

African Mineral Standards

Certificate of Analysis

Merensky Feed Grade
Platinum Ore Reference Material

Supplementary Certificate for the Major Elements

AMIS0034

Recommended Concentrations and two "Between
Laboratory" Standard Deviations

Certified Concentrations

Al ₂ O ₃	12.46%	+ -	0.66%
CaO	7.02%	+ -	0.30%
Cr ₂ O ₃	0.90%	+ -	0.04%
Fe ₂ O ₃	10.24%	+ -	0.28%
K ₂ O	0.22%	+ -	0.02%
MgO	16.45%	+ -	0.48%
MnO	0.16%	+ -	0.02%
Na ₂ O	1.01%	+ -	0.08%
SiO ₂	49.92%	+ -	0.76%
TiO ₂	0.27%	+ -	0.02%

Indicated Means

P ₂ O ₅	0.04%
LOI	0.93%

Intended Use: AMIS0034 is suitable for monitoring the accuracy of a single analysis for the major elements in the Merensky or other similar 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.

AMIS0034, has also been certified for the PGE's, Co, Cu, Cr, Ni and Specific Gravity.

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 Merensky material from the western limb of the Bushveld Complex supplied by Anglo Platinum Limited. Platreef is a Pt/Pd/Ni/Cu ore. It is primarily a PGE standard, but has also been certified for these other elements at the request of customers.

Approximate Mineral and Chemical Composition: AMIS0034 comprises Merensky Reef hand sorted underground with minor dilution from footwall and hanging wall. The Merensky Reef comprises components of feldspathic pyroxenite, pyroxenite and anorthosite. Peak PGE values are associated with a thin chromitite stringer. Mineralization in this Merensky Reef comprises 2-5% disseminated or net textured magmatic sulphides, predominantly pyrrhotite, pentlandite, chalcopyrite and pyrite. The PGE's occur as micron-sized satellite grains around but rarely within the sulphides.

Mineral Composition: The other currently certified values for this material are:

Certified Concentrations*

Pt (Pb Collection)	3.69	±	0.36 g/t
Pt (NIS)	3.73	±	0.38 g/t
Pd (Pb Collection)	1.63	±	0.18 g/t
Pd (NIS)	1.63	±	0.14 g/t
Cu (P)	1532	±	78 ppm
Cu (T/ICP)	1544	±	100 ppm
Cu (XRF)	1551	±	92 ppm
Ni (P)	1689	±	108 ppm
Ni (T/ICP)	2079	±	148 ppm
Ni (XRF)	2164	±	116 ppm
Co (P)	50	±	6 ppm
Co (T/ICP)	97	±	8 ppm
Cr (XRF)	6016	±	330 ppm
Specific Gravity	3.11	±	0.2 g/cc

Provisional Concentrations*

Au (Pb Collection)	0.43	±	0.08 g/t
Au (NIS)	0.40	±	0.08 g/t
Rh	0.24	±	0.04 g/t
Ru (NiS)	0.48	±	0.06 g/t
Ir (NiS)	0.08	±	0.01 g/t

Indicated Means*

Cu (F) 1515 ppm
Cr (T/ICP) 5222 ppm

***data for these elements are available on a separate certificate.**

Appearance: The material is a very fine light grey powder (Corstor colour chart - 5Y 7/1).

Method of Preparation: The material was crushed, dry-milled and air-classified to 100% <54um. 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 the consensus test results were carried out by an independent statistician Dr BW Smee.

Method of Analysis:

1. Multi element XRF scan.

Method of Certification: Thirteen laboratories were each given eight packages of sample selected from throughout the batch.

Final limits were calculated after first determining if all data was compatible within a spread normally expected for similar analytical methods done by reputable laboratories. Data from any one laboratory was removed from further calculations when the mean of all analyses from that laboratory failed a t test of the global means of the other laboratories. The means and standard deviations were calculated using all remaining data. Any analysis that fell outside of the mean ± 2 standard deviations was removed from the ensuing data base. The mean and standard deviations were again calculated using the remaining data. This method is different from that used by Government agencies 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 Confidence Limits published on other standards. Standards with an RSD of near or less than 5 % are certified, RSD's of between near 5 % and 15 % are Provisional, and RSD's over 15 % are Indicated. The tables below represent raw data received from the laboratories.

