

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 129c

High-Sulfur Steel

This material is available in chip form primarily for use in checking chemical methods of analysis. A companion material, SRM 1136, is available in solid form for application in optical emission and x-ray spectrometric methods of analysis.

	C	Mn	P	S	Si	Cu	Ni	Cr	V	Mo
Analyst	Combustion-Chromatographic	Persulfate-Arsenite Titration	Photometric	Combustion-Titration	Gravimetric	Photometric	Gravimetric	Titration	Titration	Photometric
1	0.126	a0.768	0.078	b0.244	c0.019	d0.014	0.251	e0.012	f0.010	0.002
2	.125	.771	.076	.248	g .023	h .014	.251	i .011	j .010	.001
3	.124	.77	.074	.248	g .018	-	k.252	l .016	m.015	.003
4	.126	n .766	.075	.241	.020	h .012	o.250	p .016	q .012	.001
Average	0.125	0.769	0.076	0.245	0.020	0.013	0.251	0.014	0.012	0.002

a Potentiometric titration.

b 1-g sample burned in oxygen at 1450 °C. Sulfur dioxide absorbed in starch-iodide solution. Iodine is liberated from iodide by titration, during the combustion, with standard KIO_3 solution.

c Double dehydration with intervening filtration.

d Diethylthiocarbamate spectrophotometric.

e Chromium separated from the bulk of the iron by hydrolytic precipitation with $NaHCO_3$, oxidized with persulfate, and titrated potentiometrically with ferrous ammonium sulfate.

f Vanadium separated as in (e), oxidized with HNO_3 , and titrated potentiometrically with ferrous ammonium sulfate.

g Molybdisilicic acid spectrophotometric method.

h Atomic absorption.

i Chromium separated as in (e), oxidation with persulfate, and titration with $Fe(NH_4)_2(SO_4)_2 - KMnO_4$.

j Vanadium separated as in (e), $Fe(NH_4)_2(SO_4)_2 - (NH_4)_2S_2O_8 - KMnO_4$.

k Dimethylglyoxime precipitate ignited to NiO.

l Perchloric acid oxidation, $Fe(NH_4)_2(SO_4)_2 - KMnO_4$.

m Mercury cathode separation, $Fe(NH_4)_2(SO_4)_2 - KMnO_4$.

n Spectrophotometric.

o Dimethylglyoxime precipitate titrated with cyanide.

p Chromium oxidation with persulfate, titration with ferrous ammonium sulfate.

q Vanadium oxidation with HNO_3 , titration with ferrous ammonium sulfate.

The material for this standard was prepared by the Carpenter Technology Corporation, Reading, Pennsylvania.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of O. Menis and J. I. Shultz.

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 R. E. Michaelis.

Lists of Analysts

1. S. A. Wicks and R. K. Bell, Analytical Chemistry Division, Institute for Materials Research, National Bureau of Standards.
2. Mary Lou Harmon, Jones and Laughlin Steel Corporation, Pittsburgh, Pennsylvania.
3. R. G. Cover, The Timken Company, Canton, Ohio.
4. R. Knauer, A. E. Paulus and C. J. Yoder, Armco Steel Corporation, Baltimore, Maryland.