

African Mineral Standards

AMIS0027

Certificate of Analysis

PGE Reference Material UG2 Reef (ore grade)

Recommended Concentrations and two "Between Laboratory" Standard Deviations

Certified Concentrations

Pt (NIS)	2.45	+ -	0.30	ppm
Pd (NIS)	1.62	+ -	0.18	ppm
Cr (F)	13.98	+ -	1.09	%
Cr (XRF)	13.74	+ -	0.87	%
Cu (P)	130	+ -	10	ppm
Cu (T/ICP)	125	+ -	14	ppm
Ni (XRF)	1197	+ -	94	ppm
Specific Gravity	3.62	+ -	0.30	g/cc

Provisional Concentrations

Pt (Pb Collection)	2.39	+ -	0.36	ppm
Pd (Pb Collection)	1.59	+ -	0.24	ppm
Co (P)	25.2	+ -	6.9	ppm
Cu (XRF)	142	+ -	20	ppm
Ir (NiS)	0.18	+ -	0.02	ppm
Ni (F)	1178	+ -	160	ppm
Ni (P)	369	+ -	80	ppm
Ni (T/ICP)	1078	+ -	222	ppm
Rh	0.49	+ -	0.08	ppm
Ru (NiS)	0.77	+ -	0.14	ppm

Indicated Means

Au (NIS)	0.05	g/t
Au (Pb Collection)	0.05	g/t
Co (T/ICP)	160	ppm

4E 4.61 g/t

Intended Use: AMIS0027 is suitable for monitoring the accuracy of a single analysis of PGE, Cu and Ni ores hosted by UG2 Reef or other similar chromitite rich mafic rocks. The material can be used for routine quality control by inserting within a batch of samples, method development and for the calibration of equipment.

The recommended mean and "Between Lab" standard deviations for this standard reflect the average results from the laboratories that participated in the round robin. Slight variations in analytical procedures between laboratories will reflect as slight biases to the recommended concentrations and this is acceptable. Good laboratories however will report results within the two standard deviation levels with a failure of <10 %.

Origin of Material: This standard was made using Pt/Pd rich UG2 chromitite (UG2) material supplied by Anglo Platinum Limited from the Western limb of the Bushveld Complex. This specific material was made from a bulk sample collected underground from the East Shaft section of the Waterval Mine.

Approximate Mineral and Chemical Composition: AMIS0027 comprises approximately 50% UG2 Chromitite seam, 45% pegmatoidal pyroxenite footwall and 5% pyroxenite hanging wall. The UG2 Chromitite is composed of chromite (60-90% by volume), orthopyroxene (5-25%), plagioclase (5-15%) as well as accessory amounts of other minerals, of which the more important are clinopyroxene, base metal sulphides, platinum-group minerals, ilmenite and magnetite. The base metal sulphides are predominantly pentlandite, pyrrhotite, pyrite, chalcopyrite and to a lesser extent millerite. The Platinum Group Minerals identified in the UG2 are cooperite, laurite, braggite, Pt-Fe Alloy and sperrylite.

Major and trace element chemistry for an additional 62 analytes was determined during the round robin but these have not been certified. Summary statistics from these analyses are presented in the appendix to this certificate.

Appearance: The material is a very fine powder. It is coloured a Medium Dark Grey (Corstor).

Method of Preparation: The material was crushed, dry-milled and air-classified to <54µm. Wet sieve particle size analysis of random samples confirmed the material was 98.5% <54µm. It was then blended in a bi-conical mixer, systematically divided and then sealed into 1kg Laboratory Packs. Explorer Packs are subdivided from the Laboratory packs as required. Samples were randomly selected for homogeneity testing and third party analysis. Statistical analysis of both homogeneity and the consensus test results were carried out by independent statisticians.

Methods of Analysis:

1. Pt, Pd and Au. ICP-OES or ICP-MS, Pb collection with Ag as a co-collector.
2. Au, Pt, Pd, Rh, Ru and Ir. ICP-MS, nickel sulphide collection.
3. Cu and Ni. Multi-acid total digestion, including HF, with ICP-OES finish.
4. Cu and Ni. Aqua regia digestion with ICP-OES finish.
5. Cr, Co, Cu and Ni. Pressed pellet XRF.
6. Cr, Co, Cu and Ni. Fusion, ICP-OES or ICP-MS
7. Specific Gravity. Gas pycnometer.
8. XRF (major elements).
9. Multi acid digest ICP scan – trace elements.

