

National Bureau of Standards
Certificate of Analysis
Standard Reference Material 1679b
Carbon Monoxide in Nitrogen
(Mobile-Source Emission Gas Standard)

This Standard Reference Material is intended for use in the calibration of instruments used for the analysis of carbon monoxide in mobile-source emissions. It is not intended as a working standard, but rather as a primary standard to which the concentration of other standards may be related.

Cylinder number:
Carbon Monoxide concentration: parts per million by volume.

The concentration of carbon monoxide is relative to all other constituents of the gas.

Each cylinder of gas is individually certified, and the analysis given on this certificate applies only to the cylinder identified on this certificate. The estimated upper limit of error of the carbon monoxide concentration is ± 1.0 percent relative. This estimate is the 95 percent confidence interval based on allowances for known sources of possible error.

The carbon monoxide in nitrogen mixtures were prepared by Airco Industrial Gases, Rare & Specialty Gas Riverton, New Jersey, according to specifications developed at the National Bureau of Standards.

Chemical analyses leading to the certification of this Standard Reference Material were performed by J. E. Sudduth, W. D. Dorko and W. P. Schmidt.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of E. E. Hughes and J. K. Taylor.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by W. R. Reed.

Washington, D.C. 20234
January 25, 1978

J. Paul Cali, Chief
Office of Standard Reference Materials

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Analysis:

Carbon monoxide in the Standard Reference Material was determined by comparisons with a secondary standard that had been previously intercompared with a set of primary gravimetric standards. The methods of intercomparison involved catalytic reduction of carbon monoxide with hydrogen and subsequent analysis of the resulting methane with a flame-ionization hydrocarbon analyzer and nondispersive infrared analysis. The relative imprecision of intercomparison is less than 0.2 percent, which is the 95 percent confidence interval of the mean (ts/\sqrt{n}) based on 100 measurements, and the inaccuracy of the primary standard is considered to be less than 1 percent of the amount of carbon monoxide present.

Stability:

These samples are contained in aluminum cylinders. The stability is considered good and no loss of concentration has been observed over a three month period. However, the value appearing on this certificate is considered valid for only 1 year from date of purchase. Periodic reanalyses of representative samples from this lot will be performed, and if significant changes are observed within the 1 year period the purchasers of other samples from the lot will be notified. Validation of the concentration of carbon monoxide in cylinders which have been in the possession of the purchasers for more than one year can be made by the National Bureau of Standards on a cost reimbursement basis if the gas pressure exceeds 3.4 MPa (500 psi).

Precaution:

If the user is unable to dispose of the cylinder it may be returned prepaid to the National Bureau of Standards for disposal.

Cylinder:

These gases are supplied in cylinders at 12.4 MPa (1800 psi) pressure with a delivered volume of 0.88 m³ (31 ft³) at STP. The cylinders conform to the DOT E6498-2216 specification and are equipped with CGA 350 valves.