Lab Code	Al2O3 Percent	CaO Percent	Cr2O3 Percent	Fe2O3 Percent	K2O Percent	MgO Percent	MnO Percent	Na2O Percent	P2O5 Percent	SiO2 Percent	TiO2 Percent	LOI Percent
A	13.30	6.92	0.87	10.32	0.22	16.20	0.15	1.01	0.03	49.70	0.27	
A	13.30	6.94	0.87	10.35	0.22	16.30	0.15	1.01	0.03	49.70	0.27	
A	13.30	6.93	0.87	10.33	0.22	16.20	0.15	1.02	0.03	49.70	0.27	
A	13.30	6.93	0.88	10.32	0.22	16.20	0.15	1.04	0.03	49.70	0.27	
A	13.30	6.94	0.87	10.35	0.22	16.20	0.15	1.01	0.03	49.70	0.27	
A	13.30	6.94	0.87	10.33	0.22	16.20	0.15	1.02	0.03	49.70	0.27	
A	13.30	6.93	0.87	10.33	0.22	16.20	0.15	1.02	0.03	49.70	0.27	
A	13.30	6.93	0.87	10.32	0.22	16.30	0.15	1.02	0.03	49.70	0.27	
B	13.21		0.58	9.55	0.22	16.08	0.15	0.98	0.04		0.22	
B	13.49		0.65	9.78	0.23	16.35	0.16	1.01	0.03		0.23	
B	12.59		0.64	9.14	0.22	15.29	0.15	0.94	0.04		0.23	
B	13.51		0.70	9.54	0.24	16.16	0.15	1.02	0.05		0.25	
B	12.70		0.61	9.02	0.23	15.29	0.14	0.97	0.03		0.22	
B	13.55		0.67	9.62	0.23	16.23	0.15	1.02	0.04		0.23	
B	13.19		0.73	10.35	0.23	16.45	0.17	0.93	0.05		0.25	
B	13.04		0.67	9.35	0.23	15.88	0.15	1.05	0.03		0.24	
C	12.20	7.00	0.87	10.17	0.16	16.60	0.14	1.01	0.01	49.80	0.23	0.63
C	12.06	6.97	0.87	10.20	0.15	16.52	0.14	1.03	0.01	49.37	0.23	0.66
C	12.00	6.94	0.87	10.15	0.16	16.50	0.14	1.01	0.02	49.50	0.23	0.62
C	12.04	7.00	0.87	10.20	0.16	16.52	0.14	1.04	0.03	49.37	0.23	0.67
C	12.17	6.95	0.87	10.24	0.16	16.43	0.15	1.06	0.01	49.19	0.22	0.67
C	12.10	6.97	0.87	10.15	0.16	16.60	0.14	1.01	0.02	49.60	0.23	0.65
C	12.00	7.00	0.88	10.23	0.16	16.60	0.15	1.00	0.01	49.10	0.24	0.63
C	12.13	7.05	0.86	10.26	0.16	16.65	0.14	1.03	0.01	49.34	0.23	0.66

