

CENTRAL GEOLOGICAL LABORATORY

CERTIFIED REFERENCE MATERIAL

CERTIFICATE OF ANALYSIS

USZ 27-99			
Iron ore "TTH"			
Element	Mass fraction (based on dry mass at 105°C)		Number of accepted sets of results p
	Certified value ⁽¹⁾ expressed as cg.g ⁻¹	95% confidence interval ⁽²⁾ expressed as cg.g ⁻¹	
SiO ₂	3.37	0.11	17
TiO ₂	0.101	0.008	10
Al ₂ O ₃	1.37	0.13	20
ΣFe	62.20	0.20	22
FeO	21.06	0.22	7
CaO	0.56	0.05	13
MgO	2.78	0.08	17
MnO	0.105	0.006	18
K ₂ O	0.07	0.01	9
SO ₃	7.14	0.30	11
Cu	0.030	0.006	11
Ni	0.008	0.001	8
Co	0.013	0.001	9

⁽¹⁾ This value is the unweighted mean of p accepted sets of results.
⁽²⁾ The 95% confidence interval is a measure of the uncertainty and is acceptable when the reference material is used for calibration purposes.

DESCRIPTION OF THE SAMPLE

The material is a reference material taken from the Tomortei iron ore deposit in the Selenge area of Mongolia. The material consists of a homogeneous powder (particles have passed a sieve with apertures smaller than 63 μm).

The material contains the following minerals expressed as cg.g⁻¹:

Magnetite:	64.9	Martite:	1.1
Hydrous ferric oxide:	2.5	Serpentine:	17.8
Pyrite:	0.3	Calcite:	7.3
Pyrrhotite:	0.4	Chlorite:	1.0

Chalcopyrite:	0.1	Plagioclase:	3.5
Monocline, pyroxene, amphibole:			0.8
Sericite-muscovite, tremolite, aqbitmolite, epidote, ilmenite, biotite, leucoxene, malachite, chalcocite:			0.3

Additional information is presented in the Annex.

INSTRUCTION FOR USE, STORAGE AND TRANSPORTATION

The recommended minimum sample intake is 100 mg. If there is a need of sample intake below 100 mg for an analytical method (e.g. the optic emission spectrometry), weigh more than 100 mg and mix in an agate mortar. Then weigh necessary weight.

Taken portions should not be poured back in a bottle as it may contaminate the material.

The reference material is stored in a polyethylene bottle of 100 g. The bottle should be stored preferably in a dry place at the room temperature, protected from an effect of chemical reagents.

The reference material can be transported by any kind of transport means. The duration of production is 1994-1999. Duration of use is 20 years.

PARTICIPATING LABORATORIES

Preparation, homogeneity and stability testing:

- Central Geological laboratory

Certification analyses:

- Methods, Standardization, Control and Metrology Laboratory of the Central Geological Laboratory, Ulaanbaatar, Mongolia
- Chemistry Laboratory of the Central Geological Laboratory, Ulaanbaatar, Mongolia
- Physical Methods Laboratory of the Central Geological Laboratory, Ulaanbaatar, Mongolia
- National Center for Standardization and Metrology, Ulaanbaatar, Mongolia
- Chemistry Laboratory of the Mongolian-Soviet joint venture "Erdenet" Concentrator, Erdenet, Mongolia
- "Amdel" Laboratories, Ltd, Australia
- "Shimadzu" Corporation, Analytical group, Kyoto, Japan
- Geological Survey of Japan, Tsukuba, Japan
- Federal Institute for Geoscience and Natural Resources, Hannover, Germany

METHODS USED

Methods of final determination were:

- gravimetric (SiO₂, SO₃, LoI, H₂O)
- volumetric (Al₂O₃, ΣFe, FeO, CaO, MgO, CO₂)
- photometry (SiO₂, TiO₂, Al₂O₃, ΣFe, P₂O₅, MnO₂)
- flame photometry (K₂O, Na₂O)
- Atomic absorption spectrometry (MgO, MnO, K₂O, Na₂O, Cu, Zn, Ni, Co)
- X-ray fluorescence spectrometry (SiO₂, TiO₂, Al₂O₃, FeO, CaO, MgO, MnO, K₂O, Na₂O, P₂O₅, SO₃, Cu, Zn, Ni, Co)
- ICP-spectrometry (SiO₂, Al₂O₃, ΣFe, CaO, MgO, MnO, P₂O₅)

LEGAL NOTICE

This reference material was confirmed and given the number USZ 27-99 by the National Center for Standardization and Metrology.

NOTE

A detailed technical report on the analysis procedure and the treatment of the analytical data is supplied with each sample.

ANNEX

Additional information (not certified) on various contents is presented here. The data are mean values of various sets of results obtained by various techniques in various laboratories.

Element	Mass fraction expressed as cg.g ⁻¹		Number of individual sets
	Content	Standard deviation	
Na ₂ O	0.04	0.02	7
P ₂ O ₅	0.016	0.005	13
LoI	1.46	0.22	7
H ₂ O	0.25	0.05	8
Zn	0.013	0.011	6