



**CERTIFICATE OF ANALYSIS FOR
NICKEL LATERITE ORE REFERENCE MATERIAL
OREAS 187**

Constituent	Certified Value	1SD
Fusion XRF		
Nickel, Ni (wt.%)	1.37	0.02
Cobalt, Co (ppm)	636	19
Aluminium oxide, Al ₂ O ₃ (wt.%)	2.80	0.04
Calcium oxide, CaO (wt.%)	0.341	0.009
<i>Chlorine, Cl (ppm)</i>	<i><50</i>	IND
<i>Copper, Cu (ppm)</i>	<i>~40</i>	IND
Chromium oxide, Cr ₂ O ₃ (wt.%)	0.987	0.017
Iron oxide, Fe ₂ O ₃ (wt.%)	19.45	0.19
<i>Potassium oxide, K₂O (wt.%)</i>	<i><0.01</i>	IND
Magnesium oxide, MgO (wt.%)	17.99	0.20
Manganese oxide, MnO (wt.%)	0.356	0.007
<i>Sodium oxide, Na₂O (wt.%)</i>	<i><0.03</i>	IND
<i>Phosphorus oxide, P₂O₅ (wt.%)</i>	<i><0.01</i>	IND
Silicon dioxide, SiO ₂ (wt.%)	46.66	0.33
<i>Sulphur oxide, SO₃ (wt.%)</i>	<i><0.01</i>	IND
Titanium oxide, TiO ₂ (wt.%)	0.033	0.005
Zinc, Zn (ppm)	196	16
Loss on ignition, LOI (wt.%)	9.27	0.27
Fusion ICP		
Nickel, Ni (wt.%)	1.37	0.03
Cobalt, Co (ppm)	629	29
Aluminium oxide, Al ₂ O ₃ (wt.%)	2.77	0.07
Calcium oxide, CaO (wt.%)	0.352	0.038
<i>Copper, Cu (ppm)</i>	<i><50</i>	IND
Chromium oxide, Cr ₂ O ₃ (wt.%)	0.987	0.027
Iron oxide, Fe ₂ O ₃ (wt.%)	19.40	0.47
<i>Potassium oxide, K₂O (wt.%)</i>	<i><0.1</i>	IND
Magnesium oxide, MgO (wt.%)	17.96	0.39
Manganese oxide, MnO (wt.%)	0.358	0.007
<i>Sodium oxide, Na₂O (wt.%)</i>	<i><0.03</i>	IND
<i>Phosphorus oxide, P₂O₅ (wt.%)</i>	<i><0.02</i>	IND
Silica dioxide, SiO ₂ (wt.%)	46.37	1.17
<i>Sulphur oxide, SO₃ (wt.%)</i>	<i><0.05</i>	IND
<i>Titanium oxide, TiO₂ (wt.%)</i>	<i>~0.03</i>	IND
Zinc, Zn (ppm)	190	11.9
IR Combustion Furnace		
Carbon, C (wt.%)	0.11	0.02
<i>Sulphur, S (wt.%)</i>	<i><0.01</i>	IND

Note: italics - indicative values only; IND - indeterminate.

INTRODUCTION

OREAS reference materials (RM) are intended to provide a low cost method of evaluating and improving the quality of analysis of geological samples. To the explorationist, they provide an important control in analytical data sets related to exploration from the grass roots level through to resource definition. To the mine geologist, they provide a tool for grade control in routine mining operations. To the analyst, they provide an effective means of calibrating analytical equipment, assessing new techniques and routinely monitoring in-house procedures.

SOURCE MATERIAL

Reference material OREAS 187 is one of a suite of thirteen nickel laterite CRMs (OREAS 182 to OREAS 195) prepared from saprolitic ore source materials. These were supplied by Anglo American Brazil Limitada from the Codemin Nickel Mine located in the state of Goiás and ~300 kms from the port of Santos, Brazil.

COMMINUTION AND HOMOGENISATION PROCEDURES

The material constituting OREAS 187 was prepared in the following manner:

- a) *drying to constant mass at 105°C;*
- b) *crushing;*
- c) *milling to 99.7% minus 75 microns;*
- d) *homogenisation and bagging into 20kg sublots;*
- e) *collection of 20 representative 300g samples during the bagging stage for the round robin program;*
- f) *packaging into 10g units in laminated foil pouches and 1kg units in wide mouth jars.*

ANALYTICAL PROGRAM FOR OREAS 187

OREAS 187 is a nickel laterite reference material prepared by Ore Research & Exploration and has been certified for Ni, Co, Al₂O₃, C, CaO, Cl, Cu, Cr₂O₃, Fe₂O₃, K₂O, MgO, MnO, Na₂O, P₂O₅, SiO₂, S, SO₃, TiO₂, Zn and LOI. Nineteen commercial analytical laboratories participated in the certification program with characterization of this suite of 20 analytes by the following methods:

- Ni, Co, Al₂O₃, CaO, Cl, Cu, Cr₂O₃, Fe₂O₃, K₂O, MgO, MnO, Na₂O, P₂O₅, SiO₂, SO₃, TiO₂ and Zn by lithium borate fusion with X-ray fluorescence (17 laboratories)
- Ni, Co, Al₂O₃, CaO, Cu, Cr₂O₃, Fe₂O₃, K₂O, MgO, MnO, Na₂O, P₂O₅, SiO₂, SO₃, TiO₂ and Zn by lithium borate or sodium peroxide fusion with ICP-OES (12 laboratories)*
- carbon and sulphur by infra-red combustion furnace (11 laboratories)
- loss on ignition (LOI) at 1000°C (18 laboratories)

*Departures from a fusion ICP method were Lab G, which used a modified aqua regia digestion with ICP to determine Ni, Co, Cu, SO₃ and Zn, and Lab H, which used 4-acid digestion ICP to determine Co and Cu.

Due to the hygroscopic nature of nickel laterites, the laboratories were instructed to dry all samples thoroughly at 105°C prior to analysis and place in a desiccator with fresh desiccant. The samples were then to be cooled to room temperature before weighing for analysis. Alternatively, all samples could be corrected to dry basis by allowing the samples to equilibrate to lab atmosphere before weighing for analysis and correction for moisture by determination at 105°C of this property on a separate portion.

For the evaluation program a total of twenty 300g test units were taken at predetermined intervals during the bagging stage and are considered representative of the entire batch. To evaluate and compensate for the effects of batch-to-batch variation at individual laboratories, samples were submitted to the laboratories in three batches of four 20g sample pulps at weekly intervals. The four samples received by each laboratory were obtained by taking two 20g scoop splits from each of two separate 300g test units.

All results, together with uncorrected means, medians, standard deviations, relative standard deviations and percent deviation of lab means from the corrected mean of means (PDM³) are presented in the Appendix (Tables A2 to A37). The analytical methods employed by each laboratory are given in the table captions and described in Table A1 of the Appendix. The parameter PDM³ is a measure of laboratory accuracy while the relative standard deviation is an effective measure of analytical precision where homogeneity of the test material has been confirmed.

STATISTICAL EVALUATION OF ANALYTICAL DATA FOR OREAS 187

Certified Value and Confidence Interval

Each batch of results is treated as a separate data set in testing for outliers. The certified value is determined from the mean of lab means after filtering of individual and batch outliers. It is computed according to the formulae

$$\bar{x}_i = \frac{1}{n_i} \sum_{j=1}^{n_i} x_{ij}$$

$$\bar{\bar{x}} = \frac{1}{p} \sum_{i=1}^p \bar{x}_i$$

where

x_{ij} is the j th result reported by laboratory i ;

p is the number of participating laboratories;

n_i is the number of results reported by laboratory i ;

\bar{x}_i is the mean for laboratory i ;

$\bar{\bar{x}}$ is the mean of means.

The confidence intervals are obtained by calculation of the variance (\hat{V}) of the consensus value ($\bar{\bar{x}}$) (mean of means) and reference to Student's- t distribution with degrees of freedom ($p-1$).

$$\hat{V}(\bar{\bar{x}}) = \frac{1}{p(p-1)} \sum_{i=1}^p (\bar{x}_i - \bar{\bar{x}})^2$$

$$\text{Confidence Interval} = \bar{x} \pm t_{1-x/2}(p-1)(\hat{V}(\bar{x}))^{1/2}$$

where

$t_{1-x/2}(p-1)$ is the $1-x/2$ fractile of the t -distribution with $(p-1)$ degrees of freedom.

The distribution of the values is assumed to be symmetrical about the mean in the calculation of the confidence interval.

The test for rejection of individual outliers from each laboratory data set is based on z scores (rejected if $|z_i| > 2.5$) computed from the robust estimators of location and scale, T and S , respectively, according to the formulae

$$S = 1.483 \frac{\text{median} / x_j - \text{median} (x_i)}{j=1, \dots, n \quad i=1, \dots, n}$$

$$z_i = \frac{x_i - T}{S}$$

where

T is the median value in a data set;

S is the median of all absolute deviations from the sample median multiplied by 1.483, a correction factor to make the estimator consistent with the usual parameter of a normal distribution.

The z -score test is used in combination with a second method of individual outlier detection that determines the percent deviation of the individual value from the median. Outliers in general are selected on the basis of z -scores > 2.5 and with percent deviations $> 1.5\%$ (XRF) and $> 3.0\%$ (other methods). In certain instances statistician's prerogative has been employed in discriminating outliers.

Each laboratory data set is tested for outlying status based on z -score discrimination and rejected if $|z_i| > 2.5$. After individual and laboratory data set (batch) outliers have been eliminated a non-iterative 3 standard deviation filter is applied, with individual values lying outside this window also relegated to outlying status. Individual outliers and, more rarely, laboratory data sets (batches) deemed to be outlying are shown left justified and in bold in the tabulated results (see Appendix) and have been omitted in the determination of certified values.

The magnitude of the confidence interval is inversely proportional to the number of participating laboratories and interlaboratory agreement. It is a measure of the reliability of the certified value, i.e. the narrower the confidence interval the greater the certainty in the certified value (see Table 1).

Table 1. Certified Values and 95% Confidence Intervals for OREAS 187.

Constituent	Certified Value	95% Confidence Interval	
		Low	High
Fusion XRF			
Nickel, Ni (wt.%)	1.37	1.36	1.39
Cobalt, Co (ppm)	636	625	648
Aluminium oxide, Al ₂ O ₃ (wt.%)	2.80	2.78	2.82
Calcium oxide, CaO (wt.%)	0.341	0.336	0.345
<i>Chlorine, Cl (ppm)</i>	<50	IND	IND
<i>Copper, Cu (ppm)</i>	~40	IND	IND
Chromium oxide, Cr ₂ O ₃ (wt.%)	0.987	0.980	0.994
Iron oxide, Fe ₂ O ₃ (wt.%)	19.45	19.36	19.54
<i>Potassium oxide, K₂O (wt.%)</i>	<0.01	IND	IND
Magnesium oxide, MgO (wt.%)	17.99	17.89	18.08
Manganese oxide, MnO (wt.%)	0.356	0.353	0.360
<i>Sodium oxide, Na₂O (wt.%)</i>	<0.03	IND	IND
<i>Phosphorus oxide, P₂O₅ (wt.%)</i>	<0.01	IND	IND
Silicon dioxide, SiO ₂ (wt.%)	46.66	46.53	46.78
<i>Sulphur oxide, SO₃ (wt.%)</i>	<0.01	IND	IND
Titanium oxide, TiO ₂ (wt.%)	0.033	0.031	0.036
Zinc, Zn (ppm)	196	187	204
Loss on ignition, LOI (wt.%)	9.27	9.11	9.44
Fusion ICP			
Nickel, Ni (wt.%)	1.37	1.35	1.38
Cobalt, Co (ppm)	629	618	639
Aluminium oxide, Al ₂ O ₃ (wt.%)	2.77	2.74	2.81
Calcium oxide, CaO (wt.%)	0.352	0.329	0.374
<i>Copper, Cu (ppm)</i>	<50	IND	IND
Chromium oxide, Cr ₂ O ₃ (wt.%)	0.987	0.977	0.997
Iron oxide, Fe ₂ O ₃ (wt.%)	19.40	19.16	19.65
<i>Potassium oxide, K₂O (wt.%)</i>	<0.1	IND	IND
Magnesium oxide, MgO (wt.%)	17.96	17.82	18.09
Manganese oxide, MnO (wt.%)	0.358	0.356	0.361
<i>Sodium oxide, Na₂O (wt.%)</i>	<0.03	IND	IND
<i>Phosphorus oxide, P₂O₅ (wt.%)</i>	<0.02	IND	IND
Silica dioxide, SiO ₂ (wt.%)	46.37	45.68	47.07
<i>Sulphur oxide, SO₃ (wt.%)</i>	<0.05	IND	IND
<i>Titanium oxide, TiO₂ (wt.%)</i>	~0.03	IND	IND
Zinc, Zn (ppm)	190	179	201
IR Combustion Furnace			
Carbon, C (wt.%)	0.11	0.09	0.12
<i>Sulphur, S (wt.%)</i>	<0.01	IND	IND

Note - italics: indicative value; IND: indeterminate; intervals may appear asymmetric due to rounding.