Lab Code	Al2O3 Percent	CaO Percent	Cr2O3 Percent	Fe2O3 Percent	K2O Percent	MgO Percent	MnO Percent	Na2O Percent	P2O5 Percent	SiO2 Percent	TiO2 Percent	LOI Percent
D	12.71	7.08		10.25	0.22	16.44	0.17	0.99	0.04	49.76	0.28	1.09
D	12.75	7.08		10.21	0.22	16.44	0.16	0.98	0.04	49.77	0.28	1.22
D	12.83	7.12		10.27	0.22	16.56	0.17	1.00	0.04	50.24	0.29	1.27
D	12.75	7.08		10.20	0.22	16.46	0.16	0.98	0.04	49.90	0.28	1.20
D	12.80	7.11		10.26	0.22	16.53	0.17	0.99	0.04	50.05	0.28	1.08
D	12.76	7.08		10.21	0.22	16.45	0.16	0.98	0.04	49.86	0.27	0.94
D	12.82	7.12		10.27	0.22	16.54	0.17	1.00	0.04	50.19	0.28	1.00
D	12.86	7.13		10.30	0.22	16.58	0.16	1.00	0.04	50.28	0.28	1.22
E	12.20	7.03	0.92	10.35	0.25	16.74	0.16	1.02	0.04	49.52	0.27	0.94
E	12.12	7.07	0.91	10.39	0.24	16.79	0.16	1.00	0.04	49.09	0.27	0.96
E	12.19	7.05	0.91	10.33	0.23	16.72	0.16	1.01	0.04	49.51	0.26	0.88
E	12.16	7.13	0.91	10.36	0.23	16.73	0.16	1.00	0.04	49.65	0.27	0.90
E	12.12	7.14	0.94	10.54	0.24	17.05	0.16	1.00	0.04	49.32	0.27	0.91
E	12.23	7.14	0.92	10.40	0.25	17.02	0.16	1.01	0.04	49.56	0.27	0.88
E	12.21	7.05	0.90	10.24	0.24	16.79	0.16	1.05	0.04	49.39	0.27	0.97
E	12.17	7.08	0.91	10.33	0.24	16.70	0.16	1.00	0.04	49.59	0.27	1.00
F	12.20	6.97	0.91	10.20	0.22	16.10	0.16	1.07	0.03	49.70	0.26	0.89
F	12.30	6.97	0.91	10.20	0.22	16.20	0.16	1.05	0.03	49.80	0.26	0.86
F	12.20	6.96	0.91	10.20	0.22	16.20	0.16	1.06	0.03	49.70	0.26	0.90
F	12.30	6.98	0.91	10.30	0.22	16.20	0.16	1.04	0.03	49.90	0.26	0.88
F	12.30	6.99	0.91	10.30	0.22	16.20	0.16	1.06	0.03	49.90	0.26	0.87
F	12.30	7.01	0.91	10.30	0.22	16.20	0.16	1.06	0.03	49.90	0.26	0.90
F	12.30	6.98	0.91	10.30	0.22	16.20	0.16	1.06	0.03	49.90	0.26	0.85
F	12.30	6.99	0.91	10.30	0.22	16.20	0.16	1.06	0.03	49.90	0.26	0.85
G	12.57	7.21	0.93	10.49	0.25	16.74	0.16	1.16	0.05	50.27	0.28	
G	12.53	7.28	0.94	10.49	0.24	16.74	0.16	1.15	0.05	51.13	0.28	
G	12.30	7.19	0.94	10.49	0.24	16.58	0.16	1.12	0.05	50.91	0.28	
G	12.40	7.19	0.91	10.39	0.24	16.30	0.16	1.13	0.05	49.63	0.27	
G	12.42	7.23	0.93	10.49	0.24	16.74	0.16	1.15	0.05	51.13	0.28	
G	12.62	7.23	0.91	10.29	0.24	16.33	0.16	1.15	0.05	50.06	0.27	
G	12.76	7.32	0.93	10.19	0.25	16.74	0.16	1.16	0.05	50.91	0.27	
G	12.44	7.35	0.92	10.39	0.23	16.74	0.17	1.09	0.03	50.70	0.27	
H	12.52	7.21		10.35	0.23	16.36	0.16	0.96	0.03	50.35	0.30	0.85
H	12.56	7.24		10.38	0.23	16.43	0.17	0.96	0.03	50.29	0.29	0.89
H	12.48	7.25		10.35	0.25	16.29	0.17	0.97	0.04	50.20	0.29	0.83
H	12.54	7.24		10.43	0.23	16.45	0.17	0.95	0.04	50.38	0.28	0.95
H	12.54	7.21		10.40	0.22	16.34	0.17	0.94	0.04	50.33	0.29	0.90
H	12.44	7.25		10.39	0.22	16.44	0.17	0.98	0.04	50.16	0.30	0.94
H	12.58	7.25		10.40	0.22	16.40	0.17	0.96	0.04	50.23	0.29	0.83
H	12.50	7.23		10.38	0.23	16.37	0.17	0.96	0.03	50.42	0.29	0.92
I	13.00	6.84	0.89	10.20	0.21	16.15	0.16	1.00	0.03	50.20	0.27	0.83
I	13.00	6.84	0.89	10.25	0.21	16.20	0.16	0.99	0.03	50.40	0.27	0.82
I	12.95	6.85	0.89	10.20	0.21	16.15	0.16	1.00	0.03	50.40	0.27	0.80