Additionally, XRF analyses were requested for the major elements and a multi-element multi acid digest and ICP scan was requested for the trace elements.

Information requested:

1. Aliquots used for all determinations.
2. Results for individual PGM's reported in ppb.
3. Results for base metals reported in ppm.
4. QC data, to include replicates, blanks and certified reference materials used.
5. Analytical techniques used.

Method of Certification: 25 laboratories were each given eight randomly selected packages of sample and results were used for the determinations below. One additional sample of a different certified material was submitted as a QC check. Round robin results for the analyses that resulted in Certification are displayed. These include:

- Pt and Pd by the NiS method;
- Pt and Pd analyses by the Pb collection method;
- Cu, Ni, Co and Cr by the aqua regia digestion method (P), the multi-acid digestion method (T), the Fusion ICP method (F) and by XRF.
- SG by either water or gas displacement in a pycnometer.

Lab Code	Co F ppm	Co P ppm	Co XRF ppm	Cr F ppm	Cr XRF ppm	Cu F ppm	Cu P ppm	Cu T ppm	Cu XRF ppm	Ir g/t	Ni F ppm	Ni P ppm	Ni T ppm	Ni XRF ppm	Pd NiS g/t	Pd Pb coll g/t	Pt NiS g/t	Pt Pb coll g/t	Rh g/t	Ru NiS g/t	SG g/cc
A	197			134572		317					1362				1.68	1.57	2.50	2.50	0.51	0.80	
A	168			129539		259					1293				1.71	1.66	2.67	2.62	0.55	0.94	
A	167			128317		288					1340				1.81	1.68	2.81	2.67	0.58	0.96	
A	153			77907		286					1108				1.31	1.14	1.98	2.02	0.41	0.52	
A	193			130887		260					1429				1.85	1.69	2.57	2.68	0.56	0.85	
A	187			131989		208					1317				1.88	1.68	2.63	2.67	0.54	0.87	
A	191			137902		263					1398				1.69	1.72	2.51	2.72	0.53	0.83	
A	185			129315		227					1233				1.78	1.68	2.54	2.64	0.56	0.95	
B		20		145274			120	130			469	360	1290			1.38		2.06			3.44
B		20		146293			120	130			508	360	1250			1.52		2.34			3.44
B		20		147907			120	130			494	360	1240			1.42		2.20			3.42
B		20		149138			120	130			534	360	1240			1.52		2.34			3.41
B		20		147633			120	130			536	360	1240			1.52		2.34			3.43
B		20		146669			120	120			522	360	1220			1.52		2.36			3.37
B		20		149343			120	130			450	360	1280			1.58		2.46			3.46
B		20		147756			120	130			410	360	1230			1.36		2.16			3.48
C																1.65		2.39			
C																1.64		2.39			
C																1.66		2.40			
C																1.69		2.37			
C																1.65		2.41			
C																1.65		2.48			
C																1.65		2.45			
C																1.63		2.40			
D		20					132	139				377	1190			1.37		2.19			
D		25					141	130				395	1120			1.50		2.31			
D		22					141	126				396	1140			1.46		2.27			
D		23					138	126				389	1160			1.50		2.16			
D		22					135	129				384	1160			1.62		2.50			
D		21					130	133				366	1180			1.37		2.33			
D		22					130	128				373	1180			1.60		2.51			
D		22					139	129				395	1180			1.45		2.11			
E		30					130	130		0.17		470	1200		1.62	1.57	2.59	2.50	0.52	0.77	
E		30					140	130		0.17		480	1200		1.65	1.65	2.57	2.52	0.51	0.77	
E		30					130	130		0.16		460	1200		1.62	1.62	2.58	2.62	0.52	0.78	
E		30					130	130		0.15		450	1200		1.66	1.61	2.60	2.51	0.52	0.76	
E		30					130	130		0.15		450	1200		1.67	1.56	2.58	2.56	0.49	0.76	
E		20					130	130		0.15		460	1200		1.59	1.59	2.60	2.55	0.52	0.76	
E		30					130	130		0.15		460	1200		1.64	1.64	2.55	2.55	0.51	0.76	
E		30					150	110		0.19		470	1000		1.68	1.65	2.57	2.50	0.53	0.75	