Statement of Homogeneity

The standard deviation of each laboratory data set includes error due to both the imprecision of the analytical method employed and to possible inhomogeneity of the material analysed. The standard deviation of the pooled individual analyses of all participating laboratories includes error due to the imprecision of each analytical method, to possible inhomogeneity of the material analysed and, in particular, to deficiencies in accuracy of each analytical method. In determining tolerance intervals that component of error attributable to measurement inaccuracy was eliminated by transformation of the individual results of each data set to a common mean (the uncorrected grand mean) according to the formula

$$x'_{ij} = x_{ij} - \bar{x}_i + \frac{\sum_{i=1}^p \sum_{j=1}^{n_i} x_{ij}}{\sum_{i=1}^p n_i}$$

where

x_{ij} is the j th raw result reported by laboratory i ;
 x'_{ij} is the j th transformed result reported by laboratory i ;
 n_i is the number of results reported by laboratory i ;
 p is the number of participating laboratories;
 \bar{x}_i is the raw mean for laboratory i .

The homogeneity of each constituent was determined from tables of factors for two-sided tolerance limits for normal distributions (ISO 3207) in which

$$\begin{aligned} \text{Lower limit is } \bar{x} - k'_2(n, p, 1 - \alpha) s_g'' \\ \text{Upper limit is } \bar{x} + k'_2(n, p, 1 - \alpha) s_g'' \end{aligned}$$

where

n is the number of results;
 $1 - \alpha$ is the confidence level;
 p is the proportion of results expected within the tolerance limits;
 k'_2 is the factor for two – sided tolerance limits (m, α unknown);
 s_g'' is the corrected grand standard deviation.

The meaning of these tolerance limits may be illustrated for nickel by lithium borate fusion XRF, where 99% of the time at least 95% of subsamples will have concentrations lying between 1.37 and 1.38 wt.%. Put more precisely, this means that if the same number of subsamples were taken and analysed in the same manner repeatedly, 99% of the tolerance intervals so constructed would cover at least 95% of the total population, and 1% of the tolerance intervals would cover less than 95% of the total population (ISO Guide 35). The corrected grand standard deviation, s_g'' , used to compute the tolerance intervals is the weighted means of standard deviations of all data sets for a particular constituent according to the formula

$$s_g'' = \frac{\sum_{i=1}^p (s_i (1 - \frac{s_i}{s_g'}))}{\sum_{i=1}^p (1 - \frac{s_i}{s_g'})}$$

where

$1 - (\frac{s_i}{2s_g'})$ is the weighting factor for laboratory i ;

s_g' is the grand standard deviation computed from the transformed (i.e. means - adjusted) results

according to the formula

$$s_g' = \left[\frac{\sum_{i=1}^p \sum_{j=i}^{n_i} (x'_{ij} - \bar{x}'_i)^2}{\sum_{i=1}^p n_i - 1} \right]^{1/2}$$

where \bar{x}'_i is the transformed mean for laboratory i

The weighting factors were applied to compensate for the considerable variation in analytical precision amongst participating laboratories. Hence, weighting factors for each data set have been constructed so as to be inversely proportional to the standard deviation of that data set. Individual outliers (shown in bold in Tables A2 to A37) were removed prior to the calculation of tolerance intervals and a weighting factor of zero was applied to those data sets where $s_i/2s_g' > 1$ (i.e. where the weighting factor $1 - s_i/2s_g' < 0$). Data sets displaying poor resolution (i.e. where the ratio of the reading increment divided by the measured value is $< 1/20$) were also omitted.

It should be noted that estimates of tolerance by this method are considered conservative as a significant proportion of the observed variance, even in those laboratories exhibiting the best analytical precision, can presumably be attributed to measurement error. Despite the limitations of this method, the tolerance intervals presented in Table 2 are considered to confirm a high level of homogeneity for this CRM.

Table 2. Certified Values and Tolerance Limits for OREAS 187.

Constituent	Certified Value	Tolerance limits 1- α =0.99, ρ =0.95	
		Low	High
Fusion XRF			
Nickel, Ni (wt.%)	1.37	1.37	1.38
Cobalt, Co (ppm)	636	631	642
Aluminium oxide, Al ₂ O ₃ (wt.%)	2.80	2.79	2.82
Calcium oxide, CaO (wt.%)	0.341	0.340	0.341
<i>Chlorine, Cl (ppm)</i>	<50	IND	IND
<i>Copper, Cu (ppm)</i>	~40	IND	IND
Chromium oxide, Cr ₂ O ₃ (wt.%)	0.987	0.980	0.994
Iron oxide, Fe ₂ O ₃ (wt.%)	19.45	19.39	19.50
<i>Potassium oxide, K₂O (wt.%)</i>	<0.01	IND	IND
Magnesium oxide, MgO (wt.%)	17.99	17.93	18.04
Manganese oxide, MnO (wt.%)	0.356	0.355	0.357
<i>Sodium oxide, Na₂O (wt.%)</i>	<0.03	IND	IND
<i>Phosphorus oxide, P₂O₅ (wt.%)</i>	<0.01	IND	IND
Silicon dioxide, SiO ₂ (wt.%)	46.66	46.54	46.78
<i>Sulphur oxide, SO₃ (wt.%)</i>	<0.01	IND	IND
Titanium oxide, TiO ₂ (wt.%)	0.033	0.030	0.037
Zinc, Zn (ppm)	196	191	201
Loss on ignition, LOI (wt.%)	9.27	9.21	9.34
Fusion ICP			
Nickel, Ni (wt.%)	1.37	1.34	1.39
Cobalt, Co (ppm)	629	618	639
Aluminium oxide, Al ₂ O ₃ (wt.%)	2.77	2.73	2.82
Calcium oxide, CaO (wt.%)	0.352	0.339	0.365
<i>Copper, Cu (ppm)</i>	<50	IND	IND
Chromium oxide, Cr ₂ O ₃ (wt.%)	0.987	0.971	1.003
Iron oxide, Fe ₂ O ₃ (wt.%)	19.40	19.14	19.66
<i>Potassium oxide, K₂O (wt.%)</i>	<0.1	IND	IND
Magnesium oxide, MgO (wt.%)	17.96	17.73	18.18
Manganese oxide, MnO (wt.%)	0.358	0.356	0.361
<i>Sodium oxide, Na₂O (wt.%)</i>	<0.03	IND	IND
<i>Phosphorus oxide, P₂O₅ (wt.%)</i>	<0.02	IND	IND
Silica dioxide, SiO ₂ (wt.%)	46.37	45.80	46.95
<i>Sulphur oxide, SO₃ (wt.%)</i>	<0.05	IND	IND
<i>Titanium oxide, TiO₂ (wt.%)</i>	~0.03	IND	IND
Zinc, Zn (ppm)	190	180	201
IR Combustion Furnace			
Carbon, C (wt.%)	0.11	IND	IND
<i>Sulphur, S (wt.%)</i>	<0.01	IND	IND

Note - intervals may appear asymmetric due to rounding; IND = indeterminate; italics = indicative value

ANOVA Study

All laboratories and all 3 rounds of sample submission were included in the ANOVA study for nickel, cobalt, iron oxide and magnesium oxide. The sampling format for OREAS 187 was structured to enable nested ANOVA treatment of the round robin results. During the bagging stage, immediately following homogenization, twenty 300g samples were taken at regular intervals representative of the entire batch of OREAS 187. For each round of sample submissions, each laboratory received paired samples from two different, non-adjacent 300g samples. For example, the samples that any one of the seventeen (XRF) laboratories could have received are:

Round 1 (week 1)	Round 2 (week 2)	Round 3 (week 3)
Sample 1: Unit 1	Sample 1: Unit 10	Sample 1: Unit 6
Sample 2: Unit 11	Sample 2: Unit 20	Sample 2: Unit 16
Sample 3: Unit 1	Sample 3: Unit 10	Sample 3: Unit 6
Sample 4: Unit 11	Sample 4: Unit 20	Sample 4: Unit 16

The purpose of the ANOVA investigation was to compare the within-unit variance with that of the between-unit variance. This approach permitted an assessment of homogeneity across the entire batch of OREAS 187. The test was performed using the following parameters:

- Significance Level $\alpha = P$ (type I error) = 0.05
- Null Hypothesis, H_0 : Between-unit variance is no greater than within-unit variance (reject H_0 if p-value < 0.05)
- Alternative Hypothesis, H_1 : Between-unit variance is greater than within-unit variance

P-values are a measure of probability whereby values less than 0.05 indicate a greater than 95% probability that the observed differences in within-unit and between-unit variances are real. The dataset was filtered for both individual and batch (lab round) outliers prior to the calculation of the p-value. This process derived p-values of 1.00 for nickel, 0.960 for cobalt, 1.00 for iron oxide and 0.995 for magnesium oxide and indicates no evidence that between-unit variance is greater than within-unit variance. Conclusion: do not reject H_0 .

Note that ANOVA is not an absolute measure of homogeneity. Rather, it establishes that the metals are distributed in a similar manner throughout OREAS 187 and that the variance between two subsamples from the same unit is statistically indistinguishable to the variance from two subsamples taken from any two separate units.

Performance Gates

Performance gates provide an indication of a level of performance that might reasonably be expected from a laboratory being monitored by this CRM in a QA/QC program. They take into account errors attributable to measurement and CRM variability. For an effective CRM the contribution of the latter should be negligible in comparison to measurement errors. Sources of measurement error include inter-lab bias, analytical precision (repeatability) and inter-batch bias (reproducibility).

Two methods have been employed to calculate performance gates. The first method uses the same filtered data set used to determine the certified value, i.e. after removal of all individual, lab dataset (batch) and 3SD outliers (single iteration). These outliers can only be removed after the absolute homogeneity of the CRM has been independently established, i.e. the outliers must be confidently deemed to be analytical rather than arising from inhomogeneity of the CRM. The standard deviation is then calculated for each analyte from the pooled individual analyses generated from the certification program. Table 3 shows performance gates calculated for two and three standard deviations. As a guide these intervals may be regarded as warning or rejection for multiple 2SD outliers, or rejection for

individual 3SD outliers in QC monitoring, although their precise application should be at the discretion of the QC manager concerned.

Standard deviation is also shown in relative percent for one, two and three relative standard deviations (1RSD, 2RSD and 3RSD) to facilitate an appreciation of the magnitude of these numbers.

