | 14.3 | 36.0 | 0.4 | 30.2 | 92.4 | 308.7 | 387.1 |
| glyoxal | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 4.8 | 0.0 | 0.0 | 1.6 | 10.2 | 16.0 |
| valeraldehyde | 0.0 | 0.3 | 1.6 | 0.8 | 3.3 | 6.0 | 0.4 | 0.6 | 2.4 | 7.2 | 12.0 |
| tolualdehyde | 0.0 | 0.3 | 1.6 | 1.6 | 7.9 | 20.0 | 0.4 | 17.4 | 53.6 | 191.9 | 241.5 |
| hexanal | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 | 12.0 | 0.0 | 0.0 | 3.8 | 22.6 | 34.4 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S0-1 | S0-2 | S0-3 | S0-4 | S0-5 | S0-6 | S1-1 | S1-2 | S2-1 | S2-2 | S2-3 | S2-4 | S3-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gravimetric mass (mg/mi) | 0.39 ± 0.07 | 0.53 ± 0.11 | 0.19 ± 0.05 | 0.24 ± 0.06 | 0.95 ± 0.16 | 0.70 ± 0.12 | 9.13 ± 1.46 | 81.73 ± 12.93 | 73.07 ± 11.56 | 20.11 ± 3.19 | 22.02 ± 3.49 | 76.16 ± 12.04 | 3.76 ± 0.61 |
| Carbon fractions by TOR (mg/mi) | | | | | | | | | | | | | |
| Organic Carbon Fraction 1 | 0.018 ± 0.010 | 0.002 ± 0.015 | 0.067 ± 0.020 | 0.073 ± 0.022 | 0.085 ± 0.028 | 0.068 ± 0.019 | 0.146 ± 0.104 | 5.721 ± 1.614 | 26.889 ± 9.418 | 3.293 ± 0.982 | 10.521 ± 2.688 | 4.681 ± 1.148 | 0.245 ± 0.087 |
| Organic Carbon Fraction 2 | 0.073 ± 0.019 | 0.050 ± 0.027 | 0.093 ± 0.024 | 0.098 ± 0.026 | 0.169 ± 0.040 | 0.207 ± 0.042 | 0.624 ± 0.158 | 11.741 ± 2.639 | 23.844 ± 4.481 | 2.957 ± 0.651 | 4.153 ± 0.840 | 7.440 ± 1.489 | 0.332 ± 0.074 |
| Organic Carbon Fraction 3 | 0.105 ± 0.040 | 0.066 ± 0.068 | 0.076 ± 0.045 | 0.093 ± 0.051 | 0.235 ± 0.074 | 0.236 ± 0.062 | 0.710 ± 0.335 | 4.985 ± 1.083 | 6.430 ± 1.642 | 3.662 ± 0.818 | 0.992 ± 0.314 | 9.719 ± 2.004 | 0.267 ± 0.154 |
| Organic Carbon Fraction 4 | 0.049 ± 0.016 | 0.015 ± 0.019 | 0.033 ± 0.015 | 0.029 ± 0.015 | 0.450 ± 0.161 | 0.077 ± 0.023 | 0.732 ± 0.240 | 2.753 ± 0.870 | 1.966 ± 0.542 | 1.416 ± 0.455 | 0.544 ± 0.185 | 6.344 ± 2.112 | 0.281 ± 0.075 |
| Pyrolyzed Organic Carbon | 0.010 ± 0.007 | 0.000 ± 0.011 | 0.000 ± 0.007 | 0.000 ± 0.008 | 0.001 ± 0.009 | 0.000 ± 0.007 | 0.064 ± 0.128 | 0.869 ± 0.247 | 0.004 ± 0.038 | 0.004 ± 0.036 | 0.001 ± 0.037 | 0.010 ± 0.036 | 0.009 ± 0.025 |
| Total Organic Carbon | 0.256 ± 0.065 | 0.129 ± 0.090 | 0.268 ± 0.074 | 0.293 ± 0.082 | 0.940 ± 0.197 | 0.588 ± 0.118 | 2.204 ± 0.501 | 26.070 ± 5.077 | 59.132 ± 10.130 | 11.332 ± 2.238 | 16.212 ± 3.036 | 28.193 ± 5.271 | 1.097 ± 0.245 |
| Elemental Carbon Fraction 1 | 0.025 ± 0.009 | 0.000 ± 0.008 | 0.005 ± 0.006 | 0.003 ± 0.006 | 0.162 ± 0.070 | 0.047 ± 0.015 | 0.539 ± 0.157 | 2.839 ± 0.973 | 1.955 ± 0.604 | 2.676 ± 0.958 | 0.619 ± 0.246 | 4.882 ± 1.647 | 0.394 ± 0.087 |
| Elemental Carbon Fraction 2 | 0.124 ± 0.026 | 0.020 ± 0.011 | 0.027 ± 0.008 | 0.028 ± 0.009 | 0.074 ± 0.017 | 0.089 ± 0.018 | 0.983 ± 0.382 | 15.778 ± 3.456 | 1.769 ± 0.725 | 3.840 ± 0.742 | 3.378 ± 0.675 | 20.854 ± 4.140 | 0.541 ± 0.155 |
| Elemental Carbon Fraction 3 | 0.016 ± 0.009 | 0.000 ± 0.003 | 0.000 ± 0.002 | 0.000 ± 0.002 | 0.000 ± 0.003 | 0.007 ± 0.004 | 0.061 ± 0.017 | 0.140 ± 0.060 | 0.791 ± 0.152 | 0.077 ± 0.045 | 0.037 ± 0.024 | 0.055 ± 0.033 | 0.008 ± 0.007 |
| Total Elemental Carbon | 0.154 ± 0.036 | 0.020 ± 0.014 | 0.031 ± 0.011 | 0.030 ± 0.011 | 0.235 ± 0.060 | 0.142 ± 0.030 | 1.516 ± 0.244 | 17.884 ± 4.524 | 4.510 ± 0.715 | 6.588 ± 1.483 | 4.030 ± 0.921 | 25.780 ± 5.804 | 0.933 ± 0.150 |
| Total Carbon | 0.410 ± 0.088 | 0.150 ± 0.096 | 0.298 ± 0.080 | 0.323 ± 0.088 | 1.175 ± 0.239 | 0.731 ± 0.141 | 3.719 ± 0.748 | 43.955 ± 8.031 | 63.645 ± 11.023 | 17.921 ± 3.386 | 20.238 ± 3.732 | 53.974 ± 9.734 | 2.030 ± 0.383 |
| Elements by XRF (mg/mi) | | | | | | | | | | | | | |
| Sodium (qualitative only) | 0.3761 ± 0.0303 | 0.0000 ± 0.0744 | 0.0736 ± 0.0413 | 0.0214 ± 0.0503 | 0.0760 ± 0.0444 | 0.0152 ± 0.0464 | 0.4612 ± 0.2117 | 0.2853 ± 0.4197 | 0.2533 ± 0.3213 | 0.4555 ± 0.1947 | 0.2630 ± 0.2848 | 0.3355 ± 0.2622 | 0.4438 ± 0.1306 |
| Magnesium (qualitative only) | 0.0062 ± 0.0045 | 0.0068 ± 0.0109 | 0.0042 ± 0.0072 | 0.0086 ± 0.0072 | 0.0000 ± 0.0103 | 0.0047 ± 0.0069 | 0.0498 ± 0.0373 | 0.0043 ± 0.0765 | 0.0071 ± 0.0488 | 0.0063 ± 0.0469 | 0.0334 ± 0.0418 | 0.0134 ± 0.0574 | 0.0445 ± 0.0197 |
| Aluminum | 0.0028 ± 0.0019 | 0.0010 ± 0.0058 | 0.0021 ± 0.0031 | 0.0020 ± 0.0036 | 0.0025 ± 0.0044 | 0.0078 ± 0.0035 | 0.0138 ± 0.0179 | 0.0014 ± 0.0464 | 0.0058 ± 0.0198 | 0.0053 ± 0.0203 | 0.0055 ± 0.0191 | 0.0000 ± 0.0471 | 0.0577 ± 0.0132 |
| Silicon | 0.0156 ± 0.0027 | 0.0163 ± 0.0034 | 0.0042 ± 0.0015 | 0.0129 ± 0.0025 | 0.0361 ± 0.0060 | 0.0417 ± 0.0068 | 1.3756 ± 0.2178 | 7.8762 ± 1.2456 | 0.1919 ± 0.0315 | 0.8379 ± 0.1329 | 0.1531 ± 0.0255 | 9.6254 ± 1.5221 | 0.2761 ± 0.0439 |
| Phosphorous | 0.0000 ± 0.0007 | 0.0000 ± 0.0017 | 0.0001 ± 0.0010 | 0.0008 ± 0.0010 | 0.0004 ± 0.0011 | 0.0000 ± 0.0011 | 0.0000 ± 0.0071 | 0.0035 ± 0.0329 | 0.2224 ± 0.0356 | 0.0068 ± 0.0068 | 0.1309 ± 0.0214 | 0.0083 ± 0.0139 | 0.0051 ± 0.0033 |
| Sulfur | 0.0178 ± 0.0029 | 0.0264 ± 0.0043 | 0.0102 ± 0.0017 | 0.0243 ± 0.0039 | 0.0281 ± 0.0045 | 0.0308 ± 0.0049 | 0.2942 ± 0.0467 | 5.0119 ± 0.7925 | 0.1804 ± 0.0288 | 0.1926 ± 0.0307 | 0.1866 ± 0.0298 | 0.9767 ± 0.1546 | 0.1660 ± 0.0263 |
| Chlorine | 0.0003 ± 0.0008 | 0.0000 ± 0.0018 | 0.0023 ± 0.0011 | 0.0006 ± 0.0013 | 0.0000 ± 0.0015 | 0.0003 ± 0.0012 | 0.0089 ± 0.0055 | 0.0458 ± 0.0813 | 0.0113 ± 0.0056 | 0.0170 ± 0.0057 | 0.0060 ± 0.0070 | 0.0095 ± 0.0163 | 0.0011 ± 0.0038 |
| Potassium | 0.0020 ± 0.0005 | 0.0024 ± 0.0010 | 0.0015 ± 0.0006 | 0.0024 ± 0.0007 | 0.0036 ± 0.0008 | 0.0045 ± 0.0009 | 0.0120 ± 0.0031 | 0.0029 ± 0.0036 | 0.0076 ± 0.0035 | 0.0048 ± 0.0032 | 0.0062 ± 0.0036 | 0.0079 ± 0.0035 | 0.0068 ± 0.0020 |
| Calcium | 0.0233 ± 0.0037 | 0.0221 ± 0.0037 | 0.0086 ± 0.0015 | 0.0190 ± 0.0031 | 0.0297 ± 0.0048 | 0.0404 ± 0.0064 | 0.1785 ± 0.0285 | 0.0367 ± 0.0068 | 0.5333 ± 0.0845 | 0.0582 ± 0.0098 | 0.4863 ± 0.0770 | 0.1270 ± 0.0204 | 0.0566 ± 0.0092 |
| Titanium | 0.0012 ± 0.0025 | 0.0013 ± 0.0055 | 0.0021 ± 0.0036 | 0.0022 ± 0.0040 | 0.0021 ± 0.0044 | 0.0031 ± 0.0035 | 0.0039 ± 0.0186 | 0.0084 ± 0.0211 | 0.0038 ± 0.0203 | 0.0083 ± 0.0190 | 0.0044 ± 0.0191 | 0.0085 ± 0.0198 | 0.0046 ± 0.0110 |
| Vanadium | 0.0004 ± 0.0011 | 0.0004 ± 0.0024 | 0.0008 ± 0.0015 | 0.0009 ± 0.0017 | 0.0006 ± 0.0019 | 0.0011 ± 0.0015 | 0.0009 ± 0.0087 | 0.0025 ± 0.0099 | 0.0015 ± 0.0087 | 0.0035 ± 0.0082 | 0.0014 ± 0.0095 | 0.0024 ± 0.0092 | 0.0022 ± 0.0052 |
| Chromium | 0.0001 ± 0.0002 | 0.0001 ± 0.0005 | 0.0001 ± 0.0003 | 0.0002 ± 0.0003 | 0.0003 ± 0.0004 | 0.0004 ± 0.0003 | 0.0010 ± 0.0019 | 0.0015 ± 0.0021 | 0.0007 ± 0.0016 | 0.0019 ± 0.0013 | 0.0003 ± 0.0023 | 0.0010 ± 0.0019 | 0.0037 ± 0.0013 |
| Manganese | 0.0011 ± 0.0002 | 0.0002 ± 0.0003 | 0.0002 ± 0.0002 | 0.0003 ± 0.0002 | 0.0004 ± 0.0002 | 0.0005 ± 0.0002 | 0.0013 ± 0.0009 | 0.0004 ± 0.0012 | 0.0001 ± 0.0010 | 0.0003 ± 0.0010 | 0.0000 ± 0.0012 | 0.0017 ± 0.0011 | 0.0010 ± 0.0006 |
| Iron | 0.0127 ± 0.0020 | 0.0055 ± 0.0011 | 0.0061 ± 0.0010 | 0.0087 ± 0.0014 | 0.0167 ± 0.0027 | 0.0234 ± 0.0037 | 0.0796 ± 0.0127 | 0.0306 ± 0.0053 | 0.0300 ± 0.0052 | 0.0246 ± 0.0044 | 0.0376 ± 0.0063 | 0.1504 ± 0.0239 | 0.0653 ± 0.0104 |
| Cobalt | 0.0001 ± 0.0002 | 0.0000 ± 0.0003 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0003 | 0.0001 ± 0.0003 | 0.0004 ± 0.0012 | 0.0001 ± 0.0010 | 0.0001 ± 0.0009 | 0.0001 ± 0.0009 | 0.0001 ± 0.0009 | 0.0005 ± 0.0020 | 0.0005 ± 0.0008 |
| Nickel | 0.0000 ± 0.0001 | 0.0001 ± 0.0002 | 0.0000 ± 0.0001 | 0.0001 ± 0.0002 | 0.0001 ± 0.0001 | 0.0001 ± 0.0001 | 0.0002 ± 0.0006 | 0.0006 ± 0.0007 | 0.0006 ± 0.0006 | 0.0002 ± 0.0007 | 0.0003 ± 0.0007 | 0.0006 ± 0.0007 | 0.0021 ± 0.0005 |
| Copper | 0.0006 ± 0.0001 | 0.0002 ± 0.0002 | 0.0002 ± 0.0001 | 0.0003 ± 0.0001 | 0.0007 ± 0.0002 | 0.0009 ± 0.0002 | 0.0010 ± 0.0006 | 0.0044 ± 0.0009 | 0.0041 ± 0.0010 | 0.0016 ± 0.0007 | 0.0025 ± 0.0007 | 0.0069 ± 0.0012 | 0.0060 ± 0.0010 |
| Zinc | 0.0045 ± 0.0010 | 0.0004 ± 0.0014 | 0.0003 ± 0.0009 | 0.0009 ± 0.0010 | 0.0033 ± 0.0012 | 0.0027 ± 0.0010 | 0.0133 ± 0.0049 | 0.0192 ± 0.0057 | 0.3394 ± 0.0539 | 0.0251 ± 0.0060 | 0.2395 ± 0.0382 | 0.0845 ± 0.0142 | 0.0174 ± 0.0038 |
| Gallium | 0.0003 ± 0.0003 | 0.0004 ± 0.0006 | 0.0002 ± 0.0004 | 0.0001 ± 0.0004 | 0.0001 ± 0.0005 | 0.0005 ± 0.0003 | 0.0009 ± 0.0018 | 0.0000 ± 0.0022 | 0.0000 ± 0.0023 | 0.0000 ± 0.0020 | 0.0034 ± 0.0017 | 0.0014 ± 0.0019 | 0.0004 ± 0.0012 |
| Arsenic | 0.0001 ± 0.0002 | 0.0000 ± 0.0005 | 0.0000 ± 0.0003 | 0.0000 ± 0.0004 | 0.0001 ± 0.0004 | 0.0001 ± 0.0003 | 0.0005 ± 0.0018 | 0.0003 ± 0.0020 | 0.0003 ± 0.0022 | 0.0001 ± 0.0018 | 0.0006 ± 0.0017 | 0.0000 ± 0.0018 | 0.0006 ± 0.0010 |
| Selenium | 0.0000 ± 0.0001 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0001 ± 0.0001 | 0.0000 ± 0.0008 | 0.0000 ± 0.0009 | 0.0000 ± 0.0009 | 0.0000 ± 0.0008 | 0.0002 ± 0.0008 | 0.0002 ± 0.0008 | 0.0000 ± 0.0005 |
| Bromine | 0.0001 ± 0.0001 | 0.0000 ± 0.0002 | 0.0001 ± 0.0001 | 0.0001 ± 0.0001 | 0.0001 ± 0.0002 | 0.0001 ± 0.0001 | 0.0015 ± 0.0006 | 0.0137 ± 0.0023 | 0.0003 ± 0.0008 | 0.0015 ± 0.0007 | 0.0008 ± 0.0006 | 0.0034 ± 0.0008 | 0.0037 ± 0.0007 |
| Rubidium | 0.0000 ± 0.0001 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0001 ± 0.0002 | 0.0001 ± 0.0002 | 0.0000 ± 0.0002 | 0.0004 ± 0.0008 | 0.0001 ± 0.0011 | 0.0003 ± 0.0010 | 0.0005 ± 0.0009 | 0.0002 ± 0.0008 | 0.0001 ± 0.0009 | 0.0003 ± 0.0005 |
| Strontium | 0.0001 ± 0.0001 | 0.0000 ± 0.0003 | 0.0000 ± 0.0002 | 0.0001 ± 0.0002 | 0.0001 ± 0.0002 | 0.0001 ± 0.0002 | 0.0003 ± 0.0010 | 0.0001 ± 0.0011 | 0.0000 ± 0.0011 | 0.0001 ± 0.0010 | 0.0001 ± 0.0009 | 0.0002 ± 0.0010 | 0.0001 ± 0.0006 |
| Yttrium | 0.0000 ± 0.0002 | 0.0001 ± 0.0004 | 0.0001 ± 0.0002 | 0.0000 ± 0.0003 | 0.0001 ± 0.0003 | 0.0001 ± 0.0002 | 0.0001 ± 0.0012 | 0.0002 ± 0.0015 | 0.0000 ± 0.0014 | 0.0004 ± 0.0013 | 0.0000 ± 0.0012 | 0.0002 ± 0.0013 | 0.0000 ± 0.0007 |
| Zirconium | 0.0001 ± 0.0002 | 0.0001 ± 0.0004 | 0.0001 ± 0.0003 | 0.0000 ± 0.0003 | 0.0002 ± 0.0003 | 0.0002 ± 0.0003 | 0.0003 ± 0.0014 | 0.0001 ± 0.0017 | 0.0000 ± 0.0016 | 0.0007 ± 0.0015 | 0.0004 ± 0.0014 | 0.0003 ± 0.0015 | 0.0014 ± 0.0008 |
| Molybdenum | 0.0001 ± 0.0003 | 0.0001 ± 0.0006 | 0.0001 ± 0.0004 | 0.0003 ± 0.0004 | 0.0003 ± 0.0005 | 0.0002 ± 0.0004 | 0.0002 ± 0.0020 | 0.0013 ± 0.0022 | 0.0059 ± 0.0023 | 0.0003 ± 0.0022 | 0.0005 ± 0.0020 | 0.0020 ± 0.0019 | 0.0000 ± 0.0012 |
| Palladium | 0.0000 ± 0.0004 | 0.0002 ± 0.0008 | 0.0000 ± 0.0005 | 0.0000 ± 0.0006 | 0.0000 ± 0.0006 | 0.0001 ± 0.0005 | 0.0000 ± 0.0027 | 0.0003 ± 0.0029 | 0.0000 ± 0.0029 | 0.0000 ± 0.0027 | 0.0000 ± 0.0026 | 0.0000 ± 0.0028 | 0.0002 ± 0.0015 |
| Silver | 0.0004 ± 0.0004 | 0.0000 ± 0.0010 | 0.0001 ± 0.0007 | 0.0001 ± 0.0007 | 0.0004 ± 0.0008 | 0.0004 ± 0.0007 | 0.0000 ± 0.0034 | 0.0029 ± 0.0036 | 0.0006 ± 0.0038 | 0.0011 ± 0.0036 | 0.0007 ± 0.0035 | 0.0010 ± 0.0037 | 0.0010 ± 0.0020 |
| Cadmium | 0.0005 ± 0.0004 | 0.0002 ± 0.0010 | 0.0004 ± 0.0006 | 0.0004 ± 0.0007 | 0.0003 ± 0.0008 | 0.0004 ± 0.0006 | 0.0013 ± 0.0033 | 0.0018 ± 0.0038 | 0.0007 ± 0.0037 | 0.0004 ± 0.0035 | 0.0023 ± 0.0034 | 0.0020 ± 0.0036 | 0.0010 ± 0.0020 |
| Indium | 0.0004 ± 0.0006 | 0.0000 ± 0.0012 | 0.0004 ± 0.0008 | 0.0002 ± 0.0009 | 0.0004 ± 0.0010 | 0.0001 ± 0.0008 | 0.0013 ± 0.0041 | 0.0013 ± 0.0046 | 0.0009 ± 0.0046 | 0.0000 ± 0.0043 | 0.0010 ± 0.0040 | 0.0044 ± 0.0045 | 0.0001 ± 0.0024 |
| Tin | 0.0002 ± 0.0009 | 0.0000 ± 0.0019 | 0.0013 ± 0.0011 | 0.0003 ± 0.0014 | 0.0000 ± 0.0015 | 0.0000 ± 0.0012 | 0.0015 ± 0.0062 | 0.0032 ± 0.0071 | 0.0000 ± 0.0069 | 0.0000 ± 0.0066 | 0.0018 ± 0.0063 | 0.0029 ± 0.0068 | 0.0005 ± 0.0036 |
| Antimony | 0.0002 ± 0.0009 | 0.0000 ± 0.0021 | 0.0007 ± 0.0013 | 0.0001 ± 0.0015 | 0.0000 ± 0.0016 | 0.0003 ± 0.0013 | 0.0056 ± 0.0064 | 0.0066 ± 0.0074 | 0.0014 ± 0.0078 | 0.0000 ± 0.0074 | 0.0000 ± 0.0069 | 0.0010 ± 0.0075 | 0.0020 ± 0.0041 |
| Barium | 0.0007 ± 0.0044 | 0.0022 ± 0.0097 | 0.0001 ± 0.0063 | 0.0000 ± 0.0071 | 0.0017 ± 0.0078 | 0.0000 ± 0.0061 | 0.0226 ± 0.0296 | 0.0000 ± 0.0369 | 0.0097 ± 0.0363 | 0.0013 ± 0.0339 | 0.0136 ± 0.0299 | 0.0045 ± 0.0346 | 0.0104 ± 0.0187 |
| Lanthanum | 0.0003 ± 0.0057 | 0.0010 ± 0.0127 | 0.0008 ± 0.0082 | 0.0047 ± 0.0093 | 0.0006 ± 0.0101 | 0.0013 ± 0.0080 | 0.0171 ± 0.0422 | 0.0295 ± 0.0486 | 0.0122 ± 0.0477 | 0.0071 ± 0.0443 | 0.0437 ± 0.0432 | 0.0335 ± 0.0454 | 0.0206 ± 0.0253 |
| Gold | 0.0002 ± 0.0003 | 0.0007 ± 0.0007 | 0.0002 ± 0.0004 | 0.0002 ± 0.0005 | 0.0006 ± 0.0005 | 0.0006 ± 0.0004 | 0.0009 ± 0.0023 | 0.0000 ± 0.0026 | 0.0000 ± 0.0096 | 0.0003 ± 0.0024 | 0.0019 ± 0.0063 | 0.0017 ± 0.0031 | 0.0008 ± 0.0014 |
| Mercury | 0.0000 ± 0.0002 | 0.0002 ± 0.0004 | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0001 ± 0.0003 | 0.0000 ± 0.0003 | 0.0000 ± 0.0014 | 0.0006 ± 0.0017 | 0.0000 ± 0.0016 | 0.0000 ± 0.0015 | 0.0000 ± 0.0014 | 0.0002 ± 0.0015 | 0.0000 ± 0.0008 |
| Thallium | 0.0001 ± 0.0002 | 0.0001 ± 0.0004 | 0.0001 ± 0.0002 | 0.0001 ± 0.0003 | 0.0000 ± 0.0003 | 0.0001 ± 0.0002 | 0.0001 ± 0.0013 | 0.0002 ± 0.0015 | 0.0001 ± 0.0015 | 0.0000 ± 0.0014 | 0.0000 ± 0.0013 | 0.0003 ± 0.0014 | 0.0000 ± 0.0008 |
| Lead | 0.0003 ± 0.0003 | 0.0003 ± 0.0007 | 0.0002 ± 0.0005 | 0.0002 ± 0.0005 | 0.0005 ± 0.0005 | 0.0006 ± 0.0004 | 0.0007 ± 0.0026 | 0.0012 ± 0.0029 | 0.0040 ± 0.0028 | 0.0016 ± 0.0027 | 0.0024 ± 0.0021 | 0.0036 ± 0.0022 | 0.0009 ± 0.0015 |
| Uranium | 0.0001 ± 0.0003 | 0.0001 ± 0.0006 | 0.0000 ± 0.0004 | 0.0000 ± 0.0005 | 0.0001 ± 0.0005 | 0.0001 ± 0.0004 | 0.0000 ± 0.0021 | 0.0000 ± 0.0025 | 0.0001 ± 0.0024 | 0.0004 ± 0.0022 | 0.0000 ± 0.0020 | 0.0003 ± 0.0022 | 0.0001 ± 0.0012 |
| Anions by IC (mg/mi) | | | | | | | | | | | | | |
| Nitrate Ion | 0.02 ± 0.00 | 0.01 ± 0.01 | 0.00 ± 0.00 | 0.01 ± 0.01 | 0.01 ± 0.01 | 0.01 ± 0.00 | 0.12 ± 0.03 | 0.04 ± 0.03 | 0.02 ± 0.03 | 0.05 ± 0.03 | 0.02 ± 0.03 | 0.02 ± 0.03 | 0.02 ± 0.01 |
| Sulfate Ion | 0.04 ± 0.01 | 0.05 ± 0.02 | 0.03 ± 0.01 | 0.06 ± 0.01 | 0.07 ± 0.01 | 0.07 ± 0.01 | 0.55 ± 0.06 | 11.80 ± 0.72 | 0.19 ± 0.05 | 0.38 ± 0.06 | 0.28 ± 0.05 | 1.72 ± 0.12 | 0.48 ± 0.03 |
| Polycyclic aromatic hydrocarbons (ug/mile) | | | | | | | | | | | | | |
| Naphthalene | 51.97 ± 13.99 | 30.34 ± 38.25 | 86.30 ± 18.33 | 63.24 ± 21.33 | 16.87 ± 27.34 | 72.77 ± 17.71 | 3668.07 ± 315.58 | 344.59 ± 121.20 | 6930.77 ± 562.74 | 3860.42 ± 331.21 | 5643.17 ± 465.49 | 10067.38 ± 805.41 | 1494.87 ± 125.73 |
| 2-methylnaphthalene | 11.79 ± 1.52 | 21.11 ± 3.75 | 42.88 ± 3.88 | 44.65 ± 4.17 | 32.83 ± 3.71 | 36.76 ± 3.42 | 9057.12 ± 719.74 | 10694.90 ± 849.77 | 22937.43 ± 1820.50 | 16855.38 ± 1338.17 | 3466.37 ± 276.58 | 33748.20 ± 2677.93 | 3058.24 ± 243.11 |
| 1-methylnaphthalene | 6.10 ± 0.71 | 10.67 ± 1.77 | 20.69 ± 1.68 | 21.72 ± 1.82 | 16.17 ± 1.68 | 17.49 ± 1.47 | 4128.15 ± 286.96 | 2909.88 ± 202.57 | 11646.48 ± 808.31 | 10901.23 ± 756.62 | 1721.31 ± 120.14 | 19453.82 ± 1349.76 | 1462.77 ± 101.72 |
| Biphenyl | 1.11 ± 0.54 | 4.69 ± 1.62 | 2.56 ± 0.70 | 2.61 ± 0.86 | 1.42 ± 1.13 | 1.91 ± 0.68 | 173.89 ± 12.15 | 1601.99 ± 101.76 | 143.47 ± 10.48 | 943.96 ± 60.20 | 156.34 ± 11.24 | 836.63 ± 53.53 | 64.37 ± 4.48 |
| 1+2ethylnaphthalene | 14.45 ± 4.10 | 13.09 ± 11.35 | 17.25 ± 5.13 | 21.59 ± 6.37 | 17.76 ± 8.29 | 7.80 ± 4.85 | 450.46 ± 50.54 | 1143.49 ± 103.49 | 2151.09 ± 183.89 | 1495.73 ± 130.64 | 228.92 ± 39.36 | 2848.04 ± 241.50 | 216.82 ± 21.66 |
| 2,6+2,7-dimethylnaphthalene | 4.11 ± 0.50 | 4.72 ± 0.99 | 10.48 ± 1.02 | 10.76 ± 1.08 | 6.05 ± 0.86 | 6.43 ± 0.71 | 398.51 ± 32.61 | 3866.59 ± 313.40 | 3056.97 ± 247.83 | 3394.15 ± 275.12 | 385.60 ± 31.59 | 7363.69 ± 596.57 | 321.83 ± 26.34 |
| 1,3+1,6+1,7dimethylnaphth | 6.45 ± 0.73 | 8.09 ± 1.37 | 13.88 ± 1.36 | 14.78 ± 1.49 | 9.88 ± 1.25 | 10.15 ± 1.07 | 825.00 ± 67.97 | 5103.07 ± 417.51 | 5014.37 ± 410.24 | 5527.81 ± 452.17 | 665.76 ± 55.00 | 12006.78 ± 981.57 | 518.14 ± 42.75 |
| 1,4+1,5+2,3-dimethylnaphth | 0.00 ± 0.28 | 0.00 ± 0.82 | 0.00 ± 0.35 | 0.62 ± 0.45 | 0.00 ± 0.58 | 0.00 ± 0.35 | 12.19 ± 2.08 | 1901.46 ± 222.34 | 1067.76 ± 124.94 | 1393.00 ± 162.92 | 172.71 ± 20.40 | 2799.25 ± 327.23 | 10.02 ± 1.65 |
| 1,2-dimethylnaphthalene | 0.64 ± 0.20 | 0.63 ± 0.52 | 1.45 ± 0.31 | 1.40 ± 0.34 | 0.94 ± 0.39 | 1.13 ± 0.27 | 151.52 ± 16.56 | 3042.99 ± 330.61 | 1343.09 ± 145.97 | 2365.94 ± 257.06 | 323.50 ± 35.24 | 5682.79 ± 617.33 | 63.76 ± 7.17 |
| 2-Methylbiphenyl | 179.69 ± 51.10 | 15.19 ± 140.98 | 85.19 ± 61.21 | 76.21 ± 75.59 | 37.70 ± 101.25 | 118.72 ± 61.22 | 0.00 ± 386.55 | 115.97 ± 427.81 | 0.00 ± 407.34 | 0.00 ± 398.85 | 0.00 ± 411.15 | 0.00 ± 442.46 | 188.74 ± 134.53 |
| 3-Methylbiphenyl | 56.70 ± 14.36 | 1.84 ± 40.13 | 28.07 ± 17.39 | 24.50 ± 21.48 | 12.93 ± 28.82 | 38.15 ± 17.35 | 13.96 ± 110.37 | 1221.95 ± 149.21 | 41.99 ± 116.55 | 338.35 ± 117.39 | 2.02 ± 117.43 | 477.88 ± 131.94 | 136.46 ± 39.32 |
| 4-Methylbiphenyl | 13.71 ± 4.27 | 0.55 ± 12.39 | 6.30 ± 5.32 | 5.63 ± 6.59 | 4.42 ± 8.89 | 13.83 ± 5.30 | 12.73 ± 34.07 | 510.81 ± 43.06 | 26.62 ± 35.96 | 153.00 ± 35.89 | 10.83 ± 36.26 | 211.29 ± 40.14 | 37.25 ± 11.80 |
| Dibenzofuran | 1.93 ± 0.16 | 0.81 ± 0.16 | 2.90 ± 0.24 | 2.42 ± 0.21 | 0.78 ± 0.12 | 0.82 ± 0.09 | 35.23 ± 2.61 | 403.69 ± 29.15 | 39.98 ± 2.96 | 47.76 ± 3.51 | 43.96 ± 3.24 | 156.12 ± 11.32 | 8.90 ± 0.70 |
| A-trimethylnaphthalene | 2.14 ± 0.18 | 1.75 ± 0.37 | 3.20 ± 0.24 | 2.96 ± 0.26 | 1.69 ± 0.27 | 1.96 ± 0.19 | 37.47 ± 2.30 | 3921.42 ± 210.70 | 209.19 ± 11.38 | 995.58 ± 53.57 | 81.53 ± 4.59 | 1070.32 ± 57.60 | 30.29 ± 1.72 |
| 1-ethyl-2-methylnaphthalene | 0.48 ± 0.13 | 0.79 ± 0.38 | 1.16 ± 0.18 | 1.40 ± 0.22 | 0.52 ± 0.27 | 0.51 ± 0.16 | 28.18 ± 1.74 | 1322.89 ± 63.72 | 63.76 ± 3.31 | 415.41 ± 20.09 | 28.37 ± 1.79 | 282.57 ± 13.72 | 14.74 ± 0.84 |
| B-trimethylnaphthalene | 0.85 ± 0.16 | 1.72 ± 0.44 | 1.16 ± 0.21 | 1.30 ± 0.25 | 1.28 ± 0.31 | 1.38 ± 0.22 | 23.14 ± 2.51 | 2454.01 ± 227.47 | 122.65 ± 11.59 | 653.79 ± 60.73 | 59.56 ± 5.79 | 694.72 ± 64.54 | 22.67 ± 2.21 |
| C-trimethylnaphthalene | 1.94 ± 0.22 | 1.48 ± 0.39 | 2.42 ± 0.27 | 1.93 ± 0.26 | 1.03 ± 0.27 | 1.09 ± 0.19 | 16.62 ± 1.75 | 2175.20 ± 179.32 | 94.60 ± 7.99 | 521.91 ± 43.13 | 48.74 ± 4.26 | 549.29 ± 45.41 | 15.99 ± 1.42 |
| 2-ethyl-1-methylnaphthalene | 0.07 ± 0.07 | 0.00 ± 0.19 | 2.15 ± 0.30 | 0.04 ± 0.10 | 0.03 ± 0.14 | 0.00 ± 0.08 | 0.55 ± 0.50 | 106.39 ± 12.82 | 5.72 ± 0.93 | 28.42 ± 3.53 | 4.02 ± 0.77 | 25.39 ± 3.19 | 0.71 ± 0.22 |
| E-trimethylnaphthalene | 1.59 ± 0.19 | 1.06 ± 0.35 | 1.81 ± 0.22 | 1.35 ± 0.22 | 0.64 ± 0.25 | 0.67 ± 0.16 | 7.90 ± 1.14 | 1086.34 ± 87.45 | 50.02 ± 4.22 | 270.10 ± 21.84 | 25.53 ± 2.35 | 312.17 ± 25.23 | 9.80 ± 0.90 |
| F-trimethylnaphthalene | 0.88 ± 0.11 | 0.89 ± 0.22 | 1.30 ± 0.15 | 0.89 ± 0.14 | 0.65 ± 0.15 | 0.55 ± 0.10 | 5.19 ± 0.67 | 1325.33 ± 103.59 | 44.36 ± 3.58 | 273.23 ± 21.42 | 23.73 ± 2.00 | 282.00 ± 22.11 | 6.51 ± 0.59 |
| 2,3,5+I-trimethylnaphthalene | 1.64 ± 0.30 | 1.17 ± 0.45 | 3.13 ± 0.52 | 1.73 ± 0.36 | 0.78 ± 0.32 | 0.60 ± 0.20 | 8.68 ± 1.78 | 1374.98 ± 201.59 | 49.34 ± 7.52 | 304.76 ± 44.87 | 25.89 ± 4.16 | 302.81 ± 44.61 | 9.18 ± 1.48 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S0-1 | S0-2 | S0-3 | S0-4 | S0-5 | S0-6 | S1-1 | S1-2 | S2-1 | S2-2 | S2-3 | S2-4 | S3-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4,5-trimethylnaphthalene | 0.41 ± 0.08 | 0.35 ± 0.20 | 0.46 ± 0.10 | 0.30 ± 0.11 | 0.22 ± 0.14 | 0.16 ± 0.09 | 1.16 ± 0.53 | 481.76 ± 41.74 | 17.09 ± 1.63 | 98.41 ± 8.59 | 6.04 ± 0.79 | 89.63 ± 7.84 | 2.09 ± 0.29 |
| J-trimethylnaphthalene | 0.00 ± 0.08 | 0.47 ± 0.25 | 0.05 ± 0.10 | 0.09 ± 0.12 | 0.19 ± 0.17 | 0.23 ± 0.11 | 3.84 ± 0.86 | 202.90 ± 28.12 | 14.37 ± 2.19 | 72.46 ± 10.12 | 6.37 ± 1.17 | 86.92 ± 12.14 | 0.29 ± 0.23 |
| 1,4,5-trimethylnaphthalene | 0.83 ± 0.07 | 0.27 ± 0.11 | 0.66 ± 0.07 | 0.52 ± 0.07 | 0.01 ± 0.07 | 0.01 ± 0.04 | 1.88 ± 0.26 | 241.81 ± 13.86 | 12.55 ± 0.77 | 71.36 ± 4.10 | 8.26 ± 0.55 | 56.66 ± 3.27 | 2.25 ± 0.18 |
| Acenaphthylene | 0.28 ± 0.17 | 1.73 ± 0.54 | 1.40 ± 0.26 | 1.41 ± 0.30 | 0.95 ± 0.37 | 2.16 ± 0.30 | 147.18 ± 10.78 | 70.56 ± 5.28 | 231.10 ± 16.86 | 592.56 ± 43.05 | 443.68 ± 32.26 | 834.99 ± 60.63 | 34.41 ± 2.75 |
| Acenaphthene | 3.23 ± 0.34 | 0.05 ± 0.55 | 0.33 ± 0.24 | 0.25 ± 0.30 | 0.01 ± 0.39 | 0.46 ± 0.24 | 57.53 ± 4.57 | 87.11 ± 6.70 | 30.66 ± 2.83 | 195.72 ± 14.44 | 41.65 ± 3.55 | 292.04 ± 21.42 | 6.99 ± 0.82 |
| Fluorene | 1.06 ± 0.26 | 0.17 ± 0.62 | 2.35 ± 0.41 | 0.69 ± 0.35 | 0.41 ± 0.45 | 0.81 ± 0.29 | 35.69 ± 4.62 | 514.66 ± 58.92 | 82.27 ± 9.78 | 504.84 ± 57.78 | 109.53 ± 12.85 | 429.36 ± 49.21 | 19.65 ± 2.41 |
| Dibenzothiophene | 0.37 ± 0.07 | 0.36 ± 0.14 | 0.47 ± 0.08 | 0.35 ± 0.08 | 0.16 ± 0.10 | 0.15 ± 0.06 | 1.03 ± 0.33 | 3.34 ± 0.51 | 4.90 ± 0.62 | 10.22 ± 1.10 | 8.47 ± 0.94 | 12.76 ± 1.36 | 3.09 ± 0.37 |
| Phenanthrene | 3.19 ± 0.25 | 4.63 ± 0.66 | 5.72 ± 0.35 | 5.60 ± 0.40 | 3.83 ± 0.48 | 4.61 ± 0.32 | 94.47 ± 3.87 | 1074.76 ± 37.94 | 145.91 ± 5.58 | 661.48 ± 23.44 | 281.34 ± 10.20 | 660.84 ± 23.46 | 58.37 ± 2.20 |
| Anthracene | 0.00 ± 0.04 | 0.13 ± 0.12 | 0.00 ± 0.05 | 0.03 ± 0.06 | 0.25 ± 0.09 | 0.30 ± 0.06 | 9.54 ± 1.03 | 373.63 ± 37.72 | 28.61 ± 2.93 | 181.91 ± 18.38 | 47.82 ± 4.87 | 136.44 ± 13.80 | 1.65 ± 0.22 |
| A-methylfluorene | 0.87 ± 0.12 | 0.77 ± 0.26 | 0.61 ± 0.12 | 1.21 ± 0.17 | 0.86 ± 0.20 | 0.83 ± 0.13 | 12.97 ± 1.23 | 523.22 ± 39.37 | 49.86 ± 3.89 | 296.78 ± 22.37 | 31.85 ± 2.57 | 150.68 ± 11.43 | 8.67 ± 0.74 |
| 1-methylfluorene | 0.82 ± 0.14 | 0.69 ± 0.23 | 1.22 ± 0.20 | 1.04 ± 0.19 | 0.74 ± 0.19 | 0.59 ± 0.13 | 15.75 ± 2.18 | 213.44 ± 27.33 | 34.94 ± 4.60 | 174.93 ± 22.42 | 26.53 ± 3.54 | 94.65 ± 12.21 | 8.06 ± 1.11 |
| B-methylfluorene | 0.17 ± 0.05 | 0.18 ± 0.13 | 0.05 ± 0.05 | 0.25 ± 0.09 | 0.22 ± 0.10 | 0.17 ± 0.07 | 2.37 ± 0.52 | 22.12 ± 3.90 | 13.13 ± 2.34 | 74.64 ± 12.97 | 9.87 ± 1.78 | 35.26 ± 6.17 | 1.97 ± 0.40 |
| 9-fluorenone | 0.06 ± 0.05 | 0.13 ± 0.13 | 0.24 ± 0.07 | 0.73 ± 0.11 | 0.26 ± 0.10 | 0.08 ± 0.06 | 9.59 ± 1.05 | 62.66 ± 6.26 | 11.94 ± 1.27 | 85.28 ± 8.48 | 6.57 ± 0.77 | 25.07 ± 2.56 | 10.85 ± 1.12 |
| Xanthone | 0.03 ± 0.08 | 0.00 ± 0.20 | 0.14 ± 0.12 | 0.27 ± 0.17 | 0.01 ± 0.15 | 0.02 ± 0.09 | 0.00 ± 0.52 | 6.25 ± 2.37 | 0.00 ± 0.54 | 1.87 ± 1.00 | 0.00 ± 0.55 | 0.00 ± 0.54 | 0.05 ± 0.21 |
| Acenaphthenequinone | 0.18 ± 0.07 | 0.00 ± 0.12 | 0.28 ± 0.10 | 0.45 ± 0.15 | 0.16 ± 0.12 | 0.02 ± 0.06 | 0.68 ± 0.39 | 16.69 ± 4.45 | 0.19 ± 0.32 | 8.25 ± 2.27 | 1.11 ± 0.49 | 9.27 ± 2.54 | 0.76 ± 0.27 |
| Perinaphthenone | 0.05 ± 0.10 | 0.00 ± 0.28 | 0.27 ± 0.15 | 0.26 ± 0.17 | 0.50 ± 0.25 | 0.29 ± 0.16 | 1.71 ± 0.93 | 5.43 ± 1.63 | 1.83 ± 0.98 | 4.44 ± 1.40 | 1.49 ± 0.95 | 6.59 ± 1.87 | 0.08 ± 0.27 |
| 2-methylanthracene | 0.36 ± 0.09 | 0.66 ± 0.19 | 1.70 ± 0.34 | 1.53 ± 0.31 | 0.49 ± 0.13 | 0.50 ± 0.12 | 3.57 ± 0.73 | 89.95 ± 16.61 | 20.52 ± 3.84 | 134.83 ± 24.86 | 11.65 ± 2.21 | 38.87 ± 7.22 | 4.42 ± 0.86 |
| 3-methylphenanthrene | 0.66 ± 0.07 | 1.03 ± 0.16 | 1.19 ± 0.10 | 1.33 ± 0.12 | 0.96 ± 0.12 | 0.87 ± 0.08 | 8.94 ± 0.65 | 260.33 ± 15.57 | 33.02 ± 2.04 | 153.84 ± 9.22 | 25.86 ± 1.62 | 79.91 ± 4.82 | 8.02 ± 0.54 |
| 2-methylphenanthrene | 0.81 ± 0.10 | 1.26 ± 0.23 | 1.50 ± 0.16 | 1.64 ± 0.18 | 1.19 ± 0.18 | 1.09 ± 0.13 | 10.38 ± 1.02 | 264.64 ± 21.52 | 37.29 ± 3.15 | 157.03 ± 12.81 | 31.23 ± 2.67 | 85.02 ± 7.01 | 9.29 ± 0.82 |
| 9-methylphenanthrene | 0.43 ± 0.10 | 0.65 ± 0.20 | 0.69 ± 0.15 | 0.65 ± 0.15 | 0.49 ± 0.14 | 0.50 ± 0.11 | 3.81 ± 0.76 | 189.08 ± 31.14 | 22.22 ± 3.75 | 125.26 ± 20.66 | 17.38 ± 2.96 | 65.07 ± 10.79 | 3.40 ± 0.62 |
| 1-methylphenanthrene | 0.38 ± 0.09 | 0.55 ± 0.19 | 0.66 ± 0.14 | 0.97 ± 0.19 | 0.48 ± 0.14 | 0.50 ± 0.11 | 4.70 ± 0.88 | 96.51 ± 14.99 | 17.55 ± 2.83 | 64.91 ± 10.11 | 13.57 ± 2.23 | 33.78 ± 5.34 | 3.85 ± 0.67 |
| Anthrone | 0.19 ± 0.08 | 0.08 ± 0.11 | 0.20 ± 0.09 | 0.18 ± 0.09 | 0.06 ± 0.08 | 0.00 ± 0.04 | 0.00 ± 0.19 | 13.08 ± 4.02 | 0.35 ± 0.25 | 4.85 ± 1.53 | 1.77 ± 0.62 | 3.30 ± 1.08 | 0.08 ± 0.10 |
| Anthraquinone | 0.00 ± 0.04 | 0.09 ± 0.13 | 0.04 ± 0.06 | 0.08 ± 0.07 | 0.50 ± 0.17 | 0.31 ± 0.10 | 0.00 ± 0.28 | 0.03 ± 0.32 | 0.00 ± 0.29 | 0.25 ± 0.32 | 0.00 ± 0.29 | 0.00 ± 0.32 | 0.00 ± 0.11 |
| 3,6-dimethylphenanthrene | 0.38 ± 0.32 | 1.05 ± 0.93 | 0.58 ± 0.40 | 0.34 ± 0.49 | 0.80 ± 0.67 | 0.00 ± 0.38 | 0.00 ± 2.47 | 38.48 ± 5.21 | 3.06 ± 2.67 | 21.41 ± 3.64 | 2.33 ± 2.68 | 14.05 ± 3.37 | 0.75 ± 0.86 |
| A-dimethylphenanthrene | 0.14 ± 0.05 | 0.47 ± 0.16 | 0.32 ± 0.09 | 0.38 ± 0.11 | 0.33 ± 0.10 | 0.27 ± 0.08 | 1.30 ± 0.34 | 57.99 ± 11.98 | 7.50 ± 1.60 | 31.61 ± 6.54 | 4.62 ± 1.00 | 15.93 ± 3.33 | 1.44 ± 0.34 |
| B-dimethylphenanthrene | 0.09 ± 0.03 | 0.30 ± 0.08 | 0.17 ± 0.04 | 0.21 ± 0.05 | 0.18 ± 0.06 | 0.16 ± 0.04 | 0.87 ± 0.14 | 28.12 ± 1.83 | 3.54 ± 0.27 | 14.42 ± 0.95 | 2.26 ± 0.21 | 7.45 ± 0.51 | 0.81 ± 0.10 |
| C-dimethylphenanthrene | 0.33 ± 0.05 | 0.93 ± 0.14 | 0.58 ± 0.07 | 0.74 ± 0.09 | 0.50 ± 0.08 | 0.45 ± 0.06 | 1.70 ± 0.24 | 98.17 ± 8.16 | 14.00 ± 1.21 | 59.41 ± 4.95 | 7.66 ± 0.69 | 30.94 ± 2.60 | 2.17 ± 0.23 |
| D-dimethylphenanthrene | 0.10 ± 0.03 | 0.29 ± 0.10 | 0.19 ± 0.05 | 0.27 ± 0.06 | 0.17 ± 0.06 | 0.14 ± 0.04 | 0.60 ± 0.16 | 18.27 ± 2.61 | 3.01 ± 0.46 | 9.93 ± 1.43 | 2.16 ± 0.35 | 5.70 ± 0.83 | 0.68 ± 0.14 |
| 1,7-dimethylphenanthrene | 0.16 ± 0.04 | 0.52 ± 0.11 | 0.34 ± 0.05 | 0.40 ± 0.07 | 0.30 ± 0.07 | 0.28 ± 0.05 | 1.18 ± 0.18 | 65.31 ± 6.37 | 8.69 ± 0.87 | 42.11 ± 4.11 | 4.80 ± 0.51 | 20.09 ± 1.98 | 1.19 ± 0.16 |
| E-dimethylphenanthrene | 0.10 ± 0.04 | 0.40 ± 0.13 | 0.24 ± 0.07 | 0.25 ± 0.07 | 0.22 ± 0.08 | 0.19 ± 0.06 | 0.62 ± 0.19 | 35.47 ± 6.88 | 4.37 ± 0.88 | 19.42 ± 3.78 | 2.84 ± 0.59 | 10.46 ± 2.05 | 0.76 ± 0.19 |
| 9-methylanthracene | 0.32 ± 0.11 | 0.06 ± 0.17 | 0.49 ± 0.15 | 1.13 ± 0.30 | 0.00 ± 0.12 | 0.05 ± 0.08 | 0.21 ± 0.45 | 6.53 ± 1.65 | 1.75 ± 0.65 | 10.12 ± 2.45 | 0.98 ± 0.55 | 3.08 ± 0.93 | 0.73 ± 0.27 |
| Fluoranthene | 0.77 ± 0.18 | 6.11 ± 0.64 | 2.05 ± 0.25 | 2.41 ± 0.31 | 1.88 ± 0.38 | 2.57 ± 0.27 | 18.31 ± 1.69 | 277.25 ± 14.80 | 26.31 ± 2.03 | 111.82 ± 6.15 | 71.84 ± 4.13 | 182.01 ± 9.82 | 5.91 ± 0.61 |
| Pyrene | 0.89 ± 0.27 | 12.31 ± 1.57 | 2.69 ± 0.44 | 2.84 ± 0.51 | 2.40 ± 0.59 | 3.72 ± 0.52 | 19.66 ± 2.97 | 450.29 ± 47.23 | 24.33 ± 3.43 | 140.35 ± 15.00 | 62.84 ± 7.10 | 272.01 ± 28.71 | 5.89 ± 0.98 |
| 9-Anthraaldehyde | 0.00 ± 0.03 | 0.01 ± 0.08 | 0.17 ± 0.06 | 0.03 ± 0.04 | 0.03 ± 0.06 | 0.03 ± 0.04 | 0.00 ± 0.14 | 5.43 ± 1.20 | 1.21 ± 0.34 | 7.44 ± 1.61 | 0.54 ± 0.23 | 1.95 ± 0.50 | 0.03 ± 0.08 |
| Retene | 0.00 ± 0.04 | 0.00 ± 0.11 | 0.00 ± 0.05 | 0.01 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.05 | 0.01 ± 0.18 | 0.15 ± 0.20 | 0.01 ± 0.19 | 0.02 ± 0.18 | 0.00 ± 0.19 | 0.02 ± 0.20 | 0.00 ± 0.10 |
| Benzonaphthothiophene | 0.02 ± 0.05 | 0.10 ± 0.16 | 0.07 ± 0.07 | 0.07 ± 0.08 | 0.05 ± 0.11 | 0.06 ± 0.07 | 0.03 ± 0.25 | 0.70 ± 0.31 | 0.18 ± 0.27 | 0.43 ± 0.28 | 0.40 ± 0.29 | 0.43 ± 0.31 | 0.02 ± 0.14 |
| 1+3-methylfluoranthene | 0.06 ± 0.04 | 0.25 ± 0.13 | 0.07 ± 0.04 | 0.15 ± 0.07 | 0.18 ± 0.09 | 0.31 ± 0.11 | 0.32 ± 0.18 | 26.55 ± 7.96 | 4.70 ± 1.45 | 13.32 ± 4.01 | 1.73 ± 0.57 | 8.01 ± 2.43 | 0.23 ± 0.12 |
| 1-MeFl+C-MeFl/Py | 0.16 ± 0.04 | 0.71 ± 0.13 | 0.28 ± 0.05 | 0.45 ± 0.07 | 0.52 ± 0.09 | 0.37 ± 0.06 | 0.84 ± 0.17 | 16.94 ± 1.83 | 3.01 ± 0.36 | 9.82 ± 1.07 | 3.28 ± 0.39 | 5.92 ± 0.67 | 0.15 ± 0.08 |
| B-MePy/MeFl | 0.05 ± 0.04 | 0.83 ± 0.22 | 0.37 ± 0.10 | 0.43 ± 0.11 | 0.39 ± 0.12 | 0.43 ± 0.10 | 0.80 ± 0.33 | 26.43 ± 4.73 | 4.49 ± 0.89 | 13.22 ± 2.40 | 3.91 ± 0.79 | 7.93 ± 1.49 | 0.37 ± 0.15 |
| C-MePy/MeFl | 0.02 ± 0.03 | 0.73 ± 0.13 | 0.29 ± 0.05 | 0.38 ± 0.06 | 0.38 ± 0.07 | 0.39 ± 0.06 | 0.61 ± 0.17 | 22.17 ± 2.22 | 3.73 ± 0.42 | 10.60 ± 1.09 | 3.49 ± 0.39 | 6.85 ± 0.72 | 0.30 ± 0.09 |
| D-MePy/MeFl | 0.09 ± 0.03 | 0.69 ± 0.10 | 0.34 ± 0.04 | 0.40 ± 0.05 | 0.35 ± 0.06 | 0.38 ± 0.04 | 0.41 ± 0.17 | 13.82 ± 0.62 | 2.05 ± 0.20 | 7.30 ± 0.36 | 2.29 ± 0.20 | 5.47 ± 0.31 | 0.32 ± 0.08 |
| 4-methylpyrene | 0.11 ± 0.04 | 0.72 ± 0.19 | 0.34 ± 0.08 | 0.38 ± 0.09 | 0.28 ± 0.09 | 0.31 ± 0.08 | 0.37 ± 0.19 | 12.71 ± 2.30 | 1.78 ± 0.40 | 5.96 ± 1.11 | 1.70 ± 0.38 | 6.88 ± 1.27 | 0.31 ± 0.12 |
| 1-methylpyrene | 0.00 ± 0.05 | 0.92 ± 0.50 | 0.52 ± 0.26 | 0.67 ± 0.33 | 0.75 ± 0.39 | 0.26 ± 0.15 | 0.02 ± 0.41 | 11.26 ± 4.99 | 0.49 ± 0.55 | 3.14 ± 1.54 | 1.36 ± 0.84 | 3.89 ± 1.88 | 1.11 ± 0.57 |
| Benzo(c)phenanthrene | 0.02 ± 0.03 | 0.51 ± 0.12 | 0.24 ± 0.05 | 0.38 ± 0.08 | 0.28 ± 0.07 | 0.29 ± 0.06 | 0.11 ± 0.13 | 5.79 ± 0.82 | 0.71 ± 0.19 | 2.57 ± 0.40 | 2.04 ± 0.33 | 3.36 ± 0.51 | 0.09 ± 0.08 |
| Benzo(ghi)fluoranthene | 0.37 ± 0.36 | 11.70 ± 2.10 | 3.08 ± 0.67 | 3.40 ± 0.78 | 3.82 ± 0.96 | 4.91 ± 0.87 | 2.90 ± 2.92 | 109.92 ± 16.62 | 5.76 ± 3.20 | 27.54 ± 5.22 | 21.68 ± 4.60 | 79.87 ± 12.39 | 0.94 ± 1.00 |
| Cyclopenta(c,d)pyrene | 0.00 ± 0.04 | 0.59 ± 0.21 | 0.25 ± 0.09 | 0.29 ± 0.10 | 0.31 ± 0.13 | 0.31 ± 0.10 | 2.02 ± 0.60 | 128.03 ± 26.34 | 3.94 ± 0.98 | 27.42 ± 5.74 | 11.99 ± 2.60 | 50.35 ± 10.45 | 0.01 ± 0.12 |
| Benz(a)anthracene | 0.10 ± 0.08 | 0.86 ± 0.31 | 0.85 ± 0.19 | 0.81 ± 0.20 | 0.86 ± 0.24 | 0.88 ± 0.19 | 0.89 ± 0.46 | 24.18 ± 4.09 | 3.54 ± 0.79 | 12.29 ± 2.14 | 8.57 ± 1.55 | 10.58 ± 1.89 | 0.25 ± 0.23 |
| Triphenylene | 0.13 ± 0.04 | 0.31 ± 0.10 | 0.61 ± 0.11 | 0.54 ± 0.11 | 0.96 ± 0.17 | 0.99 ± 0.16 | 0.28 ± 0.15 | 9.81 ± 1.56 | 1.23 ± 0.26 | 4.75 ± 0.78 | 4.92 ± 0.81 | 5.42 ± 0.89 | 0.11 ± 0.08 |
| Chrysene | 0.09 ± 0.05 | 1.06 ± 0.21 | 0.67 ± 0.11 | 0.92 ± 0.14 | 0.81 ± 0.15 | 1.15 ± 0.15 | 0.31 ± 0.25 | 9.61 ± 1.23 | 1.14 ± 0.31 | 4.88 ± 0.68 | 4.77 ± 0.67 | 4.59 ± 0.67 | 0.37 ± 0.13 |
| Benzanthrone | 0.10 ± 0.03 | 0.58 ± 0.10 | 0.55 ± 0.07 | 0.96 ± 0.11 | 1.04 ± 0.13 | 0.94 ± 0.11 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.34 ± 0.09 |
| 7-methylbenz(a)anthracene | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.04 | 0.02 ± 0.05 | 0.01 ± 0.06 | 0.00 ± 0.04 | 0.00 ± 0.15 | 0.29 ± 0.22 | 0.00 ± 0.16 | 0.30 ± 0.21 | 0.00 ± 0.16 | 0.00 ± 0.17 | 0.00 ± 0.08 |
| 3-methylchrysene | 0.01 ± 0.03 | 0.08 ± 0.08 | 0.14 ± 0.04 | 0.15 ± 0.05 | 0.11 ± 0.06 | 0.10 ± 0.04 | 0.15 ± 0.13 | 4.96 ± 0.72 | 1.15 ± 0.21 | 3.44 ± 0.51 | 1.36 ± 0.24 | 1.63 ± 0.27 | 0.05 ± 0.07 |
| Benz(a)anthracene-7,12-dione | 0.04 ± 0.03 | 0.19 ± 0.08 | 0.00 ± 0.03 | 0.31 ± 0.05 | 0.45 ± 0.06 | 0.30 ± 0.04 | 0.14 ± 0.13 | 4.99 ± 0.30 | 0.19 ± 0.13 | 2.35 ± 0.18 | 0.00 ± 0.13 | 1.12 ± 0.16 | 0.24 ± 0.08 |
| 5+6-methylchrysene | 0.00 ± 0.03 | 0.03 ± 0.09 | 0.00 ± 0.04 | 0.07 ± 0.06 | 0.07 ± 0.08 | 0.00 ± 0.03 | 0.00 ± 0.13 | 1.06 ± 0.57 | 0.12 ± 0.19 | 0.77 ± 0.43 | 0.11 ± 0.18 | 0.18 ± 0.21 | 0.00 ± 0.07 |
| Benzo(b+j+k)fluoranthene | 1.34 ± 0.43 | 0.74 ± 1.09 | 1.82 ± 0.54 | 1.95 ± 0.65 | 1.03 ± 0.80 | 0.30 ± 0.46 | 1.17 ± 2.96 | 71.70 ± 9.35 | 5.92 ± 3.28 | 24.79 ± 4.51 | 21.83 ± 4.34 | 134.84 ± 16.38 | 1.22 ± 1.04 |
| Benzo(a)fluoranthene | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.02 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.03 | 0.62 ± 0.24 | 3.04 ± 0.87 | 0.57 ± 0.23 | 2.32 ± 0.67 | 1.65 ± 0.50 | 1.13 ± 0.37 | 0.09 ± 0.08 |
| BeP | 0.00 ± 0.04 | 0.18 ± 0.12 | 0.27 ± 0.06 | 0.22 ± 0.07 | 0.48 ± 0.10 | 0.38 ± 0.07 | 0.82 ± 0.28 | 48.73 ± 5.55 | 2.65 ± 0.45 | 15.91 ± 1.89 | 7.86 ± 1.00 | 26.32 ± 3.05 | 0.33 ± 0.12 |
| BaP | 0.00 ± 0.08 | 0.52 ± 0.29 | 0.01 ± 0.11 | 0.01 ± 0.13 | 0.09 ± 0.18 | 0.07 ± 0.11 | 0.93 ± 0.49 | 40.15 ± 7.54 | 3.77 ± 0.90 | 11.11 ± 2.19 | 7.76 ± 1.59 | 21.20 ± 4.05 | 0.12 ± 0.24 |
| Perylene | 0.01 ± 0.03 | 0.00 ± 0.08 | 0.02 ± 0.04 | 0.09 ± 0.07 | 0.09 ± 0.08 | 0.02 ± 0.04 | 0.00 ± 0.13 | 10.82 ± 4.31 | 0.74 ± 0.39 | 3.07 ± 1.29 | 1.70 ± 0.77 | 14.71 ± 5.84 | 0.00 ± 0.07 |
| 7-methylbenzo(a)pyrene | 0.45 ± 0.36 | 0.00 ± 0.95 | 0.32 ± 0.43 | 0.20 ± 0.52 | 0.00 ± 0.68 | 0.00 ± 0.41 | 5.95 ± 3.05 | 14.61 ± 4.39 | 4.82 ± 3.08 | 12.19 ± 3.90 | 4.52 ± 3.08 | 60.02 ± 12.58 | 1.55 ± 1.00 |
| 9,10-dihydrobenzo(a)pyrene-7(8H)-one | 0.02 ± 0.03 | 0.09 ± 0.10 | 0.00 ± 0.03 | 0.00 ± 0.04 | 0.07 ± 0.07 | 0.00 ± 0.03 | 0.00 ± 0.13 | 0.07 ± 0.16 | 0.00 ± 0.13 | 0.05 ± 0.14 | 0.00 ± 0.14 | 0.89 ± 0.46 | 0.03 ± 0.08 |
| Dibenzo(a,j)anthracene | 0.00 ± 0.03 | 0.02 ± 0.08 | 0.00 ± 0.03 | 0.00 ± 0.04 | 0.01 ± 0.06 | 0.01 ± 0.03 | 0.00 ± 0.13 | 1.93 ± 0.22 | 0.00 ± 0.13 | 0.68 ± 0.15 | 0.18 ± 0.13 | 0.38 ± 0.15 | 0.02 ± 0.07 |
| Indeno[123-cd]pyrene | 0.00 ± 0.03 | 0.12 ± 0.10 | 0.04 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.04 ± 0.04 | 0.76 ± 0.28 | 52.25 ± 9.83 | 2.46 ± 0.58 | 13.36 ± 2.60 | 3.10 ± 0.70 | 28.45 ± 5.42 | 0.24 ± 0.10 |
| Dibenzo(ah+ac)anthracene | 0.00 ± 0.03 | 0.19 ± 0.11 | 0.10 ± 0.06 | 0.06 ± 0.05 | 0.03 ± 0.07 | 0.00 ± 0.03 | 0.07 ± 0.16 | 4.57 ± 1.23 | 0.00 ± 0.15 | 1.44 ± 0.46 | 2.12 ± 0.62 | 0.25 ± 0.21 | 0.15 ± 0.09 |
| Benzo(b)chrysene | 0.02 ± 0.03 | 0.08 ± 0.08 | 0.00 ± 0.03 | 0.01 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.03 | 0.00 ± 0.13 | 1.68 ± 0.15 | 0.07 ± 0.13 | 0.57 ± 0.13 | 0.59 ± 0.13 | 0.40 ± 0.14 | 0.08 ± 0.07 |
| Picene | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.03 | 0.01 ± 0.05 | 0.00 ± 0.06 | 0.00 ± 0.03 | 0.00 ± 0.13 | 3.07 ± 1.21 | 0.00 ± 0.14 | 0.87 ± 0.43 | 0.27 ± 0.24 | 0.71 ± 0.39 | 0.07 ± 0.09 |
| Benzo(ghi)perylene | 0.00 ± 0.14 | 0.00 ± 0.40 | 0.00 ± 0.17 | 0.00 ± 0.21 | 0.19 ± 0.29 | 0.11 ± 0.17 | 7.54 ± 1.43 | 224.69 ± 27.28 | 8.47 ± 1.55 | 69.89 ± 8.66 | 20.59 ± 2.85 | 147.95 ± 18.06 | 0.91 ± 0.42 |
| Anthanthrene | 0.00 ± 0.03 | 0.03 ± 0.08 | 0.00 ± 0.03 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.03 | 0.26 ± 0.15 | 20.83 ± 3.97 | 0.75 ± 0.21 | 7.49 ± 1.45 | 1.58 ± 0.35 | 12.75 ± 2.44 | 0.00 ± 0.07 |
| Dibenzo(b,k)fluoranthene | 0.06 ± 0.08 | 0.00 ± 0.12 | 0.62 ± 0.28 | 0.19 ± 0.15 | 0.28 ± 0.21 | 0.00 ± 0.05 | 0.00 ± 0.36 | 5.76 ± 2.46 | 0.00 ± 0.41 | 1.28 ± 0.86 | 0.00 ± 0.32 | 0.18 ± 0.54 | 0.00 ± 0.15 |
| Dibenzo(a,e)pyrene | 0.00 ± 0.03 | 0.05 ± 0.08 | 0.00 ± 0.03 | 0.00 ± 0.04 | 0.01 ± 0.06 | 0.00 ± 0.03 | 0.00 ± 0.13 | 5.83 ± 1.24 | 0.17 ± 0.14 | 1.87 ± 0.43 | 0.20 ± 0.14 | 4.38 ± 0.94 | 0.00 ± 0.07 |
| Coronene | 0.00 ± 0.03 | 0.04 ± 0.10 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.07 | 0.03 ± 0.04 | 3.77 ± 0.68 | 96.48 ± 16.07 | 2.16 ± 0.44 | 29.78 ± 4.98 | 7.24 ± 1.24 | 78.50 ± 13.08 | 0.28 ± 0.11 |
| Dibenzo(a,h)pyrene | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.03 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.03 | 0.00 ± 0.13 | 0.89 ± 0.25 | 0.00 ± 0.13 | 0.03 ± 0.13 | 0.03 ± 0.13 | 2.09 ± 0.51 | 0.02 ± 0.07 |
| nitro-PAH (ug/mile) | | | | | | | | | | | | | |
| 1-nitronaphthalene | 0.0000 ± 0.0015 | 0.0033 ± 0.0045 | 0.0000 ± 0.0019 | 0.0000 ± 0.0024 | 0.0000 ± 0.0032 | 0.0000 ± 0.0019 | 0.1327 ± 0.0188 | 0.5163 ± 0.0348 | 0.0952 ± 0.0188 | 0.1487 ± 0.0197 | 0.0567 ± 0.0183 | 0.2111 ± 0.0232 | 0.0062 ± 0.0043 |
| 2-nitronaphthalene | 0.0000 ± 0.0027 | 0.0016 ± 0.0078 | 0.0000 ± 0.0034 | 0.0000 ± 0.0042 | 0.0000 ± 0.0056 | 0.0000 ± 0.0033 | 0.3245 ± 0.0380 | 0.5477 ± 0.0570 | 0.1991 ± 0.0303 | 0.1881 ± 0.0292 | 0.0705 ± 0.0242 | 0.5949 ± 0.0614 | 0.0353 ± 0.0081 |
| 2-nitrobiphenyl | 0.0000 ± 0.0007 | 0.0000 ± 0.0021 | 0.0000 ± 0.0009 | 0.0000 ± 0.0011 | 0.0000 ± 0.0015 | 0.0000 ± 0.0009 | 0.0625 ± 0.0089 | 0.1343 ± 0.0125 | 0.0222 ± 0.0082 | 0.0876 ± 0.0100 | 0.0000 ± 0.0080 | 0.0644 ± 0.0099 | 0.0000 ± 0.0020 |
| 3-nitrobiphenyl | 0.0000 ± 0.0007 | 0.0000 ± 0.0021 | 0.0000 ± 0.0009 | 0.0000 ± 0.0011 | 0.0000 ± 0.0015 | 0.0000 ± 0.0009 | 0.0000 ± 0.0072 | 0.0215 ± 0.0136 | 0.0000 ± 0.0077 | 0.0393 ± 0.0188 | 0.0301 ± 0.0160 | 0.0491 ± 0.0227 | 0.0000 ± 0.0020 |
| 4-nitrobiphenyl | 0.0000 ± 0.0020 | 0.0000 ± 0.0059 | 0.0000 ± 0.0025 | 0.0000 ± 0.0032 | 0.0000 ± 0.0043 | 0.0000 ± 0.0025 | 0.0000 ± 0.0245 | 0.0000 ± 0.0270 | 0.0000 ± 0.0259 | 0.0000 ± 0.0253 | 0.0282 ± 0.0263 | 0.0000 ± 0.0281 | 0.0000 ± 0.0056 |
| 2-nitrofluorene | 0.0000 ± 0.0010 | 0.0052 ± 0.0030 | 0.0000 ± 0.0013 | 0.0000 ± 0.0016 | 0.0000 ± 0.0021 | 0.0001 ± 0.0013 | 0.0000 ± 0.0143 | 0.0000 ± 0.0158 | 0.0000 ± 0.0151 | 0.0000 ± 0.0148 | 0.0000 ± 0.0153 | 0.0000 ± 0.0164 | 0.0013 ± 0.0028 |
| 1,3-dinitronaphthalene | 0.0000 ± 0.0476 | 0.0000 ± 0.1401 | 0.0000 ± 0.0599 | 0.0000 ± 0.0744 | 0.0000 ± 0.1004 | 0.0000 ± 0.0594 | 0.0000 ± 0.3734 | 0.0000 ± 0.4117 | 0.0000 ± 0.3939 | 0.0000 ± 0.3858 | 0.0000 ± 0.3975 | 0.0000 ± 0.4275 | 0.0000 ± 0.1317 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S0-1 | S0-2 | S0-3 | S0-4 | S0-5 | S0-6 | S1-1 | S1-2 | S2-1 | S2-2 | S2-3 | S2-4 | S3-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,5-dinitronaphthalene | 0.0000 ± 0.0019 | 0.0000 ± 0.0056 | 0.0000 ± 0.0024 | 0.0000 ± 0.0030 | 0.0000 ± 0.0040 | 0.0000 ± 0.0024 | 0.0000 ± 0.0276 | 0.0000 ± 0.0306 | 0.0000 ± 0.0294 | 0.0000 ± 0.0285 | 0.0000 ± 0.0293 | 0.0000 ± 0.0316 | 0.0000 ± 0.0053 |
| 5-nitroacenaphthene | 0.0000 ± 0.0007 | 0.0008 ± 0.0022 | 0.0000 ± 0.0009 | 0.0000 ± 0.0011 | 0.0000 ± 0.0016 | 0.0000 ± 0.0009 | 0.0000 ± 0.0086 | 0.0044 ± 0.0103 | 0.0000 ± 0.0091 | 0.0112 ± 0.0107 | 0.0000 ± 0.0091 | 0.0000 ± 0.0098 | 0.0000 ± 0.0020 |
| 9-nitroanthracene | 0.0000 ± 0.0011 | 0.0082 ± 0.0032 | 0.0005 ± 0.0013 | 0.0000 ± 0.0017 | 0.0000 ± 0.0023 | 0.0002 ± 0.0013 | 0.0000 ± 0.0166 | 0.0000 ± 0.0183 | 0.0000 ± 0.0175 | 0.0000 ± 0.0172 | 0.0000 ± 0.0177 | 0.0000 ± 0.0190 | 0.0000 ± 0.0030 |
| 4-nitrophenanthrene | 0.0000 ± 0.0013 | 0.0000 ± 0.0040 | 0.0000 ± 0.0017 | 0.0000 ± 0.0021 | 0.0000 ± 0.0028 | 0.0000 ± 0.0017 | 0.0000 ± 0.0205 | 0.0000 ± 0.0226 | 0.0000 ± 0.0216 | 0.0000 ± 0.0211 | 0.0000 ± 0.0218 | 0.0000 ± 0.0234 | 0.0000 ± 0.0037 |
| 9-nitrophenanthrene | 0.0000 ± 0.0041 | 0.0005 ± 0.0121 | 0.0000 ± 0.0052 | 0.0000 ± 0.0064 | 0.0000 ± 0.0087 | 0.0000 ± 0.0051 | 0.0000 ± 0.0575 | 0.0000 ± 0.0634 | 0.0000 ± 0.0607 | 0.0000 ± 0.0594 | 0.0000 ± 0.0612 | 0.0000 ± 0.0658 | 0.0000 ± 0.0114 |
| 1,8-dinitronaphthalene | 0.0000 ± 0.0012 | 0.0000 ± 0.0036 | 0.0000 ± 0.0016 | 0.0000 ± 0.0019 | 0.0000 ± 0.0026 | 0.0000 ± 0.0015 | 0.0000 ± 0.0141 | 0.0037 ± 0.0161 | 0.0000 ± 0.0150 | 0.0078 ± 0.0154 | 0.0044 ± 0.0156 | 0.0175 ± 0.0180 | 0.0000 ± 0.0034 |
| 2-nitrofluoranthene | 0.0000 ± 0.0074 | 0.0019 ± 0.0220 | 0.0000 ± 0.0093 | 0.0000 ± 0.0116 | 0.0000 ± 0.0156 | 0.0000 ± 0.0092 | 0.0000 ± 0.0657 | 0.3450 ± 0.1281 | 0.0652 ± 0.0752 | 0.3308 ± 0.1217 | 0.2176 ± 0.0997 | 0.0000 ± 0.0742 | 0.0192 ± 0.0217 |
| 3-nitrofluoranthene | 0.0000 ± 0.0032 | 0.0000 ± 0.0095 | 0.0000 ± 0.0040 | 0.0000 ± 0.0050 | 0.0000 ± 0.0068 | 0.0000 ± 0.0040 | 0.0000 ± 0.0314 | 0.1253 ± 0.0431 | 0.0847 ± 0.0380 | 0.2431 ± 0.0552 | 0.0306 ± 0.0348 | 0.0000 ± 0.0358 | 0.0034 ± 0.0090 |
| 1-nitropyrene | 0.0000 ± 0.0019 | 0.0037 ± 0.0059 | 0.0006 ± 0.0025 | 0.0006 ± 0.0031 | 0.0013 ± 0.0041 | 0.0000 ± 0.0024 | 0.0352 ± 0.0244 | 0.4615 ± 0.1154 | 0.3999 ± 0.1010 | 0.5870 ± 0.1434 | 0.3262 ± 0.0845 | 0.2532 ± 0.0692 | 0.0016 ± 0.0054 |
| 7-nitrobenzo(a)anthracene | 0.0000 ± 0.0003 | 0.0004 ± 0.0009 | 0.0000 ± 0.0004 | 0.0000 ± 0.0005 | 0.0002 ± 0.0007 | 0.0000 ± 0.0004 | 0.0000 ± 0.0029 | 0.0000 ± 0.0032 | 0.0000 ± 0.0031 | 0.0000 ± 0.0030 | 0.0255 ± 0.0034 | 0.0000 ± 0.0033 | 0.0001 ± 0.0009 |
| 6-nitrochrysene | 0.0000 ± 0.0005 | 0.0000 ± 0.0016 | 0.0000 ± 0.0007 | 0.0000 ± 0.0008 | 0.0000 ± 0.0011 | 0.0000 ± 0.0007 | 0.0000 ± 0.0056 | 0.0000 ± 0.0062 | 0.0000 ± 0.0059 | 0.0000 ± 0.0058 | 0.0000 ± 0.0060 | 0.0000 ± 0.0064 | 0.0000 ± 0.0015 |
| 6-nitrobenz[a]pyrene | 0.0000 ± 0.0026 | 0.0000 ± 0.0076 | 0.0000 ± 0.0032 | 0.0000 ± 0.0040 | 0.0000 ± 0.0054 | 0.0000 ± 0.0032 | 0.0000 ± 0.0226 | 0.0000 ± 0.0249 | 0.0000 ± 0.0238 | 0.0000 ± 0.0233 | 0.0000 ± 0.0240 | 0.0000 ± 0.0258 | 0.0000 ± 0.0071 |
| Hopanes (ug/mile) | | | | | | | | | | | | | |
| 18a(H),21ß(H)-22,29,30-Trisnorhopane & | 0.20 ± 0.05 | 0.19 ± 0.13 | 0.28 ± 0.06 | 0.22 ± 0.07 | 0.33 ± 0.10 | 0.40 ± 0.07 | 0.00 ± 0.27 | 3.11 ± 0.42 | 21.48 ± 1.77 | 1.55 ± 0.32 | 6.59 ± 0.66 | 4.77 ± 0.54 | 0.12 ± 0.13 |
| 17a(H),21ß(H)-22,29,30-Trisnorhopane | 0.02 ± 0.03 | 0.02 ± 0.08 | 0.01 ± 0.03 | 0.01 ± 0.04 | 0.01 ± 0.06 | 0.02 ± 0.03 | 0.00 ± 0.13 | 0.16 ± 0.15 | 1.20 ± 0.29 | 0.06 ± 0.13 | 1.56 ± 0.35 | 0.24 ± 0.15 | 0.00 ± 0.07 |
| 17a(H),21ß(H)-30-Norhopane | 0.23 ± 0.06 | 0.24 ± 0.12 | 0.33 ± 0.07 | 0.23 ± 0.07 | 0.59 ± 0.13 | 0.66 ± 0.12 | 0.53 ± 0.27 | 8.42 ± 1.32 | 50.53 ± 7.18 | 2.57 ± 0.51 | 12.35 ± 1.84 | 10.87 ± 1.64 | 0.37 ± 0.13 |
| 17a(H),21ß(H)-Hopane | 0.10 ± 0.04 | 0.11 ± 0.12 | 0.17 ± 0.06 | 0.08 ± 0.06 | 0.33 ± 0.10 | 0.42 ± 0.07 | 0.00 ± 0.26 | 5.17 ± 0.73 | 29.64 ± 3.46 | 1.37 ± 0.35 | 10.85 ± 1.34 | 6.62 ± 0.89 | 0.22 ± 0.12 |
| 17ß(H),21a(H)-hopane | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.01 ± 0.03 | 0.00 ± 0.04 | 0.01 ± 0.06 | 0.03 ± 0.03 | 0.00 ± 0.13 | 0.76 ± 0.15 | 4.71 ± 0.39 | 0.12 ± 0.13 | 0.22 ± 0.13 | 1.13 ± 0.17 | 0.00 ± 0.07 |
| 22S-17a(H),21ß(H)-30-Homohopane | 0.06 ± 0.03 | 0.09 ± 0.09 | 0.09 ± 0.04 | 0.06 ± 0.05 | 0.20 ± 0.07 | 0.17 ± 0.04 | 0.04 ± 0.17 | 2.49 ± 0.26 | 14.34 ± 0.97 | 0.64 ± 0.19 | 3.50 ± 0.30 | 3.02 ± 0.29 | 0.00 ± 0.08 |
| 22R-17a(H),21ß(H)-30-Homohopane | 0.03 ± 0.03 | 0.00 ± 0.08 | 0.07 ± 0.04 | 0.00 ± 0.04 | 0.14 ± 0.06 | 0.12 ± 0.04 | 0.01 ± 0.15 | 2.14 ± 0.24 | 10.67 ± 0.79 | 0.55 ± 0.16 | 3.01 ± 0.28 | 2.58 ± 0.27 | 0.00 ± 0.08 |
| 17ß(H),21ß(H)-Hopane | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.02 ± 0.03 | 0.00 ± 0.04 | 0.07 ± 0.06 | 0.06 ± 0.03 | 0.00 ± 0.13 | 0.84 ± 0.19 | 5.00 ± 0.67 | 0.00 ± 0.13 | 1.60 ± 0.25 | 0.29 ± 0.15 | 0.00 ± 0.07 |
| 22S-17a(H),21ß(H)-30,31-Bishomohopan | 0.02 ± 0.03 | 0.00 ± 0.08 | 0.03 ± 0.03 | 0.03 ± 0.04 | 0.12 ± 0.06 | 0.10 ± 0.04 | 0.79 ± 0.18 | 6.00 ± 0.81 | 7.34 ± 0.97 | 0.34 ± 0.15 | 2.47 ± 0.37 | 2.62 ± 0.39 | 0.02 ± 0.07 |
| 22R-17a(H),21ß(H)-30,31-Bishomohopan | 0.02 ± 0.03 | 0.00 ± 0.08 | 0.04 ± 0.04 | 0.03 ± 0.04 | 0.10 ± 0.06 | 0.07 ± 0.03 | 0.07 ± 0.13 | 0.75 ± 0.19 | 5.97 ± 0.74 | 0.25 ± 0.15 | 1.10 ± 0.21 | 1.07 ± 0.22 | 0.04 ± 0.07 |
| 22S-17a(H),21ß(H)-30,31,32-Trisomohop | 0.04 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.09 ± 0.06 | 0.06 ± 0.04 | 0.00 ± 0.15 | 0.61 ± 0.19 | 4.44 ± 0.62 | 0.25 ± 0.16 | 0.86 ± 0.20 | 0.76 ± 0.21 | 0.06 ± 0.08 |
| 22R-17a(H),21ß(H)-30,31,32-Trishomoho | 0.02 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.03 | 0.00 ± 0.04 | 0.07 ± 0.06 | 0.05 ± 0.03 | 0.00 ± 0.13 | 0.36 ± 0.15 | 3.01 ± 0.43 | 0.16 ± 0.13 | 0.55 ± 0.15 | 0.58 ± 0.17 | 0.00 ± 0.07 |
| Steranes (ug/mile) | | | | | | | | | | | | | |
| C27-20S5a(H),14a(H)-cholestane | 0.02 ± 0.03 | 0.01 ± 0.08 | 0.02 ± 0.03 | 0.00 ± 0.04 | 0.03 ± 0.06 | 0.10 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.15 | 1.95 ± 0.35 | 0.00 ± 0.14 | 1.75 ± 0.33 | 0.52 ± 0.19 | 0.05 ± 0.07 |
| C27-20R5a(H),14ß(H)-cholestane | 0.06 ± 0.03 | 0.09 ± 0.08 | 0.09 ± 0.04 | 0.05 ± 0.04 | 0.14 ± 0.06 | 0.17 ± 0.04 | 0.00 ± 0.13 | 0.87 ± 0.20 | 5.79 ± 0.87 | 0.56 ± 0.17 | 6.93 ± 1.02 | 1.78 ± 0.31 | 0.08 ± 0.07 |
| C27-20S5a(H),14ß(H),17ß(H)-cholestane | 0.03 ± 0.03 | 0.05 ± 0.08 | 0.02 ± 0.03 | 0.04 ± 0.04 | 0.07 ± 0.06 | 0.12 ± 0.03 | 0.00 ± 0.13 | 0.36 ± 0.14 | 2.99 ± 0.23 | 0.22 ± 0.13 | 2.70 ± 0.22 | 1.01 ± 0.16 | 0.01 ± 0.07 |
| ster45+40(cholestane) | 0.09 ± 0.04 | 0.04 ± 0.10 | 0.02 ± 0.04 | 0.03 ± 0.05 | 0.18 ± 0.07 | 0.31 ± 0.06 | 0.00 ± 0.21 | 0.83 ± 0.26 | 6.34 ± 0.80 | 0.40 ± 0.22 | 6.06 ± 0.77 | 1.55 ± 0.32 | 0.33 ± 0.11 |
| C28-20S5a(H),14a(H),17a(H)-ergostane | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.03 | 0.00 ± 0.04 | 0.01 ± 0.06 | 0.03 ± 0.03 | 0.00 ± 0.13 | 0.11 ± 0.14 | 0.75 ± 0.15 | 0.01 ± 0.13 | 0.24 ± 0.13 | 0.20 ± 0.14 | 0.00 ± 0.07 |
| C28-20R5a(H),14ß(H),17ß(H)-ergostane | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.03 | 0.00 ± 0.04 | 0.03 ± 0.06 | 0.07 ± 0.03 | 0.00 ± 0.13 | 0.00 ± 0.14 | 1.06 ± 0.15 | 0.00 ± 0.13 | 1.15 ± 0.16 | 0.00 ± 0.15 | 0.00 ± 0.07 |
| C28-20S5a(H),14ß(H),17ß(H)-ergostane | 0.01 ± 0.03 | 0.00 ± 0.08 | 0.01 ± 0.03 | 0.00 ± 0.04 | 0.03 ± 0.06 | 0.08 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.15 | 1.94 ± 0.30 | 0.00 ± 0.13 | 0.71 ± 0.18 | 0.44 ± 0.17 | 0.01 ± 0.07 |
| C28-20R5a(H),14a(H),17a(H)-ergostane | 0.01 ± 0.03 | 0.01 ± 0.08 | 0.01 ± 0.03 | 0.00 ± 0.04 | 0.03 ± 0.06 | 0.09 ± 0.03 | 0.00 ± 0.13 | 0.27 ± 0.14 | 1.64 ± 0.19 | 0.05 ± 0.13 | 1.07 ± 0.16 | 0.49 ± 0.16 | 0.01 ± 0.07 |
| C29-20S5a(H),14a(H),17a(H)-stigmastan | 0.02 ± 0.03 | 0.01 ± 0.08 | 0.03 ± 0.03 | 0.02 ± 0.04 | 0.05 ± 0.06 | 0.08 ± 0.03 | 0.00 ± 0.13 | 0.49 ± 0.15 | 2.30 ± 0.28 | 0.18 ± 0.13 | 2.07 ± 0.26 | 0.73 ± 0.17 | 0.03 ± 0.07 |
| C29-20R5a(H),14ß(H),17ß(H)-stigmastan | 0.02 ± 0.03 | 0.00 ± 0.08 | 0.03 ± 0.04 | 0.04 ± 0.04 | 0.07 ± 0.06 | 0.09 ± 0.04 | 0.00 ± 0.13 | 0.93 ± 0.30 | 3.38 ± 0.90 | 0.22 ± 0.15 | 3.26 ± 0.85 | 1.03 ± 0.31 | 0.02 ± 0.08 |
| C29-20S5a(H),14ß(H),17ß(H)-stigmastan | 0.02 ± 0.03 | 0.00 ± 0.08 | 0.02 ± 0.03 | 0.02 ± 0.04 | 0.06 ± 0.06 | 0.07 ± 0.03 | 0.00 ± 0.13 | 0.52 ± 0.16 | 2.28 ± 0.35 | 0.19 ± 0.13 | 2.30 ± 0.35 | 0.68 ± 0.18 | 0.02 ± 0.07 |
| C29-20R5a(H),14a(H),17a(H)-stigmastan | 0.02 ± 0.03 | 0.00 ± 0.08 | 0.03 ± 0.03 | 0.02 ± 0.04 | 0.06 ± 0.06 | 0.10 ± 0.03 | 0.00 ± 0.13 | 0.53 ± 0.15 | 2.07 ± 0.24 | 0.11 ± 0.13 | 2.20 ± 0.24 | 0.66 ± 0.16 | 0.02 ± 0.07 |
| Alkanes (ug/mile) | | | | | | | | | | | | | |
| Dodecane | 0.00 ± 1.11 | 0.00 ± 2.98 | 0.58 ± 1.52 | 0.00 ± 1.59 | 0.00 ± 2.14 | 0.00 ± 1.40 | 0.00 ± 8.23 | 1.16 ± 10.25 | 0.00 ± 8.63 | 0.00 ± 9.14 | 0.00 ± 8.72 | 22.54 ± 15.58 | 2.23 ± 3.54 |
| Tridecane | 0.52 ± 0.48 | 0.00 ± 1.26 | 0.51 ± 0.59 | 0.00 ± 0.68 | 0.00 ± 0.91 | 0.69 ± 0.60 | 0.00 ± 3.45 | 1.04 ± 3.97 | 0.00 ± 3.64 | 0.42 ± 3.69 | 0.00 ± 3.67 | 0.00 ± 4.05 | 3.76 ± 1.65 |
| Norfarnesane | 1.18 ± 0.32 | 0.18 ± 0.44 | 2.65 ± 0.62 | 0.03 ± 0.23 | 0.00 ± 0.31 | 0.34 ± 0.21 | 0.92 ± 1.22 | 2.85 ± 1.55 | 3.46 ± 1.58 | 16.76 ± 3.93 | 3.40 ± 1.58 | 17.21 ± 4.11 | 5.80 ± 1.36 |
| Heptylcyclohexane | 0.80 ± 0.31 | 0.00 ± 0.39 | 0.70 ± 0.32 | 0.00 ± 0.21 | 0.30 ± 0.34 | 0.00 ± 0.17 | 3.55 ± 1.77 | 1.35 ± 1.42 | 0.00 ± 1.15 | 1.42 ± 1.35 | 0.02 ± 1.20 | 26.43 ± 8.22 | 0.34 ± 0.43 |
| Farnesane | 2.17 ± 1.08 | 0.00 ± 1.11 | 0.40 ± 0.59 | 1.07 ± 0.88 | 0.00 ± 0.80 | 0.00 ± 0.48 | 0.00 ± 3.05 | 4.27 ± 4.50 | 2.25 ± 3.85 | 2.90 ± 3.93 | 3.82 ± 4.26 | 72.99 ± 30.64 | 0.00 ± 1.09 |
| Tetradecane | 0.00 ± 2.07 | 0.00 ± 6.09 | 0.00 ± 2.63 | 0.00 ± 3.23 | 12.40 ± 5.57 | 0.00 ± 2.57 | 0.00 ± 16.66 | 5.85 ± 19.06 | 0.00 ± 17.58 | 0.00 ± 17.21 | 0.55 ± 18.15 | 0.00 ± 19.10 | 5.02 ± 6.12 |
| Octylcyclohexane | 0.00 ± 0.61 | 0.00 ± 1.80 | 1.88 ± 0.88 | 0.00 ± 0.97 | 0.03 ± 1.31 | 0.00 ± 0.76 | 3.43 ± 5.12 | 0.00 ± 5.44 | 0.00 ± 5.18 | 0.00 ± 5.08 | 0.46 ± 5.33 | 0.00 ± 5.64 | 0.00 ± 1.69 |
| Pentadecane | 24.95 ± 2.74 | 0.53 ± 3.10 | 5.16 ± 1.47 | 11.21 ± 2.08 | 0.00 ± 2.21 | 9.37 ± 1.69 | 0.00 ± 8.44 | 0.00 ± 9.31 | 0.00 ± 8.92 | 74.61 ± 11.98 | 17.59 ± 9.42 | 53.16 ± 11.57 | 16.71 ± 3.50 |
| Nonylcyclohexane | 0.14 ± 0.90 | 0.00 ± 2.59 | 0.30 ± 1.15 | 0.00 ± 1.37 | 0.00 ± 1.85 | 0.00 ± 1.10 | 3.63 ± 7.48 | 0.00 ± 7.88 | 1.13 ± 7.70 | 0.00 ± 7.45 | 0.00 ± 7.56 | 20.01 ± 10.60 | 0.60 ± 2.51 |
| Hexadecane | 0.00 ± 1.37 | 2.53 ± 4.07 | 1.89 ± 1.75 | 0.33 ± 2.15 | 15.59 ± 3.20 | 4.76 ± 1.78 | 63.11 ± 12.40 | 0.00 ± 12.17 | 33.78 ± 12.20 | 0.00 ± 11.44 | 4.78 ± 11.87 | 0.00 ± 12.69 | 6.46 ± 3.88 |
| Norpristane | 1.20 ± 0.46 | 1.23 ± 0.99 | 0.00 ± 0.35 | 0.23 ± 0.47 | 3.66 ± 1.18 | 2.26 ± 0.72 | 17.76 ± 5.25 | 2.78 ± 2.85 | 0.00 ± 2.31 | 1.59 ± 2.55 | 2.70 ± 2.75 | 0.57 ± 2.71 | 8.55 ± 2.30 |
| Heptadecane | 11.12 ± 1.62 | 21.19 ± 3.83 | 0.00 ± 1.12 | 0.00 ± 1.38 | 14.04 ± 2.66 | 8.76 ± 1.60 | 0.00 ± 7.28 | 0.00 ± 7.77 | 14.64 ± 8.18 | 51.15 ± 10.15 | 16.72 ± 8.35 | 118.24 ± 16.39 | 105.08 ± 11.63 |
| Decylcyclohexane | 1.64 ± 0.62 | 0.00 ± 1.10 | 0.63 ± 0.53 | 0.00 ± 0.58 | 1.85 ± 1.01 | 0.00 ± 0.46 | 1.31 ± 3.13 | 0.00 ± 3.33 | 0.00 ± 3.16 | 0.00 ± 3.14 | 0.00 ± 3.22 | 0.00 ± 3.44 | 5.84 ± 1.99 |
| Heptadecane_Pristane | 10.50 ± 1.43 | 20.40 ± 3.78 | 0.00 ± 1.42 | 0.00 ± 1.76 | 14.35 ± 2.70 | 11.52 ± 1.72 | 44.85 ± 10.02 | 0.00 ± 10.02 | 43.72 ± 10.44 | 187.94 ± 17.44 | 22.09 ± 10.00 | 115.12 ± 14.17 | 95.67 ± 8.04 |
| Undecylcyclohexane | 0.00 ± 0.15 | 5.27 ± 1.62 | 0.00 ± 0.18 | 0.00 ± 0.24 | 0.46 ± 0.42 | 0.39 ± 0.27 | 2.86 ± 1.82 | 5.24 ± 2.44 | 0.00 ± 1.08 | 0.00 ± 1.06 | 0.00 ± 1.09 | 0.00 ± 1.30 | 8.65 ± 2.41 |
| Octadecane | 0.00 ± 0.44 | 47.03 ± 3.79 | 0.00 ± 0.55 | 4.01 ± 0.79 | 3.34 ± 1.00 | 3.55 ± 0.65 | 14.75 ± 3.89 | 421.78 ± 31.30 | 34.87 ± 4.83 | 21.76 ± 4.21 | 10.22 ± 3.99 | 41.47 ± 5.44 | 10.10 ± 1.52 |
| Phytane | 0.22 ± 0.20 | 20.78 ± 1.99 | 5.80 ± 0.60 | 2.49 ± 0.41 | 2.53 ± 0.50 | 2.37 ± 0.35 | 5.08 ± 1.70 | 203.68 ± 18.04 | 21.08 ± 2.67 | 10.20 ± 1.97 | 9.21 ± 1.97 | 18.93 ± 2.65 | 101.28 ± 8.80 |
| Dodecylcyclohexane | 0.40 ± 0.15 | 2.66 ± 0.83 | 0.60 ± 0.22 | 0.42 ± 0.18 | 0.39 ± 0.20 | 0.18 ± 0.11 | 1.32 ± 0.69 | 6.25 ± 2.00 | 1.14 ± 0.67 | 0.00 ± 0.43 | 1.61 ± 0.78 | 1.46 ± 0.78 | 11.48 ± 3.28 |
| Nonadecane | 3.56 ± 0.47 | 20.94 ± 2.42 | 2.08 ± 0.36 | 2.29 ± 0.43 | 1.65 ± 0.47 | 2.06 ± 0.36 | 5.83 ± 1.74 | 262.95 ± 28.30 | 26.97 ± 3.61 | 15.57 ± 2.52 | 7.80 ± 1.95 | 28.83 ± 3.89 | 81.10 ± 8.67 |
| Tridecylcyclohexane | 0.00 ± 0.14 | 3.23 ± 0.98 | 0.00 ± 0.18 | 0.00 ± 0.22 | 0.00 ± 0.31 | 0.00 ± 0.18 | 0.00 ± 1.13 | 0.00 ± 1.28 | 0.00 ± 1.23 | 0.00 ± 1.19 | 1.13 ± 1.34 | 0.00 ± 1.29 | 5.41 ± 1.46 |
| Eicosane | 4.73 ± 0.40 | 16.07 ± 1.28 | 0.00 ± 0.34 | 2.02 ± 0.46 | 0.58 ± 0.58 | 1.83 ± 0.37 | 5.21 ± 2.26 | 162.05 ± 9.88 | 26.92 ± 2.91 | 9.29 ± 2.38 | 5.56 ± 2.40 | 17.33 ± 2.81 | 73.88 ± 4.29 |
| Tetradecylcyclohexane | 0.56 ± 0.14 | 1.52 ± 0.38 | 0.13 ± 0.05 | 0.26 ± 0.08 | 0.15 ± 0.08 | 0.10 ± 0.05 | 5.72 ± 1.34 | 3.38 ± 0.81 | 0.75 ± 0.25 | 1.26 ± 0.35 | 3.17 ± 0.76 | 0.76 ± 0.26 | 2.46 ± 0.57 |
| Heneicosane | 2.22 ± 0.34 | 16.28 ± 1.37 | 1.61 ± 0.39 | 1.66 ± 0.48 | 1.27 ± 0.63 | 1.97 ± 0.40 | 2.24 ± 2.38 | 75.22 ± 5.47 | 21.97 ± 2.93 | 3.71 ± 2.46 | 4.01 ± 2.55 | 10.64 ± 2.84 | 36.62 ± 2.38 |
| Pentadecylcyclohexane | 0.00 ± 0.82 | 1.00 ± 2.44 | 0.00 ± 1.04 | 0.00 ± 1.29 | 0.00 ± 1.74 | 0.37 ± 1.04 | 0.00 ± 6.66 | 0.00 ± 7.34 | 0.00 ± 7.02 | 0.00 ± 6.87 | 0.00 ± 7.09 | 0.00 ± 7.62 | 1.68 ± 2.31 |
| Docosane | 1.67 ± 1.29 | 14.51 ± 4.11 | 0.99 ± 1.60 | 1.03 ± 1.98 | 0.19 ± 2.66 | 1.68 ± 1.60 | 0.00 ± 10.17 | 61.26 ± 13.29 | 16.14 ± 11.03 | 0.00 ± 10.51 | 0.40 ± 10.86 | 3.89 ± 11.72 | 32.05 ± 4.92 |
| Hexadecylcyclohexane | 0.03 ± 0.04 | 5.77 ± 0.92 | 0.10 ± 0.06 | 0.21 ± 0.08 | 0.30 ± 0.12 | 0.14 ± 0.06 | 0.03 ± 0.30 | 11.64 ± 1.91 | 0.26 ± 0.33 | 0.13 ± 0.31 | 4.99 ± 0.91 | 3.55 ± 0.72 | 0.90 ± 0.21 |
| Tricosane | 2.37 ± 1.68 | 10.99 ± 4.99 | 0.53 ± 2.10 | 0.49 ± 2.60 | 0.00 ± 3.50 | 2.00 ± 2.09 | 0.00 ± 13.41 | 32.29 ± 15.11 | 0.00 ± 14.14 | 0.00 ± 13.87 | 0.00 ± 14.29 | 0.00 ± 15.35 | 32.53 ± 5.14 |
| Heptadecylcyclohexane | 0.38 ± 0.74 | 7.41 ± 3.03 | 0.00 ± 0.90 | 0.76 ± 1.18 | 0.00 ± 1.49 | 0.00 ± 0.90 | 0.00 ± 5.68 | 9.35 ± 7.23 | 0.00 ± 5.98 | 0.00 ± 5.85 | 5.32 ± 6.58 | 0.00 ± 6.48 | 11.58 ± 3.72 |
| Octadecylcyclohexane | 0.00 ± 0.63 | 3.12 ± 2.16 | 0.00 ± 0.80 | 0.00 ± 1.00 | 0.00 ± 1.32 | 0.52 ± 0.83 | 0.00 ± 5.07 | 0.00 ± 5.60 | 0.00 ± 5.24 | 0.00 ± 5.24 | 8.36 ± 6.22 | 0.00 ± 5.81 | 0.30 ± 1.78 |
| Tetracosane | 1.24 ± 2.89 | 12.95 ± 8.90 | 0.00 ± 3.60 | 0.00 ± 4.46 | 0.00 ± 6.00 | 1.56 ± 3.60 | 0.00 ± 22.93 | 20.43 ± 26.10 | 0.00 ± 24.18 | 0.00 ± 23.67 | 0.00 ± 24.47 | 0.00 ± 26.23 | 28.84 ± 9.59 |
| Pentacosane | 1.57 ± 3.18 | 20.76 ± 10.71 | 0.00 ± 3.92 | 0.00 ± 4.83 | 0.00 ± 6.49 | 0.36 ± 3.89 | 0.00 ± 24.82 | 10.57 ± 28.19 | 0.00 ± 26.49 | 0.00 ± 25.62 | 0.00 ± 26.46 | 0.00 ± 28.41 | 38.09 ± 12.51 |
| Nonadecylcyclohexane | 0.20 ± 0.78 | 4.74 ± 2.71 | 0.00 ± 0.96 | 0.00 ± 1.19 | 0.00 ± 1.60 | 0.00 ± 0.96 | 0.00 ± 6.11 | 0.00 ± 6.75 | 13.95 ± 7.88 | 0.00 ± 6.31 | 0.00 ± 6.52 | 0.00 ± 7.00 | 9.72 ± 3.40 |
| Hexacosane | 1.38 ± 3.58 | 21.23 ± 11.64 | 0.00 ± 4.42 | 0.00 ± 5.47 | 0.00 ± 7.36 | 0.00 ± 4.38 | 0.00 ± 28.21 | 7.50 ± 31.69 | 0.00 ± 29.78 | 0.00 ± 29.15 | 0.00 ± 30.10 | 0.00 ± 32.28 | 34.07 ± 12.39 |
| Eicosylcyclohexane | 0.00 ± 0.03 | 0.22 ± 0.10 | 0.00 ± 0.03 | 0.00 ± 0.04 | 0.04 ± 0.06 | 0.02 ± 0.03 | 0.01 ± 0.13 | 2.27 ± 0.61 | 33.72 ± 8.50 | 0.48 ± 0.19 | 0.70 ± 0.25 | 2.77 ± 0.74 | 0.51 ± 0.17 |
| Heptacosane | 0.92 ± 3.57 | 20.68 ± 11.67 | 0.00 ± 4.43 | 0.00 ± 5.48 | 0.00 ± 7.38 | 0.00 ± 4.37 | 0.00 ± 28.28 | 11.31 ± 31.92 | 0.00 ± 29.89 | 0.00 ± 29.21 | 0.00 ± 30.09 | 0.00 ± 32.35 | 27.42 ± 11.76 |
| Heneicosylcyclohexane | 0.03 ± 0.04 | 0.46 ± 0.21 | 0.02 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.07 | 0.09 ± 0.06 | 0.48 ± 0.30 | 3.58 ± 1.36 | 6.24 ± 2.30 | 0.08 ± 0.22 | 0.01 ± 0.21 | 0.51 ± 0.33 | 1.52 ± 0.58 |
| Octacosane | 2.25 ± 3.47 | 19.34 ± 10.67 | 0.00 ± 4.31 | 0.00 ± 5.33 | 0.00 ± 7.18 | 0.00 ± 4.25 | 0.00 ± 27.53 | 13.28 ± 30.76 | 0.08 ± 29.19 | 0.00 ± 28.44 | 0.00 ± 29.30 | 0.00 ± 31.50 | 46.63 ± 11.93 |
| Nonacosane | 2.34 ± 2.51 | 10.28 ± 7.68 | 0.00 ± 2.96 | 0.00 ± 3.65 | 0.00 ± 4.91 | 0.00 ± 2.91 | 0.00 ± 18.82 | 52.40 ± 25.69 | 1.51 ± 20.22 | 0.00 ± 19.43 | 0.00 ± 20.01 | 0.00 ± 21.51 | 25.01 ± 9.22 |
| Triacontane | 3.66 ± 2.21 | 8.09 ± 6.29 | 0.03 ± 2.51 | 0.00 ± 3.09 | 0.00 ± 4.16 | 0.00 ± 2.46 | 0.00 ± 15.91 | 27.27 ± 19.26 | 3.35 ± 17.12 | 0.00 ± 16.44 | 0.00 ± 16.96 | 0.00 ± 18.21 | 29.12 ± 8.31 |
| Hentriacontane | 4.24 ± 1.73 | 6.79 ± 4.17 | 0.58 ± 1.52 | 0.00 ± 1.81 | 0.00 ± 2.41 | 0.00 ± 1.42 | 4.02 ± 9.79 | 22.33 ± 12.91 | 0.00 ± 9.99 | 0.00 ± 9.45 | 0.00 ± 9.73 | 0.00 ± 10.45 | 26.22 ± 7.67 |
| Dotriacontane | 4.20 ± 1.13 | 5.57 ± 2.84 | 0.65 ± 1.14 | 0.32 ± 1.40 | 0.00 ± 1.87 | 0.00 ± 1.11 | 0.00 ± 7.16 | 16.22 ± 8.56 | 16.19 ± 8.22 | 0.00 ± 7.39 | 0.00 ± 7.61 | 0.00 ± 8.19 | 28.03 ± 4.93 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S0-1 | S0-2 | S0-3 | S0-4 | S0-5 | S0-6 | S1-1 | S1-2 | S2-1 | S2-2 | S2-3 | S2-4 | S3-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritriacontane | 2.55 ± 1.10 | 1.79 ± 1.45 | 0.40 ± 0.53 | 0.00 ± 0.57 | 0.00 ± 0.72 | 0.00 ± 0.43 | 0.00 ± 2.75 | 0.00 ± 2.98 | 0.46 ± 3.18 | 0.00 ± 2.75 | 0.00 ± 2.82 | 0.00 ± 3.04 | 17.34 ± 6.59 |
| Tetratriacontane | 2.93 ± 1.06 | 2.43 ± 1.60 | 0.26 ± 0.55 | 0.21 ± 0.67 | 0.00 ± 0.82 | 0.00 ± 0.49 | 0.00 ± 3.07 | 0.00 ± 3.53 | 0.00 ± 3.22 | 0.00 ± 3.16 | 0.00 ± 3.25 | 0.00 ± 3.51 | 20.03 ± 6.19 |
| Pentatriacontane | 1.50 ± 0.57 | 0.86 ± 0.64 | 0.16 ± 0.23 | 0.15 ± 0.27 | 0.00 ± 0.30 | 0.03 ± 0.19 | 0.00 ± 1.12 | 2.55 ± 1.92 | 1.56 ± 1.63 | 0.00 ± 1.14 | 0.00 ± 1.20 | 0.00 ± 1.30 | 11.68 ± 3.96 |
| Hexatriacontane | 2.51 ± 0.33 | 1.43 ± 0.55 | 0.16 ± 0.22 | 0.00 ± 0.26 | 0.00 ± 0.35 | 0.00 ± 0.21 | 0.00 ± 1.32 | 0.00 ± 1.45 | 0.00 ± 1.40 | 0.00 ± 1.36 | 0.00 ± 1.40 | 0.00 ± 1.51 | 16.64 ± 1.80 |
| Heptatriacontane | 0.98 ± 0.39 | 0.66 ± 0.42 | 0.00 ± 0.08 | 0.18 ± 0.17 | 0.05 ± 0.16 | 0.03 ± 0.10 | 0.00 ± 0.51 | 14.29 ± 5.26 | 0.00 ± 0.56 | 0.00 ± 0.54 | 0.00 ± 0.54 | 0.00 ± 0.63 | 8.80 ± 3.09 |
| Octatriacontane | 1.70 ± 1.01 | 0.68 ± 0.76 | 0.14 ± 0.25 | 0.06 ± 0.26 | 0.00 ± 0.22 | 0.04 ± 0.14 | 0.00 ± 0.73 | 2.29 ± 2.39 | 0.00 ± 0.83 | 0.00 ± 0.73 | 0.00 ± 0.79 | 0.00 ± 0.92 | 11.92 ± 6.49 |
| Nonatriacontane | 2.80 ± 0.86 | 0.00 ± 0.12 | 0.00 ± 0.05 | 0.00 ± 0.07 | 0.00 ± 0.08 | 0.01 ± 0.05 | 0.00 ± 0.27 | 0.35 ± 0.42 | 0.00 ± 0.29 | 0.00 ± 0.28 | 0.00 ± 0.29 | 0.00 ± 0.31 | 46.88 ± 14.03 |
| Polar compounds (ug/mile) | | | | | | | | | | | | | |
| heptanoic acid (c7) | 10.32 ± 2.78 | 0.42 ± 3.06 | 1.41 ± 3.28 | 3.35 ± 3.29 | 8.47 ± 3.42 | 7.83 ± 3.35 | 11.24 ± 8.64 | 0.00 ± 9.28 | 8.66 ± 9.06 | 0.52 ± 8.78 | 0.00 ± 9.03 | 0.00 ± 9.63 | 22.85 ± 4.78 |
| me-malonic (d-c3) | 2.83 ± 1.08 | 15.03 ± 3.19 | 6.20 ± 1.89 | 4.58 ± 1.54 | 1.57 ± 1.06 | 0.00 ± 0.93 | 7.64 ± 2.77 | 8.04 ± 2.96 | 0.00 ± 1.58 | 0.00 ± 1.54 | 40.68 ± 10.68 | 0.00 ± 1.70 | 4.47 ± 1.57 |
| guaiacol | 0.15 ± 0.08 | 0.13 ± 0.10 | 0.23 ± 0.10 | 0.23 ± 0.10 | 0.20 ± 0.10 | 0.00 ± 0.08 | 0.26 ± 0.24 | 0.00 ± 0.17 | 0.59 ± 0.25 | 4.57 ± 0.89 | 0.21 ± 0.18 | 0.00 ± 0.17 | 0.77 ± 0.22 |
| benzoic acid | 0.00 ± 726.96 | 0.00 ± 849.55 | 0.00 ± 907.65 | 0.00 ± 905.79 | 249.59 ± 939.80 | 1445.35 ± 950.21 | 0.00 ± 2371.39 | 0.00 ± 2579.00 | 0.00 ± 2480.05 | 0.00 ± 2441.89 | 0.00 ± 2501.38 | 0.00 ± 2734.91 | 1936.46 ± 1274.21 |
| octanoic acid (c8) | 12.69 ± 6.28 | 1.84 ± 7.12 | 4.44 ± 7.59 | 5.69 ± 7.59 | 10.60 ± 7.82 | 0.00 ± 7.41 | 11.08 ± 16.09 | 133.25 ± 23.92 | 0.00 ± 16.62 | 0.00 ± 16.15 | 0.00 ± 16.68 | 0.00 ± 17.49 | 38.41 ± 11.19 |
| phenylacetic acid | 0.00 ± 15.02 | 0.00 ± 17.11 | 0.13 ± 18.48 | 0.02 ± 19.58 | 0.44 ± 19.01 | 0.02 ± 19.71 | 0.00 ± 35.61 | 0.00 ± 35.83 | 0.00 ± 40.68 | 58.00 ± 56.77 | 0.00 ± 34.54 | 8.82 ± 50.62 | 0.00 ± 25.66 |
| maleic acid | 4.25 ± 1.20 | 9.05 ± 1.86 | 96.43 ± 12.80 | 108.89 ± 13.63 | 0.00 ± 1.21 | 0.00 ± 1.20 | 82.38 ± 12.86 | 0.00 ± 1.79 | 120.60 ± 18.07 | 0.00 ± 1.68 | 0.00 ± 1.73 | 0.00 ± 1.86 | 50.65 ± 6.20 |
| succinic acid (d-c4) | 23.29 ± 7.19 | 44.88 ± 9.12 | 12.02 ± 8.26 | 9.73 ± 8.15 | 0.00 ± 8.10 | 0.00 ± 7.98 | 14.10 ± 19.67 | 0.00 ± 21.23 | 18.38 ± 20.84 | 0.00 ± 19.90 | 12.43 ± 20.86 | 9.74 ± 22.34 | 78.92 ± 13.98 |
| 4-me-guaiacol | 0.29 ± 0.04 | 0.01 ± 0.07 | 0.35 ± 0.21 | 0.35 ± 0.30 | 0.10 ± 0.05 | 0.00 ± 0.04 | 1.61 ± 1.22 | 0.00 ± 0.12 | 0.20 ± 1.78 | 0.00 ± 0.11 | 0.19 ± 0.11 | 0.00 ± 0.12 | 1.11 ± 0.26 |
| o-toluic | 1.49 ± 2.24 | 1.65 ± 2.64 | 1.76 ± 2.82 | 1.95 ± 2.80 | 5.89 ± 3.03 | 6.38 ± 3.03 | 37.46 ± 8.21 | 1097.50 ± 164.88 | 58.06 ± 10.92 | 300.20 ± 45.67 | 22.42 ± 6.91 | 176.61 ± 27.87 | 28.98 ± 6.04 |
| me-succinic acid (d-c4) | 4.10 ± 1.07 | 11.45 ± 1.58 | 4.39 ± 1.30 | 2.97 ± 1.26 | 0.00 ± 1.22 | 0.00 ± 1.20 | 0.00 ± 2.89 | 0.00 ± 3.16 | 6.88 ± 3.38 | 0.00 ± 2.96 | 5.15 ± 3.33 | 0.00 ± 3.28 | 11.12 ± 1.95 |
| m-toluic | 2.50 ± 1.42 | 1.79 ± 1.66 | 1.73 ± 1.77 | 1.82 ± 1.76 | 6.37 ± 1.84 | 7.49 ± 1.83 | 48.89 ± 5.57 | 0.00 ± 4.88 | 52.93 ± 5.89 | 553.26 ± 33.99 | 55.00 ± 6.01 | 394.18 ± 25.38 | 47.90 ± 3.87 |
| nonanoic acid (c9) | 20.32 ± 8.60 | 13.17 ± 8.54 | 13.08 ± 8.64 | 16.60 ± 9.25 | 15.09 ± 9.13 | 1.25 ± 7.14 | 56.95 ± 27.71 | 78.50 ± 33.66 | 12.03 ± 21.04 | 3.21 ± 19.48 | 0.00 ± 19.37 | 0.00 ± 18.59 | 46.84 ± 17.06 |
| p-toluic | 3.37 ± 1.86 | 2.31 ± 2.14 | 2.91 ± 2.27 | 1.84 ± 2.21 | 7.88 ± 2.62 | 5.85 ± 2.42 | 43.16 ± 8.37 | 1476.73 ± 202.92 | 45.54 ± 8.82 | 493.37 ± 68.65 | 41.75 ± 8.43 | 235.24 ± 34.41 | 41.33 ± 6.82 |
| 2,6-dimethylbenzoic acid | 0.38 ± 1.12 | 0.00 ± 1.32 | 0.71 ± 1.41 | 1.35 ± 1.42 | 0.58 ± 1.43 | 4.17 ± 1.48 | 0.00 ± 2.70 | 0.00 ± 23.22 | 0.00 ± 2.85 | 29.04 ± 8.03 | 0.00 ± 2.83 | 0.00 ± 4.83 | 5.69 ± 2.01 |
