

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 1094

Oxygen in Maraging Steel

This Standard Reference Material (SRM) is intended primarily for use in vacuum and inert gas fusion methods for the determination of oxygen. The material for this standard was furnished to NBS by the Applied Research Laboratory of the U.S. Steel Corp., Pittsburgh, Pennsylvania.

| SRM No. | Description | Oxygen, ppm (by wt.) |
|---------|----------------|-------------------------|
| 1094 | Maraging Steel | 4.5 ^a |

^aResults determined by vacuum fusion techniques on 1-gram samples. The value given is the grand mean based on 109 determinations on 32 samples. The values found ranged from 2.5 to 7.5 ppm. Determinations made over a period of several months indicate the existence of systematic errors of the order of 2 ppm. Examination of the data indicates that the material is homogeneous relative to the magnitude of the systematic errors in the method.

SRM 1094 is supplied as a rod 1/4 in (0.6 mm) in diameter and 4 in (8.2 cm) long.

Caution: Oxygen determinations should be made on thoroughly and freshly cleaned samples that represent the full cross-section of the rods.

Analyses were performed at NBS by J. T. Sterling, J. F. Martin, and O. Mens.

The overall direction and coordination of technical measurements leading to the certification were under the chairmanship of P. D. LaFleur.

The technical and support aspects concerning the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by R. E. Michaelis.

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Stanley D. Rasberry, Chief
Office of Standard Reference Materials

(over)

SUPPLEMENTAL INFORMATION

Although not certified, nitrogen was measured both by a pressure-bomb distillation-indophenol-photometric method (71 ppm) and by vacuum fusion (61 ppm).

PREPARATION FOR THE DETERMINATION OF OXYGEN:

- (1) Samples should be cut from the original rod in such a manner as to minimize heating of the sample; i.e., by a hand hacksaw.
- (2) All surfaces of the cut sample should be thoroughly cleaned with a fine file.
- (3) Samples should be washed with ether, acetone, or other suitable solvent, dried in a stream of warm clean air, and then handled only with clean forceps.
- (4) Analyses should be made as soon after cleaning the sample as possible.

CONDITIONS FOR ANALYSIS AT NBS:

| | |
|-------------------------------|---------------------|
| Method | Vacuum fusion |
| Furnace temperature | 1675 °C |
| Furnace pressure | $<10^{-5}$ torr |
| Collection time | 4 min |
| Bath material | High-purity nickel |
| Carbon monoxide determination | Infrared absorption |