Table 3. Performance Gates for OREAS 187

Constituent	Certified Value	Absolute Standard Deviations					Relative Standard Deviations		
		1SD	2SD Low	2SD High	3SD Low	3SD High	1RSD	2RSD	3RSD
Fusion XRF									
Ni (wt.%)	1.37	0.02	1.33	1.42	1.30	1.45	1.76%	3.51%	5.27%
Co (ppm)	636	19	598	674	580	693	2.97%	5.94%	8.91%
Al ₂ O ₃ (wt.%)	2.80	0.04	2.73	2.88	2.69	2.92	1.36%	2.72%	4.07%
CaO (wt.%)	0.341	0.009	0.322	0.359	0.313	0.369	2.72%	5.45%	8.17%
Cl (ppm)	<50	IND	IND	IND	IND	IND	IND	IND	IND
Cu (ppm)	~40	IND	IND	IND	IND	IND	IND	IND	IND
Cr ₂ O ₃ (wt.%)	0.987	0.017	0.953	1.021	0.936	1.037	1.71%	3.41%	5.12%
Fe ₂ O ₃ (wt.%)	19.45	0.19	19.06	19.83	18.87	20.02	0.99%	1.97%	2.96%
K ₂ O (wt.%)	<0.01	IND	IND	IND	IND	IND	IND	IND	IND
MgO (wt.%)	17.99	0.20	17.58	18.39	17.38	18.60	1.13%	2.26%	3.39%
MnO (wt.%)	0.356	0.007	0.342	0.371	0.335	0.378	1.99%	3.98%	5.97%
Na ₂ O (wt.%)	<0.03	IND	IND	IND	IND	IND	IND	IND	IND
P ₂ O ₅ (wt.%)	<0.01	IND	IND	IND	IND	IND	IND	IND	IND
SiO ₂ (wt.%)	46.66	0.33	46.00	47.32	45.67	47.64	0.71%	1.41%	2.12%
SO ₃ (wt.%)	<0.01	IND	IND	IND	IND	IND	IND	IND	IND
TiO ₂ (wt.%)	0.033	0.005	0.024	0.043	0.020	0.047	13.57%	27.14%	40.71%
Zn (ppm)	196	16	165	227	149	242	7.96%	15.92%	23.87%
LOI (wt.%)	9.27	0.27	8.73	9.82	8.45	10.09	2.95%	5.90%	8.85%
Fusion ICP									
Ni (wt.%)	1.37	0.03	1.30	1.43	1.27	1.46	2.34%	4.68%	7.02%
Co (ppm)	629	29	572	686	543	714	4.54%	9.08%	13.62%
Al ₂ O ₃ (wt.%)	2.77	0.07	2.63	2.91	2.56	2.98	2.51%	5.03%	7.54%
CaO (wt.%)	0.352	0.038	0.276	0.428	0.238	0.466	10.80%	21.61%	32.41%
Cu (ppm)	<50	IND	IND	IND	IND	IND	IND	IND	IND
Cr ₂ O ₃ (wt.%)	0.987	0.027	0.932	1.042	0.904	1.069	2.78%	5.56%	8.34%
Fe ₂ O ₃ (wt.%)	19.40	0.47	18.45	20.35	17.98	20.83	2.45%	4.90%	7.35%
K ₂ O (wt.%)	<0.1	IND	IND	IND	IND	IND	IND	IND	IND
MgO (wt.%)	17.96	0.39	17.17	18.74	16.78	19.13	2.19%	4.38%	6.57%
MnO (wt.%)	0.358	0.007	0.345	0.372	0.338	0.379	1.88%	3.75%	5.63%
Na ₂ O (wt.%)	<0.03	IND	IND	IND	IND	IND	IND	IND	IND
P ₂ O ₅ (wt.%)	<0.02	IND	IND	IND	IND	IND	IND	IND	IND
SiO ₂ (wt.%)	46.37	1.17	44.04	48.71	42.87	49.87	2.52%	5.03%	7.55%
SO ₃ (wt.%)	<0.05	IND	IND	IND	IND	IND	IND	IND	IND
TiO ₂ (wt.%)	~0.03	IND	IND	IND	IND	IND	IND	IND	IND
Zn (ppm)	190	11.9	166	214	154	226	6.28%	12.56%	18.83%
IR Combustion Furnace									
C (wt.%)	0.11	0.02	0.06	0.15	0.04	0.17	19.73%	39.47%	59.20%
S (wt.%)	<0.01	IND	IND	IND	IND	IND	IND	IND	IND

Note - intervals may appear asymmetric due to rounding; IND = indeterminate; italics = indicative value

PARTICIPATING LABORATORIES

Acme Analytical Laboratories, Vancouver, BC, Canada
Activation Laboratories, Ancaster, Ontario, Canada
ALS, Callao, Lima, Peru
ALS, Malaga, WA, Australia
ALS, Stafford, QLD, Australia
ALS, Vancouver, BC, Canada
BV Amdel, Cardiff, NSW, Australia
BV Amdel, Stirling, SA, Australia
BV Ultra Trace, Canning Vale, WA, Australia
Inspectorate Kendari Laboratory, Kendari, Sulawesi, Indonesia
Intertek Genalysis Laboratory Services, Maddington, WA, Australia
Intertek Testing Services, Jakarta, Indonesia
Ni Lab, Pouembout, New Caledonia
SGS Geosol Laboratorios Ltda, Vespasiano, Minas Gerais, Brazil
SGS Mineral Services, Lakefield, Ontario, Canada
SGS Mineral Services, Don Mills, Ontario, Canada
SGS Mineral Services, Welshpool, WA, Australia
Société le Nickel SLN, Noumea, New Caledonia
UIS Analytical Services, Centurion, South Africa

PREPARER AND SUPPLIER OF THE REFERENCE MATERIAL

Nickel laterite ore reference material OREAS 187 has been prepared and certified and is supplied by:

*Ore Research & Exploration Pty Ltd
6-8 Gatwick Road
Bayswater North VIC 3153
AUSTRALIA*

<i>Telephone</i>	<i>(03) 9729 0333</i>	<i>International</i>	<i>+613-9729 0333</i>
<i>Facsimile</i>	<i>(03) 9761 7878</i>	<i>International</i>	<i>+613-9761 7878</i>
<i>Email</i>	<i>info@ore.com.au</i>	<i>Web</i>	<i>www.ore.com.au</i>

OREAS 187 is packaged in unit sizes of 10g (single-use laminated foil pouches) and 1kg (wide mouthed plastic jars).

INTENDED USE

OREAS 187 is intended for the following uses:

- i) for the monitoring of laboratory performance in the analysis of Ni, Co, Al₂O₃, CaO, Cl, Cu, Cr₂O₃, Fe₂O₃, K₂O, MgO, MnO, Na₂O, P₂O₅, SiO₂, SO₃, TiO₂, Zn, LOI, C and S in geological samples
- ii) for the verification of analytical methods for Ni, Co, Al₂O₃, CaO, Cl, Cu, Cr₂O₃, Fe₂O₃, K₂O, MgO, MnO, Na₂O, P₂O₅, SiO₂, SO₃, TiO₂, Zn, LOI, C and S
- iii) for the calibration of instruments used in the determination of the concentration of Ni, Co, Al₂O₃, CaO, Cl, Cu, Cr₂O₃, Fe₂O₃, K₂O, MgO, MnO, Na₂O, P₂O₅, SiO₂, SO₃, TiO₂, Zn, LOI, C and S

STABILITY AND STORAGE INSTRUCTIONS

OREAS 187 has been sourced from a sample of saprolitic nickel ore. It has been packaged in robust laminated foil pouches and plastic jars. In its unopened state and under normal conditions of storage it has a shelf life beyond ten years. Once opened the jars should be re-sealed after sampling and the contents consumed within two years.

INSTRUCTIONS FOR THE CORRECT USE OF THE REFERENCE MATERIAL

All certified values are reported on a dry basis after removal of hygroscopic moisture by drying in air at 105°C to constant mass. Users departing from these conventions should correct for moisture content.

LEGAL NOTICE

Ore Research & Exploration Pty Ltd has prepared and statistically evaluated the property values of this reference material to the best of its ability. The Purchaser by receipt hereof releases and indemnifies Ore Research & Exploration Pty Ltd from and against all liability and costs arising from the use of this material and information.

CERTIFYING OFFICER

Craig Hamlyn (B.Sc. Hons - Geology), Technical Manager

REFERENCES

ISO Guide 35 (2006), Certification of reference materials - General and statistical principals.
ISO Guide 31 (2000), Reference materials – Contents of certificates and labels.
ISO Guide 3207 (1975), Statistical interpretation of data - Determination of a statistical tolerance interval.

APPENDIX

Analytical Data for OREAS 187

Table A1. Key to abbreviations used in Tables A2 – A37.

Abbreviation	Explanation
Std.Dev.	one sigma standard deviation
Rel.Std.Dev.	one sigma relative standard deviation
PDM ³	percent deviation of lab mean from corrected mean of means
NR	not reported
BF	lithium metaborate fusion
PF	sodium peroxide fusion
4A	four acid (HF–HNO ₃ –HClO ₄ –HCl) digestion
MAR	modified aqua regia digestion
ICP	inductively coupled plasma OES or MS (unspecified)
OES	inductively coupled plasma optical emission spectrometry
XRF	x-ray fluorescence
LOI	loss on ignition
IRC	infra-red combustion furnace

Individual and batch outliers are left justified and in bold. Replicates 1 – 4 correspond to the first batch of samples submitted to labs, replicates 5 – 8 correspond to the second batch and replicates 9 – 12 correspond to the third batch.

Table A2. Fusion XRF results for Ni in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	1.35	1.41	1.35	1.36	1.41	1.37	1.37	1.38	1.39	1.42	1.35	1.35	1.34	1.37	1.39	1.39	1.35
2	1.35	1.42	1.35	1.36	1.42	1.36	1.36	1.40	1.40	1.42	1.35	1.35	1.35	1.38	1.40	1.37	1.34
3	1.35	1.41	1.35	1.35	1.42	1.35	1.36	1.41	1.39	1.41	1.35	1.37	1.35	1.38	1.40	1.38	1.34
4	1.35	1.42	1.35	1.35	1.41	1.35	1.37	1.42	1.38	1.43	1.36	1.36	1.34	1.37	1.39	1.38	1.35
5	1.34	1.40	1.36	1.37	1.41	1.37	1.36	1.38	1.38	1.41	1.35	1.36	1.35	1.38	NR	NR	NR
6	1.35	1.40	1.36	1.36	1.43	1.36	1.34	1.39	1.38	1.42	1.36	1.36	1.37	1.37	NR	NR	NR
7	1.35	1.40	1.36	1.38	1.41	1.36	1.34	1.40	1.39	1.41	1.36	1.37	1.35	1.38	NR	NR	NR
8	1.34	1.41	1.36	1.37	1.42	1.37	1.36	1.39	1.37	1.42	1.35	1.37	1.36	1.36	NR	NR	NR
9	1.37	1.40	1.36	1.35	1.44	1.36	1.37	1.41	1.39	1.43	1.34	1.36	1.37	1.35	NR	NR	NR
10	1.37	1.40	1.36	1.35	1.43	1.36	1.36	1.42	1.39	1.42	1.35	1.36	1.36	1.36	NR	NR	NR
11	1.37	1.40	1.37	1.35	1.43	1.36	1.43	1.42	1.39	1.43	1.34	1.36	1.37	1.35	NR	NR	NR
12	1.36	1.40	1.36	1.36	1.43	1.35	1.37	1.40	1.38	1.42	1.34	1.36	1.36	1.35	NR	NR	NR
Mean	1.35	1.40	1.36	1.36	1.42	1.36	1.37	1.40	1.39	1.42	1.35	1.36	1.36	1.36	1.40	1.38	1.35
Median	1.35	1.40	1.36	1.36	1.42	1.36	1.36	1.40	1.39	1.42	1.35	1.36	1.36	1.37	1.40	1.38	1.35
Std.Dev.	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Rel.Std.Dev.	0.80%	0.49%	0.46%	0.73%	0.75%	0.48%	1.67%	1.01%	0.57%	0.51%	0.49%	0.49%	0.71%	0.78%	0.41%	0.38%	0.43%
PDM ³	-1.60%	2.22%	-1.25%	-1.08%	3.41%	-1.18%	-0.60%	1.98%	0.86%	3.24%	-1.90%	-0.96%	-1.35%	-0.72%	1.53%	0.46%	-2.11%

Table A3. Fusion XRF results for Co in OREAS 187 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	610	650	620	640	660	630	NR	710	660	660	620	700	640	640	600	646	600
2	610	700	620	640	650	620	NR	720	650	670	620	700	650	640	600	617	600
3	610	700	620	630	660	620	NR	730	660	560	620	700	640	630	600	632	600
4	610	650	610	630	660	620	NR	730	660	710	620	600	640	640	600	632	600
5	610	700	620	630	650	620	NR	720	650	630	630	600	640	640	NR	NR	NR
6	610	700	620	630	670	620	NR	710	650	690	640	600	650	630	NR	NR	NR
7	610	700	610	640	650	620	NR	710	650	640	640	600	640	640	NR	NR	NR
8	610	700	610	630	670	630	NR	710	650	670	630	600	640	650	NR	NR	NR
9	620	700	630	630	670	620	NR	730	650	650	620	600	640	640	NR	NR	NR
10	610	650	620	630	670	620	NR	720	660	590	620	600	650	640	NR	NR	NR
11	610	700	620	630	670	620	NR	730	640	640	630	600	650	640	NR	NR	NR
12	610	700	620	640	670	610	NR	710	650	640	630	600	640	640	NR	NR	NR
Mean	611	688	618	633	663	621		719	653	646	627	625	643	639	600	632	600
Median	610	700	620	630	665	620		720	650	645	625	600	640	640	600	632	600
Std.Dev.	3	23	6	5	9	5		9	6	41	8	45	5	5	0	12	0
Rel.Std.Dev.	0.47%	3.29%	0.93%	0.78%	1.31%	0.83%		1.25%	0.95%	6.31%	1.24%	7.24%	0.77%	0.81%	0.00%	1.87%	0.00%
PDM ³	-4.00%	8.05%	-2.82%	-0.47%	4.12%	-2.43%		13.02%	2.55%	1.50%	-1.51%	-1.78%	1.11%	0.45%	-5.70%	-0.71%	-5.70%

