Certificate of Certified Reference Material

NCS HC 28633--28634

Ferrovanadium

Reissued in 2017

Approved by China National Analysis Center for Iron and Steel

(Beijing China)

This Certified Reference Materials is prepared in accordance with the ISO guides 30-35. The intended use for these CRM is for the quality control in Ferrovanadium analysis, the evaluating methods of analysis and the calibration of analytical instruments.

Certified Values and extended uncertainty (%)

No.		V	C	Si	Mn	P	S	Cr
NCS HC	Certified Values	54.02	0.285	0.682	0.663	0.056	0.0044	0.110
28633	Extended uncertainty	0.09	0.006	0.006	0.007	0.003	0.0004	0.004
NCS HC	Certified Values	47.32	0.475	1.89	0.365	0.093	0.014	0.289
28634	Extended uncertainty	0.07	0.007	0.03	0.007	0.003	0.002	0.005
No.		Ni	Cu	Al	As	Pb	Ca	
NCS HC	Certified Values	0.011	0.054	0.0026	0.0017	0.0006	0.022	
28633	Extended uncertainty	0.001	0.003	0.0003	0.0002	0.0001	0.001	
NCS HC	Certified Values	0.067	0.064	0.0061	0.024	0.0004	0.115	
28634	Extended uncertainty	0.003	0.003	0.0008	0.003	0.0001	0.004	

Note:

Extended Uncertainty: $U=ku_{\mathrm{CRM}}$; $u_{CRM}=\sqrt{u_{char}^2+u_{bb}^2+u_{lts}^2+u_{sts}^2}$; $u_{char}=s/\sqrt{n}$

U_{CRM} combined uncertainty; U_{bb} between bottle uncertainty;
Ults long time stability uncertainty, neglectable;
Usts short time stability uncertainty, neglectable;
Uchar standard uncertainty of analysis;
s standard deviation;
n number of data;
k=3 cover factor;

1. 8 independent laboratories take part in the analysis work.
2. The sample is powder packed in glass bottle.
   The minimum package is 50 grams. The minimum for analysis is 0.2g.
   The sample should be stored at dry and dark place.
3. The valid time of the sample is 10 years, although we reserve the right to make change as issue revisions.

Analytical Methods

Element	Analytical method
V	Titrimetric method
C	The gasometric method; Infrared absorption method
Mn	Potassium periodate photometric method; ICP-AES
Si	Gravimetric method after dehydration with perchloric acid; Molybdenum blue photometric method; ICP-AES
P	ICP-AES; Phosphorus-molybdenum blue photometric method; Bismuth-phosphorus-molybdenum blue photometric method
S	Infrared absorption method, Combustion-titrimetric method; ICP-AES
Cr	Sodium carbonate separation-diphenylcarbazide photometric method; ICP-AES
Ni	Dimethylglyoxime photometric method; ICP-AES
Cu	BCO photometric method; ICP-AES; FAAS method
Al	Chrome azurol S photometric method; ICP-AES; ICP-MS
As	HG-ICP; Molybdenum blue photometric method after distillation; ICP-AES; ICP-MS
Pb	ICP-AES, ICP-MS; ICP-AES after sediment separation; GFAAS after sediment separation
Ca	ICP-AES; FAAS

Statement:

This material is used only in labs and for analysis work, producer will be not responsible for any problem caused by misuse or not properly store.

Please check carefully the package, quantity and type of the material after receiving it. Related compensation is only limited in the certified materials, any other losses will be not included.

Jia Yunhai
Laboratory Director