Lab Code	Co F ppm	Co P ppm	Co XRF ppm	Cr F ppm	Cr XRF ppm	Cu F ppm	Cu P ppm	Cu T ppm	Cu XRF ppm	Ir g/t	Ni F ppm	Ni P ppm	Ni T ppm	Ni XRF ppm	Pd NiS g/t	Pd Pb coll g/t	Pt NiS g/t	Pt Pb coll g/t	Rh g/t	Ru NiS g/t	SG g/cc
F		24					127	128				301	890			1.49		2.70			
F		24					125	128				303	928			1.50		2.60			
F		25					125	128				306	913			1.42		2.60			
F		25					126	126				307	905			1.44		2.30			
F		24					125	127				302	862			1.45		2.60			
F		25					124	135				303	947			1.36		2.50			
F		24					125	128				304	896			1.49		2.60			
F		25					125	130				305	852			1.56		2.60			
G														1275		1.46		2.43	0.43		3.74
G														1254		1.41		2.26	0.41		3.62
G														1276		1.68		2.52	0.48		3.73
G														1240		1.59		2.56	0.48		3.78
G														1240		1.59		2.17	0.47		3.65
G														1269		1.64		2.81	0.48		3.75
G																1.58		2.33	0.47		
G														1275		1.51		2.12	0.43		3.65
H						100				0.19	1110				1.52		2.29		0.44	0.71	
H						110				0.19	1230				1.54		2.31		0.45	0.71	
H						110				0.19	1230				1.44		2.20		0.39	0.73	
H						110				0.19	1210				1.57		2.36		0.45	0.74	
H						110				0.18	1190				1.51		2.24		0.44	0.68	
H						100				0.19	1060				1.54		2.35		0.46	0.72	
H						110				0.20	1190				1.57		2.37		0.47	0.72	
H						110				0.19	1200				1.50		2.22		0.44	0.68	
I		24	230	136000	131000		135	135	150	0.20		377	1190	1260	1.63	1.86	2.57	2.73	0.48	0.82	3.33
I		23	230	134000	132000		130	135	160	0.20		369	1160	1250	1.60	1.72	2.62	2.55	0.50	0.81	3.41
I		25	220	134000	131000		133	135	150	0.19		376	1170	1310	1.54	1.47	2.47	2.41	0.47	0.78	3.35
I		24	220	136000	131000		132	140	150	0.19		371	1160	1260	1.57	1.79	2.44	2.65	0.47	0.77	3.40
I		23	230	136000	132000		132	135	160	0.20		371	1160	1250	1.62	1.82	2.61	2.71	0.50	0.84	3.38
I		25	220	133000	133000		130	130	150	0.21		376	1170	1240	1.80	1.68	2.67	2.73	0.50	0.85	3.40
I		24	230	136000	133000		131	140	160	0.20		374	1210	1270	1.59	1.60	2.59	2.65	0.48	0.81	3.29
I		25	230	134000	132000		128	135	160	0.20		377	1180	1270	1.61	1.80	2.62	2.70	0.51	0.83	3.37
J		25	180		136686		132	148	154	0.16		361	1165	1171	1.61	1.55	2.34	2.32	0.48	0.86	3.70
J		27	181		136586		134	151	154	0.17		373	1192	1150	1.64	1.56	2.51	2.35	0.43	0.66	3.69
J		27	203		136478		146	151	159	0.16		381	1155	1164	1.55	1.47	2.35	2.22	0.46	0.87	3.71
J		29	182		136755		131	148	155	0.18		364	1129	1153	1.56	1.52	2.52	2.29	0.41	0.60	3.68
J		28	203		137080		139	142	160	0.18		364	1127	1163	1.59	1.59	2.54	2.41	0.42	0.53	3.72
J		29	190		136706		133	145	153	0.18		384	1113	1165	1.56	1.53	2.32	2.27	0.46	0.83	3.69
J		25	194		136686		130	152	154	0.16		362	1099	1148	1.57	1.53	2.31	2.31	0.48	0.86	3.71