| 4-ethyl-guaiacol | 0.00 ± 0.03 | 0.00 ± 0.09 | 0.13 ± 0.05 | 0.00 ± 0.10 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.54 | 0.00 ± 0.12 | 0.00 ± 0.42 | 0.00 ± 0.11 | 0.00 ± 1.04 | 0.00 ± 0.12 | 0.04 ± 0.17 |
| syringol | 0.00 ± 0.03 | 0.00 ± 0.06 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.42 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.10 ± 0.07 |
| glutaric acid (d-c5) | 2.82 ± 0.17 | 11.78 ± 0.52 | 6.12 ± 0.27 | 4.96 ± 0.31 | 0.00 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.13 | 0.00 ± 0.14 | 40.53 ± 2.42 | 0.00 ± 0.13 | 21.76 ± 1.32 | 0.00 ± 0.15 | 7.30 ± 0.33 |
| 2-methylglutaric (d-c5) | 0.00 ± 0.03 | 1.53 ± 0.44 | 1.17 ± 0.33 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.02 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 3.38 ± 0.95 |
| 2,5-dimethylbenzoic acid | 0.00 ± 1.23 | 0.00 ± 1.45 | 0.85 ± 1.88 | 0.00 ± 1.53 | 0.00 ± 1.72 | 3.53 ± 2.37 | 6.84 ± 6.61 | 0.00 ± 3.92 | 0.00 ± 5.27 | 0.00 ± 3.67 | 0.00 ± 4.76 | 0.00 ± 4.07 | 9.48 ± 4.63 |
| 3-methylglutaric acid (d-c5) | 9.67 ± 2.54 | 1.42 ± 2.28 | 0.00 ± 2.42 | 1.63 ± 2.42 | 0.00 ± 2.43 | 0.00 ± 2.40 | 0.00 ± 5.73 | 5.07 ± 6.44 | 56.38 ± 10.90 | 0.00 ± 5.92 | 90.84 ± 15.56 | 0.00 ± 6.56 | 6.16 ± 3.43 |
| 2,4-dimethylbenzoic acid | 164.99 ± 126.45 | 0.00 ± 140.47 | 0.00 ± 148.55 | 0.00 ± 148.10 | 165.23 ± 159.84 | 327.61 ± 165.30 | 0.00 ± 359.82 | 710.66 ± 445.43 | 0.00 ± 377.93 | 0.00 ± 366.57 | 0.00 ± 378.43 | 0.00 ± 420.94 | 827.06 ± 256.80 |
| 2,3- and 3,5- dimethylbenzoic acid | 0.00 ± 0.18 | 0.02 ± 0.26 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.01 ± 0.21 | 0.50 ± 0.33 | 0.00 ± 0.73 | 260.80 ± 37.69 | 0.00 ± 1.14 | 50.53 ± 8.38 | 0.00 ± 1.60 | 36.56 ± 6.65 | 3.70 ± 1.01 |
| decanoic acid (c10) | 0.00 ± 1.79 | 0.00 ± 2.07 | 0.00 ± 2.21 | 0.00 ± 2.20 | 1.32 ± 2.32 | 0.00 ± 2.30 | 1.36 ± 4.46 | 0.00 ± 12.12 | 0.00 ± 4.69 | 0.00 ± 4.58 | 0.00 ± 4.73 | 0.00 ± 5.07 | 0.02 ± 4.88 |
| 4-allyl-guaiacol (eugenol) | 50.50 ± 4.23 | 45.38 ± 4.76 | 4.81 ± 0.54 | 79.53 ± 8.45 | 10.86 ± 1.19 | 9.59 ± 1.05 | 508.15 ± 56.03 | 6.91 ± 4.15 | 67.90 ± 7.45 | 6.13 ± 0.99 | 66.50 ± 7.30 | 0.00 ± 0.62 | 51.13 ± 4.70 |
| 4-methyl-syringol | 0.41 ± 0.14 | 0.51 ± 0.18 | 0.00 ± 0.04 | 0.33 ± 0.11 | 0.30 ± 0.11 | 0.19 ± 0.07 | 0.00 ± 0.11 | 17.26 ± 5.58 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.12 ± 0.12 | 0.00 ± 0.12 | 1.16 ± 0.38 |
| 3,4-dimethylbenzoic acid | 0.00 ± 1.29 | 0.51 ± 1.53 | 0.00 ± 1.61 | 0.00 ± 1.62 | 0.00 ± 1.62 | 0.00 ± 1.60 | 4.22 ± 8.12 | 338.28 ± 36.87 | 4.91 ± 3.53 | 87.37 ± 10.15 | 7.40 ± 3.63 | 61.96 ± 7.90 | 5.71 ± 2.25 |
| hexanedioic (adipic) acid (d-c6) | 1.59 ± 0.67 | 1.63 ± 0.79 | 0.84 ± 0.74 | 5.70 ± 1.37 | 0.00 ± 0.70 | 0.00 ± 0.69 | 0.00 ± 1.66 | 0.00 ± 1.85 | 8.65 ± 2.75 | 0.00 ± 1.72 | 0.00 ± 1.77 | 0.00 ± 1.90 | 0.77 ± 0.96 |
| salcylic acid | 0.33 ± 1.65 | 7.66 ± 2.34 | 7.98 ± 2.46 | 6.39 ± 2.33 | 16.53 ± 3.66 | 2.24 ± 2.10 | 9.16 ± 5.16 | 39.13 ± 10.26 | 20.47 ± 6.40 | 0.00 ± 4.96 | 15.24 ± 5.93 | 45.21 ± 9.79 | 13.79 ± 3.75 |
| trans-2-decenoic acid | 0.17 ± 0.28 | 0.00 ± 0.33 | 0.00 ± 0.35 | 0.13 ± 0.35 | 0.00 ± 0.35 | 0.27 ± 0.35 | 0.12 ± 0.53 | 0.00 ± 0.58 | 0.15 ± 0.58 | 0.00 ± 0.54 | 0.00 ± 0.56 | 0.00 ± 0.60 | 1.10 ± 0.48 |
| cis-pinonic acid | 0.00 ± 2.07 | 0.00 ± 2.44 | 0.00 ± 2.61 | 0.00 ± 2.59 | 0.00 ± 2.62 | 2.99 ± 2.71 | 0.00 ± 4.50 | 0.00 ± 4.95 | 0.00 ± 4.78 | 0.00 ± 4.60 | 0.00 ± 4.75 | 0.00 ± 5.16 | 0.00 ± 3.43 |
| 3-methyladipic acid (d-c6) | 0.00 ± 0.15 | 0.16 ± 0.19 | 2.06 ± 0.43 | 1.66 ± 0.35 | 75.12 ± 13.11 | 0.51 ± 0.21 | 26.89 ± 4.80 | 174.66 ± 30.56 | 150.67 ± 26.30 | 50.35 ± 8.84 | 31.38 ± 5.57 | 0.00 ± 0.42 | 18.00 ± 3.18 |
| 4-formyl-guaiacol (vanillin) | 0.34 ± 0.45 | 8.36 ± 2.04 | 8.94 ± 2.09 | 2.68 ± 0.89 | 19.27 ± 4.73 | 2.14 ± 0.82 | 38.47 ± 9.68 | 1.30 ± 1.04 | 7.66 ± 2.32 | 0.00 ± 0.75 | 11.73 ± 3.26 | 0.00 ± 0.84 | 12.21 ± 3.06 |
| undecanoic acid (c11) | 0.87 ± 0.86 | 0.88 ± 1.00 | 0.78 ± 1.06 | 1.08 ± 1.07 | 0.42 ± 1.09 | 0.00 ± 1.03 | 0.00 ± 2.31 | 5.72 ± 3.99 | 1.14 ± 3.34 | 0.62 ± 2.52 | 0.00 ± 2.51 | 4.05 ± 2.89 | 0.32 ± 1.39 |
| isoeugenol | 0.38 ± 0.23 | 0.22 ± 0.22 | 0.00 ± 0.21 | 0.00 ± 0.21 | 0.07 ± 0.23 | 1.39 ± 0.59 | 0.00 ± 0.65 | 0.00 ± 0.35 | 0.00 ± 0.35 | 0.00 ± 0.33 | 10.13 ± 4.12 | 0.00 ± 0.36 | 0.00 ± 0.29 |
| heptanedioic (pimelic) acid (d-c7) | 0.07 ± 0.61 | 2.32 ± 0.81 | 2.57 ± 0.86 | 2.33 ± 0.87 | 0.00 ± 0.76 | 1.42 ± 0.81 | 1.75 ± 1.22 | 35.77 ± 6.04 | 28.13 ± 4.82 | 0.00 ± 1.15 | 6.87 ± 1.76 | 0.00 ± 1.28 | 5.19 ± 1.30 |
| 2,3-dimethoxybenzoic acid | 0.00 ± 0.03 | 0.00 ± 0.06 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.19 | 0.00 ± 0.12 | 0.00 ± 0.06 |
| acetovanillone | 0.00 ± 2.35 | 0.21 ± 2.76 | 0.00 ± 2.95 | 13.08 ± 3.14 | 0.00 ± 2.97 | 10.48 ± 3.07 | 122.90 ± 10.60 | 0.00 ± 4.34 | 280.14 ± 22.25 | 0.00 ± 4.03 | 0.00 ± 4.16 | 0.00 ± 4.47 | 0.00 ± 3.89 |
| 2,6-dimethoxybenzoic acid | 0.16 ± 0.06 | 0.15 ± 0.08 | 1.24 ± 0.44 | 0.23 ± 0.09 | 0.04 ± 0.05 | 0.29 ± 0.11 | 13.02 ± 4.65 | 0.00 ± 0.12 | 5.32 ± 1.91 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 4.71 ± 1.68 |
| dodecanoic (lauric) acid (c12) | 0.50 ± 20.79 | 0.00 ± 24.41 | 0.00 ± 26.13 | 0.00 ± 25.97 | 19.80 ± 26.45 | 11.69 ± 26.01 | 0.00 ± 51.57 | 0.00 ± 56.75 | 5.70 ± 54.68 | 0.00 ± 53.14 | 0.00 ± 55.00 | 5.63 ± 59.18 | 43.67 ± 34.84 |
| 2,5-dimethoxybenzoic acid | 2.68 ± 0.83 | 0.74 ± 0.58 | 1.11 ± 0.66 | 6.42 ± 1.70 | 0.30 ± 0.58 | 0.00 ± 0.54 | 8.24 ± 2.49 | 0.00 ± 1.41 | 1.02 ± 1.42 | 0.00 ± 1.32 | 0.00 ± 1.37 | 0.00 ± 1.47 | 6.62 ± 1.84 |
| phthalic acid | 184.38 ± 37.02 | 136.83 ± 31.78 | 75.34 ± 24.11 | 165.61 ± 37.39 | 869.47 ± 171.87 | 50.27 ± 20.98 | 287.25 ± 74.22 | 322.20 ± 82.74 | 305.98 ± 78.68 | 838.82 ± 174.36 | 154.36 ± 56.50 | 533.19 ± 120.29 | 179.77 ± 42.96 |
| suberic acid (d-c8) | 0.00 ± 11.39 | 0.00 ± 13.32 | 0.00 ± 14.25 | 0.00 ± 14.16 | 1.36 ± 14.80 | 0.00 ± 14.22 | 0.00 ± 24.99 | 0.00 ± 27.53 | 0.00 ± 26.74 | 0.00 ± 25.78 | 0.00 ± 26.60 | 0.00 ± 30.48 | 0.00 ± 18.80 |
| levoglucosan | 3.81 ± 1.59 | 0.63 ± 1.40 | 0.00 ± 1.14 | 0.10 ± 1.26 | 0.00 ± 3.37 | 1.62 ± 1.43 | 0.00 ± 4.51 | 0.00 ± 5.24 | 0.00 ± 4.78 | 0.00 ± 11.86 | 9.32 ± 5.01 | 0.00 ± 8.84 | 4.59 ± 2.53 |
| 3,5-dimethoxybenzoic acid | 0.03 ± 0.25 | 0.04 ± 0.29 | 0.08 ± 0.31 | 0.06 ± 0.31 | 0.08 ± 0.31 | 0.02 ± 0.31 | 0.00 ± 0.77 | 0.00 ± 0.85 | 0.92 ± 0.82 | 0.00 ± 0.79 | 0.00 ± 0.82 | 8.77 ± 1.18 | 0.04 ± 0.41 |
| syringaldehyde | 0.34 ± 0.09 | 0.19 ± 0.08 | 0.20 ± 0.06 | 0.11 ± 0.05 | 0.00 ± 0.05 | 0.32 ± 0.09 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.18 | 0.00 ± 0.12 | 0.91 ± 0.19 |
| 3,4-dimethoxybenzoic acid | 0.00 ± 0.23 | 0.00 ± 0.27 | 0.48 ± 0.36 | 0.12 ± 0.30 | 0.00 ± 0.29 | 0.00 ± 0.29 | 2.77 ± 1.49 | 386.69 ± 137.17 | 10.90 ± 4.35 | 55.95 ± 20.22 | 3.62 ± 1.89 | 0.00 ± 0.55 | 4.28 ± 1.63 |
| 2,4-dimethoxybenzoic acid | 0.00 ± 0.03 | 0.61 ± 0.07 | 0.59 ± 0.06 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.11 | 0.00 ± 0.12 | 6.87 ± 0.50 | 31.47 ± 2.20 | 2.58 ± 0.22 | 0.00 ± 0.12 | 2.26 ± 0.17 |
| tridecanoic acid (c13) | 0.00 ± 0.32 | 0.00 ± 0.39 | 0.39 ± 0.41 | 0.00 ± 0.40 | 0.00 ± 0.41 | 0.01 ± 0.42 | 1.71 ± 0.73 | 0.00 ± 6.06 | 1.87 ± 0.79 | 1.21 ± 1.04 | 0.00 ± 0.61 | 0.00 ± 0.59 | 1.67 ± 0.63 |
| isophthalic acid | 28.02 ± 47.40 | 2.84 ± 54.71 | 7.30 ± 58.68 | 44.45 ± 59.23 | 0.00 ± 58.80 | 65.29 ± 61.57 | 27.60 ± 88.38 | 252.18 ± 118.93 | 90.86 ± 97.37 | 0.00 ± 88.53 | 334.43 ± 127.57 | 401.60 ± 143.80 | 92.47 ± 80.21 |
| vanillic acid | 0.00 ± 3.23 | 2.91 ± 3.83 | 3.94 ± 4.11 | 8.35 ± 4.27 | 11.24 ± 4.50 | 0.54 ± 4.05 | 10.08 ± 6.31 | 127.13 ± 23.28 | 3.03 ± 6.27 | 84.21 ± 16.14 | 16.05 ± 7.11 | 0.00 ± 6.65 | 0.00 ± 5.35 |
| homovanillic acid | 0.00 ± 1.43 | 0.00 ± 1.70 | 0.80 ± 1.90 | 0.00 ± 1.79 | 0.00 ± 1.84 | 2.91 ± 2.18 | 0.00 ± 2.55 | 79.23 ± 25.26 | 59.00 ± 18.84 | 0.00 ± 2.60 | 29.61 ± 11.21 | 0.00 ± 7.17 | 0.00 ± 2.41 |
| azelaic acid (d-c9) | 0.98 ± 2.93 | 0.77 ± 3.45 | 0.29 ± 3.68 | 1.53 ± 3.66 | 0.00 ± 3.69 | 8.71 ± 3.79 | 4.44 ± 5.65 | 2.41 ± 6.50 | 9.87 ± 6.07 | 16.07 ± 6.25 | 0.00 ± 5.92 | 0.00 ± 6.35 | 1.92 ± 4.86 |
| myristoleic acid | 0.00 ± 0.13 | 18.26 ± 2.26 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.16 | 36.20 ± 4.69 | 0.00 ± 1.26 | 22.32 ± 3.11 | 35.89 ± 4.62 | 19.71 ± 2.79 | 0.00 ± 0.27 | 0.00 ± 0.21 |
| myristic acid (c14) | 8.66 ± 5.82 | 1.70 ± 5.65 | 4.30 ± 6.21 | 7.73 ± 6.79 | 627.05 ± 160.46 | 16.72 ± 8.34 | 64.38 ± 27.79 | 0.00 ± 11.28 | 55.27 ± 26.21 | 0.00 ± 9.83 | 34.73 ± 21.75 | 0.00 ± 7.91 | 57.72 ± 19.55 |
| sebacic acid (d-c10) | 0.21 ± 0.62 | 0.08 ± 0.73 | 0.00 ± 0.78 | 1.36 ± 0.78 | 0.00 ± 0.78 | 1.69 ± 0.80 | 0.00 ± 1.25 | 0.36 ± 1.25 | 0.00 ± 1.24 | 0.00 ± 1.27 | 0.00 ± 1.24 | 0.00 ± 1.29 | 0.00 ± 1.02 |
| syringic acid | 0.23 ± 0.30 | 0.00 ± 0.36 | 4.42 ± 0.63 | 3.02 ± 0.51 | 0.00 ± 2.30 | 0.12 ± 0.38 | 7.01 ± 1.40 | 31.53 ± 3.75 | 5.87 ± 1.25 | 33.51 ± 3.93 | 4.74 ± 1.00 | 11.96 ± 1.58 | 9.41 ± 1.23 |
| pentadecanoic acid (c15) | 0.00 ± 1.70 | 0.03 ± 2.03 | 0.00 ± 2.14 | 0.00 ± 2.12 | 0.00 ± 2.15 | 0.00 ± 2.14 | 2.57 ± 3.72 | 0.00 ± 3.86 | 0.00 ± 3.69 | 0.00 ± 3.58 | 0.00 ± 3.67 | 0.00 ± 3.97 | 1.50 ± 2.87 |
| undecanedioic acid (d-c11) | 0.09 ± 0.11 | 0.31 ± 0.23 | 0.10 ± 0.14 | 0.38 ± 0.30 | 0.00 ± 0.09 | 1.98 ± 1.28 | 0.83 ± 0.75 | 0.00 ± 0.51 | 1.21 ± 1.00 | 1.96 ± 1.52 | 0.00 ± 0.14 | 0.00 ± 0.24 | 0.73 ± 0.45 |
| palmitoleic acid | 0.25 ± 0.62 | 0.65 ± 0.83 | 0.00 ± 0.60 | 0.00 ± 0.56 | 0.00 ± 0.56 | 0.00 ± 0.56 | 3.21 ± 2.54 | 0.00 ± 1.01 | 2.62 ± 2.38 | 0.00 ± 0.94 | 0.17 ± 1.62 | 0.00 ± 1.05 | 0.76 ± 1.13 |
| palmitic acid (c16) | 2.29 ± 10.60 | 12.25 ± 16.03 | 0.00 ± 11.93 | 0.00 ± 11.61 | 116.79 ± 49.71 | 7.59 ± 14.13 | 106.45 ± 68.08 | 0.00 ± 27.62 | 48.77 ± 48.51 | 0.00 ± 25.55 | 0.00 ± 32.06 | 0.00 ± 12.03 | 52.01 ± 30.05 |
| isostearic acid | 0.00 ± 0.20 | 0.00 ± 0.24 | 0.00 ± 0.25 | 0.00 ± 0.25 | 0.00 ± 0.26 | 0.00 ± 0.25 | 0.00 ± 0.53 | 0.00 ± 0.58 | 0.00 ± 0.55 | 0.00 ± 0.54 | 0.00 ± 0.56 | 0.00 ± 0.60 | 0.00 ± 0.34 |
| dodecanedioic acid (d-c12) | 0.12 ± 0.20 | 0.00 ± 0.25 | 0.21 ± 0.25 | 0.15 ± 0.25 | 0.00 ± 0.49 | 1.24 ± 0.35 | 0.00 ± 1.61 | 0.00 ± 0.40 | 0.00 ± 0.82 | 0.00 ± 0.38 | 0.00 ± 0.39 | 0.00 ± 0.42 | 0.09 ± 0.41 |
| traumatic acid | 0.00 ± 0.03 | 0.00 ± 0.06 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.06 |
| heptadecanoic acid (c17) | 0.00 ± 1.98 | 0.26 ± 2.39 | 0.00 ± 2.48 | 0.00 ± 2.47 | 19.65 ± 8.57 | 0.68 ± 2.61 | 0.55 ± 6.40 | 0.00 ± 6.81 | 0.00 ± 6.56 | 0.00 ± 6.31 | 0.00 ± 6.42 | 0.00 ± 6.82 | 0.00 ± 3.36 |
| 1,11-undecanedicarboxylic acid (d-c13) | 0.00 ± 0.04 | 0.66 ± 0.19 | 0.00 ± 0.05 | 0.52 ± 0.14 | 0.00 ± 0.05 | 0.11 ± 0.06 | 0.00 ± 0.15 | 0.00 ± 0.12 | 0.00 ± 0.14 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.13 | 0.00 ± 0.07 |
| oleic acid | 6.61 ± 6.39 | 0.25 ± 9.45 | 13.19 ± 10.06 | 9.11 ± 9.26 | 0.00 ± 3.90 | 0.00 ± 3.94 | 0.00 ± 17.43 | 0.00 ± 13.82 | 0.00 ± 17.44 | 0.00 ± 18.54 | 0.00 ± 15.19 | 0.00 ± 6.42 | 17.07 ± 15.71 |
| elaidic acid | 0.00 ± 0.48 | 0.00 ± 0.57 | 0.10 ± 0.61 | 0.41 ± 0.61 | 0.00 ± 0.61 | 0.00 ± 0.60 | 0.00 ± 0.72 | 0.00 ± 0.77 | 0.55 ± 0.80 | 0.00 ± 0.72 | 0.00 ± 0.75 | 0.00 ± 0.80 | 1.84 ± 0.82 |
| stearic acid (c18) | 0.00 ± 11.53 | 0.00 ± 13.80 | 0.00 ± 13.90 | 0.00 ± 13.87 | 448.50 ± 164.58 | 0.00 ± 14.51 | 0.00 ± 34.30 | 0.00 ± 41.43 | 0.00 ± 41.23 | 0.00 ± 36.00 | 0.00 ± 36.37 | 0.00 ± 36.23 | 0.00 ± 20.06 |
| 1,12-dodecanedicarboxylic acid (d-c14) | 2.78 ± 0.87 | 0.36 ± 0.22 | 0.66 ± 0.24 | 5.44 ± 1.42 | 0.00 ± 0.16 | 2.00 ± 0.67 | 0.75 ± 0.44 | 0.00 ± 0.27 | 0.00 ± 0.26 | 0.18 ± 0.32 | 0.00 ± 0.26 | 0.00 ± 0.28 | 0.76 ± 0.32 |
| 8,15-pimaradien-18-oic acd | 0.00 ± 0.23 | 0.00 ± 0.28 | 0.00 ± 0.29 | 0.00 ± 0.29 | 0.00 ± 1.66 | 0.25 ± 0.38 | 0.04 ± 0.35 | 0.00 ± 0.17 | 0.00 ± 0.24 | 0.00 ± 0.19 | 0.00 ± 0.19 | 0.00 ± 0.18 | 0.00 ± 0.38 |
| pimaric acid | 0.00 ± 0.30 | 0.03 ± 0.35 | 23.24 ± 3.06 | 0.00 ± 0.37 | 0.16 ± 0.38 | 0.41 ± 0.38 | 16.68 ± 2.42 | 57.77 ± 7.73 | 0.00 ± 0.91 | 9.43 ± 1.57 | 4.83 ± 1.15 | 0.00 ± 0.98 | 20.21 ± 2.69 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S0-1 | S0-2 | S0-3 | S0-4 | S0-5 | S0-6 | S1-1 | S1-2 | S2-1 | S2-2 | S2-3 | S2-4 | S3-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| sandaracopimaric acid | 0.00 ± 0.10 | 0.07 ± 0.12 | 22.24 ± 1.58 | 0.01 ± 0.12 | 0.10 ± 0.13 | 0.33 ± 0.13 | 0.00 ± 0.27 | 0.00 ± 0.30 | 0.00 ± 0.29 | 0.00 ± 0.28 | 0.00 ± 0.29 | 0.00 ± 0.31 | 0.00 ± 0.17 |
| nonadecanoic acid (c19) | 0.00 ± 3.36 | 0.09 ± 3.95 | 0.00 ± 4.23 | 0.00 ± 4.20 | 0.00 ± 4.25 | 0.01 ± 4.19 | 0.00 ± 10.00 | 0.00 ± 11.05 | 0.00 ± 10.54 | 0.00 ± 10.32 | 0.00 ± 10.64 | 55.30 ± 12.23 | 0.00 ± 5.57 |
| isopimaric acid | 0.00 ± 0.35 | 0.00 ± 0.42 | 0.00 ± 0.44 | 0.00 ± 0.44 | 0.47 ± 0.59 | 1.68 ± 0.95 | 0.00 ± 0.96 | 0.00 ± 1.06 | 0.00 ± 1.02 | 0.00 ± 0.99 | 0.00 ± 1.07 | 0.00 ± 1.10 | 0.00 ± 0.58 |
| palustric acid | 0.16 ± 0.32 | 0.00 ± 0.38 | 0.00 ± 0.40 | 0.00 ± 0.40 | 0.00 ± 0.40 | 0.00 ± 0.40 | 1.35 ± 0.61 | 0.00 ± 0.65 | 2.01 ± 0.65 | 0.00 ± 0.61 | 0.68 ± 0.64 | 0.00 ± 1.13 | 1.20 ± 0.54 |
| dihydroisopimaric acid | 0.04 ± 0.14 | 0.28 ± 0.17 | 0.00 ± 0.17 | 0.00 ± 0.17 | 0.00 ± 0.17 | 0.00 ± 0.17 | 0.00 ± 0.26 | 0.00 ± 0.29 | 0.00 ± 0.28 | 0.00 ± 0.27 | 0.00 ± 0.28 | 0.00 ± 0.30 | 0.17 ± 0.23 |
| 8-abietic acid | 0.00 ± 0.21 | 0.76 ± 0.41 | 0.00 ± 0.26 | 0.00 ± 0.26 | 0.00 ± 0.27 | 0.00 ± 0.26 | 0.00 ± 0.54 | 0.00 ± 0.28 | 0.00 ± 0.50 | 0.00 ± 0.30 | 0.00 ± 0.28 | 0.00 ± 0.29 | 0.12 ± 0.37 |
| dehydroabietic acid | 0.00 ± 4.67 | 2.30 ± 6.10 | 0.00 ± 5.86 | 0.00 ± 5.82 | 16.21 ± 9.88 | 0.00 ± 5.87 | 0.00 ± 9.83 | 0.00 ± 10.01 | 0.00 ± 9.62 | 0.00 ± 9.26 | 0.00 ± 9.64 | 0.00 ± 10.16 | 0.00 ± 8.05 |
| 8,14-abietenic acid | 0.00 ± 0.03 | 0.00 ± 0.06 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.06 |
| abietic acid | 0.00 ± 0.06 | 0.01 ± 0.08 | 0.00 ± 0.07 | 0.02 ± 0.07 | 0.00 ± 0.10 | 0.00 ± 0.07 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.16 | 0.00 ± 0.10 |
| eicosanoic acid (c20) | 0.00 ± 1.06 | 0.00 ± 1.25 | 0.00 ± 1.33 | 0.00 ± 1.32 | 0.00 ± 1.34 | 0.00 ± 1.32 | 0.00 ± 1.76 | 0.00 ± 1.94 | 0.00 ± 1.85 | 0.00 ± 1.81 | 0.00 ± 1.87 | 0.00 ± 2.01 | 0.00 ± 1.76 |
| levopimaric acid | 0.00 ± 0.03 | 0.00 ± 0.06 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.06 |
| heneicosanoic acid (c21) | 0.00 ± 1.19 | 0.00 ± 1.40 | 0.00 ± 1.50 | 0.00 ± 1.49 | 0.00 ± 1.51 | 0.00 ± 1.48 | 0.32 ± 2.73 | 0.00 ± 2.90 | 0.00 ± 2.77 | 0.00 ± 2.72 | 0.00 ± 2.81 | 0.00 ± 3.01 | 1.99 ± 2.09 |
| 7-oxodehydroabietic acid | 0.37 ± 0.09 | 1.19 ± 0.16 | 0.00 ± 0.10 | 0.00 ± 0.11 | 0.20 ± 0.11 | 0.31 ± 0.11 | 7.58 ± 1.04 | 0.00 ± 0.28 | 2.98 ± 0.65 | 0.00 ± 0.26 | 0.00 ± 0.27 | 0.00 ± 0.29 | 0.98 ± 0.18 |
| docosanoic acid (c22) | 0.00 ± 3.33 | 0.00 ± 3.94 | 0.00 ± 4.20 | 0.04 ± 4.18 | 0.00 ± 4.22 | 0.00 ± 4.16 | 0.00 ± 8.82 | 0.00 ± 9.62 | 0.00 ± 9.20 | 0.00 ± 9.07 | 0.00 ± 9.36 | 0.00 ± 9.98 | 1.58 ± 5.59 |
| tricosanoic acid (c23) | 0.00 ± 0.55 | 0.00 ± 0.67 | 0.00 ± 0.70 | 0.00 ± 0.69 | 0.65 ± 0.72 | 0.00 ± 0.69 | 0.24 ± 0.83 | 0.33 ± 0.93 | 0.00 ± 0.77 | 0.00 ± 0.81 | 0.00 ± 0.78 | 0.00 ± 0.84 | 0.00 ± 0.92 |
| tetracosanoic acid (c24) | 0.81 ± 0.49 | 3.75 ± 1.18 | 1.25 ± 0.66 | 0.00 ± 0.38 | 0.07 ± 0.43 | 0.38 ± 0.48 | 0.00 ± 0.89 | 0.00 ± 2.29 | 0.00 ± 0.94 | 0.00 ± 1.68 | 0.00 ± 3.07 | 0.00 ± 1.02 | 0.00 ± 0.41 |
| cholesterol | 0.00 ± 0.62 | 0.00 ± 0.77 | 0.00 ± 0.76 | 0.00 ± 0.75 | 0.00 ± 0.76 | 0.00 ± 0.75 | 0.00 ± 0.24 | 6.41 ± 2.26 | 0.00 ± 0.25 | 0.00 ± 0.25 | 0.00 ± 0.25 | 0.00 ± 0.27 | 1.47 ± 1.09 |
| cholestanol | 0.02 ± 4.18 | 0.15 ± 4.92 | 81.10 ± 10.95 | 0.08 ± 5.23 | 0.00 ± 5.29 | 0.00 ± 5.21 | 12.90 ± 8.22 | 102.59 ± 15.20 | 0.00 ± 8.43 | 0.00 ± 8.25 | 10.50 ± 8.67 | 0.00 ± 9.15 | 23.04 ± 7.55 |
| ergosterol | 0.00 ± 0.03 | 0.00 ± 0.06 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.11 | 10.77 ± 0.79 | 0.00 ± 0.11 | 3.13 ± 0.24 | 0.00 ± 0.11 | 0.00 ± 0.12 | 5.46 ± 0.39 |
| stigmasterol | 0.00 ± 1.30 | 0.00 ± 1.53 | 0.00 ± 1.64 | 0.00 ± 1.62 | 0.00 ± 1.64 | 0.00 ± 1.62 | 0.00 ± 2.49 | 29.59 ± 3.86 | 0.00 ± 2.62 | 0.00 ± 2.56 | 0.00 ± 2.65 | 0.00 ± 2.84 | 0.00 ± 2.15 |
| sitosterol | 0.00 ± 0.03 | 0.00 ± 0.06 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.11 | 0.00 ± 0.20 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.07 |
| Carbonyls (mg/mile) | | | | | | | | | | | | | |
| formaldehyde | 0.34 ± 0.01 | 0.47 ± 0.02 | 0.45 ± 0.01 | 1.07 ± 0.01 | 0.57 ± 0.01 | 1.44 ± 0.01 | 19.03 ± 0.06 | 0.34 ± 0.06 | 9.13 ± 0.06 | 48.74 ± 0.06 | 3.21 ± 0.06 | 0.68 ± 0.06 | 3.06 ± 0.02 |
| acetaldehyde | 0.03 ± 0.12 | 0.00 ± 0.37 | 0.01 ± 0.15 | 0.14 ± 0.18 | 0.00 ± 0.24 | 0.41 ± 0.15 | 5.07 ± 0.96 | 0.00 ± 0.98 | 1.59 ± 1.02 | 12.21 ± 0.98 | 1.46 ± 0.98 | 0.00 ± 0.97 | 0.78 ± 0.33 |
| acetone | 0.29 ± 0.17 | 0.00 ± 0.52 | 0.02 ± 0.21 | 0.10 ± 0.26 | 0.00 ± 0.35 | 0.03 ± 0.21 | 1.41 ± 1.37 | 0.00 ± 1.41 | 0.00 ± 1.46 | 1.52 ± 1.40 | 0.00 ± 1.40 | 0.00 ± 1.38 | 0.46 ± 0.47 |
| * acrolein | 0.03 ± 0.01 | 0.04 ± 0.02 | 0.10 ± 0.03 | 0.06 ± 0.02 | <0.24 | 0.11 ± 0.03 | 4.48 ± 1.12 | <0.020 | 2.85 ± 0.71 | 15.26 ± 3.82 | 0.96 ± 0.24 | 0.02 ± 0.02 | 0.78 ± 0.19 |
| propionaldehyde | 0.04 ± 0.01 | 0.05 ± 0.01 | 0.04 ± 0.01 | 0.04 ± 0.01 | 0.03 ± 0.01 | 0.05 ± 0.01 | 0.60 ± 0.04 | 0.01 ± 0.04 | 0.51 ± 0.04 | 2.07 ± 0.04 | 0.41 ± 0.04 | 0.04 ± 0.04 | 0.13 ± 0.01 |
| crotonaldehyde | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.01 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.01 ± 0.01 | 0.25 ± 0.01 | 1.23 ± 0.01 | 0.00 ± 0.01 | 0.01 ± 0.01 | 0.05 ± 0.01 |
| methyl ethyl ketone | 0.11 ± 0.01 | 0.09 ± 0.04 | 0.11 ± 0.02 | 0.10 ± 0.02 | 0.04 ± 0.03 | 0.08 ± 0.02 | 0.91 ± 0.11 | 0.04 ± 0.11 | 0.34 ± 0.12 | 1.02 ± 0.11 | 0.15 ± 0.11 | 0.05 ± 0.11 | 0.20 ± 0.04 |
| Methacrolein | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.02 ± 0.01 | 0.55 ± 0.01 | 0.01 ± 0.01 | 0.44 ± 0.01 | 2.46 ± 0.01 | 0.22 ± 0.01 | 0.00 ± 0.01 | 0.10 ± 0.01 |
| * n-butyraldehyde | 0.05 ± 0.01 | 0.10 ± 0.02 | 0.03 ± 0.02 | 0.06 ± 0.02 | <0.24 | 0.03 ± 0.02 | 0.32 ± 0.08 | <0.020 | 0.65 ± 0.16 | 4.23 ± 1.06 | 0.38 ± 0.09 | 0.05 ± 0.02 | 0.13 ± 0.03 |
| benzaldehyde | 0.04 ± 0.01 | 0.06 ± 0.01 | 0.13 ± 0.01 | 0.06 ± 0.01 | 0.10 ± 0.01 | 0.23 ± 0.01 | 6.22 ± 0.02 | 0.02 ± 0.02 | 3.31 ± 0.02 | 16.54 ± 0.02 | 2.09 ± 0.02 | 0.03 ± 0.02 | 0.85 ± 0.01 |
| glyoxal | 0.01 ± 0.01 | 0.02 ± 0.01 | 0.00 ± 0.01 | 0.01 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.08 ± 0.01 | 0.04 ± 0.01 | 0.00 ± 0.01 | 0.25 ± 0.01 | 0.04 ± 0.01 | 0.02 ± 0.01 | 0.01 ± 0.01 |
| valeraldehyde | 0.03 ± 0.01 | 0.01 ± 0.01 | 0.01 ± 0.01 | 0.02 ± 0.01 | 0.03 ± 0.01 | 0.02 ± 0.01 | 0.15 ± 0.02 | 0.02 ± 0.02 | 0.11 ± 0.03 | 0.44 ± 0.02 | 0.00 ± 0.02 | 0.03 ± 0.02 | 0.03 ± 0.01 |
| tolualdehyde | 0.00 ± 0.01 | 0.02 ± 0.01 | 0.00 ± 0.01 | 0.04 ± 0.01 | 0.02 ± 0.01 | 0.07 ± 0.01 | 0.36 ± 0.03 | 0.02 ± 0.03 | 0.10 ± 0.03 | 0.76 ± 0.03 | 0.00 ± 0.03 | 0.05 ± 0.03 | 0.02 ± 0.01 |
| hexanal | 0.00 ± 0.01 | 0.02 ± 0.01 | 0.00 ± 0.01 | 0.04 ± 0.01 | 0.02 ± 0.01 | 0.07 ± 0.01 | 0.36 ± 0.02 | 0.02 ± 0.02 | 0.10 ± 0.02 | 0.76 ± 0.02 | 0.00 ± 0.02 | 0.05 ± 0.02 | 0.02 ± 0.01 |
| *** acrolein converts to an unknown rearrangement product that co-elutes with butyraldehyde. Where indicated, the sum of acrolein and butyraldehyde is given as an estimate of the upper limit of the true value for either compound.** | | | | | | | | | | | | | |
| VOC (mg/mi) | | | | | | | | | | | | | |
| 1,3 butadiene (estimated) | 0.063 ± 0.093 | 0.501 ± 0.742 | 0.016 ± 0.023 | 0.007 ± 0.010 | 0.007 ± 0.010 | 0.010 ± 0.015 | 7.313 ± 10.823 | 0.045 ± 0.066 | 2.325 ± 3.441 | 57.787 ± 85.525 | 14.497 ± 21.455 | 45.015 ± 66.622 | 2.136 ± 3.162 |
| C2 compounds | 1.634 ± 0.402 | 11.732 ± 2.889 | 0.371 ± 0.091 | 0.267 ± 0.066 | 0.340 ± 0.084 | 1.226 ± 0.302 | 339.430 ± 54.506 | 1.519 ± 0.374 | 15.445 ± 23.745 | 2141.071 ± 527.149 | 336.596 ± 82.873 | 2197.315 ± 540.997 | 39.293 ± 9.674 |
| propene | 0.467 ± 0.099 | 3.711 ± 0.785 | 0.116 ± 0.024 | 0.051 ± 0.011 | 0.049 ± 0.010 | 0.073 ± 0.016 | 54.117 ± 11.440 | 0.330 ± 0.070 | 17.203 ± 13.370 | 427.626 ± 90.396 | 107.275 ± 22.677 | 333.109 ± 70.416 | 15.810 ± 3.342 |
| propane | 0.130 ± 0.007 | 0.302 ± 0.017 | 0.054 ± 0.003 | 0.117 ± 0.007 | 0.145 ± 0.008 | 0.126 ± 0.007 | 2.471 ± 0.140 | 0.137 ± 0.008 | 0.744 ± 0.167 | 10.619 ± 0.602 | 4.203 ± 0.238 | 11.822 ± 0.670 | 0.794 ± 0.045 |
| isoButane | 0.173 ± 0.011 | 0.239 ± 0.016 | 0.037 ± 0.002 | 0.040 ± 0.002 | 0.078 ± 0.005 | 0.065 ± 0.004 | 2.809 ± 0.181 | 0.166 ± 0.011 | 1.254 ± 0.177 | 15.095 ± 0.972 | 3.790 ± 0.244 | 32.948 ± 2.121 | 1.156 ± 0.074 |
| 1Butene+iButylene | 0.254 ± 0.030 | 2.145 ± 0.253 | 0.059 ± 0.007 | 0.056 ± 0.007 | 0.047 ± 0.006 | 0.055 ± 0.006 | 28.067 ± 3.306 | 0.263 ± 0.031 | 23.569 ± 4.398 | 131.100 ± 15.442 | 34.246 ± 4.034 | 161.281 ± 18.997 | 8.939 ± 1.053 |
| n-Butane | 0.055 ± 0.005 | 0.305 ± 0.029 | 0.008 ± 0.001 | 0.008 ± 0.001 | 0.016 ± 0.001 | 0.017 ± 0.002 | 4.647 ± 0.447 | 0.058 ± 0.006 | 3.652 ± 0.457 | 20.557 ± 1.975 | 5.667 ± 0.545 | 30.175 ± 2.900 | 1.353 ± 0.130 |
| t-2-Butene | 0.035 ± 0.006 | 0.238 ± 0.038 | 0.005 ± 0.001 | 0.009 ± 0.001 | 0.020 ± 0.003 | 0.021 ± 0.003 | 3.879 ± 0.612 | 0.067 ± 0.011 | 2.286 ± 0.583 | 16.241 ± 2.563 | 4.398 ± 0.694 | 23.708 ± 3.741 | 1.196 ± 0.189 |
| c-2-Butene | 0.015 ± 0.001 | 0.096 ± 0.006 | 0.005 ± 0.000 | 0.004 ± 0.000 | 0.004 ± 0.000 | 0.007 ± 0.001 | 1.595 ± 0.103 | 0.044 ± 0.003 | 1.163 ± 0.115 | 8.848 ± 0.572 | 1.850 ± 0.120 | 11.909 ± 0.770 | 0.451 ± 0.029 |
| 3-Me-1-Butene | 3.043 ± 0.336 | 6.330 ± 0.700 | 10.018 ± 1.108 | 2.347 ± 0.259 | 0.688 ± 0.076 | 0.595 ± 0.066 | 104.996 ± 11.608 | 2.684 ± 0.297 | 39.545 ± 6.536 | 366.132 ± 40.478 | 63.335 ± 7.002 | 581.087 ± 64.243 | 25.448 ± 2.813 |
| isopentane | 0.041 ± 0.004 | 0.294 ± 0.031 | 0.051 ± 0.005 | 0.002 ± 0.000 | 0.002 ± 0.000 | 0.017 ± 0.002 | 3.156 ± 0.330 | 0.097 ± 0.010 | 2.097 ± 0.449 | 16.871 ± 1.761 | 4.392 ± 0.459 | 22.283 ± 2.327 | 0.992 ± 0.104 |
| 1-Pentene | 0.077 ± 0.010 | 0.287 ± 0.036 | 0.005 ± 0.001 | 0.081 ± 0.010 | 0.032 ± 0.004 | 0.038 ± 0.005 | 4.283 ± 0.539 | 0.194 ± 0.025 | 2.459 ± 0.575 | 14.688 ± 1.848 | 2.293 ± 0.289 | 34.715 ± 4.368 | 1.433 ± 0.180 |
| 2-Me-1-Butene | 0.525 ± 0.053 | 1.243 ± 0.126 | 0.085 ± 0.008 | 0.015 ± 0.002 | 0.152 ± 0.016 | 0.151 ± 0.016 | 17.158 ± 1.739 | 0.862 ± 0.088 | 11.696 ± 1.838 | 90.484 ± 9.172 | 13.103 ± 1.328 | 196.627 ± 19.931 | 8.772 ± 0.889 |
| n-Pentane | 0.060 ± 0.018 | 0.308 ± 0.091 | 0.034 ± 0.010 | 0.063 ± 0.019 | 0.019 ± 0.006 | 0.052 ± 0.016 | 0.000 ± 0.000 | 0.040 ± 0.012 | 0.145 ± 0.000 | 0.529 ± 0.157 | 0.000 ± 0.000 | 0.000 ± 0.000 | 0.626 ± 0.185 |
| t-2-Pentene | 0.059 ± 0.003 | 0.204 ± 0.012 | 0.013 ± 0.001 | 0.023 ± 0.001 | 0.040 ± 0.002 | 0.041 ± 0.002 | 4.194 ± 0.238 | 0.203 ± 0.011 | 2.179 ± 0.206 | 20.634 ± 1.171 | 3.973 ± 0.225 | 35.963 ± 2.042 | 1.329 ± 0.076 |
| c-2-Pentene | 0.046 ± 0.007 | 0.126 ± 0.019 | 0.008 ± 0.001 | 0.005 ± 0.001 | 0.018 ± 0.002 | 0.020 ± 0.003 | 2.441 ± 0.363 | 0.107 ± 0.016 | 1.137 ± 0.302 | 9.967 ± 1.484 | 1.746 ± 0.260 | 20.152 ± 3.000 | 0.716 ± 0.106 |
| 2-Me-2-Butene | 0.099 ± 0.009 | 0.396 ± 0.037 | 0.013 ± 0.001 | 0.013 ± 0.001 | 0.047 ± 0.004 | 0.055 ± 0.005 | 6.178 ± 0.577 | 0.005 ± 0.001 | 1.226 ± 0.450 | 0.968 ± 0.090 | 0.171 ± 0.016 | 34.563 ± 3.226 | 2.284 ± 0.213 |
| 22DiMeButane | 0.138 ± 0.015 | 0.587 ± 0.065 | 0.011 ± 0.001 | 0.016 ± 0.002 | 0.035 ± 0.004 | 0.041 ± 0.005 | 2.235 ± 0.245 | 0.251 ± 0.028 | 3.682 ± 0.635 | 30.092 ± 3.300 | 7.318 ± 0.803 | 71.102 ± 7.798 | 2.865 ± 0.314 |
| CycloPentene | 0.012 ± 0.001 | 0.074 ± 0.008 | 0.005 ± 0.001 | 0.003 ± 0.000 | 0.007 ± 0.001 | 0.010 ± 0.001 | 1.329 ± 0.146 | 0.049 ± 0.005 | 0.795 ± 0.146 | 5.861 ± 0.645 | 1.303 ± 0.143 | 10.767 ± 1.184 | 0.349 ± 0.038 |
| CycloPentane | 0.043 ± 0.002 | 0.136 ± 0.007 | 0.025 ± 0.001 | 0.009 ± 0.001 | 0.019 ± 0.001 | 0.018 ± 0.001 | 1.722 ± 0.086 | 0.113 ± 0.006 | 1.408 ± 0.104 | 11.962 ± 0.598 | 2.060 ± 0.103 | 21.893 ± 1.095 | 1.031 ± 0.052 |
| 23DiMeButane | 0.171 ± 0.017 | 0.621 ± 0.063 | 0.037 ± 0.004 | 0.020 ± 0.002 | 0.050 ± 0.005 | 0.047 ± 0.005 | 9.674 ± 0.978 | 0.376 ± 0.038 | 5.962 ± 0.950 | 52.136 ± 5.270 | 9.465 ± 0.957 | 91.537 ± 9.253 | 3.854 ± 0.390 |
| MTBE | 0.001 ± 0.000 | 0.007 ± 0.001 | 0.000 ± 0.000 | <0.07 ± 0.007 | <0.16 ± 0.016 | <0.16 ± 0.016 | 0.149 ± 0.013 | <1.27 ± 0.000 | 0.381 ± 0.032 | <199.86 ± 20.729 | <29.75 ± 3.086 | <314.10 ± 32.579 | 0.035 ± 0.003 |
| 2-MePentane | 0.508 ± 0.049 | 1.888 ± 0.184 | 0.079 ± 0.008 | <0.07 ± 0.007 | <0.16 ± 0.016 | <0.16 ± 0.015 | 32.240 ± 3.137 | <1.27 ± 0.000 | 16.564 ± 2.624 | <199.86 ± 19.445 | <29.75 ± 2.895 | <314.10 ± 30.560 | 11.017 ± 1.072 |
| 3-MePentane | 0.342 ± 0.018 | 1.271 ± 0.067 | 0.061 ± 0.003 | 0.045 ± 0.002 | 0.098 ± 0.005 | 0.104 ± 0.005 | 19.408 ± 1.016 | 0.835 ± 0.044 | 10.980 ± 0.933 | 126.634 ± 6.633 | 20.721 ± 1.085 | 208.396 ± 10.915 | 7.363 ± 0.386 |
| 2-Me-1-Pentene | 0.051 ± 0.002 | 0.110 ± 0.004 | 0.023 ± 0.001 | 0.012 ± 0.001 | 0.012 ± 0.001 | 0.011 ± 0.000 | 1.047 ± 0.038 | 0.068 ± 0.002 | 0.459 ± 0.025 | 3.159 ± 0.116 | 0.504 ± 0.018 | 10.499 ± 0.384 | 0.571 ± 0.021 |
| 1-Hexene | 0.024 ± 0.002 | 0.204 ± 0.019 | 0.009 ± 0.001 | 0.008 ± 0.001 | 0.005 ± 0.001 | 0.005 ± 0.001 | 1.959 ± 0.182 | 0.041 ± 0.004 | 2.026 ± 0.414 | 9.453 ± 0.879 | 3.202 ± 0.298 | 13.574 ± 1.262 | 0.249 ± 0.023 |
| n-Hexane | 0.297 ± 0.025 | 1.218 ± 0.104 | 0.050 ± 0.004 | 0.047 ± 0.004 | 0.084 ± 0.007 | 0.083 ± 0.007 | 14.255 ± 1.216 | 0.709 ± 0.060 | 10.299 ± 1.457 | 113.525 ± 9.683 | 13.042 ± 1.113 | 183.683 ± 15.666 | 6.703 ± 0.572 |
| t-2-Hexene | 0.016 ± 0.001 | 0.079 ± 0.004 | 0.005 ± 0.000 | 0.005 ± 0.000 | 0.018 ± 0.001 | 0.009 ± 0.001 | 2.025 ± 0.103 | 0.087 ± 0.004 | 0.769 ± 0.071 | 7.537 ± 0.383 | 1.271 ± 0.065 | 14.583 ± 0.741 | 0.449 ± 0.023 |
| 2-Me-2-Pentene | 0.020 ± 0.002 | 0.097 ± 0.009 | 0.005 ± 0.001 | 0.002 ± 0.000 | 0.017 ± 0.001 | 0.011 ± 0.001 | 1.839 ± 0.168 | 0.089 ± 0.008 | 0.147 ± 0.096 | 0.298 ± 0.027 | 0.070 ± 0.006 | 8.663 ± 0.793 | 0.493 ± 0.045 |
| c-3-Me-2-Pentene | 0.018 ± 0.001 | 0.095 ± 0.004 | 0.004 ± 0.000 | 0.004 ± 0.000 | 0.009 ± 0.000 | 0.003 ± 0.000 | 2.007 ± 0.087 | 0.055 ± 0.002 | 0.183 ± 0.061 | 0.542 ± 0.024 | 0.106 ± 0.005 | 6.962 ± 0.303 | 0.482 ± 0.021 |
| c-3-Hexene | 0.002 ± 0.000 | 0.011 ± 0.001 | 0.000 ± 0.000 | 0.000 ± 0.000 | 0.006 ± 0.000 | 0.005 ± 0.000 | 0.285 ± 0.015 | 0.012 ± 0.001 | 0.066 ± 0.010 | 0.842 ± 0.045 | 0.129 ± 0.007 | 1.916 ± 0.103 | 0.056 ± 0.003 |
| c-2-Hexene | 0.010 ± 0.001 | 0.051 ± 0.004 | 0.000 ± 0.000 | 0.001 ± 0.000 | 0.005 ± 0.000 | 0.005 ± 0.000 | 1.182 ± 0.088 | 0.046 ± 0.004 | 0.373 ± 0.070 | 3.754 ± 0.280 | 0.653 ± 0.049 | 7.980 ± 0.596 | 0.269 ± 0.020 |
| t-3-Me-2-Pentene | 0.015 ± 0.001 | 0.077 ± 0.005 | 0.003 ± 0.000 | 0.004 ± 0.000 | 0.007 ± 0.001 | 0.001 ± 0.000 | 1.844 ± 0.113 | 0.082 ± 0.005 | 0.354 ± 0.064 | 0.332 ± 0.020 | 0.081 ± 0.005 | 10.298 ± 0.631 | 0.443 ± 0.027 |
| MeCyPentane | 0.175 ± 0.017 | 0.677 ± 0.067 | 0.028 ± 0.003 | 0.029 ± 0.003 | 0.053 ± 0.005 | 0.064 ± 0.006 | 10.192 ± 1.013 | 0.535 ± 0.053 | 6.984 ± 1.065 | 79.972 ± 7.946 | 12.744 ± 1.266 | 125.004 ± 12.420 | 4.054 ± 0.403 |
| 2,4-DiMePentane | 0.146 ± 0.007 | 0.673 ± 0.035 | 0.030 ± 0.001 | 0.024 ± 0.001 | 0.041 ± 0.002 | 0.030 ± 0.001 | 14.556 ± 0.747 | 0.300 ± 0.015 | 6.403 ± 0.557 | 42.773 ± 2.194 | 7.899 ± 0.405 | 69.676 ± 3.574 | 3.933 ± 0.202 |
| 223TriMeButane | 0.006 ± 0.001 | 0.017 ± 0.002 | 0.006 ± 0.001 | 0.004 ± 0.000 | 0.004 ± 0.000 | 0.001 ± 0.000 | 0.356 ± 0.032 | 0.010 ± 0.001 | 0.208 ± 0.039 | 1.643 ± 0.148 | 0.233 ± 0.021 | 3.849 ± 0.347 | 0.133 ± 0.012 |
| Benzene | 1.139 ± 0.132 | 6.400 ± 0.743 | 0.137 ± 0.016 | 0.166 ± 0.019 | 0.121 ± 0.014 | 0.208 ± 0.024 | 89.233 ± 10.360 | 0.988 ± 0.115 | 38.465 ± 7.031 | 518.964 ± 60.254 | 103.300 ± 11.994 | 539.333 ± 62.618 | 22.921 ± 2.661 |
| CycloHexane | 0.062 ± 0.006 | 0.225 ± 0.023 | 0.011 ± 0.001 | <0.05 ± 0.000 | 0.020 ± 0.002 | 0.027 ± 0.003 | 3.944 ± 0.396 | 0.196 ± 0.020 | <14.63 ± 0.399 | 49.878 ± 5.003 | 3.660 ± 0.367 | 35.992 ± 3.611 | 1.470 ± 0.147 |
| 4MeHexene | 0.017 ± 0.003 | 0.065 ± 0.011 | 0.000 ± 0.000 | 0.000 ± 0.000 | 0.001 ± 0.000 | 0.001 ± 0.000 | 0.444 ± 0.072 | 0.006 ± 0.001 | 0.359 ± 0.072 | 1.381 ± 0.225 | 0.263 ± 0.043 | 1.815 ± 0.296 | 0.101 ± 0.016 |
| 2MeHexane | 0.257 ± 0.011 | 1.168 ± 0.048 | 0.037 ± 0.001 | 0.040 ± 0.002 | 0.057 ± 0.002 | 0.061 ± 0.002 | 16.104 ± 0.664 | 0.622 ± 0.026 | 9.050 ± 0.618 | 100.666 ± 4.153 | 14.598 ± 0.602 | 169.078 ± 6.975 | 5.607 ± 0.231 |
| 23DiMePentane | 0.228 ± 0.008 | 1.064 ± 0.037 | 0.059 ± 0.002 | 0.047 ± 0.002 | 0.067 ± 0.002 | 0.049 ± 0.002 | 21.923 ± 0.773 | 0.464 ± 0.016 | 9.521 ± 0.561 | 63.841 ± 2.250 | 11.697 ± 0.412 | 114.575 ± 4.038 | 6.013 ± 0.212 |
| 3MeHexane | 0.287 ± 0.012 | 1.304 ± 0.055 | 0.053 ± 0.002 | <0.05 ± 0.002 | 0.064 ± 0.003 | 0.065 ± 0.003 | 17.165 ± 0.730 | 0.662 ± 0.028 | <11.92 ± 0.718 | 110.406 ± 4.695 | 16.884 ± 0.718 | 193.532 ± 8.231 | 6.359 ± 0.271 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S0-1 | S0-2 | S0-3 | S0-4 | S0-5 | S0-6 | S1-1 | S1-2 | S2-1 | S2-2 | S2-3 | S2-4 | S3-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyclohexene | 0.006 ± 0.003 | 0.048 ± 0.013 | 0.014 ± 0.001 | 0.000 ± 0.001 | 0.001 ± 0.002 | 0.004 ± 0.002 | 0.686 ± 0.151 | 0.043 ± 0.019 | 0.000 ± 0.138 | 3.608 ± 2.784 | 0.778 ± 0.467 | 4.403 ± 4.724 | 0.182 ± 0.058 |
| 3EtPentane | 0.025 ± 0.000 | 0.119 ± 0.000 | 0.005 ± 0.000 | 0.012 ± 0.000 | 0.018 ± 0.000 | 0.018 ± 0.000 | 1.349 ± 0.102 | 0.172 ± 0.000 | 2.479 ± 0.000 | 24.854 ± 0.598 | 4.170 ± 0.100 | 42.169 ± 0.926 | 0.520 ± 0.000 |
| * 1-Heptene | <0.55 ± 0.000 | <2.42 ± 0.000 | <0.09 ± 0.000 | 0.000 ± 0.019 | 0.000 ± 0.018 | 0.000 ± 0.011 | 2.063 ± 5.758 | 0.000 ± 0.128 | 0.992 ± 0.000 | 12.078 ± 13.097 | 2.008 ± 2.225 | 18.704 ± 21.043 | <13.61 ± 0.000 |
| * 224TrMePentane | <0.55 ± 0.000 | <2.42 ± 0.001 | <0.09 ± 0.000 | 0.159 ± 0.000 | 0.147 ± 0.000 | 0.092 ± 0.000 | 47.160 ± 0.021 | 1.051 ± 0.000 | 20.096 ± 0.013 | 107.273 ± 0.065 | 18.229 ± 0.000 | 172.357 ± 0.102 | <13.61 ± 0.002 |
| t-3-Heptene | 0.002 ± 0.007 | 0.016 ± 0.032 | 0.000 ± 0.001 | 0.000 ± 0.001 | 0.001 ± 0.001 | 0.001 ± 0.002 | 0.572 ± 0.369 | 0.010 ± 0.017 | 0.261 ± 0.405 | 1.793 ± 2.477 | 0.000 ± 0.459 | 2.802 ± 4.827 | 0.066 ± 0.149 |
| n-Heptane | 0.207 ± 0.001 | 0.965 ± 0.002 | 0.032 ± 0.000 | 0.043 ± 0.000 | 0.046 ± 0.000 | 0.051 ± 0.000 | 11.026 ± 0.087 | 0.524 ± 0.002 | 7.417 ± 0.047 | 74.006 ± 0.015 | 13.701 ± 0.004 | 144.189 ± 0.044 | 4.439 ± 0.012 |
| 244TMe-1-Pentene | 0.008 ± 0.005 | 0.019 ± 0.022 | 0.000 ± 0.001 | 0.002 ± 0.001 | 0.001 ± 0.001 | 0.003 ± 0.002 | 0.897 ± 0.341 | 0.019 ± 0.013 | 0.069 ± 0.363 | 0.155 ± 1.975 | 0.043 ± 0.452 | 0.453 ± 3.209 | 0.124 ± 0.126 |
| MeCyHexane | 0.074 ± 0.009 | 0.308 ± 0.048 | 0.010 ± 0.002 | 0.013 ± 0.003 | 0.019 ± 0.002 | 0.026 ± 0.001 | 4.929 ± 0.695 | 0.191 ± 0.017 | 2.940 ± 0.574 | 28.566 ± 2.402 | 6.533 ± 0.421 | 46.408 ± 4.343 | 1.822 ± 0.228 |
| 25DiMeHexane | 0.082 ± 0.004 | 0.411 ± 0.022 | 0.017 ± 0.001 | 0.024 ± 0.001 | 0.017 ± 0.001 | 0.012 ± 0.001 | 5.955 ± 0.353 | 0.150 ± 0.011 | 2.905 ± 0.272 | 20.575 ± 1.328 | 3.603 ± 0.208 | 37.207 ± 2.322 | 1.956 ± 0.108 |
| 24DiMeHexane | 0.103 ± 0.005 | 0.505 ± 0.023 | 0.019 ± 0.001 | 0.032 ± 0.002 | 0.030 ± 0.001 | 0.025 ± 0.001 | 8.304 ± 0.436 | 0.270 ± 0.011 | 4.862 ± 0.328 | 31.226 ± 1.175 | 4.888 ± 0.173 | 54.608 ± 2.085 | 2.543 ± 0.132 |
| 234TrMePentane | 0.141 ± 0.097 | 0.629 ± 0.575 | 0.026 ± 0.018 | 0.047 ± 0.016 | 0.041 ± 0.031 | 0.023 ± 0.019 | 11.761 ± 7.075 | 0.288 ± 0.132 | 5.257 ± 4.308 | 31.719 ± 41.290 | 4.672 ± 5.650 | 56.275 ± 48.614 | 3.567 ± 1.427 |
| Toluene | 2.296 ± 0.005 | 13.581 ± 0.020 | 0.438 ± 0.001 | 0.372 ± 0.001 | 0.740 ± 0.001 | 0.439 ± 0.000 | 261.901 ± 0.364 | 3.106 ± 0.003 | 69.370 ± 0.317 | <975.01 ± 94.350 | <133.42 ± 12.911 | <1147.97 ± 111.087 | 33.703 ± 0.126 |
| 23DiMeHexane | 0.053 ± 0.008 | 0.223 ± 0.033 | 0.011 ± 0.001 | 0.005 ± 0.001 | 0.006 ± 0.001 | 0.004 ± 0.001 | 4.079 ± 0.000 | 0.037 ± 0.014 | 2.729 ± 0.304 | <975.01 ± 2.223 | <133.42 ± 0.384 | <1147.97 ± 4.117 | 1.414 ± 0.112 |
| 2MeHeptane | 0.155 ± 0.007 | 0.671 ± 0.031 | 0.024 ± 0.001 | 0.013 ± 0.001 | 0.029 ± 0.001 | 0.025 ± 0.001 | 0.000 ± 0.458 | 0.281 ± 0.011 | 4.108 ± 0.347 | 44.739 ± 1.630 | 7.720 ± 0.245 | 82.846 ± 3.050 | 2.247 ± 0.103 |
| 4MeHeptane | 0.071 ± 0.005 | 0.327 ± 0.026 | 0.013 ± 0.001 | 0.009 ± 0.000 | 0.011 ± 0.001 | 0.011 ± 0.001 | 4.814 ± 0.415 | 0.117 ± 0.010 | 1.549 ± 0.255 | 17.121 ± 1.650 | 2.574 ± 0.241 | 32.037 ± 3.090 | 1.078 ± 0.095 |
| 3MeHeptane | 0.161 ± 0.003 | 0.785 ± 0.011 | 0.022 ± 0.001 | 0.006 ± 0.001 | 0.028 ± 0.001 | 0.026 ± 0.001 | 12.495 ± 0.215 | 0.302 ± 0.005 | 4.592 ± 0.128 | 49.670 ± 0.253 | 7.245 ± 0.058 | 93.031 ± 0.431 | 2.876 ± 0.043 |
| Hexanal | 0.000 ± 0.012 | 0.020 ± 0.006 | 0.000 ± 0.013 | 0.040 ± 0.013 | 0.020 ± 0.014 | 0.070 ± 0.013 | 0.360 ± 0.016 | 0.020 ± 0.017 | 0.100 ± 0.018 | 0.760 ± 0.017 | 0.000 ± 0.017 | 0.050 ± 0.017 | 0.020 ± 0.006 |
| 225TMHexane | 0.114 ± 0.001 | 0.677 ± 0.013 | 0.022 ± 0.001 | 0.038 ± 0.000 | 0.019 ± 0.000 | 0.009 ± 0.000 | 5.309 ± 0.019 | 0.130 ± 0.000 | 3.009 ± 0.116 | 17.882 ± 0.193 | 3.709 ± 0.082 | 37.107 ± 0.278 | 2.419 ± 0.012 |
| Octene-1 | 0.009 ± 0.001 | 0.104 ± 0.002 | 0.004 ± 0.000 | 0.003 ± 0.000 | 0.001 ± 0.000 | 0.001 ± 0.000 | 0.154 ± 0.005 | 0.001 ± 0.000 | 0.257 ± 0.026 | 1.591 ± 0.126 | 0.672 ± 0.029 | 2.289 ± 0.252 | 0.099 ± 0.010 |
| 11DMeCyHexane | 0.022 ± 0.006 | 0.094 ± 0.029 | 0.002 ± 0.001 | 0.003 ± 0.001 | 0.002 ± 0.001 | 0.003 ± 0.001 | 0.206 ± 0.350 | 0.002 ± 0.010 | 0.043 ± 0.241 | 5.290 ± 1.270 | 1.222 ± 0.277 | 10.568 ± 2.925 | 0.439 ± 0.083 |
| n-Octane | 0.156 ± 0.002 | 0.748 ± 0.009 | 0.032 ± 0.001 | 0.037 ± 0.000 | 0.027 ± 0.000 | 0.024 ± 0.000 | 9.138 ± 0.105 | 0.252 ± 0.003 | 3.685 ± 0.068 | 33.162 ± 0.455 | 7.227 ± 0.078 | 76.384 ± 0.743 | 2.175 ± 0.028 |
| 24DiMeHeptane | 0.022 ± 0.001 | 0.101 ± 0.005 | 0.007 ± 0.000 | 0.001 ± 0.000 | 0.001 ± 0.000 | 0.002 ± 0.000 | 1.183 ± 0.059 | 0.034 ± 0.000 | 0.670 ± 0.040 | 5.139 ± 0.178 | 0.876 ± 0.032 | 8.396 ± 0.342 | 0.316 ± 0.017 |
| 25DiMeHeptane | 0.061 ± 0.003 | 0.306 ± 0.013 | 0.012 ± 0.001 | 0.005 ± 0.000 | 0.003 ± 0.000 | 0.003 ± 0.000 | 3.493 ± 0.152 | 0.023 ± 0.002 | 1.444 ± 0.142 | 10.661 ± 0.212 | 1.900 ± 0.030 | 20.431 ± 0.289 | 1.025 ± 0.070 |
| 33DiMeHeptane | 0.021 ± 0.051 | 0.099 ± 0.364 | 0.005 ± 0.013 | 0.001 ± 0.011 | 0.001 ± 0.026 | 0.002 ± 0.008 | 1.148 ± 2.686 | 0.014 ± 0.053 | 0.059 ± 0.000 | 1.601 ± 13.773 | 0.230 ± 1.747 | 2.182 ± 20.516 | 0.527 ± 0.497 |
| EtBenzene | 0.757 ± 0.124 | 5.380 ± 0.955 | 0.197 ± 0.038 | 0.160 ± 0.033 | 0.377 ± 0.070 | 0.115 ± 0.022 | 39.651 ± 5.222 | 0.782 ± 0.136 | 17.898 ± 4.143 | 203.296 ± 33.224 | 25.783 ± 4.962 | 302.827 ± 49.354 | 7.344 ± 1.162 |
| m/p-xylene | 1.995 ± 0.004 | 15.383 ± 0.020 | 0.613 ± 0.002 | 0.526 ± 0.000 | 1.130 ± 0.001 | 0.351 ± 0.000 | 84.096 ± 0.158 | 2.183 ± 0.001 | 48.899 ± 0.969 | 535.036 ± 0.987 | 79.916 ± 0.173 | 794.786 ± 1.220 | 18.717 ± 0.042 |
| 2MeOctane | 0.174 ± 0.015 | 0.881 ± 0.080 | 0.079 ± 0.004 | 0.014 ± 0.000 | 0.029 ± 0.000 | 0.005 ± 0.000 | 6.970 ± 0.575 | 0.024 ± 0.001 | 0.160 ± 0.447 | 43.594 ± 2.352 | 7.643 ± 0.439 | 53.885 ± 5.101 | 1.841 ± 0.152 |
| 3MeOctane | 0.143 ± 0.003 | 0.760 ± 0.017 | 0.038 ± 0.001 | 0.003 ± 0.002 | 0.004 ± 0.011 | 0.001 ± 0.002 | 5.447 ± 0.132 | 0.008 ± 0.006 | 2.143 ± 0.032 | 22.290 ± 0.309 | 4.159 ± 0.077 | 48.352 ± 0.842 | 1.437 ± 0.034 |
| Styrene+heptanal | 0.037 ± 0.049 | 0.210 ± 0.331 | 0.018 ± 0.015 | 0.024 ± 0.012 | 0.137 ± 0.023 | 0.025 ± 0.007 | 1.684 ± 1.538 | 0.073 ± 0.042 | 1.803 ± 1.358 | 3.940 ± 9.764 | 0.985 ± 1.465 | 10.748 ± 15.671 | 0.429 ± 0.382 |
| o-xylene | 1.013 ± 0.007 | 6.763 ± 0.057 | 0.301 ± 0.003 | 0.254 ± 0.000 | 0.470 ± 0.000 | 0.139 ± 0.000 | 31.464 ± 0.186 | 0.849 ± 0.002 | 19.293 ± 0.071 | 199.740 ± 0.037 | 29.979 ± 0.012 | 320.588 ± 0.073 | 7.820 ± 0.038 |
| Nonene-1 | 0.144 ± 0.004 | 1.261 ± 0.019 | 0.068 ± 0.001 | 0.004 ± 0.001 | 0.004 ± 0.001 | 0.004 ± 0.001 | 4.087 ± 0.098 | 0.035 ± 0.004 | 0.191 ± 0.092 | 0.820 ± 0.392 | 0.271 ± 0.128 | 1.599 ± 1.064 | 0.836 ± 0.033 |
| n-Nonane | 0.147 ± 0.005 | 0.684 ± 0.023 | 0.045 ± 0.002 | 0.018 ± 0.001 | 0.029 ± 0.001 | 0.018 ± 0.000 | 3.590 ± 0.119 | 0.137 ± 0.004 | 2.117 ± 0.014 | 14.445 ± 0.446 | 4.721 ± 0.060 | 39.156 ± 1.035 | 1.195 ± 0.028 |
| iPropBenzene | 0.101 ± 0.000 | 0.468 ± 0.002 | 0.033 ± 0.000 | 0.025 ± 0.002 | 0.031 ± 0.001 | 0.005 ± 0.000 | 2.426 ± 0.018 | 0.077 ± 0.004 | 1.513 ± 0.118 | 9.095 ± 0.156 | 1.223 ± 0.041 | 21.124 ± 0.449 | 0.575 ± 0.004 |
| iPropCyHexane | 0.002 ± 0.007 | 0.015 ± 0.027 | 0.003 ± 0.002 | 0.017 ± 0.004 | 0.008 ± 0.002 | 0.001 ± 0.000 | 0.153 ± 0.138 | 0.029 ± 0.005 | 0.602 ± 0.072 | 1.294 ± 0.361 | 0.341 ± 0.110 | 3.734 ± 0.865 | 0.033 ± 0.050 |
| 26DiMeOctane | 0.062 ± 0.005 | 0.249 ± 0.019 | 0.020 ± 0.001 | 0.035 ± 0.004 | 0.017 ± 0.003 | 0.002 ± 0.002 | 1.271 ± 0.110 | 0.046 ± 0.004 | 0.122 ± 2.010 | 3.326 ± 0.195 | 1.015 ± 0.093 | 7.975 ± 0.730 | 0.457 ± 0.031 |
| alpha-pinene | 0.015 ± 0.021 | 0.056 ± 0.108 | 0.004 ± 0.014 | 0.011 ± 0.013 | 0.009 ± 0.016 | 0.006 ± 0.005 | 0.330 ± 0.476 | 0.012 ± 0.016 | 1.117 ± 0.711 | 0.588 ± 2.237 | 0.280 ± 0.361 | 2.198 ± 4.844 | 0.093 ± 0.107 |
| nPropBenzene | 0.312 ± 0.031 | 1.613 ± 0.179 | 0.205 ± 0.012 | 0.200 ± 0.010 | 0.236 ± 0.021 | 0.068 ± 0.005 | 7.101 ± 0.643 | 0.242 ± 0.017 | 3.832 ± 0.007 | 33.404 ± 3.684 | 5.396 ± 0.615 | 72.336 ± 6.794 | 1.599 ± 0.155 |
| mEtToluene | 1.074 ± 0.019 | 6.104 ± 0.109 | 0.416 ± 0.009 | 0.324 ± 0.006 | 0.715 ± 0.013 | 0.172 ± 0.003 | 21.894 ± 0.400 | 0.573 ± 0.011 | 15.283 ± 0.319 | 125.518 ± 2.295 | 20.959 ± 0.388 | 231.434 ± 4.339 | 5.272 ± 0.106 |
| pEtToluene | 0.472 ± 0.021 | 2.721 ± 0.111 | 0.228 ± 0.008 | 0.150 ± 0.011 | 0.323 ± 0.018 | 0.079 ± 0.005 | 9.975 ± 0.354 | 0.263 ± 0.014 | 6.429 ± 0.016 | 57.249 ± 2.070 | 9.682 ± 0.399 | 108.232 ± 3.969 | 2.652 ± 0.088 |
| 135TriMeBenzene | 0.492 ± 0.024 | 2.587 ± 0.103 | 0.197 ± 0.007 | 0.256 ± 0.008 | 0.426 ± 0.012 | 0.105 ± 0.003 | 8.264 ± 0.337 | 0.316 ± 0.010 | 6.610 ± 0.009 | 48.325 ± 1.967 | 9.321 ± 0.324 | 92.631 ± 3.781 | 2.058 ± 0.089 |
| oEtToluene | 0.558 ± 0.009 | 2.360 ± 0.034 | 0.174 ± 0.001 | 0.179 ± 0.004 | 0.273 ± 0.007 | 0.066 ± 0.003 | 7.764 ± 0.213 | 0.228 ± 0.006 | 5.718 ± 0.380 | 45.275 ± 0.165 | 7.449 ± 0.277 | 87.019 ± 0.298 | 2.058 ± 0.047 |
| Octanal | 0.021 ± 0.001 | 0.083 ± 0.001 | 0.003 ± 0.000 | 0.009 ± 0.004 | 0.017 ± 0.006 | 0.007 ± 0.008 | 0.524 ± 0.011 | 0.016 ± 0.001 | 0.508 ± 0.011 | 0.405 ± 0.000 | 0.680 ± 0.017 | 0.731 ± 0.037 | 0.116 ± 0.003 |
| beta-pinene | 0.013 ± 0.070 | 0.018 ± 0.394 | 0.000 ± 0.029 | 0.059 ± 0.024 | 0.088 ± 0.060 | 0.122 ± 0.016 | 0.161 ± 1.082 | 0.017 ± 0.039 | 0.593 ± 0.910 | 0.000 ± 7.334 | 0.256 ± 1.235 | 0.564 ± 14.414 | 0.040 ± 0.272 |
| * 124TriMeBenzene | <1.54 ± 0.159 | <8.72 ± 0.897 | <0.64 ± 0.066 | 0.525 ± 0.010 | 1.317 ± 0.006 | 0.345 ± 0.002 | <23.94 ± 2.463 | 0.864 ± 0.007 | 20.123 ± 0.142 | 162.181 ± 0.805 | 27.315 ± 0.315 | 318.745 ± 2.204 | <6.00 ± 0.618 |
| * n-Decane | <1.54 ± 0.002 | <8.72 ± 0.007 | <0.64 ± 0.001 | 0.102 ± 0.001 | 0.060 ± 0.000 | 0.023 ± 0.000 | <23.94 ± 0.046 | 0.071 ± 0.000 | 1.468 ± 0.125 | 8.336 ± 0.131 | 3.260 ± 0.022 | 22.830 ± 0.287 | <6.00 ± 0.006 |
| iButBenzene | 0.044 ± 0.003 | 0.144 ± 0.007 | 0.014 ± 0.001 | 0.011 ± 0.002 | 0.005 ± 0.001 | 0.003 ± 0.000 | 0.937 ± 0.040 | 0.007 ± 0.001 | 0.529 ± 0.288 | 2.668 ± 0.181 | 0.453 ± 0.034 | 5.852 ± 0.385 | 0.124 ± 0.009 |
| sButBenzene | 0.058 ± 0.013 | 0.135 ± 0.079 | 0.022 ± 0.006 | 0.029 ± 0.002 | 0.023 ± 0.003 | 0.006 ± 0.001 | 0.714 ± 0.316 | 0.019 ± 0.002 | 0.402 ± 0.033 | 3.262 ± 3.889 | 0.602 ± 0.651 | 6.930 ± 7.848 | 0.159 ± 0.075 |
| Limonene | 0.124 ± 0.007 | 0.760 ± 0.031 | 0.057 ± 0.002 | 0.023 ± 0.003 | 0.029 ± 0.005 | 0.010 ± 0.001 | 3.047 ± 0.077 | 0.020 ± 0.003 | <4.94 ± 0.000 | 37.516 ± 0.000 | 6.278 ± 0.000 | 75.700 ± 0.000 | 0.725 ± 0.021 |
| Indan | 0.129 ± 0.050 | 0.628 ± 0.259 | 0.043 ± 0.024 | 0.050 ± 0.010 | 0.091 ± 0.021 | 0.038 ± 0.010 | 1.988 ± 0.696 | 0.105 ± 0.010 | <2.45 ± 0.194 | 17.031 ± 1.039 | 3.267 ± 0.149 | 33.795 ± 1.694 | 0.420 ± 0.147 |
| 13diethylbenzene | 0.505 ± 0.018 | 2.585 ± 0.091 | 0.238 ± 0.008 | 0.051 ± 0.002 | 0.213 ± 0.007 | 0.062 ± 0.002 | 6.957 ± 0.245 | 0.015 ± 0.001 | 1.937 ± 0.034 | 10.390 ± 0.366 | 1.489 ± 0.053 | 16.943 ± 0.598 | 1.471 ± 0.052 |
| 14diethylbenzene | 0.064 ± 0.006 | 0.142 ± 0.013 | 0.023 ± 0.002 | 0.103 ± 0.010 | 0.075 ± 0.007 | 0.018 ± 0.002 | 0.613 ± 0.056 | 0.030 ± 0.003 | 1.019 ± 0.000 | 5.991 ± 0.545 | 1.355 ± 0.123 | 10.494 ± 0.955 | 0.165 ± 0.015 |
| 12diethylbenzene | 0.051 ± 0.005 | 0.188 ± 0.019 | 0.023 ± 0.002 | 0.201 ± 0.021 | 0.027 ± 0.003 | 0.023 ± 0.002 | 0.337 ± 0.035 | 0.015 ± 0.002 | 0.577 ± 0.011 | 5.194 ± 0.538 | 0.647 ± 0.067 | 7.795 ± 0.808 | 0.286 ± 0.029 |
| 2-propylToluene | 0.088 ± 0.003 | 0.369 ± 0.012 | 0.034 ± 0.001 | 0.125 ± 0.004 | 0.028 ± 0.001 | 0.042 ± 0.001 | 1.114 ± 0.037 | 0.012 ± 0.000 | 1.118 ± 0.030 | 8.778 ± 0.289 | 1.236 ± 0.041 | 17.779 ± 0.585 | 0.246 ± 0.008 |
| 3-ipropyltoluene | 0.089 ± 0.004 | 0.277 ± 0.014 | 0.029 ± 0.001 | 0.014 ± 0.001 | 0.006 ± 0.000 | 0.001 ± 0.000 | 1.086 ± 0.054 | 0.004 ± 0.000 | 0.734 ± 0.072 | 4.422 ± 0.218 | 0.591 ± 0.029 | 8.651 ± 0.427 | 0.278 ± 0.014 |
| 4-ipropyltoluene | 0.018 ± 0.005 | 0.005 ± 0.001 | 0.003 ± 0.001 | 0.024 ± 0.007 | 0.018 ± 0.005 | 0.015 ± 0.005 | 0.254 ± 0.077 | 0.012 ± 0.004 | 0.088 ± 0.623 | 1.560 ± 0.475 | 0.390 ± 0.119 | 2.725 ± 0.829 | 0.057 ± 0.017 |
| 2-ipropyltoluene | 0.017 ± 0.003 | 0.057 ± 0.011 | 0.006 ± 0.001 | 0.013 ± 0.003 | 0.015 ± 0.003 | 0.007 ± 0.001 | 0.225 ± 0.045 | 0.027 ± 0.005 | <2.45 ± 0.068 | 1.530 ± 0.305 | 0.354 ± 0.071 | 1.737 ± 0.346 | 0.081 ± 0.016 |
| Nonanal | 0.296 ± 0.048 | 0.160 ± 0.026 | 0.184 ± 0.030 | 0.158 ± 0.026 | 0.532 ± 0.086 | 0.145 ± 0.024 | 3.780 ± 0.615 | 0.072 ± 0.012 | 3.546 ± 0.036 | 26.850 ± 4.368 | 3.837 ± 0.624 | 53.531 ± 8.709 | 0.770 ± 0.125 |
| n-Undecane | 0.164 ± 0.019 | 0.760 ± 0.090 | 0.089 ± 0.011 | 0.143 ± 0.017 | 0.113 ± 0.013 | 0.037 ± 0.004 | 1.738 ± 0.204 | 0.040 ± 0.005 | 0.463 ± 0.339 | 4.397 ± 0.517 | 1.066 ± 0.125 | 10.493 ± 1.234 | 0.491 ± 0.058 |
| 1245tetraMeBenzene | 0.143 ± 0.010 | 0.944 ± 0.065 | 0.115 ± 0.008 | 0.042 ± 0.003 | 0.009 ± 0.001 | 0.006 ± 0.000 | 1.428 ± 0.099 | 0.010 ± 0.001 | 0.794 ± 0.000 | 8.981 ± 0.619 | 1.314 ± 0.091 | 21.270 ± 1.467 | 0.317 ± 0.022 |
| 1235tetraMeBenzene | 0.184 ± 0.003 | 1.333 ± 0.025 | 0.151 ± 0.003 | 0.086 ± 0.002 | 0.013 ± 0.000 | 0.009 ± 0.000 | 1.673 ± 0.031 | 0.012 ± 0.000 | 0.992 ± 0.000 | 11.485 ± 0.211 | 1.806 ± 0.033 | 28.959 ± 0.533 | 0.354 ± 0.006 |
| 1234tetraMeBenzene | 0.178 ± 0.032 | 1.193 ± 0.213 | 0.150 ± 0.027 | 0.034 ± 0.006 | 0.023 ± 0.004 | 0.034 ± 0.006 | 2.420 ± 0.432 | 0.007 ± 0.001 | 0.257 ± 0.000 | 11.429 ± 2.039 | 1.814 ± 0.324 | 24.847 ± 4.432 | 0.405 ± 0.072 |
| n-Dodecane | 1.098 ± 0.131 | 2.909 ± 0.349 | 0.556 ± 0.067 | 0.059 ± 0.007 | 1.922 ± 0.230 | 0.026 ± 0.003 | 8.064 ± 0.967 | 0.016 ± 0.002 | 0.147 ± 0.000 | 37.208 ± 4.460 | 5.725 ± 0.686 | 48.522 ± 5.817 | 1.926 ± 0.231 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S3-2 | S4-1 | S4-2 | S5-1 | S5-2 | S5-3 | S5-4 | S5-5 | S6-1 | S6-2 | S6-3 | S6-4 | S7-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gravimetric mass (mg/mi) | 22.36 ± 3.54 | 3.31 ± 0.54 | 2.12 ± 0.35 | 18.14 ± 2.88 | 60.91 ± 9.63 | 9.46 ± 1.51 | 207.43 ± 32.80 | 99.63 ± 15.76 | 41.62 ± 6.58 | 49.04 ± 7.76 | 10.10 ± 1.61 | 22.84 ± 3.62 | 7.66 ± 1.22 |
| Carbon fractions by TOR (mg/mi) | | | | | | | | | | | | | |
| Organic Carbon Fraction 1 | 1.821 ± 0.388 | 0.217 ± 0.080 | 0.236 ± 0.053 | 1.809 ± 0.672 | 21.743 ± 5.729 | 1.684 ± 0.448 | 37.197 ± 10.985 | 3.375 ± 0.927 | 21.352 ± 8.475 | 2.715 ± 1.104 | 1.584 ± 0.453 | 2.197 ± 0.655 | 1.722 ± 0.410 |
| Organic Carbon Fraction 2 | 2.756 ± 0.514 | 0.437 ± 0.089 | 0.348 ± 0.071 | 3.469 ± 0.698 | 18.232 ± 3.741 | 2.691 ± 0.568 | 50.194 ± 11.291 | 7.628 ± 1.663 | 11.518 ± 2.219 | 2.726 ± 0.538 | 0.762 ± 0.182 | 5.693 ± 1.276 | 1.493 ± 0.301 |
| Organic Carbon Fraction 3 | 1.957 ± 0.414 | 0.519 ± 0.181 | 0.459 ± 0.127 | 2.502 ± 0.719 | 5.157 ± 1.061 | 2.231 ± 0.517 | 7.264 ± 1.457 | 5.521 ± 1.151 | 1.948 ± 0.564 | 1.780 ± 0.536 | 0.605 ± 0.260 | 3.604 ± 0.811 | 0.371 ± 0.171 |
| Organic Carbon Fraction 4 | 1.658 ± 0.445 | 0.275 ± 0.072 | 0.777 ± 0.196 | 1.153 ± 0.341 | 1.385 ± 0.415 | 0.569 ± 0.179 | 3.461 ± 1.016 | 3.446 ± 1.042 | 0.788 ± 0.214 | 1.708 ± 0.464 | 0.804 ± 0.273 | 2.500 ± 0.867 | 0.286 ± 0.085 |
| Pyrolyzed Organic Carbon | 0.004 ± 0.022 | 0.021 ± 0.043 | 0.001 ± 0.016 | 0.095 ± 0.130 | 0.003 ± 0.034 | 0.003 ± 0.037 | 3.534 ± 1.268 | 13.964 ± 5.012 | 0.003 ± 0.037 | 0.148 ± 0.281 | 0.002 ± 0.037 | 0.004 ± 0.036 | 0.001 ± 0.025 |
| Total Organic Carbon | 8.186 ± 1.453 | 1.438 ± 0.289 | 1.801 ± 0.333 | 9.029 ± 1.616 | 46.521 ± 8.669 | 7.177 ± 1.388 | 101.649 ± 19.936 | 33.934 ± 6.652 | 35.609 ± 6.209 | 9.079 ± 1.615 | 3.738 ± 0.781 | 13.998 ± 2.783 | 3.856 ± 0.732 |
| Elemental Carbon Fraction 1 | 2.228 ± 0.620 | 0.291 ± 0.075 | 0.305 ± 0.072 | 2.641 ± 0.743 | 2.734 ± 0.967 | 0.431 ± 0.147 | 10.210 ± 3.761 | 9.260 ± 3.243 | 0.344 ± 0.101 | 7.289 ± 1.912 | 2.249 ± 0.950 | 1.383 ± 0.550 | 0.585 ± 0.187 |
| Elemental Carbon Fraction 2 | 3.337 ± 0.584 | 0.302 ± 0.097 | 0.602 ± 0.103 | 7.343 ± 3.049 | 6.628 ± 1.335 | 2.112 ± 0.452 | 70.871 ± 14.926 | 55.568 ± 11.296 | 0.298 ± 0.131 | 29.406 ± 14.514 | 2.494 ± 0.536 | 1.256 ± 0.245 | 1.736 ± 0.315 |
| Elemental Carbon Fraction 3 | 0.082 ± 0.029 | 0.011 ± 0.007 | 0.275 ± 0.121 | 0.041 ± 0.014 | 0.055 ± 0.033 | 0.010 ± 0.013 | 0.020 ± 0.016 | 0.006 ± 0.012 | 0.000 ± 0.011 | 0.057 ± 0.016 | 0.000 ± 0.012 | 0.047 ± 0.022 | 0.000 ± 0.008 |
| Total Elemental Carbon | 5.641 ± 1.085 | 0.582 ± 0.096 | 1.178 ± 0.218 | 9.929 ± 1.571 | 9.412 ± 2.161 | 2.549 ± 0.626 | 77.566 ± 19.006 | 50.871 ± 11.478 | 0.639 ± 0.110 | 36.603 ± 5.789 | 4.739 ± 1.078 | 2.682 ± 0.616 | 2.316 ± 0.459 |
| Total Carbon | 13.827 ± 2.390 | 2.021 ± 0.381 | 2.975 ± 0.516 | 18.959 ± 3.343 | 55.933 ± 10.308 | 9.731 ± 1.851 | 179.221 ± 34.287 | 84.805 ± 15.708 | 36.249 ± 6.390 | 45.681 ± 8.138 | 8.480 ± 1.606 | 16.681 ± 3.237 | 6.173 ± 1.111 |
| Elements by XRF (mg/mi) | | | | | | | | | | | | | |
| Sodium (qualitative only) | 0.2292 ± 0.1567 | 0.1341 ± 0.1326 | 0.1160 ± 0.0855 | 0.3977 ± 0.1872 | 0.3757 ± 0.2197 | 0.2698 ± 0.1947 | 0.2127 ± 0.5178 | 0.0000 ± 0.2171 | 0.2440 ± 0.2110 | 0.3421 ± 0.2269 | 0.2317 ± 0.2595 | 0.1582 ± 0.2746 | 0.3097 ± 0.1666 |
| Magnesium (qualitative only) | 0.0368 ± 0.0223 | 0.0354 ± 0.0204 | 0.0106 ± 0.0160 | 0.0455 ± 0.0322 | 0.0402 ± 0.0352 | 0.0043 ± 0.0370 | 0.1268 ± 0.0686 | 0.0058 ± 0.0468 | 0.0155 ± 0.0382 | 0.0890 ± 0.0314 | 0.0000 ± 0.0474 | 0.0000 ± 0.0461 | 0.0141 ± 0.0294 |
| Aluminum | 0.0663 ± 0.0139 | 0.0348 ± 0.0112 | 0.0078 ± 0.0071 | 0.0002 ± 0.0193 | 0.0072 ± 0.0193 | 0.0301 ± 0.0159 | 0.0685 ± 0.0320 | 0.0060 ± 0.0201 | 0.0243 ± 0.0156 | 0.0054 ± 0.0206 | 0.0357 ± 0.0150 | 0.0511 ± 0.0188 | 0.0096 ± 0.0117 |
| Silicon | 2.2776 ± 0.3602 | 0.1437 ± 0.0231 | 0.1010 ± 0.0163 | 0.1254 ± 0.0212 | 0.2638 ± 0.0425 | 0.0786 ± 0.0144 | 4.4661 ± 0.0753 | 0.8366 ± 0.1326 | 0.0471 ± 0.0102 | 0.4305 ± 0.0686 | 0.1182 ± 0.0202 | 0.3206 ± 0.0514 | 0.0279 ± 0.0069 |
| Phosphorous | 0.0356 ± 0.0064 | 0.0039 ± 0.0027 | 0.0042 ± 0.0020 | 0.0153 ± 0.0051 | 0.0349 ± 0.0074 | 0.0233 ± 0.0061 | 0.1735 ± 0.0292 | 0.0317 ± 0.0069 | 0.0431 ± 0.0082 | 0.0177 ± 0.0057 | 0.0635 ± 0.0111 | 0.0316 ± 0.0073 | 0.0518 ± 0.0088 |
| Sulfur | 0.4772 ± 0.0755 | 0.0626 ± 0.0101 | 0.0424 ± 0.0068 | 0.1930 ± 0.0309 | 0.7571 ± 0.1198 | 0.0568 ± 0.0096 | 0.9955 ± 0.1577 | 0.2865 ± 0.0455 | 0.0953 ± 0.0154 | 0.4036 ± 0.0640 | 0.1275 ± 0.0205 | 0.3861 ± 0.0612 | 0.1514 ± 0.0241 |
| Chlorine | 0.0174 ± 0.0053 | 0.0031 ± 0.0031 | 0.0005 ± 0.0033 | 0.0071 ± 0.0055 | 0.0030 ± 0.0120 | 0.0021 ± 0.0061 | 0.0254 ± 0.0164 | 0.0290 ± 0.0086 | 0.0009 ± 0.0055 | 0.0129 ± 0.0088 | 0.0150 ± 0.0055 | 0.0112 ± 0.0059 | 0.0019 ± 0.0043 |
| Potassium | 0.0212 ± 0.0037 | 0.0105 ± 0.0022 | 0.0020 ± 0.0021 | 0.0019 ± 0.0031 | 0.0058 ± 0.0029 | 0.0049 ± 0.0029 | 0.0187 ± 0.0065 | 0.0057 ± 0.0054 | 0.0455 ± 0.0076 | 0.0055 ± 0.0029 | 0.0110 ± 0.0033 | 0.0311 ± 0.0058 | 0.0072 ± 0.0024 |
| Calcium | 0.3150 ± 0.0499 | 0.0825 ± 0.0132 | 0.0674 ± 0.0108 | 0.0335 ± 0.0064 | 0.1298 ± 0.0208 | 0.1155 ± 0.0186 | 0.5319 ± 0.0844 | 0.2858 ± 0.0455 | 0.1049 ± 0.0169 | 0.1292 ± 0.0208 | 0.2079 ± 0.0331 | 0.3050 ± 0.0484 | 0.1388 ± 0.0221 |
| Titanium | 0.0100 ± 0.0104 | 0.0103 ± 0.0107 | 0.0055 ± 0.0116 | 0.0026 ± 0.0192 | 0.0063 ± 0.0187 | 0.0095 ± 0.0179 | 0.0147 ± 0.0352 | 0.0086 ± 0.0324 | 0.0024 ± 0.0188 | 0.0064 ± 0.0196 | 0.0109 ± 0.0188 | 0.0074 ± 0.0182 | 0.0055 ± 0.0136 |
| Vanadium | 0.0036 ± 0.0049 | 0.0080 ± 0.0046 | 0.0021 ± 0.0054 | 0.0008 ± 0.0089 | 0.0019 ± 0.0080 | 0.0036 ± 0.0077 | 0.0052 ± 0.0151 | 0.0034 ± 0.0156 | 0.0018 ± 0.0080 | 0.0030 ± 0.0084 | 0.0047 ± 0.0081 | 0.0013 ± 0.0090 | 0.0023 ± 0.0061 |
| Chromium | 0.0092 ± 0.0017 | 0.0046 ± 0.0011 | 0.0010 ± 0.0011 | 0.0002 ± 0.0019 | 0.0009 ± 0.0016 | 0.0023 ± 0.0014 | 0.0083 ± 0.0026 | 0.0062 ± 0.0031 | 0.0035 ± 0.0014 | 0.0021 ± 0.0015 | 0.0173 ± 0.0031 | 0.0130 ± 0.0028 | 0.0009 ± 0.0013 |
| Manganese | 0.0047 ± 0.0009 | 0.0013 ± 0.0005 | 0.0017 ± 0.0006 | 0.0014 ± 0.0009 | 0.0021 ± 0.0009 | 0.0011 ± 0.0010 | 0.0037 ± 0.0020 | 0.0033 ± 0.0014 | 0.0007 ± 0.0009 | 0.0007 ± 0.0010 | 0.0022 ± 0.0011 | 0.0062 ± 0.0015 | 0.0003 ± 0.0008 |
| Iron | 0.5034 ± 0.0796 | 0.0614 ± 0.0098 | 0.0575 ± 0.0091 | 0.0256 ± 0.0045 | 0.0396 ± 0.0066 | 0.0778 ± 0.0125 | 0.4600 ± 0.0729 | 0.3544 ± 0.0561 | 0.0511 ± 0.0083 | 0.0406 ± 0.0067 | 0.2292 ± 0.0363 | 1.1917 ± 0.1885 | 0.0297 ± 0.0049 |
| Cobalt | 0.0026 ± 0.0049 | 0.0004 ± 0.0007 | 0.0003 ± 0.0005 | 0.0001 ± 0.0008 | 0.0005 ± 0.0010 | 0.0005 ± 0.0012 | 0.0007 ± 0.0047 | 0.0023 ± 0.0040 | 0.0000 ± 0.0010 | 0.0005 ± 0.0010 | 0.0012 ± 0.0034 | 0.0048 ± 0.0176 | 0.0004 ± 0.0007 |
| Nickel | 0.0047 ± 0.0008 | 0.0063 ± 0.0010 | 0.0007 ± 0.0003 | 0.0004 ± 0.0006 | 0.0003 ± 0.0006 | 0.0006 ± 0.0006 | 0.0029 ± 0.0010 | 0.0050 ± 0.0010 | 0.0007 ± 0.0006 | 0.0010 ± 0.0006 | 0.0026 ± 0.0008 | 0.0057 ± 0.0011 | 0.0006 ± 0.0005 |
| Copper | 0.0197 ± 0.0031 | 0.0075 ± 0.0012 | 0.0045 ± 0.0008 | 0.0033 ± 0.0008 | 0.0013 ± 0.0006 | 0.0042 ± 0.0009 | 0.0277 ± 0.0045 | 0.0184 ± 0.0030 | 0.0031 ± 0.0007 | 0.0232 ± 0.0037 | 0.0145 ± 0.0024 | 0.0301 ± 0.0048 | 0.0042 ± 0.0008 |
| Zinc | 0.1403 ± 0.0223 | 0.0160 ± 0.0036 | 0.0249 ± 0.0044 | 0.0274 ± 0.0063 | 0.0383 ± 0.0076 | 0.0408 ± 0.0079 | 0.3134 ± 0.0503 | 0.1194 ± 0.0194 | 0.0472 ± 0.0087 | 0.0599 ± 0.0106 | 0.0972 ± 0.0160 | 0.1853 ± 0.0296 | 0.0567 ± 0.0095 |
| Gallium | 0.0013 ± 0.0011 | 0.0005 ± 0.0012 | 0.0010 ± 0.0008 | 0.0004 ± 0.0021 | 0.0012 ± 0.0019 | 0.0003 ± 0.0018 | 0.0013 ± 0.0037 | 0.0001 ± 0.0019 | 0.0000 ± 0.0021 | 0.0000 ± 0.0022 | 0.0023 ± 0.0019 | 0.0019 ± 0.0017 | 0.0000 ± 0.0014 |
| Arsenic | 0.0004 ± 0.0020 | 0.0001 ± 0.0010 | 0.0001 ± 0.0007 | 0.0008 ± 0.0080 | 0.0005 ± 0.0019 | 0.0003 ± 0.0016 | 0.0012 ± 0.0056 | 0.0000 ± 0.0020 | 0.0001 ± 0.0019 | 0.0012 ± 0.0027 | 0.0000 ± 0.0022 | 0.0009 ± 0.0030 | 0.0005 ± 0.0013 |
| Selenium | 0.0003 ± 0.0004 | 0.0000 ± 0.0005 | 0.0005 ± 0.0003 | 0.0000 ± 0.0008 | 0.0003 ± 0.0008 | 0.0002 ± 0.0007 | 0.0002 ± 0.0015 | 0.0005 ± 0.0008 | 0.0000 ± 0.0008 | 0.0000 ± 0.0009 | 0.0001 ± 0.0008 | 0.0003 ± 0.0007 | 0.0001 ± 0.0006 |
| Bromine | 0.0031 ± 0.0006 | 0.0011 ± 0.0004 | 0.0008 ± 0.0003 | 0.0072 ± 0.0013 | 0.0060 ± 0.0012 | 0.0003 ± 0.0006 | 0.0060 ± 0.0014 | 0.0063 ± 0.0011 | 0.0003 ± 0.0007 | 0.0060 ± 0.0012 | 0.0003 ± 0.0007 | 0.0006 ± 0.0007 | 0.0003 ± 0.0005 |
| Rubidium | 0.0003 ± 0.0005 | 0.0004 ± 0.0005 | 0.0006 ± 0.0004 | 0.0004 ± 0.0009 | 0.0001 ± 0.0009 | 0.0004 ± 0.0008 | 0.0002 ± 0.0017 | 0.0009 ± 0.0008 | 0.0002 ± 0.0009 | 0.0001 ± 0.0009 | 0.0005 ± 0.0009 | 0.0005 ± 0.0008 | 0.0002 ± 0.0006 |
| Strontium | 0.0006 ± 0.0005 | 0.0001 ± 0.0006 | 0.0008 ± 0.0004 | 0.0000 ± 0.0010 | 0.0001 ± 0.0010 | 0.0000 ± 0.0009 | 0.0001 ± 0.0019 | 0.0015 ± 0.0008 | 0.0000 ± 0.0010 | 0.0000 ± 0.0011 | 0.0005 ± 0.0010 | 0.0007 ± 0.0008 | 0.0005 ± 0.0007 |
| Yttrium | 0.0002 ± 0.0007 | 0.0000 ± 0.0007 | 0.0010 ± 0.0005 | 0.0000 ± 0.0013 | 0.0000 ± 0.0012 | 0.0000 ± 0.0012 | 0.0000 ± 0.0024 | 0.0010 ± 0.0011 | 0.0000 ± 0.0013 | 0.0000 ± 0.0014 | 0.0005 ± 0.0013 | 0.0000 ± 0.0012 | 0.0001 ± 0.0009 |
| Zirconium | 0.0011 ± 0.0008 | 0.0069 ± 0.0013 | 0.0014 ± 0.0006 | 0.0005 ± 0.0014 | 0.0002 ± 0.0014 | 0.0003 ± 0.0013 | 0.0011 ± 0.0027 | 0.0025 ± 0.0012 | 0.0000 ± 0.0015 | 0.0014 ± 0.0014 | 0.0012 ± 0.0013 | 0.0013 ± 0.0012 | 0.0006 ± 0.0011 |
| Molybdenum | 0.0027 ± 0.0011 | 0.0001 ± 0.0012 | 0.0010 ± 0.0008 | 0.0000 ± 0.0021 | 0.0003 ± 0.0020 | 0.0007 ± 0.0019 | 0.0016 ± 0.0039 | 0.0039 ± 0.0018 | 0.0000 ± 0.0021 | 0.0001 ± 0.0022 | 0.0027 ± 0.0019 | 0.0025 ± 0.0018 | 0.0020 ± 0.0014 |
| Palladium | 0.0002 ± 0.0015 | 0.0001 ± 0.0015 | 0.0002 ± 0.0012 | 0.0001 ± 0.0027 | 0.0003 ± 0.0027 | 0.0002 ± 0.0025 | 0.0000 ± 0.0050 | 0.0003 ± 0.0027 | 0.0001 ± 0.0026 | 0.0001 ± 0.0028 | 0.0000 ± 0.0027 | 0.0009 ± 0.0024 | 0.0004 ± 0.0019 |
| Silver | 0.0010 ± 0.0020 | 0.0007 ± 0.0020 | 0.0006 ± 0.0014 | 0.0007 ± 0.0035 | 0.0005 ± 0.0035 | 0.0004 ± 0.0034 | 0.0001 ± 0.0065 | 0.0013 ± 0.0033 | 0.0004 ± 0.0035 | 0.0009 ± 0.0037 | 0.0021 ± 0.0036 | 0.0013 ± 0.0031 | 0.0011 ± 0.0025 |
| Cadmium | 0.0011 ± 0.0019 | 0.0007 ± 0.0019 | 0.0003 ± 0.0014 | 0.0014 ± 0.0034 | 0.0013 ± 0.0034 | 0.0027 ± 0.0034 | 0.0000 ± 0.0065 | 0.0002 ± 0.0032 | 0.0017 ± 0.0034 | 0.0003 ± 0.0035 | 0.0005 ± 0.0034 | 0.0008 ± 0.0032 | 0.0003 ± 0.0025 |
| Indium | 0.0004 ± 0.0023 | 0.0004 ± 0.0024 | 0.0005 ± 0.0016 | 0.0006 ± 0.0042 | 0.0009 ± 0.0040 | 0.0000 ± 0.0039 | 0.0044 ± 0.0078 | 0.0000 ± 0.0039 | 0.0006 ± 0.0043 | 0.0003 ± 0.0044 | 0.0000 ± 0.0041 | 0.0018 ± 0.0037 | 0.0006 ± 0.0030 |
| Tin | 0.0040 ± 0.0035 | 0.0008 ± 0.0036 | 0.0005 ± 0.0025 | 0.0017 ± 0.0064 | 0.0025 ± 0.0063 | 0.0009 ± 0.0060 | 0.0079 ± 0.0120 | 0.0001 ± 0.0060 | 0.0003 ± 0.0064 | 0.0000 ± 0.0066 | 0.0027 ± 0.0066 | 0.0029 ± 0.0057 | 0.0015 ± 0.0046 |
| Antimony | 0.0014 ± 0.0039 | 0.0021 ± 0.0039 | 0.0005 ± 0.0028 | 0.0061 ± 0.0071 | 0.0000 ± 0.0069 | 0.0002 ± 0.0066 | 0.0025 ± 0.0133 | 0.0031 ± 0.0063 | 0.0023 ± 0.0071 | 0.0021 ± 0.0075 | 0.0014 ± 0.0071 | 0.0024 ± 0.0066 | 0.0032 ± 0.0050 |
| Barium | 0.0061 ± 0.0185 | 0.0025 ± 0.0187 | 0.0021 ± 0.0130 | 0.0224 ± 0.0309 | 0.0202 ± 0.0302 | 0.0011 ± 0.0315 | 0.0064 ± 0.0625 | 0.0000 ± 0.0308 | 0.0187 ± 0.0335 | 0.0009 ± 0.0350 | 0.0029 ± 0.0333 | 0.0076 ± 0.0312 | 0.0031 ± 0.0240 |
| Lanthanum | 0.0184 ± 0.0243 | 0.0087 ± 0.0246 | 0.0199 ± 0.0176 | 0.0229 ± 0.0438 | 0.0183 ± 0.0424 | 0.0091 ± 0.0411 | 0.0088 ± 0.0815 | 0.0249 ± 0.0416 | 0.0090 ± 0.0437 | 0.0142 ± 0.0460 | 0.0101 ± 0.0434 | 0.0375 ± 0.0411 | 0.0192 ± 0.0315 |
| Gold | 0.0024 ± 0.0024 | 0.0010 ± 0.0013 | 0.0018 ± 0.0011 | 0.0004 ± 0.0024 | 0.0009 ± 0.0024 | 0.0022 ± 0.0023 | 0.0000 ± 0.0076 | 0.0007 ± 0.0054 | 0.0005 ± 0.0026 | 0.0000 ± 0.0030 | 0.0009 ± 0.0034 | 0.0015 ± 0.0058 | 0.0004 ± 0.0020 |
| Mercury | 0.0002 ± 0.0008 | 0.0000 ± 0.0008 | 0.0008 ± 0.0006 | 0.0000 ± 0.0014 | 0.0002 ± 0.0014 | 0.0002 ± 0.0013 | 0.0002 ± 0.0027 | 0.0003 ± 0.0017 | 0.0000 ± 0.0015 | 0.0000 ± 0.0015 | 0.0000 ± 0.0014 | 0.0001 ± 0.0013 | 0.0001 ± 0.0010 |
| Thallium | 0.0001 ± 0.0008 | 0.0004 ± 0.0008 | 0.0009 ± 0.0006 | 0.0005 ± 0.0018 | 0.0001 ± 0.0013 | 0.0000 ± 0.0012 | 0.0010 ± 0.0026 | 0.0017 ± 0.0015 | 0.0003 ± 0.0014 | 0.0003 ± 0.0015 | 0.0002 ± 0.0013 | 0.0000 ± 0.0013 | 0.0006 ± 0.0010 |
| Lead | 0.0202 ± 0.0034 | 0.0014 ± 0.0014 | 0.0050 ± 0.0011 | 0.0501 ± 0.0082 | 0.0064 ± 0.0021 | 0.0029 ± 0.0020 | 0.0406 ± 0.0073 | 0.0109 ± 0.0025 | 0.0000 ± 0.0027 | 0.0098 ± 0.0030 | 0.0088 ± 0.0027 | 0.0158 ± 0.0032 | 0.0006 ± 0.0018 |
| Uranium | 0.0006 ± 0.0012 | 0.0002 ± 0.0012 | 0.0011 ± 0.0009 | 0.0000 ± 0.0021 | 0.0000 ± 0.0021 | 0.0001 ± 0.0019 | 0.0002 ± 0.0040 | 0.0022 ± 0.0022 | 0.0001 ± 0.0022 | 0.0001 ± 0.0023 | 0.0003 ± 0.0021 | 0.0000 ± 0.0019 | 0.0005 ± 0.0016 |
| Anions by IC (mg/mi) | | | | | | | | | | | | | |
| Nitrate Ion | 0.03 ± 0.01 | 0.02 ± 0.01 | 0.02 ± 0.01 | 0.02 ± 0.03 | 0.02 ± 0.03 | 0.03 ± 0.03 | 0.03 ± 0.04 | 0.02 ± 0.03 | 0.01 ± 0.03 | 0.01 ± 0.03 | 0.00 ± 0.03 | 0.04 ± 0.03 | 0.02 ± 0.02 |
| Sulfate Ion | 0.92 ± 0.06 | 0.18 ± 0.02 | 0.14 ± 0.01 | 0.56 ± 0.06 | 1.84 ± 0.12 | 0.15 ± 0.05 | 1.55 ± 0.11 | 0.37 ± 0.06 | 0.14 ± 0.05 | 0.89 ± 0.07 | 0.24 ± 0.05 | 0.70 ± 0.07 | 0.37 ± 0.03 |
| Polycyclic aromatic hydrocarbons (ug/mile) | | | | | | | | | | | | | |
| Naphthalene | 1172.12 ± 102.06 | 1194.42 ± 103.73 | 1517.09 ± 122.35 | 2687.12 ± 244.64 | 8640.93 ± 692.01 | 1556.41 ± 173.10 | 7193.84 ± 586.10 | 7994.70 ± 646.42 | 10408.33 ± 828.80 | 3262.24 ± 293.92 | 2663.67 ± 245.44 | 1830.59 ± 187.65 | 1858.31 ± 160.27 |
| 2-methylnaphthalene | 2707.31 ± 215.27 | 3708.86 ± 294.71 | 6857.91 ± 544.16 | 1634.67 ± 131.34 | 20962.81 ± 1663.84 | 3720.12 ± 296.66 | 33390.50 ± 2649.57 | 13763.35 ± 1093.13 | 39587.51 ± 3140.83 | 7442.66 ± 591.96 | 8829.54 ± 701.75 | 7293.35 ± 579.91 | 3035.79 ± 241.63 |
| 1-methylnaphthalene | 1327.77 ± 92.35 | 1876.14 ± 130.38 | 3476.60 ± 241.23 | 772.73 ± 54.39 | 11874.69 ± 824.11 | 1743.02 ± 121.64 | 21651.69 ± 1502.17 | 8364.75 ± 580.81 | 21354.44 ± 1481.49 | 3688.04 ± 256.55 | 4356.98 ± 302.85 | 3449.06 ± 239.88 | 1466.67 ± 102.13 |
| Biphenyl | 98.36 ± 6.55 | 53.44 ± 3.84 | 53.71 ± 3.60 | 37.78 ± 5.05 | 702.55 ± 44.98 | 110.32 ± 8.61 | 1928.04 ± 122.37 | 1471.56 ± 93.54 | 410.25 ± 26.70 | 317.90 ± 21.11 | 168.44 ± 11.89 | 199.22 ± 13.68 | 104.72 ± 7.21 |
| 1+2ethylnaphthalene | 153.44 ± 17.31 | 254.67 ± 24.51 | 520.08 ± 44.08 | 106.34 ± 32.65 | 1825.00 ± 156.98 | 227.54 ± 38.89 | 3281.37 ± 277.07 | 911.66 ± 86.07 | 3339.84 ± 281.15 | 566.26 ± 61.37 | 728.85 ± 70.87 | 481.78 ± 52.88 | 271.93 ± 28.74 |
