



Certificate of Certified Reference Material

NCS DC 28041----DC28045

Manganese Ore

Issued in 2009

Approved by China National Analysis Center for Iron and Steel

(Beijing China)

These Certified Reference Materials are prepared in accordance with the ISO guides 30-35. The intended use for these CRMs are for the quality control in manganese ore analysis, the evaluating methods of analysis and the calibration of analytical instruments.

Certified Values and Uncertainty

(%)											
No.		TMn	MnO ₂	TFe	SiO ₂	Al ₂ O ₃	CaO	MgO	TiO ₂	BaO	K ₂ O
NCS DC	Certified Value	14.45	20.66	0.85	56.03	8.25	2.07	0.60	0.177	0.064	3.74
28041	Uncertainty	0.05	0.05	0.01	0.08	0.06	0.03	0.02	0.005	0.003	0.05
NCS DC	Certified Value	22.18	18.35	10.62	24.73	2.80	6.20	3.14	0.123	0.164	0.83
28042	Uncertainty	0.08	0.08	0.07	0.07	0.05	0.06	0.04	0.006	0.005	0.02
NCS DC	Certified Value	30.99	45.61	10.68	17.30	6.40	1.15	0.70	0.215	1.11	0.65
28043	Uncertainty	0.08	0.08	0.07	0.06	0.05	0.01	0.01	0.005	0.01	0.02
NCS DC	Certified Value	36.31	45.02	6.90	17.70	2.08	3.30	1.29	0.085	0.410	0.49
28044	Uncertainty	0.09	0.08	0.06	0.06	0.03	0.06	0.04	0.003	0.006	0.02
NCS DC	Certified Value	44.97	67.67	2.75	16.00	2.35	0.195	0.182	0.105	0.058	1.48
28045	Uncertainty	0.06	0.06	0.04	0.07	0.04	0.005	0.005	0.003	0.002	0.02
No.		Na ₂ O	Cr	Ni	Cu	V	P	Pb	As	Zn	S
NCS DC	Certified Value	0.48					0.011	0.0025	0.013	0.015	0.012
28041	Uncertainty	0.02					0.002	0.0004	0.002	0.002	0.002
NCS DC	Certified Value	0.049	0.0023	0.0044	0.0071	0.0044	0.074	0.0066	0.032	0.012	0.044
28042	Uncertainty	0.003	0.0002	0.0003	0.0004	0.0002	0.004	0.0005	0.003	0.002	0.003
NCS DC	Certified Value	0.058	0.013	0.083	0.015	0.019	0.171	0.110	0.089	0.235	0.100
28043	Uncertainty	0.002	0.002	0.002	0.001	0.001	0.005	0.005	0.002	0.007	0.004
NCS DC	Certified Value	0.076	0.0018	0.010	0.0086	0.0075	0.105	0.0083	0.039	0.027	0.021
28044	Uncertainty	0.004	0.0006	0.002	0.0004	0.0004	0.003	0.0002	0.002	0.003	0.002
NCS DC	Certified Value	0.034	0.038	0.079	0.022	0.018	0.230	0.011	0.042	0.070	0.0086
28045	Uncertainty	0.003	0.002	0.003	0.001	0.002	0.005	0.001	0.003	0.002	0.0005

Note:

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

U_{CRM} combined uncertainty; U_{bb} between bottle uncertainty;

U_{lts} long time stability uncertainty, neglectable;

U_{sts} short time stability uncertainty, neglectable;

U_{char} standard uncertainty of analysis;

s standard deviation;
n number of data; (n=8)
k cover factor; (k=3)

1. Each certified value is the mean of analytical results of 8 independent laboratories.
2. The sample is powder with size 160 mesh packed in glass bottle.
Each bottle contains 80 grams.
The minimum weight for analysis Al_2O_3 , TFe, CaO, MgO, SiO_2 , TiO_2 , BaO, K_2O , Na_2O : 0.1 g, S: 0.25 g, others 0.2 g.
3. The sample should be stored at clean and dry place.
4. The sample should be stored at 105°C for 1 hour.
5. The valid time of the sample is 10 years, although we reserve the right to make change as issue revisions.

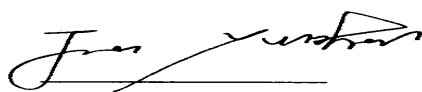
Analytical Methods

Element	Methods
TMn	Potentiometric method; Ammonium ferrous sulfate titrimetric method
MnO ₂	Potentiometric method; Ammonium ferrous sulfate titrimetric method; Permanganate photometric method
TFe	ICP-ASE method; Orthophenanthroline photometric method
SiO ₂	The perchloric acid dehydration-gravimetric method
Al ₂ O ₃	EDTA titrimetric method; ICP-ASE method
CaO	Atomic absorption spectrometry; EDTA titrimetric method; ICP-ASE method
MgO	EDTA titrimetric method; Atomic absorption spectrometry; ICP-ASE method
TiO ₂	Dianthipyrylmethane colorimetric method; ICP-ASE method
BaO	Barium sulfate gravimetric method; ICP-ASE method
K ₂ O	Atomic absorption spectrometry; ICP-ASE method
Na ₂ O	Atomic absorption spectrometry; ICP-ASE method
Cr	ICP-ASE method; Diphenylcarbazide photometric method
Ni	Dimethylglyoxime gravimetric method; ICP-ASE method
Cu	Atomic absorption spectrometry; ICP-ASE method
V	ICP-ASE method; The N-benzoyl-N-phenylhydroxylamine photometric method
P	ICP-ASE method; The n-butyric alcohol-trichloromethane extraction photometric method
Pb	Atomic absorption spectrometry; ICP-ASE method
As	Photometric method after extraction separation with 4-methyl-2-pentanone; ICP-ASE method; FAAS method; HG- ICP-ASE method
Zn	Atomic absorption spectrometry; ICP-ASE method
S	Infrared absorption method; The combustion-potassium iodate volumetric method

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.



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Laboratory Director