

U. S. Department of Commerce
Alexander B. Trowbridge,

Secretary

National Bureau of Standards
A. V. Astin, Director

Certificate of Analysis

Standard Reference Material 1605 Certified Gas Standard Oxygen in Nitrogen

Oxygen concentration 0.00103 ± 0.00001 mole percent

The concentration of oxygen is relative to the concentration of all other constituents, including the nitrogen and possible trace impurities such as water vapor and argon. The uncertainty shown represents the 95 percent confidence limit of the mean based on seventeen determinations of the oxygen in a random selection of samples in this batch. The same value was obtained on analysis of the original cylinder from which the transfer was made.

PREPARATION AND ANALYSIS.—An original mixture containing about seven percent oxygen in nitrogen was prepared by measurement of the pressure of each component. Intermediate mixtures were prepared by stepwise dilution of the original mixture by careful measurement of the pressure of the mixture and the pressure of the nitrogen used as a diluent. The concentration of the initial mixture was confirmed by mass spectrometric analysis and by an instrumental technique utilizing the paramagnetic properties of oxygen. The concentration in the final mixture is based on determination of the oxygen content using an absolute electrochemical method. The electrochemical analytical data and the oxygen concentration determined from measurement of the pressures involved in mixing agree to within 0.1 ppm or less.

STABILITY.—No change in oxygen content was observed after transfer from the batch container to the sample cylinders, nor after storage at room temperature for a period of one month. This Standard Reference Material should never be stored at temperatures higher than room temperature (25°C).

The oxygen concentration shown above is considered to be accurate for the gas as contained in an unopened cylinder for a period of five years. Periodic analysis of the bulk gas mixture from which the sample cylinder was filled will be made and users will be notified if any significant deviation from the above value appears.

Preparation and chemical analyses leading to certification of this Standard Reference Material were performed by J. M. Ives and E. E. Hughes.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of 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 T. W. Mears.

Washington, D. C. 20234
March 1, 1968

W. Wayne Meinke, Chief
Office of Standard Reference Materials

(Over)

USE AND STORAGE.— The sample is contained in a disposable cylinder and will not be refilled.

Each cylinder has been leak-tested at the joint between valve and cylinder. Valves are hand-tightened and were determined to be leak-free before filling. The valves are equipped to accept CGA-580 fittings. To avoid contamination of the contents all connections should be evacuated, or flushed with the sample, before use.

Cylinders should be stored at room temperature. Cylinder valves are equipped with rupture disk relief valves set to rupture at 1200 psi.

Each cylinder is filled to about 500 psi. The total volume of gas is approximately 68 liters measured under standard conditions.

DOT special permit number 5075.