

7-14-71

Certificate
STANDARD REFERENCE MATERIAL 742
Aluminum Oxide
Pyrometric Standard
Melting Point on the International
Practical Temperature Scale (1968)
2053 °C

S. J. Schneider and C. L. McDaniel

The material furnished is a calcined alpha alumina of a purity (99.9+ percent) suitable for the intended use.

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 2053 °; 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 [1], 115-122 (1970). The International Practical Temperature Scale of 1968 is described in Metrologia 5 [2], 35-44 (1969).

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 work on the melting point of alumina was done by S. J. Schneider and C. L. McDaniel of the Inorganic Materials Division, both in the 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.

Washington, D.
June 5, 1970

4-9-71

SRM 742, Alumina, high-temperature melting point, is available at \$62.50 for a 10-g unit and may be ordered from the

J. Paul Cali, Acting Chief
of Standard Reference Materials

Office of Standard Reference Materials
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