J		29	195		136641		133	154	154	0.18		371	1153	1155	1.63	1.67	2.52	2.55	0.48	0.81	3.69
K	189	27		138309		127	137	130		0.18	1205	407	1108		1.68	1.74	2.50	2.33	0.52	0.81	3.67
K	175	26		136830		127	135	129		0.18	1172	402	1067		1.75	1.73	2.52	2.33	0.53	0.80	3.68
K	182	11		139497		126	146	131		0.19	1200	401	1114		1.71	1.72	2.51	2.24	0.53	0.82	3.69
K	184	12		139704		128	145	124		0.18	1197	401	1074		1.71	1.76	2.55	2.31	0.54	0.82	3.70
K	190	10		138887		126	139	130		0.18	1174	389	1114		1.76	1.75	2.57	2.29	0.54	0.82	3.72
K	181	10		139163		121	139	126		0.18	1199	385	1086		1.70	1.71	2.47	2.24	0.53	0.81	3.71
K	183	10		138556		122	141	124		0.18	1175	389	1024		1.73	1.74	2.51	2.23	0.54	0.82	3.66
K	182	10		139678		123	142	123		0.18	1188	394	954		1.76	1.73	2.60	2.30	0.53	0.80	3.69
L	200			143132		134				0.20	1140				1.70		2.62		0.52	0.80	
L	200			142418		128				0.19	1121				1.61		2.50		0.49	0.77	
L	208			139956		132				0.18	1094				1.59		2.45		0.48	0.75	
L	200			144638		123				0.19	1142				1.69		2.57		0.52	0.81	
L	202			146633		126				0.19	1144				1.64		2.52		0.50	0.78	
L	210			144517		125				0.19	1139				1.65		2.54		0.51	0.78	
L	206			145673		126				0.19	1140				1.66		2.47		0.49	0.76	
L	210			145367		150				0.19	1139				1.66		2.56		0.51	0.78	
M					142955				131					1130		1.65		2.49			3.78
M					143639				133					1130		1.64		2.52			3.76
M					143639				132					1130		1.72		2.62			3.79
M					143639				132					1130		1.68		2.55			3.73
M					143639				133					1130		1.70		2.55			3.77
M					143639				133					1130		1.71		2.60			3.79
M					143639				132					1130		1.67		2.56			3.79
M					144323				131					1130		1.63		2.47			3.76
N		20	200				102	125	100			389	1010	1200		1.50		2.19			3.76
N		10	200				70	155	100			289	1090	1200		1.54		2.13			3.76
N		10	200				55	129	100			197	990	1200		1.51		2.11			3.83
N		10	200				58	123	100			206	1000	1200		1.62		2.26			3.78
N		10	200				56	127	100			210	987	1200		1.54		2.09			3.75
N		30	200				100	123	200			396	995	1200		1.60		2.29			3.76
N		30	200				111	123	100			404	989	1200		1.61		2.26			3.73
N		30	200				113	126	100			405	985	1200		1.60		2.27			3.74
O		26			131800		130	107	144	0.16		383	892	1209	1.37	1.69	2.15	2.28	0.43	0.69	
O		25			131800		129	107	140	0.18		384	884	1200	1.53	1.75	2.41	2.32	0.48	0.77	
O		25			131800		127	106	161	0.16		380	845	1227	1.45	1.80	2.28	2.42	0.45	0.73	
O		27			131600		129	108	143	0.18		388	874	1187	1.50	1.72	2.34	2.28	0.47	0.77	
O		27			131800		132	108	141	0.17		397	865	1218	1.38	1.81	2.15	2.43	0.43	0.71	
O		27			131600		130	102	138	0.16		392	911	1209	1.29	1.79	2.03	2.39	0.40	0.66	
O		27			131900		130	108	144	0.18		394	873	1227	1.44	1.79	2.25	2.40	0.44	0.73	
O		29			131800		129	105	144	0.15		390	880	1228	1.29	1.73	2.01	2.33	0.40	0.64	

