

PERSONAL EXPOSURE AND RISK ASSESSMENT OF VOLATILE ORGANIC COMPOUNDS OF ELEMENTARY CHILDREN

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Background and aims: Volatile organic compounds (VOCs) are important due to frequent presence in the environment and associated adverse health risks. VOCs are largely originated from mobile and industrial sources in ambient air. Although, several studies found an association between long-term VOC exposure to traffic-related and/or industrial-related emissions and possible health effects. A few studies investigated VOC exposure in children. In this study, we assessed personal exposure to VOCs in children with different districts in terms of traffic intensity and industrial factory density, and in different seasons (fall and spring). **Methods:** Passive samplers were used to collect long term and wide range of ambient VOCs. Children wore passive samplers for 7 days. Sample extracts were analyzed by gas chromatography / mass spectrometer (GC/MS). **Results:** TVOC concentrations of spring and fall are 9.13~156.34 ppb and 27.96~123.45 ppb at the industrial-area school, 9.97~86.99 ppb and 25.29~139.58 ppb at the traffic-area school, and 0.39~121.14 ppb and 12.84~151.06 ppb at the background school, respectively. Concentration magnitudes in descending order are industrial-area school, traffic-area school and background school. Concentrations are higher in fall than those in spring. Among VOCs, benzene, toluene, m-xylene, p-xylene and o-xylene are abundant VOCs. BTEX and TVOC indoor concentrations were significantly higher in the traffic and industrial areas. **Conclusion:** Traffic and industrial school areas have a high concentration of VOC. The data obtained in this study can be used to estimate and represent children's VOC exposure in Kaohsiung city. Further study is needed to measure the impact of VOC on the health of the children in Kaohsiung city.

Key words □ Volatile organic compounds (VOC), Passive sampler, Air pollution