I	13.00	6.83	0.89	10.20	0.21	16.20	0.16	1.00	0.03	50.50	0.27	0.83
I	13.00	6.87	0.89	10.15	0.21	16.15	0.16	0.99	0.03	50.40	0.27	0.84
I	13.00	6.83	0.89	10.15	0.21	16.15	0.16	0.99	0.03	50.40	0.28	0.85
I	13.00	6.85	0.89	10.20	0.21	16.20	0.16	0.98	0.03	50.40	0.27	0.84
I	13.00	6.82	0.89	10.20	0.21	16.25	0.16	1.00	0.03	50.50	0.27	0.83
J	12.20	6.97	0.88	10.20	0.20	16.40	0.15	0.10	0.03	49.90	0.27	1.09
J	12.20	7.02	0.88	10.30	0.22	16.40	0.17	0.14	0.02	49.40	0.28	1.11
J	12.10	6.89	0.87	10.10	0.21	16.50	0.15	0.13	0.03	49.90	0.27	1.09
J	12.50	6.96	0.88	10.20	0.21	16.40	0.16	0.14	0.01	49.70	0.27	1.25
J	12.30	7.05	0.88	10.40	0.22	16.40	0.16	0.07	0.02	49.90	0.28	1.11
J	12.50	7.05	0.88	10.40	0.21	16.80	0.17	0.13	0.04	50.30	0.28	0.93
J	12.20	7.12	0.89	9.99	0.23	16.80	0.16	0.11	0.02	50.80	0.28	1.13
J	12.20	6.98	0.87	10.40	0.21	16.60	0.16	0.09		49.80	0.27	1.08
K	11.59	6.60	0.38	9.69	0.20	15.44	0.15	0.94	0.05		0.20	
K	11.87	6.66	0.40	9.88	0.20	15.55	0.15	0.94	0.05		0.22	
K	12.34	6.83	0.47	10.17	0.22	15.85	0.16	0.97	0.05		0.22	
K	12.00	6.76	0.47	10.09	0.22	15.77	0.15	0.96	0.05		0.22	
K	12.10	6.74	0.47	10.11	0.22	15.65	0.16	0.96	0.05		0.22	
K	11.83	6.74	0.43	10.07	0.22	15.70	0.15	0.96	0.05		0.22	
K	12.19	6.76	0.43	10.05	0.22	15.73	0.16	0.96	0.05		0.22	
K	11.77	6.74	0.43	10.02	0.22	15.77	0.15	0.96	0.05		0.22	
L	12.72	7.20	0.92	10.03	0.24	15.58	0.16	1.09	0.04	50.23	0.26	1.30
L	12.67	7.14	0.91	10.04	0.23	15.59	0.16	1.07	0.02	50.03	0.27	1.50
L	12.70	7.12	0.92	10.09	0.23	15.63	0.16	1.08	0.03	50.25	0.27	1.20
L	12.78	7.15	0.92	10.13	0.23	15.69	0.16	1.08	0.02	50.12	0.27	1.10
L	12.73	7.17	0.92	10.16	0.23	15.69	0.16	1.08		49.83	0.27	1.40
L	12.77	7.27	0.91	10.09	0.23	15.69	0.16	1.08	0.03	49.95	0.27	1.20
L	12.65	7.12	0.91	10.27	0.24	15.46	0.16	1.07	0.03	50.40	0.26	1.10
L	12.65	7.15	0.90	10.20	0.23	15.64	0.16	1.06	0.03	49.96	0.26	1.40
M	12.37	6.83	0.64	9.96	0.23	16.78	0.16		0.04		0.24	
M	12.31	6.84	0.66	9.92	0.23	16.79	0.16		0.04		0.24	
M	12.22	6.79	0.59	9.84	0.23	16.67	0.16		0.04		0.24	
M	12.41	6.90	0.58	9.95	0.23	16.94	0.16		0.04		0.24	
M	12.38	6.84	0.59	9.94	0.23	16.81	0.16		0.04		0.24	
M	12.31	6.77	0.67	9.93	0.23	16.71	0.16		0.04		0.24	
M	12.44	6.91	0.71	10.04	0.23	16.93	0.16		0.03		0.24	
M	12.26	6.81	0.59	9.82	0.23	16.69	0.16		0.04		0.24	

Major element analysis results are displayed on a separate certificate.

Participating Laboratories: (Not in the 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. Assayers Canada, (Vancouver).
6. Genalysis Laboratory Services (Pty) Ltd., (Australia).
7. Geoscience Laboratories, (Geo Labs, Sudbury, Canada).
8. Geoservice Centre, Geolaboratory, (GTK. Finland).
9. OMAC Laboratories (Ireland).
10. Set Point Laboratories (Pty) Ltd (South Africa)
11. SGS Lakefield Research Africa (Pty) Ltd. (Joburg, South Africa)
12. SGS Welshpool (Australia).
13. Ultra Trace (Pty) Ltd. (Australia)

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

18 October 2007

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