U.S. Department of Commerce
Juanita M. Kreps
Secretary

National Bureau of Standards
Ernest Ambler, Director

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 690

Iron Ore Concentrate (Canada)

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

This material is in the form of powder (<0.1mm) for use in checking chemical methods of analysis and in calibration with instrumental methods of analysis.

(Results based on samples dried for one hour at 105 °C.)

Constituent	Total Fe	SiO_2	Al_2O_3	P	S	TiO_2	MnO	CaO	MgO	Na_2O	K_2O
Certified[1] Value (wt. %)	66.85	3.71	0.18	0.011	0.003	0.022	0.23	0.20	0.18	0.003	0.0030
Estimated[2] Uncertainty	0.07	0.02	0.01	0.002	0.001	0.002	0.01	0.01	0.01	0.001	0.0005
Method[3] / Labs	$SnCl_2$ – $K_2Cr_2O_7$	$HClO_4$ Dehydration	Atomic Absorption	Photometric	Combustion-Titration	Photometric	Atomic Absorption	Atomic Absorption	Atomic Absorption	Atomic Absorption	Atomic Absorption
A	[a] 66.91	[b] 3.70	0.17	[c] 0.009	<0.005	[d] 0.021	0.24	0.20	0.17	0.0026	0.0030
B	66.88	3.76	.17	[c] .013	.003	[e] .026	.23	.20	.19	.004	.003
C	[f] 66.82	3.70	.19	.011	.006	[g] .024	[h] .23	[i] .19	[i] .19	[i] .0023	[i] .0034
D	66.85	3.73	[j] .18	-	-	[j] .021	.23	[j] .21	.18	.0028 [j] .0030	[j] .0029
E	66.83	[h] 3.69 3.73	[k] .20	.009	.002	[g] .022	.24	.21	.18	.002	.003

1. The certified value listed for a constituent is the *present best estimate* of the "true" value based on results of the cooperative analytical program for certification.
2. The estimated uncertainty 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 of 0.5 g or more. (No attempt was made to derive exact statistical measures of imprecision because several methods were involved in the determinations.)
3. A detailed description of many of the methods of analysis employed in the certification program for this SRM may be found in Part 12, Chemical Analysis of Metals and Metal Bearing Ores, Annual Book of ASTM Standards.

a H_2S reduction
b Sample fused in Na_2CO_3
c Alkali-molybdate method
d H_2O_2 photometric
e Atomic absorption
f Silver reductor
g Chromotropic acid photometric
h Photometric method
i Spectroscopic method
j Flame emission
k Chromazurol S photometric

Washington, D.C. 20234
October 24, 1978

J. Paul Cali, Chief
Office of Standard Reference Materials

(over)

PLANNING, PREPARATION, TESTING, ANALYSIS:

The iron ore powder concentrate material for this SRM was prepared in final powder form, minus 74 μm (200 mesh), by the Iron Ore Company of Canada, Labrador City, Newfoundland, Canada, through the courtesy of L. Rompré.

At NBS, the material was resieved and thoroughly blended.

Homogeneity testing of selected samples representative of the final lot was performed at NBS by R. K. Bell, Assistant Research Associate, ASTM-NBS Research Associate Program. The results for iron indicate that the material variability (0.5 g samples) is $\leq$ the method imprecision.

Chemical analyses for certification were performed in the following laboratories:

Bethlehem Steel Corporation, Homer Research Laboratories, Bethlehem, Pa., D. A. Flinchbaugh.
Inland Steel Company, Indiana Harbor Works, East Chicago, Indiana, J. E. Joyce.
Ledoux and Company, Teaneck, New Jersey, S. Kallman and C. L. Maul.
National Bureau of Standards, Center for Analytical Chemistry, Washington, D.C., T. C. Rains, T. J. Brady, J. D. Messman, and T. A. Rush and by R. K. Bell, ASTM Assistant Research Associate.
STELCO, The Steel Company of Canada, Ltd.,Hilton Works, Hamilton, Ontario, Canada, O. P. Bhargava.

The overall direction and coordination of the technical measurements leading to certification were performed jointly by R. E. Michaelis, Office of Standard Reference Materials and by J. I. Shultz, Research Associate, ASTM-NBS Research Associate Program.

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 W. P. Reed.