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Reference Material Report

AMIS0865

Reference Material

Blank Silica Powder

Reference Material Report

AMIS

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Summary Statistics

Informational Values

Analyte	Method	⁷ Mean	⁹ ±Two Standard deviation (2s)	¹⁰ % RSD	Unit
Ag	¹ 4A_MICP	¹¹ Und.	Und.	Und.	ppm
Al	4A_MICP	3636	273	4	ppm
As	4A_MICP	0.8	0.2	14	ppm
Au	² NiS	3	¹² #4	56	ppb
Ba	4A_MICP	22	1	3	ppm
Be	4A_MICP	0.08	0.02	12	ppm
Bi	4A_MICP	0.05	0.03	26	ppm
C	³ Combustion/LECO	0.02	0.01	30	%
Ca	4A_MICP	290	90	15	ppm
Cd	4A_MICP	0.02	Und.	Und.	ppm
Ce	4A_MICP	9	0.8	4	ppm
Co	4A_MICP	0.5	0.1	12	ppm
Cr	4A_MICP	23	2	4	ppm
Cs	4A_MICP	0.3	0.05	9	ppm
Cu	4A_MICP	2	0.6	13	ppm
Fe	4A_MICP	0.03	0.005	8	%
Ga	4A_MICP	0.6	0.07	6	ppm
Ge	4A_MICP	0.8	0.1	8	ppm
Hf	4A_MICP	0.8	0.07	4	ppm
In	4A_MICP	Und.	Und.	Und.	ppm
Ir	NiS	2	2	36	ppb
K	4A_MICP	1796	151	4	ppm
La	4A_MICP	6	0.4	4	ppm
Li	4A_MICP	0.8	0.1	6	ppm
LOI	⁴ LOI	0.2	0.04	9	%
Mg	4A_MICP	252	38	8	ppm
Mn	4A_MICP	13	3	11	ppm
Mo	4A_MICP	0.3	0.1	27	ppm
Na	4A_MICP	113	23	10	ppm
Nb	4A_MICP	0.6	0.1	11	ppm
Ni	4A_MICP	1	0.4	13	ppm
Os	NiS	2	1	31	ppb
P	4A_MICP	Und.	Und.	Und.	ppm
Pb	4A_MICP	2	0.3	9	ppm
Pd	NiS	4	#7	93	ppb
Pt	NiS	7	#15	105	ppb
Rb	4A_MICP	7	0.9	6	ppm
Re	4A_MICP	Und.	Und.	Und.	ppm
Rh	NiS	3	3	63	ppb
Ru	NiS	4	#7	84	ppb
S	4A_MICP	Und.	Und.	Und.	%
S	Combustion/LECO	Und.	Und.	Und.	%
Sb	4A_MICP	0.1	0.03	14	ppm
Sc	4A_MICP	0.8	0.1	6	ppm
Se	4A_MICP	Und.	Und.	Und.	ppm
SG	⁵ SG	3	0.05	0.9	No unit
Sn	4A_MICP	0.2	*	*	ppm
Sr	4A_MICP	3	0.3	5	ppm
Ta	4A_MICP	0.08	0.03	18	ppm
Te	4A_MICP	Und.	Und.	Und.	ppm
Th	4A_MICP	2	0.2	3	ppm
Ti	4A_MICP	138	24	9	ppm
Tl	4A_MICP	0.06	0.009	8	ppm
U	4A_MICP	0.7	0.09	6	ppm
V	4A_MICP	5	0.9	9	ppm
W	4A_MICP	0.3	0.2	33	ppm
Y	4A_MICP	2	0.2	4	ppm
Zn	4A_MICP	2	1	34	ppm
Zr	4A_MICP	29	3	5	ppm

Major Oxides
Informational Major Oxides Values

Analyte	Method	⁷ Mean	⁹ ±Two Standard deviation (2s)	¹⁰ % RSD	Unit
Al ₂ O ₃	⁶ XRF	0.7	0.06	4	%
CaO	XRF	0.04	0.01	16	%
Cr ₂ O ₃	XRF	Und.	Und.	Und.	%
Fe ₂ O ₃	XRF	0.03	0.01	20	%
K ₂ O	XRF	0.2	0.02	4	%
MgO	XRF	0.03	0.01	16	%
MnO	XRF	Und.	Und.	Und.	%
Na ₂ O	XRF	0.02	0.009	26	%
P ₂ O ₅	XRF	0.005	0.001	16	%
SiO ₂	XRF	98.66	0.35	0.2	%
SO ₃	XRF	Und.	Und.	Und.	%
TiO ₂	XRF	0.03	<0.00001	<0.00001	%

1. Mean Concentrations and Uncertainties

AMIS0865 is a new reference material and developed in September 2022. Table 1 shows the recommended concentrations, Standard Deviations, Two Standard deviations, and Relative Standard Deviation. Table 2 shows the recommended concentrations, Standard Deviations, Two Standard deviations, and Relative Standard Deviation for Oxides.