Lab Code	Co F ppm	Co P ppm	Co XRF ppm	Cr F ppm	Cr XRF ppm	Cu F ppm	Cu P ppm	Cu T ppm	Cu XRF ppm	Ir g/t	Ni F ppm	Ni P ppm	Ni T ppm	Ni XRF ppm	Pd NiS g/t	Pd Pb coll g/t	Pt NiS g/t	Pt Pb coll g/t	Rh g/t	Ru NiS g/t	SG g/cc
P	220	21		130000	136799	100	110	110			1200	310	1000		1.56		2.28				3.70
P	260	22		139000	136799	100	110	110			1200	320	1100		1.53		2.20				3.64
P	270	21		139000	135431	100	110	110			1200	310	950		1.52		2.09				3.65
P	220	26		135000	138167	100	120	120			1200	320	1100		1.56		2.16				3.70
P	200	20		134000	137483		110	120			1200	310	1100		1.58		2.30				3.76
P	240	21		138000	137483	200	110	110			1200	310	1000		1.60		2.30				3.67
P	250	21		134000	137483	100	110	110			1200	320	1100		1.59		2.24				3.89
P	250	22		137000	137483		110	110			1200	320	1100		1.58		2.33				3.66
Q		25	100		143500	132	129	140			358	1100	1140		1.48		2.29				3.48
Q		21	100		143500	127	127	140			353	1050	1140		1.40		2.19				3.43
Q		21	100		143000	128	124	130			361	1030	1140		1.50		2.35				3.41
Q		21	100		143000	132	120	140			360	1020	1150		1.46		2.29				3.36
Q		23	100		143000	128	127	130			354	1060	1150		1.49		2.34				3.45
Q		22	100		143000	135	123	140			369	1040	1150		1.44		2.25				3.46
Q		22	100		143500	133	120	140			366	1030	1150		1.52		2.36				3.32
Q		21	100		143000	126	122	140			345	1040	1150		1.32		2.06				3.39
R															0.80		1.23				
R															0.92		1.34				
R															1.05		1.57				
R															0.79		1.22				
R															0.93		1.30				
R															1.11		1.62				
R															1.05		1.60				
R															0.67		1.03				
S		32	178		135431	132	120	133	0.17		432	1090	1190	1.66	1.76	2.32	2.59	0.49	0.37	3.51	
S		31	178		136252	127	119	131	0.16		422	1080	1180	1.56	1.59	2.21	2.29	0.46	0.48	3.51	
S		34	177		133516	132	119	126	0.21		429	1100	1170	1.67	1.56	2.28	2.29	0.50	0.92	3.56	
S		32	171		135021	133	124	133	0.17		436	1100	1180	1.66	1.61	2.38	2.38	0.50	0.53	3.45	
S		31	167		135021	131	120	127	0.16		430	1100	1170	1.60	1.80	2.24	2.63	0.48	0.57	3.65	
S		32	178		135294	129	120	127	0.16		425	1090	1180	1.62	1.57	2.28	2.28	0.49	0.55	3.46	
S		31	171		135431	129	121	128	0.21		424	1090	1190	1.59	1.67	2.13	2.44	0.47	1.01	3.47	
S		30	173		135978	126	120	129	0.16		415	1090	1170	1.61	1.45	2.28	2.10	0.48	0.58	3.53	
T		27			140300	126	127				322	808		1.03	1.10	1.82	1.64	0.27	0.48	3.70	
T		25			140500	124	132				306	759		1.01	1.07	1.91	1.60	0.26	0.43	3.69	
T		27			140600	120	130				313	863		0.95	1.46	1.79	2.20	0.24	0.39	3.71	
T		26			138300	124	111				301	759		0.86	1.13	1.47	1.57	0.20	0.33	3.65	
T		29			139800	121	129				319	880		0.94	1.27	1.61	2.00	0.22	0.38	3.66	
T		27			138300	125	122				318	850		1.11	1.18	1.80	1.69	0.25	0.40	3.70	
T		27			142000	124	126				317	836		1.08	1.23	1.89	1.87	0.27	0.44	3.66	
T		27			140500	126	137				318	800		0.87	1.23	1.28	1.92	0.18	0.29	3.64	
U							110					787			1.38		2.12				
U							112					846			1.28		1.90				
U							114					665			1.24		2.01				
U							112					821			1.48		2.25				
U							117					816			1.21		1.98				
U							114					731			1.24		2.02				
U							115					685			1.41		2.15				
U							112					672			1.34		2.30				
V	207			138000						0.17	1230										
V	207			138000						0.17	1240										
V	210			141000						0.18	1260										
V	208			140000						0.18	1250										
V	208			140000						0.18	1230										
V	208			139000						0.18	1210										
V	205			137000						0.18	1220										
V	213			142000						0.18	1220										
W		24	196			358	115	141			129	1138	1252								
W		25	194			349		136			126	1148	1250								
W		24	196			359	118	141			126	1163	1263								
W		24	198			362	116	138			127	1163	1253								
W		23	196			353	118	140			123	1170	1236								
W		25	195			362	119	137			131	1157	1229								
W		24	194			368	121	134			130	1189	1245								
W		22	197			348	117	137			124	1159	1231								
X	127	27		64573		642	132	125			1024	404	919		1.93		2.62				
X	131	27		64808		639	129	128			984	400	957		1.90		2.50				
X	129	28		67536		681	131	129			1004	401	955		1.85		2.54				
X	138	27		69401		661	130	127			1098	401	976		1.85		2.45				
X	125	27		61320		604	129	125			993	398	962		1.96		2.56				
X	131	27		56256		569	129	128			1051	402	947		1.89		2.44				
X	118	28		56777		596	131	127			930	403	943		1.90		2.64				
X	125	27		62117		625	128	125			972	399	934		1.82		2.44				
Y		6		144135			150					333									
Y		4		144576			154					337									
Y		6		145468			167					348									
Y		6		145219			154					344									
Y		3		145434			178					365									
Y		3		145764			161					353									
Y		5		145659			157					345									
Y		6		143331			160					357									