Table A4. Fusion XRF results for Al₂O₃ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	2.82	2.70	2.76	2.82	2.83	2.78	2.73	2.76	2.87	2.77	2.82	2.81	2.74	2.85	2.79	2.83	2.85
2	2.81	2.73	2.77	2.83	2.84	2.77	2.74	2.78	2.83	2.71	2.80	2.81	2.77	2.84	2.79	2.76	2.82
3	2.81	2.72	2.76	2.82	2.83	2.78	2.72	2.81	2.85	2.76	2.81	2.81	2.75	2.82	2.79	2.75	2.78
4	2.81	2.70	2.76	2.81	2.83	2.78	2.72	2.79	2.84	2.79	2.81	2.82	2.73	2.84	2.82	2.80	2.80
5	2.80	2.67	2.83	2.79	2.87	2.79	2.66	2.78	2.88	2.88	2.79	2.81	2.80	2.83	NR	NR	NR
6	2.80	2.71	2.81	2.79	2.85	2.78	2.68	2.77	2.87	3.09	2.80	2.81	2.82	2.82	NR	NR	NR
7	2.80	2.71	2.79	2.78	2.86	2.78	2.69	2.83	2.88	2.83	2.79	2.75	2.77	2.83	NR	NR	NR
8	2.79	2.71	2.78	2.79	2.85	2.81	2.69	2.76	2.94	2.88	2.78	2.76	2.82	2.83	NR	NR	NR
9	2.82	2.71	2.81	2.83	2.94	2.77	2.70	2.87	2.86	2.73	2.78	2.82	2.79	2.87	NR	NR	NR
10	2.81	2.71	2.82	2.81	2.93	2.77	2.68	2.84	2.88	2.88	2.79	2.82	2.79	2.87	NR	NR	NR
11	2.82	2.76	2.79	2.79	2.91	2.78	2.72	2.86	2.89	2.78	2.78	2.81	2.83	2.84	NR	NR	NR
12	2.81	2.70	2.79	2.80	2.91	2.76	2.72	2.84	2.89	2.71	2.78	2.81	3.05	2.85	NR	NR	NR
Mean	2.81	2.71	2.79	2.81	2.87	2.78	2.70	2.81	2.87	2.82	2.79	2.80	2.81	2.84	2.80	2.79	2.81
Median	2.81	2.71	2.79	2.81	2.86	2.78	2.71	2.80	2.88	2.78	2.79	2.81	2.79	2.84	2.79	2.78	2.81
Std.Dev.	0.01	0.02	0.02	0.02	0.04	0.01	0.02	0.04	0.03	0.11	0.01	0.02	0.08	0.02	0.01	0.04	0.03
Rel.Std.Dev.	0.33%	0.78%	0.87%	0.62%	1.42%	0.41%	0.90%	1.40%	0.99%	3.76%	0.49%	0.82%	2.91%	0.59%	0.54%	1.33%	1.06%
PDM ³	0.23%	-3.32%	-0.45%	0.11%	2.46%	-0.82%	-3.49%	0.20%	2.55%	0.49%	-0.27%	0.05%	0.12%	1.39%	-0.16%	-0.52%	0.38%

Table A5. Fusion XRF results for CaO in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	0.330	0.330	0.340	0.350	0.340	0.339	0.340	0.330	0.370	0.342	0.350	0.350	0.346	0.330	0.340	0.317	0.340
2	0.340	0.320	0.340	0.350	0.340	0.342	0.340	0.330	0.360	0.345	0.350	0.340	0.350	0.340	0.340	0.316	0.340
3	0.330	0.330	0.340	0.350	0.340	0.340	0.340	0.340	0.360	0.346	0.350	0.340	0.346	0.330	0.340	0.325	0.340
4	0.330	0.325	0.340	0.350	0.340	0.340	0.340	0.340	0.360	0.341	0.350	0.340	0.351	0.340	0.340	0.327	0.340
5	0.340	0.325	0.340	0.350	0.330	0.341	0.330	0.330	0.370	0.341	0.350	0.350	0.350	0.340	NR	NR	NR
6	0.350	0.325	0.340	0.350	0.340	0.340	0.330	0.330	0.360	0.345	0.350	0.350	0.353	0.330	NR	NR	NR
7	0.350	0.325	0.340	0.350	0.330	0.342	0.330	0.330	0.360	0.338	0.350	0.350	0.351	0.340	NR	NR	NR
8	0.340	0.325	0.340	0.350	0.330	0.344	0.340	0.330	0.370	0.350	0.340	0.350	0.350	0.340	NR	NR	NR
9	0.350	0.325	0.340	0.360	0.350	0.339	0.340	0.330	0.360	0.359	0.340	0.340	0.355	0.340	NR	NR	NR
10	0.340	0.320	0.340	0.350	0.350	0.343	0.330	0.330	0.360	0.330	0.340	0.350	0.352	0.340	NR	NR	NR
11	0.350	0.325	0.340	0.360	0.340	0.342	0.340	0.330	0.360	0.358	0.340	0.340	0.352	0.340	NR	NR	NR
12	0.340	0.320	0.340	0.360	0.340	0.340	0.340	0.330	0.350	0.351	0.340	0.340	0.358	0.340	NR	NR	NR
Mean	0.341	0.325	0.340	0.353	0.339	0.341	0.337	0.332	0.362	0.346	0.346	0.345	0.351	0.338	0.340	0.321	0.340
Median	0.340	0.325	0.340	0.350	0.340	0.341	0.340	0.330	0.360	0.345	0.350	0.345	0.351	0.340	0.340	0.321	0.340
Std.Dev.	0.008	0.003	0.000	0.005	0.007	0.002	0.005	0.004	0.006	0.008	0.005	0.005	0.003	0.005	0.000	0.006	0.000
Rel.Std.Dev.	2.33%	1.03%	0.00%	1.28%	1.97%	0.47%	1.46%	1.17%	1.60%	2.37%	1.49%	1.51%	0.95%	1.34%	0.00%	1.72%	0.00%
PDM ³	0.05%	-4.72%	-0.20%	3.47%	-0.44%	0.09%	-1.18%	-2.65%	6.16%	1.42%	1.51%	1.27%	3.08%	-0.93%	-0.20%	-5.72%	-0.20%

Table A6. Fusion XRF results for Cl in OREAS 187 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	<50	NR	NR	<50	30	NR	NR	NR	NR	NR	<50	<50	NR	NR	<50	<50	NR
2	<50	NR	NR	50	40	NR	NR	NR	NR	NR	<50	<50	NR	NR	<50	<50	NR
3	<50	NR	NR	<50	40	NR	NR	NR	NR	NR	<50	<50	NR	NR	<50	<50	NR
4	<50	NR	NR	<50	40	NR	NR	NR	NR	NR	<50	<50	NR	NR	<50	<50	NR
5	<50	NR	NR	<50	40	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
6	<50	NR	NR	<50	30	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
7	<50	NR	NR	<50	10	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
8	<50	NR	NR	<50	60	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
9	<50	NR	NR	<50	50	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
10	<50	NR	NR	50	50	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
11	<50	NR	NR	50	40	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
12	<50	NR	NR	<50	80	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
Mean				50	43												
Median				50	40												
Std.Dev.				0	17												
Rel.Std.Dev.				0.00%	40.29%												
PDM ³				8.11%	-8.11%												

Table A7. Fusion XRF results for Cu in OREAS 187 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	<50	<30	<50	35	20	33	10	<10	90	<100	20	80	NR	40	<100	41	NR
2	<50	<30	<50	35	30	34	10	<10	70	<100	20	80	NR	40	<100	20	NR
3	<50	<30	<50	30	30	34	40	40	70	<100	20	90	NR	40	<100	29	NR
4	<50	<30	<50	30	20	31	20	60	70	<100	20	60	NR	40	<100	23	NR
5	<50	<30	<50	35	30	35	230	<10	70	<100	20	60	NR	50	NR	NR	NR
6	<50	<30	<50	30	40	33	20	<10	70	<100	10	60	NR	40	NR	NR	NR
7	<50	<30	<50	30	20	34	20	<10	60	<100	<10	50	NR	40	NR	NR	NR
8	80	<30	<50	30	60	36	30	10	70	<100	<10	60	NR	60	NR	NR	NR
9	<50	<30	<50	30	40	33	20	30	<50	<100	20	40	NR	60	NR	NR	NR
10	<50	<30	<50	35	40	33	20	<10	<50	<100	10	60	NR	50	NR	NR	NR
11	<50	<30	<50	30	30	34	60	20	<50	<100	20	50	NR	60	NR	NR	NR
12	50	<30	<50	30	40	31	20	<10	<50	<100	20	30	NR	50	NR	NR	NR
Mean	65			32	33	33	42	32	71		18	60		48		28	
Median	65			30	30	33	20	30	70		20	60		45		26	
Std.Dev.	21			2	12	1	61	19	8		4	17		9		9	
Rel.Std.Dev.	32.64%			7.77%	34.64%	4.35%	146.11%	60.11%	11.71%		23.42%	28.43%		18.23%		32.87%	
PDM ³	71.30%			-16.55%	-12.15%	-12.10%	9.81%	-15.67%	87.77%		-52.56%	58.12%		25.18%		-25.55%	

Table A8. Fusion XRF results for Cr₂O₃ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	0.99	0.98	0.98	1.00	0.96	1.00	1.46	1.01	0.99	1.07	0.99	1.00	1.00	0.99	0.99	0.99	1.01
2	0.99	0.98	0.98	1.00	0.94	1.00	1.45	1.02	0.99	1.04	0.96	1.00	1.01	0.99	0.98	0.99	1.01
3	0.99	0.97	0.97	1.00	0.97	1.00	1.43	1.03	0.99	1.04	0.98	1.02	1.01	0.98	0.98	1.00	1.00
4	0.98	0.97	0.98	1.00	0.97	1.00	1.48	1.02	0.96	1.07	0.97	1.02	1.01	0.99	0.98	1.00	1.00
5	0.96	0.97	1.00	0.99	0.96	1.00	0.96	1.00	0.97	1.05	0.97	0.99	1.01	0.99	NR	NR	NR
6	0.96	0.98	1.00	1.00	0.92	1.00	0.97	1.01	0.97	1.05	0.98	0.98	1.00	0.98	NR	NR	NR
7	0.95	0.97	0.98	1.00	0.97	0.99	0.97	1.02	0.97	1.05	0.98	0.98	1.00	0.98	NR	NR	NR
8	0.96	0.98	0.98	0.99	0.92	1.00	0.97	1.00	0.97	1.04	0.96	0.98	1.01	0.98	NR	NR	NR
9	1.00	0.98	0.99	0.98	0.99	0.99	0.99	1.03	0.97	1.06	0.98	0.97	1.01	0.97	NR	NR	NR
10	1.00	0.97	0.99	0.99	0.99	0.99	0.98	1.02	0.97	1.06	0.96	0.97	1.02	0.97	NR	NR	NR
11	0.98	0.97	0.98	0.99	0.97	1.00	0.99	1.03	0.97	1.07	0.96	0.97	1.01	0.97	NR	NR	NR
12	0.98	0.98	0.99	0.98	0.99	0.98	0.99	1.00	0.96	1.10	0.96	0.96	1.01	0.97	NR	NR	NR
Mean	0.98	0.97	0.98	0.99	0.96	0.99	1.14	1.02	0.97	1.06	0.97	0.99	1.01	0.98	0.98	0.99	1.01
Median	0.98	0.97	0.98	1.00	0.97	1.00	0.99	1.02	0.97	1.05	0.97	0.98	1.01	0.98	0.98	0.99	1.01
Std.Dev.	0.02	0.00	0.01	0.01	0.03	0.01	0.23	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.00	0.01
Rel.Std.Dev.	1.78%	0.51%	0.71%	0.60%	2.63%	0.76%	20.66%	1.15%	1.10%	1.69%	0.95%	2.00%	0.51%	0.62%	0.51%	0.44%	0.57%
PDM ³	-0.86%	-1.37%	-0.23%	0.65%	-2.62%	0.79%	15.18%	2.93%	-1.37%	7.18%	-1.78%	-0.02%	1.97%	-0.66%	-0.45%	0.79%	1.83%

