

National Bureau of Standards
Certificate of Analysis
Standard Reference Material 1681a
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 and related uses. It is not intended as a daily working standard, but rather as a primary standard to which the concentration of the daily working standards may be related.

Cylinder Number:

Carbon monoxide concentration: parts per million by mole.

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

Each cylinder of gas is individually analyzed, but the concentration appearing on this certificate applies to all samples within the lot. The concentration of all samples in the lot fell within a limit of ± 0.3 percent of the average for the lot and all samples are considered identical within the stated limits of accuracy.

Chemical analyses leading to the certification of this Standard Reference Material were performed by J. E. Sudduth.

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. P. Reed.

Washington, D.C. 20234
September 5, 1978
(Revision of Certificate
Dated 1-29-75)

J. Paul Cali, Chief
Office of Standard Reference Materials

(Over)

Analysis:

Carbon monoxide in this Standard Reference Material was determined by comparison with a batch standard that had been previously intercompared with a set of primary gravimetric standards. The intercomparison involved both measurement by a nondispersive infrared technique and by measurement of methane produced by catalytic reduction of the carbon monoxide. The relative imprecision of intercomparison is less than 0.2 percent relative and the inaccuracy of the primary gravimetric standard is less than 0.4% relative. The upper limit of the total uncertainty including both the imprecision of intercomparison and the inaccuracy of the gravimetric standards is less than 1% relative at the 95% confidence level.

Stability:

These samples are contained in aluminum cylinders. The stability is considered excellent and no losses of carbon monoxide have been observed for similar samples contained in aluminum cylinders for periods of time greater than 2 years. 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 at a nominal charge if more than 500 psi remains in the cylinder.

Precaution:

This cylinder should not be reused or refilled. If the user is unable to dispose of the cylinder it may be returned to the National Bureau of Standards for disposal.

Cylinder:

These gases are supplied in cylinders at about 1800 psi pressure with a delivered volume of approximately 31 cubic feet at STP. The cylinders conform to the DOT specifications and are equipped with CGA-350 valves.