| 2,6+2,7-dimethylnaphthalene | 213.27 ± 17.54 | 329.90 ± 26.99 | 744.66 ± 60.45 | 174.99 ± 14.58 | 4025.59 ± 326.24 | 394.94 ± 32.34 | 9239.97 ± 748.51 | 2177.22 ± 176.62 | 4186.77 ± 339.31 | 1104.69 ± 89.80 | 998.16 ± 81.14 | 500.95 ± 40.90 | 433.18 ± 35.49 |
| 1,3+1,6+1,7dimethylnaphth | 299.66 ± 24.89 | 564.12 ± 46.50 | 1205.16 ± 98.69 | 270.78 ± 22.75 | 6255.85 ± 511.64 | 639.93 ± 52.89 | 14506.88 ± 1185.83 | 3842.07 ± 314.51 | 6565.46 ± 536.96 | 1959.21 ± 160.70 | 1603.69 ± 131.59 | 681.59 ± 56.26 | 674.63 ± 55.73 |
| 1,4+1,5+2,3-dimethylnaphth | 4.63 ± 1.08 | 6.68 ± 1.29 | 276.46 ± 32.53 | 64.40 ± 7.80 | 1309.61 ± 153.18 | 161.38 ± 19.08 | 3722.39 ± 435.09 | 965.16 ± 112.96 | 341.40 ± 40.08 | 167.95 ± 19.87 | 371.76 ± 43.62 | 141.83 ± 16.79 | 1.84 ± 1.22 |
| 1,2-dimethylnaphthalene | 49.81 ± 5.66 | 46.93 ± 5.35 | 152.19 ± 16.67 | 35.91 ± 4.07 | 3573.22 ± 388.18 | 171.39 ± 18.72 | 12960.25 ± 1407.77 | 4538.41 ± 493.03 | 1180.55 ± 128.32 | 1759.87 ± 191.25 | 471.76 ± 51.33 | 90.07 ± 9.91 | 101.18 ± 11.36 |
| 2-Methylbiphenyl | 0.00 ± 133.34 | 2.25 ± 133.85 | 106.15 ± 80.47 | 0.00 ± 384.12 | 0.00 ± 389.16 | 0.00 ± 405.12 | 0.00 ± 446.53 | 0.00 ± 438.73 | 0.00 ± 404.12 | 0.00 ± 445.34 | 0.00 ± 400.91 | 0.00 ± 391.10 | 96.62 ± 199.97 |
| 3-Methylbiphenyl | 40.79 ± 38.28 | 49.19 ± 38.46 | 115.17 ± 24.26 | 0.00 ± 109.56 | 378.81 ± 115.35 | 0.00 ± 115.69 | 1176.22 ± 152.40 | 807.14 ± 138.65 | 319.52 ± 118.29 | 144.65 ± 128.02 | 10.40 ± 114.58 | 0.00 ± 111.61 | 123.54 ± 57.82 |
| 4-Methylbiphenyl | 15.70 ± 11.78 | 16.63 ± 11.81 | 42.89 ± 7.24 | 0.00 ± 33.85 | 157.66 ± 35.08 | 6.96 ± 35.73 | 552.46 ± 45.41 | 363.46 ± 41.60 | 123.41 ± 36.04 | 67.31 ± 39.41 | 15.13 ± 35.38 | 0.00 ± 34.47 | 26.30 ± 17.59 |
| Dibenzofuran | 18.02 ± 1.35 | 12.73 ± 0.97 | 10.32 ± 0.77 | 13.64 ± 1.08 | 144.12 ± 10.45 | 32.56 ± 2.42 | 299.01 ± 21.61 | 352.15 ± 25.44 | 71.78 ± 5.23 | 97.24 ± 7.08 | 48.79 ± 3.59 | 34.07 ± 2.52 | 43.54 ± 3.21 |
| A-trimethylnaphthalene | 28.15 ± 1.60 | 32.61 ± 1.84 | 56.67 ± 3.08 | 48.80 ± 2.87 | 881.55 ± 47.45 | 91.32 ± 5.09 | 3174.95 ± 170.62 | 790.84 ± 42.60 | 389.81 ± 21.06 | 305.88 ± 16.58 | 161.29 ± 8.82 | 68.70 ± 3.90 | 61.29 ± 3.41 |
| 1-ethyl-2-methylnaphthalene | 8.72 ± 0.58 | 20.43 ± 1.10 | 13.86 ± 0.73 | 12.32 ± 1.19 | 272.82 ± 13.24 | 27.31 ± 1.74 | 668.91 ± 32.29 | 252.37 ± 12.27 | 225.57 ± 10.98 | 83.17 ± 4.24 | 61.07 ± 3.18 | 19.15 ± 1.41 | 17.71 ± 1.07 |
| B-trimethylnaphthalene | 16.03 ± 1.60 | 22.25 ± 2.18 | 33.93 ± 3.20 | 33.28 ± 3.39 | 557.20 ± 51.79 | 65.64 ± 6.34 | 2182.80 ± 202.36 | 599.53 ± 55.72 | 223.31 ± 20.88 | 210.69 ± 19.74 | 98.02 ± 9.31 | 32.85 ± 3.37 | 40.57 ± 3.91 |
| C-trimethylnaphthalene | 12.58 ± 1.15 | 15.68 ± 1.40 | 27.61 ± 2.32 | 24.30 ± 2.31 | 556.55 ± 45.98 | 55.72 ± 4.81 | 1738.35 ± 143.34 | 531.72 ± 43.95 | 159.85 ± 13.33 | 163.67 ± 13.67 | 75.98 ± 6.45 | 24.99 ± 2.37 | 30.49 ± 2.65 |
| 2-ethyl-1-methylnaphthalene | 0.67 ± 0.22 | 0.59 ± 0.21 | 2.51 ± 0.35 | 0.19 ± 0.48 | 19.88 ± 2.52 | 3.10 ± 0.69 | 115.92 ± 13.95 | 36.14 ± 4.46 | 10.33 ± 1.43 | 8.76 ± 1.29 | 3.34 ± 0.70 | 1.92 ± 0.58 | 1.49 ± 0.36 |
| E-trimethylnaphthalene | 5.56 ± 0.59 | 8.22 ± 0.79 | 13.75 ± 1.16 | 13.77 ± 1.48 | 235.11 ± 19.02 | 29.14 ± 2.61 | 1002.41 ± 80.72 | 267.78 ± 21.67 | 86.01 ± 7.08 | 95.81 ± 7.88 | 37.86 ± 3.27 | 11.30 ± 1.34 | 17.03 ± 1.53 |
| F-trimethylnaphthalene | 5.92 ± 0.54 | 4.64 ± 0.45 | 12.69 ± 1.03 | 13.88 ± 1.25 | 235.41 ± 18.46 | 31.30 ± 2.57 | 925.46 ± 72.36 | 280.14 ± 21.96 | 71.59 ± 5.68 | 66.00 ± 5.26 | 32.63 ± 2.67 | 11.70 ± 1.10 | 13.76 ± 1.18 |
| 2,3,5+I-trimethylnaphthalene | 7.02 ± 1.18 | 9.36 ± 1.51 | 14.06 ± 2.13 | 12.66 ± 2.29 | 239.01 ± 35.24 | 29.12 ± 4.62 | 1060.52 ± 155.56 | 272.78 ± 40.21 | 83.63 ± 12.52 | 91.79 ± 13.74 | 34.78 ± 5.41 | 10.95 ± 2.08 | 25.02 ± 3.84 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S3-2 | S4-1 | S4-2 | S5-1 | S5-2 | S5-3 | S5-4 | S5-5 | S6-1 | S6-2 | S6-3 | S6-4 | S7-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4,5-trimethylnaphthalene | 1.87 ± 0.27 | 2.51 ± 0.32 | 3.37 ± 0.34 | 4.19 ± 0.65 | 58.17 ± 5.12 | 5.29 ± 0.74 | 339.91 ± 29.47 | 102.34 ± 8.93 | 22.35 ± 2.07 | 25.29 ± 2.33 | 7.50 ± 0.88 | 0.00 ± 0.51 | 4.78 ± 0.55 |
| J-trimethylnaphthalene | 2.08 ± 0.41 | 1.59 ± 0.35 | 5.03 ± 0.74 | 4.19 ± 0.90 | 73.11 ± 10.21 | 9.34 ± 1.53 | 328.82 ± 45.50 | 75.25 ± 10.52 | 26.64 ± 3.83 | 34.36 ± 4.91 | 10.56 ± 1.68 | 3.91 ± 0.88 | 0.78 ± 0.36 |
| 1,4,5-trimethylnaphthalene | 1.58 ± 0.15 | 1.94 ± 0.17 | 2.89 ± 0.19 | 3.04 ± 0.30 | 45.97 ± 2.66 | 4.86 ± 0.38 | 230.69 ± 13.22 | 80.95 ± 4.65 | 21.09 ± 1.24 | 20.45 ± 1.22 | 6.60 ± 0.46 | 2.09 ± 0.27 | 4.37 ± 0.33 |
| Acenaphthylene | 52.21 ± 4.02 | 13.71 ± 1.27 | 20.07 ± 1.60 | 126.68 ± 9.29 | 1060.10 ± 76.94 | 265.87 ± 19.38 | 7731.23 ± 560.60 | 4006.39 ± 290.55 | 212.53 ± 15.51 | 1156.85 ± 83.97 | 342.24 ± 24.91 | 130.67 ± 9.59 | 59.25 ± 4.66 |
| Acenaphthene | 7.14 ± 0.83 | 8.24 ± 0.90 | 9.41 ± 0.83 | 22.31 ± 2.28 | 229.50 ± 16.87 | 31.93 ± 2.91 | 876.84 ± 63.74 | 256.22 ± 18.84 | 104.18 ± 7.88 | 229.38 ± 16.91 | 28.41 ± 2.68 | 14.56 ± 1.89 | 7.37 ± 1.06 |
| Fluorene | 24.87 ± 3.00 | 10.48 ± 1.43 | 20.53 ± 2.43 | 44.47 ± 5.56 | 629.80 ± 71.99 | 63.10 ± 7.64 | 2750.00 ± 313.51 | 767.92 ± 87.76 | 126.81 ± 14.79 | 258.17 ± 29.75 | 69.20 ± 8.31 | 31.61 ± 4.19 | 10.67 ± 1.61 |
| Dibenzothiophene | 2.89 ± 0.35 | 0.92 ± 0.17 | 0.97 ± 0.14 | 1.16 ± 0.34 | 28.38 ± 2.87 | 2.28 ± 0.42 | 63.03 ± 6.30 | 26.47 ± 2.69 | 7.43 ± 0.84 | 14.85 ± 1.57 | 4.05 ± 0.54 | 1.92 ± 0.38 | 3.46 ± 0.44 |
| Phenanthrene | 105.70 ± 3.81 | 27.03 ± 1.18 | 46.71 ± 1.71 | 45.28 ± 2.42 | 921.46 ± 32.54 | 136.41 ± 5.26 | 3562.04 ± 125.19 | 2272.22 ± 79.93 | 166.86 ± 6.28 | 769.91 ± 27.27 | 215.86 ± 7.94 | 105.52 ± 4.23 | 136.63 ± 4.97 |
| Anthracene | 8.53 ± 0.89 | 2.42 ± 0.29 | 5.25 ± 0.55 | 12.63 ± 1.34 | 125.72 ± 12.72 | 21.56 ± 2.23 | 938.61 ± 94.70 | 556.70 ± 56.18 | 15.92 ± 1.67 | 98.64 ± 10.00 | 40.95 ± 4.17 | 22.59 ± 2.33 | 0.99 ± 0.21 |
| A-methylfluorene | 9.83 ± 0.83 | 7.88 ± 0.69 | 5.21 ± 0.44 | 12.43 ± 1.19 | 300.61 ± 22.65 | 40.13 ± 3.16 | 541.31 ± 40.73 | 253.10 ± 19.11 | 103.08 ± 7.85 | 81.65 ± 6.27 | 34.01 ± 2.72 | 6.96 ± 0.87 | 11.42 ± 1.00 |
| 1-methylfluorene | 9.22 ± 1.25 | 6.43 ± 0.90 | 7.95 ± 1.06 | 8.65 ± 1.30 | 157.88 ± 20.25 | 31.80 ± 4.21 | 252.16 ± 32.27 | 275.63 ± 35.26 | 64.38 ± 8.34 | 60.84 ± 7.91 | 25.84 ± 3.45 | 14.63 ± 2.04 | 12.01 ± 1.65 |
| B-methylfluorene | 2.19 ± 0.44 | 1.68 ± 0.35 | 1.93 ± 0.37 | 3.75 ± 0.74 | 77.56 ± 13.47 | 10.08 ± 1.82 | 128.34 ± 22.26 | 55.14 ± 9.61 | 23.68 ± 4.16 | 20.43 ± 3.61 | 9.96 ± 1.80 | 3.80 ± 0.75 | 2.11 ± 0.46 |
| 9-fluorenone | 2.36 ± 0.28 | 4.02 ± 0.46 | 0.42 ± 0.09 | 2.69 ± 0.44 | 49.12 ± 4.91 | 0.61 ± 0.34 | 27.74 ± 2.82 | 38.26 ± 3.85 | 20.20 ± 2.07 | 32.04 ± 3.25 | 12.90 ± 1.36 | 1.13 ± 0.34 | 1.40 ± 0.26 |
| Xanthone | 0.30 ± 0.26 | 0.19 ± 0.24 | 0.31 ± 0.18 | 0.00 ± 0.51 | 2.07 ± 1.05 | 0.00 ± 0.50 | 15.78 ± 5.46 | 4.84 ± 1.94 | 0.00 ± 0.55 | 0.00 ± 0.55 | 2.09 ± 1.06 | 0.00 ± 0.49 | 0.00 ± 0.27 |
| Acenaphthenequinone | 0.86 ± 0.29 | 0.51 ± 0.21 | 0.87 ± 0.26 | 1.45 ± 0.55 | 18.05 ± 4.79 | 1.03 ± 0.46 | 24.36 ± 6.44 | 7.86 ± 2.18 | 0.46 ± 0.36 | 7.42 ± 2.07 | 1.85 ± 0.65 | 0.32 ± 0.33 | 0.81 ± 0.34 |
| Perinaphthenone | 4.84 ± 1.17 | 0.00 ± 0.26 | 2.24 ± 0.56 | 0.10 ± 0.76 | 3.48 ± 1.21 | 1.73 ± 0.97 | 3.35 ± 1.28 | 8.59 ± 2.26 | 4.87 ± 1.49 | 4.26 ± 1.43 | 1.36 ± 0.91 | 0.74 ± 0.83 | 0.00 ± 0.39 |
| 2-methylanthracene | 7.14 ± 1.36 | 4.49 ± 0.88 | 3.48 ± 0.67 | 4.96 ± 0.98 | 183.33 ± 33.78 | 4.12 ± 0.84 | 149.98 ± 27.65 | 85.92 ± 15.87 | 82.11 ± 15.16 | 40.92 ± 7.59 | 13.24 ± 2.50 | 6.85 ± 1.33 | 26.44 ± 4.93 |
| 3-methylphenanthrene | 11.52 ± 0.73 | 6.20 ± 0.43 | 8.86 ± 0.56 | 12.08 ± 0.81 | 205.03 ± 12.27 | 25.38 ± 1.59 | 326.29 ± 19.50 | 178.13 ± 10.67 | 64.16 ± 3.89 | 96.05 ± 5.79 | 38.06 ± 2.33 | 14.46 ± 0.95 | 12.48 ± 0.83 |
| 2-methylphenanthrene | 13.36 ± 1.14 | 6.83 ± 0.63 | 10.01 ± 0.85 | 13.76 ± 1.28 | 225.14 ± 18.32 | 28.06 ± 2.41 | 324.23 ± 26.35 | 182.06 ± 14.84 | 65.67 ± 5.43 | 105.49 ± 8.66 | 41.62 ± 3.50 | 17.68 ± 1.59 | 14.41 ± 1.28 |
| 9-methylphenanthrene | 7.32 ± 1.26 | 2.75 ± 0.51 | 4.55 ± 0.78 | 6.07 ± 1.12 | 152.22 ± 25.08 | 9.98 ± 1.75 | 391.43 ± 64.37 | 134.44 ± 22.17 | 39.49 ± 6.59 | 59.93 ± 9.95 | 19.92 ± 3.37 | 8.33 ± 1.48 | 7.16 ± 1.28 |
| 1-methylphenanthrene | 5.80 ± 0.95 | 3.29 ± 0.58 | 3.81 ± 0.62 | 6.46 ± 1.14 | 97.90 ± 15.19 | 10.35 ± 1.74 | 155.40 ± 24.07 | 80.69 ± 12.56 | 25.88 ± 4.11 | 44.06 ± 6.92 | 17.48 ± 2.82 | 6.54 ± 1.16 | 6.70 ± 1.14 |
| Anthrone | 0.04 ± 0.09 | 0.31 ± 0.16 | 0.02 ± 0.05 | 0.28 ± 0.23 | 5.15 ± 1.62 | 0.07 ± 0.21 | 4.10 ± 1.31 | 2.84 ± 0.94 | 2.89 ± 0.94 | 6.73 ± 2.10 | 0.32 ± 0.24 | 0.00 ± 0.19 | 0.84 ± 0.34 |
| Anthraquinone | 1.96 ± 0.50 | 0.09 ± 0.12 | 0.57 ± 0.17 | 0.00 ± 0.27 | 0.00 ± 0.28 | 0.00 ± 0.29 | 0.07 ± 0.34 | 0.90 ± 0.43 | 0.00 ± 0.29 | 0.00 ± 0.32 | 0.00 ± 0.29 | 0.00 ± 0.28 | 0.00 ± 0.17 |
| 3,6-dimethylphenanthrene | 2.13 ± 0.92 | 0.73 ± 0.87 | 2.36 ± 0.60 | 0.75 ± 2.48 | 36.18 ± 4.85 | 1.95 ± 2.63 | 60.71 ± 7.41 | 21.11 ± 3.82 | 7.71 ± 2.81 | 21.00 ± 3.85 | 3.75 ± 2.65 | 1.05 ± 2.53 | 2.11 ± 1.33 |
| A-dimethylphenanthrene | 3.01 ± 0.66 | 1.21 ± 0.30 | 1.90 ± 0.42 | 3.22 ± 0.72 | 49.21 ± 10.17 | 5.01 ± 1.09 | 69.53 ± 14.35 | 26.90 ± 5.58 | 13.03 ± 2.73 | 28.16 ± 5.85 | 7.25 ± 1.55 | 2.83 ± 0.64 | 0.11 ± 0.12 |
| B-dimethylphenanthrene | 1.38 ± 0.13 | 0.56 ± 0.09 | 1.02 ± 0.09 | 1.94 ± 0.18 | 22.74 ± 1.48 | 2.37 ± 0.21 | 32.90 ± 2.13 | 11.89 ± 0.79 | 6.73 ± 0.47 | 14.09 ± 0.93 | 3.47 ± 0.27 | 1.53 ± 0.17 | 1.25 ± 0.16 |
| C-dimethylphenanthrene | 4.49 ± 0.41 | 1.87 ± 0.21 | 2.68 ± 0.25 | 4.94 ± 0.47 | 78.06 ± 6.49 | 5.97 ± 0.55 | 135.49 ± 11.25 | 51.12 ± 4.27 | 19.18 ± 1.63 | 45.46 ± 3.80 | 10.74 ± 0.94 | 3.89 ± 0.39 | 4.05 ± 0.41 |
| D-dimethylphenanthrene | 1.09 ± 0.20 | 0.45 ± 0.11 | 0.72 ± 0.13 | 1.63 ± 0.27 | 20.09 ± 2.87 | 1.88 ± 0.31 | 27.48 ± 3.92 | 9.08 ± 1.31 | 4.87 ± 0.72 | 10.62 ± 1.53 | 3.12 ± 0.47 | 1.21 ± 0.22 | 1.06 ± 0.22 |
| 1,7-dimethylphenanthrene | 3.06 ± 0.33 | 1.04 ± 0.15 | 1.57 ± 0.18 | 3.60 ± 0.39 | 49.50 ± 4.83 | 1.92 ± 0.24 | 92.96 ± 9.06 | 34.12 ± 3.34 | 13.76 ± 1.36 | 26.01 ± 2.55 | 6.49 ± 0.67 | 2.75 ± 0.31 | 2.21 ± 0.28 |
| E-dimethylphenanthrene | 1.72 ± 0.36 | 0.60 ± 0.16 | 0.97 ± 0.21 | 1.62 ± 0.36 | 27.00 ± 5.24 | 2.16 ± 0.46 | 43.14 ± 8.36 | 17.28 ± 3.37 | 6.46 ± 1.28 | 16.11 ± 3.14 | 3.63 ± 0.74 | 1.33 ± 0.31 | 1.57 ± 0.37 |
| 9-methylanthracene | 0.92 ± 0.30 | 0.72 ± 0.27 | 0.20 ± 0.12 | 0.00 ± 0.43 | 22.11 ± 5.20 | 0.08 ± 0.46 | 15.75 ± 3.75 | 4.91 ± 1.30 | 8.71 ± 2.13 | 3.69 ± 1.04 | 1.49 ± 0.60 | 0.59 ± 0.48 | 8.66 ± 2.10 |
| Fluoranthene | 55.41 ± 3.01 | 3.11 ± 0.53 | 7.97 ± 0.54 | 11.06 ± 1.48 | 230.25 ± 12.30 | 25.12 ± 1.98 | 906.61 ± 47.93 | 568.16 ± 30.10 | 18.02 ± 1.73 | 307.62 ± 16.40 | 51.42 ± 3.12 | 25.90 ± 1.98 | 27.82 ± 1.74 |
| Pyrene | 84.49 ± 8.91 | 2.98 ± 0.78 | 7.07 ± 0.88 | 16.40 ± 2.71 | 330.19 ± 34.70 | 28.13 ± 3.75 | 1483.75 ± 154.90 | 891.70 ± 93.22 | 20.99 ± 3.13 | 490.20 ± 51.40 | 49.79 ± 5.78 | 21.13 ± 3.11 | 22.90 ± 2.74 |
| 9-Anthraaldehyde | 0.33 ± 0.12 | 0.07 ± 0.09 | 0.39 ± 0.11 | 0.00 ± 0.13 | 5.87 ± 1.28 | 0.35 ± 0.20 | 6.85 ± 1.49 | 2.63 ± 0.63 | 0.84 ± 0.28 | 3.28 ± 0.76 | 1.27 ± 0.36 | 0.13 ± 0.16 | 7.63 ± 1.66 |
| Retene | 0.00 ± 0.10 | 0.01 ± 0.10 | 0.01 ± 0.06 | 0.03 ± 0.18 | 0.11 ± 0.19 | 0.00 ± 0.19 | 0.04 ± 0.20 | 0.04 ± 0.20 | 0.02 ± 0.18 | 0.00 ± 0.20 | 0.00 ± 0.18 | 0.04 ± 0.18 | 0.00 ± 0.15 |
| Benzonaphthothiophene | 0.18 ± 0.15 | 0.06 ± 0.15 | 0.06 ± 0.09 | 0.00 ± 0.25 | 2.81 ± 0.60 | 0.06 ± 0.26 | 3.64 ± 0.77 | 1.09 ± 0.36 | 0.20 ± 0.27 | 0.41 ± 0.31 | 0.00 ± 0.26 | 0.36 ± 0.27 | 0.09 ± 0.22 |
| 1+3-methylfluoranthene | 2.43 ± 0.74 | 0.14 ± 0.10 | 0.71 ± 0.23 | 0.98 ± 0.35 | 40.52 ± 12.12 | 1.34 ± 0.46 | 63.82 ± 19.07 | 18.07 ± 5.43 | 5.30 ± 1.62 | 4.24 ± 1.31 | 3.95 ± 1.22 | 1.71 ± 0.56 | 1.62 ± 0.54 |
| 1-MeFl+C-MeFl/Py | 2.15 ± 0.25 | 0.54 ± 0.11 | 0.88 ± 0.12 | 0.62 ± 0.15 | 24.54 ± 2.65 | 1.68 ± 0.23 | 27.06 ± 2.92 | 14.35 ± 1.56 | 4.43 ± 0.51 | 9.67 ± 1.06 | 3.10 ± 0.37 | 1.63 ± 0.23 | 0.84 ± 0.17 |
| B-MePy/MeFl | 2.93 ± 0.55 | 0.39 ± 0.15 | 0.70 ± 0.15 | 2.17 ± 0.51 | 40.41 ± 7.21 | 1.23 ± 0.39 | 63.69 ± 11.33 | 17.71 ± 3.20 | 5.19 ± 1.01 | 12.83 ± 2.34 | 3.86 ± 0.78 | 1.42 ± 0.41 | 1.03 ± 0.29 |
| C-MePy/MeFl | 2.72 ± 0.29 | 0.37 ± 0.10 | 0.54 ± 0.08 | 1.60 ± 0.23 | 33.80 ± 3.38 | 0.81 ± 0.18 | 57.26 ± 5.72 | 13.33 ± 1.36 | 4.27 ± 0.46 | 11.58 ± 1.18 | 2.81 ± 0.33 | 1.15 ± 0.20 | 0.59 ± 0.14 |
| D-MePy/MeFl | 1.96 ± 0.13 | 0.30 ± 0.08 | 0.62 ± 0.06 | 0.89 ± 0.17 | 21.42 ± 0.94 | 1.30 ± 0.19 | 33.01 ± 1.42 | 12.53 ± 0.58 | 2.82 ± 0.22 | 9.15 ± 0.44 | 2.73 ± 0.21 | 1.16 ± 0.18 | 0.77 ± 0.13 |
| 4-methylpyrene | 2.35 ± 0.44 | 0.24 ± 0.11 | 0.50 ± 0.12 | 0.87 ± 0.25 | 23.42 ± 4.20 | 0.66 ± 0.24 | 48.65 ± 8.68 | 11.65 ± 2.12 | 1.80 ± 0.40 | 9.47 ± 1.73 | 1.98 ± 0.43 | 0.98 ± 0.28 | 0.90 ± 0.25 |
| 1-methylpyrene | 2.04 ± 0.94 | 0.79 ± 0.44 | 0.16 ± 0.14 | 0.00 ± 0.38 | 13.76 ± 6.02 | 0.43 ± 0.53 | 46.28 ± 19.88 | 3.80 ± 1.84 | 1.43 ± 0.86 | 8.11 ± 3.65 | 1.51 ± 0.90 | 0.02 ± 0.41 | 10.40 ± 4.55 |
| Benzo(c)phenanthrene | 1.50 ± 0.22 | 0.15 ± 0.08 | 0.25 ± 0.06 | 0.39 ± 0.15 | 9.17 ± 1.28 | 0.53 ± 0.17 | 44.22 ± 6.04 | 12.85 ± 1.78 | 0.67 ± 0.17 | 5.26 ± 0.76 | 1.28 ± 0.24 | 1.18 ± 0.23 | 0.76 ± 0.18 |
| Benzo(ghi)fluoranthene | 34.59 ± 5.20 | 0.67 ± 1.00 | 2.02 ± 0.67 | 4.77 ± 2.99 | 97.72 ± 14.80 | 6.30 ± 3.22 | 437.11 ± 64.01 | 255.60 ± 37.65 | 0.82 ± 2.99 | 120.82 ± 18.21 | 11.78 ± 3.57 | 7.31 ± 3.18 | 7.61 ± 1.93 |
| Cyclopenta(c,d)pyrene | 4.57 ± 0.98 | 0.00 ± 0.11 | 0.26 ± 0.10 | 6.44 ± 1.46 | 120.66 ± 24.81 | 1.13 ± 0.46 | 710.41 ± 145.56 | 154.78 ± 31.82 | 1.37 ± 0.50 | 105.29 ± 21.69 | 4.02 ± 0.98 | 0.46 ± 0.35 | 0.00 ± 0.17 |
| Benz(a)anthracene | 2.86 ± 0.54 | 0.23 ± 0.23 | 0.95 ± 0.22 | 2.77 ± 0.67 | 36.65 ± 6.11 | 2.03 ± 0.60 | 89.57 ± 14.83 | 36.00 ± 6.03 | 1.84 ± 0.57 | 16.89 ± 2.90 | 3.99 ± 0.85 | 4.62 ± 0.94 | 1.31 ± 0.44 |
| Triphenylene | 1.73 ± 0.29 | 0.26 ± 0.10 | 0.44 ± 0.09 | 0.62 ± 0.19 | 20.57 ± 3.21 | 0.58 ± 0.19 | 42.91 ± 6.66 | 16.73 ± 2.62 | 0.48 ± 0.18 | 7.10 ± 1.14 | 1.18 ± 0.26 | 2.76 ± 0.48 | 1.97 ± 0.35 |
| Chrysene | 2.79 ± 0.37 | 0.18 ± 0.13 | 0.70 ± 0.12 | 1.21 ± 0.30 | 19.36 ± 2.38 | 1.16 ± 0.31 | 48.56 ± 5.87 | 17.60 ± 2.18 | 0.44 ± 0.26 | 7.39 ± 0.98 | 1.92 ± 0.37 | 2.60 ± 0.43 | 1.68 ± 0.30 |
| Benzanthrone | 5.10 ± 0.53 | 0.55 ± 0.11 | 1.02 ± 0.12 | 0.00 ± 0.13 | 0.02 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.15 | 0.00 ± 0.13 | 0.08 ± 0.13 | 1.67 ± 0.23 |
| 7-methylbenz(a)anthracene | 0.00 ± 0.08 | 0.03 ± 0.08 | 0.00 ± 0.05 | 0.23 ± 0.19 | 1.34 ± 0.49 | 0.00 ± 0.16 | 0.74 ± 0.32 | 0.00 ± 0.18 | 0.00 ± 0.16 | 0.00 ± 0.18 | 0.00 ± 0.16 | 0.31 ± 0.21 | 0.00 ± 0.12 |
| 3-methylchrysene | 0.36 ± 0.10 | 0.05 ± 0.07 | 0.21 ± 0.05 | 1.67 ± 0.27 | 12.61 ± 1.78 | 0.25 ± 0.14 | 12.48 ± 1.77 | 4.92 ± 0.72 | 0.49 ± 0.15 | 2.55 ± 0.39 | 0.68 ± 0.16 | 0.86 ± 0.18 | 0.18 ± 0.11 |
| Benz(a)anthracene-7,12-dione | 3.18 ± 0.21 | 0.34 ± 0.08 | 0.45 ± 0.05 | 0.03 ± 0.13 | 3.29 ± 0.22 | 0.05 ± 0.13 | 0.13 ± 0.15 | 1.87 ± 0.18 | 0.00 ± 0.13 | 1.09 ± 0.15 | 0.06 ± 0.13 | 0.49 ± 0.13 | 1.07 ± 0.13 |
| 5+6-methylchrysene | 0.08 ± 0.10 | 0.04 ± 0.09 | 0.03 ± 0.05 | 0.76 ± 0.43 | 4.24 ± 1.96 | 0.00 ± 0.14 | 2.46 ± 1.19 | 0.61 ± 0.38 | 0.00 ± 0.14 | 0.17 ± 0.22 | 0.00 ± 0.13 | 0.49 ± 0.32 | 0.01 ± 0.11 |
| Benzo(b+j+k)fluoranthene | 7.51 ± 1.45 | 0.00 ± 1.01 | 1.99 ± 0.68 | 16.37 ± 3.74 | 93.05 ± 11.56 | 0.00 ± 3.06 | 223.89 ± 26.45 | 81.76 ± 10.48 | 0.20 ± 3.06 | 52.03 ± 7.36 | 8.88 ± 3.38 | 17.69 ± 3.88 | 23.41 ± 3.31 |
| Benzo(a)fluoranthene | 0.69 ± 0.23 | 0.02 ± 0.07 | 0.05 ± 0.05 | 1.79 ± 0.53 | 2.76 ± 0.78 | 0.09 ± 0.15 | 16.29 ± 4.39 | 4.81 ± 1.33 | 0.12 ± 0.15 | 2.44 ± 0.70 | 1.28 ± 0.41 | 0.76 ± 0.27 | 0.20 ± 0.13 |
| BeP | 5.77 ± 0.69 | 0.21 ± 0.11 | 0.92 ± 0.13 | 10.08 ± 1.23 | 47.22 ± 5.37 | 1.57 ± 0.35 | 129.98 ± 14.63 | 66.62 ± 7.56 | 0.60 ± 0.28 | 34.83 ± 4.00 | 6.04 ± 0.80 | 8.91 ± 1.11 | 2.97 ± 0.41 |
| BaP | 4.91 ± 1.03 | 0.10 ± 0.24 | 0.49 ± 0.18 | 13.19 ± 2.56 | 41.38 ± 7.76 | 0.32 ± 0.45 | 194.86 ± 36.17 | 48.98 ± 9.18 | 1.19 ± 0.52 | 42.15 ± 7.91 | 3.75 ± 0.89 | 3.85 ± 0.90 | 1.77 ± 0.57 |
| Perylene | 0.80 ± 0.37 | 0.00 ± 0.08 | 0.12 ± 0.08 | 2.69 ± 1.14 | 13.05 ± 5.18 | 0.07 ± 0.18 | 36.11 ± 14.20 | 10.84 ± 4.33 | 0.07 ± 0.18 | 8.12 ± 3.27 | 0.86 ± 0.44 | 1.41 ± 0.65 | 0.82 ± 0.38 |
| 7-methylbenzo(a)pyrene | 4.61 ± 1.42 | 0.46 ± 0.93 | 6.42 ± 1.47 | 1.00 ± 2.67 | 3.33 ± 2.84 | 0.00 ± 2.77 | 4.62 ± 3.31 | 10.43 ± 3.88 | 12.45 ± 3.96 | 4.35 ± 3.29 | 0.65 ± 2.77 | 2.58 ± 2.80 | 33.12 ± 6.86 |
| 9,10-dihydrobenzo(a)pyrene-7(8H)-one | 0.00 ± 0.07 | 0.01 ± 0.08 | 0.00 ± 0.04 | 0.03 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.15 | 0.00 ± 0.13 | 0.17 ± 0.17 | 0.07 ± 0.12 |
| Dibenzo(a,j)anthracene | 1.48 ± 0.16 | 0.09 ± 0.07 | 0.09 ± 0.05 | 0.23 ± 0.13 | 1.79 ± 0.20 | 0.00 ± 0.13 | 3.08 ± 0.30 | 0.98 ± 0.17 | 0.00 ± 0.13 | 0.86 ± 0.16 | 0.24 ± 0.13 | 0.15 ± 0.13 | 0.11 ± 0.11 |
| Indeno[123-cd]pyrene | 6.21 ± 1.20 | 0.27 ± 0.11 | 0.42 ± 0.11 | 4.08 ± 0.87 | 40.93 ± 7.72 | 0.00 ± 0.13 | 164.00 ± 30.62 | 44.98 ± 8.48 | 0.00 ± 0.13 | 42.34 ± 8.00 | 1.80 ± 0.46 | 5.30 ± 1.10 | 1.94 ± 0.43 |
| Dibenzo(ah+ac)anthracene | 0.32 ± 0.13 | 0.00 ± 0.08 | 0.07 ± 0.05 | 0.00 ± 0.14 | 4.29 ± 1.16 | 0.00 ± 0.13 | 4.20 ± 1.14 | 1.70 ± 0.53 | 0.00 ± 0.13 | 0.63 ± 0.29 | 0.66 ± 0.28 | 0.96 ± 0.35 | 0.10 ± 0.12 |
| Benzo(b)chrysene | 0.02 ± 0.07 | 0.03 ± 0.07 | 0.04 ± 0.04 | 0.30 ± 0.13 | 2.03 ± 0.13 | 0.00 ± 0.13 | 1.94 ± 0.15 | 0.73 ± 0.14 | 0.00 ± 0.13 | 0.48 ± 0.15 | 0.63 ± 0.13 | 0.46 ± 0.13 | 0.20 ± 0.11 |
| Picene | 0.52 ± 0.24 | 0.00 ± 0.07 | 0.06 ± 0.06 | 0.84 ± 0.42 | 2.77 ± 1.10 | 0.00 ± 0.14 | 3.82 ± 1.49 | 1.27 ± 0.57 | 0.00 ± 0.14 | 1.13 ± 0.54 | 0.34 ± 0.26 | 0.29 ± 0.23 | 0.13 ± 0.14 |
| Benzo(ghi)perylene | 24.47 ± 3.10 | 0.65 ± 0.41 | 1.47 ± 0.31 | 75.52 ± 9.32 | 156.99 ± 19.11 | 3.73 ± 1.16 | 637.18 ± 76.97 | 299.35 ± 36.28 | 2.85 ± 1.11 | 202.46 ± 24.62 | 13.01 ± 2.00 | 15.41 ± 2.25 | 4.98 ± 0.95 |
| Anthanthrene | 0.45 ± 0.13 | 0.00 ± 0.07 | 0.05 ± 0.05 | 6.27 ± 1.22 | 20.02 ± 3.81 | 0.00 ± 0.13 | 133.99 ± 25.38 | 29.94 ± 5.69 | 0.10 ± 0.14 | 20.54 ± 3.92 | 1.27 ± 0.30 | 0.48 ± 0.17 | 0.21 ± 0.13 |
| Dibenzo(b,k)fluoranthene | 0.07 ± 0.18 | 0.00 ± 0.12 | 0.30 ± 0.19 | 1.14 ± 0.79 | 6.16 ± 2.57 | 0.00 ± 0.27 | 3.10 ± 1.54 | 1.68 ± 1.03 | 0.00 ± 0.42 | 2.60 ± 1.36 | 0.32 ± 0.54 | 0.00 ± 0.27 | 0.22 ± 0.32 |
| Dibenzo(a,e)pyrene | 0.28 ± 0.10 | 0.00 ± 0.07 | 0.05 ± 0.05 | 1.47 ± 0.34 | 4.96 ± 1.07 | 0.01 ± 0.13 | 15.49 ± 3.27 | 7.46 ± 1.59 | 0.00 ± 0.13 | 8.33 ± 1.77 | 0.27 ± 0.15 | 0.35 ± 0.15 | 0.10 ± 0.11 |
| Coronene | 8.34 ± 1.43 | 0.23 ± 0.11 | 0.39 ± 0.09 | 49.24 ± 8.21 | 65.15 ± 10.86 | 0.89 ± 0.27 | 230.26 ± 38.31 | 136.11 ± 22.66 | 1.15 ± 0.30 | 100.28 ± 16.70 | 4.23 ± 0.75 | 3.54 ± 0.65 | 1.12 ± 0.27 |
| Dibenzo(a,h)pyrene | 0.01 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.61 ± 0.19 | 0.00 ± 0.13 | 2.75 ± 0.66 | 0.07 ± 0.14 | 0.00 ± 0.13 | 1.35 ± 0.35 | 0.03 ± 0.13 | 0.04 ± 0.13 | 0.07 ± 0.11 |
| nitro-PAH (ug/mile) | | | | | | | | | | | | | |
| 1-nitronaphthalene | 0.0013 ± 0.0043 | 0.0067 ± 0.0043 | 0.0000 ± 0.0025 | 0.0000 ± 0.0165 | 0.2266 ± 0.0217 | 0.1265 ± 0.0194 | 0.1784 ± 0.0223 | 0.0678 ± 0.0196 | 0.7249 ± 0.0440 | 0.0510 ± 0.0196 | 0.0622 ± 0.0179 | 0.0846 ± 0.0179 | 0.0113 ± 0.0065 |
| 2-nitronaphthalene | 0.0038 ± 0.0074 | 0.0153 ± 0.0076 | 0.0201 ± 0.0048 | 0.0012 ± 0.0212 | 0.3247 ± 0.0382 | 0.0000 ± 0.0222 | 0.8483 ± 0.0829 | 0.0000 ± 0.0241 | 1.1171 ± 0.1051 | 0.0586 ± 0.0257 | 0.2024 ± 0.0302 | 0.1905 ± 0.0291 | 0.0416 ± 0.0118 |
| 2-nitrobiphenyl | 0.0005 ± 0.0020 | 0.0008 ± 0.0020 | 0.0000 ± 0.0012 | 0.0000 ± 0.0075 | 0.0511 ± 0.0086 | 0.0000 ± 0.0079 | 0.2676 ± 0.0200 | 0.0559 ± 0.0096 | 0.2221 ± 0.0168 | 0.0993 ± 0.0113 | 0.0390 ± 0.0084 | 0.0000 ± 0.0076 | 0.0018 ± 0.0030 |
| 3-nitrobiphenyl | 0.0000 ± 0.0020 | 0.0000 ± 0.0020 | 0.0000 ± 0.0012 | 0.0000 ± 0.0072 | 0.0146 ± 0.0110 | 0.0431 ± 0.0201 | 0.0600 ± 0.0264 | 0.0082 ± 0.0103 | 0.0000 ± 0.0076 | 0.0000 ± 0.0084 | 0.0000 ± 0.0076 | 0.0313 ± 0.0161 | 0.0191 ± 0.0078 |
| 4-nitrobiphenyl | 0.0000 ± 0.0056 | 0.0000 ± 0.0056 | 0.0000 ± 0.0033 | 0.0000 ± 0.0244 | 0.0327 ± 0.0249 | 0.0149 ± 0.0258 | 0.0000 ± 0.0283 | 0.0000 ± 0.0278 | 0.0000 ± 0.0256 | 0.0000 ± 0.0283 | 0.0000 ± 0.0255 | 0.3256 ± 0.0309 | 0.0007 ± 0.0084 |
| 2-nitrofluorene | 0.0000 ± 0.0028 | 0.0000 ± 0.0028 | 0.0000 ± 0.0017 | 0.0033 ± 0.0143 | 0.0000 ± 0.0145 | 0.0204 ± 0.0151 | 0.0000 ± 0.0166 | 0.0000 ± 0.0163 | 0.6613 ± 0.0380 | 0.0000 ± 0.0165 | 0.0000 ± 0.0149 | 0.1661 ± 0.0172 | 0.0155 ± 0.0043 |
| 1,3-dinitronaphthalene | 0.0000 ± 0.1327 | 0.0000 ± 0.1331 | 0.0000 ± 0.0789 | 0.0000 ± 0.3717 | 0.0000 ± 0.3763 | 0.0000 ± 0.3918 | 0.0000 ± 0.4309 | 0.0000 ± 0.4254 | 0.0000 ± 0.3897 | 0.0000 ± 0.4302 | 0.0000 ± 0.3877 | 0.0000 ± 0.3788 | 0.0000 ± 0.1984 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S3-2 | S4-1 | S4-2 | S5-1 | S5-2 | S5-3 | S5-4 | S5-5 | S6-1 | S6-2 | S6-3 | S6-4 | S7-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,5-dinitronaphthalene | 0.0000 ± 0.0053 | 0.0000 ± 0.0053 | 0.0000 ± 0.0032 | 0.0000 ± 0.0274 | 0.0000 ± 0.0278 | 0.0068 ± 0.0296 | 0.0000 ± 0.0318 | 0.0138 ± 0.0324 | 0.0000 ± 0.0288 | 0.0015 ± 0.0322 | 0.0000 ± 0.0289 | 0.0000 ± 0.0279 | 0.0007 ± 0.0081 |
| 5-nitroacenaphthene | 0.0000 ± 0.0020 | 0.0000 ± 0.0020 | 0.0000 ± 0.0012 | 0.0000 ± 0.0085 | 0.0000 ± 0.0086 | 0.0000 ± 0.0091 | 0.0000 ± 0.0099 | 0.0000 ± 0.0097 | 0.0001 ± 0.0093 | 0.0000 ± 0.0099 | 0.0000 ± 0.0089 | 0.0664 ± 0.0254 | 0.0143 ± 0.0056 |
| 9-nitroanthracene | 0.0032 ± 0.0030 | 0.0000 ± 0.0030 | 0.0004 ± 0.0018 | 0.0000 ± 0.0165 | 0.0000 ± 0.0167 | 0.0349 ± 0.0176 | 0.0000 ± 0.0192 | 0.0000 ± 0.0189 | 0.0000 ± 0.0173 | 0.2464 ± 0.0236 | 0.1847 ± 0.0201 | 0.0298 ± 0.0170 | 0.0000 ± 0.0044 |
| 4-nitrophenanthrene | 0.0000 ± 0.0038 | 0.0000 ± 0.0038 | 0.0000 ± 0.0022 | 0.0000 ± 0.0204 | 0.0000 ± 0.0206 | 0.0000 ± 0.0215 | 0.0000 ± 0.0236 | 0.0000 ± 0.0232 | 0.0000 ± 0.0214 | 0.0000 ± 0.0236 | 0.0000 ± 0.0213 | 0.0000 ± 0.0207 | 0.0052 ± 0.0056 |
| 9-nitrophenanthrene | 0.0061 ± 0.0115 | 0.0000 ± 0.0115 | 0.0000 ± 0.0068 | 0.0000 ± 0.0572 | 0.0000 ± 0.0579 | 0.0000 ± 0.0604 | 0.0000 ± 0.0664 | 0.0000 ± 0.0652 | 0.0000 ± 0.0600 | 0.0777 ± 0.0665 | 0.0000 ± 0.0597 | 0.0000 ± 0.0583 | 0.0000 ± 0.0171 |
| 1,8-dinitronaphthalene | 0.0000 ± 0.0034 | 0.0003 ± 0.0035 | 0.0000 ± 0.0020 | 0.0000 ± 0.0141 | 0.0000 ± 0.0142 | 0.0000 ± 0.0148 | 0.0487 ± 0.0228 | 0.0000 ± 0.0160 | 0.0000 ± 0.0148 | 0.0000 ± 0.0163 | 0.0000 ± 0.0147 | 0.0000 ± 0.0144 | 0.0247 ± 0.0088 |
| 2-nitrofluoranthene | 0.0000 ± 0.0206 | 0.0275 ± 0.0228 | 0.0000 ± 0.0123 | 0.0000 ± 0.0645 | 0.0000 ± 0.0653 | 0.0000 ± 0.0680 | 0.0000 ± 0.0748 | 0.0000 ± 0.0735 | 0.0541 ± 0.0733 | 0.4372 ± 0.1513 | 0.0133 ± 0.0695 | 0.0794 ± 0.0741 | 0.0000 ± 0.0308 |
| 3-nitrofluoranthene | 0.0002 ± 0.0089 | 0.0004 ± 0.0090 | 0.0007 ± 0.0054 | 0.0138 ± 0.0319 | 0.0000 ± 0.0315 | 0.0000 ± 0.0328 | 0.0458 ± 0.0384 | 0.0000 ± 0.0354 | 0.1932 ± 0.0491 | 0.1567 ± 0.0477 | 0.0000 ± 0.0326 | 0.0236 ± 0.0328 | 0.0452 ± 0.0161 |
| 1-nitropyrene | 0.0131 ± 0.0064 | 0.0092 ± 0.0060 | 0.0003 ± 0.0033 | 0.3376 ± 0.0863 | 0.0000 ± 0.0202 | 0.0290 ± 0.0246 | 0.1260 ± 0.0427 | 0.0000 ± 0.0227 | 0.0541 ± 0.0280 | 0.5033 ± 0.1254 | 0.0656 ± 0.0297 | 0.2609 ± 0.0694 | 0.1183 ± 0.0244 |
| 7-nitrobenzo(a)anthracene | 0.0032 ± 0.0009 | 0.0004 ± 0.0009 | 0.0000 ± 0.0005 | 0.0455 ± 0.0038 | 0.0000 ± 0.0029 | 0.0000 ± 0.0030 | 0.0005 ± 0.0034 | 0.0000 ± 0.0033 | 0.0000 ± 0.0030 | 0.1100 ± 0.0068 | 0.0000 ± 0.0030 | 0.0238 ± 0.0032 | 0.0067 ± 0.0014 |
| 6-nitrochrysene | 0.0006 ± 0.0015 | 0.0003 ± 0.0015 | 0.0000 ± 0.0009 | 0.0167 ± 0.0057 | 0.0000 ± 0.0057 | 0.0000 ± 0.0059 | 0.0000 ± 0.0065 | 0.0000 ± 0.0064 | 0.0000 ± 0.0059 | 0.0000 ± 0.0065 | 0.0000 ± 0.0058 | 0.0066 ± 0.0057 | 0.0035 ± 0.0023 |
| 6-nitrobenz[a]pyrene | 0.0000 ± 0.0072 | 0.0000 ± 0.0072 | 0.0000 ± 0.0043 | 0.0000 ± 0.0225 | 0.0000 ± 0.0228 | 0.0000 ± 0.0237 | 0.1036 ± 0.0269 | 0.0000 ± 0.0256 | 0.0000 ± 0.0236 | 0.0000 ± 0.0260 | 0.0000 ± 0.0234 | 0.0000 ± 0.0229 | 0.0000 ± 0.0107 |
| Hopanes (ug/mile) | | | | | | | | | | | | | |
| 18a(H),21ß(H)-22,29,30-Trisnorhopane & | 3.79 ± 0.31 | 0.75 ± 0.14 | 0.75 ± 0.10 | 0.00 ± 0.27 | 32.54 ± 2.42 | 3.47 ± 0.46 | 38.21 ± 2.95 | 18.98 ± 1.44 | 7.41 ± 0.65 | 2.47 ± 0.39 | 0.65 ± 0.31 | 2.80 ± 0.40 | 1.46 ± 0.23 |
| 17a(H),21ß(H)-22,29,30-Trisnorhopane | 0.26 ± 0.10 | 0.03 ± 0.07 | 0.02 ± 0.04 | 0.00 ± 0.13 | 1.73 ± 0.38 | 0.12 ± 0.14 | 2.14 ± 0.46 | 0.80 ± 0.22 | 0.00 ± 0.13 | 0.14 ± 0.15 | 0.00 ± 0.13 | 0.31 ± 0.15 | 0.20 ± 0.12 |
| 17a(H),21ß(H)-30-Norhopane | 5.08 ± 0.75 | 0.31 ± 0.12 | 0.60 ± 0.12 | 24.22 ± 3.49 | 76.78 ± 10.88 | 8.38 ± 1.28 | 100.13 ± 14.15 | 51.03 ± 7.28 | 16.94 ± 2.48 | 4.71 ± 0.82 | 1.73 ± 0.41 | 7.09 ± 1.11 | 3.02 ± 0.49 |
| 17a(H),21ß(H)-Hopane | 4.07 ± 0.51 | 0.08 ± 0.11 | 0.46 ± 0.09 | 21.59 ± 2.54 | 65.54 ± 7.57 | 5.14 ± 0.71 | 76.25 ± 8.79 | 35.17 ± 4.12 | 10.13 ± 1.26 | 2.65 ± 0.49 | 0.57 ± 0.30 | 4.85 ± 0.68 | 2.01 ± 0.32 |
| 17ß(H),21a(H)-hopane | 0.32 ± 0.08 | 0.00 ± 0.07 | 0.03 ± 0.04 | 0.00 ± 0.13 | 1.76 ± 0.19 | 0.83 ± 0.15 | 13.42 ± 1.07 | 5.14 ± 0.43 | 1.67 ± 0.19 | 0.34 ± 0.15 | 0.10 ± 0.13 | 0.70 ± 0.14 | 0.18 ± 0.11 |
| 22S-17a(H),21ß(H)-30-Homohopane | 2.54 ± 0.20 | 0.04 ± 0.08 | 0.19 ± 0.05 | 19.37 ± 1.28 | 29.44 ± 1.97 | 2.56 ± 0.26 | 44.92 ± 2.99 | 18.06 ± 1.23 | 4.77 ± 0.37 | 1.24 ± 0.22 | 0.23 ± 0.18 | 2.41 ± 0.25 | 0.81 ± 0.14 |
| 22R-17a(H),21ß(H)-30-Homohopane | 2.05 ± 0.18 | 0.03 ± 0.08 | 0.15 ± 0.05 | 11.55 ± 0.85 | 25.28 ± 1.85 | 1.87 ± 0.22 | 38.94 ± 2.83 | 15.10 ± 1.12 | 3.63 ± 0.32 | 1.02 ± 0.20 | 0.20 ± 0.15 | 2.40 ± 0.24 | 0.70 ± 0.13 |
| 17ß(H),21ß(H)-Hopane | 0.12 ± 0.08 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.13 | 8.45 ± 1.11 | 1.30 ± 0.21 | 12.82 ± 1.66 | 1.61 ± 0.25 | 0.00 ± 0.13 | 0.57 ± 0.17 | 1.07 ± 0.20 | 0.01 ± 0.13 | 0.46 ± 0.13 |
| 22S-17a(H),21ß(H)-30,31-Bishomohopan | 1.67 ± 0.24 | 0.01 ± 0.07 | 0.09 ± 0.05 | 25.90 ± 3.32 | 16.21 ± 2.10 | 3.20 ± 0.46 | 27.28 ± 3.50 | 10.85 ± 1.42 | 2.52 ± 0.38 | 0.65 ± 0.19 | 0.00 ± 0.13 | 1.46 ± 0.25 | 0.51 ± 0.14 |
| 22R-17a(H),21ß(H)-30,31-Bishomohopan | 1.20 ± 0.18 | 0.00 ± 0.07 | 0.08 ± 0.05 | 8.21 ± 1.01 | 12.26 ± 1.50 | 0.78 ± 0.18 | 20.51 ± 2.49 | 6.71 ± 0.85 | 1.70 ± 0.26 | 0.40 ± 0.16 | 0.18 ± 0.15 | 0.99 ± 0.19 | 0.33 ± 0.12 |
| 22S-17a(H),21ß(H)-30,31,32-Trisomohop | 1.12 ± 0.18 | 0.00 ± 0.08 | 0.11 ± 0.05 | 9.75 ± 1.31 | 9.85 ± 1.34 | 0.66 ± 0.19 | 18.00 ± 2.43 | 5.34 ± 0.75 | 1.30 ± 0.25 | 0.33 ± 0.18 | 0.14 ± 0.16 | 0.80 ± 0.19 | 0.17 ± 0.12 |
| 22R-17a(H),21ß(H)-30,31,32-Trishomoho | 0.81 ± 0.14 | 0.00 ± 0.07 | 0.08 ± 0.05 | 7.61 ± 1.02 | 6.46 ± 0.87 | 0.53 ± 0.15 | 11.43 ± 1.52 | 3.62 ± 0.50 | 0.96 ± 0.19 | 0.23 ± 0.15 | 0.32 ± 0.14 | 0.56 ± 0.15 | 0.12 ± 0.11 |
| Steranes (ug/mile) | | | | | | | | | | | | | |
| C27-20S5a(H),14a(H)-cholestane | 0.14 ± 0.08 | 0.02 ± 0.07 | 0.11 ± 0.05 | 0.00 ± 0.13 | 2.69 ± 0.45 | 0.00 ± 0.14 | 2.50 ± 0.44 | 1.93 ± 0.36 | 0.29 ± 0.16 | 0.16 ± 0.16 | 0.00 ± 0.13 | 0.09 ± 0.14 | 0.24 ± 0.12 |
| C27-20R5a(H),14ß(H)-cholestane | 0.51 ± 0.11 | 0.09 ± 0.07 | 0.17 ± 0.05 | 0.00 ± 0.13 | 6.03 ± 0.90 | 0.77 ± 0.18 | 6.07 ± 0.91 | 5.04 ± 0.76 | 1.45 ± 0.26 | 1.21 ± 0.24 | 0.06 ± 0.13 | 1.28 ± 0.23 | 1.00 ± 0.20 |
| C27-20S5a(H),14ß(H),17ß(H)-cholestane | 0.39 ± 0.08 | 0.05 ± 0.07 | 0.11 ± 0.04 | 0.00 ± 0.13 | 3.22 ± 0.24 | 0.39 ± 0.13 | 3.85 ± 0.28 | 2.46 ± 0.21 | 0.76 ± 0.14 | 0.50 ± 0.15 | 0.03 ± 0.13 | 0.56 ± 0.13 | 0.47 ± 0.11 |
| ster45+40(cholestane) | 1.47 ± 0.21 | 0.01 ± 0.09 | 0.26 ± 0.07 | 0.00 ± 0.20 | 7.02 ± 0.88 | 0.63 ± 0.24 | 6.47 ± 0.83 | 5.22 ± 0.68 | 1.80 ± 0.32 | 0.52 ± 0.25 | 0.05 ± 0.21 | 1.27 ± 0.27 | 1.06 ± 0.20 |
| C28-20S5a(H),14a(H),17a(H)-ergostane | 0.07 ± 0.07 | 0.00 ± 0.07 | 0.01 ± 0.04 | 0.00 ± 0.13 | 0.78 ± 0.15 | 0.09 ± 0.13 | 1.13 ± 0.19 | 0.73 ± 0.17 | 0.21 ± 0.13 | 0.01 ± 0.15 | 0.04 ± 0.13 | 0.17 ± 0.13 | 0.10 ± 0.11 |
| C28-20R5a(H),14ß(H),17ß(H)-ergostane | 0.14 ± 0.07 | 0.00 ± 0.07 | 0.06 ± 0.04 | 0.00 ± 0.13 | 1.53 ± 0.16 | 0.00 ± 0.13 | 1.71 ± 0.18 | 1.05 ± 0.16 | 0.00 ± 0.13 | 0.00 ± 0.15 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.23 ± 0.11 |
| C28-20S5a(H),14ß(H),17ß(H)-ergostane | 0.28 ± 0.09 | 0.00 ± 0.07 | 0.07 ± 0.05 | 0.00 ± 0.13 | 2.70 ± 0.37 | 0.00 ± 0.13 | 2.95 ± 0.41 | 1.68 ± 0.28 | 0.37 ± 0.16 | 0.00 ± 0.15 | 0.00 ± 0.13 | 0.16 ± 0.14 | 0.24 ± 0.12 |
| C28-20R5a(H),14a(H),17a(H)-ergostane | 0.19 ± 0.08 | 0.01 ± 0.07 | 0.08 ± 0.04 | 0.00 ± 0.13 | 2.22 ± 0.23 | 0.17 ± 0.13 | 2.50 ± 0.25 | 1.77 ± 0.20 | 0.47 ± 0.14 | 0.13 ± 0.15 | 0.00 ± 0.13 | 0.33 ± 0.13 | 0.25 ± 0.11 |
| C29-20S5a(H),14a(H),17a(H)-stigmastan | 0.35 ± 0.09 | 0.02 ± 0.07 | 0.05 ± 0.04 | 0.00 ± 0.13 | 3.57 ± 0.40 | 0.45 ± 0.14 | 4.90 ± 0.53 | 2.54 ± 0.30 | 0.81 ± 0.16 | 0.44 ± 0.16 | 0.05 ± 0.13 | 0.58 ± 0.14 | 0.27 ± 0.12 |
| C29-20R5a(H),14ß(H),17ß(H)-stigmastan | 0.71 ± 0.21 | 0.02 ± 0.08 | 0.10 ± 0.05 | 0.00 ± 0.13 | 6.02 ± 1.56 | 0.58 ± 0.20 | 7.57 ± 1.95 | 4.45 ± 1.16 | 1.16 ± 0.34 | 0.59 ± 0.22 | 0.13 ± 0.14 | 0.90 ± 0.27 | 0.52 ± 0.20 |
| C29-20S5a(H),14ß(H),17ß(H)-stigmastan | 0.46 ± 0.10 | 0.01 ± 0.07 | 0.06 ± 0.05 | 0.00 ± 0.13 | 3.90 ± 0.57 | 0.37 ± 0.14 | 5.12 ± 0.74 | 2.74 ± 0.41 | 0.78 ± 0.18 | 0.44 ± 0.16 | 0.08 ± 0.13 | 0.53 ± 0.15 | 0.35 ± 0.12 |
| C29-20R5a(H),14a(H),17a(H)-stigmastan | 0.41 ± 0.09 | 0.00 ± 0.07 | 0.10 ± 0.05 | 0.00 ± 0.13 | 4.89 ± 0.47 | 0.35 ± 0.13 | 5.72 ± 0.55 | 2.94 ± 0.31 | 0.84 ± 0.15 | 0.38 ± 0.16 | 0.05 ± 0.13 | 0.55 ± 0.14 | 0.34 ± 0.12 |
| Alkanes (ug/mile) | | | | | | | | | | | | | |
| Dodecane | 0.00 ± 3.10 | 1.14 ± 3.35 | 0.00 ± 1.71 | 129.55 ± 49.48 | 0.00 ± 8.31 | 0.00 ± 8.57 | 0.00 ± 10.41 | 2.44 ± 10.76 | 7.02 ± 10.84 | 0.00 ± 9.43 | 0.00 ± 8.55 | 0.00 ± 8.27 | 0.00 ± 4.27 |
| Tridecane | 0.19 ± 1.23 | 4.33 ± 1.76 | 0.35 ± 0.75 | 81.06 ± 19.89 | 0.00 ± 3.48 | 0.00 ± 3.62 | 1.16 ± 4.16 | 0.13 ± 4.03 | 0.00 ± 3.65 | 0.00 ± 3.97 | 0.00 ± 3.58 | 0.00 ± 3.50 | 0.00 ± 1.79 |
| Norfarnesane | 0.41 ± 0.43 | 2.89 ± 0.81 | 0.00 ± 0.24 | 26.13 ± 5.75 | 1.82 ± 1.32 | 0.00 ± 1.14 | 7.94 ± 2.39 | 3.36 ± 1.65 | 53.48 ± 11.24 | 6.62 ± 2.17 | 0.00 ± 1.16 | 3.43 ± 1.54 | 6.36 ± 1.58 |
| Heptylcyclohexane | 1.52 ± 0.70 | 0.72 ± 0.50 | 0.18 ± 0.26 | 5.87 ± 2.34 | 5.52 ± 2.26 | 0.00 ± 1.11 | 0.24 ± 1.32 | 1.23 ± 1.44 | 29.01 ± 8.91 | 0.00 ± 1.23 | 8.64 ± 3.12 | 0.00 ± 1.09 | 0.38 ± 0.63 |
| Farnesane | 21.09 ± 8.88 | 10.32 ± 4.64 | 0.25 ± 0.71 | 8.93 ± 5.61 | 16.93 ± 8.50 | 7.36 ± 5.24 | 0.00 ± 3.69 | 32.29 ± 14.62 | 0.50 ± 3.48 | 0.00 ± 3.61 | 0.00 ± 3.17 | 17.49 ± 8.72 | 0.00 ± 1.60 |
| Tetradecane | 0.00 ± 5.76 | 2.13 ± 5.99 | 6.53 ± 3.99 | 39.67 ± 20.27 | 0.00 ± 16.78 | 26.03 ± 19.67 | 2.97 ± 19.78 | 0.00 ± 18.99 | 0.00 ± 17.64 | 0.00 ± 19.19 | 17.05 ± 18.72 | 25.09 ± 19.00 | 0.00 ± 8.73 |
| Octylcyclohexane | 0.15 ± 1.73 | 0.00 ± 1.71 | 0.00 ± 1.01 | 0.00 ± 4.90 | 0.00 ± 5.00 | 0.00 ± 5.15 | 0.00 ± 5.67 | 2.40 ± 5.75 | 56.87 ± 11.20 | 2.37 ± 5.83 | 5.33 ± 5.40 | 0.00 ± 4.99 | 6.59 ± 2.95 |
| Pentadecane | 0.00 ± 2.92 | 18.16 ± 3.60 | 6.41 ± 1.92 | 22.45 ± 8.99 | 2.57 ± 8.61 | 18.36 ± 9.30 | 4.22 ± 9.88 | 0.00 ± 9.59 | 779.69 ± 76.36 | 171.65 ± 20.27 | 50.04 ± 10.59 | 3.32 ± 8.66 | 75.01 ± 8.90 |
| Nonylcyclohexane | 0.02 ± 2.50 | 0.56 ± 2.53 | 0.00 ± 1.46 | 0.00 ± 7.12 | 0.00 ± 7.24 | 0.00 ± 7.44 | 2.40 ± 8.50 | 1.37 ± 8.28 | 3.29 ± 7.77 | 0.71 ± 8.37 | 1.52 ± 7.60 | 0.00 ± 7.18 | 0.19 ± 3.73 |
| Hexadecane | 17.84 ± 4.15 | 10.35 ± 3.98 | 9.44 ± 2.44 | 10.43 ± 11.15 | 37.90 ± 11.79 | 5.71 ± 11.70 | 0.00 ± 12.74 | 0.00 ± 12.58 | 2.32 ± 11.61 | 0.00 ± 12.72 | 42.66 ± 12.23 | 0.00 ± 11.21 | 0.00 ± 5.71 |
| Norpristane | 11.09 ± 2.85 | 1.86 ± 1.03 | 3.85 ± 1.12 | 6.41 ± 3.12 | 18.62 ± 5.44 | 3.78 ± 2.85 | 8.94 ± 3.88 | 0.83 ± 2.71 | 18.18 ± 5.39 | 16.97 ± 5.35 | 10.43 ± 3.90 | 0.22 ± 2.37 | 1.05 ± 1.32 |
| Heptadecane | 35.88 ± 4.94 | 80.69 ± 9.22 | 13.03 ± 2.24 | 114.30 ± 15.20 | 7.49 ± 7.57 | 10.48 ± 7.96 | 0.00 ± 8.16 | 33.56 ± 9.73 | 108.43 ± 14.91 | 0.00 ± 8.24 | 52.69 ± 10.36 | 0.00 ± 7.33 | 0.65 ± 3.76 |
| Decylcyclohexane | 0.00 ± 1.04 | 4.46 ± 1.70 | 0.82 ± 0.70 | 0.00 ± 3.02 | 3.28 ± 3.34 | 0.00 ± 3.15 | 0.00 ± 3.47 | 0.00 ± 3.45 | 10.55 ± 4.54 | 0.00 ± 3.48 | 0.06 ± 3.17 | 0.00 ± 3.04 | 1.31 ± 1.67 |
| Heptadecane_Pristane | 29.98 ± 4.03 | 68.41 ± 6.25 | 12.50 ± 2.17 | 105.77 ± 12.53 | 76.40 ± 11.29 | 15.24 ± 9.74 | 0.00 ± 10.48 | 39.95 ± 11.05 | 155.03 ± 15.57 | 48.39 ± 11.43 | 54.10 ± 10.65 | 3.64 ± 9.27 | 0.14 ± 4.70 |
| Undecylcyclohexane | 0.10 ± 0.47 | 3.89 ± 1.28 | 0.00 ± 0.25 | 0.00 ± 1.16 | 0.00 ± 1.21 | 0.00 ± 1.28 | 4.06 ± 2.26 | 1.67 ± 1.76 | 0.00 ± 1.10 | 0.00 ± 1.18 | 0.14 ± 1.37 | 0.00 ± 1.29 | 0.00 ± 0.65 |
| Octadecane | 9.58 ± 1.51 | 69.02 ± 5.26 | 12.02 ± 1.22 | 6.80 ± 3.66 | 103.47 ± 8.78 | 10.17 ± 3.93 | 0.00 ± 4.07 | 0.00 ± 4.03 | 2.64 ± 3.76 | 82.96 ± 7.75 | 20.52 ± 4.21 | 0.68 ± 3.63 | 3.01 ± 1.89 |
| Phytane | 6.91 ± 0.88 | 49.01 ± 4.35 | 6.16 ± 0.67 | 0.00 ± 1.54 | 33.79 ± 3.58 | 6.32 ± 1.82 | 109.74 ± 9.97 | 30.28 ± 3.44 | 27.36 ± 3.10 | 32.63 ± 3.62 | 8.86 ± 1.92 | 2.46 ± 1.63 | 2.63 ± 0.89 |
| Dodecylcyclohexane | 0.67 ± 0.31 | 3.39 ± 1.03 | 0.68 ± 0.25 | 0.92 ± 0.60 | 1.37 ± 0.71 | 0.93 ± 0.63 | 0.23 ± 0.55 | 0.18 ± 0.54 | 7.76 ± 2.40 | 0.81 ± 0.65 | 1.04 ± 0.65 | 0.00 ± 0.43 | 12.36 ± 3.56 |
| Nonadecane | 8.39 ± 1.15 | 47.16 ± 5.13 | 6.53 ± 0.83 | 4.83 ± 1.66 | 71.32 ± 8.10 | 9.29 ± 2.04 | 90.92 ± 10.22 | 18.79 ± 2.94 | 12.83 ± 2.31 | 77.58 ± 8.82 | 15.19 ± 2.51 | 1.97 ± 1.54 | 40.27 ± 4.54 |
| Tridecylcyclohexane | 2.84 ± 0.89 | 1.01 ± 0.53 | 0.00 ± 0.24 | 1.61 ± 1.31 | 1.49 ± 1.32 | 0.00 ± 1.19 | 5.43 ± 2.10 | 2.70 ± 1.62 | 2.22 ± 1.45 | 1.45 ± 1.48 | 0.00 ± 1.19 | 0.00 ± 1.15 | 1.28 ± 0.75 |
| Eicosane | 5.60 ± 0.86 | 26.59 ± 1.76 | 5.42 ± 0.58 | 2.98 ± 2.21 | 61.45 ± 4.37 | 6.99 ± 2.38 | 52.50 ± 4.14 | 14.66 ± 2.73 | 24.98 ± 2.82 | 58.76 ± 4.41 | 7.06 ± 2.37 | 0.87 ± 2.23 | 11.96 ± 1.39 |
| Tetradecylcyclohexane | 0.54 ± 0.17 | 0.53 ± 0.15 | 0.52 ± 0.15 | 0.36 ± 0.18 | 5.35 ± 1.25 | 1.21 ± 0.35 | 1.57 ± 0.43 | 3.89 ± 0.93 | 9.06 ± 2.07 | 0.93 ± 0.29 | 0.51 ± 0.20 | 0.07 ± 0.15 | 11.28 ± 2.59 |
| Heneicosane | 4.53 ± 0.89 | 30.85 ± 2.08 | 2.96 ± 0.54 | 0.76 ± 2.35 | 43.53 ± 3.73 | 4.82 ± 2.52 | 31.00 ± 3.46 | 6.81 ± 2.75 | 15.57 ± 2.72 | 30.89 ± 3.45 | 2.12 ± 2.46 | 0.00 ± 2.38 | 30.89 ± 2.34 |
| Pentadecylcyclohexane | 0.00 ± 2.30 | 0.27 ± 2.31 | 0.00 ± 1.37 | 0.00 ± 6.62 | 1.76 ± 6.75 | 0.00 ± 6.99 | 0.00 ± 7.68 | 0.00 ± 7.55 | 0.00 ± 6.95 | 0.00 ± 7.67 | 0.00 ± 6.91 | 0.00 ± 6.74 | 0.00 ± 3.43 |
| Docosane | 3.77 ± 3.57 | 25.31 ± 4.51 | 3.02 ± 2.14 | 0.00 ± 10.11 | 32.43 ± 11.06 | 0.00 ± 10.69 | 0.00 ± 11.72 | 4.12 ± 11.61 | 6.26 ± 10.72 | 17.65 ± 12.05 | 0.00 ± 10.54 | 0.00 ± 10.29 | 16.88 ± 5.66 |
| Hexadecylcyclohexane | 1.55 ± 0.30 | 5.43 ± 0.88 | 0.43 ± 0.11 | 0.24 ± 0.31 | 10.20 ± 1.67 | 1.35 ± 0.42 | 4.41 ± 0.84 | 4.36 ± 0.83 | 2.64 ± 0.58 | 0.00 ± 0.34 | 0.61 ± 0.35 | 0.00 ± 0.29 | 0.66 ± 0.23 |
| Tricosane | 0.92 ± 4.64 | 24.73 ± 4.99 | 2.98 ± 2.77 | 0.00 ± 13.37 | 30.59 ± 13.82 | 0.00 ± 14.08 | 8.86 ± 15.57 | 10.44 ± 15.31 | 0.00 ± 14.03 | 0.00 ± 15.48 | 0.00 ± 13.93 | 0.00 ± 13.59 | 14.03 ± 7.03 |
| Heptadecylcyclohexane | 0.00 ± 1.99 | 12.55 ± 3.93 | 0.00 ± 1.17 | 0.00 ± 5.68 | 15.09 ± 7.51 | 0.00 ± 5.95 | 5.73 ± 7.13 | 0.00 ± 6.56 | 8.28 ± 6.78 | 0.00 ± 6.60 | 0.00 ± 5.90 | 0.00 ± 5.77 | 1.43 ± 3.08 |
| Octadecylcyclohexane | 0.00 ± 1.76 | 0.18 ± 1.80 | 0.00 ± 1.04 | 0.00 ± 5.06 | 0.00 ± 5.15 | 0.00 ± 5.32 | 0.00 ± 5.87 | 0.00 ± 5.75 | 0.00 ± 5.30 | 0.00 ± 5.85 | 0.00 ± 5.26 | 0.00 ± 5.14 | 7.41 ± 3.48 |
| Tetracosane | 0.00 ± 7.94 | 24.83 ± 9.32 | 4.88 ± 4.89 | 0.00 ± 22.87 | 0.00 ± 23.16 | 0.00 ± 24.07 | 0.00 ± 26.45 | 0.00 ± 26.15 | 0.00 ± 23.92 | 0.00 ± 26.46 | 0.00 ± 23.82 | 0.00 ± 23.23 | 2.33 ± 11.94 |
| Pentacosane | 0.00 ± 8.59 | 23.07 ± 10.55 | 3.99 ± 5.35 | 0.00 ± 24.78 | 5.62 ± 25.57 | 0.00 ± 26.02 | 0.00 ± 28.71 | 0.00 ± 28.22 | 0.00 ± 26.07 | 0.00 ± 28.63 | 0.00 ± 25.75 | 0.00 ± 25.12 | 29.34 ± 15.14 |
| Nonadecylcyclohexane | 0.00 ± 2.11 | 3.88 ± 2.50 | 0.61 ± 1.32 | 0.00 ± 6.17 | 0.00 ± 6.19 | 0.00 ± 6.41 | 0.00 ± 7.08 | 0.52 ± 7.10 | 0.00 ± 6.38 | 0.00 ± 7.08 | 0.00 ± 6.36 | 0.00 ± 6.19 | 2.87 ± 3.41 |
| Hexacosane | 0.00 ± 9.74 | 17.21 ± 10.81 | 3.86 ± 5.99 | 0.00 ± 28.19 | 2.61 ± 28.81 | 0.00 ± 29.58 | 0.00 ± 32.53 | 0.00 ± 32.07 | 0.00 ± 29.43 | 0.00 ± 32.53 | 0.00 ± 29.28 | 0.00 ± 28.56 | 22.67 ± 15.86 |
| Eicosylcyclohexane | 0.56 ± 0.18 | 0.53 ± 0.16 | 0.02 ± 0.04 | 0.01 ± 0.13 | 3.81 ± 0.99 | 0.00 ± 0.13 | 4.51 ± 1.18 | 0.26 ± 0.17 | 0.44 ± 0.19 | 0.10 ± 0.16 | 0.21 ± 0.16 | 0.36 ± 0.17 | 1.53 ± 0.42 |
| Heptacosane | 0.00 ± 9.76 | 13.14 ± 10.55 | 4.09 ± 6.02 | 0.00 ± 28.25 | 0.00 ± 28.48 | 0.00 ± 29.67 | 0.00 ± 32.64 | 0.00 ± 32.09 | 0.00 ± 29.50 | 0.00 ± 32.60 | 0.00 ± 29.38 | 0.00 ± 28.63 | 30.35 ± 16.59 |
| Heneicosylcyclohexane | 0.68 ± 0.28 | 0.54 ± 0.23 | 0.04 ± 0.06 | 1.68 ± 0.68 | 0.47 ± 0.29 | 0.00 ± 0.20 | 1.48 ± 0.63 | 2.91 ± 1.13 | 0.40 ± 0.28 | 0.53 ± 0.33 | 0.30 ± 0.26 | 0.03 ± 0.21 | 5.05 ± 1.85 |
| Octacosane | 0.00 ± 9.51 | 17.81 ± 10.11 | 3.17 ± 5.73 | 5.32 ± 27.62 | 0.00 ± 27.74 | 0.00 ± 28.88 | 0.00 ± 31.76 | 0.00 ± 31.22 | 0.00 ± 28.82 | 0.00 ± 31.73 | 0.00 ± 28.59 | 0.00 ± 27.89 | 27.60 ± 15.10 |
| Nonacosane | 0.00 ± 6.53 | 8.83 ± 7.20 | 1.98 ± 4.01 | 9.41 ± 19.49 | 0.00 ± 18.95 | 0.00 ± 19.72 | 0.00 ± 21.70 | 0.00 ± 21.33 | 0.00 ± 19.62 | 0.00 ± 21.68 | 0.00 ± 19.52 | 0.00 ± 19.04 | 27.43 ± 12.37 |
| Triacontane | 0.00 ± 5.54 | 8.77 ± 6.05 | 1.71 ± 3.36 | 23.53 ± 17.30 | 0.00 ± 16.19 | 0.00 ± 16.69 | 0.00 ± 18.37 | 0.00 ± 18.06 | 0.00 ± 16.69 | 0.00 ± 18.34 | 0.00 ± 16.53 | 0.00 ± 16.14 | 28.29 ± 10.51 |
| Hentriacontane | 0.07 ± 3.26 | 26.57 ± 7.77 | 0.95 ± 2.00 | 20.18 ± 11.65 | 0.00 ± 9.41 | 0.00 ± 9.59 | 0.00 ± 10.53 | 0.00 ± 10.40 | 0.00 ± 9.54 | 1.97 ± 11.07 | 0.00 ± 9.50 | 0.00 ± 9.26 | 23.20 ± 8.23 |
| Dotriacontane | 0.00 ± 2.48 | 8.87 ± 2.93 | 0.90 ± 1.50 | 29.19 ± 8.72 | 0.00 ± 7.22 | 0.00 ± 7.50 | 0.00 ± 8.25 | 0.00 ± 8.11 | 0.00 ± 7.46 | 0.00 ± 8.25 | 0.00 ± 7.43 | 0.00 ± 7.24 | 18.46 ± 4.82 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S3-2 | S4-1 | S4-2 | S5-1 | S5-2 | S5-3 | S5-4 | S5-5 | S6-1 | S6-2 | S6-3 | S6-4 | S7-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritriacontane | 0.00 ± 0.96 | 7.16 ± 3.09 | 0.25 ± 0.61 | 15.98 ± 7.36 | 0.00 ± 2.69 | 0.00 ± 2.79 | 0.00 ± 3.08 | 0.00 ± 3.01 | 0.00 ± 2.79 | 0.00 ± 3.27 | 0.00 ± 2.80 | 0.00 ± 2.69 | 11.66 ± 4.95 |
| Tetratriacontane | 0.16 ± 1.13 | 4.34 ± 1.98 | 0.64 ± 0.72 | 22.09 ± 8.12 | 0.00 ± 3.08 | 0.00 ± 3.20 | 0.00 ± 3.51 | 0.00 ± 3.46 | 0.00 ± 3.20 | 0.00 ± 3.54 | 0.00 ± 3.20 | 0.00 ± 3.08 | 13.82 ± 4.84 |
| Pentatriacontane | 0.56 ± 0.53 | 2.20 ± 0.99 | 0.26 ± 0.29 | 12.10 ± 4.60 | 0.00 ± 1.11 | 0.00 ± 1.16 | 0.00 ± 1.27 | 0.00 ± 1.25 | 0.18 ± 1.34 | 0.00 ± 1.30 | 0.00 ± 1.18 | 0.00 ± 1.11 | 6.88 ± 2.59 |
| Hexatriacontane | 0.04 ± 0.46 | 3.92 ± 0.66 | 0.33 ± 0.28 | 21.07 ± 2.67 | 0.00 ± 1.33 | 0.00 ± 1.38 | 0.00 ± 1.52 | 0.00 ± 1.50 | 0.00 ± 1.38 | 0.00 ± 1.52 | 0.00 ± 1.37 | 0.00 ± 1.34 | 12.71 ± 1.54 |
| Heptatriacontane | 0.30 ± 0.28 | 1.77 ± 0.77 | 0.19 ± 0.17 | 9.80 ± 3.71 | 0.00 ± 0.49 | 0.00 ± 0.51 | 0.00 ± 0.57 | 0.00 ± 0.56 | 0.32 ± 0.75 | 0.24 ± 0.80 | 0.00 ± 0.52 | 0.00 ± 0.50 | 5.01 ± 1.93 |
| Octatriacontane | 0.12 ± 0.42 | 1.84 ± 1.30 | 0.16 ± 0.23 | 22.33 ± 12.51 | 0.00 ± 0.71 | 0.00 ± 0.74 | 0.00 ± 0.81 | 0.00 ± 0.80 | 3.22 ± 2.79 | 0.00 ± 0.87 | 0.00 ± 0.75 | 0.00 ± 0.71 | 7.17 ± 4.22 |
| Nonatriacontane | 0.00 ± 0.13 | 0.01 ± 0.13 | 0.04 ± 0.08 | 4.62 ± 1.57 | 0.00 ± 0.27 | 0.00 ± 0.28 | 0.00 ± 0.31 | 0.00 ± 0.30 | 0.00 ± 0.28 | 0.00 ± 0.31 | 0.00 ± 0.28 | 0.00 ± 0.27 | 1.68 ± 0.63 |
| Polar compounds (ug/mile) | | | | | | | | | | | | | |
| heptanoic acid (c7) | 17.86 ± 4.67 | 19.74 ± 4.74 | 4.20 ± 4.35 | 0.00 ± 8.38 | 0.00 ± 8.52 | 0.00 ± 8.83 | 0.00 ± 9.71 | 0.00 ± 9.54 | 75.28 ± 10.73 | 0.00 ± 9.69 | 0.00 ± 8.77 | 0.00 ± 8.57 | 17.84 ± 4.65 |
| me-malonic (d-c3) | 0.00 ± 1.26 | 28.63 ± 7.37 | 0.00 ± 1.24 | 0.00 ± 1.48 | 0.00 ± 1.50 | 0.00 ± 1.56 | 0.00 ± 1.71 | 0.00 ± 1.68 | 17.60 ± 5.71 | 0.00 ± 1.71 | 0.00 ± 1.54 | 5.34 ± 2.28 | 1.02 ± 1.32 |
| guaiacol | 0.00 ± 0.14 | 0.76 ± 0.22 | 0.00 ± 0.11 | 0.13 ± 0.16 | 0.00 ± 0.15 | 2.28 ± 0.48 | 0.00 ± 0.18 | 0.00 ± 0.17 | 5.51 ± 1.52 | 0.00 ± 0.18 | 0.00 ± 0.16 | 0.46 ± 0.19 | 0.89 ± 0.25 |
| benzoic acid | 2344.72 ± 1295.09 | 1343.50 ± 1270.31 | 1107.09 ± 1240.91 | 0.00 ± 2329.30 | 0.00 ± 2356.49 | 0.00 ± 2465.53 | 0.00 ± 2710.54 | 5456.32 ± 2852.34 | 6265.03 ± 2659.13 | 1410.00 ± 2790.59 | 0.00 ± 2436.94 | 0.00 ± 2376.85 | 140.70 ± 1241.59 |
| octanoic acid (c8) | 25.55 ± 10.72 | 32.43 ± 11.03 | 4.76 ± 9.97 | 0.00 ± 15.26 | 0.00 ± 15.74 | 0.00 ± 16.03 | 0.00 ± 17.63 | 390.36 ± 44.97 | 132.08 ± 22.93 | 0.00 ± 17.76 | 0.00 ± 16.01 | 0.00 ± 15.64 | 25.64 ± 10.73 |
| phenylacetic acid | 41.03 ± 36.61 | 0.17 ± 24.38 | 0.00 ± 26.62 | 0.00 ± 32.28 | 83.63 ± 61.99 | 175.80 ± 87.56 | 0.00 ± 37.43 | 0.00 ± 37.37 | 0.00 ± 33.91 | 0.00 ± 37.37 | 0.00 ± 33.69 | 0.00 ± 38.56 | 0.15 ± 29.78 |
| maleic acid | 0.00 ± 1.64 | 8.86 ± 2.20 | 0.00 ± 1.60 | 48.07 ± 8.20 | 0.00 ± 1.64 | 0.00 ± 1.71 | 0.00 ± 1.88 | 0.00 ± 1.85 | 0.00 ± 1.70 | 0.00 ± 1.87 | 0.00 ± 1.69 | 89.17 ± 13.86 | 19.22 ± 3.05 |
| succinic acid (d-c4) | 0.59 ± 10.71 | 6.39 ± 10.79 | 0.00 ± 10.61 | 79.89 ± 23.19 | 0.00 ± 19.46 | 0.00 ± 20.35 | 0.00 ± 22.21 | 276.63 ± 46.19 | 0.00 ± 20.09 | 0.00 ± 22.18 | 0.00 ± 19.99 | 0.00 ± 19.53 | 12.66 ± 10.84 |
| 4-me-guaiacol | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.05 | 0.00 ± 0.66 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.12 | 1.37 ± 0.15 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 1.30 | 0.23 ± 0.16 |
| o-toluic | 46.60 ± 8.29 | 63.86 ± 10.68 | 26.68 ± 5.75 | 16.26 ± 6.16 | 284.89 ± 43.62 | 21.17 ± 6.72 | 0.00 ± 5.99 | 303.21 ± 46.77 | 417.86 ± 63.15 | 123.64 ± 20.21 | 61.59 ± 11.35 | 32.92 ± 7.74 | 26.94 ± 5.80 |
| me-succinic acid (d-c4) | 0.10 ± 1.61 | 1.62 ± 1.63 | 0.00 ± 1.59 | 11.46 ± 3.46 | 0.00 ± 2.88 | 0.00 ± 3.03 | 0.00 ± 3.30 | 15.67 ± 4.12 | 0.00 ± 2.99 | 21.75 ± 4.60 | 0.00 ± 2.97 | 0.00 ± 2.90 | 3.51 ± 1.66 |
| m-toluic | 70.87 ± 5.05 | 128.81 ± 8.42 | 48.79 ± 3.88 | 26.25 ± 4.81 | 388.63 ± 24.93 | 0.65 ± 4.66 | 856.76 ± 53.74 | 499.80 ± 32.03 | 242.51 ± 15.76 | 257.43 ± 17.05 | 83.46 ± 7.19 | 52.72 ± 5.76 | 44.09 ± 3.71 |
| nonanoic acid (c9) | 16.90 ± 11.49 | 50.96 ± 18.02 | 5.40 ± 9.81 | 0.00 ± 17.36 | 0.00 ± 18.56 | 0.00 ± 17.01 | 0.00 ± 18.71 | 270.23 ± 76.69 | 139.58 ± 45.71 | 19.39 ± 23.88 | 0.00 ± 18.15 | 0.00 ± 17.55 | 38.40 ± 15.54 |
| p-toluic | 53.36 ± 8.34 | 99.02 ± 14.37 | 36.43 ± 6.14 | 15.85 ± 5.55 | 320.88 ± 45.53 | 0.00 ± 4.68 | 941.54 ± 130.52 | 460.76 ± 64.97 | 138.84 ± 20.88 | 235.07 ± 33.99 | 60.20 ± 10.56 | 37.06 ± 7.74 | 31.86 ± 5.75 |
| 2,6-dimethylbenzoic acid | 4.91 ± 2.00 | 0.62 ± 1.95 | 3.62 ± 1.92 | 0.00 ± 2.55 | 35.50 ± 6.49 | 0.00 ± 2.68 | 0.00 ± 15.56 | 30.33 ± 8.85 | 50.42 ± 5.94 | 9.80 ± 5.03 | 0.00 ± 2.82 | 0.00 ± 2.69 | 5.16 ± 2.03 |
| 4-ethyl-guaiacol | 0.00 ± 0.06 | 0.26 ± 0.33 | 0.00 ± 0.05 | 0.02 ± 0.18 | 2.18 ± 2.06 | 4.40 ± 0.33 | 0.00 ± 0.12 | 0.00 ± 0.12 | 2.61 ± 2.15 | 0.00 ± 2.03 | 0.15 ± 0.75 | 0.15 ± 0.12 | 0.16 ± 0.12 |
| syringol | 0.00 ± 0.07 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.10 ± 0.11 | 1.32 ± 0.54 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.52 | 2.44 ± 0.75 | 0.00 ± 0.20 | 0.00 ± 0.11 | 0.08 ± 0.11 | 0.00 ± 0.09 |
| glutaric acid (d-c5) | 0.00 ± 0.10 | 1.25 ± 0.14 | 0.00 ± 0.09 | 33.52 ± 2.00 | 60.12 ± 3.64 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.15 | 81.41 ± 4.91 | 13.82 ± 0.86 | 4.95 ± 0.27 |
| 2-methylglutaric (d-c5) | 0.03 ± 0.07 | 1.48 ± 0.43 | 0.00 ± 0.05 | 0.88 ± 0.32 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 14.56 ± 4.06 | 19.82 ± 5.50 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 1.53 ± 0.45 |
| 2,5-dimethylbenzoic acid | 7.22 ± 4.08 | 15.49 ± 6.20 | 2.94 ± 2.78 | 0.00 ± 3.67 | 34.89 ± 13.94 | 0.00 ± 3.73 | 0.00 ± 4.10 | 12.63 ± 8.68 | 0.00 ± 4.37 | 48.82 ± 18.34 | 0.00 ± 4.75 | 0.00 ± 4.23 | 5.11 ± 4.00 |
| 3-methylglutaric acid (d-c5) | 0.01 ± 3.22 | 23.79 ± 5.07 | 8.21 ± 3.55 | 5.95 ± 5.86 | 50.51 ± 10.01 | 0.00 ± 6.01 | 0.00 ± 6.61 | 0.00 ± 6.51 | 0.00 ± 5.99 | 0.00 ± 6.60 | 0.00 ± 5.95 | 18.22 ± 6.64 | 4.51 ± 3.31 |
| 2,4-dimethylbenzoic acid | 258.91 ± 213.59 | 352.96 ± 220.12 | 607.47 ± 232.39 | 0.00 ± 352.53 | 0.00 ± 358.63 | 0.00 ± 371.25 | 888.00 ± 476.33 | 274.83 ± 430.73 | 1710.78 ± 509.00 | 106.21 ± 429.18 | 0.00 ± 368.21 | 0.00 ± 359.21 | 423.97 ± 228.70 |
| 2,3- and 3,5- dimethylbenzoic acid | 3.77 ± 1.02 | 5.14 ± 1.21 | 4.48 ± 0.91 | 0.00 ± 0.58 | 31.96 ± 5.86 | 0.00 ± 0.25 | 27.42 ± 5.40 | 62.22 ± 10.18 | 17.42 ± 3.85 | 8.09 ± 2.75 | 0.64 ± 1.59 | 0.00 ± 1.23 | 1.40 ± 0.94 |
| decanoic acid (c10) | 2.20 ± 3.20 | 0.00 ± 3.41 | 10.43 ± 3.51 | 0.00 ± 4.41 | 0.00 ± 4.46 | 0.00 ± 4.64 | 0.00 ± 15.29 | 18.92 ± 7.05 | 0.00 ± 25.01 | 0.00 ± 5.38 | 0.00 ± 4.60 | 0.00 ± 4.49 | 0.00 ± 4.22 |
| 4-allyl-guaiacol (eugenol) | 22.52 ± 2.47 | 42.62 ± 4.48 | 7.09 ± 0.78 | 33.85 ± 3.71 | 52.26 ± 5.79 | 0.00 ± 0.16 | 0.00 ± 0.48 | 13.22 ± 1.80 | 0.00 ± 0.29 | 482.76 ± 53.06 | 325.41 ± 35.84 | 14.55 ± 1.61 | 10.79 ± 0.95 |
| 4-methyl-syringol | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.21 ± 0.09 | 0.00 ± 0.10 | 0.00 ± 0.11 | 22.94 ± 7.41 | 0.00 ± 0.12 | 1.11 ± 0.49 | 0.23 ± 0.13 | 0.00 ± 0.12 | 0.00 ± 0.11 | 1.57 ± 0.52 | 0.23 ± 0.11 |
| 3,4-dimethylbenzoic acid | 7.79 ± 2.34 | 18.09 ± 2.97 | 9.06 ± 2.38 | 1.23 ± 3.15 | 63.79 ± 7.88 | 18.83 ± 4.02 | 98.46 ± 11.53 | 118.96 ± 13.64 | 28.27 ± 4.67 | 35.99 ± 9.52 | 12.18 ± 5.95 | 8.82 ± 3.40 | 5.85 ± 2.26 |
| hexanedioic (adipic) acid (d-c6) | 0.47 ± 0.95 | 0.00 ± 0.93 | 0.00 ± 0.91 | 28.53 ± 6.06 | 0.00 ± 1.67 | 0.00 ± 1.80 | 0.00 ± 1.92 | 26.43 ± 5.84 | 38.79 ± 7.98 | 0.00 ± 1.91 | 0.00 ± 1.72 | 0.00 ± 1.70 | 0.28 ± 0.95 |
| salcylic acid | 2.16 ± 2.81 | 2.13 ± 2.80 | 18.96 ± 4.40 | 17.32 ± 5.83 | 2.31 ± 4.90 | 66.12 ± 12.38 | 20.66 ± 7.01 | 12.28 ± 6.31 | 80.95 ± 14.57 | 0.00 ± 5.38 | 0.00 ± 4.79 | 0.23 ± 4.76 | 1.06 ± 2.77 |
| trans-2-decenoic acid | 0.00 ± 0.46 | 0.00 ± 0.46 | 2.93 ± 0.54 | 0.00 ± 0.65 | 0.00 ± 0.53 | 0.00 ± 0.55 | 0.00 ± 0.61 | 2.48 ± 0.84 | 1.15 ± 0.81 | 0.00 ± 0.61 | 0.00 ± 0.55 | 0.00 ± 0.53 | 1.02 ± 0.48 |
| cis-pinonic acid | 0.00 ± 3.47 | 0.00 ± 3.47 | 0.00 ± 3.43 | 0.00 ± 4.63 | 0.00 ± 4.49 | 0.00 ± 4.77 | 0.00 ± 5.16 | 0.00 ± 5.06 | 0.00 ± 5.01 | 0.00 ± 5.18 | 0.00 ± 4.63 | 0.00 ± 4.52 | 0.00 ± 3.44 |
| 3-methyladipic acid (d-c6) | 11.23 ± 2.01 | 1.17 ± 0.35 | 172.20 ± 29.98 | 38.20 ± 6.75 | 0.00 ± 0.37 | 1928.71 ± 334.81 | 0.00 ± 0.42 | 680.29 ± 118.74 | 389.67 ± 67.80 | 8.98 ± 1.73 | 19.98 ± 3.61 | 27.29 ± 4.86 | 2.70 ± 0.56 |
| 4-formyl-guaiacol (vanillin) | 0.00 ± 0.72 | 0.68 ± 0.75 | 5.59 ± 1.55 | 6.25 ± 1.96 | 0.00 ± 0.75 | 0.00 ± 0.77 | 0.00 ± 0.84 | 11.32 ± 3.21 | 57.43 ± 14.25 | 0.12 ± 0.92 | 0.04 ± 0.83 | 0.49 ± 0.85 | 0.50 ± 0.74 |
| undecanoic acid (c11) | 0.00 ± 1.38 | 0.03 ± 1.40 | 0.65 ± 1.48 | 4.04 ± 2.59 | 0.83 ± 2.37 | 0.00 ± 27.03 | 0.00 ± 2.63 | 0.00 ± 11.62 | 8.67 ± 6.39 | 0.00 ± 2.63 | 0.00 ± 2.38 | 0.00 ± 2.36 | 5.51 ± 1.75 |
| isoeugenol | 1.46 ± 0.64 | 0.00 ± 0.28 | 0.00 ± 0.28 | 0.00 ± 0.33 | 1.00 ± 0.58 | 0.00 ± 0.33 | 0.00 ± 0.36 | 0.00 ± 0.40 | 0.24 ± 0.91 | 0.94 ± 0.60 | 0.00 ± 0.33 | 0.00 ± 0.32 | 0.29 ± 0.34 |
| heptanedioic (pimelic) acid (d-c7) | 0.00 ± 1.01 | 0.48 ± 1.02 | 0.00 ± 1.00 | 11.86 ± 2.37 | 3.32 ± 1.35 | 0.00 ± 1.17 | 0.00 ± 1.29 | 0.00 ± 1.27 | 76.30 ± 12.34 | 0.00 ± 1.31 | 1.79 ± 1.27 | 2.74 ± 1.30 | 0.64 ± 1.01 |
| 2,3-dimethoxybenzoic acid | 0.01 ± 0.07 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.10 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 66.55 ± 24.45 | 494.86 ± 181.60 | 19.18 ± 7.05 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.11 ± 0.09 |
| acetovanillone | 28.00 ± 4.49 | 2.68 ± 3.94 | 0.00 ± 3.89 | 0.00 ± 3.89 | 0.00 ± 3.94 | 0.00 ± 4.10 | 0.00 ± 4.51 | 0.00 ± 4.43 | 0.00 ± 4.22 | 0.00 ± 4.50 | 0.00 ± 4.06 | 0.00 ± 3.96 | 0.00 ± 3.91 |
| 2,6-dimethoxybenzoic acid | 0.13 ± 0.08 | 0.00 ± 0.06 | 8.06 ± 2.84 | 0.00 ± 0.10 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 37.62 ± 13.46 | 0.00 ± 7.11 | 0.00 ± 0.33 | 2.14 ± 0.77 | 0.00 ± 0.11 | 0.59 ± 0.19 |
| dodecanoic (lauric) acid (c12) | 30.60 ± 35.00 | 21.97 ± 35.02 | 37.20 ± 34.69 | 0.00 ± 51.24 | 0.00 ± 51.84 | 0.00 ± 53.98 | 0.00 ± 59.36 | 214.04 ± 61.49 | 36.73 ± 54.18 | 0.00 ± 59.40 | 0.00 ± 53.43 | 0.00 ± 52.13 | 0.00 ± 34.55 |
| 2,5-dimethoxybenzoic acid | 0.00 ± 0.73 | 13.82 ± 3.47 | 0.00 ± 0.72 | 0.00 ± 1.28 | 0.00 ± 1.29 | 0.00 ± 1.35 | 0.00 ± 1.48 | 0.00 ± 1.58 | 8.36 ± 2.55 | 22.10 ± 5.63 | 6.10 ± 2.10 | 0.00 ± 1.31 | 6.51 ± 1.82 |
| phthalic acid | 158.58 ± 40.76 | 144.73 ± 38.71 | 0.00 ± 25.36 | 77.15 ± 45.36 | 52.29 ± 43.79 | 7154.14 ± 1394.11 | 6990.63 ± 1367.29 | 0.00 ± 45.68 | 178.16 ± 58.91 | 92.98 ± 52.87 | 267.31 ± 72.06 | 307.47 ± 77.88 | 169.99 ± 43.73 |
| suberic acid (d-c8) | 0.00 ± 18.94 | 0.00 ± 19.04 | 10.76 ± 19.33 | 0.00 ± 25.23 | 0.00 ± 25.86 | 165.18 ± 66.94 | 0.00 ± 28.81 | 59.90 ± 40.01 | 15.87 ± 30.53 | 0.00 ± 29.41 | 0.00 ± 26.26 | 0.00 ± 25.34 | 0.00 ± 18.86 |
| levoglucosan | 1.18 ± 1.90 | 0.90 ± 1.78 | 0.00 ± 1.52 | 5.84 ± 3.56 | 0.00 ± 1.55 | 0.00 ± 99.86 | 0.00 ± 113.45 | 0.00 ± 1.72 | 0.00 ± 3.12 | 0.00 ± 2.36 | 1.97 ± 4.64 | 0.00 ± 4.67 | 3.55 ± 2.38 |
| 3,5-dimethoxybenzoic acid | 0.16 ± 0.41 | 1.18 ± 0.43 | 2.37 ± 0.46 | 0.51 ± 0.77 | 0.00 ± 0.77 | 0.00 ± 2.44 | 0.00 ± 0.89 | 0.00 ± 1.32 | 5.19 ± 0.96 | 7.24 ± 1.10 | 0.56 ± 0.80 | 1.11 ± 0.79 | 0.08 ± 0.41 |
| syringaldehyde | 0.00 ± 0.06 | 1.87 ± 0.44 | 1.54 ± 0.37 | 1.22 ± 0.33 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 3.73 ± 0.91 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.24 ± 0.11 |
| 3,4-dimethoxybenzoic acid | 0.00 ± 0.39 | 6.33 ± 2.34 | 0.00 ± 0.38 | 1.97 ± 1.23 | 51.63 ± 18.70 | 0.00 ± 0.49 | 0.00 ± 0.54 | 0.00 ± 0.53 | 41.10 ± 14.99 | 0.00 ± 0.55 | 7.64 ± 3.20 | 3.28 ± 1.74 | 6.15 ± 2.27 |
| 2,4-dimethoxybenzoic acid | 0.00 ± 0.06 | 3.74 ± 0.27 | 0.00 ± 0.05 | 2.07 ± 0.18 | 31.70 ± 2.27 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.13 | 24.61 ± 1.73 | 20.78 ± 1.49 | 5.66 ± 0.42 | 1.87 ± 0.17 | 4.25 ± 0.31 |
| tridecanoic acid (c13) | 0.00 ± 0.54 | 1.99 ± 0.67 | 0.49 ± 0.59 | 0.00 ± 0.54 | 1.15 ± 1.00 | 0.00 ± 0.54 | 0.00 ± 0.60 | 0.00 ± 0.59 | 1.50 ± 0.93 | 3.48 ± 1.05 | 0.11 ± 0.59 | 0.00 ± 0.56 | 0.59 ± 0.56 |
| isophthalic acid | 58.34 ± 80.72 | 70.50 ± 79.73 | 0.00 ± 77.02 | 147.90 ± 97.70 | 106.08 ± 94.66 | 0.00 ± 89.95 | 0.00 ± 98.92 | 0.00 ± 97.24 | 84.96 ± 95.94 | 44.52 ± 102.51 | 1998.91 ± 461.91 | 1199.92 ± 291.01 | 12.12 ± 77.42 |
| vanillic acid | 0.00 ± 5.39 | 30.86 ± 6.78 | 0.00 ± 5.35 | 7.42 ± 6.12 | 24.87 ± 7.67 | 0.00 ± 6.10 | 0.00 ± 6.71 | 0.00 ± 6.59 | 24.08 ± 7.76 | 0.00 ± 6.70 | 0.00 ± 6.04 | 6.40 ± 6.17 | 0.00 ± 5.37 |
| homovanillic acid | 7.68 ± 3.71 | 14.89 ± 5.57 | 1.92 ± 2.60 | 28.17 ± 9.76 | 0.00 ± 2.97 | 0.00 ± 2.64 | 0.00 ± 2.91 | 0.00 ± 2.86 | 0.00 ± 2.90 | 0.00 ± 2.99 | 0.00 ± 29.16 | 15.13 ± 18.39 | 0.00 ± 2.38 |
| azelaic acid (d-c9) | 0.00 ± 4.88 | 10.70 ± 5.03 | 0.00 ± 4.84 | 30.01 ± 6.55 | 20.52 ± 6.19 | 0.00 ± 5.82 | 0.00 ± 6.40 | 0.00 ± 6.29 | 2.37 ± 5.87 | 0.00 ± 6.42 | 3.98 ± 5.85 | 0.00 ± 5.64 | 0.00 ± 4.86 |
| myristoleic acid | 1.68 ± 0.39 | 28.97 ± 3.54 | 0.42 ± 0.26 | 7.19 ± 1.21 | 37.30 ± 4.82 | 0.00 ± 0.25 | 0.00 ± 0.27 | 0.00 ± 0.27 | 59.69 ± 7.53 | 11.27 ± 1.68 | 1.77 ± 0.53 | 13.43 ± 1.99 | 0.00 ± 0.23 |
| myristic acid (c14) | 27.36 ± 12.79 | 62.53 ± 20.76 | 7.69 ± 8.51 | 23.28 ± 17.81 | 0.00 ± 9.50 | 0.00 ± 6.49 | 137.09 ± 47.97 | 25.86 ± 20.15 | 37.22 ± 21.72 | 79.24 ± 33.24 | 0.00 ± 8.75 | 0.00 ± 12.43 | 7.23 ± 9.35 |
| sebacic acid (d-c10) | 0.00 ± 1.03 | 0.00 ± 1.04 | 0.00 ± 1.02 | 1.84 ± 1.17 | 0.00 ± 1.26 | 0.00 ± 1.18 | 0.00 ± 1.30 | 0.00 ± 1.28 | 0.00 ± 1.45 | 0.00 ± 1.31 | 0.00 ± 1.17 | 0.00 ± 1.16 | 0.00 ± 1.03 |
| syringic acid | 1.56 ± 0.56 | 2.72 ± 0.67 | 0.00 ± 0.50 | 3.04 ± 0.77 | 23.88 ± 2.87 | 0.00 ± 0.61 | 0.00 ± 2.32 | 0.00 ± 0.79 | 29.79 ± 3.56 | 13.39 ± 2.15 | 8.52 ± 1.20 | 2.18 ± 0.66 | 30.13 ± 3.50 |
| pentadecanoic acid (c15) | 0.00 ± 2.85 | 1.87 ± 2.89 | 3.05 ± 2.94 | 0.16 ± 3.59 | 0.00 ± 3.55 | 0.00 ± 3.58 | 0.00 ± 3.94 | 0.00 ± 3.87 | 0.96 ± 3.80 | 0.00 ± 4.13 | 0.00 ± 3.57 | 0.00 ± 3.49 | 0.00 ± 2.87 |
| undecanedioic acid (d-c11) | 0.01 ± 0.14 | 1.00 ± 0.63 | 0.00 ± 0.10 | 0.45 ± 0.51 | 0.52 ± 0.66 | 0.00 ± 0.12 | 0.00 ± 0.13 | 0.00 ± 0.13 | 1.57 ± 1.28 | 0.29 ± 0.50 | 0.11 ± 0.34 | 0.23 ± 0.37 | 0.32 ± 0.37 |
| palmitoleic acid | 0.00 ± 0.78 | 0.00 ± 0.75 | 0.10 ± 0.95 | 2.26 ± 2.17 | 0.00 ± 0.92 | 0.00 ± 0.96 | 83.23 ± 35.77 | 0.00 ± 1.04 | 3.23 ± 2.60 | 2.96 ± 2.64 | 0.00 ± 1.00 | 0.00 ± 1.36 | 2.97 ± 1.92 |
| palmitic acid (c16) | 0.00 ± 17.51 | 9.11 ± 20.12 | 1.08 ± 15.79 | 427.22 ± 186.59 | 0.00 ± 25.81 | 0.00 ± 9.44 | 88.06 ± 69.16 | 0.00 ± 25.05 | 82.86 ± 60.65 | 0.00 ± 18.50 | 0.00 ± 20.27 | 0.00 ± 22.34 | 7.69 ± 19.44 |
| isostearic acid | 0.00 ± 0.34 | 0.00 ± 0.34 | 0.00 ± 0.33 | 0.00 ± 0.52 | 0.00 ± 0.53 | 0.00 ± 0.55 | 0.00 ± 1.48 | 0.00 ± 0.59 | 0.00 ± 0.55 | 0.00 ± 0.60 | 0.00 ± 0.54 | 0.00 ± 0.53 | 0.00 ± 0.34 |
| dodecanedioic acid (d-c12) | 0.00 ± 0.33 | 0.00 ± 0.33 | 0.00 ± 0.32 | 0.00 ± 5.85 | 0.00 ± 0.37 | 0.00 ± 0.38 | 0.00 ± 1.49 | 0.00 ± 0.41 | 0.19 ± 1.26 | 0.00 ± 0.42 | 0.00 ± 0.39 | 0.00 ± 0.37 | 0.46 ± 0.35 |
| traumatic acid | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.10 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.08 |
| heptadecanoic acid (c17) | 0.00 ± 3.30 | 1.00 ± 3.54 | 0.00 ± 3.30 | 12.68 ± 9.17 | 0.00 ± 6.15 | 0.00 ± 6.25 | 0.00 ± 6.87 | 27.21 ± 14.57 | 1.49 ± 6.82 | 3.09 ± 7.77 | 0.00 ± 6.22 | 0.00 ± 6.11 | 0.27 ± 3.33 |
| 1,11-undecanedicarboxylic acid (d-c13) | 0.05 ± 0.10 | 0.00 ± 0.07 | 0.00 ± 0.06 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.13 | 0.00 ± 0.12 | 0.89 ± 0.42 | 0.00 ± 0.13 | 0.31 ± 0.28 | 0.00 ± 0.11 | 0.21 ± 0.17 |
| oleic acid | 0.00 ± 5.08 | 0.00 ± 5.55 | 0.00 ± 5.34 | 167.53 ± 96.70 | 0.00 ± 18.95 | 0.00 ± 5.89 | 0.00 ± 6.48 | 0.00 ± 6.38 | 0.00 ± 26.73 | 0.00 ± 18.50 | 0.00 ± 8.70 | 0.00 ± 11.98 | 4.15 ± 7.66 |
| elaidic acid | 0.00 ± 0.81 | 2.39 ± 0.84 | 0.00 ± 0.80 | 11.50 ± 1.26 | 0.00 ± 0.73 | 0.00 ± 0.73 | 0.00 ± 0.80 | 0.00 ± 0.79 | 0.00 ± 0.77 | 1.37 ± 0.90 | 0.00 ± 0.74 | 0.00 ± 0.71 | 2.49 ± 0.84 |
| stearic acid (c18) | 19.44 ± 25.95 | 0.00 ± 20.20 | 0.00 ± 17.99 | 259.00 ± 131.69 | 0.00 ± 34.41 | 0.00 ± 32.18 | 0.00 ± 35.39 | 0.00 ± 34.79 | 0.00 ± 46.40 | 0.00 ± 38.04 | 0.00 ± 32.97 | 0.00 ± 33.31 | 0.00 ± 19.41 |
| 1,12-dodecanedicarboxylic acid (d-c14) | 0.02 ± 0.22 | 2.09 ± 0.68 | 0.85 ± 0.34 | 0.02 ± 0.32 | 3.70 ± 1.30 | 0.00 ± 0.26 | 0.00 ± 0.29 | 0.00 ± 0.28 | 3.93 ± 1.37 | 1.85 ± 0.77 | 5.35 ± 1.80 | 0.23 ± 0.30 | 1.62 ± 0.46 |
| 8,15-pimaradien-18-oic acd | 0.00 ± 0.40 | 0.00 ± 0.39 | 0.00 ± 0.40 | 3.81 ± 3.76 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.18 | 0.00 ± 0.18 | 0.00 ± 0.16 | 0.00 ± 0.18 | 0.00 ± 0.18 | 0.00 ± 0.18 | 0.26 ± 0.43 |
| pimaric acid | 2.74 ± 0.64 | 0.00 ± 0.50 | 0.06 ± 0.49 | 6.75 ± 1.28 | 0.00 ± 0.87 | 0.00 ± 0.90 | 0.00 ± 0.99 | 0.00 ± 0.97 | 37.80 ± 5.09 | 0.00 ± 0.99 | 0.00 ± 0.89 | 0.00 ± 0.87 | 0.44 ± 0.51 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S3-2 | S4-1 | S4-2 | S5-1 | S5-2 | S5-3 | S5-4 | S5-5 | S6-1 | S6-2 | S6-3 | S6-4 | S7-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| sandaracopimaric acid | 0.06 ± 0.17 | 0.02 ± 0.17 | 0.00 ± 0.16 | 7.56 ± 0.62 | 0.00 ± 0.27 | 0.00 ± 0.29 | 0.00 ± 0.31 | 0.00 ± 0.31 | 0.00 ± 0.28 | 0.00 ± 0.31 | 0.00 ± 0.28 | 0.00 ± 0.28 | 0.32 ± 0.18 |
| nonadecanoic acid (c19) | 0.00 ± 5.61 | 0.02 ± 5.63 | 3.44 ± 5.57 | 0.00 ± 9.95 | 0.00 ± 10.07 | 0.00 ± 10.48 | 0.00 ± 11.53 | 0.00 ± 11.33 | 0.00 ± 10.44 | 0.00 ± 11.51 | 0.00 ± 10.38 | 0.00 ± 10.12 | 0.27 ± 5.59 |
| isopimaric acid | 0.00 ± 0.58 | 0.00 ± 0.59 | 0.42 ± 0.72 | 0.88 ± 1.20 | 0.00 ± 0.97 | 0.00 ± 1.01 | 0.00 ± 1.11 | 0.00 ± 1.09 | 0.00 ± 1.00 | 0.00 ± 1.11 | 0.00 ± 1.00 | 0.00 ± 0.98 | 0.00 ± 0.62 |
| palustric acid | 0.00 ± 0.53 | 0.00 ± 0.54 | 0.00 ± 0.53 | 1.02 ± 0.60 | 0.00 ± 0.60 | 0.00 ± 0.62 | 0.00 ± 0.68 | 0.00 ± 0.67 | 0.00 ± 0.62 | 1.24 ± 0.69 | 0.00 ± 0.61 | 0.00 ± 0.60 | 0.00 ± 0.53 |
| dihydroisopimaric acid | 0.00 ± 0.23 | 0.12 ± 0.23 | 0.00 ± 0.22 | 2.16 ± 0.32 | 0.00 ± 0.26 | 0.00 ± 0.27 | 0.00 ± 0.30 | 0.00 ± 0.30 | 0.00 ± 0.27 | 1.15 ± 0.32 | 0.00 ± 0.27 | 0.00 ± 0.26 | 0.37 ± 0.24 |
| 8-abietic acid | 0.00 ± 0.34 | 0.00 ± 0.37 | 0.00 ± 0.34 | 2.06 ± 1.20 | 0.00 ± 0.44 | 0.00 ± 0.27 | 0.00 ± 0.30 | 0.00 ± 0.29 | 0.81 ± 0.83 | 0.00 ± 0.40 | 0.00 ± 0.27 | 0.00 ± 0.29 | 0.00 ± 0.42 |
| dehydroabietic acid | 0.00 ± 7.76 | 5.54 ± 9.01 | 0.00 ± 7.87 | 14.68 ± 14.89 | 0.00 ± 9.62 | 0.00 ± 9.32 | 0.00 ± 10.24 | 0.00 ± 10.07 | 1.86 ± 11.87 | 0.00 ± 11.55 | 0.00 ± 9.29 | 0.00 ± 9.06 | 2.31 ± 8.15 |
| 8,14-abietenic acid | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.08 |
| abietic acid | 0.00 ± 0.10 | 0.00 ± 0.11 | 0.00 ± 0.09 | 2.12 ± 0.31 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.15 | 0.00 ± 0.16 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.12 ± 0.12 |
| eicosanoic acid (c20) | 0.00 ± 1.77 | 0.00 ± 1.78 | 0.42 ± 1.76 | 7.23 ± 1.87 | 0.00 ± 1.77 | 0.00 ± 1.84 | 0.00 ± 2.03 | 0.00 ± 1.99 | 0.00 ± 1.83 | 0.00 ± 2.02 | 0.00 ± 1.82 | 0.00 ± 1.78 | 0.19 ± 1.76 |
| levopimaric acid | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.08 |
| heneicosanoic acid (c21) | 0.00 ± 2.00 | 0.00 ± 2.00 | 0.00 ± 1.99 | 0.00 ± 2.66 | 0.00 ± 2.65 | 0.00 ± 2.76 | 0.00 ± 3.03 | 0.00 ± 2.98 | 4.72 ± 3.34 | 0.00 ± 3.03 | 0.00 ± 2.73 | 0.00 ± 2.66 | 0.00 ± 1.99 |
| 7-oxodehydroabietic acid | 0.00 ± 0.14 | 0.96 ± 0.18 | 0.10 ± 0.14 | 0.00 ± 0.25 | 0.00 ± 0.26 | 0.00 ± 0.27 | 0.00 ± 0.29 | 0.00 ± 0.29 | 5.49 ± 0.86 | 5.68 ± 0.91 | 0.00 ± 0.27 | 0.00 ± 0.26 | 2.56 ± 0.30 |
| docosanoic acid (c22) | 0.00 ± 5.63 | 0.00 ± 5.60 | 0.00 ± 5.53 | 7.38 ± 9.53 | 0.00 ± 8.79 | 0.00 ± 9.15 | 0.00 ± 10.06 | 0.00 ± 9.89 | 2.94 ± 9.52 | 0.00 ± 10.13 | 0.00 ± 9.06 | 0.00 ± 8.87 | 0.00 ± 5.61 |
