National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 1834

Fused Simulated Ore for X-ray Fluorescence Spectrometry

This Standard Reference Material (SRM) is intended for use in calibrating x-ray fluorescence spectrometers. It may be useful in particular applications, such as the x-ray spectrometric analysis of rocks, ores, and clays in which the samples are fused with a suitable fluxing agent, such as lithium tetraborate, (LTB) before measurement. SRM 1834 can also be used in quality assurance applications and to monitor instrument stability.

SRM 1834 is a silica base glass disk (3 cm in diameter x 0.3 cm thick) that was prepared at NIST (see preparation section). This glass material has about the same elemental composition as NIST SRM 97a, Flint Clay, with the amount lost on ignition replaced with oxides of lithium and boron. Therefore, when SRM 97a is fused, the resultant glass disk should give similar x-ray intensities for all certified elements as SRM 1834. In the analysis of similar fused materials, it is recommended that appropriate corrections for interelement effects be applied.

The certified constituent elements are given in Table 1 and are based on measurements made using at least two or more independent analytical methods. Noncertified values are given in Table 2 as additional information on the matrix. The noncertified values should not be used for calibration or quality control.

USE: If the SRM is to be routinely used as supplied it may be necessary to resurface the disk occasionally. It is recommended that any resurfacing be performed with 400 grit abrasive paper in the dry state to minimize any calcium contamination. If the SRM is to be shattered for the purpose of preparing fused samples, it is recommended that the SRM be first wrapped in several layers of wax or glassine paper to avoid contamination.

The certification of this SRM is valid 5 years from the date of purchase from NIST. Should any of the certified values change before the expiration of the certification period, purchasers will be notified by NIST.

The statistical analysis of the certification data was performed by R.C. Paule of the National Measurement Laboratory.

The overall direction and coordination of the technical measurements leading to certification were under the direction of P.A. Pella of the NIST Gas and Particulate Science Division.

The technical and support aspects involved in the certification and issuance of this SRM were coordinated through the Standard Reference Materials Program by T.E. Gills.

Gaithersburg, MD 20899
July 17, 1990

William P. Reed, Acting Chief
Standard Reference Materials Program

(over)

Table 1. Certified Elements in SRM 1834, Simulated Fused Ore

Element	Content, wt.%	Element	Content, wt.%
Aluminum	20.71 ± 0.10	Phosphorus	0.152 ± 0.003
Barium	0.062 ± 0.003	Potassium	0.42 ± 0.02
Calcium	0.095 ± 0.005	Silicon	20.19 ± 0.10
Iron	0.32 ± 0.03	Strontium	0.153 ± 0.008
Magnesium	0.088 ± 0.004	Titanium	1.11 ± 0.06

The listed uncertainty is ±2 standard deviations of the certified value and includes material heterogeneity and variability among the measurement methods used.

Analytical Methods	Elements
A. Direct Current Plasma Emission Spectrometry	Ca,P
B. Flame Emission Spectrometry	K,Sr
C. Gravimetry	Al,Si
D. Inductively Coupled Plasma Emission Spectrometry	Ba,Fe,Mg,P,Ti
E. X-Ray Fluorescence Spectrometry	Al,Ba,Ca,Fe,Mg,P,K,Si,Sr,Ti

Supplemental Information

Table 2. Noncertified Elements in SRM 1834, Simulated Fused Ore

	Element, wt. %
Boron	(1.1)
Chromium	(0.02)
Lithium	(4.6)
Sodium	(0.14)
Zirconium	(0.047)

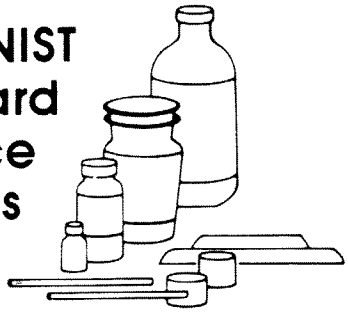
Material Preparation

The material for this SRM was fabricated by D. Blackburn and D. Kauffman of the NIST Glass and Optical Material Group, Ceramics Division of the National Institute for Materials Science and Engineering. The glass material was prepared by adding a known amount of a glass containing the minor constituents to a melt of the pure compounds comprising the major components.

Analysts

Center for Analytical Chemistry

1. T. A. Butler
2. M. S. Epstein
3. A. F. Epstein
4. P. A. Pella
5. J. M. Smeller
6. T. W. Vetter
7. R. L. Watters, Jr.
8. L. J. Wood



U.S. DEPARTMENT OF COMMERCE
National Institute of Standards and Technology

Standard Reference Material 1834

Fused Simulated Ore for X-ray Fluorescence Spectrometry

The National Institute of Standards and Technology (NIST) announces the availability of Standard Reference Material (SRM) 1834, Simulated Fused Ore, intended for calibrating x-ray fluorescence spectrometers for the analysis of rocks, ores, and clays. This synthetic glass material has an elemental composition similiar to NIST SRM 97a (Flint Clay), with the amount lost on ignition replaced by oxides of lithium and boron. SRM 1834 can also be used in quality control applications and to monitor instrument stability.

SRM 1834 is a silica base glass disk (3 cm in diameter x 0.3 cm thick) that was specially prepared by the NIST Glass and Optical Group, Ceramics Division of the National Institute for Materials Science and Engineering. The certified weight percent values of the constituent elements in SRM 1834 are given below. The certified values are based on two or more of NIST most proven analytical techniques at NIST.

Element	Content, wt.%	Element	Content, wt.%
Aluminum	20.71 ± 0.10	Phosphorus	0.152 ± 0.003
Barium	0.062 ± 0.003	Potassium	0.42 ± 0.02
Calcium	0.095 ± 0.005	Silicon	20.19 ± 0.10
Iron	0.32 ± 0.03	Strontium	0.153 ± 0.008
Magnesium	0.088 ± 0.004	Titanium	1.11 ± 0.06

SRM 1834 may be purchased for $298 each, from:

Standard Reference Materials Program
Building 202, Room 215
National Institute of Standards & Technology
Gaithersburg, MD 20899

Telephone (301) 975-6776
FAX (301) 948-3730