Table A9. Fusion XRF results for Fe₂O₃ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	19.15	19.56	19.70	19.67	19.05	19.51	19.59	19.16	19.60	19.29	19.40	19.37	19.32	19.20	19.90	19.73	19.60
2	19.15	19.57	19.71	19.67	19.15	19.35	19.56	19.34	19.61	19.25	19.40	19.41	19.39	19.20	20.00	19.57	19.60
3	19.10	19.53	19.70	19.59	19.15	19.34	19.58	19.59	19.64	19.13	19.40	19.44	19.41	19.20	20.00	19.67	19.60
4	19.10	19.53	19.67	19.61	19.10	19.20	19.52	19.59	19.54	19.28	19.40	19.33	19.26	19.25	20.00	19.59	19.60
5	19.15	19.57	19.81	19.72	19.20	19.45	19.24	19.07	19.42	19.10	19.40	19.45	19.37	19.20	NR	NR	NR
6	19.25	19.54	19.77	19.70	19.35	19.36	19.29	19.29	19.48	19.06	19.45	19.49	19.59	19.25	NR	NR	NR
7	19.25	19.58	19.68	19.73	19.10	19.34	19.26	19.37	19.55	19.07	19.45	19.60	19.42	19.20	NR	NR	NR
8	19.15	19.58	19.77	19.74	19.30	19.47	19.34	19.21	19.47	19.09	19.35	19.60	19.49	19.20	NR	NR	NR
9	19.45	19.67	19.83	19.61	19.40	19.32	19.42	19.50	19.57	19.29	19.30	19.59	19.60	19.30	NR	NR	NR
10	19.35	19.68	19.74	19.56	19.35	19.30	19.38	19.48	19.59	19.14	19.30	19.60	19.61	19.30	NR	NR	NR
11	19.40	19.67	19.80	19.64	19.30	19.33	19.64	19.56	19.45	19.31	19.35	19.56	19.56	19.25	NR	NR	NR
12	19.35	19.67	19.76	19.61	19.30	19.14	19.57	19.28	19.56	19.38	19.35	19.53	19.54	19.25	NR	NR	NR
Mean	19.24	19.59	19.75	19.65	19.23	19.34	19.45	19.37	19.54	19.20	19.38	19.50	19.46	19.23	19.98	19.64	19.60
Median	19.20	19.58	19.75	19.66	19.25	19.34	19.47	19.36	19.56	19.19	19.40	19.51	19.46	19.23	20.00	19.63	19.60
Std.Dev.	0.12	0.06	0.05	0.06	0.12	0.10	0.14	0.18	0.07	0.11	0.05	0.10	0.12	0.04	0.05	0.07	0.00
Rel.Std.Dev.	0.64%	0.30%	0.27%	0.30%	0.61%	0.54%	0.74%	0.90%	0.36%	0.58%	0.26%	0.50%	0.60%	0.20%	0.25%	0.38%	0.00%
PDM ³	-1.08%	0.75%	1.53%	1.06%	-1.13%	-0.55%	0.00%	-0.40%	0.47%	-1.28%	-0.36%	0.25%	0.08%	-1.10%	2.71%	0.98%	0.78%

Table A10. Fusion XRF results for K₂O in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	<0.01	<0.01	<0.01	0.00	0.00	NR	<0.001	<0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	<0.01	0.01	<0.01
2	<0.01	<0.01	<0.01	0.01	0.00	NR	<0.001	<0.01	0.01	0.02	<0.01	<0.01	NR	0.01	<0.01	0.01	0.01
3	<0.01	<0.01	<0.01	0.01	0.00	NR	<0.001	<0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	<0.01	0.01	<0.01
4	<0.01	<0.01	<0.01	0.01	0.00	NR	<0.001	<0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	<0.01	0.01	<0.01
5	<0.01	<0.01	<0.05	0.00	<0.001	NR	<0.001	<0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
6	<0.01	<0.01	<0.05	0.00	0.00	NR	<0.001	<0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
7	<0.01	<0.01	<0.05	0.00	0.00	NR	<0.001	<0.01	0.02	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
8	<0.01	<0.01	<0.05	0.00	0.00	NR	<0.001	<0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
9	<0.01	<0.01	<0.01	0.01	0.01	NR	<0.001	0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
10	<0.01	<0.01	<0.01	0.01	0.01	NR	<0.001	<0.01	0.02	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
11	<0.01	<0.01	<0.01	0.01	0.01	NR	<0.001	<0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
12	<0.01	<0.01	<0.01	0.00	0.01	NR	<0.001	0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
Mean				0.00	0.00			0.01	0.01	0.02				0.01		0.01	0.01
Median				0.00	0.00			0.01	0.01	0.02				0.01		0.01	0.01
Std.Dev.				0.00	0.00			0.00	0.00					0.00		0.00	
Rel.Std.Dev.				16.68%	60.59%			0.00%	33.36%					0.00%		7.51%	
PDM ³				-42.41%	-55.12%			23.41%	43.98%	159.17%				23.41%		-16.70%	23.41%

Table A11. Fusion XRF results for MgO in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	17.90	18.28	17.89	17.99	17.80	17.72	17.24	18.19	18.04	18.60	17.95	17.98	17.66	18.25	17.90	17.97	18.00
2	17.80	18.19	17.93	17.98	17.80	17.69	17.20	18.28	18.09	18.46	18.00	17.94	17.76	18.30	17.90	17.75	17.90
3	17.85	18.39	17.96	17.92	17.80	17.58	17.67	18.49	18.03	18.16	17.95	17.95	17.71	18.20	18.00	17.88	17.90
4	17.85	18.23	17.89	17.96	17.80	17.63	17.19	18.31	18.10	18.55	17.95	17.86	17.57	18.25	17.90	17.87	18.00
5	17.95	18.05	17.99	17.94	18.30	17.67	17.52	18.33	17.94	18.68	18.00	17.98	17.88	18.25	NR	NR	NR
6	18.05	18.20	17.97	17.96	18.25	17.56	17.68	18.18	18.00	18.32	18.00	18.01	17.89	18.25	NR	NR	NR
7	18.05	18.13	17.91	17.94	18.35	17.63	17.62	18.40	18.07	18.31	18.00	18.06	17.75	18.20	NR	NR	NR
8	18.00	18.25	17.90	17.93	18.25	17.63	17.71	18.20	17.99	18.51	17.95	18.05	17.86	18.25	NR	NR	NR
9	18.10	18.30	17.99	17.94	17.85	17.56	17.90	18.41	18.04	18.12	17.80	17.97	17.85	18.20	NR	NR	NR
10	18.00	18.31	17.99	17.98	17.85	17.58	17.85	18.37	18.09	18.18	17.85	18.00	17.87	18.25	NR	NR	NR
11	18.05	18.26	17.98	18.04	17.90	17.67	18.03	18.41	18.11	18.34	17.85	17.96	17.87	18.10	NR	NR	NR
12	18.00	18.28	17.98	18.05	17.85	17.57	18.05	18.16	17.96	18.19	17.85	17.95	17.99	18.15	NR	NR	NR
Mean	17.97	18.24	17.95	17.97	17.98	17.62	17.64	18.31	18.04	18.37	17.93	17.98	17.81	18.22	17.93	17.87	17.95
Median	18.00	18.26	17.97	17.96	17.85	17.63	17.68	18.32	18.04	18.33	17.95	17.98	17.86	18.25	17.90	17.87	17.95
Std.Dev.	0.10	0.09	0.04	0.04	0.23	0.05	0.30	0.11	0.06	0.19	0.07	0.05	0.12	0.05	0.05	0.09	0.06
Rel.Std.Dev.	0.54%	0.48%	0.23%	0.23%	1.27%	0.31%	1.72%	0.60%	0.31%	1.03%	0.40%	0.29%	0.66%	0.30%	0.28%	0.49%	0.32%
PDM ³	-0.10%	1.40%	-0.21%	-0.09%	-0.01%	-2.01%	-1.93%	1.81%	0.29%	2.13%	-0.31%	-0.05%	-1.00%	1.31%	-0.34%	-0.66%	-0.20%

Table A12. Fusion XRF results for MnO in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	0.348	0.350	0.350	0.360	0.353	0.352	0.360	0.350	0.356	0.375	0.353	0.360	0.356	0.365	0.350	0.359	0.360
2	0.348	0.345	0.350	0.360	0.357	0.349	0.360	0.350	0.357	0.367	0.356	0.360	0.359	0.368	0.360	0.351	0.360
3	0.348	0.345	0.350	0.360	0.355	0.348	0.360	0.360	0.359	0.371	0.355	0.360	0.360	0.365	0.350	0.359	0.360
4	0.344	0.345	0.350	0.360	0.352	0.347	0.360	0.360	0.355	0.377	0.354	0.360	0.356	0.367	0.360	0.355	0.360
5	0.347	0.350	0.350	0.360	0.358	0.350	0.350	0.350	0.351	0.372	0.355	0.360	0.356	0.367	NR	NR	NR
6	0.351	0.350	0.350	0.360	0.369	0.348	0.350	0.350	0.355	0.365	0.353	0.360	0.364	0.365	NR	NR	NR
7	0.352	0.350	0.360	0.360	0.355	0.348	0.360	0.350	0.355	0.368	0.354	0.360	0.358	0.365	NR	NR	NR
8	0.349	0.350	0.350	0.360	0.370	0.349	0.360	0.350	0.356	0.366	0.354	0.360	0.356	0.367	NR	NR	NR
9	0.351	0.345	0.350	0.350	0.360	0.347	0.360	0.350	0.356	0.372	0.353	0.360	0.364	0.368	NR	NR	NR
10	0.351	0.355	0.350	0.360	0.360	0.349	0.360	0.360	0.358	0.369	0.354	0.360	0.363	0.369	NR	NR	NR
11	0.351	0.345	0.350	0.350	0.360	0.350	0.360	0.360	0.355	0.372	0.356	0.350	0.360	0.367	NR	NR	NR
12	0.351	0.340	0.350	0.360	0.360	0.345	0.360	0.350	0.354	0.375	0.356	0.350	0.358	0.368	NR	NR	NR
Mean	0.349	0.348	0.351	0.358	0.359	0.349	0.358	0.353	0.356	0.371	0.354	0.358	0.359	0.367	0.355	0.356	0.360
Median	0.350	0.348	0.350	0.360	0.359	0.349	0.360	0.350	0.356	0.372	0.354	0.360	0.358	0.367	0.355	0.357	0.360
Std.Dev.	0.002	0.004	0.003	0.004	0.006	0.002	0.004	0.005	0.002	0.004	0.001	0.004	0.003	0.001	0.006	0.003	0.000
Rel.Std.Dev.	0.67%	1.15%	0.82%	1.09%	1.56%	0.51%	1.09%	1.39%	0.57%	1.03%	0.33%	1.09%	0.84%	0.35%	1.63%	0.98%	0.00%
PDM ³	-2.03%	-2.52%	-1.58%	0.52%	0.73%	-2.24%	0.52%	-0.88%	-0.25%	4.00%	-0.58%	0.52%	0.78%	2.90%	-0.42%	-0.14%	0.99%