| tricosanoic acid (c23) | 0.16 ± 0.96 | 0.00 ± 0.94 | 0.17 ± 0.95 | 0.98 ± 0.93 | 0.00 ± 0.74 | 0.00 ± 0.77 | 0.00 ± 0.84 | 0.00 ± 0.83 | 1.89 ± 1.11 | 1.78 ± 1.18 | 0.00 ± 0.76 | 0.00 ± 0.74 | 0.85 ± 1.01 |
| tetracosanoic acid (c24) | 0.09 ± 0.57 | 0.00 ± 0.41 | 0.33 ± 0.61 | 0.00 ± 0.89 | 0.00 ± 0.90 | 0.00 ± 0.93 | 0.00 ± 1.03 | 0.00 ± 1.01 | 0.00 ± 0.93 | 0.00 ± 1.03 | 0.00 ± 1.11 | 0.00 ± 1.88 | 0.00 ± 0.41 |
| cholesterol | 0.00 ± 0.98 | 0.00 ± 1.04 | 0.00 ± 0.99 | 0.00 ± 0.24 | 0.00 ± 0.24 | 0.00 ± 0.25 | 0.00 ± 0.27 | 0.00 ± 0.27 | 0.00 ± 0.25 | 0.00 ± 0.28 | 0.00 ± 0.25 | 0.00 ± 0.24 | 0.00 ± 1.09 |
| cholestanol | 4.24 ± 7.01 | 0.10 ± 7.01 | 0.00 ± 6.92 | 0.00 ± 7.95 | 0.00 ± 8.05 | 0.00 ± 8.38 | 0.00 ± 9.22 | 0.00 ± 9.06 | 0.00 ± 8.34 | 1.81 ± 9.23 | 0.00 ± 8.30 | 0.00 ± 8.09 | 0.00 ± 6.95 |
| ergosterol | 0.00 ± 0.06 | 0.07 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.10 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.08 |
| stigmasterol | 0.00 ± 2.17 | 0.00 ± 2.17 | 0.00 ± 2.15 | 28.84 ± 3.25 | 0.00 ± 2.50 | 0.00 ± 2.60 | 0.00 ± 2.86 | 0.00 ± 2.81 | 0.00 ± 2.59 | 0.00 ± 2.86 | 0.00 ± 2.58 | 0.00 ± 2.51 | 0.00 ± 2.16 |
| sitosterol | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.10 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.08 |
| Carbonyls (mg/mile) | | | | | | | | | | | | | |
| formaldehyde | 5.34 ± 0.02 | 7.35 ± 0.02 | 1.78 ± 0.01 | 42.00 ± 0.06 | 49.80 ± 0.06 | 22.25 ± 0.06 | 31.71 ± 0.06 | 18.86 ± 0.06 | 38.71 ± 0.06 | 7.07 ± 0.06 | 15.61 ± 0.06 | 9.71 ± 0.06 | 5.27 ± 0.03 |
| acetaldehyde | 1.57 ± 0.33 | 1.32 ± 0.32 | 0.60 ± 0.19 | 13.13 ± 0.99 | 11.35 ± 0.96 | 5.83 ± 0.99 | 11.29 ± 0.98 | 10.68 ± 0.96 | 8.95 ± 0.98 | 0.32 ± 0.99 | 4.13 ± 0.99 | 2.82 ± 0.96 | 3.16 ± 0.49 |
| acetone | 0.23 ± 0.47 | 0.44 ± 0.46 | 0.15 ± 0.28 | 1.68 ± 1.41 | 1.23 ± 1.37 | 3.57 ± 1.41 | 0.81 ± 1.40 | 0.29 ± 1.37 | 0.83 ± 1.39 | 0.00 ± 1.42 | 0.00 ± 1.42 | 0.00 ± 1.37 | 0.00 ± 0.69 |
| * acrolein | 1.32 ± 0.33 | 1.42 ± 0.35 | 0.20 ± 0.05 | 12.28 ± 3.07 | 12.18 ± 3.05 | 3.74 ± 0.93 | 0.53 ± 0.13 | 0.80 ± 0.20 | 7.05 ± 1.76 | 2.24 ± 0.56 | 5.54 ± 1.39 | 2.74 ± 0.69 | 1.82 ± 0.45 |
| propionaldehyde | 0.22 ± 0.01 | 0.23 ± 0.01 | 0.08 ± 0.01 | 1.47 ± 0.04 | 1.95 ± 0.04 | 1.32 ± 0.04 | 1.99 ± 0.04 | 0.34 ± 0.04 | 1.20 ± 0.04 | 0.20 ± 0.04 | 0.67 ± 0.04 | 0.55 ± 0.04 | 0.18 ± 0.02 |
| crotonaldehyde | 0.08 ± 0.01 | 0.08 ± 0.01 | 0.00 ± 0.01 | 0.10 ± 0.01 | 0.73 ± 0.01 | 0.27 ± 0.01 | 1.43 ± 0.01 | 0.25 ± 0.01 | 0.83 ± 0.01 | 0.13 ± 0.01 | 0.39 ± 0.01 | 0.06 ± 0.01 | 0.14 ± 0.02 |
| methyl ethyl ketone | 0.20 ± 0.04 | 0.23 ± 0.04 | 0.06 ± 0.02 | 0.93 ± 0.11 | 0.99 ± 0.11 | 0.75 ± 0.11 | 1.09 ± 0.11 | 0.12 ± 0.11 | 0.63 ± 0.11 | 0.13 ± 0.11 | 0.41 ± 0.11 | 0.36 ± 0.11 | 0.16 ± 0.06 |
| Methacrolein | 0.17 ± 0.01 | 0.20 ± 0.01 | 0.05 ± 0.01 | 2.02 ± 0.01 | 2.19 ± 0.01 | 0.89 ± 0.01 | 1.82 ± 0.01 | 1.07 ± 0.01 | 1.39 ± 0.01 | 0.23 ± 0.01 | 0.97 ± 0.01 | 0.42 ± 0.01 | 0.20 ± 0.01 |
| * n-butyraldehyde | 0.06 ± 0.02 | 0.17 ± 0.04 | 0.04 ± 0.02 | 2.81 ± 0.70 | 1.14 ± 0.29 | 1.36 ± 0.34 | 4.29 ± 1.07 | 3.32 ± 0.83 | 0.76 ± 0.19 | 0.08 ± 0.02 | 0.61 ± 0.15 | 0.23 ± 0.06 | 0.10 ± 0.03 |
| benzaldehyde | 1.23 ± 0.01 | 1.82 ± 0.01 | 0.46 ± 0.01 | 12.82 ± 0.02 | 14.83 ± 0.02 | 5.24 ± 0.02 | 13.64 ± 0.02 | 6.90 ± 0.02 | 6.85 ± 0.02 | 2.02 ± 0.02 | 4.79 ± 0.02 | 3.22 ± 0.02 | 2.08 ± 0.01 |
| glyoxal | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 | 0.14 ± 0.01 | 0.19 ± 0.01 | 0.05 ± 0.01 | 0.17 ± 0.01 | 0.01 ± 0.01 | 0.15 ± 0.01 | 0.00 ± 0.01 | 0.08 ± 0.01 | 0.05 ± 0.01 | 0.00 ± 0.01 |
| valeraldehyde | 0.03 ± 0.01 | 0.03 ± 0.01 | 0.03 ± 0.01 | 0.27 ± 0.02 | 0.24 ± 0.02 | 0.08 ± 0.02 | 0.30 ± 0.02 | 0.02 ± 0.02 | 0.23 ± 0.02 | 0.01 ± 0.02 | 0.08 ± 0.02 | 0.14 ± 0.02 | 0.02 ± 0.01 |
| tolualdehyde | 0.03 ± 0.01 | 0.05 ± 0.01 | 0.08 ± 0.01 | 1.43 ± 0.03 | 0.52 ± 0.03 | 0.38 ± 0.03 | 1.10 ± 0.03 | 1.08 ± 0.03 | 0.76 ± 0.03 | 0.20 ± 0.03 | 0.20 ± 0.03 | 0.05 ± 0.03 | 0.05 ± 0.01 |
| hexanal | 0.03 ± 0.01 | 0.05 ± 0.01 | 0.08 ± 0.01 | 1.43 ± 0.02 | 0.52 ± 0.02 | 0.38 ± 0.02 | 1.10 ± 0.02 | 1.08 ± 0.02 | 0.76 ± 0.02 | 0.20 ± 0.02 | 0.20 ± 0.02 | 0.05 ± 0.02 | 0.05 ± 0.01 |
| *** acrolein converts to an unknown rear** | | | | | | | | | | | | | |
| VOC (mg/mi) | | | | | | | | | | | | | |
| 1,3 butadiene (estimated) | 3.103 ± 4.593 | 2.224 ± 3.292 | 0.617 ± 0.914 | 28.865 ± 42.720 | 29.506 ± 43.669 | 11.245 ± 16.642 | 1.489 ± 2.203 | 0.091 ± 0.134 | 24.624 ± 36.444 | 10.183 ± 15.070 | 11.914 ± 17.633 | 4.173 ± 6.176 | 3.652 ± 5.405 |
| C2 compounds | 35.193 ± 8.665 | 30.738 ± 7.568 | 12.634 ± 3.111 | 378.917 ± 93.293 | 1374.654 ± 40.482 | 130.464 ± 32.121 | 103.973 ± 25.599 | 2.981 ± 0.734 | 417.284 ± 102.739 | 786.758 ± 34.589 | 165.363 ± 40.714 | 33.652 ± 8.285 | 78.880 ± 19.421 |
| propene | 22.963 ± 4.854 | 16.460 ± 3.480 | 4.568 ± 0.966 | 213.598 ± 45.153 | 218.347 ± 38.387 | 83.212 ± 17.590 | 11.017 ± 2.329 | 0.671 ± 0.142 | 182.218 ± 38.519 | 75.352 ± 15.929 | 88.164 ± 18.637 | 30.880 ± 6.528 | 27.025 ± 5.713 |
| propane | 1.002 ± 0.057 | 0.707 ± 0.040 | 0.522 ± 0.029 | 5.184 ± 0.294 | 4.733 ± 0.268 | 2.517 ± 0.142 | 0.133 ± 0.007 | 0.086 ± 0.005 | 3.960 ± 0.224 | 2.749 ± 0.156 | 3.090 ± 0.175 | 1.276 ± 0.072 | 1.098 ± 0.062 |
| isoButane | 1.835 ± 0.118 | 0.933 ± 0.060 | 0.321 ± 0.021 | 7.941 ± 0.511 | 5.448 ± 0.351 | 8.889 ± 0.572 | 0.995 ± 0.064 | 0.199 ± 0.013 | 5.710 ± 0.368 | 5.453 ± 0.351 | 2.878 ± 0.185 | 3.029 ± 0.195 | 1.466 ± 0.094 |
| 1Butene+iButylene | 13.928 ± 1.641 | 8.445 ± 0.995 | 2.461 ± 0.290 | 99.645 ± 11.737 | 95.722 ± 11.275 | 42.974 ± 5.062 | 4.836 ± 0.570 | 0.433 ± 0.051 | 95.344 ± 11.230 | 39.072 ± 4.602 | 54.053 ± 6.367 | 19.498 ± 2.297 | 13.150 ± 1.549 |
| n-Butane | 3.190 ± 0.307 | 1.240 ± 0.119 | 0.431 ± 0.041 | 13.130 ± 1.262 | 11.399 ± 1.095 | 6.319 ± 0.607 | 1.686 ± 0.162 | 0.069 ± 0.007 | 11.738 ± 1.128 | 6.141 ± 0.590 | 6.625 ± 0.637 | 3.659 ± 0.352 | 1.973 ± 0.190 |
| t-2-Butene | 2.644 ± 0.417 | 1.055 ± 0.166 | 0.902 ± 0.142 | 10.659 ± 1.682 | 9.612 ± 1.517 | 4.201 ± 0.663 | 0.892 ± 0.141 | 0.038 ± 0.006 | 9.353 ± 1.476 | 7.590 ± 1.198 | 5.142 ± 0.811 | 2.372 ± 0.374 | 1.575 ± 0.249 |
| c-2-Butene | 0.911 ± 0.059 | 0.501 ± 0.032 | 0.153 ± 0.010 | 4.928 ± 0.319 | 4.292 ± 0.277 | 2.443 ± 0.158 | 0.441 ± 0.028 | 0.017 ± 0.001 | 4.987 ± 0.322 | 2.099 ± 0.136 | 2.474 ± 0.160 | 1.334 ± 0.086 | 0.617 ± 0.040 |
| 3-Me-1-Butene | 51.808 ± 5.728 | 20.025 ± 2.214 | 7.433 ± 0.822 | 159.605 ± 17.645 | 118.924 ± 13.148 | 72.934 ± 8.063 | 26.188 ± 2.895 | 1.170 ± 0.129 | 109.041 ± 12.055 | 106.762 ± 11.803 | 56.022 ± 6.194 | 57.642 ± 6.373 | 25.060 ± 2.770 |
| isopentane | 1.505 ± 0.157 | 0.989 ± 0.103 | 0.284 ± 0.030 | 7.082 ± 0.739 | 4.435 ± 0.463 | 2.156 ± 0.225 | 0.743 ± 0.078 | 0.016 ± 0.002 | 8.187 ± 0.855 | 6.851 ± 0.715 | 2.845 ± 0.297 | 2.120 ± 0.221 | 1.405 ± 0.147 |
| 1-Pentene | 2.510 ± 0.316 | 1.404 ± 0.176 | 0.482 ± 0.061 | 14.981 ± 1.885 | 13.281 ± 1.671 | 2.795 ± 0.352 | 1.663 ± 0.209 | 0.040 ± 0.005 | 12.915 ± 1.625 | 7.526 ± 0.947 | 6.466 ± 0.813 | 3.340 ± 0.420 | 1.531 ± 0.193 |
| 2-Me-1-Butene | 9.431 ± 0.956 | 3.994 ± 0.405 | 2.190 ± 0.222 | 59.544 ± 6.036 | 46.922 ± 4.756 | 21.775 ± 2.207 | 8.325 ± 0.844 | 0.220 ± 0.022 | 21.808 ± 2.210 | 34.612 ± 3.508 | 21.166 ± 2.146 | 10.995 ± 1.114 | 7.063 ± 0.716 |
| n-Pentane | 0.082 ± 0.024 | 0.145 ± 0.043 | 0.016 ± 0.005 | 0.000 ± 0.000 | 0.000 ± 0.000 | 0.225 ± 0.067 | 0.000 ± 0.000 | 0.033 ± 0.010 | 0.000 ± 0.000 | 0.009 ± 0.002 | 3.174 ± 0.941 | 0.059 ± 0.017 | 0.000 ± 0.000 |
| t-2-Pentene | 2.956 ± 0.168 | 1.121 ± 0.064 | 0.509 ± 0.029 | 15.037 ± 0.854 | 11.496 ± 0.652 | 2.609 ± 0.148 | 1.950 ± 0.111 | 0.025 ± 0.001 | 8.972 ± 0.509 | 7.540 ± 0.428 | 4.473 ± 0.254 | 3.681 ± 0.209 | 1.310 ± 0.074 |
| c-2-Pentene | 1.630 ± 0.243 | 0.632 ± 0.094 | 0.267 ± 0.040 | 7.855 ± 1.169 | 6.327 ± 0.942 | 1.107 ± 0.165 | 1.079 ± 0.160 | 0.014 ± 0.002 | 5.264 ± 0.783 | 4.074 ± 0.606 | 2.435 ± 0.362 | 2.158 ± 0.321 | 0.767 ± 0.114 |
| 2-Me-2-Butene | 3.287 ± 0.307 | 1.724 ± 0.161 | 0.583 ± 0.054 | 15.343 ± 1.432 | 12.909 ± 1.205 | 0.518 ± 0.048 | 2.402 ± 0.224 | 0.058 ± 0.006 | 10.959 ± 1.023 | 10.800 ± 1.008 | 8.164 ± 0.762 | 2.512 ± 0.235 | 1.528 ± 0.143 |
| 22DiMeButane | 3.354 ± 0.368 | 1.184 ± 0.130 | 0.578 ± 0.063 | 15.629 ± 1.714 | 9.430 ± 1.034 | 6.249 ± 0.685 | 3.065 ± 0.336 | 0.056 ± 0.006 | 8.384 ± 0.920 | 12.510 ± 1.372 | 6.287 ± 0.690 | 3.465 ± 0.380 | 3.120 ± 0.342 |
| CycloPentene | 0.895 ± 0.099 | 0.375 ± 0.041 | 0.178 ± 0.020 | 4.457 ± 0.490 | 3.857 ± 0.424 | 0.712 ± 0.078 | 0.717 ± 0.079 | 0.007 ± 0.001 | 3.512 ± 0.386 | 2.103 ± 0.231 | 1.327 ± 0.146 | 1.036 ± 0.114 | 0.466 ± 0.051 |
| CycloPentane | 1.538 ± 0.077 | 0.666 ± 0.033 | 0.243 ± 0.012 | 5.711 ± 0.286 | 4.180 ± 0.209 | 2.107 ± 0.105 | 1.406 ± 0.070 | 0.021 ± 0.001 | 5.029 ± 0.252 | 3.936 ± 0.197 | 2.231 ± 0.111 | 2.297 ± 0.115 | 0.748 ± 0.038 |
| 23DiMeButane | 6.330 ± 0.640 | 2.367 ± 0.239 | 0.969 ± 0.098 | 27.045 ± 2.734 | 21.600 ± 2.183 | 18.445 ± 1.865 | 4.568 ± 0.462 | 0.144 ± 0.014 | 16.717 ± 1.690 | 18.954 ± 1.916 | 11.125 ± 1.125 | 10.178 ± 1.029 | 3.846 ± 0.389 |
| MTBE | 0.032 ± 0.003 | 0.020 ± 0.002 | <3.41 ± 0.353 | 0.392 ± 0.033 | 0.352 ± 0.030 | 1.249 ± 0.106 | 1.025 ± 0.086 | 0.000 ± 0.000 | 0.379 ± 0.032 | 0.168 ± 0.014 | 0.170 ± 0.014 | 0.706 ± 0.060 | 0.045 ± 0.004 |
| 2-MePentane | 22.209 ± 2.161 | 7.411 ± 0.721 | <3.41 ± 0.200 | 86.138 ± 8.381 | 69.802 ± 6.791 | 28.433 ± 2.766 | 14.947 ± 1.454 | 0.243 ± 0.024 | 57.891 ± 5.632 | 59.864 ± 5.824 | 31.995 ± 3.113 | 35.353 ± 3.440 | 11.928 ± 1.161 |
| 3-MePentane | 13.517 ± 0.708 | 4.489 ± 0.235 | 2.053 ± 0.107 | 59.050 ± 3.093 | 48.969 ± 2.565 | 21.640 ± 1.133 | 10.812 ± 0.566 | 0.162 ± 0.009 | 33.912 ± 1.776 | 41.147 ± 2.155 | 22.371 ± 1.172 | 21.660 ± 1.135 | 8.041 ± 0.421 |
| 2-Me-1-Pentene | 0.640 ± 0.023 | 0.427 ± 0.016 | 0.108 ± 0.004 | 6.043 ± 0.221 | 6.673 ± 0.244 | 0.592 ± 0.021 | 1.520 ± 0.056 | 0.006 ± 0.000 | 2.524 ± 0.092 | 3.052 ± 0.111 | 0.955 ± 0.035 | 0.794 ± 0.029 | 0.400 ± 0.015 |
| 1-Hexene | 0.871 ± 0.081 | 0.424 ± 0.039 | 0.182 ± 0.017 | 5.510 ± 0.512 | 4.122 ± 0.383 | 1.828 ± 0.170 | 0.641 ± 0.060 | 0.008 ± 0.001 | 6.681 ± 0.621 | 1.749 ± 0.163 | 2.671 ± 0.248 | 1.517 ± 0.141 | 0.899 ± 0.084 |
| n-Hexane | 10.112 ± 0.863 | 3.570 ± 0.304 | 1.504 ± 0.128 | 64.515 ± 5.503 | 52.163 ± 4.449 | 19.294 ± 1.646 | 9.387 ± 0.801 | 0.140 ± 0.012 | 25.123 ± 2.143 | 39.867 ± 3.400 | 24.180 ± 2.062 | 16.252 ± 1.386 | 6.817 ± 0.581 |
| t-2-Hexene | 1.137 ± 0.058 | 0.363 ± 0.019 | 0.174 ± 0.009 | 5.255 ± 0.267 | 4.174 ± 0.212 | 1.165 ± 0.059 | 0.714 ± 0.036 | 0.007 ± 0.000 | 2.987 ± 0.152 | 3.070 ± 0.156 | 1.437 ± 0.073 | 1.630 ± 0.083 | 0.500 ± 0.025 |
| 2-Me-2-Pentene | 0.688 ± 0.063 | 0.364 ± 0.033 | 0.124 ± 0.012 | 3.223 ± 0.295 | 2.794 ± 0.255 | 0.335 ± 0.031 | 0.351 ± 0.032 | 0.007 ± 0.001 | 2.273 ± 0.208 | 2.808 ± 0.257 | 1.410 ± 0.129 | 0.704 ± 0.064 | 0.310 ± 0.028 |
| c-3-Me-2-Pentene | 0.509 ± 0.022 | 0.430 ± 0.019 | 0.102 ± 0.005 | 4.735 ± 0.206 | 4.086 ± 0.178 | 0.408 ± 0.018 | 0.238 ± 0.010 | 0.007 ± 0.000 | 3.411 ± 0.148 | 3.051 ± 0.133 | 1.637 ± 0.071 | 0.522 ± 0.023 | 0.454 ± 0.020 |
| c-3-Hexene | 0.151 ± 0.008 | 0.049 ± 0.003 | 0.026 ± 0.001 | 0.607 ± 0.033 | 0.500 ± 0.027 | 0.205 ± 0.011 | 0.203 ± 0.011 | 0.001 ± 0.000 | 0.455 ± 0.025 | 0.376 ± 0.020 | 0.174 ± 0.009 | 0.155 ± 0.008 | 0.065 ± 0.004 |
| c-2-Hexene | 0.601 ± 0.045 | 0.231 ± 0.017 | 0.093 ± 0.007 | 3.135 ± 0.234 | 2.659 ± 0.198 | 0.543 ± 0.040 | 0.543 ± 0.040 | 0.004 ± 0.000 | 1.943 ± 0.145 | 1.960 ± 0.146 | 0.936 ± 0.070 | 0.991 ± 0.074 | 0.313 ± 0.023 |
| t-3-Me-2-Pentene | 0.820 ± 0.050 | 0.347 ± 0.021 | 0.142 ± 0.009 | 3.631 ± 0.222 | 3.078 ± 0.189 | 0.411 ± 0.025 | 0.563 ± 0.034 | 0.007 ± 0.001 | 2.310 ± 0.141 | 2.983 ± 0.183 | 1.310 ± 0.080 | 0.271 ± 0.017 | 0.334 ± 0.020 |
| MeCyPentane | 8.411 ± 0.836 | 2.225 ± 0.221 | 1.187 ± 0.118 | 35.903 ± 3.567 | 29.788 ± 2.959 | 7.898 ± 0.785 | 6.948 ± 0.690 | 0.067 ± 0.007 | 18.275 ± 1.816 | 23.207 ± 2.306 | 12.157 ± 1.208 | 10.006 ± 0.994 | 4.486 ± 0.446 |
| 2,4-DiMePentane | 6.193 ± 0.318 | 2.902 ± 0.149 | 0.821 ± 0.042 | 24.946 ± 1.280 | 21.329 ± 1.094 | 26.163 ± 1.342 | 3.884 ± 0.199 | 0.160 ± 0.008 | 20.258 ± 1.039 | 17.622 ± 0.904 | 14.119 ± 0.724 | 13.602 ± 0.698 | 3.141 ± 0.161 |
| 223TriMeButane | 0.219 ± 0.020 | 0.074 ± 0.007 | 0.037 ± 0.004 | 1.023 ± 0.092 | 0.734 ± 0.066 | 0.565 ± 0.051 | 0.000 ± 0.000 | 0.005 ± 0.001 | 0.748 ± 0.067 | 0.787 ± 0.071 | 0.391 ± 0.035 | 0.477 ± 0.043 | 0.160 ± 0.014 |
| Benzene | 42.626 ± 4.949 | 17.575 ± 2.040 | 5.523 ± 0.641 | 278.974 ± 32.390 | 249.491 ± 18.015 | 83.359 ± 9.678 | 26.165 ± 3.038 | 0.676 ± 0.078 | 108.019 ± 12.541 | 150.037 ± 15.096 | 65.892 ± 7.650 | 46.570 ± 5.407 | 36.842 ± 4.278 |
| CycloHexane | <19.02 ± 0.703 | 1.371 ± 0.138 | 0.957 ± 0.096 | 10.971 ± 1.101 | 7.993 ± 0.802 | <26.11 ± 0.122 | <14.34 ± 0.202 | 0.021 ± 0.002 | 7.179 ± 0.720 | 6.402 ± 0.642 | 3.475 ± 0.348 | <24.50 ± 0.769 | 1.283 ± 0.129 |
| 4MeHexene | 0.161 ± 0.026 | 0.091 ± 0.015 | 0.032 ± 0.005 | 0.922 ± 0.150 | 0.875 ± 0.143 | 0.187 ± 0.030 | 0.346 ± 0.056 | 0.003 ± 0.001 | 0.961 ± 0.157 | 0.478 ± 0.078 | 0.400 ± 0.065 | 0.458 ± 0.075 | 0.135 ± 0.022 |
| 2MeHexane | 9.493 ± 0.392 | 3.078 ± 0.127 | 1.357 ± 0.056 | 50.204 ± 2.071 | 43.268 ± 1.785 | 18.695 ± 0.771 | 8.994 ± 0.371 | 0.123 ± 0.005 | 21.013 ± 0.867 | 35.067 ± 1.447 | 18.083 ± 0.746 | 13.036 ± 0.538 | 6.808 ± 0.281 |
| 23DiMePentane | 8.163 ± 0.288 | 3.771 ± 0.133 | 1.180 ± 0.042 | 39.657 ± 1.398 | 37.114 ± 1.308 | 30.245 ± 1.066 | 5.506 ± 0.194 | 0.226 ± 0.008 | 25.755 ± 0.908 | 29.552 ± 1.041 | 24.893 ± 0.877 | 17.972 ± 0.633 | 4.733 ± 0.167 |
| 3MeHexane | <12.01 ± 0.447 | 3.347 ± 0.142 | 1.488 ± 0.063 | 56.429 ± 2.400 | 49.001 ± 2.084 | <24.89 ± 0.926 | <12.33 ± 0.459 | 0.146 ± 0.006 | 22.361 ± 0.951 | 39.716 ± 1.689 | 20.857 ± 0.887 | <16.84 ± 0.626 | 7.695 ± 0.327 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S3-2 | S4-1 | S4-2 | S5-1 | S5-2 | S5-3 | S5-4 | S5-5 | S6-1 | S6-2 | S6-3 | S6-4 | S7-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyclohexene | 0.000 ± 0.298 | 0.212 ± 0.037 | 0.070 ± 0.042 | 1.807 ± 0.541 | 0.441 ± 0.694 | 0.000 ± 0.395 | 0.000 ± 0.339 | 0.004 ± 0.003 | 1.802 ± 0.200 | 0.881 ± 0.401 | 0.690 ± 0.128 | 0.000 ± 0.431 | 0.242 ± 0.074 |
| 3EtPentane | 2.665 ± 0.030 | 0.335 ± 0.000 | 0.378 ± 0.015 | 4.830 ± 0.000 | 6.189 ± 0.000 | 3.525 ± 0.011 | 3.027 ± 0.016 | 0.024 ± 0.000 | 1.782 ± 0.000 | 3.581 ± 0.000 | 1.145 ± 0.000 | 3.847 ± 0.050 | 0.663 ± 0.000 |
| * 1-Heptene | 0.599 ± 2.015 | <8.59 ± 0.000 | 0.301 ± 0.232 | <82.54 ± 0.000 | <68.19 ± 0.000 | 0.231 ± 27.565 | 0.314 ± 1.504 | 0.003 ± 0.165 | <59.44 ± 0.000 | <51.27 ± 0.000 | <64.92 ± 0.000 | 1.013 ± 4.998 | <10.98 ± 0.000 |
| * 224TrMePentane | 16.501 ± 0.015 | <8.59 ± 0.003 | 1.901 ± 0.002 | <82.54 ± 0.039 | <68.19 ± 0.027 | 225.782 ± 0.018 | 12.319 ± 0.026 | 1.348 ± 0.000 | <59.44 ± 0.026 | <51.27 ± 0.020 | <64.92 ± 0.010 | 40.939 ± 0.022 | <10.98 ± 0.004 |
| t-3-Heptene | 0.403 ± 0.229 | 0.073 ± 0.077 | 0.045 ± 0.037 | 1.073 ± 1.285 | 0.746 ± 1.168 | 0.498 ± 0.528 | 0.705 ± 0.282 | 0.001 ± 0.003 | 0.708 ± 0.484 | 0.555 ± 0.928 | 0.263 ± 0.482 | 0.591 ± 0.348 | 0.091 ± 0.180 |
| n-Heptane | 6.846 ± 0.012 | 2.287 ± 0.003 | 1.100 ± 0.000 | 38.403 ± 0.124 | 34.881 ± 0.123 | 15.775 ± 0.051 | 8.426 ± 0.059 | 0.107 ± 0.001 | 14.473 ± 0.088 | 27.717 ± 0.103 | 14.385 ± 0.040 | 10.396 ± 0.045 | 5.377 ± 0.015 |
| 244TMe-1-Pentene | 0.127 ± 0.222 | 0.036 ± 0.066 | 0.003 ± 0.030 | 1.277 ± 0.860 | 1.270 ± 0.973 | 0.530 ± 0.135 | 0.611 ± 0.222 | 0.006 ± 0.002 | 0.910 ± 0.471 | 1.067 ± 0.616 | 0.416 ± 0.296 | 0.461 ± 0.281 | 0.152 ± 0.121 |
| MeCyHexane | 3.213 ± 0.305 | 0.951 ± 0.123 | 0.438 ± 0.044 | 12.440 ± 1.479 | 14.070 ± 1.208 | 1.948 ± 2.894 | 3.208 ± 0.153 | 0.023 ± 0.013 | 6.816 ± 0.874 | 8.916 ± 0.979 | 4.272 ± 0.768 | 4.067 ± 0.570 | 1.751 ± 0.199 |
| 25DiMeHexane | 2.609 ± 0.194 | 1.052 ± 0.058 | 0.379 ± 0.023 | 12.671 ± 0.713 | 10.348 ± 0.585 | 24.791 ± 1.390 | 1.312 ± 0.125 | 0.116 ± 0.008 | 7.491 ± 0.411 | 8.387 ± 0.483 | 6.579 ± 0.389 | 4.887 ± 0.359 | 1.704 ± 0.098 |
| 24DiMeHexane | 4.548 ± 0.153 | 1.365 ± 0.070 | 0.546 ± 0.026 | 16.764 ± 0.797 | 13.753 ± 0.692 | 32.686 ± 2.301 | 2.943 ± 0.120 | 0.182 ± 0.015 | 9.659 ± 0.490 | 11.354 ± 0.526 | 9.155 ± 0.601 | 8.447 ± 0.361 | 2.294 ± 0.105 |
| 234TrMePentane | 4.123 ± 3.029 | 1.881 ± 1.240 | 0.687 ± 0.518 | 21.516 ± 17.977 | 18.691 ± 8.676 | 62.115 ± 11.568 | 3.236 ± 2.817 | 0.417 ± 0.062 | 13.219 ± 9.623 | 14.197 ± 6.499 | 16.227 ± 4.607 | 9.743 ± 4.820 | 2.822 ± 2.264 |
| Toluene | 71.522 ± 0.201 | 29.282 ± 0.051 | <12.23 ± 1.184 | 461.040 ± 0.820 | 421.067 ± 0.827 | 273.156 ± 1.892 | 66.514 ± 0.182 | 1.458 ± 0.015 | 227.233 ± 0.404 | 191.892 ± 0.628 | 110.906 ± 0.558 | 113.815 ± 0.393 | 53.460 ± 0.104 |
| 23DiMeHexane | 2.250 ± 0.239 | 0.576 ± 0.063 | <12.23 ± 0.037 | 9.197 ± 0.698 | 9.271 ± 0.054 | 21.203 ± 0.376 | 2.047 ± 0.233 | 0.164 ± 0.002 | 4.534 ± 0.443 | 7.042 ± 0.406 | 6.253 ± 0.299 | 4.408 ± 0.357 | 1.166 ± 0.118 |
| 2MeHeptane | 4.804 ± 0.171 | 1.274 ± 0.069 | 0.749 ± 0.031 | 14.058 ± 1.102 | 1.080 ± 0.773 | 7.566 ± 0.382 | 4.686 ± 0.211 | 0.046 ± 0.002 | 8.919 ± 0.541 | 8.169 ± 0.710 | 6.027 ± 0.418 | 7.192 ± 0.259 | 2.377 ± 0.131 |
| 4MeHeptane | 1.793 ± 0.173 | 0.725 ± 0.052 | 0.322 ± 0.028 | 11.575 ± 0.772 | 8.114 ± 0.699 | 4.008 ± 0.295 | 2.213 ± 0.161 | 0.021 ± 0.002 | 5.678 ± 0.382 | 7.460 ± 0.560 | 4.389 ± 0.303 | 2.723 ± 0.262 | 1.372 ± 0.115 |
| 3MeHeptane | 5.215 ± 0.018 | 1.580 ± 0.025 | 0.848 ± 0.006 | 23.241 ± 0.386 | 21.048 ± 0.322 | 8.868 ± 0.024 | 4.841 ± 0.110 | 0.054 ± 0.001 | 11.493 ± 0.184 | 16.851 ± 0.272 | 9.107 ± 0.153 | 7.895 ± 0.032 | 3.451 ± 0.056 |
| Hexanal | 0.030 ± 0.006 | 0.050 ± 0.006 | 0.080 ± 0.013 | 1.430 ± 0.017 | 0.520 ± 0.016 | 0.380 ± 0.017 | 1.100 ± 0.017 | 1.080 ± 0.016 | 0.760 ± 0.017 | 0.200 ± 0.017 | 0.200 ± 0.017 | 0.050 ± 0.017 | 0.050 ± 0.008 |
| 225TMHexane | 2.091 ± 0.020 | 1.104 ± 0.012 | 0.366 ± 0.005 | 13.291 ± 0.104 | 12.254 ± 0.134 | 23.794 ± 0.044 | 1.298 ± 0.034 | 0.013 ± 0.023 | 7.705 ± 0.218 | 11.939 ± 0.049 | 7.007 ± 0.059 | 4.034 ± 0.046 | 2.166 ± 0.025 |
| Octene-1 | 0.166 ± 0.003 | 0.100 ± 0.005 | 0.037 ± 0.004 | 0.859 ± 0.080 | 1.108 ± 0.068 | 0.367 ± 0.011 | 0.276 ± 0.021 | 0.189 ± 0.000 | 1.791 ± 0.044 | 0.405 ± 0.046 | 0.489 ± 0.025 | 0.376 ± 0.006 | 0.209 ± 0.009 |
| 11DMeCyHexane | 0.120 ± 0.151 | 0.221 ± 0.048 | 0.140 ± 0.026 | 3.349 ± 0.644 | 2.855 ± 0.576 | 0.444 ± 0.222 | 0.868 ± 0.160 | 0.003 ± 0.002 | 1.837 ± 0.312 | 1.919 ± 0.503 | 1.055 ± 0.229 | 0.237 ± 0.211 | 0.391 ± 0.101 |
| n-Octane | 3.955 ± 0.064 | 1.239 ± 0.015 | 0.686 ± 0.008 | 16.806 ± 0.197 | 15.040 ± 0.158 | 5.783 ± 0.118 | 4.181 ± 0.051 | 0.040 ± 0.005 | 8.159 ± 0.107 | 13.135 ± 0.132 | 5.984 ± 0.080 | 5.497 ± 0.109 | 2.653 ± 0.028 |
| 24DiMeHeptane | 0.718 ± 0.032 | 0.169 ± 0.008 | 0.089 ± 0.004 | 2.225 ± 0.113 | 1.789 ± 0.102 | 1.330 ± 0.041 | 0.579 ± 0.020 | 0.060 ± 0.000 | 1.209 ± 0.063 | 1.497 ± 0.080 | 0.904 ± 0.041 | 1.228 ± 0.042 | 0.320 ± 0.015 |
| 25DiMeHeptane | 1.922 ± 0.015 | 0.498 ± 0.030 | 0.205 ± 0.002 | 6.729 ± 0.301 | 6.083 ± 0.044 | 2.446 ± 0.000 | 1.195 ± 0.000 | 0.018 ± 0.001 | 3.744 ± 0.193 | 4.761 ± 0.036 | 2.441 ± 0.119 | 2.515 ± 0.006 | 0.892 ± 0.054 |
| 33DiMeHeptane | 0.111 ± 1.481 | 0.224 ± 0.383 | 0.019 ± 0.220 | 2.270 ± 6.254 | 0.332 ± 5.442 | 0.000 ± 2.600 | 0.000 ± 1.237 | 0.003 ± 0.011 | 1.459 ± 3.646 | 0.275 ± 3.289 | 0.899 ± 1.587 | 0.043 ± 1.401 | 0.405 ± 0.790 |
| EtBenzene | 21.864 ± 4.155 | 5.657 ± 0.768 | 3.240 ± 0.563 | 92.306 ± 16.192 | 80.326 ± 11.610 | 38.373 ± 7.825 | 18.262 ± 3.300 | 0.168 ± 0.028 | 53.817 ± 6.715 | 48.545 ± 8.091 | 23.428 ± 3.059 | 20.678 ± 2.860 | 11.664 ± 1.851 |
| m/p-xylene | 66.910 ± 0.021 | 12.374 ± 0.023 | 9.060 ± 0.012 | 260.755 ± 0.319 | 208.559 ± 0.267 | 126.018 ± 0.030 | 53.136 ± 0.010 | 0.457 ± 0.000 | 108.137 ± 0.166 | 130.299 ± 0.224 | 49.263 ± 0.100 | 46.058 ± 0.026 | 29.814 ± 0.045 |
| 2MeOctane | 0.935 ± 0.320 | 1.022 ± 0.108 | 0.546 ± 0.053 | 14.063 ± 1.755 | 11.800 ± 1.155 | 1.314 ± 0.248 | 0.450 ± 0.242 | 0.011 ± 0.002 | 7.321 ± 0.809 | 9.902 ± 0.841 | 4.399 ± 0.450 | 1.155 ± 0.343 | 2.003 ± 0.172 |
| 3MeOctane | 3.032 ± 0.026 | 1.022 ± 0.018 | 0.503 ± 0.016 | 16.633 ± 0.217 | 10.950 ± 0.242 | 2.352 ± 0.243 | 2.292 ± 0.027 | 0.018 ± 0.003 | 7.670 ± 0.189 | 7.976 ± 0.146 | 4.261 ± 0.078 | 3.250 ± 0.021 | 1.627 ± 0.034 |
| Styrene+heptanal | 0.339 ± 1.328 | 0.227 ± 0.236 | 0.209 ± 0.170 | 2.773 ± 4.624 | 3.092 ± 3.881 | 3.098 ± 2.207 | 0.345 ± 0.967 | 0.038 ± 0.010 | 2.413 ± 2.039 | 1.867 ± 2.424 | 0.996 ± 1.027 | 0.270 ± 0.815 | 0.429 ± 0.573 |
| o-xylene | 27.158 ± 0.006 | 4.833 ± 0.050 | 3.482 ± 0.001 | 94.593 ± 0.190 | 79.388 ± 0.196 | 45.153 ± 0.049 | 19.781 ± 0.007 | 0.197 ± 0.000 | 41.724 ± 0.181 | 49.596 ± 0.139 | 21.012 ± 0.107 | 16.672 ± 0.002 | 11.725 ± 0.010 |
| Nonene-1 | 0.136 ± 0.079 | 1.091 ± 0.018 | 0.030 ± 0.011 | 4.172 ± 0.222 | 4.315 ± 0.189 | 1.085 ± 0.049 | 0.155 ± 0.058 | 0.004 ± 0.001 | 3.980 ± 0.106 | 3.061 ± 0.162 | 2.348 ± 0.066 | 0.050 ± 0.063 | 0.213 ± 0.035 |
| n-Nonane | 2.925 ± 0.125 | 0.665 ± 0.019 | 0.407 ± 0.009 | 8.167 ± 0.234 | 6.980 ± 0.230 | 1.806 ± 0.137 | 2.140 ± 0.073 | 0.016 ± 0.001 | 3.919 ± 0.136 | 5.950 ± 0.157 | 2.445 ± 0.070 | 2.335 ± 0.080 | 1.280 ± 0.037 |
| iPropBenzene | 2.543 ± 0.044 | 0.377 ± 0.003 | 0.181 ± 0.005 | 4.783 ± 0.031 | 4.692 ± 0.056 | 2.805 ± 0.025 | 1.489 ± 0.027 | 0.017 ± 0.001 | 2.771 ± 0.019 | 3.205 ± 0.017 | 1.436 ± 0.013 | 1.632 ± 0.051 | 0.747 ± 0.005 |
| iPropCyHexane | 0.371 ± 0.032 | 0.029 ± 0.025 | 0.040 ± 0.014 | 0.259 ± 0.281 | 0.464 ± 0.300 | 0.209 ± 0.018 | 0.221 ± 0.010 | 0.004 ± 0.001 | 0.157 ± 0.148 | 0.140 ± 0.186 | 0.109 ± 0.111 | 0.423 ± 0.025 | 0.045 ± 0.033 |
| 26DiMeOctane | 0.296 ± 0.494 | 0.233 ± 0.026 | 0.129 ± 0.018 | 2.589 ± 0.211 | 2.768 ± 0.290 | 0.165 ± 0.482 | 0.094 ± 0.220 | 0.009 ± 0.004 | 1.365 ± 0.118 | 1.721 ± 0.139 | 1.021 ± 0.044 | 0.230 ± 0.580 | 0.301 ± 0.027 |
| alpha-pinene | 1.487 ± 0.500 | 0.077 ± 0.068 | 0.053 ± 0.051 | 0.634 ± 1.117 | 0.875 ± 1.463 | 1.452 ± 0.563 | 0.662 ± 0.383 | 0.012 ± 0.002 | 0.354 ± 0.584 | 0.417 ± 0.684 | 0.132 ± 0.254 | 1.747 ± 0.231 | 0.082 ± 0.156 |
| nPropBenzene | 7.473 ± 0.745 | 1.017 ± 0.100 | 0.766 ± 0.094 | 16.673 ± 1.974 | 21.846 ± 1.986 | 8.408 ± 0.878 | 5.724 ± 0.536 | 0.032 ± 0.003 | 8.718 ± 0.902 | 10.221 ± 0.965 | 3.802 ± 0.366 | 3.452 ± 0.352 | 2.333 ± 0.233 |
| mEtToluene | 25.371 ± 0.427 | 3.397 ± 0.063 | 3.213 ± 0.061 | 67.264 ± 1.314 | 67.641 ± 1.300 | 29.914 ± 0.517 | 18.247 ± 0.326 | 0.095 ± 0.001 | 30.721 ± 0.593 | 32.874 ± 0.674 | 12.453 ± 0.268 | 12.006 ± 0.200 | 7.950 ± 0.135 |
| pEtToluene | 10.635 ± 0.549 | 1.566 ± 0.053 | 1.512 ± 0.061 | 32.764 ± 1.335 | 32.424 ± 1.322 | 12.885 ± 0.640 | 8.119 ± 0.338 | 0.035 ± 0.002 | 14.779 ± 0.455 | 16.806 ± 0.628 | 6.676 ± 0.196 | 4.981 ± 0.221 | 3.365 ± 0.147 |
| 135TriMeBenzene | 12.805 ± 0.404 | 1.244 ± 0.056 | 1.413 ± 0.051 | 31.163 ± 0.969 | 30.857 ± 0.978 | 14.953 ± 0.441 | 7.893 ± 0.282 | 0.045 ± 0.002 | 10.628 ± 0.476 | 14.657 ± 0.490 | 4.578 ± 0.229 | 5.157 ± 0.174 | 3.439 ± 0.128 |
| oEtToluene | 9.288 ± 0.151 | 1.275 ± 0.028 | 1.172 ± 0.004 | 22.312 ± 0.354 | 22.504 ± 0.466 | 10.144 ± 0.304 | 6.487 ± 0.036 | 0.038 ± 0.004 | 10.961 ± 0.207 | 11.273 ± 0.221 | 5.262 ± 0.079 | 4.006 ± 0.052 | 2.947 ± 0.044 |
| Octanal | 0.372 ± 0.018 | 0.069 ± 0.002 | 0.010 ± 0.004 | 0.870 ± 0.011 | 1.146 ± 0.018 | 0.748 ± 0.080 | 0.088 ± 0.011 | 0.009 ± 0.000 | 0.509 ± 0.008 | 0.544 ± 0.009 | 0.195 ± 0.004 | 0.127 ± 0.016 | 0.108 ± 0.001 |
| beta-pinene | 0.265 ± 1.858 | 0.026 ± 0.177 | 0.055 ± 0.203 | 0.169 ± 3.906 | 0.276 ± 3.993 | 1.212 ± 1.846 | 0.174 ± 1.304 | 0.002 ± 0.006 | 0.120 ± 1.455 | 0.141 ± 2.019 | 0.055 ± 0.458 | 0.244 ± 0.580 | 0.023 ± 0.447 |
| * 124TriMeBenzene | 41.098 ± 0.266 | <3.92 ± 0.404 | 4.501 ± 0.032 | <86.37 ± 8.887 | <88.30 ± 9.085 | 40.824 ± 0.239 | 28.830 ± 0.151 | 0.133 ± 0.002 | <32.17 ± 3.309 | <44.65 ± 4.594 | <10.13 ± 1.042 | 12.821 ± 0.118 | <9.89 ± 1.017 |
| * n-Decane | 2.749 ± 0.057 | <3.92 ± 0.004 | 0.330 ± 0.004 | <86.37 ± 0.069 | <88.30 ± 0.085 | 2.472 ± 0.055 | 1.565 ± 0.026 | 0.020 ± 0.000 | <32.17 ± 0.028 | <44.65 ± 0.036 | <10.13 ± 0.015 | 1.221 ± 0.021 | <9.89 ± 0.007 |
| iButBenzene | 1.164 ± 0.046 | 0.077 ± 0.005 | 0.086 ± 0.006 | 1.406 ± 0.096 | 1.736 ± 0.110 | 1.128 ± 0.041 | 0.521 ± 0.027 | 0.007 ± 0.000 | 0.568 ± 0.034 | 0.728 ± 0.038 | 0.298 ± 0.020 | 0.420 ± 0.018 | 0.151 ± 0.008 |
| sButBenzene | 0.823 ± 1.218 | 0.087 ± 0.053 | 0.109 ± 0.112 | 1.726 ± 1.017 | 1.970 ± 1.089 | 0.743 ± 0.818 | 0.486 ± 0.666 | 0.005 ± 0.000 | 0.613 ± 0.434 | 0.682 ± 0.525 | 0.351 ± 0.116 | 0.332 ± 0.299 | 0.142 ± 0.103 |
| Limonene | <11.74 ± 0.185 | 0.516 ± 0.002 | 1.083 ± 0.000 | 9.805 ± 0.267 | 10.510 ± 0.277 | <7.89 ± 0.000 | <6.42 ± 0.000 | 0.003 ± 0.001 | 4.187 ± 0.102 | 5.066 ± 0.137 | 1.122 ± 0.043 | <2.89 ± 0.000 | 0.993 ± 0.035 |
| Indan | <4.15 ± 0.443 | 0.264 ± 0.089 | 0.499 ± 0.037 | 5.559 ± 2.116 | 5.873 ± 2.143 | <3.27 ± 0.437 | <3.75 ± 0.149 | 0.008 ± 0.010 | 2.488 ± 0.819 | 2.171 ± 0.847 | 0.818 ± 0.230 | <1.76 ± 0.101 | 0.546 ± 0.217 |
| 13diethylbenzene | 4.430 ± 0.156 | 0.893 ± 0.031 | 0.368 ± 0.013 | 21.159 ± 0.747 | 21.428 ± 0.756 | 4.374 ± 0.154 | 1.491 ± 0.053 | 0.019 ± 0.001 | 8.185 ± 0.289 | 8.465 ± 0.299 | 2.299 ± 0.081 | 1.009 ± 0.036 | 2.171 ± 0.077 |
| 14diethylbenzene | 2.218 ± 0.202 | 0.081 ± 0.007 | 0.275 ± 0.025 | 1.294 ± 0.118 | 1.091 ± 0.099 | 0.743 ± 0.068 | 1.109 ± 0.101 | 0.025 ± 0.002 | 0.389 ± 0.035 | 0.629 ± 0.057 | 0.274 ± 0.025 | 0.460 ± 0.042 | 0.108 ± 0.010 |
| 12diethylbenzene | 1.597 ± 0.166 | 0.118 ± 0.012 | 0.233 ± 0.024 | 1.510 ± 0.156 | 0.563 ± 0.058 | 1.094 ± 0.113 | 0.481 ± 0.050 | 0.005 ± 0.001 | 1.150 ± 0.119 | 0.497 ± 0.052 | 0.627 ± 0.065 | 0.340 ± 0.035 | 0.194 ± 0.020 |
| 2-propylToluene | 3.921 ± 0.129 | 0.139 ± 0.005 | 0.321 ± 0.011 | 3.102 ± 0.102 | 3.384 ± 0.111 | 3.103 ± 0.102 | 0.892 ± 0.029 | 0.020 ± 0.001 | 1.304 ± 0.043 | 1.342 ± 0.044 | 0.466 ± 0.015 | 0.531 ± 0.017 | 0.326 ± 0.011 |
| 3-ipropyltoluene | 1.687 ± 0.083 | 0.157 ± 0.008 | 0.172 ± 0.008 | 2.296 ± 0.113 | 2.682 ± 0.132 | 1.107 ± 0.055 | 0.848 ± 0.042 | 0.005 ± 0.000 | 1.074 ± 0.053 | 1.309 ± 0.065 | 0.521 ± 0.026 | 0.617 ± 0.030 | 0.300 ± 0.015 |
| 4-ipropyltoluene | 0.025 ± 0.007 | 0.017 ± 0.005 | 0.084 ± 0.026 | 0.589 ± 0.179 | 0.673 ± 0.205 | 0.041 ± 0.013 | 0.000 ± 0.000 | 0.004 ± 0.001 | 0.308 ± 0.094 | 0.236 ± 0.072 | 0.094 ± 0.029 | 0.000 ± 0.000 | 0.015 ± 0.005 |
| 2-ipropyltoluene | <4.15 ± 0.846 | 0.039 ± 0.008 | 0.049 ± 0.010 | 0.489 ± 0.097 | 0.789 ± 0.157 | <3.27 ± 0.667 | <3.75 ± 0.765 | 0.005 ± 0.001 | 0.172 ± 0.034 | 0.255 ± 0.051 | 0.166 ± 0.033 | <1.76 ± 0.358 | 0.068 ± 0.014 |
| Nonanal | 14.313 ± 2.329 | 0.129 ± 0.021 | 1.054 ± 0.172 | 13.114 ± 2.134 | 13.170 ± 2.143 | 5.167 ± 0.841 | 3.354 ± 0.546 | 0.019 ± 0.003 | 4.866 ± 0.792 | 4.690 ± 0.763 | 0.849 ± 0.138 | 1.614 ± 0.262 | 0.188 ± 0.031 |
| n-Undecane | 2.529 ± 0.298 | 0.303 ± 0.036 | 0.227 ± 0.027 | 4.926 ± 0.579 | 5.186 ± 0.610 | 0.758 ± 0.089 | 0.466 ± 0.055 | 0.013 ± 0.002 | 2.145 ± 0.252 | 2.259 ± 0.266 | 0.523 ± 0.061 | 0.358 ± 0.042 | 0.432 ± 0.051 |
| 1245tetraMeBenzene | 5.795 ± 0.400 | 0.193 ± 0.013 | 0.423 ± 0.029 | 5.220 ± 0.360 | 4.597 ± 0.317 | 1.273 ± 0.088 | 0.750 ± 0.052 | 0.006 ± 0.001 | 1.542 ± 0.106 | 1.474 ± 0.102 | 0.321 ± 0.022 | 0.442 ± 0.030 | 0.555 ± 0.038 |
| 1235tetraMeBenzene | 7.465 ± 0.137 | 0.235 ± 0.004 | 0.582 ± 0.011 | 6.437 ± 0.118 | 5.508 ± 0.101 | 1.399 ± 0.026 | 1.031 ± 0.019 | 0.008 ± 0.000 | 1.780 ± 0.033 | 1.837 ± 0.034 | 0.292 ± 0.005 | 0.555 ± 0.010 | 0.740 ± 0.014 |
| 1234tetraMeBenzene | 2.056 ± 0.367 | 0.288 ± 0.051 | 0.599 ± 0.107 | 7.411 ± 1.322 | 6.784 ± 1.210 | 0.314 ± 0.056 | 0.377 ± 0.067 | 0.004 ± 0.001 | 2.683 ± 0.478 | 2.278 ± 0.406 | 0.309 ± 0.055 | 0.153 ± 0.027 | 0.713 ± 0.127 |
| n-Dodecane | 1.535 ± 0.184 | 1.190 ± 0.143 | 1.765 ± 0.211 | 19.107 ± 2.290 | 16.793 ± 2.013 | 0.134 ± 0.016 | 0.228 ± 0.027 | 0.008 ± 0.001 | 7.137 ± 0.855 | 4.166 ± 0.499 | 3.658 ± 0.438 | 0.252 ± 0.030 | 2.338 ± 0.280 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S7-2 | S7-3 | S7-4 | S8-1 | S8-2 | S8-3 |
|---|---|---|---|---|---|---|
| Gravimetric mass (mg/mi) | 8.81 ± 1.40 | 4.12 ± 0.69 | 4.78 ± 0.79 | 1.81 ± 0.30 | 2.08 ± 0.34 | 3.48 ± 0.56 |
| Carbon fractions by TOR (mg/mi) | | | | | | |
| Organic Carbon Fraction 1 | 0.947 ± 0.255 | 0.170 ± 0.075 | 0.038 ± 0.055 | 0.125 ± 0.049 | 0.267 ± 0.061 | 0.333 ± 0.069 |
| Organic Carbon Fraction 2 | 1.775 ± 0.356 | 0.312 ± 0.107 | 0.331 ± 0.111 | 0.392 ± 0.074 | 0.579 ± 0.109 | 0.432 ± 0.083 |
| Organic Carbon Fraction 3 | 1.729 ± 0.371 | 0.484 ± 0.251 | 0.556 ± 0.254 | 0.337 ± 0.125 | 0.489 ± 0.132 | 0.849 ± 0.186 |
| Organic Carbon Fraction 4 | 0.824 ± 0.241 | 0.711 ± 0.244 | 0.263 ± 0.113 | 0.139 ± 0.039 | 0.158 ± 0.044 | 0.755 ± 0.173 |
| Pyrolyzed Organic Carbon | 0.002 ± 0.021 | 0.004 ± 0.037 | 0.001 ± 0.036 | 0.011 ± 0.020 | 0.001 ± 0.016 | 0.026 ± 0.019 |
| Total Organic Carbon | 5.258 ± 0.989 | 1.666 ± 0.447 | 1.155 ± 0.374 | 0.983 ± 0.201 | 1.488 ± 0.284 | 2.346 ± 0.416 |
| Elemental Carbon Fraction 1 | 0.725 ± 0.242 | 0.618 ± 0.239 | 0.266 ± 0.100 | 0.205 ± 0.047 | 0.183 ± 0.047 | 0.589 ± 0.141 |
| Elemental Carbon Fraction 2 | 1.060 ± 0.185 | 0.358 ± 0.079 | 1.248 ± 0.258 | 0.353 ± 0.097 | 0.716 ± 0.129 | 0.697 ± 0.123 |
| Elemental Carbon Fraction 3 | 0.027 ± 0.013 | 0.028 ± 0.019 | 0.028 ± 0.020 | 0.000 ± 0.005 | 0.010 ± 0.007 | 0.080 ± 0.024 |
| Total Elemental Carbon | 1.808 ± 0.351 | 0.994 ± 0.243 | 1.537 ± 0.360 | 0.544 ± 0.088 | 0.906 ± 0.174 | 1.339 ± 0.248 |
| Total Carbon | 7.068 ± 1.280 | 2.661 ± 0.608 | 2.680 ± 0.598 | 1.527 ± 0.283 | 2.372 ± 0.423 | 3.685 ± 0.628 |
| Elements by XRF (mg/mi) | | | | | | |
| Sodium (qualitative only) | 0.1742 ± 0.1410 | 0.0481 ± 0.2109 | 0.1952 ± 0.2134 | 0.1727 ± 0.0971 | 0.1412 ± 0.1034 | 0.1484 ± 0.1059 |
| Magnesium (qualitative only) | 0.0211 ± 0.0221 | 0.0040 ± 0.0451 | 0.0062 ± 0.0377 | 0.0279 ± 0.0140 | 0.0102 ± 0.0168 | 0.0161 ± 0.0159 |
| Aluminum | 0.0140 ± 0.0092 | 0.0165 ± 0.0155 | 0.0115 ± 0.0152 | 0.0150 ± 0.0071 | 0.0098 ± 0.0075 | 0.0107 ± 0.0076 |
| Silicon | 0.0405 ± 0.0078 | 0.0753 ± 0.0138 | 0.0768 ± 0.0141 | 0.0454 ± 0.0078 | 0.0470 ± 0.0081 | 0.2111 ± 0.0336 |
| Phosphorous | 0.0483 ± 0.0081 | 0.0346 ± 0.0070 | 0.0022 ± 0.0069 | 0.0036 ± 0.0023 | 0.0058 ± 0.0023 | 0.0131 ± 0.0028 |
| Sulfur | 0.3445 ± 0.0545 | 0.0978 ± 0.0158 | 0.5370 ± 0.0850 | 0.0620 ± 0.0099 | 0.0721 ± 0.0115 | 0.0863 ± 0.0137 |
| Chlorine | 0.0013 ± 0.0049 | 0.0015 ± 0.0081 | 0.0013 ± 0.0107 | 0.0014 ± 0.0023 | 0.0025 ± 0.0026 | 0.0014 ± 0.0026 |
| Potassium | 0.0119 ± 0.0026 | 0.0453 ± 0.0079 | 0.0054 ± 0.0032 | 0.0031 ± 0.0014 | 0.0034 ± 0.0015 | 0.0069 ± 0.0017 |
| Calcium | 0.1255 ± 0.0200 | 0.1167 ± 0.0189 | 0.0489 ± 0.0084 | 0.0494 ± 0.0080 | 0.0639 ± 0.0102 | 0.0738 ± 0.0118 |
| Titanium | 0.0044 ± 0.0107 | 0.0115 ± 0.0272 | 0.0028 ± 0.0180 | 0.0058 ± 0.0082 | 0.0051 ± 0.0082 | 0.0048 ± 0.0081 |
| Vanadium | 0.0017 ± 0.0048 | 0.0037 ± 0.0117 | 0.0009 ± 0.0078 | 0.0024 ± 0.0038 | 0.0022 ± 0.0035 | 0.0020 ± 0.0036 |
| Chromium | 0.0007 ± 0.0010 | 0.0035 ± 0.0017 | 0.0017 ± 0.0014 | 0.0012 ± 0.0008 | 0.0013 ± 0.0007 | 0.0028 ± 0.0008 |
| Manganese | 0.0006 ± 0.0006 | 0.0016 ± 0.0010 | 0.0004 ± 0.0010 | 0.0008 ± 0.0004 | 0.0008 ± 0.0004 | 0.0015 ± 0.0005 |
| Iron | 0.0331 ± 0.0054 | 0.1972 ± 0.0313 | 0.0424 ± 0.0070 | 0.0535 ± 0.0085 | 0.0311 ± 0.0050 | 0.0985 ± 0.0156 |
| Cobalt | 0.0001 ± 0.0005 | 0.0016 ± 0.0029 | 0.0004 ± 0.0010 | 0.0002 ± 0.0006 | 0.0002 ± 0.0004 | 0.0006 ± 0.0008 |
| Nickel | 0.0007 ± 0.0004 | 0.0021 ± 0.0007 | 0.0010 ± 0.0006 | 0.0003 ± 0.0002 | 0.0007 ± 0.0003 | 0.0014 ± 0.0004 |
| Copper | 0.0041 ± 0.0007 | 0.0079 ± 0.0014 | 0.0040 ± 0.0008 | 0.0023 ± 0.0005 | 0.0023 ± 0.0005 | 0.0063 ± 0.0010 |
| Zinc | 0.0640 ± 0.0105 | 0.0343 ± 0.0071 | 0.0223 ± 0.0057 | 0.0135 ± 0.0029 | 0.0273 ± 0.0048 | 0.0392 ± 0.0065 |
| Gallium | 0.0007 ± 0.0011 | 0.0001 ± 0.0019 | 0.0002 ± 0.0018 | 0.0004 ± 0.0009 | 0.0009 ± 0.0008 | 0.0005 ± 0.0008 |
| Arsenic | 0.0002 ± 0.0010 | 0.0000 ± 0.0018 | 0.0001 ± 0.0016 | 0.0005 ± 0.0008 | 0.0002 ± 0.0007 | 0.0001 ± 0.0008 |
| Selenium | 0.0001 ± 0.0004 | 0.0006 ± 0.0007 | 0.0002 ± 0.0007 | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0003 ± 0.0003 |
| Bromine | 0.0005 ± 0.0004 | 0.0008 ± 0.0007 | 0.0016 ± 0.0006 | 0.0003 ± 0.0003 | 0.0003 ± 0.0003 | 0.0004 ± 0.0003 |
| Rubidium | 0.0002 ± 0.0005 | 0.0006 ± 0.0009 | 0.0003 ± 0.0008 | 0.0003 ± 0.0004 | 0.0001 ± 0.0004 | 0.0002 ± 0.0004 |
| Strontium | 0.0003 ± 0.0005 | 0.0010 ± 0.0009 | 0.0000 ± 0.0009 | 0.0000 ± 0.0004 | 0.0002 ± 0.0004 | 0.0002 ± 0.0004 |
| Yttrium | 0.0001 ± 0.0007 | 0.0010 ± 0.0011 | 0.0001 ± 0.0012 | 0.0000 ± 0.0005 | 0.0001 ± 0.0005 | 0.0004 ± 0.0005 |
| Zirconium | 0.0003 ± 0.0008 | 0.0014 ± 0.0013 | 0.0003 ± 0.0013 | 0.0003 ± 0.0006 | 0.0004 ± 0.0006 | 0.0005 ± 0.0006 |
| Molybdenum | 0.0022 ± 0.0011 | 0.0024 ± 0.0019 | 0.0007 ± 0.0019 | 0.0003 ± 0.0009 | 0.0013 ± 0.0009 | 0.0009 ± 0.0008 |
| Palladium | 0.0004 ± 0.0015 | 0.0000 ± 0.0026 | 0.0004 ± 0.0026 | 0.0002 ± 0.0012 | 0.0003 ± 0.0012 | 0.0003 ± 0.0012 |
| Silver | 0.0012 ± 0.0020 | 0.0006 ± 0.0034 | 0.0002 ± 0.0034 | 0.0005 ± 0.0015 | 0.0009 ± 0.0016 | 0.0009 ± 0.0015 |
| Cadmium | 0.0014 ± 0.0019 | 0.0000 ± 0.0032 | 0.0004 ± 0.0032 | 0.0010 ± 0.0015 | 0.0014 ± 0.0015 | 0.0008 ± 0.0015 |
| Indium | 0.0014 ± 0.0023 | 0.0005 ± 0.0039 | 0.0000 ± 0.0039 | 0.0007 ± 0.0018 | 0.0013 ± 0.0018 | 0.0004 ± 0.0018 |
| Tin | 0.0034 ± 0.0036 | 0.0000 ± 0.0060 | 0.0027 ± 0.0062 | 0.0011 ± 0.0027 | 0.0020 ± 0.0028 | 0.0011 ± 0.0027 |
| Antimony | 0.0021 ± 0.0039 | 0.0020 ± 0.0068 | 0.0015 ± 0.0067 | 0.0028 ± 0.0030 | 0.0012 ± 0.0030 | 0.0015 ± 0.0030 |
| Barium | 0.0160 ± 0.0178 | 0.0000 ± 0.0311 | 0.0187 ± 0.0319 | 0.0032 ± 0.0143 | 0.0068 ± 0.0145 | 0.0092 ± 0.0140 |
| Lanthanum | 0.0178 ± 0.0244 | 0.0102 ± 0.0416 | 0.0167 ± 0.0411 | 0.0168 ± 0.0189 | 0.0099 ± 0.0189 | 0.0190 ± 0.0184 |
| Gold | 0.0008 ± 0.0017 | 0.0003 ± 0.0029 | 0.0011 ± 0.0022 | 0.0014 ± 0.0010 | 0.0013 ± 0.0011 | 0.0014 ± 0.0011 |
| Mercury | 0.0004 ± 0.0008 | 0.0008 ± 0.0015 | 0.0002 ± 0.0013 | 0.0000 ± 0.0006 | 0.0001 ± 0.0006 | 0.0004 ± 0.0006 |
| Thallium | 0.0002 ± 0.0007 | 0.0014 ± 0.0013 | 0.0002 ± 0.0012 | 0.0001 ± 0.0006 | 0.0005 ± 0.0006 | 0.0000 ± 0.0005 |
| Lead | 0.0019 ± 0.0014 | 0.0056 ± 0.0023 | 0.0016 ± 0.0021 | 0.0005 ± 0.0011 | 0.0017 ± 0.0010 | 0.0050 ± 0.0012 |
| Uranium | 0.0002 ± 0.0012 | 0.0015 ± 0.0023 | 0.0000 ± 0.0020 | 0.0002 ± 0.0009 | 0.0004 ± 0.0009 | 0.0003 ± 0.0009 |
| Anions by IC (mg/mi) | | | | | | |
| Nitrate Ion | 0.02 ± 0.01 | 0.01 ± 0.03 | 0.02 ± 0.03 | 0.02 ± 0.01 | 0.01 ± 0.01 | 0.03 ± 0.01 |
| Sulfate Ion | 0.89 ± 0.06 | 0.32 ± 0.05 | 1.43 ± 0.10 | 0.15 ± 0.01 | 0.15 ± 0.01 | 0.21 ± 0.02 |
| Polycyclic aromatic hydrocarbons (ug/mile) | | | | | | |
| Naphthalene | 1723.13 ± 142.99 | 1159.06 ± 148.11 | 2596.81 ± 240.85 | 590.90 ± 52.89 | 703.59 ± 61.29 | 119.55 ± 24.43 |
| 2-methylnaphthalene | 8275.21 ± 656.79 | 799.94 ± 65.47 | 1970.31 ± 157.99 | 1639.57 ± 130.37 | 2456.06 ± 195.10 | 690.36 ± 55.11 |
| 1-methylnaphthalene | 4998.45 ± 346.88 | 361.27 ± 26.05 | 842.37 ± 59.25 | 807.45 ± 56.16 | 1243.07 ± 86.36 | 346.03 ± 24.17 |
| Biphenyl | 211.58 ± 13.62 | 19.59 ± 4.64 | 47.21 ± 5.56 | 27.45 ± 2.03 | 60.45 ± 4.02 | 15.19 ± 1.37 |
| 1+2ethylnaphthalene | 813.98 ± 69.18 | 41.06 ± 31.98 | 169.23 ± 36.11 | 149.54 ± 14.37 | 179.99 ± 16.75 | 52.75 ± 8.03 |
| 2,6+2,7-dimethylnaphthalene | 1987.70 ± 161.21 | 93.56 ± 8.12 | 105.94 ± 9.11 | 175.73 ± 14.39 | 273.93 ± 22.33 | 73.23 ± 6.10 |
| 1,3+1,6+1,7dimethylnaphth | 3307.09 ± 270.58 | 139.03 ± 12.12 | 148.68 ± 12.90 | 286.93 ± 23.69 | 429.62 ± 35.33 | 114.09 ± 9.57 |
| 1,4+1,5+2,3-dimethylnaphth | 32.96 ± 4.27 | 39.33 ± 4.96 | 12.68 ± 2.16 | 2.31 ± 0.60 | 3.38 ± 0.70 | 9.14 ± 1.34 |
| 1,2-dimethylnaphthalene | 709.87 ± 77.35 | 19.56 ± 2.36 | 18.28 ± 2.24 | 26.63 ± 3.04 | 60.39 ± 6.71 | 11.37 ± 1.39 |
| 2-Methylbiphenyl | 0.00 ± 133.97 | 0.00 ± 395.06 | 0.00 ± 401.62 | 71.41 ± 78.87 | 30.85 ± 80.62 | 79.58 ± 80.42 |
| 3-Methylbiphenyl | 146.55 ± 39.98 | 0.00 ± 112.66 | 0.00 ± 114.56 | 47.64 ± 22.69 | 51.33 ± 23.35 | 50.95 ± 23.14 |
| 4-Methylbiphenyl | 51.47 ± 12.05 | 0.00 ± 34.81 | 0.00 ± 35.38 | 12.99 ± 6.92 | 16.34 ± 7.12 | 18.97 ± 7.07 |
| Dibenzofuran | 48.21 ± 3.52 | 9.81 ± 0.83 | 15.52 ± 1.22 | 8.22 ± 0.62 | 15.24 ± 1.13 | 3.60 ± 0.29 |
| A-trimethylnaphthalene | 386.79 ± 20.83 | 24.43 ± 1.69 | 20.10 ± 1.51 | 22.78 ± 1.27 | 50.94 ± 2.77 | 12.49 ± 0.73 |
| 1-ethyl-2-methylnaphthalene | 73.67 ± 3.62 | 4.76 ± 1.06 | 5.02 ± 1.08 | 6.36 ± 0.40 | 11.68 ± 0.63 | 2.89 ± 0.27 |
| B-trimethylnaphthalene | 246.40 ± 22.90 | 15.98 ± 1.94 | 8.58 ± 1.41 | 15.15 ± 1.47 | 31.09 ± 2.93 | 7.70 ± 0.79 |
| C-trimethylnaphthalene | 184.71 ± 15.29 | 12.75 ± 1.50 | 8.34 ± 1.25 | 10.24 ± 0.90 | 30.67 ± 2.57 | 5.87 ± 0.56 |
| 2-ethyl-1-methylnaphthalene | 10.10 ± 1.28 | 0.26 ± 0.50 | 0.00 ± 0.50 | 0.60 ± 0.14 | 1.84 ± 0.28 | 0.45 ± 0.14 |
| E-trimethylnaphthalene | 100.38 ± 8.14 | 6.49 ± 1.09 | 3.65 ± 0.99 | 6.44 ± 0.58 | 12.70 ± 1.07 | 2.99 ± 0.33 |
| F-trimethylnaphthalene | 68.86 ± 5.44 | 7.34 ± 0.81 | 4.09 ± 0.63 | 3.26 ± 0.30 | 9.56 ± 0.78 | 2.91 ± 0.28 |
| 2,3,5+I-trimethylnaphthalene | 59.01 ± 8.74 | 6.60 ± 1.55 | 5.12 ± 1.41 | 6.37 ± 1.01 | 13.90 ± 2.10 | 2.87 ± 0.52 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S7-2 | S7-3 | S7-4 | S8-1 | S8-2 | S8-3 |
|---|---|---|---|---|---|---|
| 2,4,5-trimethylnaphthalene | 33.03 ± 2.91 | 2.21 ± 0.57 | 0.46 ± 0.53 | 1.58 ± 0.19 | 3.52 ± 0.35 | 0.72 ± 0.14 |
| J-trimethylnaphthalene | 3.61 ± 0.60 | 1.70 ± 0.69 | 1.95 ± 0.72 | 0.17 ± 0.14 | 0.45 ± 0.16 | 1.19 ± 0.24 |
| 1,4,5-trimethylnaphthalene | 21.68 ± 1.28 | 1.74 ± 0.26 | 1.16 ± 0.25 | 1.41 ± 0.11 | 3.28 ± 0.22 | 0.08 ± 0.06 |
| Acenaphthylene | 88.99 ± 6.69 | 58.84 ± 4.42 | 54.59 ± 4.12 | 11.26 ± 0.97 | 40.54 ± 3.08 | 9.09 ± 0.81 |
| Acenaphthene | 77.90 ± 5.82 | 6.49 ± 1.58 | 3.59 ± 1.52 | 7.02 ± 0.67 | 11.96 ± 1.01 | 2.30 ± 0.39 |
| Fluorene | 93.04 ± 10.72 | 25.14 ± 3.54 | 4.18 ± 1.87 | 3.29 ± 0.56 | 9.02 ± 1.14 | 3.41 ± 0.57 |
| Dibenzothiophene | 5.03 ± 0.55 | 0.82 ± 0.33 | 1.18 ± 0.35 | 1.44 ± 0.18 | 2.27 ± 0.26 | 0.44 ± 0.09 |
| Phenanthrene | 160.88 ± 5.75 | 69.16 ± 3.11 | 57.44 ± 2.80 | 22.06 ± 0.88 | 63.86 ± 2.31 | 13.90 ± 0.63 |
| Anthracene | 5.46 ± 0.59 | 17.63 ± 1.83 | 3.21 ± 0.46 | 0.21 ± 0.07 | 1.28 ± 0.15 | 1.80 ± 0.20 |
| A-methylfluorene | 77.27 ± 5.86 | 6.21 ± 0.84 | 5.31 ± 0.81 | 3.44 ± 0.32 | 11.37 ± 0.90 | 2.58 ± 0.26 |
| 1-methylfluorene | 39.79 ± 5.14 | 6.02 ± 1.00 | 6.47 ± 1.06 | 3.44 ± 0.49 | 9.43 ± 1.25 | 2.08 ± 0.32 |
| B-methylfluorene | 3.77 ± 0.71 | 1.42 ± 0.39 | 1.39 ± 0.38 | 0.65 ± 0.15 | 2.26 ± 0.42 | 0.61 ± 0.14 |
| 9-fluorenone | 5.94 ± 0.63 | 0.00 ± 0.31 | 0.48 ± 0.33 | 1.96 ± 0.23 | 0.89 ± 0.13 | 0.48 ± 0.09 |
| Xanthone | 0.71 ± 0.37 | 0.00 ± 0.49 | 0.57 ± 0.67 | 0.08 ± 0.13 | 0.25 ± 0.17 | 0.19 ± 0.15 |
| Acenaphthenequinone | 2.94 ± 0.81 | 0.87 ± 0.43 | 0.26 ± 0.32 | 0.96 ± 0.28 | 0.81 ± 0.25 | 0.25 ± 0.12 |
| Perinaphthenone | 0.29 ± 0.29 | 0.50 ± 0.81 | 0.77 ± 0.85 | 0.18 ± 0.17 | 0.56 ± 0.23 | 1.70 ± 0.44 |
| 2-methylanthracene | 96.58 ± 17.81 | 3.06 ± 0.64 | 3.23 ± 0.67 | 1.96 ± 0.39 | 13.97 ± 2.60 | 1.18 ± 0.25 |
| 3-methylphenanthrene | 43.79 ± 2.65 | 7.39 ± 0.57 | 5.89 ± 0.50 | 2.70 ± 0.20 | 11.03 ± 0.69 | 3.02 ± 0.21 |
| 2-methylphenanthrene | 46.72 ± 3.84 | 9.29 ± 0.95 | 7.75 ± 0.84 | 3.11 ± 0.30 | 12.58 ± 1.05 | 3.49 ± 0.33 |
| 9-methylphenanthrene | 26.56 ± 4.42 | 4.41 ± 0.86 | 2.60 ± 0.59 | 1.42 ± 0.27 | 5.09 ± 0.87 | 1.50 ± 0.28 |
| 1-methylphenanthrene | 20.18 ± 3.17 | 3.98 ± 0.79 | 2.86 ± 0.63 | 1.43 ± 0.26 | 5.45 ± 0.88 | 1.58 ± 0.28 |
| Anthrone | 1.18 ± 0.41 | 0.00 ± 0.20 | 0.47 ± 0.27 | 0.23 ± 0.11 | 0.10 ± 0.07 | 0.08 ± 0.06 |
| Anthraquinone | 0.17 ± 0.14 | 0.00 ± 0.29 | 0.00 ± 0.29 | 0.16 ± 0.09 | 0.15 ± 0.09 | 0.60 ± 0.18 |
| 3,6-dimethylphenanthrene | 7.07 ± 1.23 | 0.00 ± 2.52 | 6.60 ± 2.75 | 0.90 ± 0.53 | 2.22 ± 0.60 | 0.30 ± 0.52 |
| A-dimethylphenanthrene | 9.90 ± 2.07 | 1.69 ± 0.42 | 1.07 ± 0.30 | 0.36 ± 0.11 | 2.40 ± 0.52 | 0.98 ± 0.22 |
| B-dimethylphenanthrene | 4.56 ± 0.33 | 0.94 ± 0.15 | 0.71 ± 0.14 | 0.28 ± 0.05 | 1.22 ± 0.10 | 0.51 ± 0.06 |
| C-dimethylphenanthrene | 16.39 ± 1.40 | 2.70 ± 0.31 | 1.56 ± 0.24 | 0.94 ± 0.11 | 3.35 ± 0.30 | 1.56 ± 0.15 |
| D-dimethylphenanthrene | 3.66 ± 0.56 | 0.75 ± 0.18 | 0.50 ± 0.16 | 0.24 ± 0.06 | 0.93 ± 0.16 | 0.46 ± 0.09 |
| 1,7-dimethylphenanthrene | 10.14 ± 1.02 | 1.99 ± 0.24 | 1.08 ± 0.18 | 0.48 ± 0.07 | 1.99 ± 0.22 | 0.90 ± 0.11 |
| E-dimethylphenanthrene | 5.22 ± 1.05 | 1.13 ± 0.27 | 0.62 ± 0.19 | 0.30 ± 0.08 | 1.28 ± 0.27 | 0.56 ± 0.13 |
| 9-methylanthracene | 10.09 ± 2.40 | 0.00 ± 0.44 | 0.02 ± 0.45 | 0.76 ± 0.22 | 1.09 ± 0.30 | 0.10 ± 0.11 |
| Fluoranthene | 24.94 ± 1.48 | 30.32 ± 2.17 | 15.56 ± 1.65 | 2.16 ± 0.32 | 10.95 ± 0.69 | 6.37 ± 0.47 |
| Pyrene | 29.58 ± 3.25 | 43.68 ± 5.17 | 13.04 ± 2.54 | 1.73 ± 0.46 | 12.18 ± 1.39 | 10.68 ± 1.23 |
| 9-Anthraaldehyde | 0.96 ± 0.25 | 0.00 ± 0.13 | 13.59 ± 2.88 | 0.00 ± 0.04 | 0.13 ± 0.07 | 0.16 ± 0.07 |
| Retene | 0.01 ± 0.10 | 0.01 ± 0.18 | 0.02 ± 0.18 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.01 ± 0.06 |
| Benzonaphthothiophene | 0.18 ± 0.15 | 0.09 ± 0.26 | 0.19 ± 0.27 | 0.01 ± 0.09 | 0.09 ± 0.09 | 0.09 ± 0.09 |
| 1+3-methylfluoranthene | 2.51 ± 0.79 | 0.38 ± 0.20 | 0.72 ± 0.28 | 0.05 ± 0.05 | 0.49 ± 0.17 | 0.91 ± 0.28 |
| 1-MeFl+C-MeFl/Py | 3.30 ± 0.39 | 0.89 ± 0.17 | 0.76 ± 0.16 | 0.03 ± 0.04 | 0.95 ± 0.12 | 1.02 ± 0.13 |
| B-MePy/MeFl | 3.92 ± 0.73 | 1.62 ± 0.43 | 0.62 ± 0.33 | 0.12 ± 0.08 | 0.98 ± 0.21 | 1.61 ± 0.30 |
| C-MePy/MeFl | 3.23 ± 0.35 | 0.96 ± 0.18 | 0.48 ± 0.16 | 0.10 ± 0.05 | 0.82 ± 0.11 | 1.51 ± 0.17 |
| D-MePy/MeFl | 2.44 ± 0.15 | 0.91 ± 0.18 | 0.19 ± 0.17 | 0.13 ± 0.05 | 0.87 ± 0.07 | 0.94 ± 0.07 |
| 4-methylpyrene | 2.17 ± 0.42 | 0.69 ± 0.24 | 0.52 ± 0.22 | 0.08 ± 0.06 | 0.66 ± 0.14 | 0.93 ± 0.19 |
| 1-methylpyrene | 1.18 ± 0.58 | 0.20 ± 0.46 | 0.86 ± 0.66 | 0.00 ± 0.08 | 0.81 ± 0.40 | 0.83 ± 0.40 |
| Benzo(c)phenanthrene | 0.97 ± 0.16 | 0.26 ± 0.15 | 0.56 ± 0.16 | 0.08 ± 0.05 | 0.42 ± 0.08 | 0.55 ± 0.10 |
| Benzo(ghi)fluoranthene | 9.61 ± 1.80 | 22.65 ± 4.62 | 5.48 ± 3.15 | 0.55 ± 0.59 | 4.25 ± 0.90 | 9.27 ± 1.51 |
| Cyclopenta(c,d)pyrene | 4.12 ± 0.89 | 11.62 ± 2.51 | 0.89 ± 0.42 | 0.00 ± 0.07 | 0.62 ± 0.17 | 0.32 ± 0.11 |
| Benz(a)anthracene | 3.89 ± 0.70 | 2.52 ± 0.64 | 1.82 ± 0.56 | 0.11 ± 0.14 | 1.17 ± 0.27 | 1.32 ± 0.27 |
| Triphenylene | 3.59 ± 0.57 | 0.80 ± 0.21 | 0.82 ± 0.21 | 0.10 ± 0.05 | 1.08 ± 0.19 | 0.74 ± 0.13 |
| Chrysene | 3.20 ± 0.42 | 1.97 ± 0.38 | 1.27 ± 0.31 | 0.11 ± 0.07 | 1.09 ± 0.16 | 1.08 ± 0.16 |
| Benzanthrone | 5.57 ± 0.57 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.21 ± 0.05 | 1.10 ± 0.13 | 1.70 ± 0.19 |
| 7-methylbenz(a)anthracene | 0.14 ± 0.10 | 0.00 ± 0.16 | 0.01 ± 0.17 | 0.00 ± 0.05 | 0.34 ± 0.14 | 0.01 ± 0.05 |
| 3-methylchrysene | 1.17 ± 0.19 | 0.44 ± 0.15 | 0.30 ± 0.14 | 0.02 ± 0.04 | 0.21 ± 0.05 | 0.18 ± 0.05 |
| Benz(a)anthracene-7,12-dione | 3.53 ± 0.23 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.11 ± 0.04 | 0.50 ± 0.06 | 0.53 ± 0.06 |
| 5+6-methylchrysene | 0.35 ± 0.21 | 0.00 ± 0.14 | 0.12 ± 0.19 | 0.00 ± 0.04 | 0.02 ± 0.05 | 0.01 ± 0.05 |
| Benzo(b+j+k)fluoranthene | 7.43 ± 1.44 | 3.82 ± 3.11 | 7.96 ± 3.33 | 0.16 ± 0.60 | 2.07 ± 0.69 | 0.77 ± 0.63 |
| Benzo(a)fluoranthene | 0.53 ± 0.19 | 0.52 ± 0.22 | 0.10 ± 0.15 | 0.01 ± 0.04 | 0.07 ± 0.05 | 0.12 ± 0.06 |
| BeP | 3.25 ± 0.42 | 4.18 ± 0.60 | 1.86 ± 0.38 | 0.08 ± 0.06 | 0.70 ± 0.12 | 0.78 ± 0.12 |
| BaP | 4.18 ± 0.89 | 3.18 ± 0.80 | 2.03 ± 0.63 | 0.01 ± 0.14 | 0.37 ± 0.17 | 0.28 ± 0.16 |
| Perylene | 0.93 ± 0.42 | 0.45 ± 0.28 | 0.35 ± 0.26 | 0.03 ± 0.05 | 0.07 ± 0.07 | 0.03 ± 0.05 |
| 7-methylbenzo(a)pyrene | 0.00 ± 0.91 | 0.00 ± 2.68 | 10.81 ± 3.72 | 0.49 ± 0.56 | 0.00 ± 0.54 | 1.10 ± 0.63 |
| 9,10-dihydrobenzo(a)pyrene-7(8H)-one | 0.04 ± 0.08 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.04 ± 0.05 | 0.02 ± 0.05 | 0.01 ± 0.05 |
| Dibenzo(a,j)anthracene | 0.71 ± 0.11 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.04 | 0.14 ± 0.05 | 0.10 ± 0.05 |
| Indeno[123-cd]pyrene | 3.15 ± 0.63 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.22 ± 0.08 | 0.44 ± 0.11 | 0.37 ± 0.10 |
| Dibenzo(ah+ac)anthracene | 0.51 ± 0.18 | 0.48 ± 0.24 | 0.00 ± 0.13 | 0.04 ± 0.05 | 0.01 ± 0.04 | 0.00 ± 0.05 |
| Benzo(b)chrysene | 0.29 ± 0.07 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.08 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 |
| Picene | 0.27 ± 0.16 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.01 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 |
| Benzo(ghi)perylene | 7.33 ± 1.08 | 9.79 ± 1.66 | 5.65 ± 1.30 | 0.07 ± 0.23 | 1.54 ± 0.33 | 1.43 ± 0.32 |
| Anthanthrene | 1.00 ± 0.24 | 0.80 ± 0.22 | 0.28 ± 0.16 | 0.00 ± 0.04 | 0.08 ± 0.05 | 0.05 ± 0.05 |
| Dibenzo(b,k)fluoranthene | 0.53 ± 0.35 | 0.00 ± 0.37 | 0.00 ± 0.26 | 0.00 ± 0.08 | 0.40 ± 0.23 | 0.00 ± 0.06 |
| Dibenzo(a,e)pyrene | 0.43 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.04 | 0.01 ± 0.04 | 0.03 ± 0.04 |
| Coronene | 2.60 ± 0.47 | 2.18 ± 0.44 | 1.89 ± 0.40 | 0.05 ± 0.05 | 0.24 ± 0.07 | 0.47 ± 0.11 |
| Dibenzo(a,h)pyrene | 0.02 ± 0.07 | 0.02 ± 0.13 | 0.00 ± 0.13 | 0.01 ± 0.04 | 0.03 ± 0.04 | 0.00 ± 0.04 |
| nitro-PAH (ug/mile) | | | | | | |
| 1-nitronaphthalene | 0.0000 ± 0.0043 | 0.0033 ± 0.0170 | 0.1199 ± 0.0190 | 0.0000 ± 0.0025 | 0.0000 ± 0.0026 | 0.0000 ± 0.0025 |
| 2-nitronaphthalene | 0.0095 ± 0.0075 | 0.0189 ± 0.0220 | 0.0718 ± 0.0238 | 0.0028 ± 0.0044 | 0.0065 ± 0.0045 | 0.0001 ± 0.0044 |
| 2-nitrobiphenyl | 0.0009 ± 0.0020 | 0.0000 ± 0.0077 | 0.0000 ± 0.0078 | 0.0000 ± 0.0012 | 0.0000 ± 0.0012 | 0.0000 ± 0.0012 |
| 3-nitrobiphenyl | 0.0000 ± 0.0020 | 0.0125 ± 0.0105 | 0.0000 ± 0.0075 | 0.0000 ± 0.0012 | 0.0000 ± 0.0012 | 0.0000 ± 0.0012 |
| 4-nitrobiphenyl | 0.0000 ± 0.0057 | 0.0912 ± 0.0258 | 0.0000 ± 0.0255 | 0.0000 ± 0.0033 | 0.0000 ± 0.0034 | 0.0000 ± 0.0034 |
| 2-nitrofluorene | 0.0285 ± 0.0032 | 0.0000 ± 0.0147 | 0.0000 ± 0.0149 | 0.0003 ± 0.0016 | 0.0000 ± 0.0017 | 0.0000 ± 0.0017 |
| 1,3-dinitronaphthalene | 0.0000 ± 0.1334 | 0.0000 ± 0.3821 | 0.0000 ± 0.3882 | 0.0000 ± 0.0777 | 0.0000 ± 0.0799 | 0.0000 ± 0.0792 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S7-2 | S7-3 | S7-4 | S8-1 | S8-2 | S8-3 |
|---|---|---|---|---|---|---|
| 1,5-dinitronaphthalene | 0.0000 ± 0.0054 | 0.0000 ± 0.0282 | 0.0324 ± 0.0312 | 0.0000 ± 0.0031 | 0.0000 ± 0.0032 | 0.0000 ± 0.0032 |
| 5-nitroacenaphthene | 0.0003 ± 0.0021 | 0.0000 ± 0.0088 | 0.0005 ± 0.0093 | 0.0000 ± 0.0012 | 0.0000 ± 0.0012 | 0.0000 ± 0.0012 |
| 9-nitroanthracene | 0.0044 ± 0.0030 | 0.0000 ± 0.0170 | 0.0000 ± 0.0173 | 0.0000 ± 0.0017 | 0.0000 ± 0.0018 | 0.0000 ± 0.0018 |
| 4-nitrophenanthrene | 0.0000 ± 0.0038 | 1.0440 ± 0.0594 | 0.0000 ± 0.0213 | 0.0000 ± 0.0022 | 0.0000 ± 0.0023 | 0.0000 ± 0.0022 |
| 9-nitrophenanthrene | 0.0000 ± 0.0115 | 0.0000 ± 0.0588 | 0.0000 ± 0.0598 | 0.0000 ± 0.0067 | 0.0000 ± 0.0069 | 0.0000 ± 0.0069 |
| 1,8-dinitronaphthalene | 0.0026 ± 0.0036 | 0.0000 ± 0.0144 | 0.0217 ± 0.0171 | 0.0000 ± 0.0020 | 0.0000 ± 0.0021 | 0.0000 ± 0.0021 |
| 2-nitrofluoranthene | 0.0274 ± 0.0228 | 0.0000 ± 0.0663 | 0.0809 ± 0.0760 | 0.0000 ± 0.0121 | 0.0000 ± 0.0124 | 0.0000 ± 0.0123 |
| 3-nitrofluoranthene | 0.0029 ± 0.0090 | 0.0000 ± 0.0320 | 0.1531 ± 0.0443 | 0.0000 ± 0.0052 | 0.0000 ± 0.0054 | 0.0000 ± 0.0053 |
| 1-nitropyrene | 0.0253 ± 0.0083 | 0.0000 ± 0.0205 | 0.5372 ± 0.1321 | 0.0000 ± 0.0032 | 0.0007 ± 0.0033 | 0.0007 ± 0.0033 |
| 7-nitrobenzo(a)anthracene | 0.0056 ± 0.0009 | 0.0000 ± 0.0030 | 0.0000 ± 0.0030 | 0.0000 ± 0.0005 | 0.0002 ± 0.0005 | 0.0000 ± 0.0005 |
| 6-nitrochrysene | 0.0045 ± 0.0015 | 0.0000 ± 0.0057 | 0.0000 ± 0.0058 | 0.0000 ± 0.0009 | 0.0001 ± 0.0009 | 0.0000 ± 0.0009 |
| 6-nitrobenz[a]pyrene | 0.0000 ± 0.0072 | 0.0000 ± 0.0231 | 0.0000 ± 0.0235 | 0.0000 ± 0.0042 | 0.0000 ± 0.0043 | 0.0000 ± 0.0043 |
| Hopanes (ug/mile) | | | | | | |
| 18a(H),21ß(H)-22,29,30-Trisnorhopane & | 2.66 ± 0.25 | 2.12 ± 0.40 | 1.21 ± 0.33 | 0.23 ± 0.08 | 0.65 ± 0.09 | 1.05 ± 0.11 |
| 17a(H),21ß(H)-22,29,30-Trisnorhopane | 0.43 ± 0.13 | 0.00 ± 0.13 | 0.07 ± 0.13 | 0.02 ± 0.04 | 0.04 ± 0.05 | 0.03 ± 0.04 |
| 17a(H),21ß(H)-30-Norhopane | 6.20 ± 0.92 | 1.19 ± 0.34 | 1.58 ± 0.38 | 0.26 ± 0.08 | 0.98 ± 0.17 | 0.84 ± 0.15 |
| 17a(H),21ß(H)-Hopane | 4.89 ± 0.61 | 1.07 ± 0.32 | 0.31 ± 0.28 | 0.11 ± 0.07 | 0.59 ± 0.10 | 0.50 ± 0.10 |
| 17ß(H),21a(H)-hopane | 0.33 ± 0.08 | 0.19 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.04 | 0.01 ± 0.04 | 0.02 ± 0.04 |
| 22S-17a(H),21ß(H)-30-Homohopane | 2.82 ± 0.22 | 0.57 ± 0.18 | 0.19 ± 0.18 | 0.06 ± 0.05 | 0.33 ± 0.06 | 0.30 ± 0.06 |
| 22R-17a(H),21ß(H)-30-Homohopane | 2.40 ± 0.21 | 0.00 ± 0.15 | 0.26 ± 0.15 | 0.04 ± 0.05 | 0.21 ± 0.05 | 0.22 ± 0.05 |
| 17ß(H),21ß(H)-Hopane | 0.62 ± 0.13 | 4.36 ± 0.58 | 3.61 ± 0.49 | 0.00 ± 0.04 | 0.01 ± 0.04 | 0.00 ± 0.04 |
| 22S-17a(H),21ß(H)-30,31-Bishomohopan | 1.60 ± 0.24 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.02 ± 0.04 | 0.17 ± 0.05 | 0.16 ± 0.05 |
| 22R-17a(H),21ß(H)-30,31-Bishomohopan | 1.25 ± 0.19 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.03 ± 0.04 | 0.13 ± 0.05 | 0.11 ± 0.05 |
| 22S-17a(H),21ß(H)-30,31,32-Trisomohop | 1.15 ± 0.19 | 0.28 ± 0.16 | 0.19 ± 0.16 | 0.04 ± 0.05 | 0.14 ± 0.05 | 0.11 ± 0.05 |
| 22R-17a(H),21ß(H)-30,31,32-Trishomoho | 0.72 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.04 ± 0.04 | 0.10 ± 0.05 | 0.13 ± 0.05 |
| Steranes (ug/mile) | | | | | | |
| C27-20S5a(H),14a(H)-cholestane | 0.42 ± 0.11 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.02 ± 0.04 | 0.03 ± 0.04 | 0.06 ± 0.05 |
| C27-20R5a(H),14ß(H)-cholestane | 0.88 ± 0.17 | 0.08 ± 0.13 | 0.07 ± 0.13 | 0.06 ± 0.04 | 0.16 ± 0.05 | 0.15 ± 0.05 |
| C27-20S5a(H),14ß(H),17ß(H)-cholestane | 0.52 ± 0.08 | 0.01 ± 0.13 | 0.02 ± 0.13 | 0.04 ± 0.04 | 0.08 ± 0.04 | 0.09 ± 0.04 |
| ster45+40(cholestane) | 1.20 ± 0.19 | 0.03 ± 0.21 | 0.00 ± 0.21 | 0.07 ± 0.06 | 0.19 ± 0.06 | 0.18 ± 0.06 |
| C28-20S5a(H),14a(H),17a(H)-ergostane | 0.12 ± 0.07 | 0.09 ± 0.13 | 0.00 ± 0.13 | 0.01 ± 0.04 | 0.02 ± 0.04 | 0.01 ± 0.04 |
| C28-20R5a(H),14ß(H),17ß(H)-ergostane | 0.21 ± 0.08 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.04 | 0.03 ± 0.04 | 0.05 ± 0.04 |
| C28-20S5a(H),14ß(H),17ß(H)-ergostane | 0.40 ± 0.10 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.01 ± 0.04 | 0.03 ± 0.04 | 0.05 ± 0.04 |
| C28-20R5a(H),14a(H),17a(H)-ergostane | 0.30 ± 0.08 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.01 ± 0.04 | 0.02 ± 0.04 | 0.03 ± 0.04 |
| C29-20S5a(H),14a(H),17a(H)-stigmastan | 0.50 ± 0.10 | 0.01 ± 0.13 | 0.05 ± 0.13 | 0.03 ± 0.04 | 0.06 ± 0.04 | 0.08 ± 0.04 |
| C29-20R5a(H),14ß(H),17ß(H)-stigmastan | 0.96 ± 0.28 | 0.02 ± 0.13 | 0.07 ± 0.13 | 0.05 ± 0.05 | 0.13 ± 0.06 | 0.09 ± 0.05 |
| C29-20S5a(H),14ß(H),17ß(H)-stigmastan | 0.69 ± 0.14 | 0.04 ± 0.13 | 0.04 ± 0.13 | 0.02 ± 0.04 | 0.08 ± 0.05 | 0.08 ± 0.04 |
| C29-20R5a(H),14a(H),17a(H)-stigmastan | 0.58 ± 0.10 | 0.02 ± 0.13 | 0.01 ± 0.13 | 0.03 ± 0.04 | 0.08 ± 0.04 | 0.07 ± 0.04 |
| Alkanes (ug/mile) | | | | | | |
| Dodecane | 0.00 ± 2.92 | 3.69 ± 9.98 | 0.00 ± 8.54 | 0.00 ± 1.70 | 0.00 ± 1.81 | 0.00 ± 1.68 |
| Tridecane | 0.44 ± 1.26 | 23.24 ± 7.16 | 0.00 ± 3.58 | 0.00 ± 0.71 | 0.00 ± 0.73 | 0.00 ± 0.72 |
| Norfarnesane | 5.36 ± 1.27 | 0.57 ± 1.22 | 0.00 ± 1.17 | 0.02 ± 0.23 | 0.70 ± 0.32 | 0.21 ± 0.26 |
| Heptylcyclohexane | 0.73 ± 0.51 | 0.00 ± 1.13 | 6.82 ± 2.62 | 0.01 ± 0.23 | 0.00 ± 0.23 | 0.33 ± 0.29 |
| Farnesane | 9.54 ± 4.35 | 0.00 ± 3.26 | 8.18 ± 5.47 | 1.62 ± 1.08 | 0.00 ± 0.66 | 1.60 ± 1.09 |
| Tetradecane | 0.00 ± 5.86 | 3.76 ± 17.59 | 53.66 ± 22.71 | 0.00 ± 3.39 | 0.00 ± 3.49 | 0.00 ± 3.43 |
| Octylcyclohexane | 0.00 ± 1.73 | 0.00 ± 5.03 | 14.40 ± 6.04 | 5.57 ± 1.46 | 1.67 ± 1.12 | 0.00 ± 1.01 |
| Pentadecane | 0.00 ± 2.94 | 1.02 ± 8.72 | 0.00 ± 8.78 | 21.30 ± 2.83 | 43.58 ± 4.74 | 0.00 ± 1.74 |
| Nonylcyclohexane | 2.93 ± 2.76 | 0.00 ± 7.30 | 12.03 ± 8.69 | 0.04 ± 1.47 | 0.00 ± 1.49 | 0.00 ± 1.46 |
| Hexadecane | 0.02 ± 3.85 | 0.00 ± 11.34 | 45.33 ± 12.27 | 1.23 ± 2.25 | 0.91 ± 2.31 | 6.84 ± 2.39 |
| Norpristane | 0.85 ± 0.90 | 0.00 ± 2.35 | 2.20 ± 2.63 | 0.90 ± 0.58 | 0.33 ± 0.52 | 4.38 ± 1.24 |
| Heptadecane | 0.11 ± 2.52 | 0.00 ± 7.43 | 21.95 ± 8.40 | 12.91 ± 2.21 | 0.00 ± 1.50 | 4.52 ± 1.68 |
| Decylcyclohexane | 0.90 ± 1.13 | 0.00 ± 3.07 | 9.97 ± 4.43 | 1.47 ± 0.79 | 0.16 ± 0.64 | 0.00 ± 0.63 |
| Heptadecane_Pristane | 0.00 ± 3.16 | 4.90 ± 9.37 | 24.68 ± 9.82 | 9.00 ± 2.02 | 4.84 ± 1.96 | 13.81 ± 2.23 |
| Undecylcyclohexane | 0.43 ± 0.53 | 3.13 ± 1.90 | 2.76 ± 1.85 | 0.17 ± 0.29 | 0.00 ± 0.22 | 0.00 ± 0.25 |
| Octadecane | 38.39 ± 3.17 | 0.00 ± 3.64 | 23.24 ± 4.29 | 11.55 ± 1.18 | 16.29 ± 1.47 | 6.05 ± 0.91 |
| Phytane | 21.42 ± 2.02 | 0.00 ± 1.60 | 6.37 ± 1.81 | 11.02 ± 1.06 | 8.96 ± 0.89 | 3.22 ± 0.47 |
| Dodecylcyclohexane | 1.06 ± 0.39 | 1.01 ± 0.63 | 0.30 ± 0.51 | 0.66 ± 0.24 | 0.16 ± 0.13 | 0.46 ± 0.20 |
| Nonadecane | 24.13 ± 2.73 | 0.00 ± 1.44 | 3.67 ± 1.66 | 6.39 ± 0.82 | 8.44 ± 1.02 | 4.79 ± 0.66 |
| Tridecylcyclohexane | 0.75 ± 0.49 | 1.51 ± 1.34 | 0.00 ± 1.17 | 0.09 ± 0.25 | 0.00 ± 0.24 | 1.96 ± 0.59 |
| Eicosane | 15.16 ± 1.21 | 0.00 ± 2.24 | 3.69 ± 2.32 | 0.04 ± 0.45 | 6.27 ± 0.61 | 4.20 ± 0.54 |
| Tetradecylcyclohexane | 1.82 ± 0.43 | 0.78 ± 0.25 | 0.46 ± 0.19 | 1.67 ± 0.38 | 0.18 ± 0.07 | 0.31 ± 0.10 |
| Heneicosane | 14.46 ± 1.25 | 0.00 ± 2.39 | 0.00 ± 2.44 | 4.06 ± 0.56 | 4.43 ± 0.58 | 4.38 ± 0.58 |
| Pentadecylcyclohexane | 0.38 ± 2.32 | 0.00 ± 6.81 | 0.00 ± 6.92 | 0.00 ± 1.34 | 0.00 ± 1.38 | 0.00 ± 1.37 |
| Docosane | 8.76 ± 3.72 | 0.00 ± 10.39 | 0.00 ± 10.56 | 2.47 ± 2.10 | 3.18 ± 2.17 | 3.51 ± 2.16 |
| Hexadecylcyclohexane | 3.70 ± 0.61 | 1.24 ± 0.40 | 0.00 ± 0.31 | 0.04 ± 0.07 | 0.69 ± 0.15 | 0.00 ± 0.07 |
| Tricosane | 6.75 ± 4.71 | 0.00 ± 13.72 | 0.00 ± 13.94 | 0.69 ± 2.72 | 1.85 ± 2.80 | 2.33 ± 2.78 |
| Heptadecylcyclohexane | 2.42 ± 2.21 | 0.00 ± 5.79 | 0.00 ± 5.90 | 0.00 ± 1.16 | 0.91 ± 1.27 | 0.00 ± 1.19 |
| Octadecylcyclohexane | 1.14 ± 1.87 | 0.00 ± 5.19 | 0.00 ± 5.29 | 0.00 ± 1.03 | 0.00 ± 1.06 | 0.00 ± 1.04 |
| Tetracosane | 4.34 ± 8.13 | 0.00 ± 23.45 | 0.00 ± 23.84 | 0.65 ± 4.68 | 1.12 ± 4.82 | 0.00 ± 4.75 |
| Pentacosane | 3.51 ± 8.87 | 0.00 ± 25.39 | 0.00 ± 25.81 | 0.92 ± 5.12 | 1.11 ± 5.27 | 0.00 ± 5.13 |
| Nonadecylcyclohexane | 0.42 ± 2.18 | 0.00 ± 6.26 | 0.00 ± 6.37 | 0.01 ± 1.26 | 0.20 ± 1.30 | 0.00 ± 1.27 |
| Hexacosane | 3.21 ± 9.99 | 0.00 ± 28.86 | 0.00 ± 29.32 | 0.16 ± 5.76 | 1.14 ± 5.96 | 0.00 ± 5.81 |
| Eicosylcyclohexane | 0.28 ± 0.11 | 1.05 ± 0.32 | 0.00 ± 0.13 | 0.00 ± 0.04 | 0.09 ± 0.05 | 0.02 ± 0.04 |
| Heptacosane | 2.88 ± 10.00 | 0.00 ± 28.93 | 0.00 ± 29.40 | 0.00 ± 5.76 | 0.40 ± 5.95 | 0.00 ± 5.83 |
| Heneicosylcyclohexane | 0.74 ± 0.30 | 5.32 ± 1.97 | 0.00 ± 0.20 | 0.07 ± 0.06 | 0.01 ± 0.05 | 0.03 ± 0.06 |
| Octacosane | 5.12 ± 9.69 | 0.00 ± 28.17 | 0.00 ± 28.62 | 0.00 ± 5.58 | 2.11 ± 5.78 | 0.00 ± 5.68 |
| Nonacosane | 4.53 ± 6.87 | 0.00 ± 19.25 | 0.00 ± 19.56 | 0.00 ± 3.84 | 1.90 ± 4.06 | 0.00 ± 3.88 |
| Triacontane | 6.58 ± 5.91 | 0.00 ± 16.31 | 0.00 ± 16.54 | 0.00 ± 3.24 | 2.59 ± 3.46 | 0.00 ± 3.28 |
| Hentriacontane | 4.64 ± 3.73 | 0.00 ± 9.39 | 0.00 ± 9.50 | 0.10 ± 1.92 | 2.31 ± 2.18 | 0.00 ± 1.90 |
| Dotriacontane | 5.97 ± 2.74 | 0.00 ± 7.36 | 0.00 ± 7.44 | 0.05 ± 1.46 | 3.75 ± 1.65 | 0.00 ± 1.48 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S7-2 | S7-3 | S7-4 | S8-1 | S8-2 | S8-3 |
|---|---|---|---|---|---|---|
| Tritriacontane | 2.79 ± 1.69 | 0.05 ± 3.02 | 0.00 ± 2.77 | 0.09 ± 0.60 | 1.70 ± 1.02 | 0.00 ± 0.56 |
| Tetratriacontane | 4.08 ± 1.92 | 0.00 ± 3.23 | 0.00 ± 3.17 | 0.00 ± 0.64 | 2.52 ± 1.17 | 0.00 ± 0.64 |
| Pentatriacontane | 2.67 ± 1.14 | 0.83 ± 1.44 | 0.00 ± 1.15 | 0.00 ± 0.25 | 1.18 ± 0.56 | 0.00 ± 0.24 |
| Hexatriacontane | 1.42 ± 0.52 | 0.00 ± 1.35 | 0.00 ± 1.37 | 0.00 ± 0.27 | 2.23 ± 0.40 | 0.00 ± 0.27 |
| Heptatriacontane | 2.76 ± 1.08 | 0.00 ± 0.59 | 0.00 ± 0.52 | 0.02 ± 0.14 | 0.94 ± 0.42 | 0.00 ± 0.12 |
| Octatriacontane | 7.62 ± 4.28 | 4.98 ± 3.64 | 0.00 ± 0.75 | 0.01 ± 0.25 | 1.62 ± 1.05 | 0.00 ± 0.16 |
| Nonatriacontane | 0.77 ± 0.31 | 0.00 ± 0.27 | 0.00 ± 0.28 | 0.00 ± 0.06 | 0.55 ± 0.22 | 0.00 ± 0.07 |
| Polar compounds (ug/mile) | | | | | | |
| heptanoic acid (c7) | 0.00 ± 4.34 | 0.00 ± 8.61 | 8.87 ± 8.93 | 8.19 ± 4.35 | 2.82 ± 4.38 | 6.65 ± 4.40 |
| me-malonic (d-c3) | 0.00 ± 1.26 | 0.00 ± 1.52 | 1.51 ± 1.73 | 3.28 ± 1.45 | 0.00 ± 1.25 | 0.00 ± 1.24 |
| guaiacol | 0.00 ± 0.11 | 0.26 ± 0.17 | 0.00 ± 0.20 | 0.42 ± 0.14 | 0.33 ± 0.13 | 0.60 ± 0.17 |
| benzoic acid | 0.00 ± 1211.41 | 0.00 ± 2400.94 | 0.00 ± 2466.03 | 0.00 ± 1180.86 | 0.00 ± 1211.95 | 6333.88 ± 1431.36 |
| octanoic acid (c8) | 6.07 ± 10.19 | 0.00 ± 15.63 | 8.72 ± 16.64 | 19.96 ± 10.23 | 8.78 ± 10.19 | 11.50 ± 10.16 |
| phenylacetic acid | 0.00 ± 25.26 | 0.00 ± 35.19 | 0.00 ± 33.72 | 0.00 ± 25.88 | 0.32 ± 25.95 | 41.42 ± 35.35 |
| maleic acid | 0.11 ± 1.64 | 0.00 ± 1.66 | 0.00 ± 1.69 | 6.30 ± 1.91 | 24.82 ± 3.47 | 93.23 ± 10.35 |
| succinic acid (d-c4) | 5.35 ± 10.80 | 0.00 ± 19.70 | 0.00 ± 20.01 | 4.30 ± 10.48 | 6.26 ± 10.79 | 13.45 ± 10.86 |
| 4-me-guaiacol | 0.00 ± 0.06 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.55 ± 0.06 | 0.00 ± 0.09 | 0.00 ± 0.27 |
| o-toluic | 101.57 ± 16.06 | 0.00 ± 5.31 | 25.88 ± 7.11 | 6.21 ± 3.83 | 19.14 ± 4.97 | 33.63 ± 6.61 |
| me-succinic acid (d-c4) | 2.70 ± 1.69 | 0.00 ± 2.93 | 0.00 ± 2.98 | 1.85 ± 1.59 | 1.17 ± 1.62 | 3.28 ± 1.65 |
| m-toluic | 130.44 ± 8.46 | 0.00 ± 4.53 | 44.87 ± 5.52 | 11.06 ± 2.42 | 37.69 ± 3.37 | 55.99 ± 4.28 |
| nonanoic acid (c9) | 10.86 ± 10.66 | 0.00 ± 16.59 | 0.00 ± 18.42 | 34.27 ± 14.25 | 15.59 ± 11.26 | 14.18 ± 10.88 |
| p-toluic | 98.11 ± 14.22 | 0.00 ± 4.56 | 36.74 ± 7.76 | 9.42 ± 3.29 | 26.17 ± 4.94 | 49.55 ± 7.80 |
