



# National Institute of Standards & Technology

## Certificate of Analysis

### Standard Reference Material 670

#### Rutile

(In Cooperation with the American Society for Testing and Materials)

This Standard Reference Material (SRM) is in the form of a fine powder and is intended for use in the evaluation of chemical methods of analysis and in the calibration of instruments.

The certified values are based on analysis of material dried at 110 °C for two hours.

<u>Constituent</u>	<u>Certified Value<sup>1</sup></u> <u>Percent by Weight</u>	<u>Estimated<sup>2</sup></u> <u>Uncertainty</u>
TiO <sub>2</sub>	96.16	0.12
Fe <sub>2</sub> O <sub>3</sub>	0.86	0.05
ZrO <sub>2</sub>	0.84	0.05
SiO <sub>2</sub>	0.51	0.03
Cr <sub>2</sub> O <sub>3</sub>	0.23	0.02
V <sub>2</sub> O <sub>5</sub>	0.66	0.05

<sup>1</sup>The certified value listed for a constituent is the present best estimate of the "true" value based on the results of the cooperative program for certification.

<sup>2</sup>The estimated uncertainty listed for a constituent is based on judgment and represents an evaluation of the combined effects of method imprecision, possible systematic errors among methods, and material variability. (No attempt was made to derive exact statistical measures of imprecision because several methods were involved in the determination of most constituents.)

The overall coordination of the technical measurements leading to certification was performed under the direction of J.I. Shultz, Research Associate Program.

The technical and support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by T.E. Gills. Revision of the Certificate was coordinated through the Standard Reference Materials Program by J.S. Kane.

*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 value or any technical data presented in this certificate.*

#### PLANNING, PREPARATION, TESTING, AND ANALYSIS

The material for this SRM was provided by the Bethlehem Steel Corporation, Bethlehem, PA. The material was sieved and blended at NIST. Homogeneity testing of selected samples representative of the final lot was performed at NIST by G. Marinenko.

Gaithersburg, MD 20899  
January 22, 1993  
(Revision of certificate dated 5-20-85)

William P. Reed, Chief  
Standard Reference Materials Program

(over)

Chemical analyses for certification were performed in the following laboratories:

Associated Resources Management, Geraldton, Western Australia; A. West.

Bethlehem Steel Corporation, Homer Research Laboratory, Bethlehem, PA; D.A. Flinchbaugh, J. Fernandez and A. Urban.

CSIRO, Division of Mineral Chemistry, Port Melbourne, Victoria, Australia; E.S. Pilkington.

Government Chemical Laboratory, Department of Mines, Perth, Western Australia; M.B. Costello.

Kawecki-Berylco Industries, Inc., Division of Cabot Corporation, Boyertown, PA; F.T. Coyle, J.E. Foster, and N.J. Schuhwerk.

Ledoux and Company, Teaneck, NJ; S. Kallmann and C.L. Maul.

National Bureau of Standards, Inorganic Analytical Research Division, Center for Analytical Chemistry, Gaithersburg, MD; R.M. Lindstrom and R.L. Watters, Jr.

SCM Chemicals Ltd. Bunbury, Western Australia; M. Griffin.