

# Bureau of Standards

## Certificate of Analysis

### OF STANDARD SAMPLE No. 14 b BASIC OPEN-HEARTH STEEL, 0.8% CARBON

ANALYST.*	C	Mn		P		S		Si	COPPER. H <sub>2</sub> S-CuS-CuO.	NICKEL. Weighted as nickel dimethylglyoxime.	CHROMIUM. FeSO <sub>4</sub> -KMnO <sub>4</sub> titration.	VANADIUM.	MOLYBDENUM.	ARSENIC.
	CARBON. Direct combustion.	MANGANESE 1. Bismuthate (FeSO <sub>4</sub> -KMnO <sub>4</sub> ). 2. Other methods.	PHOSPHORUS. 1. Alkali-Molybdate. 2. Gravimetric (Weighted as Mg <sub>3</sub> P <sub>2</sub> O <sub>7</sub> after removal of arsenic).	1. Sulphur. Gravimetric (Direct oxidation and final precipitation in reduced solution). 2. Sulphur. ZnS-Evolution iodine (theoretical sulphur titre <sup>e</sup> ).	SILICON. Sulphuric acid dehydration.									
1	.818	.489	.495 <sup>b</sup>	.008	.007	.030 <sup>o</sup> .029	.030	.008	.017	.077	.022	<.001	.008	.011 <sup>d</sup> .010 <sup>e</sup>
2	.819	.483		.008	.008	.029 <sup>o</sup> .030 <sup>f</sup>	.031	.008	.015	.072	.02 <sup>g</sup>	not detected <sup>h</sup>	.008	.012 <sup>d</sup>
3	.819		.488 <sup>i</sup>	.008		.030		.011	.014 <sup>j</sup>	.089 <sup>j</sup>	.022 <sup>j</sup>			
4	.814	.49	.50 <sup>k</sup>	.008		.032	.032	.010	.016	.074 <sup>l</sup> .070	.01			
5	.82	.496	.50 <sup>k</sup>	.007		.032	.032	.010 <sup>m</sup> .010	.018 <sup>n</sup>	.073 <sup>l</sup>	.016			
6	.814	.50	.50 <sup>k</sup>	.009		.032	.031	.008	.02					
7	.807	.483		.006		.032	.033	.009	.018					
8	.81	.49		.007	.007	.032 <sup>o</sup>	.031	.007	.013	.07				
9	.819	.488	.48 <sup>k</sup>	.008		.031 <sup>o</sup> .030		.009	.019	.074				
10	.819		.497 <sup>b</sup>	.009		.031 <sup>o</sup>		.009	.018 <sup>n</sup> .018					
11	.80 <sup>p</sup> .825	.495	.49 <sup>k</sup>	.007		.033	.031	.008	.02					
12	.829	.491	.498 <sup>q</sup>	.009		.032	.026	.009	.014	.059	.016	none.	trace.	
13	.81	.51		.007		.031	.028			.08		none.		.015 <sup>r</sup>
AVERAGES.....	.817	.492	.494	.008	.007	.031	.031	.009	.017	.074	.018		.008	.012
General Averages...	.817	.493		.008		.031	.031	.009	.017	.074	.018		.008	.012

NOTE.—By the use of methods employing empirical titres for evolution sulphur, an average of 0.031 per cent was obtained by seven analysts.

<sup>a</sup> Value obtained by standardization of titrating solution against sodium oxalate through KMnO<sub>4</sub> and Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>.  
<sup>b</sup> Bismuthate-Arsenite.  
<sup>c</sup> Meinelke's Method.  
<sup>d</sup> Weighed as As<sub>2</sub>S<sub>3</sub>.  
<sup>e</sup> Converted the sulphide to arsenate, precipitated as Ag<sub>3</sub>AsO<sub>4</sub>, dissolved in HNO<sub>3</sub>, and titrated with KCNS.

<sup>f</sup> Obtained 0.028 per cent by precipitation in FeCl<sub>3</sub> solution.  
<sup>g</sup> Electrometric titration.  
<sup>h</sup> Test sensitive to 0.0005 per cent vanadium.  
<sup>i</sup> PbO<sub>2</sub>-Arsenite.  
<sup>j</sup> Johnson's Method.  
<sup>k</sup> Persulphate-Arsenite.  
<sup>l</sup> Dissolved the glyoxime precipitate and finished with KCN titration.

<sup>m</sup> HCl dehydration.  
<sup>n</sup> Finished by electrolysis.  
<sup>o</sup> Precipitated in FeCl<sub>3</sub> solution.  
<sup>p</sup> Colorimetric—Omitted from the average.  
<sup>q</sup> Ford Williams.  
<sup>r</sup> Distillation as AsCl<sub>3</sub> and iodine titration.

### \* INDEX TO ANALYSTS

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This standard is not recommended for colorimetric carbon determinations, because of uncertainty as to the condition of the carbon.

Washington, D. C.

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Director.