| 2,6-dimethylbenzoic acid | 8.91 ± 2.19 | 0.00 ± 2.61 | 0.00 ± 2.71 | 1.61 ± 1.85 | 4.03 ± 1.95 | 16.49 ± 2.48 |
| 4-ethyl-guaiacol | 1.33 ± 0.35 | 0.00 ± 0.35 | 0.00 ± 0.11 | 0.00 ± 0.05 | 0.00 ± 0.07 | 0.00 ± 0.09 |
| syringol | 0.00 ± 0.08 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.05 | 0.81 ± 0.08 | 1.04 ± 0.10 |
| glutaric acid (d-c5) | 4.98 ± 0.25 | 0.00 ± 0.13 | 0.00 ± 0.13 | 1.21 ± 0.12 | 2.29 ± 0.18 | 2.57 ± 0.19 |
| 2-methylglutaric (d-c5) | 0.50 ± 0.17 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.82 ± 0.24 | 0.00 ± 0.05 | 0.51 ± 0.16 |
| 2,5-dimethylbenzoic acid | 10.52 ± 4.91 | 0.00 ± 3.64 | 0.00 ± 3.83 | 0.00 ± 2.00 | 0.05 ± 2.06 | 12.63 ± 5.07 |
| 3-methylglutaric acid (d-c5) | 3.97 ± 3.35 | 0.00 ± 5.86 | 0.00 ± 5.96 | 0.00 ± 3.14 | 0.00 ± 3.23 | 6.09 ± 3.43 |
| 2,4-dimethylbenzoic acid | 0.00 ± 196.08 | 0.00 ± 361.97 | 0.00 ± 369.25 | 0.00 ± 193.90 | 0.00 ± 194.75 | 1330.77 ± 303.33 |
| 2,3- and 3,5- dimethylbenzoic acid | 9.96 ± 1.85 | 0.00 ± 0.69 | 0.00 ± 0.59 | 0.29 ± 0.39 | 4.17 ± 0.88 | 5.48 ± 1.06 |
| decanoic acid (c10) | 0.00 ± 2.95 | 0.00 ± 4.53 | 0.00 ± 4.60 | 0.00 ± 2.87 | 0.00 ± 2.95 | 0.88 ± 4.81 |
| 4-allyl-guaiacol (eugenol) | 5.48 ± 0.52 | 1.03 ± 0.20 | 20.50 ± 2.25 | 61.72 ± 6.64 | 17.55 ± 1.42 | 11.90 ± 1.31 |
| 4-methyl-syringol | 0.69 ± 0.23 | 0.00 ± 0.11 | 0.87 ± 0.30 | 0.00 ± 0.05 | 0.43 ± 0.15 | 0.00 ± 0.05 |
| 3,4-dimethylbenzoic acid | 20.65 ± 3.16 | 3.39 ± 3.25 | 3.25 ± 3.31 | 1.19 ± 2.11 | 6.14 ± 2.28 | 8.65 ± 2.37 |
| hexanedioic (adipic) acid (d-c6) | 0.29 ± 0.95 | 0.00 ± 1.70 | 0.00 ± 1.77 | 0.00 ± 0.90 | 1.49 ± 1.01 | 0.72 ± 0.95 |
| salcylic acid | 1.50 ± 2.79 | 0.00 ± 4.73 | 6.62 ± 5.17 | 0.30 ± 2.69 | 6.11 ± 2.98 | 2.71 ± 2.79 |
| trans-2-decenoic acid | 0.00 ± 0.46 | 0.00 ± 0.54 | 0.00 ± 0.55 | 0.00 ± 0.45 | 0.00 ± 0.46 | 0.22 ± 0.46 |
| cis-pinonic acid | 0.00 ± 3.48 | 0.00 ± 4.56 | 0.00 ± 4.64 | 0.00 ± 3.38 | 0.00 ± 3.47 | 0.00 ± 3.44 |
| 3-methyladipic acid (d-c6) | 7.27 ± 1.32 | 179.64 ± 31.39 | 14.69 ± 2.67 | 0.38 ± 0.27 | 42.63 ± 7.38 | 2.37 ± 0.52 |
| 4-formyl-guaiacol (vanillin) | 0.13 ± 0.73 | 8.85 ± 2.56 | 4.51 ± 1.59 | 0.12 ± 0.70 | 6.71 ± 1.49 | 1.37 ± 0.85 |
| undecanoic acid (c11) | 0.79 ± 1.41 | 0.00 ± 3.49 | 0.00 ± 2.38 | 0.00 ± 1.35 | 0.00 ± 1.39 | 0.91 ± 1.40 |
| isoeugenol | 1.96 ± 0.83 | 0.00 ± 0.35 | 0.00 ± 0.33 | 0.44 ± 0.32 | 0.00 ± 0.28 | 0.00 ± 0.28 |
| heptanedioic (pimelic) acid (d-c7) | 1.36 ± 1.04 | 4.30 ± 1.44 | 0.00 ± 1.16 | 0.17 ± 0.98 | 0.18 ± 1.02 | 0.47 ± 1.01 |
| 2,3-dimethoxybenzoic acid | 6.66 ± 2.45 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 |
| acetovanillone | 0.00 ± 3.94 | 0.00 ± 4.00 | 0.00 ± 4.06 | 0.00 ± 3.83 | 6.72 ± 3.99 | 7.30 ± 3.95 |
| 2,6-dimethoxybenzoic acid | 0.31 ± 0.13 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.27 ± 0.11 | 0.00 ± 0.05 | 0.20 ± 0.09 |
| dodecanoic (lauric) acid (c12) | 0.00 ± 34.89 | 0.00 ± 52.63 | 0.00 ± 53.61 | 0.59 ± 33.96 | 0.00 ± 34.82 | 5.77 ± 34.64 |
| 2,5-dimethoxybenzoic acid | 3.14 ± 1.14 | 0.00 ± 1.31 | 1.90 ± 1.49 | 7.76 ± 2.09 | 2.23 ± 0.98 | 3.17 ± 1.14 |
| phthalic acid | 63.02 ± 29.67 | 94.91 ± 48.17 | 0.00 ± 41.74 | 181.55 ± 44.35 | 83.25 ± 31.39 | 127.93 ± 34.49 |
| suberic acid (d-c8) | 0.00 ± 19.03 | 0.00 ± 26.17 | 0.00 ± 26.52 | 0.00 ± 18.49 | 0.00 ± 19.01 | 0.00 ± 18.83 |
| levoglucosan | 0.00 ± 1.60 | 0.84 ± 2.65 | 0.00 ± 1.70 | 0.52 ± 1.63 | 0.00 ± 1.54 | 0.72 ± 1.71 |
| 3,5-dimethoxybenzoic acid | 1.37 ± 0.43 | 1.34 ± 0.80 | 0.00 ± 0.80 | 0.42 ± 0.40 | 0.02 ± 0.41 | 1.86 ± 0.44 |
| syringaldehyde | 0.03 ± 0.07 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.09 ± 0.06 | 0.16 ± 0.07 | 0.88 ± 0.17 |
| 3,4-dimethoxybenzoic acid | 13.00 ± 4.68 | 5.00 ± 2.34 | 0.00 ± 0.49 | 1.67 ± 0.76 | 4.17 ± 1.59 | 6.71 ± 2.47 |
| 2,4-dimethoxybenzoic acid | 8.13 ± 0.58 | 3.19 ± 0.25 | 0.00 ± 0.11 | 2.75 ± 0.20 | 2.87 ± 0.21 | 4.72 ± 0.34 |
| tridecanoic acid (c13) | 0.63 ± 0.56 | 0.00 ± 0.54 | 0.00 ± 0.54 | 0.86 ± 0.56 | 0.36 ± 0.55 | 0.57 ± 0.55 |
| isophthalic acid | 68.16 ± 80.57 | 0.00 ± 87.71 | 0.00 ± 89.11 | 1.76 ± 75.93 | 223.29 ± 91.80 | 416.19 ± 112.32 |
| vanillic acid | 0.00 ± 5.42 | 0.00 ± 5.95 | 0.00 ± 6.04 | 0.00 ± 5.27 | 0.00 ± 5.41 | 14.32 ± 5.98 |
| homovanillic acid | 0.00 ± 2.42 | 0.00 ± 2.58 | 0.00 ± 2.62 | 0.00 ± 2.33 | 0.00 ± 2.48 | 8.84 ± 3.48 |
| azelaic acid (d-c9) | 0.00 ± 4.91 | 0.00 ± 5.67 | 0.00 ± 5.76 | 0.00 ± 4.77 | 0.00 ± 4.90 | 1.91 ± 4.87 |
| myristoleic acid | 0.00 ± 0.23 | 0.00 ± 0.24 | 24.87 ± 3.35 | 0.00 ± 0.21 | 0.00 ± 0.21 | 13.13 ± 1.57 |
| myristic acid (c14) | 0.00 ± 7.74 | 0.00 ± 6.33 | 0.00 ± 6.51 | 20.93 ± 10.71 | 0.00 ± 7.41 | 38.29 ± 14.43 |
| sebacic acid (d-c10) | 0.00 ± 1.04 | 0.00 ± 1.15 | 0.00 ± 1.22 | 0.00 ± 1.00 | 0.00 ± 1.03 | 0.00 ± 1.03 |
| syringic acid | 5.80 ± 0.84 | 0.00 ± 0.59 | 0.00 ± 0.60 | 9.29 ± 1.18 | 0.38 ± 0.51 | 0.61 ± 0.52 |
| pentadecanoic acid (c15) | 0.00 ± 2.86 | 0.00 ± 3.49 | 0.00 ± 3.55 | 0.00 ± 2.78 | 0.00 ± 2.85 | 0.53 ± 2.85 |
| undecanedioic acid (d-c11) | 0.02 ± 0.15 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.24 ± 0.21 |
| palmitoleic acid | 0.00 ± 0.82 | 0.00 ± 0.94 | 0.00 ± 0.95 | 0.00 ± 0.72 | 0.00 ± 0.81 | 2.23 ± 1.32 |
| palmitic acid (c16) | 0.00 ± 16.48 | 0.00 ± 9.21 | 0.00 ± 9.37 | 0.00 ± 16.03 | 0.00 ± 16.14 | 0.70 ± 15.60 |
| isostearic acid | 0.00 ± 0.34 | 0.00 ± 0.54 | 0.00 ± 0.54 | 0.00 ± 0.33 | 0.00 ± 0.34 | 0.00 ± 0.33 |
| dodecanedioic acid (d-c12) | 0.13 ± 0.33 | 0.00 ± 0.37 | 0.00 ± 0.38 | 0.00 ± 0.32 | 0.00 ± 0.33 | 0.13 ± 0.32 |
| traumatic acid | 0.00 ± 0.06 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 |
| heptadecanoic acid (c17) | 0.00 ± 3.32 | 0.00 ± 6.09 | 0.00 ± 6.19 | 0.00 ± 3.22 | 0.00 ± 3.31 | 0.00 ± 3.36 |
| 1,11-undecanedicarboxylic acid (d-c13) | 0.00 ± 0.09 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.20 ± 0.08 |
| oleic acid | 13.82 ± 14.14 | 0.00 ± 5.74 | 3.19 ± 34.78 | 12.97 ± 11.17 | 5.79 ± 9.26 | 0.00 ± 6.69 |
| elaidic acid | 0.15 ± 0.82 | 0.00 ± 0.71 | 0.00 ± 0.72 | 0.91 ± 0.79 | 0.00 ± 0.81 | 0.32 ± 0.81 |
| stearic acid (c18) | 0.00 ± 18.87 | 0.00 ± 39.32 | 0.00 ± 31.88 | 0.00 ± 18.35 | 0.00 ± 18.64 | 0.00 ± 19.09 |
| 1,12-dodecanedicarboxylic acid (d-c14) | 0.76 ± 0.31 | 0.00 ± 0.25 | 0.00 ± 0.26 | 0.00 ± 0.21 | 1.06 ± 0.39 | 1.09 ± 0.40 |
| 8,15-pimaradien-18-oic acd | 0.00 ± 0.39 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.37 | 0.00 ± 0.39 | 0.00 ± 0.38 |
| pimaric acid | 7.98 ± 1.16 | 0.00 ± 0.88 | 0.00 ± 0.89 | 0.00 ± 0.48 | 8.73 ± 1.25 | 3.33 ± 0.66 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S7-2 | S7-3 | S7-4 | S8-1 | S8-2 | S8-3 |
|---|---|---|---|---|---|---|
| sandaracopimaric acid | 0.00 ± 0.17 | 0.00 ± 0.28 | 0.00 ± 0.28 | 1.40 ± 0.19 | 0.00 ± 0.16 | 0.25 ± 0.16 |
| nonadecanoic acid (c19) | 0.00 ± 5.64 | 0.00 ± 10.22 | 0.00 ± 10.39 | 0.29 ± 5.49 | 0.00 ± 5.63 | 0.00 ± 5.58 |
| isopimaric acid | 0.00 ± 0.59 | 0.00 ± 0.98 | 0.00 ± 1.00 | 0.00 ± 0.57 | 0.00 ± 0.59 | 0.22 ± 0.59 |
| palustric acid | 0.39 ± 0.54 | 0.00 ± 0.60 | 0.00 ± 0.61 | 0.97 ± 0.52 | 0.38 ± 0.54 | 0.43 ± 0.53 |
| dihydroisopimaric acid | 0.00 ± 0.23 | 0.00 ± 0.27 | 0.00 ± 0.27 | 0.00 ± 0.22 | 0.00 ± 0.23 | 0.00 ± 0.22 |
| 8-abietic acid | 0.00 ± 0.35 | 0.00 ± 0.26 | 0.00 ± 0.27 | 0.23 ± 0.36 | 0.09 ± 0.35 | 0.00 ± 0.34 |
| dehydroabietic acid | 0.00 ± 7.81 | 0.00 ± 9.08 | 0.00 ± 9.23 | 0.00 ± 7.64 | 0.00 ± 7.80 | 0.00 ± 7.73 |
| 8,14-abietenic acid | 0.00 ± 0.06 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 |
| abietic acid | 0.00 ± 0.10 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.09 | 0.00 ± 0.10 | 0.00 ± 0.09 |
| eicosanoic acid (c20) | 0.00 ± 1.78 | 0.00 ± 1.80 | 0.00 ± 1.82 | 0.00 ± 1.73 | 0.00 ± 1.78 | 0.00 ± 1.76 |
| levopimaric acid | 0.00 ± 0.06 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 |
| heneicosanoic acid (c21) | 0.00 ± 2.00 | 0.00 ± 2.69 | 0.00 ± 2.73 | 0.00 ± 1.94 | 0.00 ± 2.00 | 0.00 ± 1.98 |
| 7-oxodehydroabietic acid | 0.00 ± 0.15 | 0.00 ± 0.26 | 0.00 ± 0.27 | 0.45 ± 0.15 | 0.00 ± 0.14 | 0.59 ± 0.17 |
| docosanoic acid (c22) | 0.00 ± 5.61 | 0.00 ± 8.92 | 0.00 ± 9.07 | 0.88 ± 5.47 | 0.00 ± 5.59 | 0.00 ± 5.55 |
| tricosanoic acid (c23) | 0.00 ± 0.93 | 0.00 ± 0.75 | 0.00 ± 0.76 | 0.00 ± 0.90 | 0.00 ± 0.93 | 0.18 ± 0.92 |
| tetracosanoic acid (c24) | 0.29 ± 0.64 | 0.00 ± 0.91 | 0.00 ± 0.93 | 1.36 ± 0.80 | 0.00 ± 0.54 | 0.00 ± 1.03 |
| cholesterol | 0.00 ± 1.04 | 0.00 ± 0.24 | 0.00 ± 0.25 | 0.00 ± 0.99 | 0.00 ± 1.00 | 1.25 ± 1.03 |
| cholestanol | 0.00 ± 7.03 | 0.00 ± 8.17 | 0.00 ± 8.31 | 0.02 ± 6.82 | 0.00 ± 7.01 | 3.79 ± 6.99 |
| ergosterol | 0.00 ± 0.06 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 |
| stigmasterol | 0.00 ± 2.18 | 0.00 ± 2.54 | 0.00 ± 2.58 | 0.00 ± 2.12 | 0.00 ± 2.18 | 0.00 ± 2.16 |
| sitosterol | 0.00 ± 0.06 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 |
| Carbonyls (mg/mile) | | | | | | |
| formaldehyde | 3.08 ± 0.02 | 1.85 ± 0.06 | 5.40 ± 0.06 | 1.85 ± 0.01 | 2.59 ± 0.01 | 4.25 ± 0.01 |
| acetaldehyde | 0.85 ± 0.33 | 0.00 ± 0.98 | 0.77 ± 0.99 | 0.52 ± 0.19 | 1.01 ± 0.20 | 1.81 ± 0.20 |
| acetone | 0.50 ± 0.47 | 0.00 ± 1.41 | 0.00 ± 1.41 | 0.70 ± 0.27 | 0.56 ± 0.28 | 0.58 ± 0.28 |
| * acrolein | 0.99 ± 0.25 | 0.28 ± 0.07 | 2.30 ± 0.58 | 0.37 ± 0.09 | 0.78 ± 0.19 | 1.29 ± 0.32 |
| propionaldehyde | 0.21 ± 0.01 | 0.11 ± 0.04 | 0.30 ± 0.04 | 0.10 ± 0.01 | 0.16 ± 0.01 | 0.25 ± 0.01 |
| crotonaldehyde | 0.03 ± 0.01 | 0.00 ± 0.01 | 0.12 ± 0.01 | 0.03 ± 0.01 | 0.03 ± 0.01 | 0.01 ± 0.01 |
| methyl ethyl ketone | 0.21 ± 0.04 | 0.00 ± 0.11 | 0.13 ± 0.11 | 0.19 ± 0.02 | 0.20 ± 0.02 | 0.17 ± 0.02 |
| Methacrolein | 0.18 ± 0.01 | 0.03 ± 0.01 | 0.31 ± 0.01 | 0.04 ± 0.01 | 0.09 ± 0.01 | 0.18 ± 0.01 |
| * n-butyraldehyde | 0.15 ± 0.04 | 0.01 ± 0.02 | 0.37 ± 0.09 | 0.12 ± 0.03 | 0.11 ± 0.03 | 0.03 ± 0.02 |
| benzaldehyde | 1.15 ± 0.01 | 0.67 ± 0.02 | 1.92 ± 0.02 | 0.55 ± 0.01 | 0.88 ± 0.01 | 1.39 ± 0.01 |
| glyoxal | 0.00 ± 0.01 | 0.01 ± 0.02 | 0.01 ± 0.01 | 0.00 ± 0.01 | 0.02 ± 0.01 | 0.01 ± 0.01 |
| valeraldehyde | 0.03 ± 0.01 | 0.00 ± 0.02 | 0.05 ± 0.02 | 0.04 ± 0.01 | 0.03 ± 0.01 | 0.03 ± 0.01 |
| tolualdehyde | 0.10 ± 0.01 | 0.00 ± 0.03 | 0.05 ± 0.03 | 0.03 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 |
| hexanal | 0.10 ± 0.01 | 0.00 ± 0.02 | 0.05 ± 0.02 | 0.03 ± 0.01 | 0.00 ± 0.01 | 0.00 ± 0.01 |
| *** acrolein converts to an unknown rear** | | | | | | |
| VOC (mg/mi) | | | | | | |
| 1,3 butadiene (estimated) | 5.608 ± 8.300 | 1.046 ± 1.548 | 2.471 ± 3.657 | 0.813 ± 1.204 | 0.988 ± 1.462 | 0.552 ± 0.817 |
| C2 compounds | 65.798 ± 16.200 | 14.473 ± 3.564 | 23.293 ± 5.735 | 6.697 ± 1.649 | 17.916 ± 4.411 | 12.896 ± 3.175 |
| propene | 41.502 ± 8.773 | 7.739 ± 1.636 | 18.285 ± 3.865 | 6.018 ± 1.272 | 7.308 ± 1.545 | 4.083 ± 0.863 |
| propane | 1.215 ± 0.069 | 0.487 ± 0.028 | 0.763 ± 0.043 | 0.609 ± 0.035 | 0.944 ± 0.053 | 0.880 ± 0.050 |
| isoButane | 3.258 ± 0.210 | 1.133 ± 0.073 | 1.170 ± 0.075 | 0.444 ± 0.029 | 0.439 ± 0.028 | 0.535 ± 0.035 |
| 1Butene+iButylene | 22.886 ± 2.696 | 4.304 ± 0.507 | 8.023 ± 0.945 | 3.523 ± 0.415 | 4.353 ± 0.513 | 3.685 ± 0.434 |
| n-Butane | 6.036 ± 0.580 | 0.964 ± 0.093 | 1.757 ± 0.169 | 0.620 ± 0.060 | 0.647 ± 0.062 | 0.692 ± 0.067 |
| t-2-Butene | 2.860 ± 0.451 | 0.595 ± 0.094 | 1.407 ± 0.222 | 0.544 ± 0.086 | 0.550 ± 0.087 | 0.529 ± 0.083 |
| c-2-Butene | 1.499 ± 0.097 | 0.281 ± 0.018 | 0.796 ± 0.051 | 0.214 ± 0.014 | 0.246 ± 0.016 | 0.157 ± 0.010 |
| 3-Me-1-Butene | 49.584 ± 5.482 | 19.187 ± 2.121 | 37.141 ± 4.106 | 12.593 ± 1.392 | 9.903 ± 1.095 | 13.064 ± 1.444 |
| isopentane | 2.660 ± 0.278 | 0.423 ± 0.044 | 1.231 ± 0.128 | 0.571 ± 0.060 | 0.457 ± 0.048 | 0.413 ± 0.043 |
| 1-Pentene | 4.655 ± 0.586 | 0.789 ± 0.099 | 1.406 ± 0.177 | 0.654 ± 0.082 | 0.690 ± 0.087 | 0.737 ± 0.093 |
| 2-Me-1-Butene | 16.277 ± 1.650 | 4.168 ± 0.422 | 6.295 ± 0.638 | 2.437 ± 0.247 | 3.137 ± 0.318 | 3.628 ± 0.368 |
| n-Pentane | 0.022 ± 0.007 | 0.045 ± 0.013 | 0.053 ± 0.016 | 0.487 ± 0.144 | 0.144 ± 0.043 | 0.035 ± 0.010 |
| t-2-Pentene | 4.522 ± 0.257 | 0.764 ± 0.043 | 2.317 ± 0.132 | 0.567 ± 0.032 | 0.656 ± 0.037 | 0.802 ± 0.046 |
| c-2-Pentene | 2.530 ± 0.377 | 0.403 ± 0.060 | 1.140 ± 0.170 | 0.317 ± 0.047 | 0.364 ± 0.054 | 0.411 ± 0.061 |
| 2-Me-2-Butene | 4.312 ± 0.403 | 0.382 ± 0.036 | 0.348 ± 0.033 | 1.106 ± 0.103 | 1.030 ± 0.096 | 1.013 ± 0.095 |
| 22DiMeButane | 5.490 ± 0.602 | 2.131 ± 0.234 | 1.440 ± 0.158 | 0.618 ± 0.068 | 0.723 ± 0.079 | 1.130 ± 0.124 |
| CycloPentene | 1.537 ± 0.169 | 0.245 ± 0.026 | 0.559 ± 0.062 | 0.230 ± 0.025 | 0.290 ± 0.032 | 0.315 ± 0.035 |
| CycloPentane | 2.398 ± 0.120 | 0.651 ± 0.032 | 0.879 ± 0.044 | 0.298 ± 0.015 | 0.413 ± 0.021 | 0.469 ± 0.023 |
| 23DiMeButane | 9.557 ± 0.966 | 2.336 ± 0.236 | 3.720 ± 0.376 | 1.273 ± 0.129 | 1.302 ± 0.132 | 1.682 ± 0.170 |
| MTBE | 0.786 ± 0.066 | 0.108 ± 0.009 | 0.359 ± 0.030 | 0.014 ± 0.001 | <4.31 ± 0.447 | <5.44 ± 0.564 |
| 2-MePentane | 32.171 ± 3.130 | 7.762 ± 0.755 | 12.618 ± 1.228 | 3.804 ± 0.370 | <4.31 ± 0.419 | <5.44 ± 0.530 |
| 3-MePentane | 23.141 ± 1.212 | 5.137 ± 0.269 | 8.349 ± 0.437 | 2.632 ± 0.138 | 2.711 ± 0.142 | 3.407 ± 0.179 |
| 2-Me-1-Pentene | 1.249 ± 0.046 | 0.158 ± 0.006 | 0.265 ± 0.010 | 0.152 ± 0.006 | 0.152 ± 0.006 | 0.152 ± 0.006 |
| 1-Hexene | 1.886 ± 0.175 | 0.245 ± 0.023 | 0.602 ± 0.056 | 0.266 ± 0.025 | 0.304 ± 0.028 | 0.248 ± 0.023 |
| n-Hexane | 19.996 ± 1.706 | 3.732 ± 0.318 | 5.734 ± 0.489 | 8.708 ± 0.743 | 2.367 ± 0.202 | 2.679 ± 0.229 |
| t-2-Hexene | 1.942 ± 0.099 | 0.234 ± 0.012 | 0.767 ± 0.039 | 0.209 ± 0.011 | 0.237 ± 0.012 | 0.291 ± 0.015 |
| 2-Me-2-Pentene | 1.042 ± 0.095 | 0.044 ± 0.004 | 0.041 ± 0.004 | 0.270 ± 0.025 | 0.214 ± 0.019 | 0.219 ± 0.020 |
| c-3-Me-2-Pentene | 0.794 ± 0.035 | 0.050 ± 0.002 | 0.079 ± 0.004 | 0.263 ± 0.011 | 0.146 ± 0.006 | 0.156 ± 0.007 |
| c-3-Hexene | 0.229 ± 0.012 | 0.029 ± 0.002 | 0.082 ± 0.005 | 0.032 ± 0.002 | 0.115 ± 0.006 | 0.046 ± 0.002 |
| c-2-Hexene | 1.023 ± 0.076 | 0.122 ± 0.009 | 0.356 ± 0.027 | 0.128 ± 0.010 | 0.121 ± 0.009 | 0.137 ± 0.010 |
| t-3-Me-2-Pentene | 0.318 ± 0.019 | 0.104 ± 0.006 | 0.106 ± 0.006 | 0.235 ± 0.014 | 0.216 ± 0.013 | 0.232 ± 0.014 |
| MeCyPentane | 13.809 ± 1.372 | 2.899 ± 0.288 | 5.103 ± 0.507 | 2.124 ± 0.211 | 1.680 ± 0.167 | 1.964 ± 0.195 |
| 2,4-DiMePentane | 10.405 ± 0.534 | 1.680 ± 0.086 | 3.993 ± 0.205 | 1.265 ± 0.065 | 1.186 ± 0.061 | 1.349 ± 0.069 |
| 223TriMeButane | 0.430 ± 0.039 | 0.086 ± 0.008 | 0.169 ± 0.015 | 0.046 ± 0.004 | 0.050 ± 0.005 | 0.067 ± 0.006 |
| Benzene | 63.746 ± 7.401 | 13.399 ± 1.556 | 16.533 ± 1.919 | 9.254 ± 1.074 | 9.177 ± 1.066 | 7.616 ± 0.884 |
| CycloHexane | <28.39 ± 0.437 | <5.23 ± 0.099 | <10.39 ± 0.396 | 0.585 ± 0.059 | 0.705 ± 0.071 | 1.018 ± 0.102 |
| 4MeHexene | 0.363 ± 0.059 | 0.043 ± 0.007 | 0.111 ± 0.018 | 0.054 ± 0.009 | 0.049 ± 0.008 | 0.042 ± 0.007 |
| 2MeHexane | 18.111 ± 0.747 | 3.251 ± 0.134 | 5.126 ± 0.211 | 2.139 ± 0.088 | 2.009 ± 0.083 | 2.242 ± 0.092 |
| 23DiMePentane | 18.054 ± 0.636 | 2.232 ± 0.079 | 5.109 ± 0.180 | 2.018 ± 0.071 | 1.817 ± 0.064 | 2.025 ± 0.071 |
| 3MeHexane | <24.03 ± 0.894 | <4.24 ± 0.158 | <6.44 ± 0.240 | 2.412 ± 0.102 | 2.231 ± 0.095 | 2.452 ± 0.104 |

## Appendix B1. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round1

| Species Description | S7-2 | S7-3 | S7-4 | S8-1 | S8-2 | S8-3 |
|---|---|---|---|---|---|---|
| Cyclohexene | 0.000 ± 0.573 | 0.000 ± 0.100 | 0.000 ± 0.161 | 0.092 ± 0.026 | 0.047 ± 0.072 | 0.074 ± 0.072 |
| 3EtPentane | 5.116 ± 0.060 | 0.894 ± 0.010 | 1.438 ± 0.022 | 0.236 ± 0.000 | 0.639 ± 0.000 | 0.638 ± 0.000 |
| * 1-Heptene | 1.210 ± 4.152 | 0.206 ± 0.657 | 0.448 ± 1.258 | <3.80 ± 0.000 | 0.000 ± 0.543 | 0.000 ± 0.542 |
| * 224TrMePentane | 34.007 ± 0.023 | 5.379 ± 0.002 | 10.308 ± 0.008 | <3.80 ± 0.001 | 4.443 ± 0.001 | 4.441 ± 0.001 |
| t-3-Heptene | 0.629 ± 0.490 | 0.064 ± 0.090 | 0.225 ± 0.104 | 0.042 ± 0.061 | 0.032 ± 0.057 | 0.020 ± 0.058 |
| n-Heptane | 14.632 ± 0.009 | 2.691 ± 0.005 | 3.118 ± 0.012 | 1.818 ± 0.002 | 1.695 ± 0.006 | 1.728 ± 0.005 |
| 244TMe-1-Pentene | 0.091 ± 0.357 | 0.053 ± 0.071 | 0.126 ± 0.098 | 0.019 ± 0.061 | 0.064 ± 0.059 | 0.053 ± 0.054 |
| MeCyHexane | 5.165 ± 0.552 | 1.027 ± 0.117 | 1.423 ± 0.162 | 0.877 ± 0.072 | 0.861 ± 0.071 | 0.786 ± 0.072 |
| 25DiMeHexane | 4.726 ± 0.360 | 1.004 ± 0.061 | 1.389 ± 0.106 | 0.620 ± 0.035 | 0.606 ± 0.047 | 0.618 ± 0.046 |
| 24DiMeHexane | 8.474 ± 0.365 | 1.433 ± 0.045 | 2.487 ± 0.088 | 0.813 ± 0.040 | 1.107 ± 0.046 | 1.082 ± 0.045 |
| 234TrMePentane | 9.859 ± 5.793 | 1.218 ± 0.909 | 2.372 ± 1.324 | 1.078 ± 0.680 | 1.253 ± 0.717 | 1.217 ± 0.665 |
| Toluene | 122.604 ± 0.437 | 21.454 ± 0.067 | 31.255 ± 0.103 | 16.064 ± 0.036 | 16.925 ± 0.010 | 15.710 ± 0.009 |
| 23DiMeHexane | 4.899 ± 0.409 | 0.754 ± 0.071 | 1.151 ± 0.106 | 0.399 ± 0.047 | 0.110 ± 0.052 | 0.102 ± 0.054 |
| 2MeHeptane | 8.222 ± 0.353 | 1.429 ± 0.055 | 2.131 ± 0.083 | 0.958 ± 0.049 | 1.057 ± 0.034 | 1.084 ± 0.041 |
| 4MeHeptane | 3.705 ± 0.313 | 0.574 ± 0.052 | 0.874 ± 0.078 | 0.518 ± 0.040 | 0.354 ± 0.037 | 0.426 ± 0.039 |
| 3MeHeptane | 9.434 ± 0.044 | 1.567 ± 0.005 | 2.340 ± 0.012 | 1.215 ± 0.020 | 1.124 ± 0.001 | 1.170 ± 0.025 |
| Hexanal | 0.100 ± 0.006 | 0.000 ± 0.017 | 0.050 ± 0.017 | 0.030 ± 0.010 | 0.000 ± 0.013 | 0.000 ± 0.013 |
| 225TMHexane | 4.570 ± 0.061 | 0.704 ± 0.004 | 0.887 ± 0.011 | 0.822 ± 0.008 | 0.524 ± 0.002 | 0.517 ± 0.002 |
| Octene-1 | 0.501 ± 0.007 | 0.033 ± 0.001 | 0.089 ± 0.001 | 0.065 ± 0.005 | 0.018 ± 0.001 | 0.020 ± 0.001 |
| 11DMeCyHexane | 0.310 ± 0.266 | 0.035 ± 0.048 | 0.053 ± 0.052 | 0.197 ± 0.041 | 0.047 ± 0.031 | 0.038 ± 0.034 |
| n-Octane | 6.951 ± 0.132 | 1.261 ± 0.015 | 1.367 ± 0.026 | 1.059 ± 0.011 | 0.814 ± 0.001 | 0.871 ± 0.001 |
| 24DiMeHeptane | 1.489 ± 0.048 | 0.169 ± 0.008 | 0.295 ± 0.012 | 0.122 ± 0.006 | 0.006 ± 0.001 | 0.012 ± 0.001 |
| 25DiMeHeptane | 2.848 ± 0.038 | 0.458 ± 0.003 | 0.737 ± 0.004 | 0.383 ± 0.027 | 0.071 ± 0.007 | 0.086 ± 0.009 |
| 33DiMeHeptane | 0.289 ± 2.215 | 0.023 ± 0.308 | 0.031 ± 0.478 | 0.207 ± 0.249 | 0.054 ± 0.234 | 0.067 ± 0.288 |
| EtBenzene | 32.691 ± 5.476 | 4.545 ± 0.793 | 7.053 ± 1.040 | 3.674 ± 0.532 | 3.450 ± 0.580 | 4.256 ± 0.797 |
| m/p-xylene | 88.176 ± 0.033 | 12.778 ± 0.006 | 16.755 ± 0.005 | 8.574 ± 0.018 | 9.336 ± 0.002 | 12.837 ± 0.003 |
| 2MeOctane | 1.471 ± 0.416 | 0.276 ± 0.068 | 0.204 ± 0.101 | 0.796 ± 0.074 | 0.102 ± 0.003 | 0.127 ± 0.003 |
| 3MeOctane | 3.945 ± 0.050 | 0.644 ± 0.016 | 0.958 ± 0.008 | 0.701 ± 0.011 | 0.030 ± 0.032 | 0.027 ± 0.019 |
| Styrene+heptanal | 0.639 ± 1.631 | 0.203 ± 0.229 | 0.098 ± 0.288 | 0.138 ± 0.173 | 0.406 ± 0.182 | 0.245 ± 0.231 |
| o-xylene | 33.355 ± 0.010 | 4.690 ± 0.002 | 5.896 ± 0.002 | 3.539 ± 0.030 | 3.734 ± 0.005 | 4.737 ± 0.005 |
| Nonene-1 | 0.210 ± 0.082 | 0.039 ± 0.017 | 0.045 ± 0.017 | 0.664 ± 0.016 | 0.101 ± 0.012 | 0.098 ± 0.014 |
| n-Nonane | 3.002 ± 0.118 | 0.642 ± 0.017 | 0.608 ± 0.023 | 0.587 ± 0.014 | 0.441 ± 0.006 | 0.500 ± 0.013 |
| iPropBenzene | 2.404 ± 0.052 | 0.347 ± 0.010 | 0.465 ± 0.013 | 0.284 ± 0.002 | 0.122 ± 0.013 | 0.272 ± 0.002 |
| iPropCyHexane | 0.428 ± 0.024 | 0.081 ± 0.004 | 0.108 ± 0.008 | 0.020 ± 0.019 | 0.110 ± 0.008 | 0.017 ± 0.006 |
| 26DiMeOctane | 0.226 ± 0.375 | 0.036 ± 0.279 | 0.079 ± 0.113 | 0.178 ± 0.020 | 0.076 ± 0.012 | 0.058 ± 0.011 |
| alpha-pinene | 1.128 ± 0.405 | 0.840 ± 0.057 | 0.341 ± 0.073 | 0.060 ± 0.051 | 0.035 ± 0.072 | 0.033 ± 0.085 |
| nPropBenzene | 6.048 ± 0.655 | 0.853 ± 0.101 | 1.090 ± 0.112 | 0.765 ± 0.071 | 1.072 ± 0.110 | 1.276 ± 0.147 |
| mEtToluene | 22.303 ± 0.374 | 3.445 ± 0.064 | 3.826 ± 0.064 | 2.429 ± 0.043 | 3.742 ± 0.069 | 5.011 ± 0.090 |
| pEtToluene | 9.337 ± 0.418 | 1.589 ± 0.071 | 1.599 ± 0.071 | 1.067 ± 0.039 | 1.714 ± 0.086 | 2.254 ± 0.115 |
| 135TriMeBenzene | 9.766 ± 0.344 | 1.662 ± 0.053 | 1.652 ± 0.054 | 0.899 ± 0.042 | 2.013 ± 0.067 | 2.679 ± 0.078 |
| oEtToluene | 7.920 ± 0.091 | 1.224 ± 0.006 | 1.252 ± 0.021 | 0.962 ± 0.026 | 1.539 ± 0.032 | 1.786 ± 0.014 |
| Octanal | 0.224 ± 0.014 | 0.015 ± 0.003 | 0.052 ± 0.006 | 0.064 ± 0.001 | 0.079 ± 0.002 | 0.036 ± 0.008 |
| beta-pinene | 0.207 ± 1.290 | 0.042 ± 0.228 | 0.095 ± 0.182 | 0.014 ± 0.119 | 0.036 ± 0.233 | 0.128 ± 0.361 |
| * 124TriMeBenzene | 28.536 ± 0.142 | 5.037 ± 0.031 | 4.037 ± 0.039 | <2.64 ± 0.271 | 5.160 ± 0.051 | 7.970 ± 0.039 |
| * n-Decane | 1.469 ± 0.031 | 0.327 ± 0.006 | 0.403 ± 0.007 | <2.64 ± 0.003 | 0.526 ± 0.002 | 0.406 ± 0.007 |
| iButBenzene | 0.644 ± 0.028 | 0.115 ± 0.005 | 0.149 ± 0.006 | 0.054 ± 0.003 | 0.052 ± 0.007 | 0.138 ± 0.006 |
| sButBenzene | 0.498 ± 0.671 | 0.088 ± 0.129 | 0.106 ± 0.097 | 0.053 ± 0.035 | 0.135 ± 0.127 | 0.112 ± 0.184 |
| Limonene | <6.48 ± 0.102 | <1.25 ± 0.020 | <0.94 ± 0.000 | 0.342 ± 0.009 | 1.231 ± 0.002 | 1.775 ± 0.001 |
| Indan | <3.05 ± 0.191 | <0.52 ± 0.040 | <0.61 ± 0.034 | 0.155 ± 0.056 | 0.644 ± 0.049 | 0.809 ± 0.078 |
| 13diethylbenzene | 1.906 ± 0.067 | 0.402 ± 0.014 | 0.341 ± 0.012 | 0.557 ± 0.020 | 0.487 ± 0.017 | 0.784 ± 0.028 |
| 14diethylbenzene | 0.712 ± 0.065 | 0.176 ± 0.016 | 0.197 ± 0.018 | 0.051 ± 0.005 | 0.303 ± 0.028 | 0.461 ± 0.042 |
| 12diethylbenzene | 0.549 ± 0.057 | 0.113 ± 0.012 | 0.154 ± 0.016 | 0.031 ± 0.003 | 0.198 ± 0.021 | 0.147 ± 0.015 |
| 2-propylToluene | 1.283 ± 0.042 | 0.278 ± 0.009 | 0.217 ± 0.007 | 0.089 ± 0.003 | 0.315 ± 0.010 | 0.570 ± 0.019 |
| 3-ipropyltoluene | 0.897 ± 0.044 | 0.173 ± 0.008 | 0.143 ± 0.007 | 0.115 ± 0.006 | 0.084 ± 0.004 | 0.060 ± 0.003 |
| 4-ipropyltoluene | 0.121 ± 0.037 | 0.032 ± 0.010 | 0.012 ± 0.004 | 0.025 ± 0.007 | 0.126 ± 0.038 | 0.128 ± 0.039 |
| 2-ipropyltoluene | <3.05 ± 0.621 | <0.52 ± 0.107 | <0.61 ± 0.125 | 0.034 ± 0.007 | 0.107 ± 0.021 | 0.094 ± 0.019 |
| Nonanal | 4.236 ± 0.689 | 1.188 ± 0.193 | 0.570 ± 0.093 | 0.072 ± 0.012 | 0.594 ± 0.097 | 1.410 ± 0.229 |
| n-Undecane | 0.522 ± 0.062 | 0.140 ± 0.017 | 0.211 ± 0.025 | 0.158 ± 0.019 | 0.384 ± 0.045 | 0.336 ± 0.040 |
| 1245tetraMeBenzene | 1.317 ± 0.091 | 0.526 ± 0.036 | 0.156 ± 0.011 | 0.129 ± 0.009 | 0.374 ± 0.026 | 1.015 ± 0.070 |
| 1235tetraMeBenzene | 1.674 ± 0.031 | 0.710 ± 0.013 | 0.194 ± 0.004 | 0.171 ± 0.003 | 0.522 ± 0.010 | 1.480 ± 0.027 |
| 1234tetraMeBenzene | 0.390 ± 0.070 | 0.248 ± 0.044 | 0.070 ± 0.012 | 0.176 ± 0.031 | 0.147 ± 0.026 | 0.182 ± 0.032 |
| n-Dodecane | 0.533 ± 0.064 | 0.320 ± 0.038 | 0.220 ± 0.027 | 0.862 ± 0.103 | 0.178 ± 0.021 | 0.277 ± 0.033 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W0-1 | W0-2 | W0-3 | W0-4 | W0-5 | W0-6 | W1-1 | W1-2 | W1-3 | W2-1 | W2-2 | W2-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gravimetric mass (mg/mi) | 0.85 ± 0.06 | 0.27 ± 0.08 | 0.50 ± 0.06 | 0.39 ± 0.06 | 0.90 ± 0.07 | 0.45 ± 0.06 | 113.12 ± 5.66 | 43.21 ± 2.17 | 59.60 ± 2.99 | 52.30 ± 2.63 | 15.30 ± 0.80 | 5.98 ± 0.32 |
| Carbon fractions by TOR (mg/mi) | | | | | | | | | | | | |
| Organic Carbon Fraction 1 | 0.297 ± 0.035 | 0.330 ± 0.054 | 0.380 ± 0.044 | 0.333 ± 0.040 | 0.432 ± 0.047 | 0.370 ± 0.043 | 30.315 ± 3.862 | 19.243 ± 2.447 | 13.521 ± 1.848 | 11.534 ± 1.330 | 1.673 ± 0.220 | 0.739 ± 0.073 |
| Organic Carbon Fraction 2 | 0.152 ± 0.019 | 0.139 ± 0.028 | 0.126 ± 0.019 | 0.178 ± 0.024 | 0.158 ± 0.022 | 0.151 ± 0.021 | 32.806 ± 4.713 | 6.533 ± 0.973 | 12.019 ± 2.088 | 9.862 ± 1.459 | 1.198 ± 0.190 | 0.516 ± 0.048 |
| Organic Carbon Fraction 3 | 0.177 ± 0.039 | 0.161 ± 0.058 | 0.110 ± 0.037 | 0.161 ± 0.043 | 0.138 ± 0.042 | 0.131 ± 0.038 | 6.667 ± 1.498 | 2.070 ± 0.492 | 5.339 ± 1.370 | 2.920 ± 0.708 | 0.987 ± 0.289 | 0.599 ± 0.094 |
| Organic Carbon Fraction 4 | 0.059 ± 0.032 | 0.026 ± 0.048 | 0.037 ± 0.035 | 0.034 ± 0.034 | 0.101 ± 0.040 | 0.041 ± 0.034 | 4.799 ± 1.228 | 0.886 ± 0.247 | 3.168 ± 0.810 | 1.375 ± 0.359 | 0.812 ± 0.273 | 0.601 ± 0.119 |
| Pyrolyzed Organic Carbon | 0.000 ± 0.005 | 0.000 ± 0.009 | 0.000 ± 0.006 | 0.004 ± 0.006 | 0.070 ± 0.025 | 0.009 ± 0.007 | 0.370 ± 0.130 | 2.526 ± 0.888 | 0.040 ± 0.030 | 0.004 ± 0.027 | 0.133 ± 0.054 | 0.071 ± 0.022 |
| Total Organic Carbon | 0.684 ± 0.062 | 0.655 ± 0.088 | 0.645 ± 0.066 | 0.710 ± 0.068 | 0.900 ± 0.078 | 0.702 ± 0.068 | 74.958 ± 5.708 | 31.258 ± 2.533 | 34.087 ± 2.917 | 25.693 ± 1.956 | 4.795 ± 0.439 | 2.503 ± 0.176 |
| Elemental Carbon Fraction 1 | 0.059 ± 0.018 | 0.014 ± 0.024 | 0.078 ± 0.026 | 0.045 ± 0.021 | 0.156 ± 0.036 | 0.068 ± 0.023 | 7.742 ± 1.999 | 1.609 ± 0.397 | 4.826 ± 1.026 | 5.015 ± 1.247 | 0.811 ± 0.225 | 1.257 ± 0.200 |
| Elemental Carbon Fraction 2 | 0.084 ± 0.022 | 0.028 ± 0.032 | 0.059 ± 0.024 | 0.040 ± 0.023 | 0.085 ± 0.025 | 0.043 ± 0.023 | 6.666 ± 1.123 | 10.889 ± 2.025 | 6.633 ± 0.941 | 17.759 ± 3.283 | 2.840 ± 0.435 | 1.436 ± 0.146 |
| Elemental Carbon Fraction 3 | 0.000 ± 0.002 | 0.000 ± 0.003 | 0.024 ± 0.020 | 0.000 ± 0.002 | 0.000 ± 0.002 | 0.000 ± 0.002 | 0.059 ± 0.049 | 0.035 ± 0.026 | 0.170 ± 0.103 | 0.075 ± 0.047 | 0.063 ± 0.036 | 0.039 ± 0.016 |
| Total Elemental Carbon | 0.143 ± 0.039 | 0.035 ± 0.053 | 0.160 ± 0.047 | 0.080 ± 0.040 | 0.171 ± 0.046 | 0.102 ± 0.041 | 14.094 ± 2.406 | 10.008 ± 2.132 | 11.589 ± 1.939 | 22.844 ± 4.953 | 3.580 ± 0.654 | 2.660 ± 0.285 |
| Total Carbon | 0.827 ± 0.080 | 0.687 ± 0.112 | 0.802 ± 0.087 | 0.788 ± 0.085 | 1.070 ± 0.096 | 0.804 ± 0.086 | 89.053 ± 6.078 | 41.266 ± 3.021 | 45.677 ± 3.317 | 48.538 ± 3.443 | 8.381 ± 0.660 | 5.158 ± 0.320 |
| Elements by XRF (mg/mi) | | | | | | | | | | | | |
| Sodium (qualitative only) | 0.0014 ± 0.0064 | 0.0048 ± 0.0103 | 0.0057 ± 0.0075 | 0.0072 ± 0.0073 | 0.0012 ± 0.0070 | 0.0000 ± 0.0073 | 0.1497 ± 0.0394 | 0.0044 ± 0.0330 | 0.0067 ± 0.0341 | 0.0000 ± 0.0324 | 0.0798 ± 0.0343 | 0.0093 ± 0.0149 |
| Magnesium (qualitative only) | 0.0005 ± 0.0064 | 0.0008 ± 0.0102 | 0.0002 ± 0.0074 | 0.0012 ± 0.0072 | 0.0041 ± 0.0070 | 0.0022 ± 0.0073 | 0.0323 ± 0.0366 | 0.0000 ± 0.0324 | 0.0112 ± 0.0337 | 0.0000 ± 0.0323 | 0.0026 ± 0.0328 | 0.0059 ± 0.0147 |
| Aluminum | 0.0006 ± 0.0043 | 0.0000 ± 0.0069 | 0.0015 ± 0.0050 | 0.0020 ± 0.0049 | 0.0034 ± 0.0047 | 0.0013 ± 0.0049 | 0.0884 ± 0.0253 | 0.0520 ± 0.0223 | 0.3477 ± 0.0296 | 0.0151 ± 0.0220 | 0.0878 ± 0.0229 | 0.0180 ± 0.0100 |
| Silicon | 0.0091 ± 0.0022 | 0.0042 ± 0.0033 | 0.0093 ± 0.0025 | 0.0045 ± 0.0024 | 0.0256 ± 0.0027 | 0.0076 ± 0.0024 | 0.3956 ± 0.0252 | 0.4679 ± 0.0276 | 4.1770 ± 0.2194 | 0.1465 ± 0.0136 | 0.9915 ± 0.0538 | 0.0717 ± 0.0061 |
| Phosphorous | 0.0019 ± 0.0004 | 0.0010 ± 0.0006 | 0.0019 ± 0.0005 | 0.0016 ± 0.0005 | 0.0052 ± 0.0005 | 0.0016 ± 0.0005 | 0.2364 ± 0.0122 | 0.0641 ± 0.0039 | 0.0572 ± 0.0036 | 0.0211 ± 0.0023 | 0.0811 ± 0.0046 | 0.0250 ± 0.0016 |
| Sulfur | 0.0121 ± 0.0010 | 0.0090 ± 0.0013 | 0.0119 ± 0.0010 | 0.0119 ± 0.0010 | 0.0298 ± 0.0017 | 0.0103 ± 0.0010 | 2.8849 ± 0.1469 | 0.4669 ± 0.0240 | 0.6226 ± 0.0318 | 0.1011 ± 0.0063 | 1.3880 ± 0.0702 | 0.1161 ± 0.0061 |
| Chlorine | 0.0010 ± 0.0004 | 0.0000 ± 0.0006 | 0.0006 ± 0.0004 | 0.0002 ± 0.0004 | 0.0021 ± 0.0004 | 0.0001 ± 0.0004 | 0.0304 ± 0.0026 | 0.0118 ± 0.0019 | 0.0558 ± 0.0034 | 0.0111 ± 0.0019 | 0.0151 ± 0.0020 | 0.0153 ± 0.0011 |
| Potassium | 0.0006 ± 0.0006 | 0.0000 ± 0.0009 | 0.0006 ± 0.0007 | 0.0007 ± 0.0007 | 0.0010 ± 0.0006 | 0.0009 ± 0.0007 | 0.0076 ± 0.0034 | 0.0002 ± 0.0030 | 0.0027 ± 0.0031 | 0.0022 ± 0.0030 | 0.0000 ± 0.0031 | 0.0033 ± 0.0014 |
| Calcium | 0.0103 ± 0.0006 | 0.0081 ± 0.0007 | 0.0122 ± 0.0008 | 0.0081 ± 0.0006 | 0.0236 ± 0.0013 | 0.0092 ± 0.0006 | 0.1876 ± 0.0097 | 0.1276 ± 0.0067 | 0.1277 ± 0.0068 | 0.0650 ± 0.0038 | 0.0686 ± 0.0040 | 0.0721 ± 0.0037 |
| Titanium | 0.0000 ± 0.0002 | 0.0000 ± 0.0003 | 0.0001 ± 0.0002 | 0.0002 ± 0.0002 | 0.0003 ± 0.0002 | 0.0002 ± 0.0002 | 0.0019 ± 0.0012 | 0.0004 ± 0.0010 | 0.0014 ± 0.0011 | 0.0019 ± 0.0010 | 0.0003 ± 0.0011 | 0.0008 ± 0.0005 |
| Vanadium | 0.0000 ± 0.0001 | 0.0001 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0001 ± 0.0001 | 0.0001 ± 0.0005 | 0.0000 ± 0.0004 | 0.0004 ± 0.0004 | 0.0002 ± 0.0004 | 0.0002 ± 0.0004 | 0.0002 ± 0.0002 |
| Chromium | 0.0010 ± 0.0003 | 0.0004 ± 0.0005 | 0.0007 ± 0.0004 | 0.0006 ± 0.0004 | 0.0020 ± 0.0004 | 0.0007 ± 0.0004 | 0.0170 ± 0.0020 | 0.0023 ± 0.0016 | 0.0088 ± 0.0018 | 0.0032 ± 0.0016 | 0.0025 ± 0.0017 | 0.0069 ± 0.0008 |
| Manganese | 0.0001 ± 0.0009 | 0.0000 ± 0.0014 | 0.0003 ± 0.0011 | 0.0003 ± 0.0010 | 0.0003 ± 0.0010 | 0.0001 ± 0.0010 | 0.0057 ± 0.0052 | 0.0004 ± 0.0046 | 0.0062 ± 0.0048 | 0.0006 ± 0.0046 | 0.0000 ± 0.0047 | 0.0010 ± 0.0021 |
| Iron | 0.0132 ± 0.0015 | 0.0064 ± 0.0022 | 0.0217 ± 0.0019 | 0.0103 ± 0.0016 | 0.0626 ± 0.0035 | 0.0274 ± 0.0021 | 0.6778 ± 0.0352 | 0.1231 ± 0.0094 | 0.4376 ± 0.0233 | 0.0430 ± 0.0073 | 0.0356 ± 0.0073 | 0.0922 ± 0.0056 |
| Cobalt | 0.0000 ± 0.0002 | 0.0001 ± 0.0002 | 0.0000 ± 0.0002 | 0.0001 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0001 ± 0.0009 | 0.0001 ± 0.0008 | 0.0004 ± 0.0008 | 0.0000 ± 0.0008 | 0.0000 ± 0.0008 | 0.0002 ± 0.0004 |
| Nickel | 0.0001 ± 0.0002 | 0.0004 ± 0.0004 | 0.0004 ± 0.0003 | 0.0002 ± 0.0003 | 0.0004 ± 0.0003 | 0.0003 ± 0.0003 | 0.0037 ± 0.0014 | 0.0011 ± 0.0012 | 0.0032 ± 0.0013 | 0.0005 ± 0.0012 | 0.0007 ± 0.0012 | 0.0022 ± 0.0006 |
| Copper | 0.0008 ± 0.0002 | 0.0003 ± 0.0003 | 0.0009 ± 0.0003 | 0.0013 ± 0.0003 | 0.0013 ± 0.0002 | 0.0003 ± 0.0002 | 0.0118 ± 0.0014 | 0.0013 ± 0.0011 | 0.0129 ± 0.0013 | 0.0026 ± 0.0011 | 0.0015 ± 0.0011 | 0.0056 ± 0.0006 |
| Zinc | 0.0051 ± 0.0007 | 0.0015 ± 0.0010 | 0.0045 ± 0.0007 | 0.0044 ± 0.0007 | 0.0081 ± 0.0008 | 0.0025 ± 0.0007 | 0.1230 ± 0.0071 | 0.0295 ± 0.0034 | 0.0594 ± 0.0044 | 0.0240 ± 0.0033 | 0.0281 ± 0.0034 | 0.0345 ± 0.0022 |
| Gallium | 0.0005 ± 0.0008 | 0.0000 ± 0.0013 | 0.0001 ± 0.0009 | 0.0001 ± 0.0009 | 0.0008 ± 0.0009 | 0.0007 ± 0.0009 | 0.0000 ± 0.0045 | 0.0016 ± 0.0040 | 0.0012 ± 0.0042 | 0.0000 ± 0.0040 | 0.0002 ± 0.0041 | 0.0006 ± 0.0018 |
| Arsenic | 0.0000 ± 0.0002 | 0.0000 ± 0.0003 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0051 ± 0.0013 | 0.0000 ± 0.0011 | 0.0005 ± 0.0011 | 0.0000 ± 0.0011 | 0.0000 ± 0.0011 | 0.0002 ± 0.0005 |
| Selenium | 0.0000 ± 0.0002 | 0.0000 ± 0.0003 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0010 | 0.0000 ± 0.0009 | 0.0000 ± 0.0009 | 0.0000 ± 0.0009 | 0.0000 ± 0.0009 | 0.0000 ± 0.0004 |
| Bromine | 0.0001 ± 0.0002 | 0.0003 ± 0.0004 | 0.0000 ± 0.0003 | 0.0002 ± 0.0003 | 0.0002 ± 0.0003 | 0.0002 ± 0.0003 | 0.0509 ± 0.0029 | 0.0154 ± 0.0014 | 0.0164 ± 0.0015 | 0.0021 ± 0.0012 | 0.0004 ± 0.0012 | 0.0005 ± 0.0005 |
| Rubidium | 0.0000 ± 0.0002 | 0.0000 ± 0.0003 | 0.0002 ± 0.0003 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0001 ± 0.0013 | 0.0004 ± 0.0011 | 0.0001 ± 0.0012 | 0.0000 ± 0.0011 | 0.0006 ± 0.0011 | 0.0002 ± 0.0005 |
| Strontium | 0.0001 ± 0.0005 | 0.0003 ± 0.0007 | 0.0006 ± 0.0005 | 0.0003 ± 0.0005 | 0.0001 ± 0.0005 | 0.0004 ± 0.0005 | 0.0002 ± 0.0026 | 0.0007 ± 0.0023 | 0.0009 ± 0.0024 | 0.0004 ± 0.0023 | 0.0002 ± 0.0023 | 0.0004 ± 0.0010 |
| Yttrium | 0.0001 ± 0.0003 | 0.0000 ± 0.0005 | 0.0000 ± 0.0003 | 0.0001 ± 0.0003 | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0000 ± 0.0017 | 0.0004 ± 0.0015 | 0.0000 ± 0.0015 | 0.0000 ± 0.0015 | 0.0002 ± 0.0015 | 0.0004 ± 0.0007 |
| Zirconium | 0.0004 ± 0.0006 | 0.0000 ± 0.0010 | 0.0000 ± 0.0007 | 0.0000 ± 0.0007 | 0.0006 ± 0.0007 | 0.0012 ± 0.0007 | 0.0000 ± 0.0035 | 0.0014 ± 0.0031 | 0.0000 ± 0.0032 | 0.0007 ± 0.0031 | 0.0000 ± 0.0032 | 0.0019 ± 0.0014 |
| Molybdenum | 0.0001 ± 0.0007 | 0.0000 ± 0.0011 | 0.0002 ± 0.0008 | 0.0000 ± 0.0008 | 0.0003 ± 0.0008 | 0.0002 ± 0.0008 | 0.0027 ± 0.0040 | 0.0002 ± 0.0036 | 0.0005 ± 0.0037 | 0.0002 ± 0.0036 | 0.0022 ± 0.0037 | 0.0015 ± 0.0016 |
| Palladium | 0.0001 ± 0.0009 | 0.0012 ± 0.0014 | 0.0002 ± 0.0010 | 0.0010 ± 0.0010 | 0.0011 ± 0.0010 | 0.0012 ± 0.0010 | 0.0025 ± 0.0050 | 0.0008 ± 0.0045 | 0.0044 ± 0.0047 | 0.0029 ± 0.0045 | 0.0009 ± 0.0045 | 0.0033 ± 0.0020 |
| Silver | 0.0006 ± 0.0007 | 0.0000 ± 0.0011 | 0.0000 ± 0.0008 | 0.0005 ± 0.0008 | 0.0007 ± 0.0007 | 0.0011 ± 0.0008 | 0.0022 ± 0.0039 | 0.0000 ± 0.0035 | 0.0017 ± 0.0036 | 0.0014 ± 0.0034 | 0.0009 ± 0.0035 | 0.0003 ± 0.0016 |
| Cadmium | 0.0000 ± 0.0009 | 0.0000 ± 0.0015 | 0.0006 ± 0.0011 | 0.0000 ± 0.0010 | 0.0001 ± 0.0010 | 0.0000 ± 0.0011 | 0.0000 ± 0.0053 | 0.0000 ± 0.0048 | 0.0000 ± 0.0049 | 0.0000 ± 0.0047 | 0.0028 ± 0.0048 | 0.0004 ± 0.0022 |
| Indium | 0.0000 ± 0.0007 | 0.0000 ± 0.0012 | 0.0000 ± 0.0008 | 0.0001 ± 0.0008 | 0.0001 ± 0.0008 | 0.0005 ± 0.0008 | 0.0000 ± 0.0042 | 0.0008 ± 0.0037 | 0.0000 ± 0.0039 | 0.0023 ± 0.0037 | 0.0017 ± 0.0038 | 0.0007 ± 0.0017 |
| Tin | 0.0010 ± 0.0009 | 0.0009 ± 0.0014 | 0.0001 ± 0.0010 | 0.0003 ± 0.0010 | 0.0000 ± 0.0010 | 0.0004 ± 0.0010 | 0.0011 ± 0.0051 | 0.0002 ± 0.0045 | 0.0000 ± 0.0047 | 0.0075 ± 0.0045 | 0.0000 ± 0.0046 | 0.0032 ± 0.0021 |
| Antimony | 0.0000 ± 0.0009 | 0.0005 ± 0.0014 | 0.0004 ± 0.0010 | 0.0005 ± 0.0010 | 0.0002 ± 0.0010 | 0.0008 ± 0.0010 | 0.0028 ± 0.0051 | 0.0024 ± 0.0046 | 0.0026 ± 0.0048 | 0.0008 ± 0.0046 | 0.0000 ± 0.0046 | 0.0023 ± 0.0021 |
| Barium | 0.0026 ± 0.0021 | 0.0005 ± 0.0033 | 0.0004 ± 0.0024 | 0.0005 ± 0.0024 | 0.0000 ± 0.0023 | 0.0014 ± 0.0024 | 0.0054 ± 0.0120 | 0.0000 ± 0.0107 | 0.0068 ± 0.0111 | 0.0102 ± 0.0107 | 0.0043 ± 0.0108 | 0.0070 ± 0.0049 |
| Lanthanum | 0.0012 ± 0.0050 | 0.0000 ± 0.0080 | 0.0020 ± 0.0058 | 0.0000 ± 0.0056 | 0.0005 ± 0.0055 | 0.0000 ± 0.0057 | 0.0055 ± 0.0286 | 0.0089 ± 0.0256 | 0.0059 ± 0.0264 | 0.0110 ± 0.0255 | 0.0000 ± 0.0258 | 0.0057 ± 0.0116 |
| Gold | 0.0000 ± 0.0010 | 0.0014 ± 0.0015 | 0.0003 ± 0.0011 | 0.0004 ± 0.0011 | 0.0005 ± 0.0011 | 0.0005 ± 0.0011 | 0.0002 ± 0.0055 | 0.0000 ± 0.0049 | 0.0000 ± 0.0051 | 0.0029 ± 0.0049 | 0.0000 ± 0.0050 | 0.0008 ± 0.0022 |
| Mercury | 0.0000 ± 0.0004 | 0.0000 ± 0.0006 | 0.0002 ± 0.0004 | 0.0003 ± 0.0004 | 0.0002 ± 0.0004 | 0.0004 ± 0.0004 | 0.0004 ± 0.0021 | 0.0000 ± 0.0019 | 0.0000 ± 0.0019 | 0.0000 ± 0.0019 | 0.0000 ± 0.0019 | 0.0003 ± 0.0009 |
| Thallium | 0.0002 ± 0.0007 | 0.0000 ± 0.0011 | 0.0001 ± 0.0008 | 0.0000 ± 0.0008 | 0.0000 ± 0.0007 | 0.0001 ± 0.0008 | 0.0001 ± 0.0039 | 0.0000 ± 0.0035 | 0.0001 ± 0.0036 | 0.0018 ± 0.0035 | 0.0003 ± 0.0035 | 0.0001 ± 0.0016 |
| Lead | 0.0004 ± 0.0007 | 0.0002 ± 0.0010 | 0.0007 ± 0.0008 | 0.0003 ± 0.0007 | 0.0014 ± 0.0007 | 0.0004 ± 0.0007 | 0.0684 ± 0.0051 | 0.0048 ± 0.0033 | 0.0457 ± 0.0042 | 0.0082 ± 0.0033 | 0.0003 ± 0.0034 | 0.0024 ± 0.0015 |
| Uranium | 0.0000 ± 0.0009 | 0.0005 ± 0.0014 | 0.0000 ± 0.0010 | 0.0004 ± 0.0010 | 0.0000 ± 0.0010 | 0.0000 ± 0.0010 | 0.0026 ± 0.0052 | 0.0006 ± 0.0046 | 0.0000 ± 0.0048 | 0.0033 ± 0.0046 | 0.0013 ± 0.0047 | 0.0002 ± 0.0021 |
| Anions by IC (mg/mi) | | | | | | | | | | | | |
| Nitrate Ion | 0.01 ± 0.00 | 0.01 ± 0.00 | 0.01 ± 0.00 | 0.01 ± 0.00 | 0.01 ± 0.00 | 0.00 ± 0.00 | 0.07 ± 0.01 | 0.02 ± 0.01 | 0.03 ± 0.01 | 0.01 ± 0.01 | 0.02 ± 0.01 | 0.02 ± 0.00 |
| Sulfate Ion | 0.03 ± 0.00 | 0.03 ± 0.00 | 0.03 ± 0.00 | 0.03 ± 0.00 | 0.05 ± 0.00 | 0.02 ± 0.00 | 8.40 ± 0.45 | 0.98 ± 0.05 | 1.11 ± 0.06 | 0.12 ± 0.01 | 2.13 ± 0.11 | 0.25 ± 0.01 |
| Polycyclic aromatic hydrocarbons (ug/mile) | | | | | | | | | | | | |
| Naphthalene | 51.40 ± 10.19 | 80.89 ± 14.99 | 49.75 ± 10.12 | 123.92 ± 21.34 | 64.48 ± 12.34 | 37.62 ± 8.28 | 4081.51 ± 627.38 | 5910.91 ± 910.03 | 4700.21 ± 721.41 | 5290.14 ± 813.27 | 2007.10 ± 311.76 | 5865.27 ± 902.14 |
| 2-methylnaphthalene | 55.38 ± 5.78 | 109.34 ± 11.39 | 71.23 ± 7.43 | 136.98 ± 14.09 | 87.69 ± 9.09 | 59.95 ± 6.26 | 9410.47 ± 956.87 | 12495.84 ± 1280.70 | 16274.70 ± 1652.13 | 18396.17 ± 1875.71 | 1686.84 ± 173.50 | 11540.78 ± 1179.57 |
| 1-methylnaphthalene | 24.78 ± 2.80 | 47.01 ± 5.25 | 29.01 ± 3.27 | 57.50 ± 6.33 | 37.04 ± 4.13 | 25.62 ± 2.89 | 5346.25 ± 577.52 | 6622.75 ± 720.47 | 9824.14 ± 1059.65 | 10660.97 ± 1154.41 | 764.52 ± 83.51 | 5654.05 ± 613.61 |
| Biphenyl | 2.87 ± 0.41 | 4.76 ± 0.67 | 2.97 ± 0.43 | 4.68 ± 0.64 | 3.80 ± 0.54 | 2.74 ± 0.40 | 589.43 ± 75.66 | 467.30 ± 60.30 | 750.63 ± 96.24 | 980.79 ± 126.09 | 48.83 ± 6.38 | 414.04 ± 53.35 |
| 1+2ethylnaphthalene | 20.89 ± 3.03 | 24.16 ± 3.50 | 10.24 ± 1.59 | 15.01 ± 2.24 | 16.23 ± 2.41 | 15.31 ± 2.28 | 1217.18 ± 166.27 | 1439.55 ± 197.47 | 1964.00 ± 267.90 | 2213.12 ± 302.60 | 185.05 ± 25.65 | 997.31 ± 136.70 |
| 2,6+2,7-dimethylnaphthalene | 8.22 ± 1.04 | 11.69 ± 1.50 | 7.88 ± 1.01 | 13.20 ± 1.64 | 9.86 ± 1.24 | 6.59 ± 0.86 | 1396.61 ± 167.69 | 1156.44 ± 139.68 | 2283.57 ± 273.84 | 2525.65 ± 303.83 | 177.23 ± 21.52 | 992.13 ± 119.61 |
| 1,3+1,6+1,7dimethylnaphth | 13.28 ± 1.70 | 18.71 ± 2.42 | 12.10 ± 1.58 | 20.74 ± 2.61 | 15.23 ± 1.95 | 9.92 ± 1.31 | 2129.17 ± 257.46 | 1682.82 ± 204.69 | 3303.98 ± 399.00 | 3731.02 ± 451.96 | 281.50 ± 34.43 | 1379.09 ± 167.45 |
| 1,4+1,5+2,3-dimethylnaphth | 0.89 ± 0.34 | 3.66 ± 0.83 | 1.87 ± 0.46 | 1.88 ± 0.46 | 0.58 ± 0.40 | 1.03 ± 0.42 | 585.96 ± 68.46 | 362.92 ± 42.70 | 778.60 ± 90.85 | 586.16 ± 68.65 | 28.08 ± 3.63 | 264.79 ± 31.12 |
| 1,2-dimethylnaphthalene | 1.32 ± 0.27 | 1.88 ± 0.50 | 1.44 ± 0.31 | 2.17 ± 0.38 | 1.63 ± 0.33 | 1.00 ± 0.28 | 1090.95 ± 145.82 | 551.67 ± 74.09 | 1260.23 ± 168.31 | 1568.63 ± 210.03 | 32.43 ± 4.46 | 955.66 ± 128.14 |
| 2-Methylbiphenyl | 0.00 ± 16.31 | 55.40 ± 25.35 | 0.00 ± 11.29 | 0.00 ± 10.87 | 0.00 ± 13.34 | 0.00 ± 11.03 | 0.00 ± 25.99 | 0.00 ± 23.19 | 0.00 ± 26.09 | 45.40 ± 35.31 | 0.00 ± 26.09 | 0.00 ± 25.43 |
| 3-Methylbiphenyl | 0.00 ± 3.85 | 25.51 ± 7.26 | 0.00 ± 3.11 | 0.00 ± 2.98 | 0.00 ± 3.84 | 0.00 ± 2.91 | 247.43 ± 30.39 | 94.05 ± 15.59 | 288.56 ± 34.37 | 460.76 ± 52.02 | 0.00 ± 7.58 | 114.80 ± 17.92 |
| 4-Methylbiphenyl | 0.00 ± 1.37 | 7.31 ± 2.45 | 0.00 ± 1.17 | 0.00 ± 1.11 | 0.00 ± 1.32 | 0.00 ± 1.10 | 132.75 ± 14.09 | 46.04 ± 6.42 | 139.50 ± 14.66 | 218.78 ± 22.08 | 2.48 ± 3.06 | 46.04 ± 6.55 |
| Dibenzofuran | 1.29 ± 0.15 | 1.16 ± 0.15 | 0.90 ± 0.11 | 1.52 ± 0.18 | 0.00 ± 0.04 | 0.00 ± 0.04 | 51.04 ± 5.65 | 52.10 ± 5.81 | 53.73 ± 5.94 | 50.78 ± 5.64 | 11.30 ± 1.28 | 45.47 ± 5.06 |
| A-trimethylnaphthalene | 1.65 ± 0.15 | 2.04 ± 0.20 | 1.33 ± 0.13 | 2.30 ± 0.21 | 1.58 ± 0.15 | 1.06 ± 0.11 | 240.31 ± 21.07 | 156.27 ± 13.85 | 338.39 ± 29.61 | 326.42 ± 28.73 | 27.34 ± 2.45 | 118.98 ± 10.51 |
| 1-ethyl-2-methylnaphthalene | 0.31 ± 0.04 | 0.38 ± 0.07 | 0.27 ± 0.04 | 0.46 ± 0.05 | 0.33 ± 0.04 | 0.20 ± 0.04 | 47.68 ± 3.65 | 29.19 ± 2.27 | 61.26 ± 4.68 | 54.17 ± 4.17 | 5.20 ± 0.43 | 21.61 ± 1.67 |
| B-trimethylnaphthalene | 2.22 ± 0.34 | 1.97 ± 0.32 | 1.36 ± 0.23 | 2.44 ± 0.38 | 1.91 ± 0.30 | 1.19 ± 0.20 | 174.90 ± 25.29 | 79.22 ± 11.52 | 255.01 ± 36.82 | 410.19 ± 59.34 | 25.38 ± 3.73 | 133.32 ± 19.34 |
| C-trimethylnaphthalene | 1.71 ± 0.15 | 1.80 ± 0.17 | 1.19 ± 0.11 | 1.84 ± 0.16 | 1.52 ± 0.13 | 0.86 ± 0.08 | 184.48 ± 14.76 | 86.46 ± 7.02 | 235.86 ± 18.83 | 222.65 ± 17.90 | 20.23 ± 1.66 | 81.80 ± 6.61 |
| 2-ethyl-1-methylnaphthalene | 0.02 ± 0.03 | 0.03 ± 0.07 | 0.01 ± 0.04 | 0.03 ± 0.04 | 0.04 ± 0.04 | 0.02 ± 0.04 | 5.57 ± 0.73 | 3.37 ± 0.46 | 7.73 ± 1.00 | 6.47 ± 0.85 | 0.49 ± 0.14 | 2.66 ± 0.37 |
| E-trimethylnaphthalene | 0.92 ± 0.09 | 1.00 ± 0.12 | 0.67 ± 0.08 | 1.17 ± 0.12 | 0.89 ± 0.09 | 0.53 ± 0.07 | 137.40 ± 12.35 | 54.31 ± 4.94 | 162.67 ± 14.59 | 148.98 ± 13.44 | 11.44 ± 1.06 | 53.35 ± 4.84 |
| F-trimethylnaphthalene | 1.01 ± 0.12 | 1.10 ± 0.15 | 0.72 ± 0.09 | 1.19 ± 0.14 | 0.96 ± 0.12 | 0.56 ± 0.08 | 112.28 ± 12.31 | 52.58 ± 5.81 | 144.41 ± 15.80 | 135.59 ± 14.90 | 13.29 ± 1.49 | 51.64 ± 5.69 |
| 2,3,5+I-trimethylnaphthalene | 1.32 ± 0.16 | 1.36 ± 0.18 | 0.94 ± 0.12 | 1.54 ± 0.18 | 1.19 ± 0.15 | 0.64 ± 0.09 | 141.28 ± 15.64 | 62.35 ± 6.96 | 171.02 ± 18.91 | 160.59 ± 17.82 | 13.93 ± 1.58 | 61.74 ± 6.88 |
| 2,4,5-trimethylnaphthalene | 0.26 ± 0.05 | 0.25 ± 0.08 | 0.10 ± 0.04 | 0.22 ± 0.05 | 0.20 ± 0.05 | 0.15 ± 0.04 | 29.15 ± 4.31 | 12.75 ± 1.91 | 30.19 ± 4.47 | 24.81 ± 3.68 | 1.84 ± 0.31 | 9.46 ± 1.42 |
| J-trimethylnaphthalene | 0.31 ± 0.05 | 0.16 ± 0.07 | 0.21 ± 0.04 | 0.35 ± 0.06 | 0.09 ± 0.04 | 0.06 ± 0.04 | 68.65 ± 7.90 | 26.42 ± 3.07 | 74.02 ± 8.51 | 87.29 ± 10.08 | 3.19 ± 0.40 | 24.31 ± 2.82 |
| 1,4,5-trimethylnaphthalene | 0.03 ± 0.03 | 0.11 ± 0.07 | 0.03 ± 0.04 | 0.08 ± 0.04 | 0.10 ± 0.05 | 0.03 ± 0.04 | 26.37 ± 4.30 | 11.35 ± 1.87 | 28.71 ± 4.68 | 26.74 ± 4.37 | 1.46 ± 0.29 | 8.50 ± 1.41 |
| Acenaphthylene | 2.16 ± 0.31 | 5.40 ± 0.73 | 5.61 ± 0.66 | 4.96 ± 0.59 | 3.82 ± 0.48 | 1.41 ± 0.29 | 477.44 ± 51.17 | 260.61 ± 28.15 | 462.42 ± 49.50 | 653.11 ± 70.17 | 66.40 ± 7.25 | 1426.55 ± 153.56 |
| Acenaphthene | 1.27 ± 0.53 | 0.00 ± 0.38 | 0.00 ± 0.41 | 0.00 ± 0.39 | 0.00 ± 0.26 | 0.00 ± 0.27 | 57.97 ± 5.31 | 358.67 ± 30.49 | 77.35 ± 6.88 | 82.10 ± 7.35 | 16.64 ± 2.03 | 57.19 ± 5.31 |
| Fluorene | 3.65 ± 0.38 | 3.16 ± 0.35 | 1.92 ± 0.21 | 3.42 ± 0.36 | 3.53 ± 0.38 | 2.31 ± 0.25 | 256.67 ± 26.32 | 189.69 ± 19.62 | 290.88 ± 29.78 | 458.55 ± 47.11 | 55.02 ± 5.74 | 336.73 ± 34.69 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W0-1 | W0-2 | W0-3 | W0-4 | W0-5 | W0-6 | W1-1 | W1-2 | W1-3 | W2-1 | W2-2 | W2-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dibenzothiophene | 0.17 ± 0.04 | 0.17 ± 0.07 | 0.15 ± 0.04 | 0.21 ± 0.05 | 0.17 ± 0.04 | 0.07 ± 0.04 | 7.88 ± 0.95 | 5.43 ± 0.66 | 6.80 ± 0.82 | 6.41 ± 0.78 | 1.31 ± 0.21 | 5.14 ± 0.63 |
| Phenanthrene | 14.66 ± 1.64 | 11.84 ± 1.36 | 8.16 ± 0.96 | 14.76 ± 1.66 | 11.59 ± 1.33 | 8.15 ± 0.96 | 877.20 ± 93.45 | 536.59 ± 57.64 | 741.64 ± 78.93 | 1466.54 ± 156.57 | 111.00 ± 12.05 | 908.52 ± 97.25 |
| Anthracene | 0.01 ± 0.02 | 1.79 ± 0.26 | 0.97 ± 0.14 | 0.71 ± 0.11 | 0.96 ± 0.14 | 1.48 ± 0.21 | 217.94 ± 29.59 | 124.71 ± 17.01 | 197.89 ± 26.84 | 454.31 ± 61.75 | 13.84 ± 1.90 | 196.90 ± 26.81 |
| A-methylfluorene | 1.40 ± 0.17 | 1.36 ± 0.18 | 0.71 ± 0.10 | 1.59 ± 0.19 | 1.46 ± 0.18 | 0.58 ± 0.09 | 132.39 ± 14.36 | 55.35 ± 6.07 | 141.57 ± 15.34 | 119.47 ± 13.01 | 16.16 ± 1.80 | 55.84 ± 6.11 |
| 1-methylfluorene | 0.98 ± 0.13 | 1.05 ± 0.15 | 0.67 ± 0.09 | 1.28 ± 0.16 | 1.01 ± 0.13 | 0.44 ± 0.07 | 68.03 ± 7.81 | 36.27 ± 4.20 | 74.95 ± 8.60 | 72.59 ± 8.36 | 12.07 ± 1.42 | 35.91 ± 4.16 |
| B-methylfluorene | 0.30 ± 0.07 | 0.31 ± 0.09 | 0.20 ± 0.06 | 0.42 ± 0.08 | 0.22 ± 0.06 | 0.18 ± 0.05 | 25.52 ± 4.76 | 12.09 ± 2.27 | 36.01 ± 6.71 | 20.98 ± 3.93 | 4.71 ± 0.91 | 12.31 ± 2.31 |
| 9-fluorenone | 0.00 ± 0.07 | 0.00 ± 0.08 | 2.58 ± 0.33 | 0.64 ± 0.14 | 0.00 ± 0.06 | 0.08 ± 0.05 | 152.32 ± 17.50 | 153.41 ± 17.74 | 68.22 ± 7.87 | 131.37 ± 15.14 | 33.52 ± 3.94 | 132.15 ± 15.26 |
| Xanthone | 1.06 ± 0.15 | 1.17 ± 0.18 | 1.65 ± 0.22 | 2.50 ± 0.35 | 0.16 ± 0.05 | 0.86 ± 0.13 | 96.35 ± 13.49 | 31.15 ± 4.39 | 59.78 ± 8.37 | 50.96 ± 7.16 | 4.89 ± 0.72 | 23.65 ± 3.34 |
| Acenaphthenequinone | 2.58 ± 0.33 | 0.18 ± 0.08 | 0.21 ± 0.06 | 1.31 ± 0.17 | 0.76 ± 0.11 | 0.77 ± 0.11 | 20.66 ± 2.61 | 0.00 ± 0.14 | 30.06 ± 3.76 | 31.93 ± 4.00 | 0.86 ± 0.21 | 0.00 ± 0.15 |
| Perinaphthenone | 2.29 ± 0.35 | 5.68 ± 0.77 | 11.24 ± 1.50 | 6.23 ± 0.81 | 3.08 ± 0.41 | 2.10 ± 0.29 | 186.86 ± 33.67 | 58.23 ± 10.54 | 180.46 ± 32.50 | 88.60 ± 16.00 | 11.53 ± 2.12 | 71.66 ± 12.95 |
| 2-methylanthracene | 1.30 ± 0.14 | 1.61 ± 0.18 | 0.51 ± 0.07 | 1.09 ± 0.12 | 0.91 ± 0.10 | 0.68 ± 0.08 | 79.93 ± 8.06 | 31.07 ± 3.17 | 72.17 ± 7.27 | 86.59 ± 8.76 | 2.29 ± 0.27 | 23.06 ± 2.35 |
| 3-methylphenanthrene | 3.69 ± 0.28 | 3.94 ± 0.31 | 2.09 ± 0.17 | 3.37 ± 0.26 | 3.20 ± 0.25 | 1.71 ± 0.14 | 190.22 ± 14.04 | 72.26 ± 5.43 | 146.84 ± 10.81 | 171.85 ± 12.76 | 15.81 ± 1.21 | 55.87 ± 4.18 |
| 2-methylphenanthrene | 4.60 ± 0.45 | 4.81 ± 0.48 | 2.74 ± 0.28 | 4.26 ± 0.42 | 4.28 ± 0.42 | 2.05 ± 0.22 | 198.55 ± 18.67 | 80.02 ± 7.62 | 155.75 ± 14.63 | 184.04 ± 17.37 | 18.83 ± 1.82 | 62.69 ± 5.96 |
| 9-methylphenanthrene | 2.13 ± 0.21 | 1.68 ± 0.18 | 0.98 ± 0.10 | 1.92 ± 0.19 | 1.62 ± 0.17 | 0.90 ± 0.10 | 86.12 ± 8.61 | 37.61 ± 3.80 | 79.54 ± 7.94 | 108.07 ± 10.83 | 5.32 ± 0.56 | 35.90 ± 3.62 |
| 1-methylphenanthrene | 3.73 ± 0.63 | 6.48 ± 1.09 | 2.85 ± 0.48 | 5.40 ± 0.91 | 3.85 ± 0.65 | 2.09 ± 0.36 | 104.70 ± 17.65 | 45.80 ± 7.75 | 78.98 ± 13.31 | 103.60 ± 17.48 | 9.63 ± 1.64 | 36.64 ± 6.20 |
| Anthrone | 0.04 ± 0.03 | 0.56 ± 0.14 | 0.14 ± 0.05 | 0.05 ± 0.04 | 0.88 ± 0.19 | 0.14 ± 0.05 | 6.83 ± 1.46 | 1.53 ± 0.37 | 3.85 ± 0.84 | 4.22 ± 0.92 | 0.00 ± 0.13 | 1.23 ± 0.31 |
| Anthraquinone | 3.52 ± 0.45 | 3.41 ± 0.49 | 8.15 ± 0.94 | 6.68 ± 0.86 | 3.12 ± 0.45 | 1.04 ± 0.19 | 129.24 ± 17.83 | 44.19 ± 6.20 | 82.23 ± 11.38 | 95.57 ± 13.24 | 34.16 ± 4.83 | 88.24 ± 12.25 |
| 3,6-dimethylphenanthrene | 1.73 ± 0.18 | 1.76 ± 0.20 | 0.68 ± 0.08 | 1.66 ± 0.18 | 1.59 ± 0.17 | 0.50 ± 0.07 | 30.94 ± 3.19 | 11.85 ± 1.25 | 20.85 ± 2.16 | 23.83 ± 2.47 | 2.18 ± 0.27 | 6.99 ± 0.75 |
| A-dimethylphenanthrene | 1.69 ± 0.18 | 2.56 ± 0.28 | 1.61 ± 0.18 | 2.00 ± 0.22 | 1.93 ± 0.21 | 0.99 ± 0.11 | 44.59 ± 4.80 | 15.79 ± 1.72 | 28.98 ± 3.12 | 32.97 ± 3.56 | 3.02 ± 0.36 | 9.89 ± 1.08 |
| B-dimethylphenanthrene | 1.40 ± 0.16 | 1.71 ± 0.20 | 0.68 ± 0.09 | 1.12 ± 0.13 | 0.60 ± 0.08 | 0.61 ± 0.08 | 25.40 ± 2.88 | 11.07 ± 1.27 | 17.26 ± 1.96 | 19.22 ± 2.18 | 2.74 ± 0.34 | 6.49 ± 0.75 |
| C-dimethylphenanthrene | 3.93 ± 0.33 | 3.49 ± 0.30 | 1.53 ± 0.14 | 3.70 ± 0.31 | 3.27 ± 0.28 | 1.15 ± 0.10 | 71.89 ± 5.96 | 23.22 ± 1.96 | 48.04 ± 3.98 | 50.43 ± 4.21 | 3.35 ± 0.32 | 15.78 ± 1.33 |
| D-dimethylphenanthrene | 1.27 ± 0.14 | 0.96 ± 0.13 | 0.60 ± 0.08 | 1.19 ± 0.14 | 1.07 ± 0.12 | 0.41 ± 0.06 | 19.76 ± 2.17 | 6.38 ± 0.72 | 10.61 ± 1.17 | 13.67 ± 1.51 | 1.24 ± 0.20 | 4.69 ± 0.54 |
| 1,7-dimethylphenanthrene | 2.39 ± 0.20 | 2.18 ± 0.19 | 0.93 ± 0.09 | 2.16 ± 0.18 | 1.87 ± 0.16 | 0.78 ± 0.07 | 41.12 ± 3.37 | 14.65 ± 1.22 | 32.83 ± 2.68 | 23.02 ± 1.90 | 2.00 ± 0.21 | 9.54 ± 0.80 |
| E-dimethylphenanthrene | 1.69 ± 0.16 | 1.52 ± 0.15 | 0.82 ± 0.08 | 1.97 ± 0.18 | 1.41 ± 0.13 | 0.50 ± 0.06 | 26.83 ± 2.46 | 9.61 ± 0.90 | 18.41 ± 1.69 | 17.86 ± 1.65 | 1.71 ± 0.21 | 6.52 ± 0.62 |
| 9-methylanthracene | 0.21 ± 0.05 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.09 ± 0.04 | 0.00 ± 0.04 | 3.74 ± 0.63 | 2.03 ± 0.36 | 5.38 ± 0.89 | 6.41 ± 1.05 | 0.00 ± 0.13 | 1.42 ± 0.29 |
| Fluoranthene | 21.16 ± 1.60 | 18.53 ± 1.43 | 17.69 ± 1.34 | 32.12 ± 2.42 | 19.22 ± 1.45 | 12.45 ± 0.94 | 188.61 ± 14.28 | 146.04 ± 11.22 | 183.33 ± 13.85 | 442.87 ± 33.68 | 43.82 ± 3.40 | 258.94 ± 19.78 |
| Pyrene | 27.40 ± 2.44 | 23.32 ± 2.12 | 27.09 ± 2.42 | 50.66 ± 4.51 | 26.64 ± 2.38 | 16.01 ± 1.43 | 280.79 ± 25.15 | 222.44 ± 20.14 | 268.57 ± 24.02 | 516.74 ± 46.42 | 39.06 ± 3.59 | 271.61 ± 24.50 |
| 9-Anthraaldehyde | 1.17 ± 0.31 | 0.72 ± 0.20 | 1.68 ± 0.45 | 3.45 ± 0.90 | 0.32 ± 0.10 | 0.34 ± 0.10 | 4.01 ± 1.09 | 1.14 ± 0.35 | 1.15 ± 0.35 | 1.70 ± 0.49 | 0.08 ± 0.14 | 0.69 ± 0.25 |
| Retene | 0.23 ± 0.06 | 0.00 ± 0.09 | 0.15 ± 0.06 | 0.27 ± 0.07 | 0.00 ± 0.05 | 0.05 ± 0.05 | 1.35 ± 0.31 | 0.71 ± 0.22 | 0.97 ± 0.26 | 0.59 ± 0.23 | 0.24 ± 0.19 | 0.39 ± 0.20 |
| Benzonaphthothiophene | 0.04 ± 0.06 | 0.01 ± 0.13 | 0.02 ± 0.07 | 0.02 ± 0.07 | 0.02 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.26 | 0.00 ± 0.26 | 0.18 ± 0.26 | 0.00 ± 0.28 | 0.00 ± 0.26 | 0.00 ± 0.28 |
| 1+3-methylfluoranthene | 1.90 ± 0.24 | 1.95 ± 0.26 | 1.56 ± 0.20 | 2.29 ± 0.29 | 1.61 ± 0.21 | 0.95 ± 0.13 | 18.57 ± 2.45 | 8.15 ± 1.09 | 13.69 ± 1.80 | 15.86 ± 2.10 | 2.24 ± 0.33 | 8.91 ± 1.19 |
| 1-MeFl+C-MeFl/Py | 2.84 ± 0.28 | 2.28 ± 0.24 | 1.62 ± 0.16 | 2.68 ± 0.26 | 1.90 ± 0.19 | 1.16 ± 0.12 | 18.45 ± 1.87 | 9.24 ± 0.95 | 15.80 ± 1.60 | 17.40 ± 1.77 | 2.55 ± 0.29 | 8.91 ± 0.91 |
| B-MePy/MeFl | 3.86 ± 0.32 | 3.80 ± 0.32 | 1.81 ± 0.15 | 3.32 ± 0.27 | 2.62 ± 0.21 | 1.74 ± 0.14 | 36.33 ± 3.09 | 11.14 ± 0.97 | 28.15 ± 2.39 | 42.90 ± 3.66 | 2.75 ± 0.27 | 17.93 ± 1.54 |
| C-MePy/MeFl | 2.73 ± 0.21 | 2.92 ± 0.24 | 1.24 ± 0.10 | 2.14 ± 0.17 | 1.84 ± 0.15 | 1.36 ± 0.11 | 29.54 ± 2.41 | 9.16 ± 0.77 | 21.75 ± 1.77 | 36.37 ± 2.98 | 2.18 ± 0.22 | 14.91 ± 1.24 |
| D-MePy/MeFl | 2.01 ± 0.24 | 1.36 ± 0.18 | 1.33 ± 0.16 | 1.94 ± 0.24 | 1.53 ± 0.19 | 0.85 ± 0.11 | 19.70 ± 2.48 | 8.05 ± 1.02 | 13.02 ± 1.64 | 13.65 ± 1.73 | 1.94 ± 0.28 | 7.64 ± 0.98 |
| 4-methylpyrene | 1.96 ± 0.21 | 1.31 ± 0.16 | 1.11 ± 0.13 | 1.93 ± 0.21 | 1.34 ± 0.15 | 0.77 ± 0.09 | 16.99 ± 1.90 | 7.26 ± 0.83 | 12.34 ± 1.38 | 14.55 ± 1.63 | 1.38 ± 0.20 | 7.14 ± 0.81 |
| 1-methylpyrene | 3.27 ± 0.31 | 1.62 ± 0.17 | 0.89 ± 0.09 | 5.86 ± 0.56 | 5.97 ± 0.57 | 0.77 ± 0.08 | 16.12 ± 1.56 | 5.92 ± 0.59 | 12.21 ± 1.18 | 14.70 ± 1.43 | 0.79 ± 0.15 | 5.78 ± 0.58 |
| Benzo(c)phenanthrene | 1.89 ± 0.25 | 1.36 ± 0.19 | 0.68 ± 0.09 | 0.81 ± 0.11 | 1.14 ± 0.15 | 1.12 ± 0.15 | 11.92 ± 1.67 | 5.50 ± 0.79 | 8.42 ± 1.18 | 17.71 ± 2.47 | 2.70 ± 0.41 | 7.55 ± 1.06 |
| Benzo(ghi)fluoranthene | 8.83 ± 0.69 | 18.96 ± 1.62 | 5.49 ± 0.43 | 3.94 ± 0.29 | 11.65 ± 0.96 | 12.32 ± 1.03 | 143.34 ± 12.49 | 90.54 ± 7.98 | 136.15 ± 11.84 | 208.93 ± 18.28 | 33.71 ± 2.98 | 107.82 ± 9.47 |
| Cyclopenta(c,d)pyrene | 2.27 ± 0.26 | 1.62 ± 0.22 | 1.47 ± 0.19 | 1.28 ± 0.17 | 0.16 ± 0.04 | 0.71 ± 0.10 | 142.88 ± 22.62 | 15.34 ± 2.45 | 59.97 ± 9.50 | 77.12 ± 12.24 | 3.22 ± 0.54 | 40.99 ± 6.51 |
| Benz(a)anthracene | 4.19 ± 0.48 | 3.63 ± 0.49 | 1.59 ± 0.24 | 2.69 ± 0.35 | 2.75 ± 0.36 | 1.86 ± 0.23 | 59.16 ± 8.44 | 17.55 ± 2.55 | 38.02 ± 5.44 | 74.79 ± 10.68 | 5.23 ± 0.85 | 31.01 ± 4.45 |
| Triphenylene | 0.66 ± 0.06 | 0.30 ± 0.07 | 0.09 ± 0.04 | 0.53 ± 0.05 | 0.48 ± 0.05 | 0.89 ± 0.08 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| Chrysene | 5.72 ± 0.39 | 3.80 ± 0.28 | 2.70 ± 0.18 | 3.63 ± 0.25 | 3.90 ± 0.26 | 3.32 ± 0.23 | 66.75 ± 5.48 | 18.70 ± 1.57 | 39.89 ± 3.28 | 86.44 ± 7.13 | 8.84 ± 0.76 | 36.14 ± 3.00 |
| Benzanthrone | 2.38 ± 0.38 | 1.52 ± 0.26 | 2.48 ± 0.40 | 2.29 ± 0.37 | 1.99 ± 0.32 | 2.25 ± 0.37 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| 7-methylbenz(a)anthracene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.02 ± 0.04 | 0.00 ± 0.04 | 1.80 ± 1.03 | 0.00 ± 0.13 | 0.54 ± 0.34 | 1.00 ± 0.59 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| 3-methylchrysene | 0.27 ± 0.04 | 0.16 ± 0.07 | 0.15 ± 0.04 | 0.20 ± 0.04 | 0.16 ± 0.04 | 0.13 ± 0.04 | 8.88 ± 0.93 | 1.99 ± 0.25 | 4.37 ± 0.48 | 6.67 ± 0.71 | 0.45 ± 0.14 | 2.07 ± 0.26 |
| Benz(a)anthracene-7,12-dione | 0.52 ± 0.10 | 0.38 ± 0.10 | 0.50 ± 0.11 | 0.57 ± 0.12 | 0.45 ± 0.10 | 0.48 ± 0.10 | 9.07 ± 1.82 | 2.50 ± 0.53 | 6.95 ± 1.40 | 3.58 ± 0.74 | 1.53 ± 0.34 | 2.47 ± 0.52 |
| 5+6-methylchrysene | 0.09 ± 0.03 | 0.00 ± 0.07 | 0.01 ± 0.04 | 0.03 ± 0.04 | 0.02 ± 0.04 | 0.02 ± 0.04 | 7.73 ± 1.31 | 0.00 ± 0.13 | 1.23 ± 0.25 | 1.81 ± 0.34 | 0.06 ± 0.13 | 0.70 ± 0.18 |
| Benzo(b+j+k)fluoranthene | 1.40 ± 0.26 | 0.47 ± 0.17 | 3.60 ± 0.70 | 0.49 ± 0.13 | 1.01 ± 0.18 | 0.51 ± 0.14 | 28.07 ± 6.09 | 8.17 ± 1.85 | 13.35 ± 2.95 | 89.15 ± 19.13 | 10.61 ± 2.37 | 28.79 ± 6.26 |
| Benzo(a)fluoranthene | 0.14 ± 0.04 | 0.03 ± 0.07 | 0.15 ± 0.05 | 0.00 ± 0.04 | 0.08 ± 0.04 | 0.04 ± 0.04 | 3.19 ± 0.67 | 0.59 ± 0.18 | 1.73 ± 0.39 | 10.60 ± 2.17 | 2.97 ± 0.63 | 5.37 ± 1.11 |
| BeP | 0.60 ± 0.07 | 0.33 ± 0.08 | 1.16 ± 0.14 | 0.48 ± 0.06 | 0.53 ± 0.06 | 0.36 ± 0.05 | 38.79 ± 4.33 | 12.25 ± 1.38 | 31.08 ± 3.46 | 38.59 ± 4.32 | 2.69 ± 0.33 | 20.26 ± 2.28 |
| BaP | 0.44 ± 0.10 | 0.02 ± 0.21 | 0.98 ± 0.15 | 0.07 ± 0.12 | 0.04 ± 0.12 | 0.02 ± 0.12 | 48.41 ± 4.60 | 11.66 ± 1.19 | 49.88 ± 4.73 | 66.81 ± 6.36 | 1.42 ± 0.44 | 37.82 ± 3.63 |
| Perylene | 0.01 ± 0.03 | 0.02 ± 0.07 | 0.22 ± 0.05 | 0.00 ± 0.04 | 0.05 ± 0.04 | 0.00 ± 0.04 | 8.81 ± 1.66 | 2.55 ± 0.50 | 6.87 ± 1.29 | 12.75 ± 2.39 | 1.65 ± 0.34 | 7.12 ± 1.35 |
| 7-methylbenzo(a)pyrene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.19 ± 0.09 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 5.69 ± 1.61 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| 9,10-dihydrobenzo(a)pyrene-7(8H)-one | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.24 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| Dibenzo(a,j)anthracene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 6.95 ± 1.37 | 0.83 ± 0.21 | 3.06 ± 0.61 | 2.88 ± 0.59 | 0.00 ± 0.13 | 1.54 ± 0.34 |
| Indeno[123-cd]pyrene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 77.90 ± 15.05 | 14.23 ± 2.78 | 44.22 ± 8.55 | 83.67 ± 16.18 | 2.55 ± 0.53 | 36.33 ± 7.04 |
| Dibenzo(ah+ac)anthracene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 3.88 ± 0.52 | 0.38 ± 0.14 | 1.02 ± 0.19 | 3.57 ± 0.48 | 0.00 ± 0.13 | 1.38 ± 0.24 |
| Benzo(b)chrysene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 2.36 ± 0.52 | 0.27 ± 0.15 | 1.31 ± 0.32 | 2.67 ± 0.59 | 0.00 ± 0.13 | 0.86 ± 0.24 |
| Picene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 6.71 ± 1.23 | 0.47 ± 0.16 | 1.35 ± 0.28 | 3.78 ± 0.70 | 0.00 ± 0.13 | 1.53 ± 0.32 |
| Benzo(ghi)perylene | 0.13 ± 0.10 | 0.00 ± 0.23 | 0.00 ± 0.13 | 0.07 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 203.06 ± 26.82 | 50.43 ± 6.71 | 127.86 ± 16.88 | 165.40 ± 21.88 | 1.25 ± 0.49 | 63.34 ± 8.41 |
| Anthanthrene | 0.01 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 14.83 ± 2.16 | 4.43 ± 0.67 | 14.52 ± 2.11 | 31.01 ± 4.51 | 0.00 ± 0.13 | 12.94 ± 1.90 |
| Dibenzo(b,k)fluoranthene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 4.00 ± 0.56 | 0.56 ± 0.15 | 3.20 ± 0.45 | 5.34 ± 0.73 | 0.28 ± 0.14 | 3.62 ± 0.51 |
| Dibenzo(a,e)pyrene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 12.16 ± 2.22 | 2.58 ± 0.49 | 10.31 ± 1.89 | 11.50 ± 2.10 | 0.00 ± 0.13 | 6.37 ± 1.17 |
| Coronene | 0.17 ± 0.04 | 0.00 ± 0.07 | 0.09 ± 0.04 | 0.06 ± 0.04 | 0.07 ± 0.04 | 0.09 ± 0.04 | 83.48 ± 11.02 | 23.06 ± 3.06 | 79.19 ± 10.44 | 70.27 ± 9.29 | 3.34 ± 0.46 | 28.51 ± 3.78 |
| Dibenzo(a,h)pyrene | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.01 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.16 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| nitro-PAH (ug/mile) | | | | | | | | | | | | |
| 1-nitronaphthalene | 0.0000 ± 0.0023 | 0.0157 ± 0.0039 | 0.0043 ± 0.0029 | 0.0002 ± 0.0023 | 0.0000 ± 0.0021 | 0.0000 ± 0.0025 | 0.9942 ± 0.0903 | 0.2246 ± 0.0228 | 0.5651 ± 0.0524 | 0.2109 ± 0.0216 | 0.2146 ± 0.0220 | 0.1401 ± 0.0155 |
| 2-nitronaphthalene | 0.0050 ± 0.0028 | 0.0036 ± 0.0030 | 0.0017 ± 0.0027 | 0.0076 ± 0.0032 | 0.0000 ± 0.0016 | 0.0000 ± 0.0019 | 2.1823 ± 0.2711 | 0.5336 ± 0.0687 | 1.1204 ± 0.1403 | 0.4881 ± 0.0630 | 0.4300 ± 0.0560 | 0.2443 ± 0.0331 |
| 2-nitrobiphenyl | 0.0046 ± 0.0010 | 0.0000 ± 0.0003 | 0.0002 ± 0.0003 | 0.0003 ± 0.0004 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0971 ± 0.0167 | 0.0181 ± 0.0034 | 0.0757 ± 0.0131 | 0.0204 ± 0.0038 | 0.0121 ± 0.0024 | 0.0085 ± 0.0019 |
| 3-nitrobiphenyl | 0.0000 ± 0.0001 | 0.0035 ± 0.0007 | 0.0013 ± 0.0004 | 0.0001 ± 0.0002 | 0.0016 ± 0.0004 | 0.0000 ± 0.0001 | 0.0803 ± 0.0136 | 0.0166 ± 0.0030 | 0.0308 ± 0.0053 | 0.0191 ± 0.0034 | 0.0177 ± 0.0031 | 0.0128 ± 0.0023 |
| 4-nitrobiphenyl | 0.0000 ± 0.0015 | 0.0000 ± 0.0013 | 0.0016 ± 0.0023 | 0.0000 ± 0.0014 | 0.0000 ± 0.0009 | 0.0000 ± 0.0018 | 0.1715 ± 0.0320 | 0.0432 ± 0.0100 | 0.1037 ± 0.0203 | 0.0959 ± 0.0191 | 0.0609 ± 0.0130 | 0.0079 ± 0.0045 |
| 2-nitrofluorene | 0.0013 ± 0.0002 | 0.0000 ± 0.0001 | 0.0029 ± 0.0003 | 0.0002 ± 0.0001 | 0.0000 ± 0.0001 | 0.0001 ± 0.0001 | 0.0414 ± 0.0037 | 0.0261 ± 0.0024 | 0.0167 ± 0.0016 | 0.0081 ± 0.0009 | 0.0038 ± 0.0005 | 0.0085 ± 0.0009 |
| 1,3-dinitronaphthalene | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0000 ± 0.0002 | 0.0000 ± 0.0003 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0129 ± 0.0021 | 0.0000 ± 0.0009 | 0.0000 ± 0.0009 | 0.0000 ± 0.0008 | 0.0065 ± 0.0016 | 0.0013 ± 0.0012 |
| 1,5-dinitronaphthalene | 0.0001 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0000 | 0.0009 ± 0.0001 | 0.0000 ± 0.0000 | 0.0000 ± 0.0000 | 0.0042 ± 0.0006 | 0.0007 ± 0.0002 | 0.0026 ± 0.0004 | 0.0124 ± 0.0018 | 0.0013 ± 0.0003 | 0.0047 ± 0.0007 |
| 5-nitroacenaphthene | 0.0000 ± 0.0004 | 0.0045 ± 0.0011 | 0.0000 ± 0.0004 | 0.0020 ± 0.0006 | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0000 ± 0.0010 | 0.0182 ± 0.0030 | 0.0336 ± 0.0045 | 0.0153 ± 0.0028 | 0.0049 ± 0.0018 | 0.0004 ± 0.0016 |
| 9-nitroanthracene | 0.0334 ± 0.0052 | 0.0000 ± 0.0001 | 0.0072 ± 0.0012 | 0.0068 ± 0.0012 | 0.0000 ± 0.0001 | 0.0079 ± 0.0013 | 0.0000 ± 0.0002 | 0.0395 ± 0.0066 | 0.0265 ± 0.0045 | 0.0204 ± 0.0035 | 0.3047 ± 0.0500 | 0.0440 ± 0.0074 |
| 4-nitrophenanthrene | 0.0000 ± 0.0000 | 0.0000 ± 0.0001 | 0.0000 ± 0.0000 | 0.0009 ± 0.0001 | 0.0000 ± 0.0000 | 0.0000 ± 0.0000 | 0.0000 ± 0.0001 | 0.0024 ± 0.0003 | 0.0034 ± 0.0004 | 0.0014 ± 0.0002 | 0.0015 ± 0.0002 | 0.0277 ± 0.0024 |
| 9-nitrophenanthrene | 0.0031 ± 0.0004 | 0.0000 ± 0.0001 | 0.0026 ± 0.0003 | 0.0009 ± 0.0001 | 0.0013 ± 0.0002 | 0.0004 ± 0.0001 | 0.0000 ± 0.0001 | 0.0036 ± 0.0006 | 0.0000 ± 0.0001 | 0.0043 ± 0.0007 | 0.0091 ± 0.0014 | 0.0244 ± 0.0037 |
| 1,8-dinitronaphthalene | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0067 ± 0.0011 | 0.0352 ± 0.0044 | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0047 ± 0.0008 | 0.0027 ± 0.0006 |
| 2-nitrofluoranthene | 0.0075 ± 0.0008 | 0.0000 ± 0.0002 | 0.0116 ± 0.0013 | 0.0101 ± 0.0011 | 0.0000 ± 0.0001 | 0.0120 ± 0.0012 | 0.0000 ± 0.0003 | 0.0513 ± 0.0057 | 0.0851 ± 0.0093 | 0.0394 ± 0.0045 | 0.0359 ± 0.0041 | 0.0412 ± 0.0047 |
| 3-nitrofluoranthene | 0.0000 ± 0.0000 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0002 ± 0.0001 | 0.0024 ± 0.0002 | 0.0000 ± 0.0001 | 0.1195 ± 0.0085 | 0.0199 ± 0.0015 | 0.0000 ± 0.0002 | 0.0000 ± 0.0002 | 0.0102 ± 0.0008 | 0.0787 ± 0.0057 |
| 1-nitropyrene | 0.0214 ± 0.0026 | 0.0000 ± 0.0003 | 0.0154 ± 0.0019 | 0.0110 ± 0.0012 | 0.0154 ± 0.0019 | 0.0034 ± 0.0005 | 0.4422 ± 0.0536 | 0.1245 ± 0.0154 | 0.2797 ± 0.0340 | 0.1133 ± 0.0140 | 0.4616 ± 0.0563 | 0.0362 ± 0.0047 |
| 7-nitrobenzo(a)anthracene | 0.0020 ± 0.0004 | 0.0000 ± 0.0001 | 0.0011 ± 0.0003 | 0.0185 ± 0.0025 | 0.0016 ± 0.0004 | 0.0002 ± 0.0001 | 0.1138 ± 0.0152 | 0.0675 ± 0.0092 | 0.0686 ± 0.0093 | 0.0500 ± 0.0069 | 0.1032 ± 0.0139 | 0.0478 ± 0.0066 |
| 6-nitrochrysene | 0.0007 ± 0.0001 | 0.0000 ± 0.0001 | 0.0003 ± 0.0001 | 0.0165 ± 0.0026 | 0.0000 ± 0.0000 | 0.0000 ± 0.0000 | 0.0404 ± 0.0064 | 0.0088 ± 0.0014 | 0.0349 ± 0.0055 | 0.0250 ± 0.0040 | 0.0122 ± 0.0020 | 0.0078 ± 0.0013 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W0-1 | W0-2 | W0-3 | W0-4 | W0-5 | W0-6 | W1-1 | W1-2 | W1-3 | W2-1 | W2-2 | W2-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6-nitrobenz[a]pyrene | 0.0000 ± 0.0000 | 0.0000 ± 0.0001 | 0.0000 ± 0.0000 | 0.0000 ± 0.0000 | 0.0000 ± 0.0000 | 0.0000 ± 0.0000 | 0.0336 ± 0.0029 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0082 ± 0.0007 | 0.0178 ± 0.0015 |
| Hopanes (ug/mile) | | | | | | | | | | | | |
| 18a(H),21ß(H)-22,29,30-Trisnorhopane & | 0.22 ± 0.03 | 0.07 ± 0.07 | 0.00 ± 0.04 | 0.10 ± 0.04 | 0.16 ± 0.04 | 0.10 ± 0.04 | 19.74 ± 2.09 | 8.90 ± 0.96 | 5.21 ± 0.57 | 14.71 ± 1.57 | 1.83 ± 0.24 | 2.75 ± 0.32 |