Table A13. Fusion XRF results for Na₂O in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	0.027	0.010	0.020	NR	0.097	NR	<0.01	<0.01	0.020	<0.1	0.012	0.010	NR	0.030	0.020	0.017	0.020
2	0.025	0.010	0.020	NR	0.106	NR	<0.01	0.020	0.010	<0.1	0.009	<0.01	NR	0.030	0.020	0.030	0.190
3	0.024	0.010	0.020	NR	0.098	NR	<0.01	0.010	0.010	<0.1	0.008	0.030	NR	0.030	0.020	0.033	<0.01
4	0.029	0.010	0.020	NR	0.103	NR	<0.01	0.020	0.020	<0.1	0.016	<0.01	NR	0.030	0.030	0.037	<0.01
5	0.027	0.010	0.020	NR	0.149	NR	<0.01	<0.01	0.030	<0.1	0.016	0.020	NR	0.030	NR	NR	NR
6	0.023	0.010	0.030	NR	0.158	NR	<0.01	0.010	0.010	<0.1	0.009	0.030	NR	0.020	NR	NR	NR
7	0.024	0.010	0.040	NR	0.154	NR	<0.01	<0.01	0.030	<0.1	0.011	<0.01	NR	0.030	NR	NR	NR
8	0.022	0.010	0.030	NR	0.167	NR	<0.01	<0.01	0.020	<0.1	0.010	<0.01	NR	0.030	NR	NR	NR
9	0.030	0.010	0.030	NR	0.164	NR	<0.01	0.020	0.020	<0.1	0.014	0.030	NR	0.040	NR	NR	NR
10	0.028	0.010	0.020	NR	0.170	NR	<0.01	0.020	0.020	<0.1	0.009	0.020	NR	0.040	NR	NR	NR
11	0.029	0.010	0.010	NR	0.156	NR	<0.01	0.020	0.020	<0.1	0.009	0.020	NR	0.040	NR	NR	NR
12	0.030	0.010	0.030	NR	0.176	NR	<0.01	0.030	<0.01	<0.1	0.012	0.020	NR	0.030	NR	NR	NR
Mean	0.027	0.010	0.024		0.142			0.019	0.019		0.011	0.023		0.032	0.023	0.029	0.105
Median	0.027	0.010	0.020		0.155			0.020	0.020		0.011	0.020		0.030	0.020	0.032	0.105
Std.Dev.	0.003	0.000	0.008		0.031			0.006	0.007		0.003	0.007		0.006	0.005	0.008	0.120
Rel.Std.Dev.	10.61%	0.00%	32.81%		21.80%			34.18%	36.70%		24.89%	31.43%		18.23%	22.22%	29.00%	114.48%
PDM ³	22.86%	-53.64%	12.04%		556.01%			-13.07%	-11.49%		-47.84%	4.31%		46.81%	4.31%	35.72%	386.79%

Table A14. Fusion XRF results for P₂O₅ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	0.004	<0.01	0.004	0.005	0.001	NR	<0.01	<0.01	0.010	0.015	0.001	<0.01	NR	<0.01	<0.01	<0.002	<0.01
2	0.004	0.010	0.004	0.005	0.001	NR	<0.01	<0.01	0.010	0.019	<0.001	<0.01	NR	<0.01	<0.01	<0.002	<0.01
3	0.004	<0.01	0.004	0.005	0.001	NR	<0.01	<0.01	0.010	<0.01	0.001	<0.01	NR	<0.01	<0.01	0.002	<0.01
4	0.004	<0.01	0.004	0.005	<0.001	NR	<0.01	<0.01	0.010	<0.01	<0.001	<0.01	NR	<0.01	<0.01	<0.002	<0.01
5	0.004	0.005	0.004	0.005	<0.001	NR	<0.01	<0.01	0.010	<0.01	0.003	<0.01	NR	<0.01	NR	NR	NR
6	0.004	0.005	0.004	0.006	0.001	NR	<0.01	<0.01	0.010	<0.01	0.003	<0.01	NR	<0.01	NR	NR	NR
7	0.004	<0.01	0.002	0.005	<0.001	NR	<0.01	<0.01	0.010	<0.01	0.003	<0.01	NR	<0.01	NR	NR	NR
8	0.004	0.005	0.003	0.006	0.001	NR	<0.01	<0.01	0.010	<0.01	0.003	<0.01	NR	<0.01	NR	NR	NR
9	0.004	<0.01	0.005	0.005	0.001	NR	<0.01	<0.01	0.010	<0.01	0.002	<0.01	NR	<0.01	NR	NR	NR
10	0.004	<0.01	0.004	0.005	0.001	NR	<0.01	<0.01	0.010	<0.01	0.002	<0.01	NR	<0.01	NR	NR	NR
11	0.004	<0.01	0.005	0.005	0.001	NR	<0.01	<0.01	0.010	<0.01	0.002	<0.01	NR	<0.01	NR	NR	NR
12	0.004	0.005	0.004	0.004	<0.001	NR	<0.01	<0.01	0.010	<0.01	0.001	<0.01	NR	<0.01	NR	NR	NR
Mean	0.004	0.006	0.004	0.005	0.001				0.010	0.017	0.002					0.002	
Median	0.004	0.005	0.004	0.005	0.001				0.010	0.017	0.002					0.002	
Std.Dev.	0.000	0.002	0.001	0.001	0.000				0.000	0.003	0.001						
Rel.Std.Dev.	0.00%	37.27%	20.25%	10.13%	0.00%				0.00%	16.64%	41.70%						
PDM ³	21.21%	81.82%	18.69%	54.04%	-69.70%				203.03%	415.15%	-36.36%					-39.39%	

Table A15. Fusion XRF results for SiO₂ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A	Lab B	Lab C	Lab D	Lab E	Lab F	Lab G	Lab H	Lab I	Lab J	Lab K	Lab L	Lab N	Lab O	Lab P	Lab Q	Lab R
	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF	BF*XRF
1	47.00	47.16	46.64	46.80	46.20	46.63	47.07	46.20	46.60	46.44	46.90	46.52	45.58	46.90	46.60	46.62	46.50
2	46.80	47.04	46.80	46.88	46.20	46.50	47.39	46.50	46.65	46.47	46.90	46.51	45.90	47.10	46.60	46.47	46.60
3	46.80	47.27	46.69	46.78	46.20	46.40	47.41	47.00	46.53	46.01	46.90	46.54	45.92	47.00	46.50	46.75	46.40
4	46.70	46.99	46.73	46.77	46.30	46.34	47.37	46.70	46.54	46.44	46.90	46.48	45.50	47.10	46.50	46.46	46.50
5	47.10	47.10	46.89	46.81	46.60	46.72	46.24	46.50	46.29	46.22	46.70	46.49	46.19	47.00	NR	NR	NR
6	47.40	46.87	46.70	46.87	46.50	46.47	46.07	46.40	46.48	46.11	46.60	46.63	46.40	46.90	NR	NR	NR
7	47.30	47.02	46.78	46.83	46.70	46.56	46.09	46.70	46.39	46.13	46.60	46.86	46.06	46.90	NR	NR	NR
8	47.10	46.97	46.77	46.82	46.50	46.70	46.06	46.30	46.21	46.29	46.80	46.78	46.24	47.00	NR	NR	NR
9	47.10	46.96	46.83	46.81	46.80	46.33	46.99	47.10	46.58	45.82	46.60	46.68	46.31	47.40	NR	NR	NR
10	46.90	46.97	46.91	46.79	46.70	46.27	46.82	46.90	46.55	45.79	46.70	46.72	46.33	47.40	NR	NR	NR
11	46.90	46.93	46.76	46.74	46.90	46.61	47.26	47.10	46.33	46.24	46.50	46.62	46.41	47.20	NR	NR	NR
12	46.80	47.01	46.71	46.84	46.90	46.26	47.38	46.70	46.43	46.34	46.70	46.74	46.53	47.20	NR	NR	NR
Mean	46.99	47.02	46.77	46.81	46.54	46.48	46.85	46.68	46.47	46.19	46.73	46.63	46.11	47.09	46.55	46.58	46.50
Median	46.95	47.00	46.77	46.81	46.55	46.48	47.03	46.70	46.51	46.23	46.70	46.63	46.22	47.05	46.55	46.55	46.50
Std.Dev.	0.22	0.11	0.08	0.04	0.27	0.16	0.57	0.30	0.14	0.23	0.14	0.13	0.33	0.18	0.06	0.14	0.08
Rel.Std.Dev.	0.46%	0.23%	0.17%	0.09%	0.58%	0.35%	1.22%	0.65%	0.29%	0.50%	0.31%	0.27%	0.72%	0.38%	0.12%	0.30%	0.18%
PDM ³	0.72%	0.78%	0.24%	0.33%	-0.25%	-0.38%	0.40%	0.04%	-0.41%	-1.00%	0.16%	-0.06%	-1.17%	0.93%	-0.23%	-0.18%	-0.34%

Table A16. Fusion XRF results for SO₃ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	0.005	<0.01	0.002	<0.001	<0.001	NR	<0.001	<0.002	NR	NR	0.006	NR	NR	NR	<0.01	<0.002	NR
2	0.005	<0.01	0.002	0.002	<0.001	NR	<0.001	0.015	NR	NR	0.005	NR	NR	NR	<0.01	<0.002	NR
3	0.006	<0.01	0.003	0.001	<0.001	NR	0.003	<0.002	NR	NR	0.004	NR	NR	NR	<0.01	0.002	NR
4	0.006	<0.01	0.003	0.001	<0.001	NR	<0.001	<0.002	NR	NR	0.006	NR	NR	NR	<0.01	<0.002	NR
5	<0.001	<0.01	0.002	0.004	0.008	NR	<0.001	0.068	NR	NR	0.007	NR	NR	NR	NR	NR	NR
6	0.001	<0.01	0.002	0.005	0.006	NR	<0.001	<0.002	NR	NR	0.004	NR	NR	NR	NR	NR	NR
7	0.002	<0.01	0.002	0.005	0.006	NR	<0.001	0.046	NR	NR	0.005	NR	NR	NR	NR	NR	NR
8	0.002	<0.01	<0.002	0.004	0.009	NR	<0.001	0.037	NR	NR	0.004	NR	NR	NR	NR	NR	NR
9	0.004	<0.01	<0.002	0.004	0.005	NR	0.012	<0.002	NR	NR	0.003	NR	NR	NR	NR	NR	NR
10	0.005	<0.01	0.003	0.002	0.005	NR	0.007	<0.002	NR	NR	0.002	NR	NR	NR	NR	NR	NR
11	0.004	<0.01	0.003	0.003	0.004	NR	0.018	<0.002	NR	NR	0.003	NR	NR	NR	NR	NR	NR
12	0.005	<0.01	0.002	0.003	0.005	NR	0.009	0.005	NR	NR	0.003	NR	NR	NR	NR	NR	NR
Mean	0.004		0.002	0.003	0.006		0.010	0.034			0.004					0.002	
Median	0.005		0.002	0.003	0.006		0.009	0.037			0.004					0.002	
Std.Dev.	0.002		0.001	0.001	0.002		0.006	0.025			0.001						
Rel.Std.Dev.	41.56%		21.52%	46.78%	28.17%		57.45%	73.26%			34.56%						
PDM ³	9.40%		-35.82%	-17.34%	60.45%		162.07%	814.59%			15.88%					-46.52%	

Table A17. Fusion XRF results for TiO₂ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	0.050	0.040	0.030	0.032	0.030	NR	0.030	0.060	0.040	0.032	0.030	0.050	NR	0.030	0.040	0.027	0.030
2	0.050	0.035	0.030	0.034	0.030	NR	0.030	0.050	0.030	0.032	0.040	0.040	NR	0.030	0.030	0.028	0.040
3	0.060	0.030	0.030	0.032	0.030	NR	0.030	0.040	0.040	0.030	0.040	0.050	NR	0.030	0.040	0.028	0.030
4	0.060	0.030	0.030	0.031	0.030	NR	0.030	0.040	0.030	0.035	0.040	0.040	NR	0.030	0.030	0.027	0.040
5	0.040	0.030	0.040	0.035	0.030	NR	0.030	0.100	0.040	0.034	0.050	0.040	NR	0.030	NR	NR	NR
6	0.040	0.030	0.030	0.034	0.020	NR	0.030	0.060	0.040	0.037	0.040	0.040	NR	0.030	NR	NR	NR
7	0.040	0.030	0.030	0.035	0.030	NR	0.030	0.070	0.030	0.028	0.040	0.040	NR	0.030	NR	NR	NR
8	0.050	0.030	0.030	0.033	0.040	NR	0.030	0.070	0.030	0.028	0.050	0.040	NR	0.030	NR	NR	NR
9	0.050	0.030	0.030	0.032	0.040	NR	0.030	0.060	0.030	0.026	0.040	0.040	NR	0.030	NR	NR	NR
10	0.040	0.035	0.030	0.030	0.030	NR	0.030	0.040	0.040	0.035	0.040	0.040	NR	0.030	NR	NR	NR
11	0.040	0.035	0.030	0.031	0.030	NR	0.030	0.040	0.040	0.032	0.040	0.040	NR	0.030	NR	NR	NR
12	0.050	0.030	0.030	0.030	0.030	NR	0.030	0.050	0.040	0.039	0.030	0.030	NR	0.030	NR	NR	NR
Mean	0.048	0.032	0.031	0.032	0.031		0.030	0.057	0.036	0.032	0.040	0.041		0.03	0.04	0.03	0.04
Median	0.050	0.030	0.030	0.032	0.030		0.030	0.055	0.040	0.032	0.040	0.040		0.03	0.04	0.03	0.04
Std.Dev.	0.008	0.003	0.003	0.002	0.005		0.000	0.018	0.005	0.004	0.006	0.005		0.00	0.01	0.00	0.01
Rel.Std.Dev.	15.87%	10.42%	9.36%	5.50%	16.70%		0.00%	31.33%	14.37%	12.04%	15.08%	12.61%		0.00%	16.50%	2.61%	16.50%
PDM ³	41.99%	-4.09%	-7.83%	-3.10%	-7.83%		-10.32%	69.40%	7.12%	-3.35%	19.57%	22.06%		-10.32%	4.63%	-17.05%	4.63%

