



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 698

Bauxite (Jamaican)

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

This Standard Reference Material (SRM) is in the form of fine powder (nominal particle size < 0.08 mm) and is intended for use in evaluating chemical and instrumental methods of analyses.

(All analyses are based on samples dried 2 hours at 140°C)

| Constituent | Certified Value ¹ Percent by Weight | Estimated Uncertainty ² |
|--------------------------------|---|---------------------------------------|
| Al ₂ O ₃ | 48.2 | 0.4 |
| Fe ₂ O ₃ | 19.6 | .2 |
| SiO ₂ | 0.69 | .03 |
| TiO ₂ | 2.38 | .07 |
| ZrO ₂ | 0.061 | .009 |
| P ₂ O ₅ | .37 | .01 |
| V ₂ O ₅ | .064 | .005 |
| Cr ₂ O ₃ | .080 | .006 |
| CaO | .62 | .02 |
| MgO | .058 | .008 |
| MnO | .38 | .03 |
| ZnO | .029 | .002 |
| K ₂ O | .010 | .002 |
| SO ₃ | 0.143 | 0.004 |
| Loss on Ignition ³ | 27.3 | .2 |

¹The certified value listed for a constituent is the present best estimate of the "true" value. The certified values are given as the oxide on an equivalent weight basis and assume stoichiometry in the form of compounds listed.

²The 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 for samples 1.0 g or more. (No attempt was made to derive exact statistical measures of imprecision because several methods were involved in the determination of most constituents).

³Determined by igniting to constant weight at 1050°C .

Gaithersburg, MD 20899
January 2, 1991
(Revision of certificate dated 8-24-79)

William P. Reed, Acting Chief
Standard Reference Materials Program

(over)

ADDITIONAL INFORMATION ON THE COMPOSITION

Constituents other than those certified are present in this material as indicated below. They are not certified but are given as additional information on the composition.

| Constituent | Concentration, Percent by weight | Constituent | Concentration, Percent by weight |
|-------------------|-------------------------------------|-------------|-------------------------------------|
| BaO | (0.008) | Co | (0.0045) |
| Na ₂ O | (0.015) | Hf | (0.0015) |
| Ce | (0.030) | Sc | (0.0051) |

The mineralogical composition of SRM 698 is 75% gibbsite, 20% hematite, and 5% anatase. It was determined by x-ray diffraction studies at the Geological Survey, U.S. Department of the Interior, Reston, VA, (J.W. Hosterman). These results are semiquantitative (to the nearest 5%).

PLANNING, PREPARATION, TESTING, ANALYSIS:

The material for this SRM was mined in Jamaica, and was provided by the Reynolds Metals Company, Bauxite, Arkansas, through the courtesy of J.B. Ezell, Jr. It was processed (crushed, ground, sieved, and mixed) at the Colorado School of Mines Research Institute under a contract with the National Institute of Standards and Technology.

Homogeneity testing was performed at NIST by J.S. Maples and T.E. Gills using instrumental neutron activation analysis.

Cooperative analyses for certification were performed in the following laboratories:

- Aluminum Company of America, Alcoa Center, PA, R.C. Obbink.
- Aluminum Company of Canada, Ltd., Arvida Research Center, Arvida, Quebec, Canada, L. Girolami.
- Andrew S. McCreath & Son, Inc., Harrisburg, PA, F.A. Pennington, Jr., R.F. Eakin, and S.L. Miller.
- General Refractories Co., U.S. Refractories Division, Research Center, Baltimore, MD, S. Banerjee.
- Geological Survey, U.S. Department of the Interior, Reston, VA, H.J. Rose, Jr., and J.W. Hosterman.
- Kaiser Aluminum and Chemical Corp., Center for Technology, Pleasanton, CA, H.J. Seim, A.E. McLaughlin, D.F.G. Marten, A. Kermaninejad, R.C. Kinne, J.R. Skarset, J. Boruk, and U. Vogel.
- National Institute of Standards and Technology, Gaithersburg, MD, R.K. Bell (Retired), ASTM-NIST Assistant Research Associate W.R. Kelly and K.E. Murphy.
- National-Southwire Aluminum Co., Hawesville, KY, N. Robinson and E. Gotzy.
- Ormet Corp. Burnside, LA, W.L. Brown and A.D. Lafleur.
- Reynolds Aluminum Co., Alumina Research Division, Bauxite, AR, J.B. Ezell, Jr.
- University of Kentucky, Institute for Mining and Minerals Research, Center for Energy Research Laboratory, Lexington, KY, T.V. Rebagay.

The overall coordination of the technical measurements leading to certification were performed under the direction of J.I. Schultz, Research Associate, ASTM-NIST Research Associate Program.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Standard Reference Materials Program by R.E. Michaelis and R. Alvarez.

The update and revision of this Certificate of Analysis was coordinated through the Standard Reference Materials Program by Thomas E. Gills.