| 17a(H),21ß(H)-22,29,30-Trisnorhopane | 0.06 ± 0.05 | 0.04 ± 0.08 | 0.04 ± 0.05 | 0.01 ± 0.04 | 0.02 ± 0.05 | 0.00 ± 0.05 | 18.07 ± 3.69 | 1.53 ± 0.39 | 2.06 ± 0.49 | 7.63 ± 1.60 | 0.00 ± 0.16 | 0.39 ± 0.21 |
| 17a(H),21ß(H)-30-Norhopane | 0.25 ± 0.06 | 0.11 ± 0.08 | 0.15 ± 0.06 | 0.19 ± 0.06 | 0.23 ± 0.07 | 0.16 ± 0.06 | 83.25 ± 16.92 | 30.10 ± 6.20 | 19.49 ± 4.05 | 43.59 ± 8.92 | 7.02 ± 1.54 | 6.56 ± 1.46 |
| 17a(H),21ß(H)-Hopane | 0.24 ± 0.05 | 0.02 ± 0.07 | 0.18 ± 0.06 | 0.15 ± 0.05 | 0.11 ± 0.05 | 0.21 ± 0.05 | 55.34 ± 10.74 | 14.74 ± 2.89 | 8.97 ± 1.77 | 27.42 ± 5.35 | 3.10 ± 0.64 | 4.44 ± 0.90 |
| 17ß(H),21a(H)-hopane | 0.00 ± 0.03 | 0.01 ± 0.07 | 0.01 ± 0.04 | 0.00 ± 0.04 | 0.04 ± 0.04 | 0.00 ± 0.04 | 3.28 ± 0.88 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.20 ± 0.15 |
| 22S-17a(H),21ß(H)-30-Homohopane | 0.12 ± 0.03 | 0.04 ± 0.07 | 0.05 ± 0.04 | 0.03 ± 0.04 | 0.05 ± 0.04 | 0.00 ± 0.04 | 34.84 ± 4.40 | 14.80 ± 1.89 | 9.76 ± 1.25 | 23.57 ± 2.99 | 1.11 ± 0.20 | 3.98 ± 0.53 |
| 22R-17a(H),21ß(H)-30-Homohopane | 0.08 ± 0.04 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.04 ± 0.04 | 0.00 ± 0.04 | 25.08 ± 5.55 | 10.95 ± 2.44 | 10.71 ± 2.38 | 18.86 ± 4.18 | 0.00 ± 0.13 | 3.00 ± 0.69 |
| 17ß(H),21ß(H)-Hopane | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 4.99 ± 0.94 | 0.00 ± 0.13 | 1.61 ± 0.32 | 5.88 ± 1.10 | 0.00 ± 0.13 | 0.75 ± 0.19 |
| 22S-17a(H),21ß(H)-30,31-Bishomohopan | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.02 ± 0.04 | 17.76 ± 4.98 | 7.27 ± 2.06 | 3.78 ± 1.09 | 12.94 ± 3.64 | 1.35 ± 0.42 | 0.00 ± 0.14 |
| 22R-17a(H),21ß(H)-30,31-Bishomohopan | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 11.63 ± 1.48 | 5.59 ± 0.73 | 3.07 ± 0.42 | 7.71 ± 1.00 | 0.60 ± 0.15 | 1.46 ± 0.24 |
| 22S-17a(H),21ß(H)-30,31,32-Trisomohop | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 11.25 ± 2.48 | 0.00 ± 0.13 | 1.98 ± 0.46 | 6.79 ± 1.51 | 0.00 ± 0.13 | 0.43 ± 0.18 |
| 22R-17a(H),21ß(H)-30,31,32-Trishomoho | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 5.21 ± 0.95 | 0.00 ± 0.13 | 0.00 ± 0.13 | 4.18 ± 0.77 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| Steranes (ug/mile) | | | | | | | | | | | | |
| C27-20S5a(H),14a(H)-cholestane | 0.00 ± 0.03 | 0.01 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| C27-20R5a(H),14ß(H)-cholestane | 0.01 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.02 ± 0.04 | 9.87 ± 2.57 | 0.00 ± 0.13 | 1.35 ± 0.40 | 1.83 ± 0.51 | 0.35 ± 0.18 | 0.53 ± 0.22 |
| C27-20S5a(H),14ß(H),17ß(H)-cholestane | 0.07 ± 0.03 | 0.04 ± 0.07 | 0.02 ± 0.04 | 0.02 ± 0.04 | 0.04 ± 0.04 | 0.05 ± 0.04 | 11.14 ± 2.22 | 1.42 ± 0.32 | 1.31 ± 0.30 | 2.52 ± 0.53 | 0.48 ± 0.17 | 0.00 ± 0.14 |
| ster45+40(cholestane) | 0.05 ± 0.03 | 0.02 ± 0.07 | 0.01 ± 0.04 | 0.01 ± 0.04 | 0.01 ± 0.04 | 0.03 ± 0.04 | 11.67 ± 1.79 | 1.25 ± 0.24 | 1.39 ± 0.26 | 2.37 ± 0.40 | 0.43 ± 0.15 | 0.34 ± 0.15 |
| C28-20S5a(H),14a(H),17a(H)-ergostane | 0.01 ± 0.03 | 0.00 ± 0.07 | 0.01 ± 0.04 | 0.03 ± 0.04 | 0.00 ± 0.04 | 0.03 ± 0.04 | 4.54 ± 1.08 | 1.44 ± 0.37 | 0.00 ± 0.13 | 0.92 ± 0.26 | 0.49 ± 0.18 | 0.47 ± 0.18 |
| C28-20R5a(H),14ß(H),17ß(H)-ergostane | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 6.11 ± 1.67 | 0.50 ± 0.21 | 0.64 ± 0.24 | 0.86 ± 0.30 | 0.00 ± 0.14 | 0.00 ± 0.14 |
| C28-20S5a(H),14ß(H),17ß(H)-ergostane | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.01 ± 0.04 | 0.00 ± 0.04 | 9.46 ± 2.25 | 0.00 ± 0.13 | 0.00 ± 0.13 | 1.18 ± 0.32 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| C28-20R5a(H),14a(H),17a(H)-ergostane | 0.01 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.03 ± 0.04 | 0.02 ± 0.04 | 0.01 ± 0.04 | 6.68 ± 0.94 | 0.00 ± 0.13 | 2.22 ± 0.34 | 0.62 ± 0.17 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| C29-20S5a(H),14a(H),17a(H)-stigmastan | 0.06 ± 0.03 | 0.02 ± 0.07 | 0.01 ± 0.04 | 0.02 ± 0.04 | 0.02 ± 0.04 | 0.03 ± 0.04 | 3.53 ± 0.68 | 0.00 ± 0.13 | 0.00 ± 0.13 | 1.12 ± 0.25 | 0.41 ± 0.15 | 0.00 ± 0.14 |
| C29-20R5a(H),14ß(H),17ß(H)-stigmastan | 0.02 ± 0.03 | 0.03 ± 0.07 | 0.04 ± 0.04 | 0.02 ± 0.04 | 0.02 ± 0.04 | 0.04 ± 0.04 | 6.75 ± 0.90 | 0.00 ± 0.13 | 0.00 ± 0.13 | 1.71 ± 0.27 | 0.32 ± 0.14 | 0.00 ± 0.14 |
| C29-20S5a(H),14ß(H),17ß(H)-stigmastan | 0.05 ± 0.03 | 0.03 ± 0.07 | 0.01 ± 0.04 | 0.04 ± 0.04 | 0.02 ± 0.04 | 0.04 ± 0.04 | 10.74 ± 2.19 | 0.00 ± 0.13 | 0.00 ± 0.13 | 1.28 ± 0.29 | 0.28 ± 0.14 | 0.29 ± 0.15 |
| C29-20R5a(H),14a(H),17a(H)-stigmastan | 0.04 ± 0.03 | 0.05 ± 0.07 | 0.02 ± 0.04 | 0.00 ± 0.04 | 0.01 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.13 | 1.00 ± 0.25 | 1.58 ± 0.36 | 1.37 ± 0.33 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| Alkanes (ug/mile) | | | | | | | | | | | | |
| Dodecane | 15.89 ± 6.29 | 7.88 ± 4.79 | 7.22 ± 4.48 | 14.38 ± 6.06 | 9.90 ± 5.07 | 1.50 ± 3.18 | 139.28 ± 35.92 | 178.00 ± 44.77 | 753.76 ± 176.78 | 254.17 ± 62.45 | 176.32 ± 44.44 | 368.74 ± 88.76 |
| Tridecane | 5.91 ± 1.90 | 5.57 ± 2.02 | 4.18 ± 1.80 | 8.16 ± 2.21 | 12.52 ± 2.72 | 0.81 ± 1.45 | 133.98 ± 17.56 | 175.47 ± 22.56 | 244.21 ± 30.53 | 165.33 ± 21.38 | 141.27 ± 18.53 | 660.39 ± 80.25 |
| Norfarnesane | 3.50 ± 1.06 | 0.00 ± 0.38 | 0.00 ± 0.46 | 0.80 ± 0.63 | 0.00 ± 0.49 | 0.00 ± 0.30 | 161.83 ± 29.52 | 185.47 ± 33.79 | 53.54 ± 10.32 | 13.63 ± 3.37 | 25.20 ± 5.34 | 306.66 ± 55.35 |
| Heptylcyclohexane | 0.39 ± 0.19 | 0.63 ± 0.26 | 0.31 ± 0.19 | 0.85 ± 0.28 | 0.71 ± 0.25 | 0.03 ± 0.15 | 15.85 ± 3.00 | 46.26 ± 8.33 | 20.91 ± 3.87 | 14.38 ± 2.75 | 6.25 ± 1.32 | 3.86 ± 0.93 |
| Farnesane | 2.47 ± 0.68 | 2.66 ± 0.74 | 1.84 ± 0.58 | 2.27 ± 0.66 | 1.97 ± 0.61 | 1.45 ± 0.52 | 100.23 ± 18.44 | 79.57 ± 14.76 | 145.62 ± 26.55 | 73.15 ± 13.62 | 19.50 ± 3.99 | 89.68 ± 16.59 |
| Tetradecane | 14.26 ± 1.80 | 7.25 ± 1.41 | 0.16 ± 0.86 | 5.08 ± 1.16 | 4.98 ± 1.17 | 0.00 ± 0.69 | 330.51 ± 28.42 | 184.59 ± 16.61 | 469.86 ± 39.81 | 624.56 ± 52.96 | 31.55 ± 4.11 | 253.13 ± 22.29 |
| Octylcyclohexane | 0.00 ± 0.10 | 0.20 ± 0.30 | 0.17 ± 0.21 | 0.00 ± 0.15 | 0.31 ± 0.23 | 0.00 ± 0.15 | 10.48 ± 2.61 | 0.00 ± 0.54 | 7.39 ± 1.99 | 18.35 ± 4.20 | 0.00 ± 0.42 | 0.00 ± 0.31 |
| Pentadecane | 4.85 ± 0.82 | 2.49 ± 0.61 | 1.19 ± 0.44 | 2.35 ± 0.55 | 1.93 ± 0.51 | 0.35 ± 0.35 | 203.19 ± 24.43 | 58.72 ± 7.56 | 234.87 ± 28.11 | 341.92 ± 40.81 | 11.04 ± 2.03 | 113.60 ± 14.03 |
| Nonylcyclohexane | 0.00 ± 0.09 | 0.50 ± 0.28 | 0.00 ± 0.09 | 0.18 ± 0.18 | 0.00 ± 0.10 | 0.00 ± 0.15 | 2.90 ± 0.88 | 7.12 ± 1.64 | 0.00 ± 0.27 | 9.91 ± 2.17 | 0.15 ± 0.43 | 8.37 ± 1.88 |
| Hexadecane | 6.88 ± 0.93 | 22.77 ± 1.70 | 6.14 ± 0.84 | 8.73 ± 0.97 | 11.67 ± 1.10 | 7.38 ± 0.90 | 127.60 ± 10.27 | 66.67 ± 5.86 | 172.41 ± 13.56 | 186.04 ± 14.74 | 28.79 ± 3.10 | 111.48 ± 9.21 |
| Norpristane | 0.00 ± 0.04 | 1.61 ± 0.19 | 1.28 ± 0.15 | 1.96 ± 0.20 | 0.51 ± 0.09 | 0.70 ± 0.10 | 62.99 ± 5.36 | 22.62 ± 2.00 | 78.83 ± 6.67 | 109.07 ± 9.26 | 4.89 ± 0.52 | 33.09 ± 2.88 |
| Heptadecane | 2.24 ± 0.29 | 3.31 ± 0.40 | 1.37 ± 0.25 | 2.04 ± 0.29 | 0.60 ± 0.21 | 0.52 ± 0.20 | 164.07 ± 12.83 | 34.32 ± 2.93 | 183.05 ± 14.25 | 171.50 ± 13.49 | 7.17 ± 0.89 | 68.21 ± 5.55 |
| Decylcyclohexane | 0.78 ± 0.15 | 0.00 ± 0.08 | 0.08 ± 0.06 | 0.12 ± 0.06 | 0.39 ± 0.10 | 0.00 ± 0.04 | 4.50 ± 0.87 | 3.55 ± 0.72 | 0.30 ± 0.25 | 4.60 ± 0.90 | 0.00 ± 0.17 | 2.57 ± 0.58 |
| Heptadecane_Pristane | 2.82 ± 0.35 | 1.52 ± 0.24 | 1.34 ± 0.21 | 1.64 ± 0.24 | 1.52 ± 0.23 | 0.50 ± 0.14 | 45.19 ± 4.61 | 19.30 ± 2.08 | 65.69 ± 6.62 | 84.08 ± 8.48 | 4.14 ± 0.60 | 30.26 ± 3.16 |
| Undecylcyclohexane | 0.54 ± 0.16 | 0.08 ± 0.13 | 0.25 ± 0.11 | 0.43 ± 0.14 | 0.31 ± 0.12 | 0.06 ± 0.08 | 13.78 ± 3.16 | 0.16 ± 0.32 | 9.31 ± 2.22 | 13.38 ± 3.09 | 0.38 ± 0.36 | 5.07 ± 1.34 |
| Octadecane | 1.16 ± 1.00 | 12.27 ± 1.84 | 0.00 ± 0.99 | 0.00 ± 0.99 | 0.00 ± 1.13 | 1.38 ± 1.04 | 103.40 ± 9.54 | 31.89 ± 4.59 | 106.94 ± 9.76 | 126.08 ± 11.36 | 13.72 ± 3.51 | 56.53 ± 6.38 |
| Phytane | 2.61 ± 0.52 | 1.21 ± 0.41 | 1.45 ± 0.39 | 1.75 ± 0.42 | 1.92 ± 0.45 | 0.54 ± 0.27 | 66.37 ± 10.03 | 18.98 ± 3.24 | 66.33 ± 10.01 | 78.56 ± 11.81 | 2.98 ± 1.01 | 25.98 ± 4.27 |
| Dodecylcyclohexane | 0.19 ± 0.06 | 0.02 ± 0.07 | 0.17 ± 0.06 | 0.40 ± 0.09 | 0.00 ± 0.04 | 0.06 ± 0.05 | 3.56 ± 0.57 | 2.16 ± 0.38 | 9.04 ± 1.31 | 3.04 ± 0.50 | 0.47 ± 0.19 | 2.49 ± 0.43 |
| Nonadecane | 3.07 ± 0.31 | 1.66 ± 0.23 | 2.19 ± 0.25 | 2.66 ± 0.28 | 2.17 ± 0.24 | 0.74 ± 0.14 | 102.07 ± 8.56 | 29.30 ± 2.60 | 71.05 ± 5.99 | 97.42 ± 8.22 | 7.13 ± 0.78 | 35.47 ± 3.11 |
| Tridecylcyclohexane | 0.00 ± 0.04 | 0.00 ± 0.08 | 0.14 ± 0.07 | 0.00 ± 0.04 | 0.44 ± 0.12 | 0.03 ± 0.06 | 4.85 ± 0.88 | 1.80 ± 0.40 | 2.23 ± 0.47 | 4.96 ± 0.90 | 0.34 ± 0.21 | 2.40 ± 0.49 |
| Eicosane | 0.00 ± 1.36 | 0.00 ± 1.92 | 0.00 ± 1.18 | 0.00 ± 1.19 | 0.00 ± 1.26 | 0.00 ± 1.20 | 82.46 ± 9.76 | 13.24 ± 4.94 | 40.81 ± 6.68 | 59.15 ± 8.25 | 0.00 ± 4.01 | 18.31 ± 5.48 |
| Tetradecylcyclohexane | 0.53 ± 0.12 | 0.56 ± 0.14 | 0.11 ± 0.06 | 0.43 ± 0.11 | 0.64 ± 0.15 | 0.17 ± 0.07 | 1.79 ± 0.41 | 4.51 ± 0.92 | 4.43 ± 0.90 | 6.88 ± 1.38 | 0.86 ± 0.26 | 0.86 ± 0.26 |
| Heneicosane | 2.85 ± 0.31 | 2.72 ± 0.32 | 2.59 ± 0.30 | 3.69 ± 0.38 | 3.34 ± 0.36 | 2.52 ± 0.29 | 50.53 ± 4.65 | 18.64 ± 1.87 | 20.11 ± 1.97 | 38.25 ± 3.59 | 5.39 ± 0.73 | 18.42 ± 1.85 |
| Pentadecylcyclohexane | 0.99 ± 0.26 | 0.53 ± 0.26 | 0.26 ± 0.17 | 0.91 ± 0.27 | 0.75 ± 0.27 | 0.38 ± 0.29 | 19.83 ± 4.63 | 2.65 ± 1.09 | 0.00 ± 0.42 | 5.12 ± 1.63 | 0.00 ± 0.45 | 0.62 ± 0.74 |
| Docosane | 0.00 ± 1.32 | 2.19 ± 1.82 | 0.00 ± 1.19 | 0.00 ± 1.01 | 0.00 ± 1.15 | 0.72 ± 1.57 | 46.27 ± 8.57 | 10.43 ± 4.98 | 10.55 ± 5.01 | 21.35 ± 6.24 | 0.00 ± 4.09 | 21.42 ± 6.24 |
| Hexadecylcyclohexane | 0.17 ± 0.05 | 1.27 ± 0.26 | 0.12 ± 0.05 | 0.05 ± 0.04 | 0.92 ± 0.18 | 0.52 ± 0.11 | 1.52 ± 0.36 | 7.33 ± 1.58 | 2.48 ± 0.56 | 7.57 ± 1.63 | 1.93 ± 0.45 | 2.80 ± 0.63 |
| Tricosane | 1.89 ± 0.32 | 1.89 ± 0.42 | 1.37 ± 0.34 | 1.60 ± 0.33 | 3.44 ± 0.48 | 4.53 ± 0.64 | 44.18 ± 4.54 | 13.43 ± 1.94 | 12.37 ± 1.84 | 23.07 ± 2.78 | 0.00 ± 0.83 | 16.22 ± 2.22 |
| Heptadecylcyclohexane | 2.32 ± 0.59 | 3.65 ± 0.88 | 3.04 ± 0.74 | 0.00 ± 0.08 | 1.00 ± 0.33 | 1.06 ± 0.34 | 0.00 ± 0.33 | 0.60 ± 0.47 | 2.89 ± 0.90 | 7.89 ± 1.93 | 0.30 ± 0.41 | 0.01 ± 0.39 |
| Octadecylcyclohexane | 0.20 ± 0.05 | 0.37 ± 0.10 | 0.11 ± 0.04 | 0.12 ± 0.04 | 0.10 ± 0.04 | 0.12 ± 0.04 | 15.58 ± 3.39 | 3.15 ± 0.73 | 2.61 ± 0.61 | 4.30 ± 0.97 | 1.43 ± 0.37 | 1.81 ± 0.45 |
| Tetracosane | 0.00 ± 1.19 | 0.00 ± 1.54 | 0.00 ± 1.08 | 0.00 ± 1.02 | 0.00 ± 1.17 | 0.00 ± 1.38 | 0.00 ± 3.98 | 0.00 ± 3.22 | 0.00 ± 3.26 | 0.00 ± 3.53 | 0.00 ± 3.42 | 0.00 ± 3.83 |
| Pentacosane | 0.04 ± 0.44 | 0.17 ± 0.64 | 0.00 ± 0.49 | 0.33 ± 0.49 | 0.30 ± 0.55 | 0.00 ± 0.72 | 21.94 ± 4.62 | 1.39 ± 1.92 | 9.88 ± 2.97 | 12.35 ± 3.40 | 0.00 ± 1.64 | 5.94 ± 2.56 |
| Nonadecylcyclohexane | 0.00 ± 0.08 | 0.85 ± 0.27 | 0.23 ± 0.16 | 0.19 ± 0.14 | 0.42 ± 0.17 | 0.53 ± 0.20 | 5.05 ± 1.30 | 0.19 ± 0.40 | 0.59 ± 0.46 | 6.20 ± 1.55 | 2.49 ± 0.81 | 2.72 ± 0.86 |
| Hexacosane | 0.00 ± 0.39 | 0.00 ± 0.53 | 0.00 ± 0.35 | 0.00 ± 0.31 | 0.00 ± 0.34 | 0.00 ± 0.39 | 3.38 ± 1.58 | 0.00 ± 1.04 | 3.01 ± 1.55 | 0.00 ± 1.07 | 0.00 ± 1.35 | 0.64 ± 1.48 |
| Eicosylcyclohexane | 0.01 ± 0.03 | 0.01 ± 0.07 | 0.02 ± 0.04 | 0.02 ± 0.04 | 0.19 ± 0.05 | 0.00 ± 0.04 | 4.15 ± 0.65 | 6.83 ± 1.06 | 0.85 ± 0.19 | 7.50 ± 1.15 | 0.04 ± 0.13 | 0.22 ± 0.14 |
| Heptacosane | 0.00 ± 0.18 | 0.33 ± 0.31 | 0.00 ± 0.19 | 0.00 ± 0.19 | 0.00 ± 0.20 | 0.00 ± 0.19 | 5.70 ± 1.55 | 9.72 ± 2.22 | 8.51 ± 2.02 | 13.50 ± 2.90 | 5.75 ± 1.56 | 0.39 ± 0.75 |
| Heneicosylcyclohexane | 0.02 ± 0.03 | 0.02 ± 0.07 | 0.02 ± 0.04 | 0.00 ± 0.04 | 0.02 ± 0.04 | 0.02 ± 0.04 | 1.77 ± 0.44 | 0.53 ± 0.19 | 0.55 ± 0.19 | 1.65 ± 0.41 | 0.02 ± 0.13 | 0.11 ± 0.15 |
| Octacosane | 0.47 ± 0.51 | 0.00 ± 0.73 | 0.00 ± 0.40 | 0.00 ± 0.40 | 0.00 ± 0.45 | 0.00 ± 0.43 | 0.00 ± 1.13 | 0.00 ± 1.25 | 5.59 ± 2.28 | 0.00 ± 1.43 | 2.07 ± 1.89 | 0.18 ± 1.78 |
| Nonacosane | 0.28 ± 0.13 | 0.64 ± 0.26 | 0.31 ± 0.13 | 0.21 ± 0.13 | 0.14 ± 0.13 | 0.27 ± 0.13 | 6.71 ± 1.70 | 0.47 ± 0.63 | 11.89 ± 2.62 | 11.86 ± 2.64 | 3.88 ± 1.21 | 3.87 ± 1.24 |
| Triacontane | 0.39 ± 0.35 | 0.00 ± 0.56 | 0.00 ± 0.30 | 0.00 ± 0.30 | 0.00 ± 0.36 | 0.00 ± 0.33 | 0.00 ± 1.23 | 1.21 ± 1.56 | 6.31 ± 2.39 | 0.00 ± 0.91 | 0.00 ± 1.33 | 0.12 ± 1.48 |
| Hentriacontane | 0.00 ± 0.06 | 0.00 ± 0.14 | 0.00 ± 0.09 | 0.00 ± 0.08 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.43 | 0.00 ± 0.32 | 0.22 ± 0.76 | 0.00 ± 0.50 | 0.00 ± 0.56 | 0.00 ± 0.38 |
| Dotriacontane | 0.08 ± 0.15 | 0.35 ± 0.27 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.51 | 0.00 ± 0.39 | 2.91 ± 0.85 | 0.00 ± 0.39 | 0.99 ± 0.64 | 1.08 ± 0.67 |
| Tritriacontane | 0.00 ± 0.04 | 0.00 ± 0.09 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.87 ± 0.52 | 0.00 ± 0.15 | 0.00 ± 0.30 | 0.00 ± 0.15 | 0.00 ± 0.18 | 0.00 ± 0.19 |
| Tetratriacontane | 0.25 ± 0.13 | 0.44 ± 0.26 | 0.00 ± 0.12 | 0.04 ± 0.12 | 0.27 ± 0.16 | 0.20 ± 0.14 | 0.00 ± 0.34 | 0.00 ± 0.47 | 1.79 ± 0.80 | 0.00 ± 0.36 | 0.00 ± 0.47 | 0.00 ± 0.56 |
| Pentatriacontane | 0.00 ± 0.04 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.17 | 0.00 ± 0.18 | 0.11 ± 0.41 | 0.00 ± 0.15 | 0.00 ± 0.17 | 0.00 ± 0.16 |
| Hexatriacontane | 0.16 ± 0.12 | 0.48 ± 0.24 | 0.00 ± 0.10 | 0.00 ± 0.10 | 0.07 ± 0.12 | 0.13 ± 0.13 | 0.00 ± 0.35 | 0.00 ± 0.29 | 0.00 ± 0.38 | 0.00 ± 0.30 | 0.00 ± 0.29 | 0.00 ± 0.51 |
| Heptatriacontane | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.14 | 0.00 ± 0.16 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.28 |
| Octatriacontane | 0.17 ± 0.09 | 0.23 ± 0.16 | 0.00 ± 0.08 | 0.00 ± 0.07 | 0.15 ± 0.10 | 0.23 ± 0.11 | 0.00 ± 0.24 | 0.00 ± 0.26 | 0.00 ± 0.26 | 0.00 ± 0.29 | 0.00 ± 0.21 | 0.00 ± 0.33 |
| Nonatriacontane | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| Polar compounds (ug/mile) | | | | | | | | | | | | |
| heptanoic acid (c7) | 1.47 ± 1.37 | 0.00 ± 1.11 | 0.00 ± 1.07 | 0.00 ± 0.93 | 0.00 ± 1.30 | 0.00 ± 1.21 | 0.00 ± 5.21 | 0.00 ± 2.24 | 0.00 ± 1.84 | 0.00 ± 1.95 | 22.26 ± 9.80 | 0.00 ± 1.96 |
| me-malonic (d-c3) | 0.39 ± 0.11 | 0.00 ± 0.18 | 0.11 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.21 | 0.06 ± 0.69 | 0.05 ± 0.70 | 7.24 ± 2.10 | 0.00 ± 0.37 | 0.00 ± 0.21 |
| guaiacol | -99.00 ± 0.03 | -99.00 ± 0.07 | -99.00 ± 0.04 | -99.00 ± 0.04 | -99.00 ± 0.04 | -99.00 ± 0.04 | -99.00 ± 0.13 | -99.00 ± 0.13 | -99.00 ± 0.13 | -99.00 ± 0.16 | -99.00 ± 0.13 | -99.00 ± 0.14 |
| benzoic acid | 0.00 ± 69.10 | 0.00 ± 127.28 | 0.00 ± 47.11 | 0.00 ± 53.04 | 0.00 ± 82.67 | 0.00 ± 55.47 | 0.00 ± 303.75 | 0.00 ± 146.02 | 0.00 ± 97.57 | 0.00 ± 358.22 | 0.00 ± 370.53 | 0.00 ± 116.36 |
| octanoic acid (c8) | 0.00 ± 1.33 | 0.00 ± 1.57 | 0.00 ± 1.34 | 0.00 ± 1.49 | 0.00 ± 1.52 | 0.41 ± 1.65 | 27.43 ± 8.43 | 0.00 ± 2.74 | 0.00 ± 2.92 | 0.00 ± 3.24 | 23.68 ± 7.85 | 0.00 ± 3.08 |
| phenylacetic acid | 0.33 ± 0.23 | 1.47 ± 0.63 | 0.22 ± 0.28 | 1.16 ± 0.39 | 1.57 ± 0.45 | 0.05 ± 0.26 | 177.79 ± 26.08 | 34.33 ± 5.82 | 0.00 ± 0.37 | 68.67 ± 10.72 | 27.51 ± 4.87 | 11.48 ± 2.68 |
| maleic acid | 0.00 ± 0.12 | 0.00 ± 0.21 | 0.00 ± 0.16 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.17 | 0.00 ± 1.71 | 0.00 ± 0.40 | 0.00 ± 0.33 | 0.00 ± 0.98 | 0.00 ± 0.86 | 0.00 ± 0.34 |
| succinic acid (d-c4) | 0.00 ± 0.23 | 0.00 ± 0.41 | 0.00 ± 0.23 | 0.00 ± 0.24 | 0.00 ± 0.23 | 0.00 ± 0.24 | 0.00 ± 1.57 | 0.00 ± 1.01 | 0.00 ± 1.81 | 0.00 ± 0.51 | 0.00 ± 2.17 | 0.00 ± 0.49 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W0-1 | W0-2 | W0-3 | W0-4 | W0-5 | W0-6 | W1-1 | W1-2 | W1-3 | W2-1 | W2-2 | W2-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-me-guaiacol | -99.00 ± 0.03 | -99.00 ± 0.07 | -99.00 ± 0.04 | -99.00 ± 0.04 | -99.00 ± 0.04 | -99.00 ± 0.04 | -99.00 ± 0.22 | -99.00 ± 0.13 | -99.00 ± 0.14 | -99.00 ± 0.16 | -99.00 ± 0.14 | -99.00 ± 0.14 |
| o-toluic | 0.58 ± 0.50 | 2.16 ± 1.26 | 0.39 ± 0.57 | 1.57 ± 0.79 | 1.99 ± 0.89 | 0.44 ± 0.57 | 209.73 ± 46.75 | 28.39 ± 7.90 | 0.00 ± 0.70 | 80.33 ± 19.12 | 33.32 ± 8.97 | 15.47 ± 5.26 |
| me-succinic acid (d-c4) | 0.00 ± 0.04 | 0.00 ± 0.08 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.00 ± 0.67 | 0.00 ± 0.78 | 0.00 ± 0.15 |
| m-toluic | 0.88 ± 0.45 | 0.10 ± 0.80 | 0.04 ± 0.43 | 0.96 ± 0.56 | 2.57 ± 0.73 | 0.09 ± 0.39 | 444.71 ± 53.01 | 53.60 ± 8.06 | 229.09 ± 28.15 | 108.58 ± 14.45 | 61.77 ± 9.01 | 14.49 ± 3.81 |
| nonanoic acid (c9) | 0.00 ± 1.73 | 0.00 ± 2.07 | 0.00 ± 1.84 | 0.00 ± 2.02 | 0.00 ± 2.02 | 0.00 ± 2.08 | 0.00 ± 5.66 | 0.00 ± 3.71 | 0.00 ± 3.32 | 0.00 ± 4.95 | 16.67 ± 7.52 | 0.00 ± 4.14 |
| p-toluic | 0.39 ± 0.45 | 0.08 ± 0.77 | 0.04 ± 0.43 | 0.82 ± 0.61 | 1.08 ± 0.65 | 0.08 ± 0.37 | 327.74 ± 45.97 | 36.78 ± 7.19 | 56.51 ± 9.81 | 93.27 ± 14.83 | 42.04 ± 7.91 | 8.53 ± 3.72 |
| 2,6-dimethylbenzoic acid | 0.00 ± 0.10 | 0.00 ± 0.27 | 0.00 ± 0.07 | 0.00 ± 0.10 | 0.00 ± 0.15 | 0.00 ± 0.12 | 24.85 ± 5.71 | 0.00 ± 0.64 | 14.28 ± 3.57 | 7.43 ± 2.22 | 25.12 ± 5.78 | 0.53 ± 0.85 |
| 4-ethyl-guaiacol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| syringol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| glutaric acid (d-c5) | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 2-methylglutaric (d-c5) | 0.01 ± 0.06 | 0.04 ± 0.08 | 0.01 ± 0.04 | 0.01 ± 0.04 | 0.03 ± 0.05 | 0.15 ± 0.06 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.31 | 0.00 ± 0.42 | 0.00 ± 0.16 |
| 2,5-dimethylbenzoic acid | 0.00 ± 0.14 | 0.67 ± 0.57 | 0.00 ± 0.25 | 0.01 ± 0.30 | 0.54 ± 0.43 | 0.03 ± 0.29 | 0.00 ± 0.46 | 6.62 ± 1.93 | 30.16 ± 5.75 | 1.47 ± 1.22 | 13.29 ± 3.02 | 2.26 ± 1.32 |
| 3-methylglutaric acid (d-c5) | 0.01 ± 0.17 | 0.00 ± 0.13 | 0.00 ± 0.06 | 0.00 ± 0.10 | 0.00 ± 0.09 | 0.00 ± 0.06 | 0.00 ± 0.19 | 0.00 ± 0.20 | 0.00 ± 0.19 | 0.00 ± 0.24 | 0.00 ± 0.43 | 0.00 ± 0.20 |
| 2,4-dimethylbenzoic acid | 0.00 ± 39.58 | 0.56 ± 67.61 | 0.00 ± 25.82 | 0.00 ± 26.33 | 0.00 ± 36.71 | 0.00 ± 24.98 | 0.00 ± 62.82 | 0.00 ± 72.72 | 0.00 ± 51.18 | 0.00 ± 150.54 | 0.00 ± 191.81 | 0.00 ± 53.36 |
| 2,3- and 3,5- dimethylbenzoic acid | 0.00 ± 0.13 | 0.00 ± 0.24 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.19 | 0.00 ± 0.13 | 50.91 ± 9.81 | 0.00 ± 1.62 | 34.50 ± 7.29 | 1.64 ± 2.52 | 7.64 ± 3.26 | 0.00 ± 0.93 |
| decanoic acid (c10) | 0.35 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.41 | 0.00 ± 0.30 | 0.00 ± 0.33 | 0.00 ± 0.38 | 0.00 ± 0.51 | 0.00 ± 0.33 |
| 4-allyl-guaiacol (eugenol) | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 4-methyl-syringol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3,4-dimethylbenzoic acid | 0.56 ± 0.27 | 0.00 ± 0.37 | 0.30 ± 0.28 | 0.87 ± 0.36 | 1.00 ± 0.39 | 0.00 ± 0.19 | 78.26 ± 14.43 | 9.74 ± 2.99 | 56.84 ± 10.84 | 17.28 ± 4.33 | 15.83 ± 4.02 | 0.00 ± 1.37 |
| hexanedioic (adipic) acid (d-c6) | 0.00 ± 0.04 | 0.09 ± 0.10 | 0.17 ± 0.07 | 0.00 ± 0.10 | 0.00 ± 0.06 | 0.04 ± 0.05 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.16 | 0.00 ± 0.28 | 0.00 ± 0.16 |
| salcylic acid | 0.25 ± 0.51 | 0.32 ± 0.79 | 0.47 ± 0.45 | 0.36 ± 0.80 | 1.37 ± 1.09 | 0.07 ± 0.30 | 122.36 ± 21.72 | 0.00 ± 4.44 | 14.33 ± 6.53 | 0.00 ± 4.80 | 26.11 ± 8.12 | 0.00 ± 1.16 |
| trans-2-decenoic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| cis-pinonic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3-methyladipic acid (d-c6) | 0.02 ± 0.03 | 0.00 ± 0.07 | 0.01 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.16 | 0.00 ± 0.18 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| 4-formyl-guaiacol (vanillin) | 0.00 ± 0.04 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.31 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.82 ± 0.52 | 0.00 ± 0.22 | 0.00 ± 0.16 |
| undecanoic acid (c11) | 0.00 ± 0.12 | 0.00 ± 0.15 | 0.00 ± 0.12 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 1.84 ± 0.75 | 0.00 ± 0.30 | 0.00 ± 0.34 | 0.00 ± 0.41 | 1.85 ± 0.75 | 0.00 ± 0.29 |
| isoeugenol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| heptanedioic (pimelic) acid (d-c7) | 0.00 ± 0.07 | 0.00 ± 0.12 | 0.01 ± 0.09 | 0.00 ± 0.08 | 0.00 ± 0.08 | 0.01 ± 0.09 | 0.00 ± 0.26 | 0.00 ± 0.25 | 0.00 ± 0.25 | 0.00 ± 0.27 | 0.00 ± 0.28 | 0.00 ± 0.27 |
| 2,3-dimethoxybenzoic acid | 0.00 ± 0.04 | 0.00 ± 0.08 | 0.00 ± 0.05 | 0.00 ± 0.15 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 11.18 | 0.00 ± 0.17 | 0.00 ± 0.17 | 0.00 ± 20.57 | 0.00 ± 0.20 | 0.00 ± 0.18 |
| acetovanillone | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 2,6-dimethoxybenzoic acid | 0.14 ± 0.21 | 0.00 ± 0.16 | 0.00 ± 0.11 | 1.15 ± 0.40 | 0.00 ± 0.11 | 0.00 ± 0.11 | 6.46 ± 1.71 | 0.00 ± 0.31 | 0.00 ± 0.32 | 4.72 ± 1.45 | 0.00 ± 0.43 | 0.00 ± 0.33 |
| dodecanoic (lauric) acid (c12) | 0.72 ± 0.46 | 0.00 ± 0.44 | 0.00 ± 0.29 | 1.78 ± 0.55 | 0.00 ± 0.45 | 0.00 ± 0.38 | 0.00 ± 0.90 | 0.00 ± 0.72 | 0.00 ± 0.88 | 10.33 ± 1.72 | 7.09 ± 1.46 | 0.00 ± 0.78 |
| 2,5-dimethoxybenzoic acid | 0.01 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 2.41 ± 0.39 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.56 ± 0.21 | 0.00 ± 0.14 |
| phthalic acid | 0.27 ± 0.78 | 0.00 ± 1.41 | 0.00 ± 1.29 | 0.00 ± 1.15 | 0.00 ± 1.14 | 0.00 ± 1.24 | 18.48 ± 32.57 | 0.00 ± 7.03 | 0.00 ± 13.41 | 0.00 ± 12.19 | 72.00 ± 43.10 | 0.00 ± 3.04 |
| suberic acid (d-c8) | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| levoglucosan | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3,5-dimethoxybenzoic acid | 0.00 ± 0.04 | 0.00 ± 0.08 | 0.10 ± 0.07 | 0.07 ± 0.06 | 0.01 ± 0.06 | 0.49 ± 0.14 | 14.70 ± 3.34 | 5.89 ± 1.45 | 0.00 ± 0.16 | 24.69 ± 5.49 | 0.83 ± 0.39 | 0.00 ± 0.16 |
| syringaldehyde | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3,4-dimethoxybenzoic acid | 0.00 ± 0.03 | 0.00 ± 0.12 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.00 ± 0.28 | 0.00 ± 0.15 |
| 2,4-dimethoxybenzoic acid | 0.32 ± 0.07 | 0.25 ± 0.10 | 0.23 ± 0.07 | 0.41 ± 0.09 | 0.41 ± 0.10 | 1.23 ± 0.23 | 36.09 ± 6.28 | 0.66 ± 0.26 | 26.63 ± 4.66 | 35.81 ± 6.24 | 0.00 ± 0.15 | 0.00 ± 0.15 |
| tridecanoic acid (c13) | 0.04 ± 0.09 | 0.00 ± 0.11 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.10 | 0.09 ± 0.10 | 1.59 ± 0.67 | 0.00 ± 0.29 | 0.00 ± 0.35 | 0.00 ± 0.26 | 1.15 ± 0.61 | 0.00 ± 0.29 |
| isophthalic acid | 0.00 ± 1.62 | 0.00 ± 2.15 | 0.00 ± 1.27 | 0.00 ± 1.42 | 0.00 ± 1.16 | 0.00 ± 0.92 | 0.00 ± 6.84 | 0.00 ± 6.57 | 0.00 ± 5.76 | 0.00 ± 12.22 | 0.00 ± 7.69 | 0.00 ± 2.56 |
| vanillic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| homovanillic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| azelaic acid (d-c9) | 0.00 ± 0.05 | 0.00 ± 0.14 | 0.05 ± 0.12 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.38 ± 0.13 | 0.00 ± 0.30 | 0.00 ± 0.19 | 0.00 ± 0.17 | 0.00 ± 0.21 | 0.00 ± 0.17 | 0.00 ± 0.21 |
| myristoleic acid | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.32 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.26 | 0.00 ± 0.24 | 0.00 ± 0.15 |
| myristic acid (c14) | 0.00 ± 0.28 | 0.04 ± 0.40 | 0.00 ± 0.21 | 0.00 ± 0.38 | 0.00 ± 0.31 | 1.53 ± 0.27 | 26.68 ± 2.56 | 0.00 ± 0.63 | 0.00 ± 0.68 | 0.00 ± 0.79 | 3.33 ± 1.04 | 0.00 ± 0.65 |
| sebacic acid (d-c10) | 0.00 ± 0.04 | 0.00 ± 0.10 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.23 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.14 |
| syringic acid | 0.77 ± 0.20 | 12.03 ± 1.98 | 0.48 ± 0.17 | 6.16 ± 1.03 | 4.62 ± 0.79 | 0.00 ± 0.09 | 1.50 ± 0.59 | 0.00 ± 0.20 | 0.00 ± 0.29 | 3.10 ± 0.84 | 2.00 ± 0.66 | 0.00 ± 0.21 |
| pentadecanoic acid (c15) | 0.22 ± 0.14 | 0.05 ± 0.19 | 0.00 ± 0.13 | 0.12 ± 0.16 | 0.00 ± 0.13 | 1.64 ± 0.31 | 10.58 ± 2.17 | 0.00 ± 0.59 | 0.00 ± 0.48 | 0.00 ± 0.41 | 1.28 ± 0.88 | 0.00 ± 0.61 |
| undecanedioic acid (c11) | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |
| palmitoleic acid | 0.04 ± 0.08 | 0.03 ± 0.17 | 0.02 ± 0.10 | 0.01 ± 0.17 | 0.00 ± 0.11 | 0.05 ± 0.10 | 1.99 ± 1.76 | 0.00 ± 0.28 | 0.00 ± 0.31 | 0.00 ± 0.31 | 0.00 ± 0.43 | 0.00 ± 0.32 |
| palmitic acid (c16) | 1.27 ± 0.57 | 0.00 ± 0.93 | 0.00 ± 0.52 | 0.30 ± 0.71 | 0.00 ± 0.60 | 13.23 ± 1.16 | 258.42 ± 20.92 | 0.00 ± 1.57 | 0.00 ± 1.72 | 0.00 ± 1.45 | 8.29 ± 2.21 | 0.00 ± 1.57 |
| isostearic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| dodecanedioic acid (d-c12) | 0.01 ± 0.03 | 0.00 ± 0.07 | 0.01 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.14 |
| traumatic acid | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.01 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.17 | 0.00 ± 0.15 | 0.00 ± 0.17 | 0.00 ± 0.16 | 0.00 ± 0.14 |
| heptadecanoic acid (c17) | 0.10 ± 0.10 | 0.00 ± 0.17 | 0.00 ± 0.11 | 0.00 ± 0.10 | 0.00 ± 0.10 | 1.04 ± 0.27 | 29.67 ± 6.94 | 0.00 ± 0.34 | 0.00 ± 0.36 | 0.00 ± 0.38 | 0.00 ± 0.62 | 0.00 ± 0.62 |
| 1,11-undecanedicarboxylic acid (d-c13) | 0.01 ± 0.04 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.00 ± 0.16 | 0.00 ± 0.17 | 0.00 ± 0.15 |
| oleic acid | 0.27 ± 0.42 | 3.38 ± 1.27 | 0.00 ± 0.43 | 0.30 ± 0.63 | 0.00 ± 0.43 | 6.54 ± 1.43 | 133.09 ± 24.58 | 3.15 ± 2.79 | 0.00 ± 1.60 | 0.00 ± 1.38 | 2.08 ± 2.65 | 0.00 ± 1.62 |
| elaidic acid | 0.00 ± 0.05 | 0.00 ± 0.12 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.06 | 0.00 ± 0.14 | 126.63 ± 30.07 | 0.00 ± 0.40 | 0.00 ± 0.79 | 0.00 ± 0.27 | 0.00 ± 0.47 | 0.00 ± 0.23 |
| stearic acid (c18) | 0.00 ± 2.53 | 0.00 ± 2.97 | 0.00 ± 1.96 | 0.00 ± 2.21 | 0.00 ± 2.07 | 6.07 ± 2.88 | 352.50 ± 77.39 | 0.00 ± 6.48 | 11.53 ± 9.61 | 0.00 ± 6.72 | 4.03 ± 8.41 | 0.00 ± 6.96 |
| 1,12-dodecanedicarboxylic acid (d-c14) | 0.04 ± 0.04 | 0.00 ± 0.09 | 0.03 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.24 | 0.00 ± 0.17 | 0.00 ± 0.16 | 0.00 ± 0.17 | 0.00 ± 0.16 | 0.00 ± 0.17 |
| 8,15-pimaradien-18-oic acd | 0.00 ± 0.04 | 0.38 ± 0.17 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.03 ± 0.05 | 0.00 ± 0.20 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.17 | 0.00 ± 0.16 | 0.00 ± 0.16 |
| pimaric acid | 1.37 ± 0.33 | 0.52 ± 0.21 | 0.00 ± 0.06 | 0.02 ± 0.11 | 0.00 ± 0.09 | 0.00 ± 0.07 | 1.36 ± 0.47 | 0.00 ± 0.24 | 0.00 ± 0.21 | 0.03 ± 0.30 | 0.06 ± 0.28 | 0.00 ± 0.22 |
| sandaracopimaric acid | 0.18 ± 0.24 | 0.21 ± 0.24 | 0.00 ± 0.10 | 0.33 ± 0.31 | 2.51 ± 1.23 | 0.02 ± 0.11 | 0.77 ± 0.71 | 0.00 ± 0.30 | 0.00 ± 0.30 | 11.37 ± 5.16 | 0.16 ± 0.49 | 0.00 ± 0.32 |
| nonadecanoic acid (c19) | 0.40 ± 0.19 | 0.00 ± 0.12 | 0.00 ± 0.08 | 2.72 ± 0.55 | 0.91 ± 0.28 | 0.00 ± 0.08 | 1.36 ± 0.49 | 0.06 ± 0.32 | 2.02 ± 0.57 | 0.00 ± 0.27 | 0.94 ± 0.42 | 0.00 ± 0.25 |
| isopimaric acid | 0.04 ± 0.04 | 0.26 ± 0.11 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.20 ± 0.08 | 0.00 ± 0.05 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.04 ± 0.18 | 0.00 ± 0.15 | 0.00 ± 0.15 |
| palustric acid | 0.03 ± 0.03 | 0.03 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.97 ± 0.23 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.03 ± 0.13 | 0.00 ± 0.14 |
| dihydroisopimaric acid | 0.00 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| 8-abietic acid | 0.00 ± 0.03 | 0.00 ± 0.08 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.01 ± 0.05 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.00 ± 0.17 | 0.00 ± 0.15 | 0.00 ± 0.14 |
| dehydroabietic acid | 0.00 ± 0.09 | 0.00 ± 0.15 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.10 | 0.48 ± 0.15 | 0.00 ± 0.51 | 0.00 ± 0.32 | 0.00 ± 0.31 | 0.00 ± 0.33 | 0.00 ± 0.32 | 0.00 ± 0.33 |
| 8,14-abietenic acid | 0.07 ± 0.07 | 0.00 ± 0.08 | 0.00 ± 0.05 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.05 | 1.48 ± 0.45 | 0.71 ± 0.32 | 0.00 ± 0.20 | 0.27 ± 0.26 | 0.00 ± 0.20 | 0.00 ± 0.22 |
| abietic acid | 0.06 ± 0.03 | 0.00 ± 0.07 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.20 ± 0.16 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 |
| eicosanoic acid (c20) | 0.00 ± 0.05 | 0.00 ± 0.09 | 0.00 ± 0.06 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.07 | 0.83 ± 0.61 | 0.00 ± 0.18 | 0.00 ± 0.25 | 0.00 ± 0.21 | 0.00 ± 0.20 | 0.00 ± 0.21 |
| levopimaric acid | 0.00 ± 0.04 | 1.42 ± 0.40 | 0.00 ± 0.04 | 0.00 ± 0.05 | 0.00 ± 0.05 | 0.00 ± 0.04 | 0.86 ± 0.30 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.37 ± 0.21 | 0.08 ± 0.16 | 0.00 ± 0.15 |
| heneicosanoic acid (c21) | 0.00 ± 0.05 | 0.00 ± 0.10 | 0.00 ± 0.05 | 0.47 ± 0.13 | 0.00 ± 0.05 | 0.00 ± 0.05 | 1.69 ± 0.53 | 0.00 ± 0.20 | 0.00 ± 0.23 | 0.10 ± 0.30 | 0.21 ± 0.30 | 0.00 ± 0.21 |
| 7-oxodehydroabietic acid | 0.00 ± 0.11 | 0.00 ± 0.20 | 0.00 ± 0.14 | 2.43 ± 0.79 | 4.40 ± 1.23 | 0.00 ± 0.14 | 0.00 ± 0.49 | 0.00 ± 0.39 | 0.00 ± 0.40 | 0.00 ± 0.49 | 0.00 ± 0.53 | 0.00 ± 0.42 |
| docosanoic acid (c22) | 0.00 ± 0.09 | 0.00 ± 0.17 | 0.00 ± 0.11 | 0.00 ± 0.10 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.82 | 0.00 ± 0.35 | 0.27 ± 0.91 | 0.00 ± 0.62 | 0.00 ± 0.45 | 0.00 ± 0.44 |
| tricosanoic acid (c23) | 0.04 ± 0.05 | 0.38 ± 0.17 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.00 ± 0.04 | 0.04 ± 0.05 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.18 | 0.00 ± 0.17 | 0.00 ± 0.16 |
| tetracosanoic acid (c24) | 0.08 ± 0.14 | 0.14 ± 0.17 | 0.00 ± 0.10 | 0.00 ± 0.10 | 0.00 ± 0.14 | 0.00 ± 0.10 | 0.00 ± 0.49 | 0.00 ± 0.39 | 0.00 ± 0.53 | 0.00 ± 0.36 | 4.95 ± 1.60 | 0.00 ± 0.44 |
| cholesterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| cholestanol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| ergosterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| stigmasterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| sitosterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W0-1 | W0-2 | W0-3 | W0-4 | W0-5 | W0-6 | W1-1 | W1-2 | W1-3 | W2-1 | W2-2 | W2-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbonyls (mg/mile) | | | | | | | | | | | | |
| formaldehyde | 10.32 ± 0.60 | | | | | | | 2.04 ± 0.98 | | 292.42 ± 16.34 | 6.00 ± 1.10 | |
| acetaldehyde | 3.02 ± 0.46 | | | | | | | 0.00 ± 1.71 | | 266.47 ± 25.51 | 2.07 ± 1.90 | |
| acetone | 14.01 ± 1.13 | | | | | | | 27.14 ± 4.31 | | 88.47 ± 7.28 | 0.00 ± 3.65 | |
| * acrolein | <0.042 ± <0.007 | | | | | | | <0.020 | | 4.57 ± 1.14 | <0.065 ± <0.043 | |
| propionaldehyde | 0.00 ± 0.15 | | | | | | | 0.00 ± 1.00 | | 27.73 ± 3.28 | 0.00 ± 1.01 | |
| crotonaldehyde | 0.00 ± 0.22 | | | | | | | 0.00 ± 1.44 | | 15.15 ± 2.18 | 0.00 ± 1.44 | |
| methyl ethyl ketone | 0.72 ± 0.32 | | | | | | | 0.00 ± 1.80 | | 11.47 ± 2.98 | 0.00 ± 1.81 | |
| Methacrolein | 0.00 ± 0.22 | | | | | | | 0.00 ± 1.44 | | 28.74 ± 3.58 | 0.00 ± 1.44 | |
| * n-butyraldehyde | -0.04 ± -0.01 | | | | | | | <0.020 | | 0.00 ± 0.00 | -0.07 ± -0.03 | |
| benzaldehyde | 2.28 ± 0.37 | | | | | | | 0.00 ± 1.91 | | 158.01 ± 16.09 | 0.62 ± 1.92 | |
| glyoxal | 0.00 ± 0.11 | | | | | | | 0.00 ± 0.71 | | 0.57 ± 0.71 | 0.00 ± 0.71 | |
| valeraldehyde | 0.00 ± 0.25 | | | | | | | 0.00 ± 1.66 | | 9.41 ± 2.05 | 0.00 ± 1.67 | |
| tolualdehyde | 1.26 ± 0.38 | | | | | | | 0.00 ± 2.06 | | 72.42 ± 11.81 | 0.00 ± 2.07 | |
| hexanal | 0.00 ± 0.28 | | | | | | | 0.00 ± 1.84 | | 5.98 ± 2.05 | 0.00 ± 1.85 | |
| *** acrolein converts to an unknown rearrangement product that co-elutes with butyraldehyde. Where indicated, the sum of acrolein and butyraldehyde is given as an estimate of the upper limit of the true value for either compound.** | | | | | | | | | | | | |
| VOC (mg/mi) | | | | | | | | | | | | |
| 1,3 butadiene (estimated) | 0.021 ± 0.100 | | | | | | | | | 16.987 ± 9.388 | 2.069 ± 1.143 | |
| C2 compounds | 0.873 ± 0.123 | | | | | | | | | 583.030 ± 82.328 | 53.674 ± 7.579 | |
| propene | 0.121 ± 0.015 | | | | | | | | | 97.989 ± 11.883 | 11.934 ± 1.447 | |
| propane | 0.529 ± 0.026 | | | | | | | | | 5.191 ± 0.260 | 1.348 ± 0.067 | |
| isoButane | 0.434 ± 0.022 | | | | | | | | | 11.388 ± 0.569 | 10.534 ± 0.527 | |
| 1Butene+iButylene | 0.097 ± 0.007 | | | | | | | | | 51.360 ± 3.482 | 7.972 ± 0.540 | |
| n-Butane | 1.397 ± 0.070 | | | | | | | | | 141.736 ± 7.087 | 67.430 ± 3.371 | |
| t-2-Butene | 0.039 ± 0.002 | | | | | | | | | 12.866 ± 0.709 | 2.426 ± 0.134 | |
| c-2-Butene | 0.036 ± 0.003 | | | | | | | | | 9.830 ± 0.909 | 1.420 ± 0.131 | |
| 3-Me-1-Butene | 0.009 ± 0.001 | | | | | | | | | 3.180 ± 0.159 | 0.711 ± 0.036 | |
| isopentane | 0.955 ± 0.062 | | | | | | | | | 166.535 ± 10.872 | 43.804 ± 2.860 | |
| 1-Pentene | 0.017 ± 0.001 | | | | | | | | | 6.471 ± 0.388 | 0.672 ± 0.040 | |
| 2-Me-1-Butene | 0.031 ± 0.002 | | | | | | | | | 10.382 ± 0.760 | 1.321 ± 0.097 | |
| n-Pentane | 0.299 ± 0.018 | | | | | | | | | 37.995 ± 2.265 | 14.511 ± 0.865 | |
| t-2-Pentene | 0.031 ± 0.002 | | | | | | | | | 12.742 ± 0.637 | 1.176 ± 0.059 | |
| c-2-Pentene | 0.018 ± 0.002 | | | | | | | | | 6.767 ± 0.588 | 0.615 ± 0.053 | |
| 2-Me-2-Butene | 0.550 ± 0.029 | | | | | | | | | 12.314 ± 0.660 | 1.371 ± 0.073 | |
| 22DiMeButane | 0.027 ± 0.002 | | | | | | | | | 7.264 ± 0.470 | 3.625 ± 0.235 | |
| CycloPentene | 0.008 ± 0.001 | | | | | | | | | 3.488 ± 0.214 | 0.854 ± 0.052 | |
| CycloPentane | 0.037 ± 0.002 | | | | | | | | | 5.382 ± 0.269 | 1.279 ± 0.064 | |
| 23DiMeButane | 0.048 ± 0.003 | | | | | | | | | 18.455 ± 1.095 | 4.857 ± 0.288 | |
| MTBE | 0.041 ± 0.002 | | | | | | | | | 1.419 ± 0.086 | 0.107 ± 0.006 | |
| 2-MePentane | 0.139 ± 0.008 | | | | | | | | | 63.020 ± 3.605 | 12.314 ± 0.704 | |
| 3-MePentane | 0.118 ± 0.006 | | | | | | | | | 41.405 ± 2.070 | 8.381 ± 0.419 | |
| 2-Me-1-Pentene | 0.006 ± 0.001 | | | | | | | | | 2.767 ± 0.138 | 0.272 ± 0.014 | |
| 1-Hexene | 0.007 ± 0.001 | | | | | | | | | 4.045 ± 0.202 | 0.377 ± 0.019 | |
| n-Hexane | 0.367 ± 0.018 | | | | | | | | | 41.519 ± 2.079 | 6.244 ± 0.313 | |
| t-2-Hexene | 0.058 ± 0.003 | | | | | | | | | 5.030 ± 0.252 | 0.462 ± 0.023 | |
| 2-Me-2-Pentene | 0.010 ± 0.001 | | | | | | | | | 2.700 ± 0.142 | 0.236 ± 0.012 | |
| c-3-Me-2-Pentene | 0.005 ± 0.001 | | | | | | | | | 2.132 ± 0.107 | 0.176 ± 0.009 | |
| c-3-Hexene | 0.003 ± 0.001 | | | | | | | | | 0.617 ± 0.031 | 0.056 ± 0.003 | |
| c-2-Hexene | 0.004 ± 0.001 | | | | | | | | | 2.669 ± 0.133 | 0.212 ± 0.011 | |
| t-3-Me-2-Pentene | 0.014 ± 0.001 | | | | | | | | | 3.943 ± 0.197 | 0.368 ± 0.018 | |
| MeCyPentane | 0.090 ± 0.005 | | | | | | | | | 32.376 ± 1.865 | 4.240 ± 0.244 | |
| 2,4-DiMePentane | 0.058 ± 0.003 | | | | | | | | | 28.249 ± 1.412 | 4.031 ± 0.202 | |
| 223TriMeButane | 0.003 ± 0.001 | | | | | | | | | 0.510 ± 0.025 | 0.127 ± 0.006 | |
| Benzene | 0.191 ± 0.012 | | | | | | | | | 160.599 ± 9.929 | 8.903 ± 0.550 | |
| CycloHexane | 0.030 ± 0.002 | | | | | | | | | 17.403 ± 1.005 | 1.298 ± 0.075 | |
| 4MeHexene | 0.003 ± 0.001 | | | | | | | | | 0.922 ± 0.085 | 0.150 ± 0.014 | |
| 2MeHexane | 0.051 ± 0.003 | | | | | | | | | 35.993 ± 1.800 | 3.597 ± 0.180 | |
| 23DiMePentane | 0.082 ± 0.004 | | | | | | | | | 50.348 ± 2.517 | 6.500 ± 0.325 | |
| 3MeHexane | 0.063 ± 0.003 | | | | | | | | | 40.649 ± 2.032 | 4.260 ± 0.213 | |
| Cyclohexene | 0.006 ± 0.001 | | | | | | | | | 0.181 ± 0.038 | 0.015 ± 0.003 | |
| 3EtPentane | 0.020 ± 0.001 | | | | | | | | | 11.583 ± 0.741 | 1.133 ± 0.072 | |
| 1-Heptene | 0.012 ± 0.001 | | | | | | | | | 4.578 ± 0.229 | 0.564 ± 0.028 | |
| 224TrMePentane | 0.202 ± 0.014 | | | | | | | | | 109.638 ± 7.820 | 10.272 ± 0.733 | |
| t-3-Heptene | 0.004 ± 0.001 | | | | | | | | | 2.150 ± 0.108 | 0.114 ± 0.006 | |
| n-Heptane | 0.060 ± 0.003 | | | | | | | | | 32.692 ± 1.635 | 3.182 ± 0.159 | |
| 244TMe-1-Pentene | 0.005 ± 0.001 | | | | | | | | | 0.616 ± 0.032 | 0.039 ± 0.002 | |
| MeCyHexane | 0.046 ± 0.002 | | | | | | | | | 14.754 ± 0.738 | 1.588 ± 0.079 | |
| 25DiMeHexane | 0.026 ± 0.002 | | | | | | | | | 11.913 ± 0.812 | 1.161 ± 0.079 | |
| 24DiMeHexane | 0.041 ± 0.002 | | | | | | | | | 22.907 ± 1.145 | 1.966 ± 0.098 | |
| 234TrMePentane | 0.071 ± 0.004 | | | | | | | | | 33.279 ± 1.664 | 2.543 ± 0.127 | |
| Toluene | 1.073 ± 0.054 | | | | | | | | | 282.351 ± 14.118 | 18.258 ± 0.913 | |
| 23DiMeHexane | 0.034 ± 0.002 | | | | | | | | | 12.972 ± 0.698 | 1.219 ± 0.066 | |
| 2MeHeptane | 0.037 ± 0.002 | | | | | | | | | 21.231 ± 1.062 | 1.491 ± 0.075 | |
| 4MeHeptane | 0.017 ± 0.001 | | | | | | | | | 8.674 ± 0.667 | 0.626 ± 0.048 | |
| 3MeHeptane | 0.036 ± 0.002 | | | | | | | | | 23.037 ± 1.152 | 1.460 ± 0.073 | |
| Hexanal | 0.000 ± 0.279 | | | | | | | | | 5.980 ± 2.046 | 0.000 ± 1.854 | |
| 225TMHexane | 0.014 ± 0.001 | | | | | | | | | 4.950 ± 0.248 | 0.450 ± 0.022 | |
| Octene-1 | 0.030 ± 0.001 | | | | | | | | | 8.278 ± 0.414 | 1.490 ± 0.075 | |
| 11DMeCyHexane | 0.003 ± 0.001 | | | | | | | | | 1.076 ± 0.054 | 0.103 ± 0.005 | |
| n-Octane | 0.044 ± 0.002 | | | | | | | | | 20.698 ± 1.035 | 1.385 ± 0.069 | |
| 24DiMeHeptane | 0.029 ± 0.001 | | | | | | | | | 2.121 ± 0.106 | 0.318 ± 0.016 | |
| 25DiMeHeptane | 0.020 ± 0.001 | | | | | | | | | 8.939 ± 0.447 | 0.550 ± 0.027 | |
| 33DiMeHeptane | 0.002 ± 0.001 | | | | | | | | | 0.301 ± 0.015 | 0.021 ± 0.001 | |
| EtBenzene | 0.293 ± 0.015 | | | | | | | | | 67.992 ± 3.400 | 3.167 ± 0.158 | |
| m/p-xylene | 0.887 ± 0.044 | | | | | | | | | 193.225 ± 9.661 | 11.796 ± 0.590 | |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W0-1 | W0-2 | W0-3 | W0-4 | W0-5 | W0-6 | W1-1 | W1-2 | W1-3 | W2-1 | W2-2 | W2-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2MeOctane | 0.023 ± 0.001 | | | | | | | | | 6.570 ± 0.329 | 0.000 ± 0.001 | |
| 3MeOctane | 0.032 ± 0.002 | | | | | | | | | 13.391 ± 0.824 | 0.600 ± 0.037 | |
| Styrene+heptanal | 0.134 ± 0.007 | | | | | | | | | 4.536 ± 0.227 | 0.224 ± 0.011 | |
| o-xylene | 0.378 ± 0.019 | | | | | | | | | 70.561 ± 3.528 | 3.824 ± 0.191 | |
| Nonene-1 | 0.016 ± 0.001 | | | | | | | | | 3.885 ± 0.194 | 0.200 ± 0.010 | |
| n-Nonane | 0.057 ± 0.003 | | | | | | | | | 10.513 ± 0.526 | 0.614 ± 0.031 | |
| iPropBenzene | 0.044 ± 0.002 | | | | | | | | | 6.662 ± 0.333 | 0.302 ± 0.015 | |
| iPropCyHexane | 0.005 ± 0.001 | | | | | | | | | 1.297 ± 0.086 | 0.076 ± 0.005 | |
| 26DiMeOctane | 0.035 ± 0.002 | | | | | | | | | 4.280 ± 0.269 | 0.296 ± 0.019 | |
| alpha-pinene | 0.028 ± 0.005 | | | | | | | | | 0.567 ± 0.104 | 0.043 ± 0.008 | |
| nPropBenzene | 0.139 ± 0.007 | | | | | | | | | 15.555 ± 0.778 | 0.614 ± 0.031 | |
| mEtToluene | 0.576 ± 0.029 | | | | | | | | | 53.167 ± 2.658 | 2.711 ± 0.136 | |
| pEtToluene | 0.261 ± 0.013 | | | | | | | | | 20.666 ± 1.033 | 1.088 ± 0.054 | |
| 135TriMeBenzene | 0.313 ± 0.016 | | | | | | | | | 25.833 ± 1.292 | 1.396 ± 0.070 | |
| oEtToluene | 0.224 ± 0.011 | | | | | | | | | 16.783 ± 0.839 | 0.884 ± 0.044 | |
| Octanal | 0.033 ± 0.009 | | | | | | | | | 1.375 ± 0.393 | 0.110 ± 0.031 | |
| beta-pinene | 0.006 ± 0.001 | | | | | | | | | 0.563 ± 0.028 | 0.039 ± 0.002 | |
| 124TriMeBenzene | 1.074 ± 0.054 | | | | | | | | | 64.800 ± 3.240 | 3.721 ± 0.186 | |
| n-Decane | 0.089 ± 0.005 | | | | | | | | | 5.982 ± 0.334 | 0.576 ± 0.032 | |
| iButBenzene | 0.036 ± 0.002 | | | | | | | | | 1.812 ± 0.091 | 0.111 ± 0.006 | |
| sButBenzene | 0.023 ± 0.001 | | | | | | | | | 1.392 ± 0.070 | 0.069 ± 0.003 | |
| Limonene | 0.293 ± 0.015 | | | | | | | | | 12.781 ± 0.639 | 0.897 ± 0.045 | |
| Indan | 0.076 ± 0.008 | | | | | | | | | 8.506 ± 0.913 | 0.425 ± 0.046 | |
| 13diethylbenzene | 0.164 ± 0.016 | | | | | | | | | 3.873 ± 0.388 | 0.294 ± 0.029 | |
| 14diethylbenzene | 0.465 ± 0.026 | | | | | | | | | 11.343 ± 0.630 | 0.653 ± 0.036 | |
| 12diethylbenzene | 0.044 ± 0.002 | | | | | | | | | 1.720 ± 0.086 | 0.118 ± 0.006 | |
| 2-propylToluene | 0.134 ± 0.007 | | | | | | | | | 2.349 ± 0.117 | 0.274 ± 0.014 | |
| 3-ipropyltoluene | 0.037 ± 0.002 | | | | | | | | | 1.871 ± 0.094 | 0.099 ± 0.005 | |
| 4-ipropyltoluene | 0.038 ± 0.002 | | | | | | | | | 0.082 ± 0.005 | 0.021 ± 0.001 | |
| 2-ipropyltoluene | 0.028 ± 0.005 | | | | | | | | | 0.416 ± 0.076 | 0.048 ± 0.009 | |
| Nonanal | 0.337 ± 0.017 | | | | | | | | | 7.059 ± 0.353 | 0.567 ± 0.028 | |
| n-Undecane | 0.079 ± 0.016 | | | | | | | | | 1.487 ± 0.297 | 0.108 ± 0.022 | |
| 1245tetraMeBenzene | 0.161 ± 0.026 | | | | | | | | | 1.778 ± 0.286 | 0.203 ± 0.033 | |
| 1235tetraMeBenzene | 0.228 ± 0.011 | | | | | | | | | 2.036 ± 0.102 | 0.263 ± 0.013 | |
| 1234tetraMeBenzene | 0.098 ± 0.005 | | | | | | | | | 0.480 ± 0.024 | 0.089 ± 0.004 | |
| n-Dodecane | 0.092 ± 0.005 | | | | | | | | | 0.193 ± 0.010 | 0.048 ± 0.002 | |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W3-1 | W3-2 | W3-3 | W4-1 | W4-2 | W4-3 | W5-1 | W5-2 | W5-3 | W6-1 | W6-2 | W6-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gravimetric mass (mg/mi) | 29.38 ± 1.49 | 23.57 ± 1.19 | 15.21 ± 0.77 | 6.89 ± 0.42 | 6.02 ± 0.33 | 11.65 ± 0.60 | 16.82 ± 0.86 | 47.47 ± 2.39 | 45.26 ± 2.28 | 56.31 ± 2.83 | 17.14 ± 0.90 | 9.97 ± 0.53 |
| Carbon fractions by TOR (mg/mi) | | | | | | | | | | | | |
| Organic Carbon Fraction 1 | 4.040 ± 0.488 | 2.341 ± 0.210 | 1.499 ± 0.140 | 0.831 ± 0.151 | 0.935 ± 0.106 | 1.763 ± 0.162 | 4.747 ± 0.457 | 7.529 ± 0.874 | 3.870 ± 0.448 | 19.798 ± 2.738 | 3.142 ± 0.379 | 1.484 ± 0.165 |
| Organic Carbon Fraction 2 | 2.800 ± 0.406 | 2.387 ± 0.253 | 1.558 ± 0.159 | 0.552 ± 0.097 | 0.564 ± 0.063 | 1.418 ± 0.188 | 2.218 ± 0.254 | 2.971 ± 0.407 | 5.775 ± 0.918 | 7.444 ± 1.182 | 2.527 ± 0.345 | 1.948 ± 0.227 |
| Organic Carbon Fraction 3 | 1.350 ± 0.323 | 1.643 ± 0.285 | 0.840 ± 0.148 | 0.417 ± 0.158 | 0.709 ± 0.146 | 1.213 ± 0.253 | 0.873 ± 0.166 | 2.442 ± 0.610 | 3.732 ± 0.967 | 2.636 ± 0.678 | 1.157 ± 0.281 | 0.983 ± 0.198 |
| Organic Carbon Fraction 4 | 1.935 ± 0.539 | 1.376 ± 0.250 | 1.194 ± 0.247 | 0.289 ± 0.168 | 0.370 ± 0.108 | 0.877 ± 0.175 | 0.716 ± 0.169 | 3.503 ± 0.896 | 2.193 ± 0.580 | 2.170 ± 0.617 | 0.505 ± 0.201 | 0.601 ± 0.172 |
| Pyrolyzed Organic Carbon | 0.083 ± 0.039 | 0.200 ± 0.070 | 0.030 ± 0.018 | 0.036 ± 0.030 | 0.002 ± 0.016 | 0.042 ± 0.020 | 0.010 ± 0.020 | 0.009 ± 0.027 | 0.004 ± 0.028 | 0.075 ± 0.037 | 0.003 ± 0.028 | 0.003 ± 0.020 |
| Total Organic Carbon | 10.207 ± 0.792 | 7.938 ± 0.521 | 5.109 ± 0.341 | 2.090 ± 0.270 | 2.563 ± 0.208 | 5.301 ± 0.376 | 8.544 ± 0.582 | 16.452 ± 1.260 | 15.572 ± 1.241 | 32.125 ± 2.732 | 7.333 ± 0.590 | 4.996 ± 0.362 |
| Elemental Carbon Fraction 1 | 6.625 ± 1.529 | 2.653 ± 0.393 | 2.479 ± 0.448 | 1.848 ± 0.513 | 1.101 ± 0.189 | 2.445 ± 0.418 | 2.623 ± 0.476 | 10.626 ± 2.388 | 6.031 ± 1.451 | 7.804 ± 2.158 | 2.791 ± 0.724 | 1.681 ± 0.346 |
| Elemental Carbon Fraction 2 | 9.589 ± 1.503 | 6.486 ± 0.820 | 1.726 ± 0.183 | 1.536 ± 0.278 | 1.962 ± 0.225 | 2.794 ± 0.375 | 4.761 ± 0.648 | 17.472 ± 2.513 | 9.459 ± 1.570 | 12.598 ± 1.972 | 6.798 ± 0.938 | 1.527 ± 0.200 |
| Elemental Carbon Fraction 3 | 0.118 ± 0.098 | 0.062 ± 0.030 | 0.057 ± 0.028 | 0.000 ± 0.009 | 0.014 ± 0.009 | 0.045 ± 0.025 | 0.031 ± 0.017 | 0.042 ± 0.032 | 0.177 ± 0.123 | 0.063 ± 0.053 | 0.000 ± 0.009 | 0.022 ± 0.015 |
| Total Elemental Carbon | 16.248 ± 2.884 | 9.001 ± 1.220 | 4.232 ± 0.564 | 3.349 ± 0.650 | 3.073 ± 0.409 | 5.237 ± 0.770 | 7.389 ± 1.099 | 28.129 ± 4.914 | 15.662 ± 3.042 | 20.387 ± 4.074 | 9.585 ± 1.674 | 3.216 ± 0.484 |
| Total Carbon | 26.457 ± 1.812 | 16.938 ± 0.999 | 9.341 ± 0.577 | 5.415 ± 0.492 | 5.637 ± 0.378 | 10.535 ± 0.676 | 15.932 ± 1.004 | 44.582 ± 3.029 | 31.238 ± 2.129 | 52.513 ± 3.899 | 16.921 ± 1.175 | 8.203 ± 0.543 |
| Elements by XRF (mg/mi) | | | | | | | | | | | | |
| Sodium (qualitative only) | 0.0098 ± 0.0352 | 0.0459 ± 0.0195 | 0.0433 ± 0.0195 | 0.0398 ± 0.0331 | 0.0037 ± 0.0191 | 0.0182 ± 0.0187 | 0.0052 ± 0.0232 | 0.0787 ± 0.0371 | 0.1537 ± 0.0406 | 0.0664 ± 0.0353 | 0.0000 ± 0.0343 | 0.0180 ± 0.0236 |
| Magnesium (qualitative only) | 0.0073 ± 0.0331 | 0.0030 ± 0.0189 | 0.0016 ± 0.0189 | 0.0150 ± 0.0322 | 0.0000 ± 0.0189 | 0.0125 ± 0.0185 | 0.0009 ± 0.0229 | 0.0000 ± 0.0354 | 0.0550 ± 0.0377 | 0.0081 ± 0.0341 | 0.0000 ± 0.0341 | 0.0105 ± 0.0233 |
| Aluminum | 0.0222 ± 0.0224 | 0.0837 ± 0.0136 | 0.0598 ± 0.0133 | 0.0234 ± 0.0218 | 0.0051 ± 0.0128 | 0.0256 ± 0.0126 | 0.0109 ± 0.0155 | 0.0362 ± 0.0242 | 0.3248 ± 0.0310 | 0.0032 ± 0.0231 | 0.0079 ± 0.0232 | 0.0144 ± 0.0157 |
| Silicon | 0.1455 ± 0.0137 | 0.8640 ± 0.0448 | 0.3649 ± 0.0199 | 0.1494 ± 0.0135 | 0.0571 ± 0.0069 | 0.1216 ± 0.0088 | 0.0350 ± 0.0077 | 0.3011 ± 0.0205 | 3.7576 ± 0.1997 | 0.1327 ± 0.0136 | 0.0781 ± 0.0122 | 0.1605 ± 0.0116 |
| Phosphorous | 0.0950 ± 0.0053 | 0.0780 ± 0.0041 | 0.1059 ± 0.0055 | 0.0480 ± 0.0032 | 0.0159 ± 0.0014 | 0.0286 ± 0.0019 | 0.0353 ± 0.0023 | 0.2070 ± 0.0107 | 0.0902 ± 0.0052 | 0.1367 ± 0.0072 | 0.0558 ± 0.0036 | 0.0363 ± 0.0023 |
| Sulfur | 0.2153 ± 0.0115 | 1.0009 ± 0.0504 | 0.6767 ± 0.0341 | 0.0952 ± 0.0061 | 0.1660 ± 0.0086 | 0.1344 ± 0.0071 | 0.1312 ± 0.0071 | 0.4076 ± 0.0211 | 1.8294 ± 0.0931 | 0.2325 ± 0.0124 | 0.0934 ± 0.0062 | 0.3340 ± 0.0171 |
| Chlorine | 0.0187 ± 0.0021 | 0.0305 ± 0.0019 | 0.8524 ± 0.0428 | 0.0080 ± 0.0018 | 0.0030 ± 0.0011 | 0.0035 ± 0.0010 | 0.0109 ± 0.0014 | 0.0328 ± 0.0026 | 0.0398 ± 0.0029 | 0.0481 ± 0.0031 | 0.0074 ± 0.0019 | 0.0043 ± 0.0013 |
| Potassium | 0.0022 ± 0.0031 | 0.0033 ± 0.0018 | 0.0036 ± 0.0018 | 0.0060 ± 0.0030 | 0.0012 ± 0.0018 | 0.0048 ± 0.0017 | 0.0018 ± 0.0021 | 0.0223 ± 0.0035 | 0.0000 ± 0.0035 | 0.0025 ± 0.0032 | 0.0000 ± 0.0032 | 0.0019 ± 0.0022 |
| Calcium | 0.2356 ± 0.0120 | 0.0975 ± 0.0050 | 0.1874 ± 0.0095 | 0.1038 ± 0.0056 | 0.0401 ± 0.0023 | 0.0885 ± 0.0046 | 0.0898 ± 0.0047 | 0.3298 ± 0.0167 | 0.0681 ± 0.0041 | 0.3576 ± 0.0181 | 0.1648 ± 0.0085 | 0.0817 ± 0.0043 |
| Titanium | 0.0013 ± 0.0011 | 0.0010 ± 0.0006 | 0.0013 ± 0.0006 | 0.0010 ± 0.0010 | 0.0005 ± 0.0006 | 0.0019 ± 0.0006 | 0.0009 ± 0.0007 | 0.0005 ± 0.0011 | 0.0005 ± 0.0012 | 0.0007 ± 0.0011 | 0.0008 ± 0.0011 | 0.0011 ± 0.0007 |
| Vanadium | 0.0003 ± 0.0004 | 0.0001 ± 0.0002 | 0.0001 ± 0.0002 | 0.0000 ± 0.0004 | 0.0002 ± 0.0002 | 0.0001 ± 0.0002 | 0.0000 ± 0.0003 | 0.0005 ± 0.0005 | 0.0000 ± 0.0005 | 0.0004 ± 0.0004 | 0.0003 ± 0.0004 | 0.0000 ± 0.0003 |
| Chromium | 0.0115 ± 0.0018 | 0.0094 ± 0.0011 | 0.0095 ± 0.0011 | 0.0042 ± 0.0016 | 0.0028 ± 0.0010 | 0.0088 ± 0.0010 | 0.0061 ± 0.0012 | 0.0134 ± 0.0019 | 0.0047 ± 0.0019 | 0.0089 ± 0.0018 | 0.0032 ± 0.0017 | 0.0055 ± 0.0012 |
| Manganese | 0.0022 ± 0.0047 | 0.0015 ± 0.0027 | 0.0011 ± 0.0027 | 0.0001 ± 0.0046 | 0.0005 ± 0.0027 | 0.0007 ± 0.0026 | 0.0016 ± 0.0033 | 0.0032 ± 0.0051 | 0.0018 ± 0.0053 | 0.0017 ± 0.0049 | 0.0000 ± 0.0049 | 0.0008 ± 0.0033 |
| Iron | 0.3880 ± 0.0209 | 0.1566 ± 0.0089 | 0.1676 ± 0.0094 | 0.1286 ± 0.0096 | 0.0452 ± 0.0047 | 0.1343 ± 0.0079 | 0.0878 ± 0.0066 | 0.2512 ± 0.0150 | 0.0542 ± 0.0085 | 0.1646 ± 0.0112 | 0.0705 ± 0.0082 | 0.0741 ± 0.0063 |
| Cobalt | 0.0001 ± 0.0008 | 0.0000 ± 0.0005 | 0.0003 ± 0.0005 | 0.0000 ± 0.0008 | 0.0001 ± 0.0005 | 0.0000 ± 0.0004 | 0.0004 ± 0.0006 | 0.0000 ± 0.0009 | 0.0001 ± 0.0009 | 0.0000 ± 0.0008 | 0.0000 ± 0.0008 | 0.0000 ± 0.0006 |
| Nickel | 0.0032 ± 0.0013 | 0.0031 ± 0.0007 | 0.0022 ± 0.0007 | 0.0012 ± 0.0012 | 0.0013 ± 0.0007 | 0.0015 ± 0.0007 | 0.0026 ± 0.0009 | 0.0046 ± 0.0014 | 0.0005 ± 0.0014 | 0.0022 ± 0.0013 | 0.0007 ± 0.0013 | 0.0010 ± 0.0009 |
| Copper | 0.0085 ± 0.0012 | 0.0047 ± 0.0007 | 0.0073 ± 0.0007 | 0.0149 ± 0.0013 | 0.0097 ± 0.0008 | 0.0054 ± 0.0007 | 0.0036 ± 0.0008 | 0.0122 ± 0.0013 | 0.0017 ± 0.0013 | 0.0040 ± 0.0012 | 0.0060 ± 0.0012 | 0.0031 ± 0.0008 |
| Zinc | 0.1143 ± 0.0066 | 0.0405 ± 0.0027 | 0.0957 ± 0.0051 | 0.0806 ± 0.0051 | 0.0177 ± 0.0020 | 0.0271 ± 0.0022 | 0.0461 ± 0.0032 | 0.2213 ± 0.0116 | 0.0234 ± 0.0037 | 0.1834 ± 0.0098 | 0.0583 ± 0.0044 | 0.0255 ± 0.0025 |
| Gallium | 0.0000 ± 0.0041 | 0.0025 ± 0.0023 | 0.0001 ± 0.0023 | 0.0017 ± 0.0040 | 0.0017 ± 0.0023 | 0.0036 ± 0.0023 | 0.0018 ± 0.0028 | 0.0002 ± 0.0044 | 0.0000 ± 0.0046 | 0.0000 ± 0.0042 | 0.0048 ± 0.0043 | 0.0027 ± 0.0029 |
| Arsenic | 0.0000 ± 0.0011 | 0.0001 ± 0.0006 | 0.0001 ± 0.0006 | 0.0000 ± 0.0011 | 0.0005 ± 0.0006 | 0.0000 ± 0.0006 | 0.0000 ± 0.0008 | 0.0000 ± 0.0012 | 0.0000 ± 0.0013 | 0.0000 ± 0.0012 | 0.0006 ± 0.0012 | 0.0000 ± 0.0008 |
| Selenium | 0.0000 ± 0.0009 | 0.0000 ± 0.0005 | 0.0000 ± 0.0005 | 0.0000 ± 0.0009 | 0.0000 ± 0.0005 | 0.0000 ± 0.0005 | 0.0000 ± 0.0006 | 0.0000 ± 0.0010 | 0.0000 ± 0.0010 | 0.0000 ± 0.0010 | 0.0000 ± 0.0010 | 0.0000 ± 0.0007 |
| Bromine | 0.0023 ± 0.0012 | 0.0036 ± 0.0007 | 0.0084 ± 0.0008 | 0.0002 ± 0.0012 | 0.0010 ± 0.0007 | 0.0013 ± 0.0007 | 0.0001 ± 0.0008 | 0.0021 ± 0.0013 | 0.0199 ± 0.0017 | 0.0004 ± 0.0012 | 0.0000 ± 0.0012 | 0.0033 ± 0.0009 |
| Rubidium | 0.0004 ± 0.0011 | 0.0001 ± 0.0007 | 0.0002 ± 0.0007 | 0.0001 ± 0.0011 | 0.0005 ± 0.0007 | 0.0003 ± 0.0006 | 0.0003 ± 0.0008 | 0.0000 ± 0.0012 | 0.0004 ± 0.0013 | 0.0005 ± 0.0012 | 0.0000 ± 0.0012 | 0.0001 ± 0.0008 |
| Strontium | 0.0016 ± 0.0024 | 0.0012 ± 0.0013 | 0.0011 ± 0.0013 | 0.0007 ± 0.0023 | 0.0006 ± 0.0013 | 0.0005 ± 0.0013 | 0.0000 ± 0.0016 | 0.0002 ± 0.0025 | 0.0002 ± 0.0026 | 0.0009 ± 0.0024 | 0.0007 ± 0.0024 | 0.0005 ± 0.0016 |
| Yttrium | 0.0000 ± 0.0015 | 0.0002 ± 0.0009 | 0.0000 ± 0.0009 | 0.0000 ± 0.0015 | 0.0002 ± 0.0009 | 0.0000 ± 0.0008 | 0.0000 ± 0.0011 | 0.0002 ± 0.0016 | 0.0000 ± 0.0017 | 0.0004 ± 0.0016 | 0.0004 ± 0.0016 | 0.0008 ± 0.0011 |
| Zirconium | 0.0009 ± 0.0032 | 0.0004 ± 0.0018 | 0.0040 ± 0.0018 | 0.0019 ± 0.0031 | 0.0009 ± 0.0018 | 0.0034 ± 0.0018 | 0.0012 ± 0.0022 | 0.0034 ± 0.0034 | 0.0019 ± 0.0036 | 0.0019 ± 0.0033 | 0.0012 ± 0.0033 | 0.0008 ± 0.0022 |
| Molybdenum | 0.0022 ± 0.0037 | 0.0014 ± 0.0021 | 0.0051 ± 0.0021 | 0.0007 ± 0.0036 | 0.0003 ± 0.0021 | 0.0002 ± 0.0021 | 0.0021 ± 0.0025 | 0.0141 ± 0.0040 | 0.0039 ± 0.0042 | 0.0017 ± 0.0038 | 0.0096 ± 0.0039 | 0.0000 ± 0.0026 |
| Palladium | 0.0039 ± 0.0046 | 0.0008 ± 0.0026 | 0.0020 ± 0.0026 | 0.0004 ± 0.0044 | 0.0018 ± 0.0026 | 0.0043 ± 0.0026 | 0.0004 ± 0.0032 | 0.0001 ± 0.0049 | 0.0038 ± 0.0052 | 0.0049 ± 0.0047 | 0.0004 ± 0.0047 | 0.0032 ± 0.0032 |
| Silver | 0.0000 ± 0.0035 | 0.0006 ± 0.0020 | 0.0014 ± 0.0020 | 0.0002 ± 0.0034 | 0.0007 ± 0.0020 | 0.0022 ± 0.0020 | 0.0006 ± 0.0024 | 0.0011 ± 0.0038 | 0.0024 ± 0.0040 | 0.0048 ± 0.0036 | 0.0000 ± 0.0036 | 0.0011 ± 0.0025 |
| Cadmium | 0.0000 ± 0.0048 | 0.0003 ± 0.0028 | 0.0000 ± 0.0028 | 0.0000 ± 0.0047 | 0.0004 ± 0.0028 | 0.0000 ± 0.0027 | 0.0001 ± 0.0033 | 0.0000 ± 0.0052 | 0.0000 ± 0.0054 | 0.0000 ± 0.0050 | 0.0000 ± 0.0050 | 0.0000 ± 0.0034 |
| Indium | 0.0014 ± 0.0038 | 0.0004 ± 0.0022 | 0.0008 ± 0.0022 | 0.0000 ± 0.0037 | 0.0005 ± 0.0022 | 0.0000 ± 0.0021 | 0.0003 ± 0.0026 | 0.0021 ± 0.0041 | 0.0000 ± 0.0043 | 0.0006 ± 0.0039 | 0.0016 ± 0.0039 | 0.0000 ± 0.0027 |
| Tin | 0.0009 ± 0.0046 | 0.0002 ± 0.0026 | 0.0020 ± 0.0026 | 0.0009 ± 0.0045 | 0.0030 ± 0.0026 | 0.0017 ± 0.0026 | 0.0012 ± 0.0032 | 0.0000 ± 0.0049 | 0.0000 ± 0.0052 | 0.0004 ± 0.0047 | 0.0020 ± 0.0048 | 0.0028 ± 0.0032 |
| Antimony | 0.0003 ± 0.0047 | 0.0018 ± 0.0027 | 0.0023 ± 0.0027 | 0.0000 ± 0.0045 | 0.0020 ± 0.0027 | 0.0005 ± 0.0026 | 0.0000 ± 0.0032 | 0.0027 ± 0.0050 | 0.0008 ± 0.0053 | 0.0000 ± 0.0048 | 0.0016 ± 0.0048 | 0.0022 ± 0.0033 |
| Barium | 0.0071 ± 0.0109 | 0.0030 ± 0.0062 | 0.0042 ± 0.0063 | 0.0028 ± 0.0106 | 0.0052 ± 0.0062 | 0.0091 ± 0.0061 | 0.0035 ± 0.0075 | 0.0077 ± 0.0117 | 0.0000 ± 0.0122 | 0.0051 ± 0.0113 | 0.0004 ± 0.0113 | 0.0130 ± 0.0077 |
| Lanthanum | 0.0000 ± 0.0260 | 0.0058 ± 0.0149 | 0.0094 ± 0.0149 | 0.0000 ± 0.0252 | 0.0008 ± 0.0149 | 0.0031 ± 0.0145 | 0.0028 ± 0.0180 | 0.0012 ± 0.0280 | 0.0106 ± 0.0293 | 0.0082 ± 0.0268 | 0.0146 ± 0.0269 | 0.0087 ± 0.0183 |
| Gold | 0.0000 ± 0.0050 | 0.0017 ± 0.0029 | 0.0025 ± 0.0029 | 0.0000 ± 0.0049 | 0.0019 ± 0.0029 | 0.0002 ± 0.0028 | 0.0003 ± 0.0035 | 0.0000 ± 0.0054 | 0.0002 ± 0.0057 | 0.0004 ± 0.0052 | 0.0037 ± 0.0052 | 0.0034 ± 0.0035 |
| Mercury | 0.0017 ± 0.0019 | 0.0009 ± 0.0011 | 0.0006 ± 0.0011 | 0.0000 ± 0.0019 | 0.0007 ± 0.0011 | 0.0000 ± 0.0011 | 0.0004 ± 0.0013 | 0.0000 ± 0.0021 | 0.0000 ± 0.0022 | 0.0000 ± 0.0020 | 0.0007 ± 0.0020 | 0.0000 ± 0.0013 |
| Thallium | 0.0000 ± 0.0035 | 0.0006 ± 0.0020 | 0.0003 ± 0.0020 | 0.0000 ± 0.0034 | 0.0000 ± 0.0020 | 0.0000 ± 0.0020 | 0.0004 ± 0.0024 | 0.0020 ± 0.0038 | 0.0000 ± 0.0040 | 0.0000 ± 0.0036 | 0.0000 ± 0.0036 | 0.0012 ± 0.0025 |
| Lead | 0.0358 ± 0.0039 | 0.0035 ± 0.0019 | 0.0047 ± 0.0020 | 0.0043 ± 0.0033 | 0.0015 ± 0.0019 | 0.0030 ± 0.0019 | 0.0030 ± 0.0023 | 0.0142 ± 0.0037 | 0.0020 ± 0.0038 | 0.0018 ± 0.0035 | 0.0067 ± 0.0035 | 0.0051 ± 0.0024 |
| Uranium | 0.0000 ± 0.0047 | 0.0015 ± 0.0027 | 0.0012 ± 0.0027 | 0.0002 ± 0.0046 | 0.0011 ± 0.0027 | 0.0002 ± 0.0026 | 0.0013 ± 0.0033 | 0.0000 ± 0.0051 | 0.0000 ± 0.0053 | 0.0009 ± 0.0048 | 0.0007 ± 0.0049 | 0.0023 ± 0.0033 |
| Anions by IC (mg/mi) | | | | | | | | | | | | |
| Nitrate Ion | 0.02 ± 0.01 | 0.03 ± 0.01 | 0.04 ± 0.01 | 0.01 ± 0.01 | 0.03 ± 0.01 | 0.02 ± 0.01 | 0.03 ± 0.01 | 0.02 ± 0.01 | 0.06 ± 0.01 | 0.01 ± 0.01 | 0.01 ± 0.01 | 0.05 ± 0.01 |
| Sulfate Ion | 0.24 ± 0.02 | 1.99 ± 0.11 | 1.65 ± 0.09 | 0.17 ± 0.01 | 0.40 ± 0.02 | 0.24 ± 0.01 | 0.23 ± 0.02 | 0.59 ± 0.03 | 4.19 ± 0.22 | 0.20 ± 0.02 | 0.11 ± 0.01 | 0.81 ± 0.04 |
| Polycyclic aromatic hydrocarbons (ug/mile) | | | | | | | | | | | | |
| Naphthalene | 1924.91 ± 296.78 | 835.97 ± 130.70 | 1862.48 ± 287.77 | 479.49 ± 76.38 | 523.21 ± 83.25 | 1111.88 ± 173.51 | 2213.96 ± 342.90 | 1511.38 ± 235.25 | 7313.75 ± 1120.23 | 4786.73 ± 738.00 | 6271.44 ± 963.02 | 983.66 ± 153.93 |
| 2-methylnaphthalene | 3566.82 ± 362.07 | 1557.06 ± 158.54 | 2639.91 ± 268.01 | 1010.27 ± 103.23 | 753.20 ± 77.28 | 2508.56 ± 257.39 | 5147.60 ± 528.11 | 13825.62 ± 1409.79 | 18124.51 ± 1838.57 | 5840.62 ± 599.28 | 10287.39 ± 1048.32 | 2770.00 ± 282.68 |
| 1-methylnaphthalene | 1923.09 ± 207.49 | 720.62 ± 78.01 | 1195.15 ± 128.99 | 511.28 ± 55.54 | 346.41 ± 37.79 | 1404.54 ± 153.00 | 2677.12 ± 291.53 | 7100.06 ± 768.91 | 9217.26 ± 993.59 | 2700.41 ± 294.13 | 4962.15 ± 537.11 | 1350.73 ± 146.44 |
| Biphenyl | 241.78 ± 31.01 | 65.07 ± 8.39 | 99.64 ± 12.81 | 46.09 ± 5.97 | 37.00 ± 4.81 | 115.90 ± 14.99 | 176.17 ± 22.78 | 640.29 ± 82.34 | 648.08 ± 83.07 | 235.45 ± 30.43 | 371.17 ± 47.74 | 122.78 ± 15.84 |
| 1+2ethylnaphthalene | 499.03 ± 68.21 | 169.62 ± 23.37 | 357.48 ± 48.92 | 176.39 ± 24.34 | 115.33 ± 16.03 | 377.59 ± 51.98 | 602.90 ± 82.88 | 1536.80 ± 210.22 | 1993.46 ± 271.81 | 461.93 ± 63.59 | 865.71 ± 118.49 | 422.23 ± 57.94 |
| 2,6+2,7-dimethylnaphthalene | 476.49 ± 57.14 | 172.11 ± 20.70 | 243.70 ± 29.25 | 116.16 ± 14.01 | 65.10 ± 7.90 | 387.07 ± 46.78 | 497.13 ± 60.10 | 1843.72 ± 221.82 | 1442.15 ± 172.89 | 494.64 ± 59.83 | 924.93 ± 111.27 | 310.68 ± 37.43 |
| 1,3+1,6+1,7dimethylnaphth | 715.20 ± 86.42 | 256.39 ± 31.11 | 384.67 ± 46.53 | 190.42 ± 23.17 | 105.88 ± 12.97 | 636.87 ± 77.54 | 758.63 ± 92.38 | 2721.45 ± 329.72 | 1919.17 ± 231.73 | 832.91 ± 101.45 | 1378.59 ± 167.03 | 503.06 ± 61.06 |
| 1,4+1,5+2,3-dimethylnaphth | 57.40 ± 6.75 | 32.08 ± 3.83 | 13.64 ± 2.36 | 13.42 ± 1.65 | 3.71 ± 0.78 | 58.44 ± 6.93 | 62.75 ± 7.46 | 654.49 ± 76.65 | 325.24 ± 37.99 | 208.06 ± 24.55 | 321.11 ± 37.63 | 26.45 ± 3.25 |
| 1,2-dimethylnaphthalene | 280.72 ± 37.50 | 62.71 ± 8.40 | 45.67 ± 6.19 | 51.12 ± 6.86 | 17.20 ± 2.35 | 295.20 ± 39.67 | 332.10 ± 44.63 | 1886.01 ± 252.52 | 722.21 ± 96.43 | 440.76 ± 59.23 | 360.57 ± 48.27 | 71.38 ± 9.59 |
| 2-Methylbiphenyl | 0.00 ± 13.84 | 0.00 ± 12.67 | 108.74 ± 39.81 | 0.00 ± 11.37 | 0.00 ± 13.54 | 0.00 ± 13.83 | 0.00 ± 17.54 | 0.00 ± 23.43 | 117.60 ± 41.36 | 0.00 ± 22.88 | 0.00 ± 23.10 | 78.90 ± 33.95 |
| 3-Methylbiphenyl | 65.93 ± 11.97 | 0.00 ± 5.44 | 105.06 ± 16.59 | 0.00 ± 5.12 | 0.00 ± 4.36 | 42.48 ± 9.95 | 66.44 ± 12.42 | 197.57 ± 25.88 | 259.64 ± 31.72 | 59.05 ± 12.57 | 93.63 ± 15.84 | 163.25 ± 21.89 |
| 4-Methylbiphenyl | 29.78 ± 4.67 | 0.00 ± 1.99 | 40.36 ± 5.91 | 0.00 ± 1.77 | 0.00 ± 1.62 | 19.51 ± 3.87 | 28.08 ± 4.68 | 97.91 ± 11.10 | 91.97 ± 10.47 | 23.29 ± 4.58 | 41.90 ± 6.15 | 76.33 ± 8.96 |
| Dibenzofuran | 24.91 ± 2.75 | 12.09 ± 1.34 | 26.29 ± 2.91 | 8.29 ± 0.93 | 6.95 ± 0.78 | 9.60 ± 1.08 | 18.99 ± 2.13 | 68.79 ± 7.64 | 48.01 ± 5.31 | 52.11 ± 5.82 | 71.15 ± 7.88 | 17.49 ± 1.95 |
| A-trimethylnaphthalene | 70.40 ± 6.16 | 29.89 ± 2.63 | 32.34 ± 2.84 | 20.65 ± 1.83 | 10.56 ± 0.94 | 69.67 ± 6.19 | 68.25 ± 6.06 | 269.45 ± 23.72 | 117.99 ± 10.33 | 91.24 ± 8.10 | 130.87 ± 11.52 | 48.84 ± 4.31 |
| 1-ethyl-2-methylnaphthalene | 14.38 ± 1.10 | 5.52 ± 0.43 | 6.44 ± 0.52 | 4.00 ± 0.31 | 2.16 ± 0.18 | 12.41 ± 0.97 | 12.84 ± 1.00 | 49.79 ± 3.83 | 20.88 ± 1.60 | 21.86 ± 1.70 | 24.62 ± 1.90 | 9.40 ± 0.73 |
| B-trimethylnaphthalene | 92.54 ± 13.38 | 32.06 ± 4.66 | 39.49 ± 5.73 | 25.74 ± 3.75 | 10.31 ± 1.52 | 79.33 ± 11.53 | 80.06 ± 11.65 | 184.73 ± 26.75 | 99.83 ± 14.44 | 100.80 ± 14.66 | 151.49 ± 21.94 | 60.49 ± 8.78 |
| C-trimethylnaphthalene | 48.02 ± 3.84 | 21.10 ± 1.70 | 26.10 ± 2.10 | 14.95 ± 1.21 | 6.73 ± 0.56 | 52.23 ± 4.25 | 47.07 ± 3.83 | 190.42 ± 15.31 | 59.10 ± 4.72 | 74.83 ± 6.08 | 94.53 ± 7.60 | 38.12 ± 3.07 |
| 2-ethyl-1-methylnaphthalene | 1.53 ± 0.21 | 0.47 ± 0.09 | 0.60 ± 0.18 | 0.46 ± 0.07 | 0.19 ± 0.07 | 1.29 ± 0.18 | 1.48 ± 0.21 | 6.83 ± 0.89 | 2.16 ± 0.31 | 3.05 ± 0.42 | 2.64 ± 0.37 | 0.92 ± 0.15 |
| E-trimethylnaphthalene | 30.97 ± 2.78 | 12.15 ± 1.10 | 13.29 ± 1.21 | 8.60 ± 0.78 | 3.72 ± 0.35 | 31.18 ± 2.84 | 29.78 ± 2.72 | 128.77 ± 11.62 | 38.82 ± 3.49 | 45.88 ± 4.18 | 54.54 ± 4.92 | 23.32 ± 2.12 |
| F-trimethylnaphthalene | 29.38 ± 3.22 | 12.33 ± 1.36 | 15.88 ± 1.75 | 9.27 ± 1.03 | 4.02 ± 0.46 | 31.67 ± 3.50 | 29.26 ± 3.24 | 116.22 ± 12.77 | 35.91 ± 3.95 | 43.25 ± 4.79 | 52.79 ± 5.81 | 23.12 ± 2.55 |
| 2,3,5+I-trimethylnaphthalene | 32.77 ± 3.63 | 14.97 ± 1.67 | 19.26 ± 2.15 | 11.74 ± 1.32 | 4.42 ± 0.51 | 37.39 ± 4.18 | 34.05 ± 3.81 | 139.37 ± 15.47 | 40.23 ± 4.46 | 59.16 ± 6.61 | 65.83 ± 7.32 | 27.38 ± 3.05 |
| 2,4,5-trimethylnaphthalene | 5.60 ± 0.84 | 4.56 ± 0.68 | 2.82 ± 0.45 | 2.44 ± 0.37 | 0.63 ± 0.12 | 5.58 ± 0.84 | 5.48 ± 0.82 | 24.40 ± 3.62 | 6.52 ± 0.98 | 11.63 ± 1.74 | 15.66 ± 2.33 | 7.45 ± 1.11 |
| J-trimethylnaphthalene | 17.27 ± 1.99 | 2.40 ± 0.29 | 5.04 ± 0.61 | 4.31 ± 0.50 | 1.26 ± 0.16 | 15.81 ± 1.84 | 14.65 ± 1.70 | 60.36 ± 6.97 | 14.64 ± 1.69 | 16.76 ± 1.95 | 10.73 ± 1.25 | 3.63 ± 0.43 |
| 1,4,5-trimethylnaphthalene | 5.76 ± 0.95 | 2.34 ± 0.40 | 0.83 ± 0.23 | 0.80 ± 0.15 | 0.55 ± 0.12 | 5.83 ± 0.96 | 4.88 ± 0.82 | 22.39 ± 3.66 | 5.70 ± 0.96 | 8.19 ± 1.36 | 4.22 ± 0.72 | 2.07 ± 0.36 |
| Acenaphthylene | 128.24 ± 13.71 | 93.06 ± 9.98 | 61.06 ± 6.57 | 42.54 ± 4.59 | 31.32 ± 3.41 | 139.51 ± 15.07 | 228.95 ± 24.74 | 994.70 ± 106.86 | 993.69 ± 106.26 | 1125.66 ± 121.56 | 393.69 ± 42.29 | 43.63 ± 4.73 |
| Acenaphthene | 88.89 ± 7.79 | 58.79 ± 5.33 | 15.86 ± 1.94 | 8.34 ± 1.23 | 24.35 ± 2.54 | 11.59 ± 1.51 | 62.87 ± 5.75 | 60.15 ± 5.54 | 139.78 ± 12.01 | 15.41 ± 1.95 | 29.91 ± 3.08 | 3.81 ± 1.00 |