Table A18. Fusion XRF results for Zn in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A BF*XRF	Lab B BF*XRF	Lab C BF*XRF	Lab D BF*XRF	Lab E BF*XRF	Lab F BF*XRF	Lab G BF*XRF	Lab H BF*XRF	Lab I BF*XRF	Lab J BF*XRF	Lab K BF*XRF	Lab L BF*XRF	Lab N BF*XRF	Lab O BF*XRF	Lab P BF*XRF	Lab Q BF*XRF	Lab R BF*XRF
1	180	196	190	195	190	192	120	200	220	220	180	250	NR	200	100	207	NR
2	180	193	190	195	200	193	130	210	200	200	180	250	NR	210	100	186	NR
3	180	191	190	190	200	189	120	200	210	210	170	250	NR	210	100	204	NR
4	180	182	190	190	200	187	140	200	200	190	180	250	NR	220	100	195	NR
5	180	183	200	195	220	194	140	210	200	200	180	170	NR	220	NR	NR	NR
6	180	193	200	195	230	192	150	210	210	210	180	170	NR	210	NR	NR	NR
7	180	182	180	195	210	193	150	210	200	200	180	170	NR	220	NR	NR	NR
8	180	190	190	195	230	196	130	200	150	210	170	180	NR	210	NR	NR	NR
9	180	187	190	190	230	191	120	210	220	220	190	170	NR	220	NR	NR	NR
10	180	189	200	185	230	192	120	210	200	210	180	170	NR	230	NR	NR	NR
11	180	182	200	195	220	191	120	210	210	190	190	170	NR	230	NR	NR	NR
12	180	190	190	190	230	185	130	190	200	230	180	160	NR	220	NR	NR	NR
Mean	180	188	193	193	216	191	131	205	202	208	180	197		217	100	198	
Median	180	189	190	195	220	192	130	210	200	210	180	170		220	100	200	
Std.Dev.	0	5	6	3	15	3	12	7	18	12	6	40		9	0	9	
Rel.Std.Dev.	0.00%	2.57%	3.23%	1.75%	6.97%	1.61%	8.90%	3.29%	8.93%	5.86%	3.35%	20.15%		4.10%	0.00%	4.79%	
PDM ³	-8.00%	-3.98%	-1.61%	-1.61%	10.31%	-2.24%	-33.13%	4.78%	3.07%	6.05%	-8.00%	0.52%		10.74%	-48.89%	1.20%	

Table A19. Results for LOI at 1000°C in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A LOI	Lab B LOI	Lab C LOI	Lab D LOI	Lab E LOI	Lab F LOI	Lab G LOI	Lab H LOI	Lab I LOI	Lab J LOI	Lab K LOI	Lab L LOI	Lab M LOI	Lab O LOI	Lab P LOI	Lab Q LOI	Lab R LOI
1	9.23	9.35	9.13	9.14	8.90	9.83	NR	9.28	8.79	9.88	9.34	9.20	9.75	8.72	9.47	9.29	8.90
2	9.22	9.35	9.15	9.16	8.86	10.34	NR	9.32	8.73	10.36	9.35	9.40	9.88	8.68	9.44	9.33	8.88
3	9.18	9.36	9.17	9.18	8.85	10.29	NR	9.29	8.71	9.86	9.37	9.50	9.90	8.64	9.48	9.29	8.93
4	9.23	9.34	9.16	9.17	8.82	10.26	NR	9.22	8.76	9.74	9.35	9.40	9.88	8.50	9.47	9.33	8.91
5	9.09	9.34	9.18	9.17	9.21	10.42	9.64	9.23	8.91	10.27	9.55	9.30	10.38	8.76	NR	NR	NR
6	9.06	9.34	9.19	9.19	9.14	10.23	9.71	9.34	8.93	9.87	9.54	9.00	10.24	8.69	NR	NR	NR
7	9.06	9.34	9.17	9.16	9.06	10.33	9.34	9.30	9.18	9.69	9.56	9.10	10.30	8.74	NR	NR	NR
8	9.19	9.34	9.17	9.13	9.06	10.60	9.34	9.29	9.08	9.75	9.58	9.10	10.41	8.76	NR	NR	NR
9	9.19	9.37	9.18	9.12	8.93	9.84	9.46	9.18	9.01	11.40	9.91	9.20	11.03	8.68	NR	NR	NR
10	9.27	9.38	9.22	9.14	9.00	10.32	9.31	9.14	9.06	11.16	9.76	9.10	11.14	8.63	NR	NR	NR
11	9.29	9.39	9.22	9.16	9.02	9.90	9.37	9.17	9.11	10.07	9.96	9.10	11.12	8.67	NR	NR	NR
12	9.28	9.40	9.23	9.18	9.00	9.88	9.40	9.19	9.28	10.03	9.80	9.10	11.19	8.67	NR	NR	NR
Mean	9.19	9.36	9.18	9.16	8.99	10.19	9.45	9.25	8.96	10.17	9.59	9.21	10.43	8.68	9.47	9.31	8.91
Median	9.21	9.35	9.18	9.16	9.00	10.27	9.39	9.26	8.97	9.95	9.56	9.15	10.34	8.68	9.47	9.31	8.91
Std.Dev.	0.08	0.02	0.03	0.02	0.12	0.26	0.15	0.07	0.19	0.56	0.22	0.16	0.55	0.07	0.02	0.03	0.02
Rel.Std.Dev.	0.88%	0.23%	0.33%	0.24%	1.34%	2.53%	1.58%	0.71%	2.10%	5.48%	2.32%	1.70%	5.28%	0.81%	0.18%	0.28%	0.23%
PDM ³	-0.90%	0.87%	-1.01%	-1.25%	-3.09%	9.84%	1.85%	-0.31%	-3.36%	9.69%	3.39%	-0.71%	12.50%	-6.43%	2.05%	0.40%	-3.98%

Table A20. Fusion ICP results for Ni in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	1.38	1.39	1.32	1.38	1.30	1.35	1.38	1.01	1.41	1.38	1.29	1.32
2	1.38	1.40	1.35	1.37	1.34	1.34	1.39	1.24	1.38	1.35	1.37	1.32
3	1.37	1.40	1.35	1.36	1.34	1.34	1.38	1.35	1.36	1.37	1.36	1.32
4	1.39	1.39	1.34	1.36	1.33	1.34	1.40	1.20	1.37	1.36	1.34	1.32
5	1.36	1.39	1.38	1.39	1.38	1.33	1.43	1.22	1.44	1.37	NR	NR
6	1.37	1.38	1.37	1.40	1.36	1.34	1.44	1.28	1.36	1.36	NR	NR
7	1.35	1.42	1.34	1.41	1.38	1.33	1.42	1.28	1.39	1.36	NR	NR
8	1.36	1.41	1.33	1.36	1.38	1.33	1.42	1.20	1.42	1.36	NR	NR
9	1.41	1.33	1.34	1.39	1.37	1.33	1.37	1.40	1.42	1.35	NR	NR
10	1.39	1.33	1.31	1.37	1.39	1.33	1.38	1.37	1.38	1.35	NR	NR
11	1.35	1.29	1.29	1.36	1.42	1.32	1.38	1.18	1.44	1.35	NR	NR
12	1.39	1.32	1.35	1.41	1.39	1.32	1.39	1.15	1.40	1.37	NR	NR
Mean	1.37	1.37	1.34	1.38	1.37	1.33	1.40	1.24	1.40	1.36	1.34	1.32
Median	1.37	1.39	1.34	1.38	1.38	1.33	1.39	1.23	1.39	1.36	1.35	1.32
Std.Dev.	0.02	0.04	0.02	0.02	0.03	0.01	0.02	0.11	0.03	0.01	0.04	0.00
Rel.Std.Dev.	1.38%	3.13%	1.84%	1.50%	2.27%	0.64%	1.67%	8.50%	2.06%	0.78%	2.66%	0.32%
PDM ³	0.60%	0.47%	-1.90%	0.94%	0.10%	-2.40%	2.43%	-9.09%	2.36%	-0.59%	-1.84%	-3.34%

Table A21. Fusion ICP results for Co in OREAS 187 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	550	617	620	620	607	620	630	693	626	640	601	639
2	550	627	620	620	623	620	630	690	597	630	593	629
3	550	620	620	620	640	630	640	721	593	640	601	647
4	560	630	620	600	625	620	640	672	610	630	606	630
5	620	645	620	670	638	600	640	683	651	630	NR	NR
6	630	683	640	620	649	590	650	676	651	620	NR	NR
7	610	690	640	680	658	600	630	675	651	630	NR	NR
8	660	684	620	620	655	590	640	647	651	620	NR	NR
9	610	700	680	680	719	610	580	620	614	630	NR	NR
10	590	665	660	620	717	600	580	626	597	630	NR	NR
11	570	618	640	680	721	610	580	590	637	630	NR	NR
12	590	651	680	640	708	610	590	583	589	630	NR	NR
Mean	591	653	638	639	663	608	619	656	622	630	600	636
Median	590	648	630	620	652	610	630	673	620	630	601	635
Std.Dev.	36	31	23	30	42	13	28	43	25	6	5	8
Rel.Std.Dev.	6.10%	4.73%	3.65%	4.64%	6.28%	2.08%	4.49%	6.57%	4.05%	0.96%	0.90%	1.32%
PDM ³	-6.03%	3.78%	1.53%	1.66%	5.51%	-3.24%	-1.52%	4.39%	-1.05%	0.20%	-4.53%	1.21%

Table A22. Fusion ICP results for Al₂O₃ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A	Lab C	Lab D	Lab E	Lab G	Lab H	Lab I	Lab J	Lab M	Lab O	Lab P	Lab S
	PF*OES	PF*OES	PF*OES	PF*OES	MAR*OES	BF*OES	PF*ICP	BF*OES	PF*OES	PF*OES	PF*OES	PF*OES
1	2.86	2.75	2.65	2.68	2.84	2.82	2.94	2.72	2.97	2.76	2.82	2.91
2	2.76	2.77	2.65	2.74	2.84	2.78	2.92	2.66	2.94	2.77	2.87	2.87
3	2.75	2.79	2.68	2.87	2.85	2.80	2.91	2.79	3.16	2.78	2.78	2.89
4	2.80	2.78	2.66	2.73	2.83	2.80	2.89	2.59	2.64	2.75	2.67	2.90
5	2.79	2.81	2.76	2.75	2.81	2.82	2.81	2.75	2.72	2.74	NR	NR
6	2.78	2.82	2.74	2.79	2.78	2.80	2.79	2.77	2.80	2.69	NR	NR
7	2.74	2.84	2.82	2.78	2.82	2.79	2.77	2.74	2.80	2.69	NR	NR
8	2.78	2.82	2.70	2.70	2.80	2.81	2.83	2.58	2.68	2.68	NR	NR
9	2.96	2.71	2.72	2.77	2.91	2.77	2.64	2.77	2.78	2.71	NR	NR
10	4.13	2.69	2.76	2.52	2.87	2.80	2.78	2.80	2.77	2.70	NR	NR
11	2.74	2.60	2.76	2.73	3.05	2.81	2.80	2.61	2.75	2.73	NR	NR
12	3.18	2.63	2.80	2.60	2.91	2.78	2.73	2.60	2.76	2.68	NR	NR
Mean	2.94	2.75	2.73	2.72	2.86	2.80	2.82	2.70	2.81	2.72	2.79	2.89
Median	2.79	2.78	2.73	2.74	2.84	2.80	2.81	2.73	2.77	2.72	2.80	2.90
Std.Dev.	0.40	0.08	0.06	0.09	0.07	0.02	0.09	0.08	0.14	0.04	0.09	0.02
Rel.Std.Dev.	13.46%	2.83%	2.12%	3.35%	2.52%	0.57%	3.09%	3.15%	5.13%	1.33%	3.05%	0.54%
PDM ³	6.04%	-0.76%	-1.69%	-1.81%	3.15%	0.96%	1.65%	-2.67%	1.53%	-1.75%	0.47%	4.40%

