U. S. Department of Commerce
Maurice H. Stans
Secretary

National Bureau of Standards
A. M. Branscomb, Director

Certificate of Analysis

3-12-71

Standard Reference Material 1265

Electrolytic Iron

This standard is in the form of disks 31 mm (1 1/4 in) in diameter and 19 mm (3/4 in) thick, generally for use in optical emission and x-ray spectrometric analysis.[a]

Element	Percent, by weight
Carbon	0.006_7
Manganese	$.005_8$
Phosphorus	.003
Sulfur	$.005_9$
Silicon	.008
Copper	$.005_8$
Nickel	.041
Chromium	$.007_3$
Vanadium	(.0006)[b]
Molybdenum	$.005_0$
Cobalt	.007
Titanium	.0006
Arsenic	(.0002)
Aluminum (Total)	(.0007)
Boron	(.00015)
Iron (by difference)	(99.9)

[a]This material also is available in the form of chips, SRM, 365, for use in chemical methods of analysis; rods, SRM 1099, 6.4 mm (1/4 in) in diameter and 102 mm (4 in) long for the determination of gases in metals by vacuum fusion and neutron activation methods of analyses, and rods, SRM 665, 3.2 mm (1/8 in) in diameter and 51 mm (2 in) long for application in microchemical methods of analysis such as electron probe microanalysis, spark source mass spectrometric analysis, and laser probe analysis.

[b]Values in parenthesis are not certified since they are based on the results from a single laboratory.

PROVISIONAL CERTIFICATION: The value listed for a certified element is the present best estimate of the true value based on the results of the cooperative analytical program. The value listed is not expected to deviate from the true value by more than ± 1 in the last significant figure reported; for a subscript figure, the deviation is not expected to be more than ± 5. Based on the results of homogeneity testing, maximum variations within and among samples are estimated less than the accuracy figures given above.

The overall direction and coordination of the technical measurements at NBS leading to certification were performed under the direction of O. Menis, B. F. Scribner, J. I. Shultz, and J. L. Weber, Jr.

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 R. E. Michaelis.

Washington, D. C. 20234
July 28, 1970

J. Paul Cali, Acting Chief
Office of Standard Reference Materials

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PLANNING, PREPARATION, TESTING, ANALYSIS: This standard is one of five replacements for the original eight 1100 series iron and steel SRMs. Material from the same melt is available in a variety of forms to serve in checking methods of analysis and in calibrating instrumental techniques.

The material for this standard was vacuum melted and cast at the Carpenter Technology Corporation, Reading, Pennsylvania, under a contract with the National Bureau of Standards. The contract was made possible by a grant from the American Iron and Steel Institute.

The ingots were processed by Carpenter Technology Corporation to provide material of the highest possible homogeneity. Following acceptance of the composition based on NBS analyses, selected portions of the ingot material were extensively tested for homogeneity at NBS by D. M. Bouchette, S. D. Rasberry, and J. L. Weber, Jr. Only that material meeting a critical evaluation was processed to the final sizes.

Chemical analyses for certification generally were made on composite samples representative of each final shape and size; for certain elements, however, and based on previous experience, only one composite sample was analyzed with the results applied to the other forms of the material.

Cooperative analyses for certification were performed in the Research Laboratories of Armco Steel Corporation by R. L. LeRoy and J. F. Woodruff.

Analyses were performed in the Analytical Chemistry Division of the National Bureau of Standards by the following: R. Alvarez, J. R. Baldwin, E. Belkas, M. M. Darr, E. R. Deardorff, T. E. Gills, E. J. Maienthal, C. W. Mueller, P. J. Paulsen, B. A. Thompson, and S. A. Wicks.

ADDITIONAL INFORMATION ON THE COMPOSITION: Provisional certification is made only for the elements indicated. The five replacements, however, contain a graded series for 40 elements and information on the elements not initially certified may be of importance in the use of the material. Although these are not certified, upper limit values are presented in the following table for the remaining elements. (Some may be certified at a later date.)

Elements Detected (ppm by weight)

Element	Upper Limit	Method
W	< 1	Neutron activation
Sn	< 5	Spark source mass spectrometry
Nb	< 0.5	Spark source mass spectrometry
Pb	< 0.5	Polarographic
Ag	< 0.2	Spark source mass spectrometry
Zn	< 3	Spark source mass spectrometry
N	<20	Distillation-photometric
Ge	<50	Spark source mass spectrometry
O	<70	Vacuum fusion
H	< 5	Vacuum fusion

Elements Sought but Not Detected (ppm by weight)

Element	Upper Limit	Method
Ta	<0.5	Neutron activation
Zr	<0.1	Spark source mass spectrometry
Sb	<0.5	Neutron activation
Bi	<0.1	Spark source mass spectrometry
Ca	<0.1	Atomic absorption
Mg	<0.2	Atomic absorption
Se	<0.1	Spark source mass spectrometry
Te	<0.1	Spark source mass spectrometry
Ce	<0.05	Spark source mass spectrometry
La	<0.05	Spark source mass spectrometry
Pr	<0.05	Spark source mass spectrometry
Au	<0.02	Neutron activation
Hf	<0.2	Spark source mass spectrometry