Table 1. Recommended concentrations, Standard Deviations, Two Standard deviations and Relative Stand Deviation.

Analyte	Method	⁷ Mean	⁸ ±Standard deviation (s)	⁹ ±Two Standard deviation (2s)	¹⁰ % RSD	Unit
Ag	¹ 4A_MICP	¹¹ Und.	Und.	Und.	Und.	ppm
Al	4A_MICP	3636	137	273	4	ppm
As	4A_MICP	0.8	0.1	0.2	14	ppm
Au	² NiS	3	2	¹² #4	56	ppb
Ba	4A_MICP	22	0.7	1	3	ppm
Be	4A_MICP	0.08	0.009	0.02	12	ppm
Bi	4A_MICP	0.05	0.01	0.03	26	ppm
C	³ Combustion/LECO	0.02	0.005	0.01	30	%
Ca	4A_MICP	290	45	90	15	ppm
Cd	4A_MICP	0.02	Und.	Und.	Und.	ppm
Ce	4A_MICP	9	0.4	0.8	4	ppm
Co	4A_MICP	0.5	0.06	0.1	12	ppm
Cr	4A_MICP	23	0.9	2	4	ppm
Cs	4A_MICP	0.3	0.02	0.05	9	ppm
Cu	4A_MICP	2	0.3	0.6	13	ppm
Fe	4A_MICP	0.03	0.003	0.005	8	%
Ga	4A_MICP	0.6	0.04	0.07	6	ppm
Ge	4A_MICP	0.8	0.06	0.1	8	ppm
Hf	4A_MICP	0.8	0.04	0.07	4	ppm
In	4A_MICP	Und.	Und.	Und.	Und.	ppm
Ir	NiS	2	0.9	2	36	ppb
K	4A_MICP	1796	75	151	4	ppm
La	4A_MICP	6	0.2	0.4	4	ppm
Li	4A_MICP	0.8	0.05	0.1	6	ppm
LOI	⁴ LOI	0.2	0.02	0.04	9	%
Mg	4A_MICP	252	19	38	8	ppm
Mn	4A_MICP	13	1	3	11	ppm
Mo	4A_MICP	0.3	0.07	0.1	27	ppm
Na	4A_MICP	113	12	23	10	ppm
Nb	4A_MICP	0.6	0.07	0.1	11	ppm
Ni	4A_MICP	1	0.2	0.4	13	ppm
Os	NiS	2	0.5	1	31	ppb
P	4A_MICP	Und.	Und.	Und.	Und.	ppm
Pb	4A_MICP	2	0.1	0.3	9	ppm
Pd	NiS	4	4	#7	93	ppb
Pt	NiS	7	7	#15	105	ppb
Rb	4A_MICP	7	0.4	0.9	6	ppm
Re	4A_MICP	Und.	Und.	Und.	Und.	ppm
Rh	NiS	3	2	3	63	ppb
Ru	NiS	4	4	#7	84	ppb
S	4A_MICP	Und.	Und.	Und.	Und.	%
S	Combustion/LECO	Und.	Und.	Und.	Und.	%
Sb	4A_MICP	0.1	0.02	0.03	14	ppm
Sc	4A_MICP	0.8	0.05	0.1	6	ppm
Se	4A_MICP	Und.	Und.	Und.	Und.	ppm
SG	⁵ SG	3	0.02	0.05	0.9	No unit
Sn	4A_MICP	0.2	¹³ *	*	*	ppm
Sr	4A_MICP	3	0.2	0.3	5	ppm
Ta	4A_MICP	0.08	0.01	0.03	18	ppm
Te	4A_MICP	Und.	Und.	Und.	Und.	ppm
Th	4A_MICP	2	0.08	0.2	3	ppm
Ti	4A_MICP	138	12	24	9	ppm
Tl	4A_MICP	0.06	0.004	0.009	8	ppm
U	4A_MICP	0.7	0.04	0.09	6	ppm
V	4A_MICP	5	0.4	0.9	9	ppm
W	4A_MICP	0.3	0.1	0.2	33	ppm
Y	4A_MICP	2	0.08	0.2	4	ppm
Zn	4A_MICP	2	0.6	1	34	ppm

Analyte	Method	⁷ Mean	⁸ ±Standard deviation (s)	⁹ ±Two Standard deviation (2s)	¹⁰ % RSD	Unit
Zr	4A_MICP	29	1	3	5	ppm

Table 2. Recommended concentrations, Standard Deviations, Two Standard deviations and Relative Stand Deviation for oxides

