National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material® 680a

High-Purity Platinum

This Standard Reference Material (SRM) is issued to meet the needs of analysts working at trace level concentrations in platinum. The range of values reported reported by cooperating laboratories, represents the analytical state of the art at the time this SRM was measured. The platinum material is in the form of wire 0.51 mm (0.020 in) in diameter and is available in two lengths, 10.2 cm (4 in) designated L-1 and 1.0 m (39.4 in) designated L-2.

Element[a]	Recommended Value (mg/kg)[b]	Range of Values Reported (mg/kg)
Copper	0.1	0.087 to < 1
Silver	< 0.1	< 0.06 to < 1
Palladium	0.2	< 0.1 to < 1
Lead	< 1	(0.6 to 3)
Iron	1.3	0.6 to 2.6
Nickel	< 1	0.3 to < 1
Gold	< 1	0.1 to 8
Magnesium	< 1	< 0.05 to 2
Zirconium	< 0.1	< 0.03 to 0.3
Rhodium	< 0.2	0.09 to < 1
Iridium	< 0.01	0.007 to 0.01
Oxygen	4	3.2 to 5.2[c]

[a] Other elements are also contained in the SRM such as Al, Ca, Na, Si, and Sn.

[b] The values listed are based on a consideration of the analytical methods and results reported by cooperating laboratories. For all elements, no estimate of accuracy could be made due to a lack of agreement amoung analytical methods used or because only one analytical method was used.

[c] Range from one laboratory only.

This Certificate of Analysis has undergone editorial revision to reflect program and organizational changes at NIST and at the Department of Commerce. No attempt was made to reevaluate the certificate values or any technical data presented on this certificate.

The revision of this Certificate of Analysis was coordinated through the Standard Reference Materials Program by P.A. Lundberg.

Gaithersburg, MD 20899
July 19, 1995
(Revision of certificate dated 3-1-77)

Thomas E. Gills, Chief
Standard Reference Materials Program

This SRM has been established to provide a homogeneous reference material for the analysis of high-purity platinum, a material with extensive scientific and industrial applications, where the properties are greatly affected by the kind and amount of impurity elements. With coordination provided by the National Institute of Standards & Technology (formerly the National Bureau of Standards), the planning, preparation, homogeneity testing and analyses were conducted by the following organizations: Sigmund Cohn; Johnson Matthey Co., Ltd; Engelhard Industries, Inc.; and RCA Laboratories.

Source of Material: The material for SRM 680a was prepared at Sigmund Cohn by induction melting of high-purity platinum sponge in a zirconium silicate crucible followed by casting into a platinum-lined, water-cooled copper mold. The ingot was trimmed, swaged, and drawn into a wire using the utmost precautions to minimize contamination.

Extensive homogeneity testing was performed by NIST as well as by the four cooperating laboratories listed above using a combination of the following methods: optical emission spectrography, spark source mass spectrograph and electrical measurements including EMF, Temperature Coefficient of Resistivity (TCR), and Residual Resistivity Ratio (RRR). The material was found to be homogeneous within the limits of precision of the analytical methods used at these trace levels. Elemental analyses were made at NIST by one or more of the following methods: optical emission spectrography, spark source mass spectrography (isotopic dilution), polarography, spectrophotometry, activation analysis, and vacuum fusion.

The following organizations also contributed emission spectrographic measurements:

J. Bishop & Co., Malvern, PA
Engelhard Industries, Newark, NJ
Johnson Matthey Co., Ltd., London, England

CAUTION - NOTICE AND WARNING TO USER

Before use, it is recommended that possible surface contamination be removed by placing the sample in warm aqua regia ($HCl + HNO_3$) for approximately five min and then followed by rinsing in distilled water.