The mean and standard deviation for all data was calculated. Outliers were defined as samples beyond the mean \pm 2 Standard Deviations from all data. These outliers were removed from the data (shown in red) and a new mean and standard deviation was determined. This method is different from that used to calculate the Confidence Interval shown on many Government-produced standards in that the actual "between-laboratory" standard deviation is used in the calculations. This produces upper and lower limits that reflect actual individual analyses rather than a grouped set of analyses. The limits can therefore be used to monitor accuracy from individual analyses, unlike the Certified Limits published on other standards which quote a Confidence Interval.

Participating Laboratories: The 25 laboratories were (not in same order as in the table of assays):

1. ACME Analytical Laboratories Ltd., (Canada).
2. Activation Laboratories Ltd., (ActLabs, Ancaster, ON, Canada).
3. ALS Chemex South Africa (Pty) Ltd.
4. ALS Chemex, (Vancouver, Canada).
5. Amdel Limited, (Perth, Australia).
6. Anglo Platinum, Eastern Bushveld Regional Laboratory (South Africa).
7. Anglo Research (Crown Campus, South Africa).
8. Anglo Research (Germiston Campus, South Africa)
9. Assayers Canada, (Vancouver).
10. Barplats Laboratory, (South Africa).
11. Becquerel Laboratories, (Canada).
12. Genalysis Laboratory Services (Pty) Ltd., (Australia).
13. Geoscience Laboratories, (Geo Labs, Sudbury, Canada).
14. Geoservice Centre, Geolaboratory, (GTK. Finland).
15. Impala Mineral Processes Laboratory
16. Nkomati JV Laboratory
17. OMAC Laboratories (Ireland).
18. Pt Intertek Utama Services (Intertek, Indonesia)
19. Set Point Laboratories (Pty) Ltd (South Africa)
20. SGS Lakefield Research (Canada)
21. SGS Lakefield Research Africa (Pty) Ltd. (Joburg, South Africa)
22. SGS Welshpool (Australia).
23. SRC Labs., (Canada).
24. Ultra Trace (Pty) Ltd. (Australia).
25. Zimplats Assay Laboratory (Zimbabwe).

Availability: This product is available in Laboratory Packs containing 1kg of material and Explorer Packs containing custom weights (from 50 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.