Analyte	Method	⁷ Mean	⁸ ±Standard deviation (s)	⁹ ±Two Standard deviation (2s)	¹⁰ % RSD	Unit
Al ₂ O ₃	⁶ XRF	0.7	0.03	0.06	4	%
CaO	XRF	0.04	0.006	0.01	16	%
Cr ₂ O ₃	XRF	Und.	Und.	Und.	Und.	%
Fe ₂ O ₃	XRF	0.03	0.007	0.01	20	%
K ₂ O	XRF	0.2	0.008	0.02	4	%
MgO	XRF	0.03	0.005	0.01	16	%
MnO	XRF	Und.	Und.	Und.	Und.	%
Na ₂ O	XRF	0.02	0.004	0.009	26	%
P ₂ O ₅	XRF	0.005	0.0007	0.001	16	%
SiO ₂	XRF	98.66	0.18	0.35	0.2	%
SO ₃	XRF	Und.	Und.	Und.	Und.	%
TiO ₂	XRF	0.03	<0.00001	<0.00001	<0.00001	%

1. 4A_MICP is a Four-acid digestion with either ICPOES/ICPMS/AAS finish
2. NiS is Nickel Sulphide
3. Combustion/LECO
4. LOI is Loss On Ignition
5. SG is Specific Gravity
6. XRF is X-ray Fluorescence
7. Mean is the average of results received
8. Standard Deviation (s)
9. Two standard deviations (2s)
10. % RSD is Relative Standard Deviation in percentage
11. Und. is not detected
12. # denotes 2s>Mean. AMIS doesn't suggest that this value should be used by the laboratory
13. * denotes that the results were too similar and SD and RSD% could not be calculated

2. Intended Use

AMIS0865 is a Reference Material, fit for use as a control sample in routine assay laboratory quality control when inserted within runs of test samples and measured in parallel to test samples. The reference material is to be used only for internal quality control. The values quoted herein are not certified.

3. Analytical and Physical Methods

A complete list of analytical and physical methods as generic method codes with a brief description of the methods is available on the AMIS web site www.amis.co.za

4. Origin of Material

This standard was made from silica chips and the material was sourced in South Africa.

5. Approximate Mineral and Chemical Composition

The material is a silica blank chips which typically contains >95% SiO₂.

6. Health and Safety

The material is a very fine 8/N White powder. Safety precautions for handling fine particulate matter are recommended, such as the use of safety glasses, breathing protection, gloves and a laboratory coat.

7. Method of Preparation

The particle size distribution for this material was shown to have a nominal top size of 75 µm. The procedure of preparation in brief is as follows: The material was blended in a bi-conical mixer, systematically divided and sealed into 1kg Laboratory Packs. Explorer Packs are then subdivided from the Laboratory Packs as required. Final packaged units were then selected on a random basis and submitted for analysis to an independent laboratory accredited with the ISO17025:2017 standard of general requirements for the competence of testing and calibration laboratories. The results obtained from this laboratory are then evaluated statistically by AMIS for homogeneity.

8. Storage information

The material should be stored in a cool dry place, in such a way that it does not compromise the integrity of the RM. The material should be stored in conditions which will ensure it does not absorb moisture.

9. Methods of Analysis Requested

The following methods of analysis were requested:

- a) Pt, Pd, Au, Rh, Ru, Ir: NiS collection, ICP-OES or ICP-MS
- b) Multi element scan: Multi-acid total digestion, including HF, ICP-OES or ICP-MS
- c) Major oxides and LOI-XRF fusion
- d) SG – gas pycnometer
- e) S and C Combustion/LECO

10. Reported Values

This material has been carefully prepared and tested by a third-party independent ISO17025 accredited laboratory. The material was not submitted for interlaboratory proficiency testing.

11. Metrological Traceability

Traceability to SI units is via the standards used by the individual laboratory that did the analysis which is accredited to the ISO17025 general requirements for the competence of testing and calibration laboratories and who have maintained measurement traceability during the analytical process.

12. Period of Validity

The values are valid for this product, while still sealed in its original packaging, until notification to the contrary. The stability of the material will be subject to continuous testing for the duration of the inventory. Should product stability become an issue, all customers will be notified and notification to that effect will be placed on the www.amis.co.za website.

13. Minimum Sample Size

The majority of laboratories reporting used a 0.5g sample size for the ICP-OES and a 30g sample size for the fire assay. These are the recommended minimum sample sizes for the use of this material.

14. Availability

This product is available in Laboratory Packs containing 1kg of material and Explorer Packs containing custom weights (from 30g to 250g) of material. The Laboratory Packs are sealed bottles delivered in sealed foil pouches. The Explorer Packs contain material in standard geochem envelopes, nitrogen flushed, and vacuum sealed in foil pouches.

15. Recommended use in Quality Control

Users should set their own limits i.e., 1, 2 and 3 standard deviations from an obtained mean value based on at least 10 replicate analyses using this RM.

16. Legal Notice

This certificate and the reference material described in it have been prepared with due care and attention. However, AMIS and Melesha Gopi Mungaroo; accept no liability for any decisions or actions taken following the use of the reference material.

Date of Version 000: 29 September 2022

Version: 000

Approving Officer:

African Mineral Standards: _____

Melesha Gopi Mungaroo (Senior Quality Specialist)