U. S. Department of Commerce
Malcolm Baldrige
Secretary
National Bureau of Standards
Ernest Ambler, Director

National Bureau of Standards

Certificate

Standard Reference Material 2220

Temperature and Enthalpy of Fusion - Tin

This Standard Reference Material (SRM) consists of high purity (99.9995 percent) tin foil. SRM 2220 is intended for use in calibrating differential scanning calorimeters, differential thermal analyzers, and similar instruments.

The temperature and enthalpy of fusion for SRM 2220 were measured by differential scanning calorimetry. The experimental procedure followed the American Society for Testing and Materials (ASTM) recommended practices [1, 2]. The documentation for these procedures is given in NBS Special Publication 260-99.

Certified Values:

Melting Temperature*	505.08 ± 0.39 K
Enthalpy of Fusion	56.57 ± 0.10 J/g

*Heating rate of 2.5 K/min

The certified values are averages of measurements on twenty one specimens taken from nine different samples of the material. The listed uncertainties are three times the estimated standard error of the certified values. These uncertainties include contributions to variability from instrumental factors, operating procedures, and effects of remounting the specimens.

Material Specification: SRM 2220 is made from tin foil (2.5 cm wide x 609.6 cm long x 0.127 mm thick). The SRM consists of a 25.5 mm square of the tin foil from which specimens can be cut easily. The SRM unit supplied will provide approximately sixty-four 8 mg test specimens.

The measurements were performed by S.A. Sullivan and J.E. Callanan under the technical direction of J.E. Callanan, both of the NBS Chemical Engineering Sciences Division.

Consultation on the statistical design of the experimental work and statistical analysis of the data was provided by D.F. Vecchia of the NBS Statistical Engineering Division.

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 L.J. Kieffer.

References:

1. ASTM Standard Practice for temperature calibration of differential scanning calorimeters and differential thermal analyzers E967.
2. ASTM Standard Practice for heat flow calibration of differential scanning calorimeters E968.

Gaithersburg, MD 20899
November 15, 1985

Stanley D. Rasberry, Chief
Office of Standard Reference Materials