| Fluorene | 112.50 ± 11.51 | 62.64 ± 6.43 | 57.79 ± 5.95 | 33.16 ± 3.42 | 18.64 ± 1.94 | 74.15 ± 7.67 | 123.29 ± 12.76 | 300.25 ± 30.87 | 311.17 ± 31.83 | 157.06 ± 16.27 | 162.52 ± 16.73 | 56.83 ± 5.87 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W3-1 | W3-2 | W3-3 | W4-1 | W4-2 | W4-3 | W5-1 | W5-2 | W5-3 | W6-1 | W6-2 | W6-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dibenzothiophene | 1.90 ± 0.23 | 2.31 ± 0.28 | 3.35 ± 0.43 | 1.06 ± 0.13 | 0.99 ± 0.13 | 1.71 ± 0.21 | 1.73 ± 0.22 | 9.18 ± 1.11 | 7.38 ± 0.89 | 46.86 ± 5.62 | 4.62 ± 0.57 | 10.23 ± 1.23 |
| Phenanthrene | 376.44 ± 40.02 | 180.77 ± 19.26 | 200.52 ± 21.36 | 92.77 ± 9.99 | 69.73 ± 7.55 | 231.09 ± 24.83 | 297.02 ± 31.98 | 1044.58 ± 111.56 | 695.50 ± 73.98 | 608.41 ± 65.38 | 471.95 ± 50.45 | 216.38 ± 23.22 |
| Anthracene | 94.40 ± 12.76 | 27.82 ± 3.75 | 8.65 ± 1.17 | 6.38 ± 0.86 | 9.04 ± 1.23 | 28.35 ± 3.85 | 70.59 ± 9.64 | 232.54 ± 31.62 | 174.01 ± 23.59 | 108.81 ± 14.86 | 108.68 ± 14.78 | 16.63 ± 2.28 |
| A-methylfluorene | 30.39 ± 3.31 | 13.13 ± 1.44 | 16.03 ± 1.76 | 9.38 ± 1.04 | 4.33 ± 0.50 | 20.61 ± 2.27 | 33.07 ± 3.64 | 109.08 ± 11.87 | 55.81 ± 6.07 | 38.67 ± 4.25 | 45.03 ± 4.91 | 22.39 ± 2.46 |
| 1-methylfluorene | 20.15 ± 2.31 | 10.56 ± 1.22 | 14.42 ± 1.67 | 6.98 ± 0.81 | 5.07 ± 0.60 | 14.07 ± 1.64 | 24.97 ± 2.90 | 59.83 ± 6.89 | 36.92 ± 4.25 | 31.66 ± 3.68 | 37.23 ± 4.29 | 17.16 ± 1.99 |
| B-methylfluorene | 6.39 ± 1.19 | 3.61 ± 0.68 | 3.64 ± 0.70 | 1.87 ± 0.35 | 1.15 ± 0.23 | 3.97 ± 0.75 | 8.40 ± 1.58 | 21.20 ± 3.96 | 15.50 ± 2.90 | 11.20 ± 2.11 | 11.03 ± 2.07 | 3.90 ± 0.74 |
| 9-fluorenone | 37.54 ± 4.30 | 26.40 ± 3.02 | 62.25 ± 7.11 | 18.94 ± 2.20 | 22.93 ± 2.67 | 15.21 ± 1.78 | 20.98 ± 2.49 | 179.42 ± 20.65 | 98.34 ± 11.31 | 137.97 ± 15.97 | 138.37 ± 15.93 | 37.78 ± 4.41 |
| Xanthone | 14.10 ± 1.96 | 0.31 ± 0.08 | 10.75 ± 1.49 | 4.32 ± 0.60 | 10.52 ± 1.47 | 6.98 ± 0.97 | 6.45 ± 0.92 | 46.52 ± 6.53 | 28.17 ± 3.95 | 8.63 ± 1.23 | 12.70 ± 1.80 | 8.92 ± 1.27 |
| Acenaphthenequinone | 8.39 ± 1.05 | 0.00 ± 0.06 | 0.00 ± 0.17 | 0.45 ± 0.08 | 5.03 ± 0.63 | 4.00 ± 0.51 | 0.00 ± 0.08 | 11.34 ± 1.47 | 12.13 ± 1.55 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.00 ± 0.09 |
| Perinaphthenone | 39.51 ± 6.73 | 10.97 ± 1.65 | 3.74 ± 0.52 | 6.79 ± 0.96 | 29.71 ± 4.95 | 24.51 ± 3.92 | 36.76 ± 6.66 | 133.25 ± 24.04 | 131.46 ± 23.68 | 58.36 ± 10.57 | 13.88 ± 2.54 | 7.11 ± 1.31 |
| 2-methylanthracene | 18.71 ± 1.88 | 4.22 ± 0.43 | 2.52 ± 0.30 | 3.34 ± 0.34 | 6.35 ± 0.65 | 8.50 ± 0.87 | 13.44 ± 1.37 | 47.62 ± 4.82 | 30.25 ± 3.05 | 17.93 ± 1.83 | 16.44 ± 1.67 | 5.94 ± 0.61 |
| 3-methylphenanthrene | 40.85 ± 3.01 | 18.02 ± 1.34 | 20.13 ± 1.50 | 11.06 ± 0.83 | 16.05 ± 1.21 | 37.14 ± 2.79 | 33.66 ± 2.54 | 121.18 ± 9.00 | 51.04 ± 3.77 | 56.92 ± 4.28 | 44.91 ± 3.34 | 29.30 ± 2.19 |
| 2-methylphenanthrene | 44.54 ± 4.18 | 21.55 ± 2.03 | 23.00 ± 2.18 | 12.03 ± 1.16 | 19.12 ± 1.83 | 41.66 ± 3.95 | 35.76 ± 3.42 | 134.63 ± 12.71 | 58.44 ± 5.51 | 70.75 ± 6.75 | 51.34 ± 4.87 | 33.75 ± 3.21 |
| 9-methylphenanthrene | 19.19 ± 1.91 | 8.29 ± 0.83 | 6.61 ± 0.68 | 6.25 ± 0.63 | 6.72 ± 0.68 | 15.05 ± 1.51 | 16.12 ± 1.63 | 64.41 ± 6.46 | 41.22 ± 4.11 | 33.77 ± 3.41 | 20.66 ± 2.08 | 11.13 ± 1.12 |
| 1-methylphenanthrene | 28.70 ± 4.81 | 12.09 ± 2.02 | 12.01 ± 2.02 | 7.95 ± 1.33 | 13.87 ± 2.34 | 23.57 ± 3.97 | 24.48 ± 4.14 | 73.95 ± 12.48 | 42.30 ± 7.14 | 55.76 ± 9.44 | 28.17 ± 4.77 | 25.72 ± 4.35 |
| Anthrone | 0.00 ± 0.06 | 0.43 ± 0.12 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.74 ± 0.17 | 1.02 ± 0.23 | 0.00 ± 0.08 | 3.09 ± 0.68 | 0.00 ± 0.14 | 1.18 ± 0.30 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| Anthraquinone | 40.72 ± 5.48 | 11.20 ± 1.46 | 0.13 ± 0.21 | 4.42 ± 0.60 | 31.01 ± 4.22 | 23.71 ± 3.20 | 2.60 ± 0.49 | 8.38 ± 1.30 | 90.53 ± 12.51 | 31.21 ± 4.42 | 17.62 ± 2.54 | 11.99 ± 1.77 |
| 3,6-dimethylphenanthrene | 5.86 ± 0.61 | 2.52 ± 0.27 | 3.09 ± 0.36 | 2.63 ± 0.28 | 5.13 ± 0.54 | 7.67 ± 0.80 | 6.28 ± 0.66 | 20.60 ± 2.14 | 6.59 ± 0.70 | 9.73 ± 1.03 | 6.05 ± 0.65 | 4.67 ± 0.50 |
| A-dimethylphenanthrene | 7.96 ± 0.85 | 4.23 ± 0.46 | 4.88 ± 0.54 | 0.89 ± 0.10 | 7.77 ± 0.84 | 9.46 ± 1.02 | 7.63 ± 0.83 | 26.59 ± 2.87 | 7.88 ± 0.86 | 19.79 ± 2.16 | 10.57 ± 1.16 | 7.25 ± 0.79 |
| B-dimethylphenanthrene | 4.31 ± 0.46 | 2.24 ± 0.26 | 1.72 ± 0.25 | 0.48 ± 0.07 | 0.98 ± 0.13 | 3.85 ± 0.42 | 1.00 ± 0.14 | 7.89 ± 0.91 | 8.75 ± 1.00 | 7.74 ± 0.90 | 4.03 ± 0.48 | 2.84 ± 0.33 |
| C-dimethylphenanthrene | 11.90 ± 0.98 | 4.64 ± 0.39 | 3.86 ± 0.36 | 4.56 ± 0.38 | 10.92 ± 0.92 | 12.66 ± 1.06 | 9.73 ± 0.83 | 36.27 ± 3.03 | 14.24 ± 1.19 | 23.77 ± 2.01 | 12.68 ± 1.07 | 6.38 ± 0.54 |
| D-dimethylphenanthrene | 3.32 ± 0.36 | 1.53 ± 0.18 | 1.31 ± 0.22 | 1.27 ± 0.15 | 3.21 ± 0.36 | 4.27 ± 0.47 | 2.37 ± 0.28 | 9.57 ± 1.07 | 4.29 ± 0.49 | 7.10 ± 0.80 | 3.17 ± 0.38 | 2.11 ± 0.25 |
| 1,7-dimethylphenanthrene | 8.21 ± 0.66 | 2.78 ± 0.23 | 2.17 ± 0.24 | 2.73 ± 0.23 | 6.80 ± 0.56 | 7.80 ± 0.64 | 5.81 ± 0.49 | 21.41 ± 1.77 | 7.99 ± 0.67 | 14.60 ± 1.22 | 7.51 ± 0.64 | 3.57 ± 0.31 |
| E-dimethylphenanthrene | 5.55 ± 0.50 | 2.24 ± 0.21 | 1.81 ± 0.23 | 2.08 ± 0.19 | 5.02 ± 0.46 | 5.80 ± 0.53 | 3.66 ± 0.35 | 14.64 ± 1.35 | 5.90 ± 0.55 | 10.39 ± 0.97 | 5.22 ± 0.50 | 2.66 ± 0.26 |
| 9-methylanthracene | 1.37 ± 0.23 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.53 ± 0.10 | 0.75 ± 0.14 | 0.80 ± 0.15 | 1.00 ± 0.19 | 3.14 ± 0.54 | 2.09 ± 0.38 | 1.52 ± 0.29 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| Fluoranthene | 96.38 ± 7.12 | 43.20 ± 3.20 | 36.69 ± 2.75 | 32.09 ± 2.42 | 30.44 ± 2.32 | 46.24 ± 3.51 | 76.41 ± 5.89 | 265.40 ± 20.19 | 203.23 ± 15.33 | 199.98 ± 15.38 | 73.82 ± 5.63 | 48.42 ± 3.71 |
| Pyrene | 96.81 ± 8.41 | 44.24 ± 3.87 | 31.42 ± 2.79 | 37.51 ± 3.34 | 37.04 ± 3.32 | 47.37 ± 4.21 | 76.98 ± 7.01 | 321.20 ± 28.88 | 227.09 ± 20.30 | 241.66 ± 21.90 | 69.63 ± 6.30 | 37.27 ± 3.39 |
| 9-Anthraaldehyde | 0.33 ± 0.10 | 0.01 ± 0.06 | 0.00 ± 0.16 | 3.18 ± 0.84 | 0.36 ± 0.11 | 0.60 ± 0.18 | 0.00 ± 0.08 | 0.83 ± 0.28 | 12.77 ± 3.39 | 22.38 ± 5.93 | 12.30 ± 3.28 | 8.23 ± 2.18 |
| Retene | 0.23 ± 0.09 | 0.20 ± 0.09 | 0.00 ± 0.23 | 0.58 ± 0.12 | 0.22 ± 0.09 | 0.19 ± 0.09 | 0.31 ± 0.12 | 0.66 ± 0.23 | 1.14 ± 0.28 | 5.20 ± 0.96 | 0.00 ± 0.19 | 0.07 ± 0.11 |
| Benzonaphthothiophene | 0.10 ± 0.12 | 0.06 ± 0.12 | 0.03 ± 0.32 | 0.04 ± 0.08 | 0.04 ± 0.12 | 0.03 ± 0.12 | 0.00 ± 0.15 | 0.00 ± 0.28 | 0.00 ± 0.27 | 0.00 ± 0.27 | 0.33 ± 0.28 | 0.27 ± 0.17 |
| 1+3-methylfluoranthene | 4.79 ± 0.58 | 1.91 ± 0.24 | 1.39 ± 0.24 | 2.02 ± 0.26 | 3.51 ± 0.45 | 4.38 ± 0.56 | 4.44 ± 0.60 | 10.78 ± 1.43 | 8.74 ± 1.16 | 14.04 ± 1.86 | 5.94 ± 0.79 | 2.51 ± 0.34 |
| 1-MeFl+C-MeFl/Py | 4.81 ± 0.45 | 2.23 ± 0.22 | 1.89 ± 0.24 | 2.10 ± 0.21 | 4.07 ± 0.40 | 5.30 ± 0.52 | 4.68 ± 0.48 | 12.02 ± 1.22 | 9.17 ± 0.94 | 13.55 ± 1.39 | 7.13 ± 0.73 | 3.21 ± 0.34 |
| B-MePy/MeFl | 8.36 ± 0.66 | 2.68 ± 0.22 | 1.87 ± 0.22 | 3.41 ± 0.28 | 5.17 ± 0.43 | 7.79 ± 0.65 | 7.99 ± 0.69 | 19.79 ± 1.70 | 20.91 ± 1.78 | 19.78 ± 1.70 | 7.96 ± 0.69 | 3.41 ± 0.30 |
| C-MePy/MeFl | 6.24 ± 0.47 | 1.86 ± 0.15 | 1.14 ± 0.18 | 2.11 ± 0.16 | 3.29 ± 0.26 | 6.22 ± 0.49 | 5.62 ± 0.47 | 13.79 ± 1.14 | 16.88 ± 1.38 | 13.55 ± 1.12 | 5.36 ± 0.46 | 2.07 ± 0.19 |
| D-MePy/MeFl | 4.08 ± 0.46 | 1.66 ± 0.20 | 1.53 ± 0.24 | 1.73 ± 0.21 | 2.73 ± 0.33 | 3.71 ± 0.45 | 3.49 ± 0.45 | 9.77 ± 1.23 | 7.52 ± 0.95 | 11.79 ± 1.50 | 4.10 ± 0.53 | 2.13 ± 0.28 |
| 4-methylpyrene | 3.19 ± 0.32 | 1.45 ± 0.16 | 1.40 ± 0.22 | 1.76 ± 0.19 | 1.92 ± 0.21 | 2.95 ± 0.32 | 3.31 ± 0.38 | 8.72 ± 0.99 | 8.26 ± 0.93 | 11.17 ± 1.27 | 3.92 ± 0.46 | 1.82 ± 0.22 |
| 1-methylpyrene | 3.00 ± 0.26 | 1.25 ± 0.12 | 0.86 ± 0.18 | 1.91 ± 0.18 | 1.88 ± 0.18 | 2.52 ± 0.24 | 2.70 ± 0.27 | 7.09 ± 0.70 | 6.69 ± 0.66 | 11.99 ± 1.17 | 3.87 ± 0.40 | 1.96 ± 0.20 |
| Benzo(c)phenanthrene | 3.69 ± 0.43 | 1.68 ± 0.22 | 0.15 ± 0.16 | 0.22 ± 0.05 | 1.74 ± 0.23 | 2.09 ± 0.27 | 0.00 ± 0.08 | 7.30 ± 1.04 | 8.31 ± 1.16 | 12.35 ± 1.73 | 2.44 ± 0.38 | 1.69 ± 0.25 |
| Benzo(ghi)fluoranthene | 40.60 ± 3.18 | 18.30 ± 1.49 | 18.38 ± 1.48 | 19.88 ± 1.62 | 18.72 ± 1.54 | 26.46 ± 2.22 | 46.58 ± 4.11 | 120.31 ± 10.53 | 141.95 ± 12.33 | 80.84 ± 7.14 | 15.44 ± 1.36 | 11.91 ± 1.05 |
| Cyclopenta(c,d)pyrene | 12.02 ± 1.37 | 2.69 ± 0.34 | 1.32 ± 0.23 | 3.31 ± 0.38 | 2.20 ± 0.27 | 5.25 ± 0.68 | 11.21 ± 1.79 | 56.52 ± 8.97 | 42.22 ± 6.69 | 99.99 ± 15.89 | 6.07 ± 0.99 | 2.20 ± 0.37 |
| Benz(a)anthracene | 14.89 ± 1.60 | 4.82 ± 0.61 | 3.09 ± 0.58 | 7.24 ± 0.86 | 4.64 ± 0.57 | 10.50 ± 1.28 | 13.02 ± 1.88 | 27.81 ± 3.99 | 36.60 ± 5.23 | 40.96 ± 5.88 | 9.29 ± 1.39 | 6.75 ± 1.00 |
| Triphenylene | 0.00 ± 0.06 | 0.35 ± 0.07 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| Chrysene | 18.63 ± 1.10 | 7.67 ± 0.51 | 5.76 ± 0.43 | 6.81 ± 0.45 | 6.51 ± 0.44 | 10.34 ± 0.72 | 13.92 ± 1.17 | 33.75 ± 2.79 | 46.16 ± 3.79 | 43.07 ± 3.59 | 9.75 ± 0.83 | 7.41 ± 0.63 |
| Benzanthrone | 35.34 ± 5.66 | 19.17 ± 3.07 | 1.66 ± 0.33 | 7.15 ± 1.15 | 11.41 ± 1.84 | 6.96 ± 1.13 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| 7-methylbenz(a)anthracene | 0.11 ± 0.09 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.11 ± 0.07 | 0.04 ± 0.06 | 0.30 ± 0.18 | 0.00 ± 0.08 | 0.30 ± 0.23 | 0.77 ± 0.46 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| 3-methylchrysene | 1.71 ± 0.15 | 0.56 ± 0.07 | 0.26 ± 0.16 | 0.46 ± 0.05 | 0.42 ± 0.07 | 1.27 ± 0.12 | 0.89 ± 0.12 | 3.73 ± 0.42 | 3.52 ± 0.39 | 3.38 ± 0.38 | 0.31 ± 0.14 | 0.18 ± 0.08 |
| Benz(a)anthracene-7,12-dione | 7.02 ± 1.37 | 4.99 ± 1.00 | 0.52 ± 0.20 | 1.23 ± 0.25 | 2.84 ± 0.55 | 1.41 ± 0.29 | 0.93 ± 0.21 | 5.25 ± 1.07 | 17.42 ± 3.48 | 5.26 ± 1.07 | 1.06 ± 0.27 | 1.89 ± 0.39 |
| 5+6-methylchrysene | 0.44 ± 0.08 | 0.13 ± 0.06 | 0.05 ± 0.16 | 0.17 ± 0.04 | 0.13 ± 0.06 | 0.29 ± 0.07 | 0.34 ± 0.10 | 1.03 ± 0.23 | 1.21 ± 0.25 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.05 ± 0.08 |
| Benzo(b+j+k)fluoranthene | 19.34 ± 4.04 | 16.76 ± 3.61 | 4.54 ± 0.94 | 7.36 ± 1.48 | 10.05 ± 2.06 | 27.29 ± 5.75 | 2.13 ± 0.52 | 15.93 ± 3.51 | 28.65 ± 6.21 | 60.55 ± 13.04 | 16.81 ± 3.70 | 19.54 ± 4.22 |
| Benzo(a)fluoranthene | 2.40 ± 0.49 | 1.47 ± 0.29 | 0.74 ± 0.21 | 0.84 ± 0.17 | 0.89 ± 0.18 | 5.83 ± 1.18 | 0.22 ± 0.09 | 2.76 ± 0.58 | 3.66 ± 0.77 | 7.07 ± 1.45 | 1.69 ± 0.38 | 0.55 ± 0.14 |
| BeP | 16.80 ± 1.63 | 7.16 ± 0.76 | 3.65 ± 0.34 | 3.33 ± 0.28 | 4.96 ± 0.49 | 8.69 ± 0.73 | 4.82 ± 0.55 | 29.13 ± 3.26 | 39.44 ± 4.39 | 24.90 ± 2.80 | 5.32 ± 0.62 | 7.04 ± 0.79 |
| BaP | 16.78 ± 1.47 | 4.95 ± 0.50 | 1.75 ± 0.55 | 3.20 ± 0.27 | 4.09 ± 0.38 | 9.10 ± 0.77 | 4.36 ± 0.48 | 35.56 ± 3.41 | 50.61 ± 4.80 | 32.84 ± 3.17 | 8.09 ± 0.89 | 4.27 ± 0.48 |
| Perylene | 3.36 ± 0.47 | 0.89 ± 0.18 | 0.41 ± 0.18 | 0.81 ± 0.12 | 0.92 ± 0.15 | 2.01 ± 0.33 | 1.16 ± 0.24 | 6.13 ± 1.16 | 8.32 ± 1.57 | 8.66 ± 1.63 | 2.72 ± 0.54 | 1.05 ± 0.22 |
| 7-methylbenzo(a)pyrene | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.79 ± 0.26 | 0.52 ± 0.19 | 6.51 ± 1.73 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| 9,10-dihydrobenzo(a)pyrene-7(8H)-one | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| Dibenzo(a,j)anthracene | 1.26 ± 0.25 | 0.61 ± 0.13 | 0.14 ± 0.16 | 0.08 ± 0.04 | 0.40 ± 0.10 | 0.34 ± 0.09 | 0.00 ± 0.08 | 2.66 ± 0.54 | 5.05 ± 1.00 | 1.90 ± 0.40 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| Indeno[123-cd]pyrene | 19.27 ± 3.69 | 8.97 ± 1.74 | 6.23 ± 1.24 | 2.62 ± 0.51 | 5.51 ± 1.08 | 9.42 ± 1.83 | 3.16 ± 0.63 | 40.30 ± 7.81 | 59.27 ± 11.46 | 87.92 ± 17.03 | 0.00 ± 0.14 | 2.79 ± 0.56 |
| Dibenzo(ah+ac)anthracene | 1.16 ± 0.16 | 0.60 ± 0.10 | 0.03 ± 0.16 | 0.00 ± 0.04 | 0.37 ± 0.08 | 0.42 ± 0.08 | 0.00 ± 0.08 | 2.04 ± 0.30 | 2.93 ± 0.40 | 1.83 ± 0.28 | 0.00 ± 0.14 | 0.04 ± 0.08 |
| Benzo(b)chrysene | 1.03 ± 0.22 | 0.00 ± 0.06 | 0.20 ± 0.17 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.13 ± 0.07 | 0.00 ± 0.08 | 0.35 ± 0.17 | 1.87 ± 0.42 | 1.16 ± 0.29 | 0.00 ± 0.14 | 0.13 ± 0.09 |
| Picene | 2.14 ± 0.39 | 0.00 ± 0.06 | 0.14 ± 0.16 | 0.09 ± 0.04 | 0.00 ± 0.06 | 0.43 ± 0.10 | 0.00 ± 0.08 | 1.30 ± 0.27 | 1.33 ± 0.28 | 1.57 ± 0.32 | 0.00 ± 0.14 | 0.24 ± 0.09 |
| Benzo(ghi)perylene | 37.46 ± 4.95 | 5.49 ± 0.75 | 6.31 ± 1.01 | 5.09 ± 0.69 | 8.87 ± 1.19 | 10.20 ± 1.37 | 6.08 ± 0.85 | 84.08 ± 11.13 | 118.47 ± 15.63 | 94.43 ± 12.55 | 17.63 ± 2.38 | 9.83 ± 1.33 |
| Anthanthrene | 3.02 ± 0.45 | 0.27 ± 0.07 | 0.49 ± 0.18 | 0.17 ± 0.05 | 0.17 ± 0.06 | 0.99 ± 0.16 | 0.00 ± 0.08 | 0.00 ± 0.14 | 12.44 ± 1.81 | 11.43 ± 1.68 | 2.47 ± 0.39 | 0.10 ± 0.08 |
| Dibenzo(b,k)fluoranthene | 1.55 ± 0.22 | 0.54 ± 0.09 | 0.00 ± 0.16 | 0.25 ± 0.05 | 0.56 ± 0.09 | 1.35 ± 0.19 | 0.41 ± 0.10 | 2.59 ± 0.38 | 6.08 ± 0.83 | 2.61 ± 0.38 | 0.00 ± 0.14 | 0.82 ± 0.13 |
| Dibenzo(a,e)pyrene | 0.44 ± 0.10 | 1.11 ± 0.21 | 0.60 ± 0.20 | 0.49 ± 0.10 | 0.78 ± 0.16 | 1.95 ± 0.36 | 0.00 ± 0.08 | 7.07 ± 1.30 | 12.70 ± 2.32 | 3.02 ± 0.57 | 0.88 ± 0.21 | 0.89 ± 0.18 |
| Coronene | 15.11 ± 1.98 | 6.89 ± 0.91 | 3.69 ± 0.51 | 2.08 ± 0.27 | 4.70 ± 0.62 | 6.56 ± 0.85 | 5.55 ± 0.74 | 46.42 ± 6.14 | 74.44 ± 9.81 | 24.30 ± 3.23 | 7.16 ± 0.96 | 5.46 ± 0.73 |
| Dibenzo(a,h)pyrene | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.07 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 4.57 ± 0.41 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| nitro-PAH (ug/mile) | | | | | | | | | | | | |
| 1-nitronaphthalene | 0.1798 ± 0.0184 | 0.0000 ± 0.0028 | 0.1501 ± 0.0160 | 0.0027 ± 0.0034 | 0.0168 ± 0.0046 | 0.0177 ± 0.0047 | 0.5800 ± 0.0544 | 0.2849 ± 0.0281 | 0.3013 ± 0.0293 | 0.0175 ± 0.0054 | 0.0670 ± 0.0092 | 0.1121 ± 0.0128 |
| 2-nitronaphthalene | 0.4275 ± 0.0550 | 0.0777 ± 0.0120 | 0.2597 ± 0.0326 | 0.0436 ± 0.0079 | 0.0781 ± 0.0124 | 0.2786 ± 0.0370 | 0.8353 ± 0.1060 | 0.6360 ± 0.0812 | 0.5122 ± 0.0657 | 0.0369 ± 0.0079 | 0.1231 ± 0.0182 | 0.3106 ± 0.0411 |
| 2-nitrobiphenyl | 0.0117 ± 0.0023 | 0.0030 ± 0.0008 | 0.0086 ± 0.0018 | 0.0038 ± 0.0010 | 0.0057 ± 0.0013 | 0.0000 ± 0.0004 | 0.0095 ± 0.0020 | 0.0185 ± 0.0035 | 0.0039 ± 0.0011 | 0.0081 ± 0.0018 | 0.0136 ± 0.0027 | 0.0102 ± 0.0021 |
| 3-nitrobiphenyl | 0.0300 ± 0.0052 | 0.0023 ± 0.0006 | 0.0130 ± 0.0021 | 0.0002 ± 0.0002 | 0.0058 ± 0.0011 | 0.0086 ± 0.0016 | 0.0285 ± 0.0049 | 0.0243 ± 0.0042 | 0.0390 ± 0.0067 | 0.0059 ± 0.0012 | 0.0050 ± 0.0010 | 0.0084 ± 0.0016 |
| 4-nitrobiphenyl | 0.0000 ± 0.0013 | 0.0000 ± 0.0013 | 0.0272 ± 0.0061 | 0.0000 ± 0.0011 | 0.0000 ± 0.0019 | 0.0000 ± 0.0013 | 0.0734 ± 0.0150 | 0.0000 ± 0.0025 | 0.1192 ± 0.0230 | 0.0244 ± 0.0069 | 0.0000 ± 0.0033 | 0.1153 ± 0.0223 |
| 2-nitrofluorene | 0.0015 ± 0.0002 | 0.0000 ± 0.0001 | 0.0130 ± 0.0010 | 0.0000 ± 0.0001 | 0.0012 ± 0.0002 | 0.0004 ± 0.0001 | 0.0046 ± 0.0006 | 0.0000 ± 0.0002 | 0.0131 ± 0.0013 | 0.0050 ± 0.0006 | 0.0116 ± 0.0012 | 0.0014 ± 0.0003 |
| 1,3-dinitronaphthalene | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0115 ± 0.0015 | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0000 ± 0.0006 | 0.0039 ± 0.0014 | 0.0158 ± 0.0024 | 0.0098 ± 0.0019 | 0.0000 ± 0.0008 | 0.0000 ± 0.0010 |
| 1,5-dinitronaphthalene | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0022 ± 0.0003 | 0.0000 ± 0.0000 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0012 ± 0.0002 | 0.0000 ± 0.0002 | 0.0044 ± 0.0007 | 0.0005 ± 0.0002 | 0.0012 ± 0.0003 | 0.0032 ± 0.0005 |
| 5-nitroacenaphthene | 0.0043 ± 0.0013 | 0.0000 ± 0.0005 | 0.0071 ± 0.0015 | 0.0000 ± 0.0004 | 0.0000 ± 0.0005 | 0.0000 ± 0.0005 | 0.0147 ± 0.0026 | 0.0000 ± 0.0014 | 0.0272 ± 0.0039 | 0.0000 ± 0.0011 | 0.0000 ± 0.0012 | 0.0317 ± 0.0042 |
| 9-nitroanthracene | 0.0639 ± 0.0099 | 0.0000 ± 0.0001 | 0.0091 ± 0.0016 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0143 ± 0.0024 | 0.2022 ± 0.0332 | 0.0158 ± 0.0028 | 0.0538 ± 0.0090 | 0.0008 ± 0.0004 | 0.0181 ± 0.0031 | 0.0196 ± 0.0034 |
| 4-nitrophenanthrene | 0.0012 ± 0.0001 | 0.0000 ± 0.0001 | 0.0024 ± 0.0003 | 0.0000 ± 0.0000 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0027 ± 0.0003 | 0.0015 ± 0.0002 | 0.0068 ± 0.0006 | 0.0001 ± 0.0001 | 0.0009 ± 0.0002 | 0.0000 ± 0.0001 |
| 9-nitrophenanthrene | 0.0042 ± 0.0006 | 0.0000 ± 0.0001 | 0.0234 ± 0.0035 | 0.0000 ± 0.0000 | 0.0000 ± 0.0001 | 0.0065 ± 0.0010 | 0.0048 ± 0.0008 | 0.0084 ± 0.0013 | 0.0000 ± 0.0002 | 0.0046 ± 0.0007 | 0.0053 ± 0.0009 | 0.0000 ± 0.0001 |
| 1,8-dinitronaphthalene | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0002 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0048 ± 0.0007 | 0.0027 ± 0.0006 | 0.0000 ± 0.0003 | 0.0000 ± 0.0003 | 0.0057 ± 0.0009 | 0.0041 ± 0.0008 | 0.0000 ± 0.0002 |
| 2-nitrofluoranthene | 0.0305 ± 0.0035 | 0.0018 ± 0.0005 | 0.0140 ± 0.0016 | 0.0135 ± 0.0015 | 0.0000 ± 0.0003 | 0.0152 ± 0.0017 | 0.0273 ± 0.0032 | 0.0000 ± 0.0004 | 0.0229 ± 0.0027 | 0.0623 ± 0.0069 | 0.0221 ± 0.0026 | 0.0000 ± 0.0002 |
| 3-nitrofluoranthene | 0.0051 ± 0.0004 | 0.0000 ± 0.0001 | 0.0635 ± 0.0045 | 0.0043 ± 0.0003 | 0.0000 ± 0.0001 | 0.0041 ± 0.0003 | 0.0022 ± 0.0003 | 0.0256 ± 0.0019 | 0.1186 ± 0.0084 | 0.0073 ± 0.0006 | 0.0024 ± 0.0003 | 0.0080 ± 0.0006 |
| 1-nitropyrene | 0.3259 ± 0.0380 | 0.0049 ± 0.0009 | 0.0542 ± 0.0052 | 0.0499 ± 0.0061 | 0.0674 ± 0.0077 | 0.0301 ± 0.0037 | 0.2510 ± 0.0307 | 0.1122 ± 0.0139 | 0.6285 ± 0.0759 | 0.0903 ± 0.0112 | 0.0507 ± 0.0064 | 0.1771 ± 0.0217 |
| 7-nitrobenzo(a)anthracene | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0084 ± 0.0012 | 0.0009 ± 0.0003 | 0.0049 ± 0.0008 | 0.0023 ± 0.0005 | 0.0603 ± 0.0082 | 0.0350 ± 0.0049 | 0.0000 ± 0.0003 | 0.0807 ± 0.0109 | 0.0233 ± 0.0033 | 0.2039 ± 0.0272 |
| 6-nitrochrysene | 0.0049 ± 0.0008 | 0.0000 ± 0.0001 | 0.0199 ± 0.0023 | 0.0000 ± 0.0000 | 0.0020 ± 0.0003 | 0.0000 ± 0.0001 | 0.0301 ± 0.0048 | 0.0125 ± 0.0020 | 0.0341 ± 0.0054 | 0.0904 ± 0.0143 | 0.0137 ± 0.0022 | 0.0574 ± 0.0091 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W3-1 | W3-2 | W3-3 | W4-1 | W4-2 | W4-3 | W5-1 | W5-2 | W5-3 | W6-1 | W6-2 | W6-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6-nitrobenz[a]pyrene | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0002 | 0.0030 ± 0.0003 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0067 ± 0.0006 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 |
| Hopanes (ug/mile) | | | | | | | | | | | | |
| 18a(H),21ß(H)-22,29,30-Trisnorhopane & | 1.15 ± 0.14 | 0.83 ± 0.10 | 0.00 ± 0.16 | 0.21 ± 0.05 | 0.15 ± 0.06 | 0.63 ± 0.09 | 1.49 ± 0.18 | 0.00 ± 0.14 | 2.01 ± 0.26 | 12.58 ± 1.36 | 0.88 ± 0.17 | 0.73 ± 0.11 |
| 17a(H),21ß(H)-22,29,30-Trisnorhopane | 0.47 ± 0.16 | 0.28 ± 0.13 | 0.00 ± 0.18 | 0.00 ± 0.05 | 0.00 ± 0.07 | 0.44 ± 0.15 | 0.00 ± 0.10 | 0.00 ± 0.17 | 0.43 ± 0.22 | 9.75 ± 2.02 | 0.00 ± 0.16 | 0.09 ± 0.13 |
| 17a(H),21ß(H)-30-Norhopane | 4.19 ± 0.81 | 3.06 ± 0.63 | 1.44 ± 0.37 | 0.70 ± 0.16 | 0.51 ± 0.13 | 2.43 ± 0.46 | 2.25 ± 0.52 | 7.34 ± 1.62 | 7.73 ± 1.69 | 47.16 ± 9.66 | 1.69 ± 0.48 | 1.95 ± 0.46 |
| 17a(H),21ß(H)-Hopane | 2.68 ± 0.53 | 2.11 ± 0.41 | 1.23 ± 0.32 | 0.47 ± 0.10 | 0.33 ± 0.10 | 1.16 ± 0.23 | 1.49 ± 0.32 | 5.58 ± 1.13 | 5.01 ± 1.01 | 29.18 ± 5.69 | 1.14 ± 0.29 | 1.42 ± 0.30 |
| 17ß(H),21a(H)-hopane | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.03 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 1.70 ± 0.47 | 0.00 ± 0.14 | 0.16 ± 0.09 |
| 22S-17a(H),21ß(H)-30-Homohopane | 1.55 ± 0.18 | 1.86 ± 0.24 | 0.00 ± 0.16 | 0.27 ± 0.05 | 0.36 ± 0.08 | 1.37 ± 0.17 | 0.95 ± 0.15 | 0.00 ± 0.14 | 2.51 ± 0.35 | 21.04 ± 2.68 | 0.87 ± 0.18 | 1.02 ± 0.15 |
| 22R-17a(H),21ß(H)-30-Homohopane | 0.85 ± 0.20 | 1.78 ± 0.40 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.25 ± 0.08 | 1.21 ± 0.27 | 0.67 ± 0.17 | 0.00 ± 0.14 | 0.00 ± 0.14 | 17.26 ± 3.84 | 0.71 ± 0.22 | 0.91 ± 0.23 |
| 17ß(H),21ß(H)-Hopane | 0.28 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 2.19 ± 0.43 | 0.00 ± 0.14 | 0.13 ± 0.08 |
| 22S-17a(H),21ß(H)-30,31-Bishomohopan | 0.72 ± 0.22 | 1.01 ± 0.30 | 0.34 ± 0.20 | 0.11 ± 0.05 | 0.06 ± 0.06 | 0.28 ± 0.10 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.81 ± 0.28 | 12.50 ± 3.53 | 0.43 ± 0.20 | 0.63 ± 0.20 |
| 22R-17a(H),21ß(H)-30,31-Bishomohopan | 0.52 ± 0.09 | 0.37 ± 0.08 | 0.00 ± 0.16 | 0.13 ± 0.04 | 0.14 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.45 ± 0.15 | 8.03 ± 1.04 | 0.00 ± 0.14 | 0.38 ± 0.09 |
| 22S-17a(H),21ß(H)-30,31,32-Trisomohop | 0.24 ± 0.08 | 0.50 ± 0.13 | 0.00 ± 0.16 | 0.06 ± 0.04 | 0.11 ± 0.07 | 0.41 ± 0.11 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 6.66 ± 1.48 | 0.00 ± 0.14 | 0.22 ± 0.10 |
| 22R-17a(H),21ß(H)-30,31,32-Trishomoho | 0.16 ± 0.07 | 0.22 ± 0.07 | 0.00 ± 0.16 | 0.02 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 2.77 ± 0.52 | 0.00 ± 0.14 | 0.06 ± 0.08 |
| Steranes (ug/mile) | | | | | | | | | | | | |
| C27-20S5a(H),14a(H)-cholestane | 0.08 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 1.25 ± 0.26 | 0.25 ± 0.14 | 0.00 ± 0.14 | 0.42 ± 0.11 |
| C27-20R5a(H),14ß(H)-cholestane | 0.03 ± 0.06 | 0.09 ± 0.07 | 0.00 ± 0.16 | 0.03 ± 0.05 | 0.03 ± 0.07 | 0.10 ± 0.08 | 0.00 ± 0.08 | 0.73 ± 0.26 | 1.65 ± 0.47 | 4.64 ± 1.23 | 0.50 ± 0.21 | 1.50 ± 0.42 |
| C27-20S5a(H),14ß(H),17ß(H)-cholestane | 0.48 ± 0.12 | 0.17 ± 0.07 | 0.00 ± 0.16 | 0.05 ± 0.04 | 0.09 ± 0.06 | 0.35 ± 0.09 | 0.00 ± 0.08 | 0.46 ± 0.17 | 0.74 ± 0.21 | 6.32 ± 1.27 | 0.39 ± 0.16 | 0.95 ± 0.21 |
| ster45+40(cholestane) | 0.42 ± 0.10 | 0.18 ± 0.07 | 0.11 ± 0.16 | 0.09 ± 0.05 | 0.06 ± 0.06 | 0.14 ± 0.06 | 0.33 ± 0.10 | 0.65 ± 0.18 | 0.65 ± 0.18 | 5.54 ± 0.87 | 0.37 ± 0.16 | 0.21 ± 0.09 |
| C28-20S5a(H),14a(H),17a(H)-ergostane | 0.24 ± 0.09 | 0.16 ± 0.07 | 0.00 ± 0.16 | 0.09 ± 0.05 | 0.03 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.40 ± 0.17 | 2.96 ± 0.71 | 0.28 ± 0.16 | 0.13 ± 0.09 |
| C28-20R5a(H),14ß(H),17ß(H)-ergostane | 0.08 ± 0.07 | 0.01 ± 0.06 | 0.02 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.39 ± 0.20 | 3.37 ± 0.95 | 0.17 ± 0.16 | 0.04 ± 0.09 |
| C28-20S5a(H),14ß(H),17ß(H)-ergostane | 0.15 ± 0.07 | 0.16 ± 0.07 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.07 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 1.53 ± 0.40 | 2.15 ± 0.54 | 0.00 ± 0.14 | 0.04 ± 0.08 |
| C28-20R5a(H),14a(H),17a(H)-ergostane | 0.21 ± 0.07 | 0.12 ± 0.06 | 0.00 ± 0.16 | 0.02 ± 0.04 | 0.06 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.30 ± 0.15 | 3.32 ± 0.49 | 0.46 ± 0.16 | 0.09 ± 0.08 |
| C29-20S5a(H),14a(H),17a(H)-stigmastan | 0.23 ± 0.07 | 0.06 ± 0.06 | 0.00 ± 0.16 | 0.06 ± 0.04 | 0.09 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.96 ± 0.22 | 4.41 ± 0.84 | 0.20 ± 0.15 | 0.16 ± 0.08 |
| C29-20R5a(H),14ß(H),17ß(H)-stigmastan | 0.00 ± 1.12 | 0.16 ± 0.06 | 0.00 ± 0.16 | 0.20 ± 0.05 | 0.25 ± 0.07 | 0.09 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 2.30 ± 0.34 | 7.79 ± 1.04 | 0.45 ± 0.15 | 0.21 ± 0.08 |
| C29-20S5a(H),14ß(H),17ß(H)-stigmastan | 0.39 ± 0.10 | 0.10 ± 0.06 | 0.00 ± 0.16 | 0.10 ± 0.04 | 0.08 ± 0.06 | 0.15 ± 0.07 | 0.24 ± 0.09 | 0.00 ± 0.14 | 0.87 ± 0.22 | 6.02 ± 1.24 | 0.27 ± 0.15 | 0.17 ± 0.09 |
| C29-20R5a(H),14a(H),17a(H)-stigmastan | 0.23 ± 0.08 | 0.09 ± 0.06 | 0.00 ± 0.16 | 0.07 ± 0.04 | 0.16 ± 0.07 | 0.06 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.74 ± 0.21 | 3.27 ± 0.70 | 0.25 ± 0.15 | 0.10 ± 0.08 |
| Alkanes (ug/mile) | | | | | | | | | | | | |
| Dodecane | 75.95 ± 20.82 | 72.14 ± 19.83 | 217.07 ± 52.72 | 57.00 ± 16.49 | 57.48 ± 16.55 | 53.80 ± 15.76 | 86.48 ± 23.56 | 421.68 ± 100.88 | 163.35 ± 41.54 | 1.92 ± 5.63 | 212.13 ± 52.76 | 0.00 ± 3.06 |
| Tridecane | 46.82 ± 7.02 | 80.68 ± 11.01 | 218.04 ± 27.17 | 124.83 ± 16.28 | 69.76 ± 9.78 | 57.47 ± 8.34 | 85.39 ± 11.82 | 0.00 ± 2.02 | 514.91 ± 62.59 | 367.10 ± 45.43 | 22.83 ± 4.76 | 420.00 ± 51.51 |
| Norfarnesane | 10.86 ± 2.50 | 3.24 ± 1.20 | 87.74 ± 16.20 | 32.40 ± 6.31 | 9.99 ± 2.36 | 28.25 ± 4.86 | 20.37 ± 4.41 | 327.16 ± 58.96 | 343.54 ± 61.75 | 138.13 ± 25.40 | 203.62 ± 37.00 | 120.10 ± 22.11 |
| Heptylcyclohexane | 9.22 ± 1.77 | 0.45 ± 0.26 | 1.22 ± 0.48 | 0.00 ± 0.15 | 3.15 ± 0.71 | 4.22 ± 0.90 | 19.72 ± 3.64 | 9.84 ± 1.96 | 3.42 ± 0.85 | 0.40 ± 0.37 | 1.16 ± 0.50 | 2.23 ± 0.60 |
| Farnesane | 43.89 ± 8.17 | 9.43 ± 2.00 | 28.04 ± 5.18 | 9.33 ± 1.98 | 4.48 ± 1.12 | 26.97 ± 5.16 | 44.15 ± 8.35 | 223.92 ± 40.66 | 103.23 ± 18.98 | 29.59 ± 5.80 | 79.96 ± 14.83 | 59.48 ± 11.09 |
| Tetradecane | 105.11 ± 9.40 | 26.16 ± 3.00 | 115.93 ± 9.71 | 47.78 ± 4.76 | 15.25 ± 2.19 | 104.54 ± 9.52 | 144.72 ± 13.28 | 464.74 ± 39.72 | 234.56 ± 20.50 | 120.91 ± 11.37 | 209.27 ± 18.56 | 221.99 ± 19.57 |
| Octylcyclohexane | 2.07 ± 0.65 | 1.00 ± 0.44 | 4.31 ± 1.38 | 1.84 ± 0.55 | 0.00 ± 0.26 | 0.00 ± 0.19 | 4.67 ± 1.25 | 9.90 ± 2.52 | 7.74 ± 2.08 | 4.99 ± 1.53 | 0.00 ± 0.47 | 6.03 ± 1.52 |
| Pentadecane | 4.83 ± 0.92 | 13.34 ± 1.90 | 29.56 ± 3.87 | 15.83 ± 2.18 | 4.39 ± 0.88 | 47.94 ± 5.98 | 64.18 ± 8.13 | 196.76 ± 23.77 | 38.86 ± 5.23 | 50.02 ± 6.56 | 78.00 ± 9.82 | 75.51 ± 9.44 |
| Nonylcyclohexane | 1.13 ± 0.40 | 0.00 ± 0.20 | 1.81 ± 0.64 | 0.00 ± 0.13 | 0.00 ± 0.21 | 0.00 ± 0.16 | 4.11 ± 1.01 | 4.16 ± 1.12 | 3.07 ± 0.92 | 3.05 ± 0.91 | 2.50 ± 0.83 | 5.28 ± 1.22 |
| Hexadecane | 27.10 ± 2.30 | 18.05 ± 1.58 | 93.08 ± 5.52 | 15.79 ± 1.60 | 20.55 ± 1.73 | 44.20 ± 3.60 | 51.06 ± 4.66 | 109.74 ± 9.05 | 66.92 ± 5.79 | 93.23 ± 7.87 | 59.64 ± 5.32 | 57.35 ± 5.09 |
| Norpristane | 17.49 ± 1.50 | 4.86 ± 0.45 | 3.03 ± 0.36 | 1.44 ± 0.17 | 3.04 ± 0.31 | 22.54 ± 1.95 | 23.53 ± 2.07 | 43.95 ± 3.79 | 6.65 ± 0.66 | 14.18 ± 1.30 | 15.80 ± 1.42 | 19.34 ± 1.70 |
| Heptadecane | 26.65 ± 2.18 | 7.80 ± 0.75 | 16.46 ± 1.45 | 6.77 ± 0.67 | 3.64 ± 0.45 | 32.60 ± 2.42 | 28.26 ± 2.44 | 95.89 ± 7.66 | 14.51 ± 1.41 | 34.23 ± 2.94 | 31.68 ± 2.72 | 30.40 ± 2.59 |
| Decylcyclohexane | 1.69 ± 0.31 | 0.62 ± 0.15 | 0.84 ± 0.30 | 0.14 ± 0.07 | 0.04 ± 0.08 | 1.74 ± 0.32 | 3.00 ± 0.56 | 6.17 ± 1.13 | 0.26 ± 0.26 | 5.05 ± 0.96 | 1.54 ± 0.43 | 0.85 ± 0.23 |
| Heptadecane_Pristane | 11.74 ± 1.24 | 3.79 ± 0.47 | 8.50 ± 0.96 | 6.00 ± 0.68 | 2.81 ± 0.38 | 22.83 ± 2.35 | 16.71 ± 1.81 | 25.95 ± 2.74 | 6.33 ± 0.81 | 12.77 ± 1.44 | 14.51 ± 1.60 | 17.24 ± 1.85 |
| Undecylcyclohexane | 1.99 ± 0.50 | 1.56 ± 0.41 | 3.08 ± 0.79 | 2.55 ± 0.59 | 0.49 ± 0.19 | 4.65 ± 1.04 | 1.78 ± 0.53 | 1.37 ± 0.57 | 0.37 ± 0.38 | 1.38 ± 0.56 | 3.72 ± 1.05 | 4.86 ± 1.18 |
| Octadecane | 12.45 ± 2.17 | 0.00 ± 1.59 | 72.05 ± 5.17 | 0.10 ± 1.43 | 3.64 ± 1.78 | 21.14 ± 2.82 | 13.67 ± 3.19 | 60.59 ± 6.64 | 46.16 ± 5.55 | 139.88 ± 12.45 | 60.04 ± 6.57 | 24.03 ± 3.87 |
| Phytane | 13.59 ± 2.17 | 4.08 ± 0.82 | 10.01 ± 1.84 | 6.94 ± 1.19 | 2.91 ± 0.67 | 20.65 ± 3.20 | 15.89 ± 2.68 | 28.71 ± 4.67 | 5.24 ± 1.34 | 16.19 ± 2.86 | 10.75 ± 2.10 | 15.98 ± 2.70 |
| Dodecylcyclohexane | 0.96 ± 0.17 | 0.65 ± 0.13 | 2.09 ± 0.35 | 0.33 ± 0.08 | 0.44 ± 0.08 | 2.27 ± 0.35 | 1.39 ± 0.25 | 3.60 ± 0.57 | 0.12 ± 0.17 | 3.25 ± 0.53 | 0.52 ± 0.20 | 2.40 ± 0.39 |
| Nonadecane | 16.43 ± 1.43 | 6.78 ± 0.64 | 9.76 ± 0.89 | 6.99 ± 0.65 | 4.70 ± 0.48 | 31.25 ± 2.67 | 20.34 ± 1.84 | 41.29 ± 3.58 | 8.65 ± 0.89 | 37.51 ± 3.29 | 15.21 ± 1.43 | 22.19 ± 1.98 |
| Tridecylcyclohexane | 0.85 ± 0.20 | 0.20 ± 0.10 | 0.18 ± 0.19 | 0.00 ± 0.05 | 0.26 ± 0.11 | 1.33 ± 0.26 | 1.40 ± 0.31 | 2.00 ± 0.43 | 0.37 ± 0.21 | 2.91 ± 0.58 | 0.90 ± 0.28 | 0.00 ± 0.11 |
| Eicosane | 0.00 ± 2.10 | 0.00 ± 1.76 | 33.57 ± 4.43 | 0.00 ± 1.43 | 0.00 ± 2.06 | 10.11 ± 2.81 | 0.00 ± 3.24 | 15.66 ± 5.32 | 22.08 ± 5.60 | 156.32 ± 15.77 | 40.83 ± 6.89 | 11.34 ± 4.43 |
| Tetradecylcyclohexane | 1.74 ± 0.36 | 0.53 ± 0.14 | 0.18 ± 0.17 | 0.38 ± 0.11 | 1.27 ± 0.28 | 2.09 ± 0.38 | 2.13 ± 0.46 | 2.30 ± 0.51 | 1.05 ± 0.29 | 9.19 ± 1.82 | 0.87 ± 0.26 | 1.22 ± 0.29 |
| Heneicosane | 6.05 ± 0.61 | 3.90 ± 0.43 | 4.18 ± 0.50 | 2.96 ± 0.34 | 3.58 ± 0.40 | 10.82 ± 1.03 | 7.93 ± 0.92 | 14.19 ± 1.49 | 7.60 ± 0.91 | 40.72 ± 3.83 | 6.25 ± 0.81 | 7.30 ± 0.86 |
| Pentadecylcyclohexane | 1.26 ± 0.38 | 0.47 ± 0.24 | 0.00 ± 0.37 | 0.21 ± 0.15 | 1.13 ± 0.35 | 1.40 ± 0.41 | 2.48 ± 0.91 | 0.00 ± 0.62 | 0.00 ± 0.58 | 14.19 ± 3.47 | 0.77 ± 0.76 | 1.14 ± 0.66 |
| Docosane | 0.34 ± 1.79 | 2.28 ± 1.99 | 2.46 ± 3.18 | 0.00 ± 1.13 | 0.00 ± 1.64 | 2.73 ± 2.08 | 0.00 ± 2.39 | 0.00 ± 4.09 | 14.58 ± 5.53 | 109.39 ± 15.60 | 26.79 ± 6.72 | 2.87 ± 3.92 |
| Hexadecylcyclohexane | 1.24 ± 0.27 | 0.73 ± 0.16 | 1.01 ± 0.28 | 1.39 ± 0.28 | 1.21 ± 0.24 | 2.51 ± 0.43 | 4.16 ± 0.90 | 3.87 ± 0.86 | 2.52 ± 0.57 | 4.45 ± 0.97 | 0.39 ± 0.18 | 0.17 ± 0.10 |
| Tricosane | 3.68 ± 0.56 | 6.91 ± 0.79 | 3.21 ± 0.74 | 2.50 ± 0.42 | 1.66 ± 0.43 | 6.56 ± 0.82 | 0.00 ± 0.83 | 6.30 ± 1.44 | 0.00 ± 0.93 | 16.75 ± 2.23 | 0.33 ± 1.04 | 0.00 ± 0.76 |
| Heptadecylcyclohexane | 3.99 ± 0.97 | 2.63 ± 0.69 | 0.50 ± 0.31 | 0.00 ± 0.10 | 2.30 ± 0.61 | 4.53 ± 1.04 | 1.94 ± 0.65 | 6.72 ± 1.69 | 12.61 ± 2.90 | 23.49 ± 5.15 | 0.29 ± 0.43 | 0.00 ± 0.19 |
| Octadecylcyclohexane | 1.32 ± 0.23 | 0.53 ± 0.12 | 0.00 ± 0.16 | 0.46 ± 0.11 | 0.86 ± 0.15 | 2.01 ± 0.33 | 0.31 ± 0.12 | 3.48 ± 0.80 | 4.63 ± 1.04 | 3.97 ± 0.90 | 1.02 ± 0.30 | 0.17 ± 0.10 |
| Tetracosane | 0.00 ± 1.60 | 0.00 ± 1.79 | 0.00 ± 3.02 | 0.00 ± 1.20 | 0.00 ± 1.54 | 0.00 ± 1.71 | 0.00 ± 2.32 | 0.00 ± 3.44 | 0.00 ± 3.89 | 15.56 ± 6.11 | 7.92 ± 5.50 | 0.00 ± 2.46 |
| Pentacosane | 1.91 ± 1.37 | 5.46 ± 1.20 | 1.92 ± 1.20 | 0.71 ± 0.64 | 0.00 ± 0.66 | 0.99 ± 0.94 | 0.00 ± 1.45 | 5.10 ± 2.46 | 0.00 ± 1.68 | 3.31 ± 2.18 | 0.00 ± 1.33 | 0.00 ± 1.07 |
| Nonadecylcyclohexane | 1.61 ± 0.44 | 1.86 ± 0.43 | 0.56 ± 0.34 | 0.61 ± 0.23 | 0.73 ± 0.27 | 1.26 ± 0.38 | 0.00 ± 0.28 | 2.14 ± 0.75 | 4.02 ± 1.11 | 3.85 ± 1.07 | 1.85 ± 0.70 | 2.28 ± 0.72 |
| Hexacosane | 0.00 ± 0.68 | 1.75 ± 0.76 | 0.43 ± 0.97 | 0.00 ± 0.38 | 0.00 ± 0.49 | 0.00 ± 0.61 | 0.00 ± 0.75 | 0.00 ± 1.33 | 7.12 ± 1.89 | 32.03 ± 3.99 | 14.21 ± 2.46 | 0.00 ± 1.06 |
| Eicosylcyclohexane | 0.46 ± 0.09 | 0.13 ± 0.06 | 0.21 ± 0.16 | 0.04 ± 0.04 | 0.03 ± 0.06 | 0.22 ± 0.07 | 0.73 ± 0.14 | 0.74 ± 0.18 | 0.30 ± 0.15 | 5.79 ± 0.90 | 0.47 ± 0.16 | 0.78 ± 0.15 |
| Heptacosane | 5.28 ± 1.13 | 3.17 ± 0.67 | 2.11 ± 0.71 | 0.26 ± 0.31 | 0.00 ± 0.24 | 1.56 ± 0.51 | 1.65 ± 0.75 | 3.32 ± 1.19 | 7.00 ± 1.78 | 0.10 ± 0.68 | 2.64 ± 1.07 | 0.86 ± 0.64 |
| Heneicosylcyclohexane | 0.42 ± 0.11 | 0.01 ± 0.06 | 0.09 ± 0.16 | 0.08 ± 0.04 | 0.03 ± 0.06 | 0.18 ± 0.07 | 0.76 ± 0.20 | 0.18 ± 0.15 | 0.96 ± 0.27 | 0.31 ± 0.16 | 0.39 ± 0.18 | 0.05 ± 0.08 |
| Octacosane | 1.26 ± 0.83 | 0.48 ± 0.82 | 4.60 ± 1.56 | 0.00 ± 0.56 | 0.00 ± 0.72 | 0.00 ± 0.71 | 0.00 ± 1.26 | 2.31 ± 2.00 | 6.94 ± 2.51 | 35.28 ± 6.21 | 7.58 ± 2.59 | 0.00 ± 1.30 |
| Nonacosane | 5.25 ± 1.03 | 2.36 ± 0.46 | 0.82 ± 0.53 | 0.63 ± 0.20 | 0.76 ± 0.26 | 0.81 ± 0.27 | 0.00 ± 0.27 | 9.58 ± 2.24 | 6.35 ± 1.65 | 10.72 ± 2.42 | 3.48 ± 1.16 | 0.00 ± 0.25 |
| Triacontane | 2.11 ± 0.78 | 0.72 ± 0.61 | 1.45 ± 1.17 | 0.00 ± 0.39 | 0.00 ± 0.53 | 0.38 ± 0.54 | 0.00 ± 0.82 | 0.04 ± 1.47 | 3.51 ± 1.99 | 14.39 ± 3.82 | 2.88 ± 1.89 | 0.00 ± 0.88 |
| Hentriacontane | 1.70 ± 0.53 | 0.64 ± 0.29 | 0.00 ± 0.33 | 0.05 ± 0.10 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.12 | 0.00 ± 0.28 | 0.00 ± 0.60 | 0.00 ± 0.59 | 0.00 ± 0.31 | 0.00 ± 0.18 |
| Dotriacontane | 1.18 ± 0.33 | 0.45 ± 0.27 | 1.97 ± 0.55 | 0.00 ± 0.16 | 0.00 ± 0.24 | 0.00 ± 0.23 | 0.00 ± 0.28 | 0.00 ± 0.53 | 2.83 ± 0.86 | 8.54 ± 1.56 | 1.59 ± 0.72 | 0.00 ± 0.34 |
| Tritriacontane | 0.73 ± 0.20 | 0.00 ± 0.10 | 0.00 ± 0.18 | 0.00 ± 0.06 | 0.00 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.10 | 0.00 ± 0.17 | 0.00 ± 0.28 | 0.00 ± 0.19 | 0.00 ± 0.20 | 0.00 ± 0.09 |
| Tetratriacontane | 0.82 ± 0.27 | 0.39 ± 0.23 | 0.69 ± 0.49 | 0.17 ± 0.15 | 0.13 ± 0.21 | 2.34 ± 0.47 | 0.00 ± 0.29 | 0.00 ± 0.48 | 1.96 ± 0.84 | 5.15 ± 1.26 | 0.00 ± 0.58 | 0.00 ± 0.32 |
| Pentatriacontane | 0.04 ± 0.10 | 0.00 ± 0.07 | 0.00 ± 0.18 | 0.00 ± 0.05 | 0.00 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.08 | 0.00 ± 0.15 | 0.00 ± 0.24 | 0.00 ± 0.21 | 0.00 ± 0.15 | 0.00 ± 0.09 |
| Hexatriacontane | 0.40 ± 0.22 | 0.13 ± 0.20 | 0.29 ± 0.40 | 0.00 ± 0.13 | 0.00 ± 0.19 | 0.00 ± 0.16 | 0.00 ± 0.22 | 0.00 ± 0.39 | 1.62 ± 0.74 | 4.16 ± 1.06 | 0.00 ± 0.43 | 0.00 ± 0.23 |
| Heptatriacontane | 0.16 ± 0.12 | 0.00 ± 0.06 | 0.00 ± 0.18 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.46 ± 0.21 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.16 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| Octatriacontane | 0.04 ± 0.13 | 0.13 ± 0.14 | 0.40 ± 0.33 | 0.00 ± 0.08 | 0.12 ± 0.13 | 0.00 ± 0.12 | 0.00 ± 0.16 | 0.00 ± 0.28 | 0.52 ± 0.46 | 1.68 ± 0.61 | 0.00 ± 0.35 | 0.00 ± 0.16 |
| Nonatriacontane | 0.93 ± 0.32 | 0.00 ± 0.06 | 0.00 ± 0.17 | 0.33 ± 0.13 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| Polar compounds (ug/mile) | | | | | | | | | | | | |
| heptanoic acid (c7) | 0.00 ± 1.90 | 0.00 ± 1.17 | 0.00 ± 3.00 | 0.30 ± 1.56 | 0.00 ± 1.86 | 0.00 ± 1.13 | 0.00 ± 1.60 | 0.00 ± 1.84 | 0.00 ± 3.16 | 0.00 ± 1.86 | 0.00 ± 2.25 | 1.29 ± 3.62 |
| me-malonic (d-c3) | 7.51 ± 1.66 | 0.00 ± 0.11 | 0.00 ± 0.54 | 0.40 ± 0.21 | 1.20 ± 0.41 | 4.29 ± 1.03 | 0.00 ± 0.34 | 0.00 ± 0.22 | 0.00 ± 0.37 | 0.00 ± 0.25 | 0.00 ± 0.54 | 1.07 ± 0.56 |
| guaiacol | -99.00 ± 0.06 | -99.00 ± 0.06 | -99.00 ± 0.16 | -99.00 ± 0.04 | -99.00 ± 0.06 | -99.00 ± 0.06 | -99.00 ± 0.08 | -99.00 ± 0.16 | -99.00 ± 0.15 | -99.00 ± 0.13 | -99.00 ± 0.14 | -99.00 ± 0.09 |
| benzoic acid | 0.00 ± 144.25 | 0.00 ± 64.19 | 0.00 ± 255.72 | 0.00 ± 105.49 | 0.00 ± 88.17 | 0.00 ± 105.54 | 0.00 ± 112.60 | 0.00 ± 120.43 | 0.00 ± 227.01 | 0.00 ± 95.96 | 0.00 ± 104.66 | 0.00 ± 65.57 |
| octanoic acid (c8) | 8.21 ± 3.36 | 0.00 ± 2.15 | 4.97 ± 4.59 | 0.00 ± 1.66 | 0.84 ± 2.34 | 1.31 ± 2.40 | 0.00 ± 2.64 | 0.00 ± 3.17 | 0.00 ± 4.17 | 0.00 ± 2.50 | 0.00 ± 2.87 | 15.79 ± 5.49 |
| phenylacetic acid | 47.76 ± 7.07 | 7.96 ± 1.46 | 15.74 ± 3.20 | 7.58 ± 1.29 | 6.28 ± 1.23 | 6.42 ± 1.26 | 31.20 ± 4.92 | 61.85 ± 9.75 | 3.91 ± 1.64 | 1.69 ± 1.33 | 6.40 ± 1.98 | 30.12 ± 4.77 |
| maleic acid | 0.00 ± 0.15 | 0.00 ± 0.30 | 0.00 ± 0.38 | 0.00 ± 0.17 | 0.00 ± 0.22 | 0.00 ± 0.16 | 0.00 ± 0.22 | 0.00 ± 1.42 | 0.00 ± 1.17 | 0.00 ± 0.57 | 0.00 ± 0.81 | 0.00 ± 0.26 |
| succinic acid (d-c4) | 0.00 ± 1.14 | 0.00 ± 0.45 | 0.00 ± 0.84 | 0.20 ± 0.40 | 0.00 ± 0.49 | 0.00 ± 0.67 | 0.00 ± 0.85 | 0.00 ± 1.78 | 0.00 ± 2.63 | 0.00 ± 0.59 | 0.00 ± 0.97 | 0.00 ± 0.91 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W3-1 | W3-2 | W3-3 | W4-1 | W4-2 | W4-3 | W5-1 | W5-2 | W5-3 | W6-1 | W6-2 | W6-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-me-guaiacol | -99.00 ± 0.06 | -99.00 ± 0.06 | -99.00 ± 0.16 | -99.00 ± 0.04 | -99.00 ± 0.06 | -99.00 ± 0.06 | -99.00 ± 0.09 | -99.00 ± 0.15 | -99.00 ± 0.14 | -99.00 ± 0.14 | -99.00 ± 0.14 | -99.00 ± 0.11 |
| o-toluic | 62.03 ± 13.95 | 9.53 ± 2.71 | 21.83 ± 6.50 | 9.42 ± 2.48 | 7.99 ± 2.39 | 8.74 ± 2.56 | 26.21 ± 6.59 | 79.36 ± 18.92 | 0.00 ± 1.69 | 0.00 ± 1.51 | 4.27 ± 2.91 | 40.96 ± 9.77 |
| me-succinic acid (d-c4) | 0.00 ± 0.16 | 0.00 ± 0.06 | 0.00 ± 0.17 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.13 | 0.00 ± 0.15 | 0.00 ± 0.36 | 0.00 ± 0.15 | 0.00 ± 0.71 | 0.00 ± 0.27 |
| m-toluic | 114.73 ± 13.77 | 21.04 ± 3.02 | 35.15 ± 5.90 | 12.95 ± 1.87 | 16.36 ± 2.49 | 20.01 ± 2.91 | 41.01 ± 5.68 | 133.23 ± 17.29 | 62.83 ± 9.16 | 0.00 ± 1.60 | 13.21 ± 3.66 | 89.09 ± 11.22 |
| nonanoic acid (c9) | 6.60 ± 3.60 | 1.44 ± 3.01 | 0.41 ± 4.88 | 0.00 ± 2.41 | 0.00 ± 2.82 | 2.34 ± 3.16 | 0.43 ± 4.08 | 0.00 ± 4.02 | 0.00 ± 4.72 | 0.00 ± 3.20 | 0.00 ± 3.78 | 16.01 ± 5.97 |
| p-toluic | 98.01 ± 13.76 | 15.15 ± 2.75 | 21.06 ± 5.12 | 8.57 ± 1.60 | 13.94 ± 2.59 | 13.06 ± 2.49 | 29.66 ± 5.10 | 92.51 ± 14.73 | 39.97 ± 7.71 | 0.00 ± 1.58 | 4.80 ± 3.25 | 61.22 ± 9.32 |
| 2,6-dimethylbenzoic acid | 7.03 ± 1.65 | 0.00 ± 0.12 | 0.05 ± 0.47 | 0.00 ± 0.12 | 0.01 ± 0.14 | 0.17 ± 0.28 | 1.06 ± 0.57 | 11.14 ± 2.97 | 0.00 ± 0.43 | 0.00 ± 0.26 | 0.00 ± 0.39 | 0.84 ± 0.54 |
| 4-ethyl-guaiacol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| syringol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| glutaric acid (d-c5) | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 2-methylglutaric (d-c5) | 0.00 ± 0.12 | 0.00 ± 0.08 | 0.50 ± 0.69 | 0.02 ± 0.05 | 0.04 ± 0.12 | 0.06 ± 0.29 | 0.00 ± 0.15 | 0.00 ± 0.16 | 0.00 ± 0.48 | 0.00 ± 0.16 | 0.00 ± 0.15 | 0.00 ± 0.10 |
| 2,5-dimethylbenzoic acid | 7.77 ± 1.70 | 1.38 ± 0.69 | 3.54 ± 1.47 | 2.30 ± 0.75 | 1.44 ± 0.70 | 3.75 ± 1.07 | 4.58 ± 1.31 | 15.08 ± 3.34 | 5.54 ± 1.81 | 0.00 ± 0.64 | 1.15 ± 1.16 | 17.46 ± 3.41 |
| 3-methylglutaric acid (d-c5) | 0.00 ± 0.13 | 0.00 ± 0.22 | 0.00 ± 0.23 | 0.00 ± 0.06 | 0.02 ± 0.11 | 0.00 ± 0.36 | 0.00 ± 0.12 | 0.00 ± 0.20 | 0.00 ± 0.36 | 0.00 ± 0.21 | 0.00 ± 0.20 | 0.00 ± 0.36 |
| 2,4-dimethylbenzoic acid | 0.00 ± 40.32 | 0.00 ± 29.61 | 0.08 ± 101.65 | 0.00 ± 48.40 | 0.00 ± 41.14 | 0.00 ± 51.87 | 0.00 ± 47.45 | 0.00 ± 49.42 | 0.00 ± 97.25 | 0.00 ± 47.37 | 0.00 ± 49.28 | 336.46 ± 206.70 |
| 2,3- and 3,5- dimethylbenzoic acid | 6.03 ± 1.59 | 0.00 ± 0.66 | 0.13 ± 1.19 | 0.57 ± 0.52 | 0.08 ± 0.64 | 0.04 ± 0.70 | 0.02 ± 1.09 | 5.52 ± 3.07 | 0.00 ± 1.78 | 0.00 ± 0.43 | 0.00 ± 0.78 | 10.15 ± 2.61 |
| decanoic acid (c10) | 0.45 ± 0.26 | 0.00 ± 0.18 | 0.05 ± 0.47 | 0.31 ± 0.21 | 0.00 ± 0.20 | 0.77 ± 0.29 | 0.00 ± 0.28 | 0.00 ± 0.31 | 0.00 ± 0.37 | 0.00 ± 0.30 | 0.00 ± 0.34 | 11.95 ± 1.33 |
| 4-allyl-guaiacol (eugenol) | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 4-methyl-syringol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3,4-dimethylbenzoic acid | 16.19 ± 3.04 | 4.47 ± 1.09 | 3.32 ± 1.65 | 4.04 ± 0.89 | 4.83 ± 1.16 | 5.57 ± 1.28 | 5.81 ± 1.66 | 19.90 ± 4.76 | 8.24 ± 2.82 | 0.00 ± 0.67 | 0.00 ± 1.18 | 17.84 ± 3.68 |
| hexanedioic (adipic) acid (d-c6) | 0.00 ± 0.07 | 0.00 ± 0.10 | 0.00 ± 0.22 | 0.12 ± 0.09 | 0.00 ± 0.08 | 0.00 ± 0.11 | 0.00 ± 0.09 | 0.00 ± 0.16 | 0.00 ± 0.17 | 0.00 ± 0.15 | 0.00 ± 0.17 | 0.00 ± 0.14 |
| salcylic acid | 26.05 ± 4.99 | 1.51 ± 1.18 | 0.95 ± 3.12 | 6.96 ± 1.82 | 2.20 ± 1.61 | 3.90 ± 1.82 | 0.00 ± 2.14 | 0.00 ± 2.70 | 20.53 ± 7.55 | 0.00 ± 0.87 | 0.00 ± 1.05 | 17.87 ± 4.79 |
| trans-2-decenoic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| cis-pinonic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3-methyladipic acid (d-c6) | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.15 | 0.00 ± 0.08 |
| 4-formyl-guaiacol (vanillin) | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.21 | 0.00 ± 0.07 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.16 | 0.00 ± 0.17 | 0.00 ± 0.17 | 0.00 ± 0.19 | 0.03 ± 0.22 |
| undecanoic acid (c11) | 1.11 ± 0.33 | 0.00 ± 0.19 | 0.00 ± 0.47 | 0.00 ± 0.17 | 0.00 ± 0.18 | 0.03 ± 0.23 | 0.00 ± 0.30 | 0.00 ± 0.32 | 0.00 ± 0.38 | 0.00 ± 0.29 | 0.00 ± 0.34 | 8.67 ± 1.27 |
| isoeugenol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| heptanedioic (pimelic) acid (d-c7) | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.27 | 0.00 ± 0.09 | 0.00 ± 0.12 | 0.00 ± 0.18 | 0.00 ± 0.17 | 0.00 ± 0.27 | 0.00 ± 0.27 | 0.00 ± 0.26 | 0.00 ± 0.27 | 0.08 ± 0.46 |
| 2,3-dimethoxybenzoic acid | 0.00 ± 3.81 | 0.00 ± 0.08 | 0.00 ± 0.77 | 0.00 ± 0.05 | 0.00 ± 0.09 | 0.00 ± 0.11 | 0.00 ± 0.11 | 0.00 ± 0.18 | 0.00 ± 2.71 | 0.00 ± 0.25 | 0.00 ± 2.54 | 0.00 ± 1.50 |
| acetovanillone | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 2,6-dimethoxybenzoic acid | 2.90 ± 0.79 | 0.63 ± 0.41 | 0.00 ± 0.55 | 0.00 ± 0.12 | 0.03 ± 0.20 | 1.99 ± 0.64 | 5.45 ± 1.32 | 0.00 ± 0.44 | 5.65 ± 1.59 | 0.00 ± 0.36 | 18.59 ± 3.83 | 27.81 ± 5.22 |
| dodecanoic (lauric) acid (c12) | 5.18 ± 0.93 | 0.18 ± 0.61 | 32.64 ± 3.19 | 4.09 ± 0.82 | 0.71 ± 0.66 | 6.83 ± 1.07 | 1.14 ± 0.86 | 0.00 ± 0.79 | 0.00 ± 0.83 | 0.00 ± 0.75 | 0.00 ± 0.80 | 62.81 ± 5.57 |
| 2,5-dimethoxybenzoic acid | 0.00 ± 0.07 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 1.75 ± 0.26 | 0.00 ± 0.14 | 0.99 ± 0.25 | 0.00 ± 0.13 | 0.00 ± 0.16 | 0.00 ± 0.09 |
| phthalic acid | 14.98 ± 12.31 | 0.45 ± 4.33 | 2.82 ± 3.87 | 0.00 ± 2.74 | 1.32 ± 4.11 | 0.71 ± 2.60 | 0.00 ± 5.04 | 0.00 ± 29.98 | 14.74 ± 32.80 | 0.00 ± 1.80 | 0.00 ± 2.25 | 0.00 ± 2.09 |
| suberic acid (d-c8) | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| levoglucosan | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3,5-dimethoxybenzoic acid | 3.97 ± 0.91 | 1.23 ± 0.32 | 2.02 ± 0.60 | 1.78 ± 0.42 | 0.26 ± 0.13 | 2.97 ± 0.69 | 1.98 ± 0.54 | 0.00 ± 0.16 | 6.31 ± 1.55 | 0.00 ± 0.22 | 0.00 ± 0.16 | 23.45 ± 5.15 |
| syringaldehyde | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3,4-dimethoxybenzoic acid | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.17 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.09 | 0.00 ± 0.21 | 0.00 ± 0.24 | 0.00 ± 0.14 | 0.00 ± 0.16 | 0.00 ± 0.17 |
| 2,4-dimethoxybenzoic acid | 8.11 ± 1.41 | 3.37 ± 0.61 | 0.00 ± 0.18 | 3.08 ± 0.55 | 1.04 ± 0.22 | 0.29 ± 0.10 | 7.54 ± 1.35 | 2.52 ± 0.56 | 6.33 ± 1.19 | 3.61 ± 0.73 | 29.39 ± 5.14 | 44.04 ± 7.60 |
| tridecanoic acid (c13) | 0.55 ± 0.23 | 0.12 ± 0.18 | 0.00 ± 0.26 | 0.49 ± 0.17 | 0.00 ± 0.13 | 0.00 ± 0.16 | 0.00 ± 0.19 | 0.00 ± 0.25 | 0.00 ± 0.24 | 0.00 ± 0.22 | 0.00 ± 0.27 | 1.92 ± 0.51 |
| isophthalic acid | 2.53 ± 6.76 | 0.00 ± 2.04 | 0.00 ± 7.16 | 0.00 ± 3.31 | 0.00 ± 3.51 | 0.00 ± 4.29 | 0.00 ± 3.87 | 0.00 ± 4.64 | 0.00 ± 10.94 | 0.00 ± 2.43 | 0.00 ± 2.78 | 0.00 ± 4.48 |
| vanillic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| homovanillic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| azelaic acid (d-c9) | 0.00 ± 0.18 | 0.24 ± 0.27 | 0.00 ± 0.23 | 0.00 ± 0.10 | 0.00 ± 0.12 | 0.00 ± 0.13 | 0.00 ± 0.17 | 0.00 ± 0.28 | 0.00 ± 0.34 | 0.00 ± 0.17 | 0.00 ± 0.21 | 0.00 ± 0.11 |
| myristoleic acid | 0.08 ± 0.09 | 0.00 ± 0.07 | 0.00 ± 0.17 | 0.40 ± 0.13 | 0.00 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.15 | 0.00 ± 0.17 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.20 | 0.00 ± 0.14 |
| myristic acid (c14) | 1.58 ± 0.60 | 0.00 ± 0.39 | 16.66 ± 1.75 | 3.16 ± 0.67 | 0.06 ± 0.43 | 1.37 ± 0.60 | 0.00 ± 0.61 | 0.00 ± 0.67 | 0.00 ± 0.65 | 0.00 ± 0.65 | 0.00 ± 0.67 | 12.97 ± 1.51 |
| sebacic acid (d-c10) | 0.00 ± 0.07 | 0.00 ± 0.06 | 0.00 ± 0.18 | 0.00 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.18 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| syringic acid | 2.05 ± 0.45 | 0.08 ± 0.17 | 21.02 ± 3.51 | 8.65 ± 1.42 | 0.85 ± 0.28 | 4.06 ± 0.75 | 11.36 ± 1.92 | 6.95 ± 1.41 | 2.99 ± 0.82 | 0.00 ± 0.23 | 0.00 ± 0.33 | 12.83 ± 2.15 |
| pentadecanoic acid (c15) | 1.07 ± 0.35 | 0.18 ± 0.25 | 0.00 ± 0.41 | 1.51 ± 0.31 | 0.35 ± 0.22 | 0.85 ± 0.31 | 0.00 ± 0.35 | 0.00 ± 0.46 | 0.00 ± 0.42 | 0.00 ± 0.36 | 0.00 ± 0.50 | 0.43 ± 0.48 |
| undecanedioic acid (c11) | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |
| palmitoleic acid | 0.00 ± 0.24 | 0.00 ± 0.14 | 0.00 ± 0.50 | 0.27 ± 0.34 | 0.00 ± 0.18 | 0.10 ± 0.18 | 0.00 ± 0.19 | 0.00 ± 0.37 | 0.00 ± 0.31 | 0.00 ± 0.30 | 0.00 ± 0.32 | 0.00 ± 0.41 |
| palmitic acid (c16) | 1.48 ± 1.15 | 0.00 ± 0.98 | 12.96 ± 2.11 | 3.68 ± 1.04 | 1.09 ± 0.88 | 1.77 ± 1.17 | 0.00 ± 1.19 | 0.00 ± 1.41 | 0.00 ± 1.36 | 0.00 ± 1.25 | 0.00 ± 1.41 | 0.00 ± 1.41 |
| isostearic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| dodecanedioic acid (d-c12) | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.15 | 0.00 ± 0.20 | 0.00 ± 0.14 | 0.00 ± 0.08 |
| traumatic acid | 0.01 ± 0.06 | 0.01 ± 0.06 | 0.09 ± 0.19 | 0.00 ± 0.05 | 0.00 ± 0.06 | 0.03 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.16 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.12 |
| heptadecanoic acid (c17) | 0.10 ± 0.21 | 0.04 ± 0.24 | 0.00 ± 0.33 | 0.23 ± 0.17 | 0.00 ± 0.15 | 0.00 ± 0.14 | 0.00 ± 0.27 | 0.00 ± 0.35 | 0.00 ± 0.39 | 0.00 ± 0.32 | 0.00 ± 0.30 | 0.00 ± 0.21 |
| 1,11-undecanedicarboxylic acid (d-c13) | 0.00 ± 0.07 | 0.00 ± 0.06 | 0.00 ± 0.17 | 0.00 ± 0.04 | 0.00 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.09 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.20 | 0.00 ± 0.15 | 0.00 ± 0.12 |
| oleic acid | 1.23 ± 0.97 | 0.00 ± 0.57 | 0.88 ± 1.25 | 0.00 ± 0.68 | 1.77 ± 1.00 | 1.49 ± 0.91 | 0.00 ± 0.62 | 0.00 ± 1.39 | 0.00 ± 1.04 | 0.00 ± 1.25 | 0.00 ± 1.63 | 0.00 ± 0.84 |
| elaidic acid | 0.00 ± 0.14 | 0.00 ± 0.10 | 0.00 ± 0.29 | 0.00 ± 0.12 | 0.00 ± 0.09 | 0.00 ± 0.10 | 0.00 ± 0.11 | 0.00 ± 0.25 | 0.00 ± 0.21 | 0.00 ± 0.24 | 0.00 ± 0.21 | 0.00 ± 0.24 |
| stearic acid (c18) | 0.00 ± 3.21 | 0.00 ± 3.30 | 1.91 ± 6.79 | 0.00 ± 2.70 | 0.00 ± 2.95 | 0.00 ± 3.19 | 0.00 ± 4.47 | 0.00 ± 7.04 | 0.00 ± 6.60 | 0.00 ± 6.59 | 0.00 ± 7.89 | 0.00 ± 6.63 |
| 1,12-dodecanedicarboxylic acid (d-c14) | 0.00 ± 0.07 | 0.00 ± 0.08 | 0.00 ± 0.18 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.07 | 0.00 ± 0.12 | 0.00 ± 0.17 | 0.00 ± 0.17 | 0.00 ± 0.16 | 0.00 ± 0.17 | 0.00 ± 0.14 |
| 8,15-pimaradien-18-oic acd | 0.00 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.17 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.07 | 0.00 ± 0.10 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.18 | 0.00 ± 0.25 | 0.00 ± 0.15 |
| pimaric acid | 0.11 ± 0.12 | 0.00 ± 0.11 | 0.31 ± 0.29 | 1.01 ± 0.30 | 0.00 ± 0.11 | 0.00 ± 0.09 | 0.00 ± 0.17 | 0.00 ± 0.22 | 0.23 ± 0.32 | 0.00 ± 0.23 | 0.62 ± 0.37 | 3.28 ± 0.75 |
| sandaracopimaric acid | 0.00 ± 0.18 | 0.09 ± 0.19 | 0.37 ± 0.52 | 0.00 ± 0.15 | 0.12 ± 0.30 | 0.04 ± 0.25 | 0.00 ± 0.20 | 0.00 ± 0.32 | 0.00 ± 0.42 | 0.00 ± 0.37 | 1.16 ± 0.88 | 0.11 ± 0.39 |
| nonadecanoic acid (c19) | 0.01 ± 0.17 | 0.02 ± 0.12 | 13.04 ± 2.22 | 1.29 ± 0.35 | 0.00 ± 0.18 | 0.94 ± 0.33 | 1.69 ± 0.47 | 0.59 ± 0.40 | 0.10 ± 0.34 | 0.00 ± 0.28 | 1.99 ± 0.58 | 0.38 ± 0.30 |
| isopimaric acid | 0.11 ± 0.08 | 0.17 ± 0.09 | 0.00 ± 0.17 | 0.00 ± 0.04 | 0.00 ± 0.07 | 0.24 ± 0.10 | 0.00 ± 0.09 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.24 ± 0.19 | 0.35 ± 0.22 | 0.00 ± 0.11 |
| palustric acid | 0.29 ± 0.08 | 0.00 ± 0.06 | 0.02 ± 0.16 | 0.07 ± 0.05 | 0.01 ± 0.06 | 0.19 ± 0.07 | 0.00 ± 0.08 | 0.16 ± 0.15 | 0.16 ± 0.15 | 0.08 ± 0.14 | 0.09 ± 0.15 | 0.04 ± 0.08 |
| dihydroisopimaric acid | 0.06 ± 0.06 | 0.05 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.02 ± 0.06 | 0.01 ± 0.08 | 0.16 ± 0.15 | 0.00 ± 0.14 | 0.49 ± 0.17 | 0.46 ± 0.17 | 0.48 ± 0.12 |
| 8-abietic acid | 0.07 ± 0.07 | 0.16 ± 0.08 | 0.00 ± 0.17 | 0.00 ± 0.05 | 0.00 ± 0.07 | 0.08 ± 0.07 | 0.00 ± 0.10 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.00 ± 0.16 | 0.00 ± 0.14 | 0.08 ± 0.14 |
| dehydroabietic acid | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.25 | 0.00 ± 0.10 | 0.00 ± 0.15 | 0.00 ± 0.13 | 0.00 ± 0.22 | 0.00 ± 0.29 | 0.00 ± 0.28 | 0.00 ± 0.47 | 0.00 ± 0.31 | 0.00 ± 0.19 |
| 8,14-abietenic acid | 0.00 ± 0.09 | 0.08 ± 0.11 | 0.00 ± 0.19 | 0.00 ± 0.07 | 0.00 ± 0.08 | 0.00 ± 0.07 | 0.00 ± 0.14 | 0.00 ± 0.18 | 0.00 ± 0.19 | 0.55 ± 0.30 | 0.76 ± 0.34 | 0.44 ± 0.23 |
| abietic acid | 0.04 ± 0.06 | 0.03 ± 0.06 | 0.00 ± 0.16 | 0.00 ± 0.04 | 0.00 ± 0.06 | 0.03 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.76 ± 0.25 | 0.00 ± 0.14 | 0.01 ± 0.08 |
| eicosanoic acid (c20) | 0.00 ± 0.09 | 0.00 ± 0.08 | 0.00 ± 0.19 | 0.00 ± 0.06 | 0.00 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.16 | 0.00 ± 0.22 | 0.00 ± 0.20 | 0.00 ± 0.22 | 2.65 ± 1.03 | 0.00 ± 0.22 |
| levopimaric acid | 0.00 ± 0.07 | 0.02 ± 0.07 | 0.01 ± 0.17 | 0.00 ± 0.04 | 0.00 ± 0.07 | 0.00 ± 0.07 | 0.00 ± 0.09 | 0.00 ± 0.15 | 0.00 ± 0.15 | 0.14 ± 0.16 | 0.83 ± 0.30 | 0.39 ± 0.17 |
| heneicosanoic acid (c21) | 0.00 ± 0.08 | 0.60 ± 0.18 | 0.00 ± 0.21 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.14 | 0.66 ± 0.38 | 0.00 ± 0.23 | 0.00 ± 0.28 | 1.40 ± 0.49 | 0.04 ± 0.19 |
| 7-oxodehydroabietic acid | 0.00 ± 0.20 | 0.00 ± 0.20 | 0.03 ± 0.41 | 0.00 ± 0.17 | 0.00 ± 0.20 | 0.00 ± 0.20 | 0.00 ± 0.33 | 0.00 ± 0.42 | 0.00 ± 0.42 | 0.00 ± 0.42 | 0.00 ± 0.53 | 0.00 ± 0.30 |
| docosanoic acid (c22) | 0.00 ± 0.19 | 0.00 ± 0.21 | 0.00 ± 0.35 | 0.00 ± 0.12 | 0.00 ± 0.16 | 0.03 ± 0.24 | 0.00 ± 0.27 | 3.22 ± 1.73 | 0.00 ± 0.40 | 0.00 ± 0.80 | 0.00 ± 0.48 | 0.13 ± 0.54 |
| tricosanoic acid (c23) | 0.18 ± 0.11 | 0.12 ± 0.11 | 0.00 ± 0.20 | 0.00 ± 0.05 | 0.00 ± 0.07 | 0.04 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.16 | 0.00 ± 0.17 | 0.00 ± 0.22 | 0.00 ± 0.18 | 0.00 ± 0.11 |
| tetracosanoic acid (c24) | 0.00 ± 0.17 | 0.00 ± 0.16 | 0.00 ± 0.30 | 0.00 ± 0.14 | 0.00 ± 0.18 | 0.00 ± 0.18 | 0.00 ± 0.21 | 0.00 ± 0.33 | 0.00 ± 0.52 | 0.00 ± 0.32 | 0.00 ± 0.34 | 0.00 ± 0.23 |
| cholesterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| cholestanol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| ergosterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| stigmasterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| sitosterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W3-1 | W3-2 | W3-3 | W4-1 | W4-2 | W4-3 | W5-1 | W5-2 | W5-3 | W6-1 | W6-2 | W6-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbonyls (mg/mile) | | | | | | | | | | | | |
| formaldehyde | 221.82 ± 12.36 | | | 25.48 ± 1.44 | | | 304.19 ± 16.94 | | | 58.66 ± 3.46 | | |
| acetaldehyde | 130.33 ± 12.39 | | | 29.00 ± 2.86 | | | 193.16 ± 18.35 | | | 130.75 ± 13.02 | | |
| acetone | 200.18 ± 12.97 | | | 29.15 ± 2.10 | | | 117.89 ± 8.00 | | | 136.52 ± 10.00 | | |
| * acrolein | 4.55 ± 1.14 | | | 0.41 ± 0.10 | | | 3.07 ± 0.77 | | | 1.94 ± 0.49 | | |
| propionaldehyde | 24.33 ± 2.72 | | | 5.42 ± 0.62 | | | 39.19 ± 4.44 | | | 11.55 ± 1.65 | | |
| crotonaldehyde | 14.36 ± 1.69 | | | 0.00 ± 0.29 | | | 8.92 ± 1.19 | | | 5.46 ± 1.61 | | |
| methyl ethyl ketone | 11.20 ± 2.11 | | | 4.12 ± 0.87 | | | 20.94 ± 3.78 | | | 3.18 ± 1.96 | | |
| Methacrolein | 34.15 ± 3.85 | | | 3.89 ± 0.52 | | | 25.22 ± 2.87 | | | 9.36 ± 1.80 | | |
| * n-butyraldehyde | 0.08 ± 0.02 | | | 0.05 ± 0.01 | | | 0.30 ± 0.07 | | | 0.10 ± 0.03 | | |
| benzaldehyde | 126.70 ± 12.71 | | | 17.48 ± 1.80 | | | 93.10 ± 9.39 | | | 47.26 ± 5.21 | | |
| glyoxal | 1.15 ± 0.27 | | | 0.77 ± 0.16 | | | 0.57 ± 0.36 | | | 1.15 ± 0.72 | | |
| valeraldehyde | 6.72 ± 0.91 | | | 3.14 ± 0.50 | | | 8.95 ± 1.26 | | | 4.05 ± 1.68 | | |
| tolualdehyde | 64.57 ± 10.45 | | | 8.37 ± 1.44 | | | 18.36 ± 3.16 | | | 20.70 ± 3.83 | | |
| hexanal | 9.96 ± 1.27 | | | 4.49 ± 0.61 | | | 1.99 ± 0.93 | | | 2.50 ± 1.86 | | |
| *** acrolein converts to an unknown rear** | | | | | | | | | | | | |
| VOC (mg/mi) | | | | | | | | | | | | |
| 1,3 butadiene (estimated) | 11.059 ± 6.112 | | | 1.827 ± 1.010 | | | 5.123 ± 2.831 | | | 9.722 ± 5.373 | | |
| C2 compounds | 256.860 ± 36.271 | | | 34.717 ± 4.902 | | | 140.835 ± 19.887 | | | 209.616 ± 29.599 | | |
| propene | 63.793 ± 7.736 | | | 10.538 ± 1.278 | | | 29.552 ± 3.584 | | | 56.077 ± 6.801 | | |
| propane | 1.677 ± 0.084 | | | 0.784 ± 0.039 | | | 1.655 ± 0.083 | | | 2.060 ± 0.103 | | |
| isoButane | 8.893 ± 0.445 | | | 2.123 ± 0.106 | | | 7.723 ± 0.386 | | | 6.091 ± 0.305 | | |
| 1Butene+iButylene | 32.603 ± 2.210 | | | 7.212 ± 0.489 | | | 15.790 ± 1.070 | | | 26.866 ± 1.821 | | |
| n-Butane | 59.466 ± 2.973 | | | 15.892 ± 0.795 | | | 62.473 ± 3.124 | | | 34.995 ± 1.750 | | |
| t-2-Butene | 7.487 ± 0.412 | | | 1.675 ± 0.092 | | | 5.134 ± 0.283 | | | 5.484 ± 0.302 | | |
| c-2-Butene | 4.889 ± 0.452 | | | 1.130 ± 0.104 | | | 3.123 ± 0.289 | | | 3.261 ± 0.301 | | |
| 3-Me-1-Butene | 1.795 ± 0.090 | | | 0.315 ± 0.016 | | | 0.922 ± 0.046 | | | 1.018 ± 0.051 | | |
| isopentane | 59.476 ± 3.883 | | | 18.151 ± 1.185 | | | 60.547 ± 3.953 | | | 43.875 ± 2.864 | | |
| 1-Pentene | 2.932 ± 0.176 | | | 0.441 ± 0.026 | | | 1.833 ± 0.110 | | | 2.460 ± 0.147 | | |
| 2-Me-1-Butene | 5.222 ± 0.382 | | | 0.935 ± 0.068 | | | 2.788 ± 0.204 | | | 3.381 ± 0.247 | | |
| n-Pentane | 18.771 ± 1.119 | | | 4.608 ± 0.275 | | | 17.860 ± 1.064 | | | 22.367 ± 1.333 | | |
| t-2-Pentene | 4.845 ± 0.242 | | | 0.823 ± 0.041 | | | 3.983 ± 0.199 | | | 3.271 ± 0.164 | | |
| c-2-Pentene | 2.631 ± 0.229 | | | 0.463 ± 0.040 | | | 2.045 ± 0.178 | | | 1.856 ± 0.161 | | |
| 2-Me-2-Butene | 47.566 ± 2.548 | | | 1.650 ± 0.088 | | | 4.600 ± 0.246 | | | 4.805 ± 0.257 | | |
| 22DiMeButane | 4.056 ± 0.263 | | | 0.805 ± 0.052 | | | 3.573 ± 0.231 | | | 4.191 ± 0.271 | | |
| CycloPentene | 1.822 ± 0.112 | | | 0.311 ± 0.019 | | | 1.158 ± 0.071 | | | 1.212 ± 0.074 | | |
| CycloPentane | 2.632 ± 0.132 | | | 0.554 ± 0.028 | | | 2.143 ± 0.107 | | | 2.328 ± 0.116 | | |
| 23DiMeButane | 7.154 ± 0.424 | | | 2.091 ± 0.124 | | | 7.684 ± 0.456 | | | 6.116 ± 0.363 | | |
| MTBE | 0.615 ± 0.037 | | | 0.128 ± 0.008 | | | 0.285 ± 0.017 | | | 0.289 ± 0.017 | | |
| 2-MePentane | 24.113 ± 1.379 | | | 5.572 ± 0.319 | | | 23.420 ± 1.340 | | | 21.916 ± 1.254 | | |
| 3-MePentane | 15.662 ± 0.783 | | | 3.777 ± 0.189 | | | 15.653 ± 0.783 | | | 13.951 ± 0.698 | | |
| 2-Me-1-Pentene | 1.041 ± 0.052 | | | 0.215 ± 0.011 | | | 0.893 ± 0.045 | | | 0.586 ± 0.029 | | |
| 1-Hexene | 1.615 ± 0.081 | | | 0.281 ± 0.014 | | | 1.329 ± 0.066 | | | 2.193 ± 0.110 | | |
| n-Hexane | 16.483 ± 0.826 | | | 3.734 ± 0.187 | | | 13.922 ± 0.697 | | | 11.363 ± 0.569 | | |
| t-2-Hexene | 1.815 ± 0.091 | | | 0.511 ± 0.026 | | | 1.921 ± 0.096 | | | 1.288 ± 0.064 | | |
| 2-Me-2-Pentene | 1.226 ± 0.065 | | | 0.365 ± 0.019 | | | 1.183 ± 0.062 | | | 0.954 ± 0.050 | | |
| c-3-Me-2-Pentene | 0.910 ± 0.045 | | | 0.254 ± 0.013 | | | 0.830 ± 0.042 | | | 0.628 ± 0.031 | | |
| c-3-Hexene | 0.260 ± 0.013 | | | 0.050 ± 0.003 | | | 0.267 ± 0.013 | | | 0.182 ± 0.009 | | |
| c-2-Hexene | 0.875 ± 0.044 | | | 0.185 ± 0.009 | | | 0.971 ± 0.049 | | | 0.686 ± 0.034 | | |
| t-3-Me-2-Pentene | 1.546 ± 0.077 | | | 0.405 ± 0.020 | | | 1.455 ± 0.073 | | | 1.060 ± 0.053 | | |
| MeCyPentane | 11.508 ± 0.663 | | | 2.621 ± 0.151 | | | 10.773 ± 0.621 | | | 7.152 ± 0.412 | | |
| 2,4-DiMePentane | 7.735 ± 0.387 | | | 3.052 ± 0.153 | | | 10.214 ± 0.511 | | | 3.933 ± 0.197 | | |
| 223TriMeButane | 0.198 ± 0.010 | | | 0.062 ± 0.003 | | | 0.219 ± 0.011 | | | 0.196 ± 0.010 | | |
| Benzene | 75.769 ± 4.685 | | | 12.591 ± 0.778 | | | 36.063 ± 2.230 | | | 53.602 ± 3.314 | | |
| CycloHexane | 4.050 ± 0.234 | | | 0.929 ± 0.054 | | | 4.339 ± 0.251 | | | 2.146 ± 0.124 | | |
| 4MeHexene | 0.349 ± 0.032 | | | 0.068 ± 0.006 | | | 0.316 ± 0.029 | | | 0.284 ± 0.026 | | |
| 2MeHexane | 10.872 ± 0.544 | | | 2.749 ± 0.137 | | | 10.365 ± 0.518 | | | 8.328 ± 0.416 | | |
| 23DiMePentane | 12.370 ± 0.618 | | | 5.119 ± 0.256 | | | 17.567 ± 0.878 | | | 6.377 ± 0.319 | | |
| 3MeHexane | 12.592 ± 0.630 | | | 3.175 ± 0.159 | | | 11.841 ± 0.592 | | | 9.745 ± 0.487 | | |
| Cyclohexene | 0.066 ± 0.014 | | | 0.020 ± 0.004 | | | 0.050 ± 0.010 | | | 0.041 ± 0.009 | | |
| 3EtPentane | 3.638 ± 0.233 | | | 0.897 ± 0.057 | | | 3.458 ± 0.221 | | | 2.759 ± 0.176 | | |
| 1-Heptene | 1.080 ± 0.054 | | | 0.275 ± 0.014 | | | 1.942 ± 0.097 | | | 1.506 ± 0.075 | | |
| 224TrMePentane | 24.413 ± 1.741 | | | 12.316 ± 0.878 | | | 30.049 ± 2.143 | | | 15.820 ± 1.128 | | |
| t-3-Heptene | 0.595 ± 0.030 | | | 0.125 ± 0.006 | | | 0.667 ± 0.033 | | | 0.416 ± 0.021 | | |
| n-Heptane | 9.679 ± 0.484 | | | 2.673 ± 0.134 | | | 9.421 ± 0.471 | | | 7.250 ± 0.362 | | |
| 244TMe-1-Pentene | 0.259 ± 0.014 | | | 0.100 ± 0.005 | | | 0.145 ± 0.008 | | | 0.148 ± 0.008 | | |
| MeCyHexane | 4.956 ± 0.248 | | | 1.263 ± 0.063 | | | 4.709 ± 0.235 | | | 3.731 ± 0.187 | | |
| 25DiMeHexane | 3.148 ± 0.215 | | | 1.374 ± 0.094 | | | 3.389 ± 0.231 | | | 2.517 ± 0.172 | | |
| 24DiMeHexane | 5.798 ± 0.290 | | | 2.312 ± 0.116 | | | 6.276 ± 0.314 | | | 4.412 ± 0.221 | | |
| 234TrMePentane | 6.911 ± 0.346 | | | 3.795 ± 0.190 | | | 8.451 ± 0.423 | | | 6.519 ± 0.326 | | |
| Toluene | 107.730 ± 5.387 | | | 27.999 ± 1.400 | | | 73.510 ± 3.676 | | | 92.506 ± 4.625 | | |
| 23DiMeHexane | 3.323 ± 0.179 | | | 1.617 ± 0.087 | | | 3.704 ± 0.199 | | | 2.687 ± 0.145 | | |
| 2MeHeptane | 5.498 ± 0.275 | | | 1.641 ± 0.082 | | | 5.145 ± 0.257 | | | 4.749 ± 0.237 | | |
| 4MeHeptane | 2.348 ± 0.181 | | | 0.693 ± 0.053 | | | 2.162 ± 0.166 | | | 1.970 ± 0.152 | | |
| 3MeHeptane | 5.610 ± 0.280 | | | 1.710 ± 0.085 | | | 5.248 ± 0.262 | | | 5.223 ± 0.261 | | |
| Hexanal | 9.958 ± 1.272 | | | 4.490 ± 0.612 | | | 1.991 ± 0.928 | | | 2.503 ± 1.860 | | |
| 225TMHexane | 1.533 ± 0.077 | | | 0.450 ± 0.023 | | | 1.463 ± 0.073 | | | 1.554 ± 0.078 | | |
| Octene-1 | 2.768 ± 0.138 | | | 1.544 ± 0.077 | | | 3.547 ± 0.177 | | | 2.626 ± 0.131 | | |
| 11DMeCyHexane | 0.311 ± 0.016 | | | 0.075 ± 0.004 | | | 0.383 ± 0.019 | | | 0.560 ± 0.028 | | |
| n-Octane | 5.335 ± 0.267 | | | 1.665 ± 0.083 | | | 5.079 ± 0.254 | | | 4.707 ± 0.235 | | |
| 24DiMeHeptane | 0.610 ± 0.030 | | | 0.345 ± 0.017 | | | 0.754 ± 0.038 | | | 0.607 ± 0.030 | | |
| 25DiMeHeptane | 2.265 ± 0.113 | | | 0.734 ± 0.037 | | | 2.211 ± 0.111 | | | 2.029 ± 0.101 | | |
| 33DiMeHeptane | 0.080 ± 0.004 | | | 0.031 ± 0.002 | | | 0.089 ± 0.004 | | | 0.089 ± 0.004 | | |
| EtBenzene | 22.971 ± 1.149 | | | 5.641 ± 0.282 | | | 16.668 ± 0.833 | | | 15.540 ± 0.777 | | |
| m/p-xylene | 71.190 ± 3.560 | | | 17.419 ± 0.871 | | | 49.642 ± 2.482 | | | 46.692 ± 2.335 | | |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W3-1 | W3-2 | W3-3 | W4-1 | W4-2 | W4-3 | W5-1 | W5-2 | W5-3 | W6-1 | W6-2 | W6-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2MeOctane | 1.846 ± 0.092 | | | 0.554 ± 0.028 | | | 2.315 ± 0.116 | | | 2.193 ± 0.110 | | |
| 3MeOctane | 2.980 ± 0.183 | | | 0.950 ± 0.058 | | | 2.903 ± 0.179 | | | 3.018 ± 0.186 | | |
| Styrene+heptanal | 1.796 ± 0.090 | | | 0.963 ± 0.048 | | | 1.233 ± 0.062 | | | 1.080 ± 0.054 | | |
| o-xylene | 24.974 ± 1.249 | | | 6.558 ± 0.328 | | | 18.002 ± 0.900 | | | 17.700 ± 0.885 | | |
| Nonene-1 | 0.567 ± 0.028 | | | 0.304 ± 0.015 | | | 1.010 ± 0.050 | | | 0.585 ± 0.029 | | |
| n-Nonane | 2.845 ± 0.142 | | | 0.950 ± 0.048 | | | 2.798 ± 0.140 | | | 3.113 ± 0.156 | | |
| iPropBenzene | 1.773 ± 0.089 | | | 0.618 ± 0.031 | | | 1.725 ± 0.086 | | | 1.276 ± 0.064 | | |
| iPropCyHexane | 0.385 ± 0.026 | | | 0.125 ± 0.008 | | | 0.392 ± 0.026 | | | 0.422 ± 0.028 | | |
| 26DiMeOctane | 1.287 ± 0.081 | | | 0.459 ± 0.029 | | | 1.349 ± 0.085 | | | 1.292 ± 0.081 | | |
| alpha-pinene | 0.227 ± 0.042 | | | 0.080 ± 0.015 | | | 0.265 ± 0.049 | | | 0.211 ± 0.039 | | |
| nPropBenzene | 4.560 ± 0.228 | | | 1.312 ± 0.066 | | | 4.042 ± 0.202 | | | 3.691 ± 0.185 | | |
| mEtToluene | 19.537 ± 0.977 | | | 5.165 ± 0.258 | | | 14.890 ± 0.745 | | | 15.517 ± 0.776 | | |
| pEtToluene | 7.789 ± 0.389 | | | 2.089 ± 0.104 | | | 5.726 ± 0.286 | | | 6.025 ± 0.301 | | |
| 135TriMeBenzene | 9.307 ± 0.465 | | | 2.527 ± 0.126 | | | 7.351 ± 0.368 | | | 7.546 ± 0.377 | | |
| oEtToluene | 6.449 ± 0.322 | | | 1.813 ± 0.091 | | | 4.967 ± 0.248 | | | 5.478 ± 0.274 | | |
| Octanal | 0.434 ± 0.124 | | | 0.208 ± 0.060 | | | 0.474 ± 0.135 | | | 0.351 ± 0.100 | | |
| beta-pinene | 0.156 ± 0.008 | | | 0.069 ± 0.003 | | | 0.189 ± 0.009 | | | 0.116 ± 0.006 | | |
| 124TriMeBenzene | 25.918 ± 1.296 | | | 7.002 ± 0.350 | | | 20.028 ± 1.001 | | | 19.996 ± 1.000 | | |
