

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 2629

Nitric Oxide in Nitrogen

(Nominal Concentration 20 ppm)

(Mobile-Source Emission Gas Standard)

(In Cooperation with the Motor Vehicle Manufacturers Association)

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

Nitric oxide concentration: \pm $\mu\text{mole/mole(ppm)}$
Cylinder Number: Sample Number:

The concentration of nitric oxide is relative to all other constituents of the gas. The uncertainty shown is the estimated upper limit of error of the nitric oxide concentration and is the 95 percent confidence interval based on allowances for known sources of possible error.

Each cylinder of gas is individually analyzed, and the concentration given above applies only to the cylinder identified by cylinder number and sample number on this certificate.

CAUTION: Care must be taken to avoid accidental contamination of the sample during the use of the cylinder with any gas handling system.

The research and development leading to the certification of this SRM were supported in part by the Motor Vehicle Manufacturers Association of the United States, Inc. (MVMA), Detroit, Michigan.

The development and evaluation of the nitric oxide in nitrogen series of Standard Reference Materials were performed in the Gas and Particulate Science Division by W. P. Thorn, W. R. Miller, and W. D. Dorko.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of E. E. Hughes and H. L. Rook of the Gas and Particulate Science Division.

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 T. E. Gills.

Washington, D.C. 20234
June 7, 1982

George A. Uriano, Chief
Office of Standard Reference Materials

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Certification Information

The cylinder identified on this certificate is one of a group or "lot" of cylinders. A lot contains a minimum of 26 cylinders and is prepared commercially according to rigid specifications to ensure that the lot is homogeneous and stable. Each cylinder in the lot is individually analyzed at NBS for nitric oxide content.

Analysis

The nitric oxide content of this Standard Reference Material was determined by comparison with secondary standards that had been previously intercompared with a set of primary gravimetric standards. The method of intercomparison utilized the chemiluminescent reaction of nitric oxide with ozone.

Representative samples have been analyzed for the presence of other nitrogen oxides by passing the sample through a high-temperature catalytic furnace which converts these other oxides of nitrogen to nitric oxide. Under the conditions of the analysis a minimum of one percent of other nitrogen oxides would have been detected. No other oxides of nitrogen were detected in the samples analyzed within the stated limits.

Stability

Loss of nitric oxide by adsorption on the container walls may occur in new cylinders not previously used for nitric oxide mixtures. To ensure stability, a moderate preconditioning procedure was used for these cylinders. The use of this preconditioning procedure may result in desorption of nitric oxide from the cylinder walls when the cylinder pressure is reduced. It is not recommended that the sample be used for accurate analyses at cylinder pressures below 2.8 MPa (400 psi).

The concentration on this certificate is valid for one year from the date of purchase from NBS. Periodic reanalyses of representative samples from this lot will be performed at NBS, and if significant changes are observed within one year, the purchasers of samples from the lot will be notified.

Cylinder

This SRM is supplied in cylinders with a deliverable volume of 0.85 m^3 (30 cubic feet) at STP. The cylinders conform to DOT specifications and are equipped with CGA-660 valves.

The cylinder becomes the property of the purchaser.