



National Institute of Standards & Technology

Certificate

Standard Reference Material 742

Aluminum Oxide

Pyrometric Standard

Melting Point on the

2052 °C

International Temperature Scale of 1990

The material furnished is a calcined alpha alumina of a purity (99.9+ percent) suitable for the intended use. SRM 742 is in the form of a powder and is packaged in a 10 gram unit.

The melting point given above is the value obtained when the material is melted in a vacuum using tungsten containers, and does not necessarily represent the melting point of pure alpha alumina. It is estimated from an examination of twenty sub-samples (every fiftieth sample) representing the entire lot of material, that the melting point of this sample does not deviate by more than 2 °C from 2052 °C; and that melting point determinations, including temperature measurements, were reproducible within ± 1 °C. The overall maximum uncertainty of the melting point is estimated to be ± 5 °C.

For details of the melting point experiments, and the effect of environmental changes on the melting point of alumina, see J. Research NBS 71A [4], 317-333 (1967). For the results of an international survey on the use of alumina as a fixed point see Pure & Applied Chem. 21, 115-122 (1970). The International Temperature Scale of 1990 is described in Metrologia 27, 3 (1990).

The alumina was obtained from a commercial source: Spectrographic analyses by V. Stewart of the Analytical Chemistry Division and by the supplier define the purity of the alumina. The experimental determination of the melting point of alumina was done by S. J. Schneider and C. L. McDaniel of the Inorganic Materials Division, Institute for Materials Research. The photoelectric pyrometer was calibrated at the beginning and end of the measurements by E. Lewis of the Heat Division, Institute for Basic Standards.

This certificate is a revision of the certificate dated June 5, 1970. The changes consist primarily of the conversion of temperatures on the IPTS-68 to those on the ITS-90 by B.W. Mangum of the Chemical Process Metrology Division.

The technical and support aspects involved in the revision, update and issuance of this Standard Reference Material were coordinated through the Standard Reference Materials Program by J. C. Colbert.

Gaithersburg, MD 20899
July 6, 1990
(Revision of certificate dated 6-5-70)

William P. Reed, Acting Chief
Standard Reference Materials Program