| n-Decane | 1.863 ± 0.104 | | | 0.675 ± 0.038 | | | 1.978 ± 0.110 | | | 2.422 ± 0.135 | | |
| iButBenzene | 0.533 ± 0.027 | | | 0.184 ± 0.009 | | | 0.568 ± 0.028 | | | 0.468 ± 0.023 | | |
| sButBenzene | 0.394 ± 0.020 | | | 0.125 ± 0.006 | | | 0.417 ± 0.021 | | | 0.388 ± 0.019 | | |
| Limonene | 5.959 ± 0.298 | | | 1.685 ± 0.084 | | | 4.842 ± 0.242 | | | 5.008 ± 0.250 | | |
| Indan | 3.186 ± 0.342 | | | 0.704 ± 0.076 | | | 2.530 ± 0.272 | | | 2.733 ± 0.293 | | |
| 13diethylbenzene | 2.060 ± 0.206 | | | 0.604 ± 0.061 | | | 1.699 ± 0.170 | | | 1.846 ± 0.185 | | |
| 14diethylbenzene | 6.191 ± 0.344 | | | 1.426 ± 0.079 | | | 5.164 ± 0.287 | | | 4.815 ± 0.267 | | |
| 12diethylbenzene | 0.637 ± 0.032 | | | 0.199 ± 0.010 | | | 0.612 ± 0.031 | | | 0.790 ± 0.039 | | |
| 2-propylToluene | 1.349 ± 0.067 | | | 0.477 ± 0.024 | | | 1.180 ± 0.059 | | | 1.132 ± 0.057 | | |
| 3-ipropyltoluene | 0.720 ± 0.036 | | | 0.219 ± 0.011 | | | 0.700 ± 0.035 | | | 0.643 ± 0.032 | | |
| 4-ipropyltoluene | 0.126 ± 0.007 | | | 0.039 ± 0.002 | | | 0.042 ± 0.002 | | | 0.054 ± 0.003 | | |
| 2-ipropyltoluene | 0.277 ± 0.050 | | | 0.109 ± 0.020 | | | 0.221 ± 0.040 | | | 0.256 ± 0.047 | | |
| Nonanal | 4.843 ± 0.242 | | | 1.116 ± 0.056 | | | 3.853 ± 0.193 | | | 3.892 ± 0.195 | | |
| n-Undecane | 0.888 ± 0.178 | | | 0.254 ± 0.051 | | | 0.799 ± 0.160 | | | 1.307 ± 0.261 | | |
| 1245tetraMeBenzene | 1.636 ± 0.263 | | | 0.400 ± 0.064 | | | 1.421 ± 0.228 | | | 1.358 ± 0.218 | | |
| 1235tetraMeBenzene | 2.048 ± 0.102 | | | 0.516 ± 0.026 | | | 1.794 ± 0.090 | | | 1.642 ± 0.082 | | |
| 1234tetraMeBenzene | 0.762 ± 0.038 | | | 0.185 ± 0.009 | | | 0.721 ± 0.036 | | | 0.569 ± 0.028 | | |
| n-Dodecane | 0.679 ± 0.034 | | | 0.183 ± 0.009 | | | 0.593 ± 0.030 | | | 0.715 ± 0.036 | | |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W6-4 | W7-1 | W7-2 | W7-3 | W7-4 | W8-1 | W8-2 | W8-3 |
|---|---|---|---|---|---|---|---|---|
| Gravimetric mass (mg/mi) | 73.13 ± 3.66 | 5.08 ± 0.31 | 12.44 ± 0.64 | 3.45 ± 0.26 | 4.65 ± 0.29 | 4.21 ± 0.24 | 8.46 ± 0.46 | 27.78 ± 1.40 |
| Carbon fractions by TOR (mg/mi) | | | | | | | | |
| Organic Carbon Fraction 1 | 27.138 ± 2.784 | 0.693 ± 0.099 | 2.520 ± 0.241 | 0.594 ± 0.103 | 0.910 ± 0.113 | 0.692 ± 0.076 | 0.715 ± 0.108 | 0.900 ± 0.098 |
| Organic Carbon Fraction 2 | 17.357 ± 2.672 | 0.691 ± 0.084 | 1.796 ± 0.196 | 0.856 ± 0.113 | 0.498 ± 0.066 | 0.661 ± 0.064 | 0.539 ± 0.078 | 0.672 ± 0.077 |
| Organic Carbon Fraction 3 | 2.799 ± 0.614 | 0.795 ± 0.157 | 1.133 ± 0.181 | 0.903 ± 0.181 | 0.652 ± 0.144 | 0.506 ± 0.094 | 0.628 ± 0.140 | 0.581 ± 0.120 |
| Organic Carbon Fraction 4 | 1.806 ± 0.473 | 0.515 ± 0.143 | 1.101 ± 0.225 | 0.370 ± 0.141 | 0.459 ± 0.148 | 0.730 ± 0.138 | 1.053 ± 0.247 | 0.369 ± 0.113 |
| Pyrolyzed Organic Carbon | 0.103 ± 0.044 | 0.009 ± 0.019 | 0.147 ± 0.037 | 0.002 ± 0.021 | 0.081 ± 0.030 | 0.032 ± 0.018 | 0.036 ± 0.022 | 0.002 ± 0.016 |
| Total Organic Carbon | 49.201 ± 3.545 | 2.700 ± 0.230 | 6.682 ± 0.446 | 2.692 ± 0.249 | 2.576 ± 0.231 | 2.602 ± 0.187 | 2.950 ± 0.254 | 2.517 ± 0.204 |
| Elemental Carbon Fraction 1 | 2.344 ± 0.599 | 1.073 ± 0.229 | 2.524 ± 0.523 | 1.000 ± 0.246 | 0.611 ± 0.149 | 0.578 ± 0.095 | 3.180 ± 0.758 | 1.487 ± 0.302 |
| Elemental Carbon Fraction 2 | 1.981 ± 0.287 | 1.734 ± 0.255 | 1.422 ± 0.168 | 0.295 ± 0.087 | 0.944 ± 0.141 | 0.947 ± 0.107 | 1.306 ± 0.232 | 1.860 ± 0.218 |
| Elemental Carbon Fraction 3 | 0.047 ± 0.039 | 0.036 ± 0.020 | 0.040 ± 0.018 | 0.003 ± 0.007 | 0.028 ± 0.017 | 0.009 ± 0.007 | 0.094 ± 0.072 | 0.005 ± 0.006 |
| Total Elemental Carbon | 4.270 ± 0.787 | 2.824 ± 0.464 | 3.836 ± 0.556 | 1.285 ± 0.265 | 1.488 ± 0.263 | 1.499 ± 0.186 | 4.534 ± 0.884 | 3.343 ± 0.470 |
| Total Carbon | 53.470 ± 3.536 | 5.525 ± 0.401 | 10.518 ± 0.658 | 3.978 ± 0.352 | 4.063 ± 0.339 | 4.098 ± 0.278 | 7.483 ± 0.547 | 5.857 ± 0.396 |
| Elements by XRF (mg/mi) | | | | | | | | |
| Sodium (qualitative only) | 0.0607 ± 0.0320 | 0.0007 ± 0.0229 | 0.0225 ± 0.0192 | 0.0436 ± 0.0255 | 0.0112 ± 0.0235 | 0.0056 ± 0.0164 | 0.0330 ± 0.0233 | 0.0071 ± 0.0191 |
| Magnesium (qualitative only) | 0.0050 ± 0.0308 | 0.0000 ± 0.0227 | 0.0065 ± 0.0189 | 0.0121 ± 0.0250 | 0.0091 ± 0.0232 | 0.0031 ± 0.0162 | 0.0013 ± 0.0226 | 0.0060 ± 0.0189 |
| Aluminum | 0.0160 ± 0.0209 | 0.0167 ± 0.0154 | 0.0112 ± 0.0128 | 0.0105 ± 0.0169 | 0.0056 ± 0.0157 | 0.0042 ± 0.0110 | 0.0159 ± 0.0154 | 0.0047 ± 0.0128 |
| Silicon | 0.0772 ± 0.0111 | 0.1340 ± 0.0105 | 0.0998 ± 0.0082 | 0.0580 ± 0.0088 | 0.1021 ± 0.0095 | 0.0278 ± 0.0055 | 0.0565 ± 0.0081 | 0.0399 ± 0.0065 |
| Phosphorous | 0.1608 ± 0.0084 | 0.0106 ± 0.0015 | 0.0481 ± 0.0027 | 0.0191 ± 0.0018 | 0.0411 ± 0.0025 | 0.0210 ± 0.0015 | 0.0344 ± 0.0023 | 0.0150 ± 0.0014 |
| Sulfur | 0.2488 ± 0.0131 | 0.0716 ± 0.0045 | 0.1855 ± 0.0096 | 0.0743 ± 0.0047 | 0.1116 ± 0.0062 | 0.0837 ± 0.0046 | 0.1662 ± 0.0088 | 0.0868 ± 0.0049 |
| Chlorine | 0.0178 ± 0.0019 | 0.0054 ± 0.0013 | 0.0121 ± 0.0012 | 0.0015 ± 0.0014 | 0.0041 ± 0.0013 | 0.0052 ± 0.0009 | 0.0050 ± 0.0013 | 0.0088 ± 0.0011 |
| Potassium | 0.0090 ± 0.0029 | 0.0032 ± 0.0021 | 0.0008 ± 0.0018 | 0.0203 ± 0.0025 | 0.0017 ± 0.0022 | 0.0014 ± 0.0015 | 0.0041 ± 0.0021 | 0.0003 ± 0.0018 |
| Calcium | 0.3285 ± 0.0166 | 0.0488 ± 0.0028 | 0.1025 ± 0.0053 | 0.0684 ± 0.0038 | 0.1425 ± 0.0073 | 0.0578 ± 0.0031 | 0.0762 ± 0.0041 | 0.0538 ± 0.0029 |
| Titanium | 0.0021 ± 0.0010 | 0.0007 ± 0.0007 | 0.0010 ± 0.0006 | 0.0013 ± 0.0008 | 0.0005 ± 0.0007 | 0.0007 ± 0.0005 | 0.0007 ± 0.0007 | 0.0006 ± 0.0006 |
| Vanadium | 0.0000 ± 0.0004 | 0.0000 ± 0.0003 | 0.0001 ± 0.0002 | 0.0001 ± 0.0003 | 0.0002 ± 0.0003 | 0.0002 ± 0.0002 | 0.0002 ± 0.0003 | 0.0001 ± 0.0002 |
| Chromium | 0.0141 ± 0.0017 | 0.0035 ± 0.0012 | 0.0076 ± 0.0010 | 0.0017 ± 0.0013 | 0.0040 ± 0.0012 | 0.0035 ± 0.0008 | 0.0075 ± 0.0012 | 0.0042 ± 0.0010 |
| Manganese | 0.0020 ± 0.0044 | 0.0003 ± 0.0032 | 0.0012 ± 0.0027 | 0.0006 ± 0.0036 | 0.0005 ± 0.0033 | 0.0003 ± 0.0023 | 0.0003 ± 0.0032 | 0.0006 ± 0.0027 |
| Iron | 0.4563 ± 0.0240 | 0.0575 ± 0.0057 | 0.0994 ± 0.0065 | 0.0527 ± 0.0060 | 0.1222 ± 0.0080 | 0.0480 ± 0.0042 | 0.1075 ± 0.0073 | 0.0855 ± 0.0059 |
| Cobalt | 0.0000 ± 0.0007 | 0.0001 ± 0.0006 | 0.0000 ± 0.0005 | 0.0001 ± 0.0006 | 0.0004 ± 0.0006 | 0.0000 ± 0.0004 | 0.0002 ± 0.0006 | 0.0000 ± 0.0005 |
| Nickel | 0.0036 ± 0.0012 | 0.0009 ± 0.0009 | 0.0022 ± 0.0007 | 0.0000 ± 0.0009 | 0.0015 ± 0.0009 | 0.0011 ± 0.0006 | 0.0026 ± 0.0009 | 0.0011 ± 0.0007 |
| Copper | 0.0146 ± 0.0013 | 0.0046 ± 0.0008 | 0.0056 ± 0.0007 | 0.0032 ± 0.0009 | 0.0042 ± 0.0008 | 0.0038 ± 0.0006 | 0.0063 ± 0.0008 | 0.0039 ± 0.0007 |
| Zinc | 0.1670 ± 0.0089 | 0.0122 ± 0.0022 | 0.0508 ± 0.0031 | 0.0149 ± 0.0025 | 0.0461 ± 0.0032 | 0.0265 ± 0.0020 | 0.0288 ± 0.0026 | 0.0257 ± 0.0022 |
| Gallium | 0.0069 ± 0.0038 | 0.0002 ± 0.0028 | 0.0013 ± 0.0023 | 0.0012 ± 0.0031 | 0.0018 ± 0.0029 | 0.0009 ± 0.0020 | 0.0018 ± 0.0028 | 0.0001 ± 0.0023 |
| Arsenic | 0.0000 ± 0.0010 | 0.0000 ± 0.0008 | 0.0000 ± 0.0006 | 0.0003 ± 0.0008 | 0.0000 ± 0.0008 | 0.0006 ± 0.0005 | 0.0000 ± 0.0008 | 0.0000 ± 0.0006 |
| Selenium | 0.0000 ± 0.0009 | 0.0000 ± 0.0006 | 0.0000 ± 0.0005 | 0.0000 ± 0.0007 | 0.0000 ± 0.0007 | 0.0000 ± 0.0005 | 0.0000 ± 0.0006 | 0.0000 ± 0.0005 |
| Bromine | 0.0012 ± 0.0011 | 0.0003 ± 0.0008 | 0.0007 ± 0.0007 | 0.0009 ± 0.0009 | 0.0012 ± 0.0008 | 0.0003 ± 0.0006 | 0.0011 ± 0.0008 | 0.0003 ± 0.0007 |
| Rubidium | 0.0008 ± 0.0011 | 0.0001 ± 0.0008 | 0.0002 ± 0.0007 | 0.0000 ± 0.0009 | 0.0000 ± 0.0008 | 0.0004 ± 0.0006 | 0.0002 ± 0.0008 | 0.0003 ± 0.0007 |
| Strontium | 0.0029 ± 0.0022 | 0.0001 ± 0.0016 | 0.0009 ± 0.0013 | 0.0006 ± 0.0018 | 0.0000 ± 0.0016 | 0.0001 ± 0.0011 | 0.0002 ± 0.0016 | 0.0007 ± 0.0013 |
| Yttrium | 0.0002 ± 0.0014 | 0.0001 ± 0.0010 | 0.0000 ± 0.0009 | 0.0010 ± 0.0011 | 0.0005 ± 0.0011 | 0.0005 ± 0.0007 | 0.0000 ± 0.0010 | 0.0001 ± 0.0009 |
| Zirconium | 0.0020 ± 0.0030 | 0.0007 ± 0.0022 | 0.0019 ± 0.0018 | 0.0026 ± 0.0024 | 0.0018 ± 0.0022 | 0.0021 ± 0.0016 | 0.0022 ± 0.0022 | 0.0004 ± 0.0018 |
| Molybdenum | 0.0090 ± 0.0035 | 0.0000 ± 0.0025 | 0.0049 ± 0.0021 | 0.0003 ± 0.0028 | 0.0038 ± 0.0026 | 0.0008 ± 0.0018 | 0.0004 ± 0.0025 | 0.0012 ± 0.0021 |
| Palladium | 0.0003 ± 0.0042 | 0.0019 ± 0.0031 | 0.0018 ± 0.0026 | 0.0027 ± 0.0035 | 0.0020 ± 0.0032 | 0.0019 ± 0.0022 | 0.0027 ± 0.0031 | 0.0014 ± 0.0026 |
| Silver | 0.0000 ± 0.0033 | 0.0012 ± 0.0024 | 0.0019 ± 0.0020 | 0.0033 ± 0.0027 | 0.0026 ± 0.0025 | 0.0000 ± 0.0017 | 0.0010 ± 0.0024 | 0.0005 ± 0.0020 |
| Cadmium | 0.0000 ± 0.0045 | 0.0004 ± 0.0033 | 0.0003 ± 0.0028 | 0.0006 ± 0.0036 | 0.0021 ± 0.0034 | 0.0000 ± 0.0024 | 0.0000 ± 0.0033 | 0.0006 ± 0.0028 |
| Indium | 0.0000 ± 0.0035 | 0.0007 ± 0.0026 | 0.0003 ± 0.0022 | 0.0012 ± 0.0029 | 0.0002 ± 0.0027 | 0.0011 ± 0.0019 | 0.0015 ± 0.0026 | 0.0010 ± 0.0022 |
| Tin | 0.0009 ± 0.0043 | 0.0019 ± 0.0032 | 0.0002 ± 0.0026 | 0.0025 ± 0.0035 | 0.0018 ± 0.0032 | 0.0018 ± 0.0023 | 0.0001 ± 0.0032 | 0.0019 ± 0.0026 |
| Antimony | 0.0042 ± 0.0044 | 0.0032 ± 0.0032 | 0.0010 ± 0.0027 | 0.0000 ± 0.0035 | 0.0007 ± 0.0033 | 0.0012 ± 0.0023 | 0.0047 ± 0.0032 | 0.0024 ± 0.0027 |
| Barium | 0.0022 ± 0.0101 | 0.0068 ± 0.0075 | 0.0083 ± 0.0063 | 0.0112 ± 0.0083 | 0.0065 ± 0.0077 | 0.0115 ± 0.0054 | 0.0063 ± 0.0075 | 0.0023 ± 0.0062 |
| Lanthanum | 0.0113 ± 0.0242 | 0.0073 ± 0.0179 | 0.0000 ± 0.0149 | 0.0018 ± 0.0196 | 0.0071 ± 0.0183 | 0.0026 ± 0.0128 | 0.0074 ± 0.0179 | 0.0000 ± 0.0148 |
| Gold | 0.0031 ± 0.0047 | 0.0000 ± 0.0035 | 0.0003 ± 0.0029 | 0.0031 ± 0.0038 | 0.0012 ± 0.0035 | 0.0008 ± 0.0025 | 0.0007 ± 0.0035 | 0.0004 ± 0.0029 |
| Mercury | 0.0025 ± 0.0018 | 0.0000 ± 0.0013 | 0.0002 ± 0.0011 | 0.0013 ± 0.0014 | 0.0001 ± 0.0013 | 0.0007 ± 0.0009 | 0.0004 ± 0.0013 | 0.0000 ± 0.0011 |
| Thallium | 0.0000 ± 0.0033 | 0.0000 ± 0.0024 | 0.0000 ± 0.0020 | 0.0007 ± 0.0026 | 0.0000 ± 0.0025 | 0.0005 ± 0.0017 | 0.0013 ± 0.0024 | 0.0008 ± 0.0020 |
| Lead | 0.0137 ± 0.0032 | 0.0009 ± 0.0023 | 0.0028 ± 0.0019 | 0.0015 ± 0.0025 | 0.0040 ± 0.0024 | 0.0017 ± 0.0017 | 0.0021 ± 0.0023 | 0.0009 ± 0.0019 |
| Uranium | 0.0000 ± 0.0044 | 0.0009 ± 0.0032 | 0.0017 ± 0.0027 | 0.0002 ± 0.0036 | 0.0000 ± 0.0033 | 0.0010 ± 0.0023 | 0.0015 ± 0.0032 | 0.0014 ± 0.0027 |
| Anions by IC (mg/mi) | | | | | | | | |
| Nitrate Ion | 0.01 ± 0.01 | 0.01 ± 0.01 | 0.02 ± 0.01 | 0.02 ± 0.01 | 0.01 ± 0.01 | 0.02 ± 0.01 | 0.03 ± 0.01 | 0.02 ± 0.01 |
| Sulfate Ion | 0.22 ± 0.02 | 0.15 ± 0.01 | 0.43 ± 0.02 | 0.13 ± 0.01 | 0.18 ± 0.01 | 0.18 ± 0.01 | 0.31 ± 0.02 | 0.19 ± 0.01 |
| Polycyclic aromatic hydrocarbons (ug/mile) | | | | | | | | |
| Naphthalene | 4284.80 ± 657.84 | 753.59 ± 117.48 | 1131.41 ± 176.12 | 928.52 ± 145.26 | 1228.44 ± 191.68 | 616.23 ± 97.27 | 1524.80 ± 236.26 | 781.55 ± 122.75 |
| 2-methylnaphthalene | 9798.31 ± 994.83 | 1700.61 ± 172.46 | 2539.05 ± 259.83 | 2080.22 ± 213.19 | 3419.88 ± 350.92 | 1644.33 ± 168.34 | 3288.80 ± 335.22 | 1903.50 ± 195.50 |
| 1-methylnaphthalene | 4261.56 ± 459.80 | 805.89 ± 86.85 | 1258.91 ± 136.82 | 971.29 ± 105.67 | 1567.22 ± 170.73 | 836.86 ± 91.00 | 1661.23 ± 179.90 | 914.91 ± 99.76 |
| Biphenyl | 230.05 ± 29.54 | 63.47 ± 8.16 | 130.05 ± 16.78 | 67.08 ± 8.69 | 101.32 ± 13.12 | 55.91 ± 7.24 | 157.10 ± 20.21 | 74.74 ± 9.69 |
| 1+2ethylnaphthalene | 734.77 ± 100.39 | 214.52 ± 29.44 | 354.67 ± 48.77 | 163.24 ± 22.58 | 275.25 ± 37.98 | 220.87 ± 30.46 | 370.80 ± 50.86 | 215.75 ± 29.82 |
| 2,6+2,7-dimethylnaphthalene | 756.20 ± 90.74 | 158.38 ± 18.99 | 303.70 ± 36.65 | 195.65 ± 23.65 | 299.26 ± 36.20 | 194.48 ± 23.48 | 351.61 ± 42.31 | 188.89 ± 22.86 |
| 1,3+1,6+1,7dimethylnaphth | 1092.67 ± 132.07 | 249.53 ± 30.15 | 493.89 ± 60.03 | 308.54 ± 37.56 | 451.29 ± 55.00 | 325.20 ± 39.57 | 553.22 ± 67.08 | 309.84 ± 37.78 |
| 1,4+1,5+2,3-dimethylnaphth | 251.20 ± 29.37 | 16.06 ± 2.07 | 33.36 ± 3.99 | 67.81 ± 8.03 | 105.43 ± 12.46 | 22.73 ± 2.74 | 120.27 ± 14.13 | 70.30 ± 8.32 |
| 1,2-dimethylnaphthalene | 271.98 ± 36.35 | 63.38 ± 8.48 | 141.70 ± 19.02 | 64.93 ± 8.72 | 56.97 ± 7.68 | 84.25 ± 11.32 | 232.75 ± 31.16 | 73.19 ± 9.85 |
| 2-Methylbiphenyl | 0.00 ± 23.53 | 0.00 ± 22.01 | 0.00 ± 18.62 | 0.00 ± 15.06 | 0.00 ± 15.93 | 0.00 ± 13.54 | 0.02 ± 17.85 | 0.00 ± 16.44 |
| 3-Methylbiphenyl | 66.11 ± 12.72 | 34.12 ± 9.21 | 78.95 ± 13.32 | 0.00 ± 5.40 | 2.31 ± 7.05 | 8.32 ± 6.62 | 43.75 ± 10.15 | 7.30 ± 7.12 |
| 4-Methylbiphenyl | 29.35 ± 4.88 | 17.16 ± 3.65 | 38.90 ± 5.52 | 0.00 ± 2.07 | 3.50 ± 2.80 | 5.98 ± 2.66 | 20.62 ± 3.97 | 5.42 ± 2.83 |
| Dibenzofuran | 42.46 ± 4.70 | 11.64 ± 1.28 | 19.45 ± 2.17 | 15.95 ± 1.78 | 19.33 ± 2.16 | 9.08 ± 1.02 | 15.41 ± 1.71 | 9.92 ± 1.11 |
| A-trimethylnaphthalene | 101.71 ± 8.91 | 25.36 ± 2.22 | 53.36 ± 4.72 | 30.65 ± 2.72 | 46.54 ± 4.14 | 32.75 ± 2.90 | 52.16 ± 4.59 | 30.40 ± 2.71 |
| 1-ethyl-2-methylnaphthalene | 20.69 ± 1.59 | 4.82 ± 0.38 | 10.53 ± 0.82 | 6.04 ± 0.48 | 8.72 ± 0.68 | 6.33 ± 0.49 | 10.10 ± 0.78 | 5.97 ± 0.47 |
| B-trimethylnaphthalene | 109.16 ± 15.78 | 25.36 ± 3.67 | 68.28 ± 9.91 | 32.66 ± 4.75 | 46.33 ± 6.75 | 35.81 ± 5.21 | 52.53 ± 7.62 | 30.90 ± 4.51 |
| C-trimethylnaphthalene | 73.11 ± 5.84 | 17.87 ± 1.42 | 42.40 ± 3.43 | 23.14 ± 1.88 | 31.84 ± 2.59 | 23.80 ± 1.93 | 34.92 ± 2.81 | 20.88 ± 1.70 |
| 2-ethyl-1-methylnaphthalene | 2.30 ± 0.33 | 0.41 ± 0.10 | 1.18 ± 0.17 | 0.61 ± 0.12 | 0.68 ± 0.13 | 0.58 ± 0.09 | 0.95 ± 0.15 | 0.45 ± 0.09 |
| E-trimethylnaphthalene | 45.18 ± 4.06 | 10.17 ± 0.92 | 26.04 ± 2.37 | 13.99 ± 1.28 | 17.83 ± 1.63 | 14.32 ± 1.30 | 22.24 ± 2.01 | 12.76 ± 1.17 |
| F-trimethylnaphthalene | 44.44 ± 4.88 | 10.44 ± 1.14 | 26.96 ± 2.97 | 13.65 ± 1.51 | 19.13 ± 2.12 | 13.68 ± 1.51 | 20.45 ± 2.25 | 12.06 ± 1.34 |
| 2,3,5+I-trimethylnaphthalene | 56.57 ± 6.27 | 12.36 ± 1.37 | 35.59 ± 3.97 | 16.44 ± 1.84 | 21.33 ± 2.39 | 17.50 ± 1.96 | 25.07 ± 2.79 | 14.79 ± 1.66 |
| 2,4,5-trimethylnaphthalene | 8.95 ± 1.33 | 2.95 ± 0.45 | 10.43 ± 1.55 | 4.15 ± 0.63 | 4.91 ± 0.74 | 4.25 ± 0.64 | 7.10 ± 1.06 | 3.25 ± 0.49 |
| J-trimethylnaphthalene | 16.82 ± 1.95 | 1.50 ± 0.19 | 8.04 ± 0.94 | 1.81 ± 0.23 | 2.08 ± 0.26 | 2.63 ± 0.31 | 3.24 ± 0.39 | 2.04 ± 0.25 |
| 1,4,5-trimethylnaphthalene | 8.14 ± 1.34 | 1.15 ± 0.22 | 2.37 ± 0.40 | 0.91 ± 0.18 | 1.19 ± 0.23 | 1.15 ± 0.21 | 1.26 ± 0.24 | 1.22 ± 0.22 |
| Acenaphthylene | 440.69 ± 47.17 | 104.76 ± 11.14 | 79.06 ± 8.51 | 99.39 ± 10.70 | 66.48 ± 7.20 | 71.17 ± 7.68 | 280.80 ± 30.13 | 97.98 ± 10.54 |
| Acenaphthene | 14.88 ± 1.84 | 0.67 ± 0.71 | 71.56 ± 6.41 | 5.22 ± 1.02 | 24.30 ± 2.56 | 1.55 ± 0.72 | 89.69 ± 7.87 | 22.86 ± 2.42 |
| Fluorene | 157.99 ± 16.20 | 48.23 ± 4.92 | 67.15 ± 6.92 | 47.98 ± 4.97 | 64.52 ± 6.68 | 34.23 ± 3.54 | 110.31 ± 11.32 | 46.86 ± 4.84 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W6-4 | W7-1 | W7-2 | W7-3 | W7-4 | W8-1 | W8-2 | W8-3 |
|---|---|---|---|---|---|---|---|---|
| Dibenzothiophene | 4.13 ± 0.51 | 1.60 ± 0.20 | 2.44 ± 0.30 | 2.88 ± 0.36 | 0.72 ± 0.13 | 0.84 ± 0.11 | 1.09 ± 0.16 | 1.45 ± 0.19 |
| Phenanthrene | 292.67 ± 31.22 | 137.33 ± 14.46 | 253.37 ± 27.12 | 96.62 ± 10.39 | 124.18 ± 13.36 | 86.86 ± 9.37 | 221.26 ± 23.54 | 136.64 ± 14.67 |
| Anthracene | 69.30 ± 9.41 | 10.92 ± 1.41 | 42.71 ± 5.78 | 17.17 ± 2.32 | 14.77 ± 2.00 | 8.75 ± 1.18 | 39.81 ± 5.34 | 24.75 ± 3.34 |
| A-methylfluorene | 51.88 ± 5.64 | 11.06 ± 1.20 | 27.64 ± 3.03 | 13.56 ± 1.50 | 22.11 ± 2.41 | 12.28 ± 1.36 | 18.29 ± 1.97 | 10.75 ± 1.19 |
| 1-methylfluorene | 36.85 ± 4.24 | 8.69 ± 1.00 | 16.88 ± 1.96 | 10.54 ± 1.23 | 17.18 ± 2.00 | 8.59 ± 1.00 | 13.00 ± 1.51 | 8.96 ± 1.05 |
| B-methylfluorene | 10.81 ± 2.03 | 2.49 ± 0.47 | 4.27 ± 0.80 | 3.15 ± 0.60 | 3.95 ± 0.75 | 2.69 ± 0.51 | 4.18 ± 0.79 | 2.20 ± 0.42 |
| 9-fluorenone | 50.20 ± 5.81 | 10.84 ± 1.13 | 31.90 ± 3.66 | 18.16 ± 2.12 | 22.33 ± 2.60 | 2.31 ± 0.31 | 12.97 ± 1.50 | 31.14 ± 3.58 |
| Xanthone | 8.85 ± 1.26 | 3.75 ± 0.51 | 10.90 ± 1.52 | 4.88 ± 0.69 | 3.03 ± 0.44 | 1.84 ± 0.26 | 1.48 ± 0.23 | 6.04 ± 0.82 |
| Acenaphthenequinone | 0.00 ± 0.14 | 1.68 ± 0.24 | 3.66 ± 0.47 | 3.63 ± 0.48 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.70 ± 0.14 | 2.38 ± 0.32 |
| Perinaphthenone | 19.94 ± 3.62 | 5.59 ± 1.03 | 10.74 ± 1.58 | 9.99 ± 1.53 | 6.04 ± 1.12 | 5.61 ± 0.79 | 6.01 ± 0.79 | 12.52 ± 1.85 |
| 2-methylanthracene | 18.22 ± 1.84 | 4.94 ± 0.49 | 21.08 ± 2.13 | 3.71 ± 0.39 | 2.54 ± 0.27 | 4.48 ± 0.46 | 3.27 ± 0.34 | 4.55 ± 0.47 |
| 3-methylphenanthrene | 49.11 ± 3.63 | 12.03 ± 0.89 | 37.91 ± 2.83 | 10.40 ± 0.79 | 17.08 ± 1.29 | 10.39 ± 0.79 | 12.42 ± 0.93 | 14.32 ± 1.08 |
| 2-methylphenanthrene | 56.13 ± 5.29 | 14.64 ± 1.36 | 41.51 ± 3.93 | 12.40 ± 1.19 | 20.34 ± 1.94 | 11.47 ± 1.11 | 13.93 ± 1.32 | 16.54 ± 1.58 |
| 9-methylphenanthrene | 22.59 ± 2.26 | 6.29 ± 0.61 | 16.04 ± 1.61 | 5.23 ± 0.53 | 4.97 ± 0.50 | 4.95 ± 0.50 | 6.56 ± 0.65 | 6.65 ± 0.66 |
| 1-methylphenanthrene | 28.16 ± 4.75 | 19.62 ± 3.27 | 40.38 ± 6.80 | 10.86 ± 1.82 | 9.36 ± 1.57 | 11.11 ± 1.87 | 9.41 ± 1.56 | 10.56 ± 1.77 |
| Anthrone | 1.72 ± 0.40 | 0.27 ± 0.11 | 1.69 ± 0.37 | 0.21 ± 0.10 | 0.00 ± 0.09 | 0.04 ± 0.05 | 0.00 ± 0.08 | 0.02 ± 0.06 |
| Anthraquinone | 21.70 ± 3.09 | 10.56 ± 1.40 | 13.05 ± 1.75 | 7.86 ± 1.13 | 5.43 ± 0.82 | 5.90 ± 0.83 | 3.78 ± 0.53 | 14.24 ± 1.77 |
| 3,6-dimethylphenanthrene | 8.73 ± 0.92 | 1.54 ± 0.18 | 7.25 ± 0.76 | 1.80 ± 0.21 | 2.53 ± 0.28 | 1.95 ± 0.21 | 1.48 ± 0.18 | 2.40 ± 0.26 |
| A-dimethylphenanthrene | 14.11 ± 1.53 | 2.69 ± 0.30 | 6.81 ± 0.74 | 2.26 ± 0.26 | 4.31 ± 0.48 | 2.26 ± 0.25 | 2.72 ± 0.30 | 4.87 ± 0.51 |
| B-dimethylphenanthrene | 7.28 ± 0.84 | 1.16 ± 0.15 | 4.98 ± 0.56 | 3.66 ± 0.42 | 1.15 ± 0.15 | 1.77 ± 0.21 | 0.76 ± 0.12 | 2.25 ± 0.26 |
| C-dimethylphenanthrene | 18.63 ± 1.55 | 4.10 ± 0.34 | 14.65 ± 1.22 | 4.30 ± 0.37 | 3.45 ± 0.30 | 3.60 ± 0.31 | 2.29 ± 0.21 | 5.66 ± 0.47 |
| D-dimethylphenanthrene | 5.57 ± 0.63 | 1.23 ± 0.16 | 3.63 ± 0.40 | 1.32 ± 0.17 | 1.30 ± 0.17 | 0.98 ± 0.12 | 0.67 ± 0.11 | 1.87 ± 0.21 |
| 1,7-dimethylphenanthrene | 12.43 ± 1.03 | 2.24 ± 0.20 | 8.89 ± 0.73 | 2.54 ± 0.23 | 2.04 ± 0.19 | 2.15 ± 0.18 | 1.19 ± 0.13 | 3.32 ± 0.28 |
| E-dimethylphenanthrene | 7.24 ± 0.67 | 1.58 ± 0.16 | 6.04 ± 0.55 | 1.94 ± 0.20 | 1.66 ± 0.18 | 1.37 ± 0.13 | 0.93 ± 0.12 | 2.66 ± 0.25 |
| 9-methylanthracene | 1.60 ± 0.30 | 0.00 ± 0.08 | 1.51 ± 0.26 | 0.22 ± 0.10 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| Fluoranthene | 104.71 ± 7.92 | 48.55 ± 3.59 | 75.30 ± 5.67 | 24.15 ± 1.84 | 36.54 ± 2.77 | 25.20 ± 1.91 | 29.55 ± 2.19 | 67.47 ± 5.10 |
| Pyrene | 133.50 ± 11.97 | 37.67 ± 3.30 | 76.32 ± 6.72 | 21.93 ± 1.98 | 47.19 ± 4.22 | 23.96 ± 2.15 | 26.04 ± 2.29 | 74.60 ± 6.61 |
| 9-Anthraaldehyde | 5.61 ± 1.51 | 0.69 ± 0.20 | 0.08 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.04 ± 0.05 | 0.00 ± 0.08 | 5.54 ± 1.46 |
| Retene | 1.02 ± 0.26 | 0.00 ± 0.11 | 0.00 ± 0.08 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.06 | 0.01 ± 0.12 | 0.00 ± 0.09 |
| Benzonaphthothiophene | 0.00 ± 0.25 | 0.13 ± 0.16 | 0.00 ± 0.12 | 0.13 ± 0.17 | 0.00 ± 0.17 | 0.02 ± 0.09 | 0.11 ± 0.17 | 0.11 ± 0.12 |
| 1+3-methylfluoranthene | 8.31 ± 1.10 | 2.67 ± 0.35 | 3.47 ± 0.43 | 2.54 ± 0.33 | 2.27 ± 0.30 | 1.52 ± 0.20 | 0.97 ± 0.15 | 2.85 ± 0.36 |
| 1-MeFl+C-MeFl/Py | 10.14 ± 1.03 | 2.91 ± 0.29 | 4.71 ± 0.45 | 3.03 ± 0.31 | 2.72 ± 0.28 | 1.97 ± 0.20 | 1.22 ± 0.14 | 3.39 ± 0.33 |
| B-MePy/MeFl | 14.56 ± 1.24 | 4.47 ± 0.37 | 4.83 ± 0.39 | 3.38 ± 0.29 | 3.07 ± 0.27 | 3.06 ± 0.25 | 2.29 ± 0.20 | 3.77 ± 0.31 |
| C-MePy/MeFl | 10.81 ± 0.89 | 3.36 ± 0.27 | 3.52 ± 0.28 | 2.22 ± 0.19 | 2.37 ± 0.21 | 1.98 ± 0.16 | 1.48 ± 0.14 | 2.56 ± 0.21 |
| D-MePy/MeFl | 8.49 ± 1.07 | 1.88 ± 0.24 | 3.11 ± 0.36 | 1.60 ± 0.21 | 2.23 ± 0.28 | 1.22 ± 0.15 | 0.92 ± 0.14 | 2.27 ± 0.27 |
| 4-methylpyrene | 7.99 ± 0.90 | 1.74 ± 0.20 | 2.66 ± 0.28 | 1.33 ± 0.17 | 2.13 ± 0.25 | 1.29 ± 0.15 | 1.03 ± 0.14 | 1.79 ± 0.20 |
| 1-methylpyrene | 6.62 ± 0.65 | 2.14 ± 0.21 | 2.93 ± 0.27 | 2.73 ± 0.27 | 1.92 ± 0.20 | 0.07 ± 0.05 | 1.02 ± 0.13 | 1.62 ± 0.16 |
| Benzo(c)phenanthrene | 5.16 ± 0.74 | 2.39 ± 0.33 | 2.56 ± 0.32 | 0.98 ± 0.15 | 1.87 ± 0.26 | 1.66 ± 0.22 | 1.80 ± 0.24 | 1.63 ± 0.21 |
| Benzo(ghi)fluoranthene | 25.61 ± 2.23 | 11.38 ± 0.87 | 16.95 ± 1.22 | 9.39 ± 0.75 | 2.02 ± 0.20 | 7.30 ± 0.51 | 10.83 ± 0.83 | 12.72 ± 0.95 |
| Cyclopenta(c,d)pyrene | 17.57 ± 2.79 | 3.58 ± 0.46 | 7.49 ± 0.85 | 2.37 ± 0.35 | 2.27 ± 0.35 | 4.15 ± 0.49 | 4.01 ± 0.53 | 5.28 ± 0.67 |
| Benz(a)anthracene | 20.19 ± 2.90 | 6.87 ± 0.83 | 9.41 ± 1.02 | 3.79 ± 0.53 | 5.62 ± 0.68 | 4.88 ± 0.54 | 5.54 ± 0.66 | 6.31 ± 0.72 |
| Triphenylene | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.21 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| Chrysene | 20.81 ± 1.72 | 7.31 ± 0.50 | 9.74 ± 0.60 | 4.53 ± 0.32 | 6.05 ± 0.41 | 5.51 ± 0.35 | 6.36 ± 0.41 | 6.31 ± 0.41 |
| Benzanthrone | 0.00 ± 0.13 | 1.86 ± 0.32 | 5.18 ± 0.84 | 1.61 ± 0.28 | 1.79 ± 0.31 | 1.79 ± 0.30 | 2.05 ± 0.35 | 2.09 ± 0.35 |
| 7-methylbenz(a)anthracene | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.12 ± 0.08 | 0.06 ± 0.09 | 0.00 ± 0.06 |
| 3-methylchrysene | 2.83 ± 0.32 | 0.46 ± 0.09 | 0.93 ± 0.10 | 0.24 ± 0.08 | 0.26 ± 0.09 | 0.44 ± 0.06 | 0.47 ± 0.09 | 0.34 ± 0.07 |
| Benz(a)anthracene-7,12-dione | 1.02 ± 0.25 | 0.82 ± 0.19 | 2.02 ± 0.41 | 0.73 ± 0.17 | 0.68 ± 0.16 | 0.79 ± 0.16 | 0.77 ± 0.18 | 0.91 ± 0.19 |
| 5+6-methylchrysene | 0.00 ± 0.13 | 0.33 ± 0.09 | 0.54 ± 0.11 | 0.20 ± 0.09 | 0.17 ± 0.09 | 0.22 ± 0.06 | 0.21 ± 0.09 | 0.23 ± 0.07 |
| Benzo(b+j+k)fluoranthene | 19.29 ± 4.22 | 9.61 ± 1.59 | 15.95 ± 2.87 | 4.02 ± 0.91 | 3.57 ± 0.82 | 5.99 ± 1.21 | 10.63 ± 2.00 | 8.26 ± 1.80 |
| Benzo(a)fluoranthene | 1.67 ± 0.37 | 1.25 ± 0.22 | 2.20 ± 0.39 | 0.38 ± 0.11 | 0.16 ± 0.09 | 0.56 ± 0.11 | 1.38 ± 0.26 | 1.02 ± 0.19 |
| BeP | 8.57 ± 0.97 | 2.71 ± 0.28 | 7.77 ± 0.82 | 1.78 ± 0.20 | 1.78 ± 0.20 | 2.22 ± 0.22 | 3.81 ± 0.40 | 3.59 ± 0.38 |
| BaP | 8.14 ± 0.87 | 4.07 ± 0.42 | 9.08 ± 0.83 | 2.13 ± 0.32 | 1.40 ± 0.30 | 2.55 ± 0.26 | 5.67 ± 0.53 | 4.83 ± 0.46 |
| Perylene | 1.60 ± 0.33 | 2.30 ± 0.32 | 2.82 ± 0.38 | 0.33 ± 0.10 | 0.50 ± 0.12 | 1.02 ± 0.15 | 0.84 ± 0.18 | 0.91 ± 0.18 |
| 7-methylbenzo(a)pyrene | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| 9,10-dihydrobenzo(a)pyrene-7(8H)-one | 0.00 ± 0.13 | 0.04 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| Dibenzo(a,j)anthracene | 0.00 ± 0.13 | 0.21 ± 0.09 | 0.44 ± 0.10 | 0.12 ± 0.09 | 0.06 ± 0.09 | 0.14 ± 0.05 | 0.20 ± 0.09 | 0.20 ± 0.07 |
| Indeno[123-cd]pyrene | 21.41 ± 4.15 | 0.54 ± 0.14 | 2.09 ± 0.35 | 0.57 ± 0.14 | 1.94 ± 0.40 | 0.76 ± 0.13 | 0.00 ± 0.08 | 4.12 ± 0.81 |
| Dibenzo(ah+ac)anthracene | 0.29 ± 0.14 | 0.33 ± 0.09 | 0.27 ± 0.07 | 0.20 ± 0.09 | 0.05 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| Benzo(b)chrysene | 0.00 ± 0.13 | 0.23 ± 0.10 | 0.38 ± 0.10 | 0.00 ± 0.08 | 0.40 ± 0.12 | 0.21 ± 0.06 | 0.42 ± 0.12 | 0.35 ± 0.10 |
| Picene | 0.43 ± 0.15 | 0.00 ± 0.08 | 0.23 ± 0.07 | 0.04 ± 0.08 | 0.08 ± 0.09 | 0.23 ± 0.06 | 0.38 ± 0.11 | 0.35 ± 0.09 |
| Benzo(ghi)perylene | 26.06 ± 3.47 | 6.89 ± 0.96 | 22.32 ± 2.85 | 5.31 ± 0.75 | 6.32 ± 0.88 | 6.21 ± 0.84 | 10.17 ± 1.33 | 9.79 ± 1.32 |
| Anthanthrene | 1.43 ± 0.26 | 1.33 ± 0.21 | 1.93 ± 0.29 | 0.71 ± 0.14 | 0.64 ± 0.13 | 0.55 ± 0.09 | 1.26 ± 0.20 | 2.22 ± 0.33 |
| Dibenzo(b,k)fluoranthene | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.44 ± 0.08 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.73 ± 0.13 | 0.51 ± 0.09 |
| Dibenzo(a,e)pyrene | 0.82 ± 0.20 | 0.46 ± 0.12 | 1.64 ± 0.31 | 0.00 ± 0.08 | 0.26 ± 0.10 | 0.48 ± 0.10 | 0.82 ± 0.17 | 0.72 ± 0.15 |
| Coronene | 4.09 ± 0.56 | 2.99 ± 0.40 | 9.96 ± 1.32 | 2.64 ± 0.36 | 3.05 ± 0.41 | 2.43 ± 0.32 | 4.22 ± 0.56 | 4.20 ± 0.56 |
| Dibenzo(a,h)pyrene | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| nitro-PAH (ug/mile) | | | | | | | | |
| 1-nitronaphthalene | 0.1068 ± 0.0122 | 0.0465 ± 0.0069 | 0.0785 ± 0.0097 | 0.0000 ± 0.0034 | 0.0002 ± 0.0034 | 0.0092 ± 0.0039 | 0.0256 ± 0.0053 | 0.0171 ± 0.0048 |
| 2-nitronaphthalene | 0.1829 ± 0.0252 | 0.2575 ± 0.0340 | 0.2761 ± 0.0365 | 0.0292 ± 0.0065 | 0.0453 ± 0.0085 | 0.0451 ± 0.0082 | 0.1831 ± 0.0247 | 0.8450 ± 0.1069 |
| 2-nitrobiphenyl | 0.0117 ± 0.0023 | 0.0077 ± 0.0016 | 0.0207 ± 0.0038 | 0.0036 ± 0.0010 | 0.0004 ± 0.0005 | 0.0008 ± 0.0005 | 0.0008 ± 0.0005 | 0.0040 ± 0.0010 |
| 3-nitrobiphenyl | 0.0084 ± 0.0016 | 0.0024 ± 0.0006 | 0.0058 ± 0.0011 | 0.0015 ± 0.0004 | 0.0010 ± 0.0004 | 0.0028 ± 0.0006 | 0.0053 ± 0.0011 | 0.0038 ± 0.0008 |
| 4-nitrobiphenyl | 0.0199 ± 0.0061 | 0.0000 ± 0.0024 | 0.0000 ± 0.0013 | 0.0000 ± 0.0025 | 0.0010 ± 0.0031 | 0.0000 ± 0.0012 | 0.0000 ± 0.0022 | 0.0000 ± 0.0015 |
| 2-nitrofluorene | 0.0027 ± 0.0004 | 0.0138 ± 0.0011 | 0.0072 ± 0.0006 | 0.0023 ± 0.0003 | 0.0005 ± 0.0002 | 0.0031 ± 0.0003 | 0.0031 ± 0.0003 | 0.0040 ± 0.0004 |
| 1,3-dinitronaphthalene | 0.0063 ± 0.0015 | 0.0038 ± 0.0009 | 0.0026 ± 0.0006 | 0.0000 ± 0.0004 | 0.0000 ± 0.0005 | 0.0000 ± 0.0004 | 0.0068 ± 0.0010 | 0.0000 ± 0.0004 |
| 1,5-dinitronaphthalene | 0.0007 ± 0.0002 | 0.0005 ± 0.0001 | 0.0024 ± 0.0003 | 0.0000 ± 0.0001 | 0.0013 ± 0.0002 | 0.0009 ± 0.0001 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 |
| 5-nitroacenaphthene | 0.0000 ± 0.0011 | 0.0002 ± 0.0010 | 0.0038 ± 0.0012 | 0.0000 ± 0.0007 | 0.0000 ± 0.0007 | 0.0001 ± 0.0006 | 0.0055 ± 0.0010 | 0.0000 ± 0.0009 |
| 9-nitroanthracene | 0.0156 ± 0.0027 | 0.0277 ± 0.0043 | 0.0870 ± 0.0132 | 0.0099 ± 0.0017 | 0.0130 ± 0.0020 | 0.0443 ± 0.0070 | 0.0087 ± 0.0014 | 0.0180 ± 0.0028 |
| 4-nitrophenanthrene | 0.0015 ± 0.0002 | 0.0291 ± 0.0025 | 0.0000 ± 0.0001 | 0.0007 ± 0.0001 | 0.0006 ± 0.0001 | 0.0000 ± 0.0000 | 0.0091 ± 0.0007 | 0.0006 ± 0.0001 |
| 9-nitrophenanthrene | 0.0038 ± 0.0006 | 0.0031 ± 0.0004 | 0.0041 ± 0.0006 | 0.0012 ± 0.0002 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0019 ± 0.0003 | 0.0023 ± 0.0003 |
| 1,8-dinitronaphthalene | 0.0000 ± 0.0003 | 0.0069 ± 0.0009 | 0.0059 ± 0.0008 | 0.0000 ± 0.0001 | 0.0060 ± 0.0007 | 0.0000 ± 0.0001 | 0.0002 ± 0.0002 | 0.0046 ± 0.0007 |
| 2-nitrofluoranthene | 0.0319 ± 0.0036 | 0.0609 ± 0.0056 | 0.0259 ± 0.0030 | 0.0102 ± 0.0010 | 0.0022 ± 0.0005 | 0.0105 ± 0.0012 | 0.0103 ± 0.0012 | 0.0119 ± 0.0013 |
| 3-nitrofluoranthene | 0.0002 ± 0.0002 | 0.0376 ± 0.0021 | 0.0051 ± 0.0003 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0014 ± 0.0002 | 0.0001 ± 0.0001 | 0.0007 ± 0.0001 |
| 1-nitropyrene | 0.0561 ± 0.0070 | 0.0276 ± 0.0030 | 0.1192 ± 0.0132 | 0.0223 ± 0.0027 | 0.0221 ± 0.0027 | 0.0529 ± 0.0060 | 0.0250 ± 0.0031 | 0.0231 ± 0.0029 |
| 7-nitrobenzo(a)anthracene | 0.0231 ± 0.0033 | 0.2920 ± 0.0375 | 0.0402 ± 0.0039 | 0.0016 ± 0.0004 | 0.0011 ± 0.0004 | 0.0337 ± 0.0036 | 0.0044 ± 0.0007 | 0.0028 ± 0.0006 |
| 6-nitrochrysene | 0.0096 ± 0.0016 | 0.0036 ± 0.0006 | 0.0159 ± 0.0018 | 0.0004 ± 0.0001 | 0.0016 ± 0.0003 | 0.0076 ± 0.0010 | 0.0016 ± 0.0003 | 0.0004 ± 0.0001 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W6-4 | W7-1 | W7-2 | W7-3 | W7-4 | W8-1 | W8-2 | W8-3 |
|---|---|---|---|---|---|---|---|---|
| 6-nitrobenz[a]pyrene | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0171 ± 0.0015 | 0.0000 ± 0.0001 | 0.0000 ± 0.0001 | 0.0020 ± 0.0002 | 0.0000 ± 0.0001 | 0.0004 ± 0.0001 |
| Hopanes (ug/mile) | | | | | | | | |
| 18a(H),21ß(H)-22,29,30-Trisnorhopane & | 14.75 ± 1.57 | 0.21 ± 0.08 | 0.60 ± 0.08 | 0.34 ± 0.09 | 0.06 ± 0.09 | 0.25 ± 0.05 | 0.26 ± 0.08 | 0.23 ± 0.06 |
| 17a(H),21ß(H)-22,29,30-Trisnorhopane | 13.99 ± 2.87 | 0.03 ± 0.09 | 0.85 ± 0.22 | 0.18 ± 0.10 | 0.00 ± 0.10 | 0.00 ± 0.06 | 0.14 ± 0.10 | 0.03 ± 0.07 |
| 17a(H),21ß(H)-30-Norhopane | 61.83 ± 12.58 | 0.31 ± 0.12 | 1.88 ± 0.40 | 0.63 ± 0.17 | 0.23 ± 0.11 | 0.64 ± 0.14 | 0.71 ± 0.18 | 0.64 ± 0.16 |
| 17a(H),21ß(H)-Hopane | 39.59 ± 7.68 | 0.33 ± 0.11 | 0.92 ± 0.20 | 0.83 ± 0.16 | 0.21 ± 0.10 | 0.46 ± 0.11 | 0.51 ± 0.13 | 0.47 ± 0.11 |
| 17ß(H),21a(H)-hopane | 3.63 ± 0.98 | 0.06 ± 0.08 | 0.11 ± 0.07 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.05 ± 0.05 | 0.00 ± 0.08 | 0.05 ± 0.06 |
| 22S-17a(H),21ß(H)-30-Homohopane | 25.66 ± 3.24 | 0.13 ± 0.09 | 0.71 ± 0.11 | 0.44 ± 0.10 | 0.22 ± 0.09 | 0.29 ± 0.06 | 0.28 ± 0.09 | 0.23 ± 0.07 |
| 22R-17a(H),21ß(H)-30-Homohopane | 20.73 ± 4.59 | 0.10 ± 0.09 | 0.65 ± 0.16 | 0.43 ± 0.12 | 0.03 ± 0.09 | 0.15 ± 0.06 | 0.15 ± 0.09 | 0.28 ± 0.09 |
| 17ß(H),21ß(H)-Hopane | 4.11 ± 0.78 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.02 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| 22S-17a(H),21ß(H)-30,31-Bishomohopan | 13.90 ± 3.90 | 0.00 ± 0.08 | 0.32 ± 0.11 | 0.09 ± 0.09 | 0.00 ± 0.09 | 0.11 ± 0.06 | 0.08 ± 0.09 | 0.04 ± 0.06 |
| 22R-17a(H),21ß(H)-30,31-Bishomohopan | 8.81 ± 1.13 | 0.00 ± 0.08 | 0.13 ± 0.06 | 0.11 ± 0.09 | 0.00 ± 0.09 | 0.02 ± 0.05 | 0.00 ± 0.08 | 0.07 ± 0.06 |
| 22S-17a(H),21ß(H)-30,31,32-Trisomohop | 7.26 ± 1.60 | 0.00 ± 0.08 | 0.24 ± 0.08 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.09 ± 0.05 | 0.00 ± 0.08 | 0.02 ± 0.06 |
| 22R-17a(H),21ß(H)-30,31,32-Trishomoho | 2.29 ± 0.44 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| Steranes (ug/mile) | | | | | | | | |
| C27-20S5a(H),14a(H)-cholestane | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.04 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.01 ± 0.06 |
| C27-20R5a(H),14ß(H)-cholestane | 10.95 ± 2.85 | 0.01 ± 0.09 | 0.22 ± 0.10 | 0.18 ± 0.10 | 0.08 ± 0.10 | 0.10 ± 0.06 | 0.02 ± 0.09 | 0.06 ± 0.07 |
| C27-20S5a(H),14ß(H),17ß(H)-cholestane | 11.85 ± 2.36 | 0.00 ± 0.08 | 0.29 ± 0.09 | 0.32 ± 0.10 | 0.09 ± 0.09 | 0.10 ± 0.05 | 0.10 ± 0.09 | 0.09 ± 0.06 |
| ster45+40(cholestane) | 11.47 ± 1.75 | 0.05 ± 0.08 | 0.28 ± 0.08 | 0.34 ± 0.10 | 0.08 ± 0.09 | 0.12 ± 0.05 | 0.11 ± 0.09 | 0.10 ± 0.07 |
| C28-20S5a(H),14a(H),17a(H)-ergostane | 6.04 ± 1.42 | 0.05 ± 0.08 | 0.11 ± 0.07 | 0.08 ± 0.08 | 0.02 ± 0.09 | 0.03 ± 0.05 | 0.07 ± 0.08 | 0.03 ± 0.06 |
| C28-20R5a(H),14ß(H),17ß(H)-ergostane | 7.49 ± 2.03 | 0.01 ± 0.08 | 0.04 ± 0.07 | 0.10 ± 0.10 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.11 ± 0.09 | 0.02 ± 0.07 |
| C28-20S5a(H),14ß(H),17ß(H)-ergostane | 5.26 ± 1.26 | 0.00 ± 0.08 | 0.08 ± 0.07 | 0.14 ± 0.09 | 0.00 ± 0.09 | 0.02 ± 0.05 | 0.01 ± 0.08 | 0.00 ± 0.06 |
| C28-20R5a(H),14a(H),17a(H)-ergostane | 5.67 ± 0.80 | 0.00 ± 0.08 | 0.36 ± 0.08 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.30 ± 0.07 | 0.75 ± 0.14 | 0.00 ± 0.06 |
| C29-20S5a(H),14a(H),17a(H)-stigmastan | 8.21 ± 1.54 | 0.06 ± 0.08 | 0.17 ± 0.07 | 0.06 ± 0.08 | 0.04 ± 0.09 | 0.09 ± 0.05 | 0.06 ± 0.08 | 0.06 ± 0.06 |
| C29-20R5a(H),14ß(H),17ß(H)-stigmastan | 13.83 ± 1.82 | 0.06 ± 0.08 | 0.32 ± 0.07 | 0.22 ± 0.09 | 0.09 ± 0.09 | 0.14 ± 0.05 | 0.14 ± 0.09 | 0.04 ± 0.06 |
| C29-20S5a(H),14ß(H),17ß(H)-stigmastan | 10.02 ± 2.05 | 0.07 ± 0.08 | 0.25 ± 0.08 | 0.16 ± 0.09 | 0.06 ± 0.09 | 0.12 ± 0.05 | 0.10 ± 0.09 | 0.07 ± 0.06 |
| C29-20R5a(H),14a(H),17a(H)-stigmastan | 8.19 ± 1.73 | 0.03 ± 0.08 | 0.11 ± 0.07 | 0.10 ± 0.09 | 0.00 ± 0.09 | 0.06 ± 0.05 | 0.01 ± 0.08 | 0.04 ± 0.06 |
| Alkanes (ug/mile) | | | | | | | | |
| Dodecane | 334.31 ± 80.40 | 0.19 ± 2.62 | 45.86 ± 14.03 | 0.00 ± 2.90 | 103.41 ± 27.33 | 90.21 ± 24.08 | 140.52 ± 35.64 | 150.76 ± 38.23 |
| Tridecane | 500.95 ± 60.84 | 143.43 ± 18.39 | 39.56 ± 6.20 | 0.00 ± 1.82 | 133.79 ± 17.41 | 154.25 ± 19.78 | 185.68 ± 23.46 | 174.06 ± 22.29 |
| Norfarnesane | 202.38 ± 36.67 | 49.90 ± 9.42 | 52.78 ± 9.94 | 9.01 ± 2.15 | 0.06 ± 0.77 | 18.21 ± 3.79 | 85.48 ± 15.75 | 49.53 ± 9.41 |
| Heptylcyclohexane | 2.88 ± 0.74 | 0.45 ± 0.28 | 0.00 ± 0.16 | 1.33 ± 0.42 | 0.78 ± 0.34 | 0.11 ± 0.19 | 0.00 ± 0.18 | 0.48 ± 0.27 |
| Farnesane | 55.64 ± 10.42 | 22.00 ± 4.26 | 33.35 ± 6.30 | 16.00 ± 3.20 | 13.05 ± 2.69 | 13.87 ± 2.79 | 31.67 ± 6.00 | 15.03 ± 3.03 |
| Tetradecane | 156.09 ± 13.99 | 77.17 ± 7.12 | 90.74 ± 8.33 | 36.56 ± 3.89 | 31.55 ± 3.54 | 50.44 ± 4.98 | 83.77 ± 7.71 | 44.58 ± 4.59 |
| Octylcyclohexane | 4.88 ± 1.48 | 1.63 ± 0.63 | 0.00 ± 0.14 | 0.00 ± 0.18 | 0.98 ± 0.53 | 0.00 ± 0.13 | 0.00 ± 0.21 | 0.00 ± 0.20 |
| Pentadecane | 67.46 ± 8.51 | 41.32 ± 5.17 | 40.37 ± 5.07 | 15.71 ± 2.20 | 16.20 ± 2.28 | 24.66 ± 3.21 | 29.12 ± 3.75 | 20.86 ± 2.82 |
| Nonylcyclohexane | 3.34 ± 0.94 | 0.27 ± 0.29 | 0.00 ± 0.18 | 0.25 ± 0.29 | 1.29 ± 0.48 | 0.00 ± 0.16 | 0.00 ± 0.25 | 0.00 ± 0.13 |
| Hexadecane | 62.91 ± 5.44 | 44.61 ± 3.24 | 19.21 ± 1.99 | 11.10 ± 1.46 | 30.89 ± 2.35 | 11.47 ± 1.42 | 29.56 ± 2.29 | 21.51 ± 1.93 |
| Norpristane | 23.47 ± 2.04 | 12.10 ± 1.06 | 14.90 ± 1.30 | 4.96 ± 0.48 | 5.32 ± 0.51 | 3.72 ± 0.36 | 7.06 ± 0.64 | 5.59 ± 0.52 |
| Heptadecane | 46.59 ± 3.81 | 16.63 ± 1.42 | 12.99 ± 1.16 | 8.36 ± 0.82 | 10.23 ± 0.94 | 7.33 ± 0.72 | 9.69 ± 0.91 | 7.74 ± 0.77 |
| Decylcyclohexane | 5.07 ± 0.94 | 0.60 ± 0.18 | 1.28 ± 0.25 | 0.40 ± 0.16 | 0.72 ± 0.20 | 0.71 ± 0.15 | 0.87 ± 0.22 | 0.69 ± 0.17 |
| Heptadecane_Pristane | 22.57 ± 2.37 | 8.00 ± 0.88 | 8.50 ± 0.93 | 5.16 ± 0.62 | 5.34 ± 0.64 | 5.01 ± 0.59 | 5.61 ± 0.66 | 3.23 ± 0.43 |
| Undecylcyclohexane | 3.02 ± 0.89 | 2.24 ± 0.59 | 0.06 ± 0.09 | 0.61 ± 0.25 | 0.60 ± 0.26 | 0.00 ± 0.08 | 0.59 ± 0.23 | 0.80 ± 0.26 |
| Octadecane | 65.27 ± 6.70 | 46.82 ± 3.74 | 10.90 ± 2.14 | 10.11 ± 2.14 | 48.52 ± 3.99 | 0.84 ± 1.46 | 43.56 ± 3.62 | 14.74 ± 2.34 |
| Phytane | 23.89 ± 3.91 | 8.20 ± 1.44 | 9.76 ± 1.63 | 3.20 ± 0.75 | 4.30 ± 0.92 | 5.23 ± 0.96 | 4.29 ± 0.89 | 2.92 ± 0.67 |
| Dodecylcyclohexane | 1.97 ± 0.69 | 0.99 ± 0.19 | 0.17 ± 0.08 | 0.47 ± 0.13 | 0.54 ± 0.14 | 0.00 ± 0.06 | 0.57 ± 0.14 | 0.27 ± 0.10 |
| Nonadecane | 35.70 ± 3.08 | 8.76 ± 0.80 | 14.02 ± 1.24 | 4.41 ± 0.46 | 5.75 ± 0.58 | 6.97 ± 0.66 | 4.95 ± 0.50 | 4.60 ± 0.47 |
| Tridecylcyclohexane | 2.26 ± 0.46 | 0.71 ± 0.19 | 0.00 ± 0.07 | 0.05 ± 0.11 | 0.52 ± 0.16 | 0.00 ± 0.06 | 0.29 ± 0.13 | 0.25 ± 0.12 |
| Eicosane | 61.11 ± 7.99 | 46.05 ± 4.71 | 6.38 ± 2.67 | 9.83 ± 3.00 | 46.74 ± 5.01 | 0.00 ± 1.98 | 38.69 ± 4.35 | 7.13 ± 2.90 |
| Tetradecylcyclohexane | 6.57 ± 1.31 | 0.84 ± 0.21 | 1.27 ± 0.27 | 0.46 ± 0.14 | 0.41 ± 0.14 | 0.57 ± 0.14 | 0.15 ± 0.10 | 0.63 ± 0.16 |
| Heneicosane | 56.74 ± 5.17 | 3.08 ± 0.37 | 3.97 ± 0.43 | 3.07 ± 0.37 | 3.70 ± 0.44 | 2.55 ± 0.31 | 1.75 ± 0.27 | 3.70 ± 0.42 |
| Pentadecylcyclohexane | 16.57 ± 3.93 | 0.23 ± 0.26 | 0.91 ± 0.31 | 1.00 ± 0.38 | 0.95 ± 0.45 | 0.91 ± 0.28 | 0.00 ± 0.22 | 0.75 ± 0.30 |
| Docosane | 87.39 ± 12.86 | 15.49 ± 3.55 | 0.00 ± 1.89 | 4.75 ± 2.86 | 26.06 ± 4.48 | 0.00 ± 1.52 | 19.56 ± 3.84 | 7.17 ± 2.84 |
| Hexadecylcyclohexane | 1.99 ± 0.46 | 0.07 ± 0.09 | 0.06 ± 0.06 | 0.11 ± 0.09 | 0.28 ± 0.10 | 0.02 ± 0.05 | 0.01 ± 0.08 | 1.13 ± 0.24 |
| Tricosane | 26.49 ± 2.98 | 2.67 ± 0.55 | 4.25 ± 0.60 | 1.17 ± 0.47 | 4.37 ± 0.73 | 2.04 ± 0.40 | 1.38 ± 0.49 | 1.96 ± 0.48 |
| Heptadecylcyclohexane | 1.70 ± 0.66 | 1.35 ± 0.40 | 4.46 ± 1.04 | 6.87 ± 1.54 | 0.56 ± 0.26 | 2.01 ± 0.56 | 0.19 ± 0.23 | 0.86 ± 0.33 |
| Octadecylcyclohexane | 3.20 ± 0.74 | 0.20 ± 0.09 | 0.31 ± 0.09 | 0.11 ± 0.09 | 0.24 ± 0.11 | 0.22 ± 0.06 | 0.18 ± 0.09 | 0.30 ± 0.09 |
| Tetracosane | 1.95 ± 4.59 | 0.34 ± 2.82 | 0.00 ± 2.08 | 0.58 ± 2.66 | 9.99 ± 3.65 | 0.00 ± 1.64 | 5.47 ± 3.16 | 0.00 ± 2.37 |
| Pentacosane | 15.29 ± 3.63 | 0.60 ± 0.87 | 0.00 ± 0.82 | 0.00 ± 0.80 | 0.00 ± 1.01 | 0.26 ± 0.62 | 0.00 ± 0.85 | 0.00 ± 0.72 |
| Nonadecylcyclohexane | 2.07 ± 0.71 | 0.80 ± 0.32 | 1.06 ± 0.35 | 0.70 ± 0.31 | 0.00 ± 0.17 | 0.00 ± 0.11 | 1.80 ± 0.48 | 0.00 ± 0.13 |
| Hexacosane | 0.00 ± 1.03 | 4.63 ± 1.04 | 0.53 ± 0.77 | 1.89 ± 0.92 | 6.30 ± 1.20 | 0.00 ± 0.53 | 4.90 ± 1.07 | 0.53 ± 0.77 |
| Eicosylcyclohexane | 3.64 ± 0.99 | 0.02 ± 0.08 | 1.35 ± 0.21 | 0.02 ± 0.08 | 0.02 ± 0.09 | 0.25 ± 0.06 | 0.06 ± 0.08 | 0.10 ± 0.06 |
| Heptacosane | 0.00 ± 0.43 | 0.57 ± 0.42 | 0.12 ± 0.32 | 0.00 ± 0.31 | 0.87 ± 0.46 | 0.02 ± 0.30 | 0.20 ± 0.37 | 0.27 ± 0.34 |
| Heneicosylcyclohexane | 1.86 ± 0.45 | 0.06 ± 0.08 | 0.51 ± 0.13 | 0.08 ± 0.09 | 0.03 ± 0.09 | 0.05 ± 0.05 | 0.05 ± 0.08 | 0.03 ± 0.06 |
| Octacosane | 0.00 ± 1.37 | 4.46 ± 1.33 | 2.41 ± 1.04 | 2.40 ± 1.16 | 4.33 ± 1.39 | 0.40 ± 0.74 | 4.43 ± 1.33 | 0.85 ± 0.93 |
| Nonacosane | 1.52 ± 0.79 | 0.47 ± 0.28 | 0.20 ± 0.18 | 0.00 ± 0.18 | 0.71 ± 0.29 | 0.56 ± 0.19 | 0.38 ± 0.27 | 0.67 ± 0.24 |
| Triacontane | 0.00 ± 1.15 | 1.26 ± 0.84 | 2.51 ± 0.89 | 0.85 ± 0.78 | 2.21 ± 1.00 | 0.32 ± 0.51 | 1.80 ± 0.91 | 0.65 ± 0.64 |
| Hentriacontane | 0.00 ± 0.41 | 0.00 ± 0.13 | 0.06 ± 0.16 | 0.00 ± 0.09 | 0.10 ± 0.25 | 0.00 ± 0.06 | 0.00 ± 0.12 | 0.00 ± 0.10 |
| Dotriacontane | 0.00 ± 0.41 | 0.73 ± 0.36 | 0.50 ± 0.28 | 0.60 ± 0.34 | 1.67 ± 0.46 | 0.00 ± 0.20 | 1.01 ± 0.38 | 0.26 ± 0.27 |
| Tritriacontane | 0.00 ± 0.14 | 0.00 ± 0.09 | 0.00 ± 0.07 | 0.00 ± 0.09 | 0.00 ± 0.10 | 0.00 ± 0.05 | 0.00 ± 0.09 | 0.00 ± 0.07 |
| Tetratriacontane | 0.00 ± 0.54 | 0.43 ± 0.30 | 0.52 ± 0.25 | 0.28 ± 0.29 | 0.86 ± 0.36 | 0.37 ± 0.19 | 0.93 ± 0.36 | 0.64 ± 0.27 |
| Pentatriacontane | 3.15 ± 1.20 | 0.00 ± 0.10 | 0.00 ± 0.07 | 0.00 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.10 | 0.00 ± 0.07 |
| Hexatriacontane | 0.00 ± 0.28 | 0.00 ± 0.22 | 0.15 ± 0.19 | 0.00 ± 0.25 | 0.54 ± 0.31 | 0.00 ± 0.12 | 0.49 ± 0.29 | 0.11 ± 0.21 |
| Heptatriacontane | 0.00 ± 0.18 | 0.11 ± 0.14 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.06 | 0.13 ± 0.17 | 0.02 ± 0.11 |
| Octatriacontane | 0.00 ± 0.32 | 0.04 ± 0.17 | 0.00 ± 0.12 | 0.03 ± 0.17 | 0.33 ± 0.21 | 0.00 ± 0.09 | 0.40 ± 0.21 | 0.08 ± 0.15 |
| Nonatriacontane | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| Polar compounds (ug/mile) | | | | | | | | |
| heptanoic acid (c7) | 0.00 ± 2.12 | 0.00 ± 2.51 | 9.79 ± 3.85 | 0.00 ± 1.34 | 0.00 ± 1.31 | 4.34 ± 2.45 | 0.00 ± 2.21 | 3.08 ± 2.80 |
| me-malonic (d-c3) | 0.00 ± 0.29 | 0.00 ± 0.18 | 2.06 ± 0.59 | 0.65 ± 0.26 | 0.00 ± 0.22 | 0.10 ± 0.18 | 0.23 ± 0.33 | 0.00 ± 0.16 |
| guaiacol | -99.00 ± 0.13 | -99.00 ± 0.09 | -99.00 ± 0.07 | -99.00 ± 0.08 | -99.00 ± 0.09 | -99.00 ± 0.05 | -99.00 ± 0.08 | -99.00 ± 0.06 |
| benzoic acid | 0.00 ± 120.50 | 0.00 ± 145.41 | 0.00 ± 51.42 | 0.00 ± 68.36 | 0.00 ± 72.90 | 0.00 ± 167.55 | 0.00 ± 84.77 | 0.00 ± 143.21 |
| octanoic acid (c8) | 0.00 ± 3.30 | 4.62 ± 3.21 | 5.77 ± 3.00 | 0.00 ± 1.72 | 0.00 ± 1.73 | 1.11 ± 2.11 | 0.00 ± 2.17 | 0.49 ± 2.38 |
| phenylacetic acid | 13.82 ± 2.91 | 24.78 ± 3.98 | 64.13 ± 9.42 | 2.09 ± 0.83 | 0.70 ± 0.68 | 5.24 ± 1.01 | 0.02 ± 0.55 | 6.08 ± 1.23 |
| maleic acid | 0.00 ± 0.35 | 0.00 ± 0.57 | 0.00 ± 0.36 | 0.01 ± 0.55 | 0.00 ± 0.29 | 0.00 ± 0.18 | 0.13 ± 1.40 | 0.00 ± 0.18 |
| succinic acid (d-c4) | 0.00 ± 0.77 | 0.00 ± 0.89 | 0.00 ± 1.13 | 0.00 ± 0.48 | 0.00 ± 0.41 | 0.00 ± 0.74 | 0.00 ± 2.35 | 0.00 ± 0.48 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W6-4 | W7-1 | W7-2 | W7-3 | W7-4 | W8-1 | W8-2 | W8-3 |
|---|---|---|---|---|---|---|---|---|
| 4-me-guaiacol | -99.00 ± 0.13 | -99.00 ± 0.08 | -99.00 ± 0.06 | -99.00 ± 0.08 | -99.00 ± 0.09 | -99.00 ± 0.05 | -99.00 ± 0.08 | -99.00 ± 0.06 |
| o-toluic | 16.65 ± 5.34 | 32.83 ± 7.96 | 83.42 ± 18.55 | 3.79 ± 1.80 | 2.27 ± 1.54 | 7.39 ± 2.13 | 0.96 ± 1.23 | 8.52 ± 2.55 |
| me-succinic acid (d-c4) | 0.00 ± 0.38 | 0.00 ± 0.09 | 0.00 ± 0.19 | 0.00 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.23 | 0.00 ± 0.33 | 0.00 ± 0.22 |
| m-toluic | 6.58 ± 2.80 | 21.22 ± 3.37 | 116.10 ± 14.01 | 8.97 ± 2.02 | 8.12 ± 1.97 | 11.97 ± 1.85 | 0.16 ± 1.05 | 15.41 ± 2.46 |
| nonanoic acid (c9) | 0.00 ± 4.00 | 5.51 ± 3.90 | 6.61 ± 3.61 | 0.00 ± 2.32 | 0.00 ± 2.07 | 0.00 ± 2.48 | 0.00 ± 2.65 | 0.00 ± 2.81 |
| p-toluic | 0.00 ± 2.04 | 13.44 ± 2.92 | 84.75 ± 12.05 | 3.21 ± 1.64 | 1.96 ± 1.54 | 9.14 ± 1.78 | 0.13 ± 0.87 | 9.52 ± 2.09 |
| 2,6-dimethylbenzoic acid | 0.61 ± 0.81 | 0.21 ± 0.39 | 4.67 ± 1.17 | 0.02 ± 0.25 | 0.04 ± 0.13 | 0.34 ± 0.25 | 0.00 ± 0.18 | 0.00 ± 0.18 |
| 4-ethyl-guaiacol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| syringol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| glutaric acid (d-c5) | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 2-methylglutaric (d-c5) | 0.00 ± 0.15 | 0.00 ± 0.10 | 0.04 ± 0.24 | 0.01 ± 0.10 | 0.00 ± 0.09 | 0.00 ± 0.22 | 0.00 ± 0.11 | 0.00 ± 0.07 |
| 2,5-dimethylbenzoic acid | 1.86 ± 1.18 | 5.79 ± 1.48 | 20.96 ± 3.86 | 0.05 ± 0.54 | 1.16 ± 0.79 | 4.56 ± 1.14 | 0.53 ± 0.67 | 2.49 ± 0.89 |
| 3-methylglutaric acid (d-c5) | 0.00 ± 0.18 | 0.00 ± 0.34 | 0.00 ± 0.34 | 0.00 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.30 | 0.00 ± 0.18 | 0.00 ± 0.17 |
| 2,4-dimethylbenzoic acid | 0.00 ± 53.72 | 0.00 ± 60.81 | 642.03 ± 177.89 | 0.00 ± 32.79 | 0.00 ± 34.69 | 0.00 ± 71.18 | 0.00 ± 40.56 | 0.00 ± 75.98 |
| 2,3- and 3,5- dimethylbenzoic acid | 0.00 ± 0.87 | 0.00 ± 1.04 | 13.95 ± 2.80 | 0.00 ± 0.42 | 0.00 ± 0.74 | 0.60 ± 0.61 | 0.00 ± 0.28 | 0.01 ± 0.75 |
| decanoic acid (c10) | 0.00 ± 0.34 | 1.13 ± 0.36 | 0.62 ± 0.27 | 0.00 ± 0.20 | 0.00 ± 0.19 | 0.04 ± 0.20 | 0.00 ± 0.21 | 0.00 ± 0.23 |
| 4-allyl-guaiacol (eugenol) | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 4-methyl-syringol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3,4-dimethylbenzoic acid | 0.00 ± 0.97 | 6.35 ± 1.57 | 23.46 ± 4.27 | 0.67 ± 0.67 | 1.95 ± 0.89 | 3.50 ± 0.85 | 0.00 ± 0.37 | 3.94 ± 1.03 |
| hexanedioic (adipic) acid (d-c6) | 0.00 ± 0.14 | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.28 ± 0.15 | 0.00 ± 0.12 | 0.00 ± 0.13 | 0.00 ± 0.28 | 0.00 ± 0.15 |
| salcylic acid | 0.00 ± 0.89 | 0.23 ± 1.87 | 25.90 ± 4.99 | 0.46 ± 0.87 | 0.07 ± 0.49 | 5.96 ± 1.89 | 0.26 ± 0.63 | 0.00 ± 1.15 |
| trans-2-decenoic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| cis-pinonic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3-methyladipic acid (d-c6) | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.03 ± 0.08 | 0.00 ± 0.09 | 0.05 ± 0.06 | 0.00 ± 0.09 | 0.00 ± 0.07 |
| 4-formyl-guaiacol (vanillin) | 0.00 ± 0.19 | 0.21 ± 0.19 | 1.02 ± 0.29 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.05 | 0.00 ± 0.12 | 0.00 ± 0.08 |
| undecanoic acid (c11) | 0.00 ± 0.37 | 0.36 ± 0.32 | 0.22 ± 0.25 | 0.00 ± 0.20 | 0.00 ± 0.19 | 0.00 ± 0.18 | 0.00 ± 0.21 | 0.00 ± 0.21 |
| isoeugenol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| heptanedioic (pimelic) acid (d-c7) | 0.00 ± 0.25 | 0.00 ± 0.30 | 0.00 ± 0.12 | 0.00 ± 0.16 | 0.00 ± 0.16 | 0.00 ± 0.11 | 0.00 ± 0.16 | 0.00 ± 0.28 |
| 2,3-dimethoxybenzoic acid | 0.00 ± 0.39 | 0.00 ± 0.14 | 0.00 ± 0.50 | 0.00 ± 0.12 | 0.00 ± 14.89 | 0.00 ± 0.07 | 0.00 ± 0.32 | 0.00 ± 17.31 |
| acetovanillone | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 2,6-dimethoxybenzoic acid | 1.59 ± 0.87 | 0.35 ± 0.45 | 3.07 ± 0.80 | 0.06 ± 0.25 | 0.87 ± 0.55 | 0.20 ± 0.29 | 0.74 ± 0.51 | 0.33 ± 0.38 |
| dodecanoic (lauric) acid (c12) | 0.00 ± 0.72 | 4.28 ± 0.91 | 6.88 ± 1.06 | 0.00 ± 0.52 | 0.00 ± 0.46 | 2.40 ± 0.71 | 0.00 ± 0.50 | 0.00 ± 0.51 |
| 2,5-dimethoxybenzoic acid | 0.00 ± 0.13 | 0.00 ± 0.09 | 0.00 ± 0.06 | 0.03 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| phthalic acid | 0.00 ± 9.28 | 0.42 ± 3.50 | 1.21 ± 3.50 | 0.81 ± 2.63 | 0.42 ± 1.80 | 0.26 ± 2.90 | 0.42 ± 5.33 | 0.00 ± 2.87 |
| suberic acid (d-c8) | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.00 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| levoglucosan | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3,5-dimethoxybenzoic acid | 7.51 ± 1.79 | 0.19 ± 0.15 | 3.02 ± 0.70 | 0.78 ± 0.26 | 1.67 ± 0.45 | 0.86 ± 0.23 | 1.02 ± 0.31 | 1.05 ± 0.29 |
| syringaldehyde | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| 3,4-dimethoxybenzoic acid | 0.00 ± 0.14 | 0.00 ± 0.09 | 0.00 ± 0.07 | 0.00 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.00 ± 0.09 | 0.00 ± 0.07 |
| 2,4-dimethoxybenzoic acid | 10.48 ± 1.90 | 2.32 ± 0.45 | 5.78 ± 1.02 | 1.96 ± 0.39 | 3.34 ± 0.62 | 2.08 ± 0.38 | 2.88 ± 0.54 | 2.65 ± 0.49 |
| tridecanoic acid (c13) | 0.00 ± 0.29 | 0.00 ± 0.19 | 0.16 ± 0.18 | 0.00 ± 0.14 | 0.00 ± 0.14 | 0.00 ± 0.12 | 0.00 ± 0.16 | 0.00 ± 0.14 |
| isophthalic acid | 0.00 ± 2.64 | 0.00 ± 6.84 | 2.81 ± 6.22 | 0.00 ± 1.73 | 0.00 ± 1.69 | 0.00 ± 2.97 | 0.00 ± 9.44 | 0.00 ± 3.65 |
| vanillic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| homovanillic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| azelaic acid (d-c9) | 0.00 ± 0.17 | 0.00 ± 0.11 | 0.00 ± 0.09 | 0.00 ± 0.17 | 0.00 ± 0.15 | 0.00 ± 0.13 | 0.00 ± 0.20 | 0.00 ± 0.12 |
| myristoleic acid | 0.00 ± 0.14 | 0.21 ± 0.15 | 0.49 ± 0.17 | 0.00 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.19 ± 0.14 | 0.00 ± 0.07 |
| myristic acid (c14) | 0.00 ± 0.59 | 0.14 ± 0.58 | 1.39 ± 0.60 | 0.00 ± 0.38 | 0.00 ± 0.37 | 0.00 ± 0.41 | 0.00 ± 0.36 | 0.00 ± 0.34 |
| sebacic acid (d-c10) | 0.00 ± 0.13 | 0.00 ± 0.08 | 0.00 ± 0.07 | 0.00 ± 0.09 | 0.00 ± 0.10 | 0.00 ± 0.07 | 0.00 ± 0.09 | 0.00 ± 0.07 |
| syringic acid | 0.00 ± 0.20 | 0.78 ± 0.31 | 1.69 ± 0.40 | 0.00 ± 0.21 | 0.00 ± 0.15 | 0.96 ± 0.27 | 0.00 ± 0.13 | 0.00 ± 0.11 |
| pentadecanoic acid (c15) | 0.00 ± 0.38 | 0.36 ± 0.33 | 0.40 ± 0.27 | 0.00 ± 0.20 | 0.19 ± 0.23 | 0.29 ± 0.22 | 0.00 ± 0.22 | 0.00 ± 0.19 |
| undecanedioic acid (c11) | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |
| palmitoleic acid | 0.00 ± 0.30 | 0.00 ± 0.18 | 0.29 ± 0.21 | 0.00 ± 0.18 | 0.00 ± 0.17 | 0.00 ± 0.13 | 0.07 ± 0.19 | 0.00 ± 0.15 |
| palmitic acid (c16) | 0.00 ± 1.17 | 1.72 ± 1.23 | 0.00 ± 0.99 | 0.00 ± 0.87 | 0.00 ± 0.81 | 0.00 ± 0.86 | 0.00 ± 0.86 | 0.00 ± 0.78 |
| isostearic acid | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| dodecanedioic acid (d-c12) | 0.00 ± 0.14 | 0.00 ± 0.08 | 0.00 ± 0.06 | 0.03 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.06 | 0.00 ± 0.09 | 0.00 ± 0.06 |
| traumatic acid | 0.00 ± 0.13 | 0.00 ± 0.09 | 0.00 ± 0.07 | 0.05 ± 0.08 | 0.00 ± 0.09 | 0.00 ± 0.05 | 0.07 ± 0.09 | 0.00 ± 0.06 |
| heptadecanoic acid (c17) | 0.00 ± 0.28 | 0.00 ± 0.21 | 0.01 ± 0.17 | 0.00 ± 0.17 | 0.14 ± 0.22 | 0.00 ± 0.14 | 0.00 ± 0.20 | 0.00 ± 0.16 |
| 1,11-undecanedicarboxylic acid (d-c13) | 0.00 ± 0.14 | 0.00 ± 0.09 | 0.00 ± 0.07 | 0.08 ± 0.11 | 0.00 ± 0.09 | 0.00 ± 0.07 | 0.00 ± 0.11 | 0.00 ± 0.07 |
| oleic acid | 0.00 ± 0.90 | 2.82 ± 1.10 | 2.19 ± 1.04 | 1.30 ± 0.97 | 0.00 ± 0.94 | 0.00 ± 0.50 | 1.03 ± 1.03 | 0.00 ± 0.66 |
| elaidic acid | 0.00 ± 0.18 | 0.00 ± 0.11 | 0.00 ± 0.09 | 0.00 ± 0.13 | 0.00 ± 0.15 | 0.00 ± 0.11 | 0.00 ± 0.12 | 0.00 ± 0.13 |
| stearic acid (c18) | 0.00 ± 6.61 | 2.39 ± 5.81 | 0.63 ± 4.28 | 2.47 ± 4.15 | 1.89 ± 3.81 | 0.00 ± 3.06 | 0.00 ± 3.94 | 0.00 ± 3.55 |
| 1,12-dodecanedicarboxylic acid (d-c14) | 0.00 ± 0.16 | 0.00 ± 0.10 | 0.00 ± 0.07 | 0.20 ± 0.12 | 0.00 ± 0.10 | 0.00 ± 0.07 | 0.00 ± 0.11 | 0.00 ± 0.08 |
| 8,15-pimaradien-18-oic acd | 0.00 ± 0.19 | 0.00 ± 0.10 | 0.04 ± 0.08 | 0.00 ± 0.11 | 0.00 ± 0.10 | 0.00 ± 0.06 | 0.00 ± 0.09 | 0.02 ± 0.08 |
| pimaric acid | 0.25 ± 0.30 | 0.76 ± 0.28 | 2.31 ± 0.53 | 1.07 ± 0.33 | 0.00 ± 0.16 | 0.00 ± 0.08 | 0.10 ± 0.18 | 0.11 ± 0.17 |
| sandaracopimaric acid | 0.00 ± 0.42 | 0.00 ± 0.20 | 0.23 ± 0.31 | 0.07 ± 0.27 | 0.00 ± 0.24 | 0.00 ± 0.21 | 0.00 ± 0.23 | 0.00 ± 0.26 |
| nonadecanoic acid (c19) | 0.13 ± 0.32 | 1.33 ± 0.39 | 1.74 ± 0.44 | 1.99 ± 0.47 | 0.10 ± 0.15 | 0.31 ± 0.22 | 0.00 ± 0.15 | 0.00 ± 0.13 |
| isopimaric acid | 0.12 ± 0.17 | 0.10 ± 0.10 | 0.12 ± 0.08 | 0.04 ± 0.10 | 0.09 ± 0.11 | 0.08 ± 0.07 | 0.24 ± 0.12 | 0.00 ± 0.07 |
| palustric acid | 0.07 ± 0.14 | 0.01 ± 0.08 | 0.30 ± 0.08 | 0.08 ± 0.09 | 0.04 ± 0.09 | 0.01 ± 0.05 | 0.00 ± 0.08 | 0.00 ± 0.06 |
| dihydroisopimaric acid | 0.22 ± 0.15 | 0.03 ± 0.08 | 0.15 ± 0.07 | 0.02 ± 0.09 | 0.00 ± 0.09 | 0.04 ± 0.05 | 0.04 ± 0.09 | 0.12 ± 0.07 |
| 8-abietic acid | 0.00 ± 0.15 | 0.25 ± 0.12 | 0.05 ± 0.08 | 0.20 ± 0.11 | 0.04 ± 0.10 | 0.00 ± 0.05 | 0.72 ± 0.18 | 0.00 ± 0.07 |
| dehydroabietic acid | 0.00 ± 0.38 | 0.07 ± 0.22 | 0.12 ± 0.21 | 0.00 ± 0.21 | 0.00 ± 0.24 | 0.00 ± 0.11 | 0.00 ± 0.20 | 0.00 ± 0.17 |
| 8,14-abietenic acid | 1.16 ± 0.39 | 0.00 ± 0.11 | 0.11 ± 0.12 | 0.01 ± 0.13 | 0.00 ± 0.11 | 0.24 ± 0.12 | 0.00 ± 0.12 | 0.00 ± 0.10 |
| abietic acid | 0.34 ± 0.17 | 0.26 ± 0.11 | 0.07 ± 0.06 | 0.11 ± 0.09 | 0.03 ± 0.09 | 0.02 ± 0.05 | 0.23 ± 0.10 | 0.06 ± 0.06 |
| eicosanoic acid (c20) | 0.00 ± 0.33 | 0.05 ± 0.15 | 0.00 ± 0.10 | 0.00 ± 0.15 | 0.00 ± 0.12 | 0.00 ± 0.09 | 0.00 ± 0.12 | 0.00 ± 0.09 |
| levopimaric acid | 0.75 ± 0.28 | 0.00 ± 0.09 | 0.02 ± 0.07 | 0.07 ± 0.09 | 0.00 ± 0.09 | 0.00 ± 0.06 | 0.00 ± 0.09 | 0.00 ± 0.07 |
| heneicosanoic acid (c21) | 3.48 ± 0.82 | 0.00 ± 0.12 | 0.00 ± 0.10 | 0.08 ± 0.14 | 0.00 ± 0.12 | 0.00 ± 0.07 | 0.00 ± 0.12 | 0.00 ± 0.09 |
| 7-oxodehydroabietic acid | 0.00 ± 0.59 | 0.00 ± 0.26 | 0.00 ± 0.28 | 0.05 ± 0.25 | 0.00 ± 0.26 | 0.00 ± 0.19 | 0.00 ± 0.24 | 0.00 ± 0.23 |
| docosanoic acid (c22) | 0.00 ± 0.64 | 0.00 ± 0.21 | 0.00 ± 0.25 | 0.00 ± 0.28 | 0.00 ± 0.19 | 0.00 ± 0.13 | 0.00 ± 0.19 | 0.04 ± 0.25 |
| tricosanoic acid (c23) | 0.00 ± 0.18 | 0.00 ± 0.09 | 0.08 ± 0.10 | 0.17 ± 0.13 | 0.00 ± 0.10 | 0.01 ± 0.06 | 0.02 ± 0.11 | 0.00 ± 0.08 |
| tetracosanoic acid (c24) | 0.00 ± 0.33 | 0.00 ± 0.18 | 0.00 ± 0.20 | 0.93 ± 0.33 | 0.49 ± 0.28 | 0.00 ± 0.12 | 0.00 ± 0.23 | 0.19 ± 0.28 |
| cholesterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| cholestanol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| ergosterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| stigmasterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |
| sitosterol | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 | -99.00 ± -99.00 |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W6-4 | W7-1 | W7-2 | W7-3 | W7-4 | W8-1 | W8-2 | W8-3 |
|---|---|---|---|---|---|---|---|---|
| Carbonyls (mg/mile) | | | | | | | | |
| formaldehyde | | 29.04 ± 1.72 | 58.54 ± 3.29 | | | 34.30 ± 1.94 | | |
| acetaldehyde | | 30.31 ± 3.28 | 74.74 ± 7.21 | | | 23.88 ± 2.44 | | |
| acetone | | 426.41 ± 27.41 | 43.46 ± 3.22 | | | 22.55 ± 1.83 | | |
| * acrolein | | <0.730 ± <0.021 | 1.17 ± 0.29 | | | 0.41 ± 0.10 | | |
| propionaldehyde | | 5.38 ± 0.74 | 9.80 ± 1.15 | | | 4.05 ± 0.50 | | |
| crotonaldehyde | | 2.70 ± 0.80 | 3.10 ± 0.60 | | | 1.94 ± 0.41 | | |
| methyl ethyl ketone | | 4.33 ± 1.30 | 5.66 ± 1.25 | | | 3.95 ± 0.89 | | |
| Methacrolein | | 5.02 ± 0.89 | 9.70 ± 1.20 | | | 3.88 ± 0.55 | | |
| * n-butyraldehyde | | -0.73 ± -0.04 | 0.00 ± 0.00 | | | 0.00 ± 0.00 | | |
| benzaldehyde | | 24.42 ± 2.60 | 48.85 ± 4.97 | | | 17.41 ± 1.81 | | |
| glyoxal | | 0.57 ± 0.35 | 0.57 ± 0.24 | | | 0.76 ± 0.20 | | |
| valeraldehyde | | 2.23 ± 0.83 | 4.03 ± 0.69 | | | 2.68 ± 0.51 | | |
| tolualdehyde | | 13.29 ± 2.43 | 25.05 ± 4.12 | | | 9.45 ± 1.64 | | |
| hexanal | | 8.92 ± 1.38 | 1.99 ± 0.68 | | | 3.48 ± 0.63 | | |
| *** acrolein converts to an unknown rear** | | | | | | | | |
| VOC (mg/mi) | | | | | | | | |
| 1,3 butadiene (estimated) | | 2.453 ± 1.356 | 4.898 ± 2.707 | | | 1.796 ± 0.993 | | |
| C2 compounds | | 44.392 ± 6.268 | 104.984 ± 14.824 | | | 33.364 ± 4.711 | | |
| propene | | 14.152 ± 1.716 | 28.253 ± 3.426 | | | 10.361 ± 1.256 | | |
| propane | | 1.707 ± 0.085 | 1.333 ± 0.067 | | | 0.780 ± 0.039 | | |
| isoButane | | 4.377 ± 0.219 | 4.075 ± 0.204 | | | 2.889 ± 0.144 | | |
| 1Butene+iButylene | | 8.925 ± 0.605 | 17.356 ± 1.177 | | | 7.174 ± 0.486 | | |
| n-Butane | | 29.527 ± 1.476 | 36.581 ± 1.829 | | | 20.850 ± 1.042 | | |
| t-2-Butene | | 2.304 ± 0.127 | 3.953 ± 0.218 | | | 1.657 ± 0.091 | | |
| c-2-Butene | | 1.193 ± 0.110 | 3.508 ± 0.324 | | | 0.948 ± 0.088 | | |
| 3-Me-1-Butene | | 0.521 ± 0.026 | 0.811 ± 0.041 | | | 0.391 ± 0.020 | | |
| isopentane | | 33.010 ± 2.155 | 49.634 ± 3.240 | | | 22.703 ± 1.482 | | |
| 1-Pentene | | 0.844 ± 0.051 | 1.206 ± 0.072 | | | 0.611 ± 0.037 | | |
| 2-Me-1-Butene | | 1.803 ± 0.132 | 2.465 ± 0.180 | | | 1.175 ± 0.086 | | |
| n-Pentane | | 11.347 ± 0.676 | 10.426 ± 0.621 | | | 7.361 ± 0.439 | | |
| t-2-Pentene | | 1.804 ± 0.090 | 2.283 ± 0.114 | | | 1.038 ± 0.052 | | |
| c-2-Pentene | | 0.987 ± 0.086 | 1.323 ± 0.115 | | | 0.575 ± 0.050 | | |
| 2-Me-2-Butene | | 3.372 ± 0.181 | 3.871 ± 0.207 | | | 1.950 ± 0.104 | | |
| 22DiMeButane | | 4.766 ± 0.309 | 1.925 ± 0.125 | | | 1.486 ± 0.096 | | |
| CycloPentene | | 0.616 ± 0.038 | 0.779 ± 0.048 | | | 0.333 ± 0.020 | | |
| CycloPentane | | 2.012 ± 0.101 | 1.284 ± 0.064 | | | 0.874 ± 0.044 | | |
| 23DiMeButane | | 5.355 ± 0.318 | 5.217 ± 0.310 | | | 3.226 ± 0.191 | | |
| MTBE | | 0.113 ± 0.007 | 0.231 ± 0.014 | | | 0.131 ± 0.008 | | |
| 2-MePentane | | 17.222 ± 0.985 | 13.467 ± 0.770 | | | 8.845 ± 0.506 | | |
| 3-MePentane | | 11.276 ± 0.564 | 8.914 ± 0.446 | | | 5.899 ± 0.295 | | |
| 2-Me-1-Pentene | | 0.473 ± 0.024 | 0.567 ± 0.028 | | | 0.325 ± 0.016 | | |
| 1-Hexene | | 0.486 ± 0.024 | 0.749 ± 0.037 | | | 0.428 ± 0.021 | | |
| n-Hexane | | 7.054 ± 0.353 | 8.513 ± 0.426 | | | 5.114 ± 0.256 | | |
| t-2-Hexene | | 0.734 ± 0.037 | 0.931 ± 0.047 | | | 0.470 ± 0.024 | | |
| 2-Me-2-Pentene | | 0.663 ± 0.035 | 0.801 ± 0.042 | | | 0.494 ± 0.026 | | |
| c-3-Me-2-Pentene | | 0.445 ± 0.022 | 0.601 ± 0.030 | | | 0.338 ± 0.017 | | |
| c-3-Hexene | | 0.100 ± 0.005 | 0.138 ± 0.007 | | | 0.067 ± 0.003 | | |
| c-2-Hexene | | 0.364 ± 0.018 | 0.521 ± 0.026 | | | 0.254 ± 0.013 | | |
| t-3-Me-2-Pentene | | 0.744 ± 0.037 | 0.922 ± 0.046 | | | 0.552 ± 0.028 | | |
| MeCyPentane | | 6.736 ± 0.388 | 6.171 ± 0.356 | | | 3.929 ± 0.226 | | |
| 2,4-DiMePentane | | 3.584 ± 0.179 | 6.729 ± 0.336 | | | 4.076 ± 0.204 | | |
| 223TriMeButane | | 0.131 ± 0.007 | 0.191 ± 0.010 | | | 0.094 ± 0.005 | | |
| Benzene | | 19.781 ± 1.223 | 33.823 ± 2.091 | | | 12.332 ± 0.762 | | |
| CycloHexane | | 2.102 ± 0.121 | 2.244 ± 0.130 | | | 1.318 ± 0.076 | | |
| 4MeHexene | | 0.123 ± 0.011 | 0.178 ± 0.016 | | | 0.106 ± 0.010 | | |
| 2MeHexane | | 4.643 ± 0.232 | 6.657 ± 0.333 | | | 3.890 ± 0.194 | | |
| 23DiMePentane | | 5.503 ± 0.275 | 10.814 ± 0.541 | | | 6.890 ± 0.345 | | |
| 3MeHexane | | 5.400 ± 0.270 | 7.651 ± 0.383 | | | 4.501 ± 0.225 | | |
| Cyclohexene | | 0.046 ± 0.010 | 0.038 ± 0.008 | | | 0.029 ± 0.006 | | |
| 3EtPentane | | 1.595 ± 0.102 | 2.097 ± 0.134 | | | 1.319 ± 0.084 | | |
| 1-Heptene | | 0.771 ± 0.039 | 1.047 ± 0.052 | | | 0.460 ± 0.023 | | |
| 224TrMePentane | | 14.044 ± 1.002 | 34.575 ± 2.466 | | | 13.809 ± 0.985 | | |
| t-3-Heptene | | 0.256 ± 0.013 | 0.324 ± 0.016 | | | 0.167 ± 0.008 | | |
| n-Heptane | | 4.007 ± 0.200 | 5.766 ± 0.288 | | | 3.849 ± 0.192 | | |
| 244TMe-1-Pentene | | 0.151 ± 0.008 | 0.179 ± 0.009 | | | 0.131 ± 0.007 | | |
| MeCyHexane | | 2.218 ± 0.111 | 2.588 ± 0.129 | | | 2.024 ± 0.101 | | |
| 25DiMeHexane | | 1.896 ± 0.129 | 3.626 ± 0.247 | | | 1.833 ± 0.125 | | |
| 24DiMeHexane | | 2.991 ± 0.150 | 5.867 ± 0.293 | | | 3.045 ± 0.152 | | |
| 234TrMePentane | | 5.510 ± 0.275 | 11.334 ± 0.567 | | | 4.509 ± 0.225 | | |
| Toluene | | 42.219 ± 2.111 | 80.985 ± 4.049 | | | 29.397 ± 1.470 | | |
| 23DiMeHexane | | 1.934 ± 0.104 | 4.341 ± 0.234 | | | 2.106 ± 0.113 | | |
| 2MeHeptane | | 2.498 ± 0.125 | 3.506 ± 0.175 | | | 2.404 ± 0.120 | | |
| 4MeHeptane | | 1.083 ± 0.083 | 1.448 ± 0.111 | | | 0.974 ± 0.075 | | |
| 3MeHeptane | | 2.651 ± 0.133 | 3.778 ± 0.189 | | | 2.446 ± 0.122 | | |
| Hexanal | | 8.919 ± 1.379 | 1.992 ± 0.682 | | | 3.481 ± 0.627 | | |
| 225TMHexane | | 0.847 ± 0.042 | 0.878 ± 0.044 | | | 0.790 ± 0.040 | | |
| Octene-1 | | 2.728 ± 0.136 | 3.435 ± 0.172 | | | 2.565 ± 0.128 | | |
| 11DMeCyHexane | | 0.124 ± 0.006 | 0.164 ± 0.008 | | | 0.144 ± 0.007 | | |
| n-Octane | | 1.964 ± 0.098 | 3.220 ± 0.161 | | | 2.533 ± 0.127 | | |
| 24DiMeHeptane | | 0.556 ± 0.028 | 0.660 ± 0.033 | | | 0.571 ± 0.029 | | |
| 25DiMeHeptane | | 1.151 ± 0.058 | 1.428 ± 0.071 | | | 1.196 ± 0.060 | | |
| 33DiMeHeptane | | 0.049 ± 0.002 | 0.061 ± 0.003 | | | 0.045 ± 0.002 | | |
| EtBenzene | | 8.147 ± 0.407 | 14.399 ± 0.720 | | | 6.614 ± 0.331 | | |
| m/p-xylene | | 26.786 ± 1.339 | 45.446 ± 2.272 | | | 22.269 ± 1.113 | | |

## Appendix B2. Chemical Composition of Dilution Blanks and Vehicle Exhaust Samples from Round2

| Species Description | W6-4 | W7-1 | W7-2 | W7-3 | W7-4 | W8-1 | W8-2 | W8-3 |
|---|---|---|---|---|---|---|---|---|
| 2MeOctane | | 0.810 ± 0.041 | 1.311 ± 0.066 | | | 0.807 ± 0.040 | | |
| 3MeOctane | | 1.508 ± 0.093 | 1.896 ± 0.117 | | | 1.437 ± 0.088 | | |
| Styrene+heptanal | | 1.376 ± 0.069 | 1.731 ± 0.087 | | | 1.386 ± 0.069 | | |
| o-xylene | | 10.428 ± 0.521 | 17.591 ± 0.880 | | | 8.630 ± 0.431 | | |
| Nonene-1 | | 0.404 ± 0.020 | 0.572 ± 0.029 | | | 0.509 ± 0.025 | | |
| n-Nonane | | 1.489 ± 0.074 | 1.538 ± 0.077 | | | 1.606 ± 0.080 | | |
| iPropBenzene | | 1.318 ± 0.066 | 1.488 ± 0.074 | | | 0.898 ± 0.045 | | |
| iPropCyHexane | | 0.209 ± 0.014 | 0.206 ± 0.014 | | | 0.211 ± 0.014 | | |
| 26DiMeOctane | | 0.712 ± 0.045 | 0.760 ± 0.048 | | | 0.838 ± 0.053 | | |
| alpha-pinene | | 0.126 ± 0.023 | 0.167 ± 0.031 | | | 0.120 ± 0.022 | | |
| nPropBenzene | | 4.599 ± 0.230 | 3.598 ± 0.180 | | | 1.909 ± 0.095 | | |
| mEtToluene | | 17.864 ± 0.893 | 13.671 ± 0.684 | | | 7.241 ± 0.362 | | |
| pEtToluene | | 7.610 ± 0.381 | 5.627 ± 0.281 | | | 2.788 ± 0.139 | | |
| 135TriMeBenzene | | 8.527 ± 0.426 | 6.499 ± 0.325 | | | 3.686 ± 0.184 | | |
| oEtToluene | | 6.211 ± 0.311 | 4.983 ± 0.249 | | | 2.684 ± 0.134 | | |
| Octanal | | 0.304 ± 0.087 | 0.385 ± 0.110 | | | 0.352 ± 0.101 | | |
| beta-pinene | | 0.098 ± 0.005 | 0.139 ± 0.007 | | | 0.122 ± 0.006 | | |
| 124TriMeBenzene | | 25.224 ± 1.261 | 20.092 ± 1.005 | | | 10.431 ± 0.522 | | |
| n-Decane | | 1.209 ± 0.068 | 1.130 ± 0.063 | | | 1.214 ± 0.068 | | |
| iButBenzene | | 0.388 ± 0.019 | 0.387 ± 0.019 | | | 0.328 ± 0.016 | | |
| sButBenzene | | 0.335 ± 0.017 | 0.276 ± 0.014 | | | 0.211 ± 0.011 | | |
| Limonene | | 5.681 ± 0.284 | 4.898 ± 0.245 | | | 2.734 ± 0.137 | | |
| Indan | | 2.167 ± 0.233 | 1.934 ± 0.208 | | | 1.067 ± 0.115 | | |
| 13diethylbenzene | | 1.660 ± 0.166 | 1.579 ± 0.158 | | | 0.967 ± 0.097 | | |
| 14diethylbenzene | | 4.996 ± 0.278 | 3.958 ± 0.220 | | | 2.584 ± 0.144 | | |
| 12diethylbenzene | | 0.496 ± 0.025 | 0.499 ± 0.025 | | | 0.365 ± 0.018 | | |
| 2-propylToluene | | 1.207 ± 0.060 | 1.369 ± 0.068 | | | 0.846 ± 0.042 | | |
| 3-ipropyltoluene | | 0.665 ± 0.033 | 0.591 ± 0.030 | | | 0.427 ± 0.021 | | |
| 4-ipropyltoluene | | 0.110 ± 0.006 | 0.047 ± 0.003 | | | 0.031 ± 0.002 | | |
| 2-ipropyltoluene | | 0.178 ± 0.032 | 0.280 ± 0.051 | | | 0.182 ± 0.033 | | |
| Nonanal | | 4.113 ± 0.206 | 3.203 ± 0.160 | | | 2.021 ± 0.101 | | |
| n-Undecane | | 0.649 ± 0.130 | 0.557 ± 0.111 | | | 0.529 ± 0.106 | | |
| 1245tetraMeBenzene | | 1.556 ± 0.250 | 1.233 ± 0.198 | | | 0.766 ± 0.123 | | |
| 1235tetraMeBenzene | | 2.044 ± 0.102 | 1.630 ± 0.082 | | | 0.972 ± 0.049 | | |
| 1234tetraMeBenzene | | 0.655 ± 0.033 | 0.597 ± 0.030 | | | 0.345 ± 0.017 | | |
| n-Dodecane | | 0.637 ± 0.032 | 0.459 ± 0.023 | | | 0.362 ± 0.018 | | |