Certificate of Certified Reference Material

NCS DC 78302

Tibet Soil

Reissued in 2013

Approved by China National Analysis Center for Iron and Steel

(Beijing　China)

Certified Values and Uncertainty

NCS DC78302	Chemical Composition (μg/g)						
	Al*	As	Be	Ca*	Cd	Co	Ce
Certified Values	7.11±0.12	3.8±0.7	2.96±0.08	2.59±0.04	0.081±0.015	13.1±1.1	83.6±3.3
Standard Deviation	0.06	0.4	0.04	0.02	0.008	0.6	1.7
	Cr	Cu	Eu	Fe*	K*	La	Mg*
Certified Values	60.8±3.6	24.6±2.8	1.4±0.3	3.34±0.11	2.12±0.18	41.9±4.0	1.53±0.04
Standard Deviation	1.8	1.4	0.2	0.6	0.09	2.0	0.02
	Mn	Na*	N*	Nd	Ni	P*	Pb
Certified Values	677±23	1.52±0.11	0.128±0.003	42.3±4.8	31.1±1.6	0.86±0.08	14.2±2.7
Standard Deviation	12	0.06	0.002	2.4	0.8	0.04	1.4
	Rb	Sc	Si*	Sm	Sr	Th	Ti*
Certified Values	135±14	10.8±1.5	30.57±0.11	7.1±0.5	163±29	17.6±0.7	0.40±0.03
Standard Deviation	7	0.8	0.06	0.3	15	0.4	0.02
	U	V	Zn	Yb	Se	Ba	Br
Certified Values	3.84±0.40	77.5±8.0	58.0±6.6	3.1±0.6	0.16±0.04	(509)	(1.3)
Standard Deviation	0.20	4.0	3.3	0.3	0.02		
	Cs	Dy	Hf	Hg	Lu	Sb	Ta
Certified Values	(7.3)	(5)	(7.3)	(0.018)	(0.48)	(0.4)	(1.1)
Standard Deviation							
	Tb	B**	Ga**	In**	Mo**	Pr**	W**
Certified Values	(0.9)	(25)	(13)	(0.06)	(0.8)	(9)	(3.5)
Standard Deviation							
	Er**	Y**					
Certified Values	(239)	(25)					
Standard Deviation							

Note:

1. * means major element(in percent).The value in () is for reference only.
   ** means the result of one laboratory using one method.
2. Certified values are calculated according to analytical results of 11 independent laboratories.
3. The sample is powder packed in glass bottle. The minimum package is 15 grams.
4. The sample should be stored in drier.
5. The sample should be stoved at 105°C for 4 to 6 hours before using.
6. The minimum quantity for analysis is 250 mg.
7. The volatile element should be determined before stoving and then delete lose weight of water.

Analytical Methods

Al	ICP VOL GRA XRF	Th	INAA IDSSMS
As	AAS AFS ICP INAA POL SP	Ti	ICP XRF INAA POL SP
Be	AAS ICP OES GRA	U	INAA IDSSMS
Ca	AAS ICP INAA VOL XRF	V	ICP INAA SP
Cd	AAS POL	Yb	INAA IDSSMS
Co	AAS ICP INAA SP	Zn	AAS ICP
Ce	INAA IDSSMS	Ba	AAS ICP OES INAA IDSSMS
Cr	AAS ICP INAA	Br	INAA
Cu	AAS ICP OES INAA IDSSMS POL SP	Cs	INAA
Eu	INAA IDSSMS	Dy	INAA
Fe	AAS ICP INAA SP VOL XRF	Hf	INAA
K	AAS ICP INAA ISE XRF	Hg	AAS MIP
La	INAA IDSSMS	Lu	INAA
Mg	AAS ICP VOL XRF	Sb	INAA
Mn	AAS ICP INAA SP XRF	Ta	INAA
Na	AAS ICP INAA XRF	Tb	INAA
Nd	INAA IDSSMS	Se	AAS AFS IGC
Ni	AAS ICP OES	Sc	ICP INAA
N	Kj VOL	Si	XRF VOL GRA
P	POL SP XRF	Sm	ICP INAA
Pb	AAS OES ICSSMS RIDS POL	Sr	AAS ICP XRF INAA IDSSMS
Rb	INAA XRF	B	ICP
Ga	ICP	In	INAA
Mo	POL	Pr	IDSSMS
W	INAA	Y	ICP

Note:

AAS: Atomic Absorption Spectrometry
AFS: Atomic Fluorescence Spectrometry
ICP: Inductively Coupled Plasma emisson spectrometry
MIP: Microwave Induced Plasma spectrometry
OES: Optical Emisson Spectrometry
XRF: X-Ray Flurescence
INAA: Instrumental Neutron Activation Analysis
IDSSMS: Isotope Dilution Spark Source Mass Spectrometry
RIDS: Radioisotope-Dilution Stoichiometry
POL: Polarography
SP: Spectrophotometry
VOL: Volumetry
GRA: Gravimetry
IGC: Inorganic Gas Chromatography
ISE: Ion Selective Electrode
Kj: Kjeldahl method for nitrogen

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