Legal Notice: This certificate and the reference material described in it have been prepared with due care and attention. However AMIS, Set Point Technology (Pty) Ltd, Mike McWha, Dr Barry Smee and Smee and Associates Ltd; accept no liability for any decisions or actions taken following the use of the reference material.

25 January 2008

Certifying Officers:



African Mineral Standards: _____
Mike McWha
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Geochemist: _____
Barry W. Smee
BSc, PhD, P.Geo, (B.C.)

APPENDIX

AMIS0027:- uncertified major and trace elements, data from 14 laboratories.

	%	2SD	RSD%	n
Al ₂ O ₃	13.025	0.498	1.914	85
CaO	3.115	0.160	2.570	103
Cr ₂ O ₃	20.111	1.007	2.502	56
Fe ₂ O ₃	19.702	0.657	1.668	74
K ₂ O	0.128	0.011	4.270	85
LOI	0.069	0.083	59.769	31
MgO	14.968	0.489	1.632	86
MnO	0.176	0.053	15.111	80
Na ₂ O	0.511	0.044	4.268	77
P ₂ O ₅	0.012	0.006	24.041	57
S	0.055	0.008	7.652	45
SiO ₂	27.288	1.118	2.048	71
TiO ₂	0.565	0.023	2.055	86
V ₂ O ₅	0.168	0.033	9.789	32

	ppm	2SD	RSD%	n
Ag M/ICP	0.11	0.12	52.480	23
As M/ICP	2.34	1.43	30.480	31
Ba M/ICP	42.3	4.0	4.764	63
Be M/ICP	0.13	0.09	36.463	14
Bi M/ICP	0.067	0.035	25.966	30
Cd M/ICP	1.32	2.06	78.120	12
Ce M/ICP	4.42	0.85	9.641	39
Co M/ICP	166	46	13.7	47
Cs M/ICP	0.23	0.09	18.993	31
Cu M/ICP	127	13	5.3	75
Dy M/ICP	0.44	0.08	9.117	32
Er M/ICP	0.29	0.03	5.333	30
Eu M/ICP	0.15	0.02	6.206	31
Ga M/ICP	34.8	6.4	9.260	38
Gd M/ICP	0.41	0.09	10.845	32
Ge M/ICP	0.68	0.86	63.191	32
Hf M/ICP	0.31	0.11	18.364	23
Hg M/ICP	0.036	0.033	46.409	8
Ho M/ICP	0.10			27
In M/ICP	0.022	0.008	18.820	15
La M/ICP	2.24	0.38	8.501	45
Li M/ICP	2.70	0.51	9.400	38
Lu M/ICP	0.045	0.011	12.115	16
Mo M/ICP	0.98	0.68	34.555	46
Nb M/ICP	0.71	0.35	24.590	32
Nd M/ICP	1.85	0.21	5.788	32
Ni M/ICP	1092	167	7.6	72
Os M/ICP	0.103	0.017	8.3	14
Pb M/ICP	22.9	4.5	9.924	40
Pr M/ICP	0.54	0.09	8.268	32
Rb M/ICP	4.62	0.43	4.639	32
Sb M/ICP	18.5	7.0	18.984	53
Sc M/ICP	13.9	2.5	8.814	62
Se M/ICP	3.26	2.99	45.854	22
Sm M/ICP	0.42	0.12	13.937	32
Sn M/ICP	1.92	0.36	9.262	37
Sr M/ICP	76.1	13.3	8.724	70
Ta M/ICP	0.38	0.90	117.575	24
Tb M/ICP	0.066	0.014	10.634	24
Te M/ICP	0.29	0.44	75.506	30
Th M/ICP	0.62	0.11	8.516	39
Ti M/ICP	0.040			7
Tm M/ICP	0.040			15
U M/ICP	0.37	0.09	11.548	40
V M/ICP	923	252	13.6	40
W M/ICP	0.39	0.76	96.360	40
Y M/ICP	2.39	0.64	13.500	48
Yb M/ICP	0.30	0.01	2.018	30
Zn M/ICP	281	122	21.8	63
Zr M/ICP	12.3	3.4	13.972	37