



Certificate of Analysis

Standard Reference Material 14e

Basic Open-Hearth Steel, 0.8% Carbon

ANALYST	C	Mn	P	S	Si	Cu	Ni	Cr	V	Mo	Al
	Direct combustion	Persulfate-Arsenite	Photometric	Combustion Iodate titration	Perchloric acid dehydration	Photometric	Weighed as nickel dimethylglyoxime	FeSO ₄ -KMnO ₄ titration		Photometric	
1.....	0.753	0.409	{ 0.010 a.007 }	^b 0.036	^c 0.177	^d 0.077	0.053	^e 0.073	^f 0.001	0.013	^g 0.061
2.....	^h .755	ⁱ .405	^j .008	^k .038	^l .176	^m .080	.053	.074	ⁿ .001	.012	^o .061
.....	.753	^p .402	^q .007	^r .040	.179	^s .069	^t .051	^u .070	^v .001	.011	^w .060
4.....	.752	^x .401	^y .007	^z .039	.178	^{aa} .074	.058	{ ^{ab} .069 ^{ac} .067 }	^{ad} .003	.015	^{ae} .060
5.....	^{af} .752	.401	.007	.041	.176	{ ^{ag} .069 ^{ah} .065 }	{ ^{ai} .053 ^{aj} .050 }	{ ^{ak} .071 ^{al} .072 }	{ ^{am} .002 ^{an} .003 }	.012	^{ao} .060
Average.....	0.753	0.404	0.008	0.039	0.177	0.072	0.053	0.071	0.002	0.013	0.060

^a Gravimetric method (weighed as Mg₂P₂O₇ after removal of arsenic).

^b 1-g sample burned in oxygen at 1,425 °C and sulfur dioxide absorbed in starch-iodide solution. Iodine is liberated from iodide by titration, during the combustion, with standard KIO₃ solution. The titer is based on 93 percent of the theoretical factor.

^c Double dehydration with intervening filtration.
^d Diethyldithiocarbamate photometric method. See J. Res. NBS 47, 380 (1951) RP2265.

^e Chromium separated from the bulk of the iron in a 10-g sample by hydrolytic precipitation with NaHCO₃, oxidized with persulfate, and titrated potentiometrically with ferrous ammonium sulfate.

^f Vanadium separated as in (e), oxidized with HNO₃, and titrated potentiometrically with ferrous ammonium sulfate.

^g Mercury cathode-cupferron-aluminon photometric method. See J. Res. NBS 64A (Phys. and Chem.) No. 3, 235 (1960).

^h Differential gasometric method.

ⁱ Titrating solution standardized with a standard steel.

^j Alkali-molybdate method.

^k Neocuproine photometric method.

^l Mercury cathode separation. Vanadium oxidized with HNO₃, and titrated with ferrous ammonium sulfate.

^m Mercury cathode-cupferron-8 hydroxyquinoline.

ⁿ Sodium bismuthate oxidation, potentiometric titration with HgNO₃.

^o Copper precipitated with Na₂S₂O₃ and finished by electrolysis.

^p Dimethylglyoxime precipitate titrated with cyanide.

^q Persulfate oxidation, and potentiometric titration with ferrous ammonium sulfate.

^r Nitric acid oxidation, and potentiometric titration with ferrous ammonium sulfate.

^s Mercury cathode-cupferron-aluminon photometric method.

^t Ammonium molybdate color complex extracted into isobutyl alcohol.

^u Copper-ammonia complex photometric method.

^v Chromate photometric method.

^w Chromium separated from the bulk of the iron in a 10-g sample by ether extraction, oxidized with HClO₄, and titrated with FeSO₄-KMnO₄.

^x Ether-cupferron-NH₄OH-Al₂O₃.

^y Thermal conductivity method.
^z Diethyldithiocarbamate photometric method.

^{aa} Na₂S₂O₃-CuS-KI-Na₂S₂O₃ titration.

^{ab} Photometric method.

^{ac} Diphenylcarbazide photometric method.

^{ad} FeSO₄-(NH₄)₂S₂O₈-KMnO₄ method.

^{ae} Aluminon photometric method.

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The steel for the preparation of this standard was furnished by the Bethlehem Steel Co.

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