Table A23. Fusion ICP results for CaO in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A	Lab C	Lab D	Lab E	Lab G	Lab H	Lab I	Lab J	Lab M	Lab O	Lab P	Lab S
	PF*OES	PF*OES	PF*OES	PF*OES	MAR*OES	BF*OES	PF*ICP	BF*OES	PF*OES	PF*OES	PF*OES	PF*OES
1	0.570	0.330	0.400	0.320	0.350	0.350	0.350	0.355	0.286	0.330	0.400	0.416
2	0.380	0.360	0.400	0.300	0.350	0.330	0.360	0.359	0.290	0.430	0.400	0.426
3	0.370	0.380	0.400	0.350	0.350	0.340	0.370	0.364	0.287	0.360	0.400	0.412
4	0.430	0.360	0.400	0.290	0.340	0.340	0.360	0.347	0.295	0.360	0.300	0.427
5	0.490	0.350	0.400	0.290	0.350	0.340	0.360	0.355	0.331	0.410	NR	NR
6	0.470	0.330	0.300	0.260	0.350	0.340	0.360	0.350	0.351	0.330	NR	NR
7	0.410	0.360	0.300	0.290	0.350	0.340	0.350	0.345	0.331	0.290	NR	NR
8	0.420	0.370	0.300	0.270	0.350	0.340	0.360	0.355	0.331	0.290	NR	NR
9	0.510	0.270	0.300	0.300	0.340	0.340	0.340	0.376	0.297	0.420	NR	NR
10	0.500	0.310	0.400	0.270	0.340	0.340	0.360	0.370	0.297	0.500	NR	NR
11	0.470	0.300	0.400	0.310	0.350	0.330	0.360	0.358	0.287	0.450	NR	NR
12	0.460	0.300	0.400	0.260	0.350	0.340	0.340	0.346	0.297	0.360	NR	NR
Mean	0.457	0.335	0.367	0.293	0.348	0.339	0.356	0.357	0.307	0.378	0.375	0.420
Median	0.465	0.340	0.400	0.290	0.350	0.340	0.360	0.355	0.297	0.360	0.400	0.421
Std.Dev.	0.058	0.034	0.049	0.026	0.005	0.005	0.009	0.010	0.023	0.065	0.050	0.007
Rel.Std.Dev.	12.64%	10.14%	13.43%	9.00%	1.30%	1.52%	2.53%	2.68%	7.36%	17.25%	13.33%	1.74%
PDM ³	29.82%	-4.77%	4.23%	-16.85%	-1.21%	-3.58%	1.15%	1.39%	-12.85%	7.31%	6.60%	19.53%

Table A24. Fusion ICP results for Cu in OREAS 187 (abbreviations as in Table A1; values in ppm).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	<50	42	<50	<50	<50	40	<50	<10	38	<50	31	38
2	<50	44	<50	<50	<50	40	<50	<10	37	<50	68	47
3	<50	39	<50	<50	130	40	<50	14	37	<50	35	41
4	<50	40	<50	<50	<50	40	<50	12	35	50	23	37
5	<50	26	<50	<50	<50	40	<50	<10	25	<50	NR	NR
6	<50	34	<50	<50	<50	40	<50	<10	28	<50	NR	NR
7	<50	26	50	<50	<50	40	<50	<10	25	<50	NR	NR
8	<50	20	<50	<50	<50	40	<50	<10	24	<50	NR	NR
9	<50	31	50	<50	<50	30	<50	<10	46	<50	NR	NR
10	<50	31	<50	<50	<50	30	<50	<10	39	50	NR	NR
11	<50	31	<50	<50	<50	30	<50	<10	45	100	NR	NR
12	<50	30	<50	<50	<50	30	<50	<10	48	80	NR	NR
Mean		33	50		130	37		13	36	70	39	41
Median		31	50		130	40		13	37	65	33	40
Std.Dev.		7	0			5		1	8	24	20	4
Rel.Std.Dev.		22.03%	0.00%			13.43%		8.97%	23.79%	34.99%	50.46%	10.88%
PDM ³		-9.03%	38.53%		260.17%	1.59%		-64.21%	-1.28%	93.94%	8.74%	13.69%

Table A25. Fusion ICP results for Cr₂O₃ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A	Lab C	Lab D	Lab E	Lab G	Lab H	Lab I	Lab J	Lab M	Lab O	Lab P	Lab S
	PF*OES	PF*OES	PF*OES	PF*OES	MAR*OES	BF*OES	PF*ICP	BF*OES	PF*OES	PF*OES	PF*OES	PF*OES
1	1.01	1.03	1.04	0.98	0.97	0.96	0.95	1.01	0.93	1.01	0.92	1.00
2	0.99	1.05	1.04	0.95	0.98	0.97	0.96	0.99	0.91	0.99	1.00	1.00
3	1.01	1.05	1.03	0.99	0.98	0.96	0.96	1.04	0.89	1.01	0.98	1.02
4	0.99	1.04	1.02	0.92	0.99	0.97	0.97	0.96	0.91	0.99	0.95	1.01
5	1.01	0.97	0.96	0.99	0.98	0.97	1.09	1.00	1.01	1.01	NR	NR
6	1.01	0.97	0.97	0.94	0.96	0.96	1.10	0.99	1.00	0.98	NR	NR
7	0.98	1.00	0.97	1.01	0.98	0.96	1.09	0.98	0.99	0.99	NR	NR
8	0.99	1.00	0.97	0.89	0.98	0.96	1.10	0.96	1.00	0.99	NR	NR
9	1.04	0.98	0.96	0.96	0.98	0.98	1.03	1.01	0.96	0.98	NR	NR
10	1.01	1.00	0.96	0.89	0.96	0.97	1.04	1.01	0.98	0.98	NR	NR
11	0.99	0.95	0.97	0.96	1.01	0.98	1.03	0.95	0.98	0.98	NR	NR
12	1.02	0.98	0.97	0.92	0.99	0.98	1.04	0.96	0.97	0.98	NR	NR
Mean	1.00	1.00	0.99	0.95	0.98	0.97	1.03	0.99	0.96	0.99	0.96	1.01
Median	1.01	1.00	0.97	0.96	0.98	0.97	1.04	0.99	0.98	0.99	0.97	1.01
Std.Dev.	0.02	0.03	0.03	0.04	0.01	0.01	0.06	0.03	0.04	0.01	0.03	0.01
Rel.Std.Dev.	1.67%	3.32%	3.45%	4.14%	1.34%	0.90%	5.63%	2.77%	4.13%	1.23%	3.55%	0.67%
PDM ³	1.76%	1.55%	0.03%	-3.73%	-0.74%	-1.92%	4.37%	0.23%	-2.65%	0.47%	-2.36%	2.11%

Table A26. Fusion ICP results for Fe₂O₃ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A	Lab C	Lab D	Lab E	Lab G	Lab H	Lab I	Lab J	Lab M	Lab O	Lab P	Lab S
	PF*OES	PF*OES	PF*OES	PF*OES	MAR*OES	BF*OES	PF*ICP	BF*OES	PF*OES	PF*OES	PF*OES	PF*OES
1	19.60	19.86	19.40	18.80	19.73	19.82	18.46	20.32	19.37	19.95	19.00	20.00
2	19.45	19.94	19.60	18.50	19.75	19.87	19.22	20.21	19.23	19.55	18.90	20.05
3	19.30	19.98	19.70	19.50	19.49	19.93	18.71	20.61	18.96	19.70	18.70	20.06
4	19.50	19.99	19.60	18.35	19.76	19.91	19.59	19.98	19.10	19.65	17.60	20.04
5	19.70	19.42	19.30	19.30	19.62	19.53	18.99	19.55	20.04	19.25	NR	NR
6	19.75	19.31	19.20	17.95	19.31	19.48	18.48	19.35	19.67	18.90	NR	NR
7	19.45	19.86	19.30	19.65	19.56	19.47	19.86	19.52	18.90	19.00	NR	NR
8	19.60	19.74	18.90	17.40	19.71	19.40	18.96	18.76	19.14	18.90	NR	NR
9	19.40	19.42	19.30	19.75	19.64	19.76	18.98	20.43	18.87	19.60	NR	NR
10	19.10	19.76	19.30	17.95	19.42	19.55	18.94	20.05	18.71	19.60	NR	NR
11	18.55	18.99	19.20	19.25	19.67	19.56	19.11	19.32	18.73	19.55	NR	NR
12	19.00	19.48	19.60	18.65	19.69	19.37	18.87	19.20	18.90	19.60	NR	NR
Mean	19.37	19.65	19.37	18.75	19.61	19.64	19.01	19.78	19.13	19.44	18.55	20.04
Median	19.45	19.75	19.30	18.73	19.66	19.56	18.97	19.76	19.03	19.58	18.80	20.04
Std.Dev.	0.34	0.32	0.23	0.75	0.14	0.21	0.41	0.57	0.40	0.34	0.65	0.03
Rel.Std.Dev.	1.76%	1.61%	1.17%	4.02%	0.72%	1.05%	2.14%	2.90%	2.07%	1.76%	3.48%	0.13%
PDM ³	-0.17%	1.27%	-0.17%	-3.33%	1.09%	1.22%	-1.99%	1.93%	-1.37%	0.19%	-4.38%	3.28%

Table A27. Fusion ICP results for K₂O in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	0.100	<0.1	<0.02	<0.1	0.010	<0.01	<0.01	<0.1	0.018	0.120	<0.2	0.080
2	<0.1	<0.1	<0.02	<0.1	0.010	<0.01	<0.01	<0.1	0.022	0.120	<0.2	0.077
3	<0.1	<0.1	<0.02	<0.1	0.020	<0.01	<0.01	0.101	0.076	0.120	<0.2	0.074
4	<0.1	<0.1	<0.02	<0.1	0.020	0.010	<0.01	<0.1	<0.01	0.120	<0.2	0.074
5	0.300	<0.1	0.100	<0.1	0.010	<0.01	<0.01	0.124	0.006	0.120	NR	NR
6	0.200	<0.1	0.100	<0.1	0.010	<0.01	<0.01	<0.1	0.006	0.120	NR	NR
7	0.200	<0.1	<0.1	<0.1	0.010	<0.01	<0.01	<0.1	0.006	0.120	NR	NR
8	0.300	<0.1	<0.1	<0.1	0.010	<0.01	0.020	<0.1	0.007	<0.1	NR	NR
9	0.100	NR	<0.1	<0.1	0.010	<0.01	<0.01	<0.1	0.007	<0.1	NR	NR
10	<0.1	0.096	<0.1	<0.1	0.010	<0.01	0.020	<0.1	0.007	0.120	NR	NR
11	<0.1	0.145	<0.1	<0.1	0.010	<0.01	<0.01	<0.1	0.007	0.120	NR	NR
12	<0.1	0.145	<0.1	<0.1	0.020	<0.01	<0.01	<0.1	0.007	0.120	NR	NR
Mean	0.200	0.128	0.100		0.013	0.010	0.020	0.113	0.016	0.120		0.076
Median	0.200	0.145	0.100		0.010	0.010	0.020	0.113	0.007	0.120		0.075
Std.Dev.	0.089	0.028	0.000		0.005		0.000	0.016	0.021	0.000		0.003
Rel.Std.Dev.	44.72%	21.65%	0.00%		36.18%		0.00%	14.46%	133%	0.00%		3.67%
PDM ³	187.43%	84.66%	43.71%		-82.04%	-85.63%	-71.26%	61.68%	-77.61%	73.12%		9.65%

Table A28. Fusion ICP results for MgO in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	17.85	17.72	17.60	16.75	18.30	18.23	17.97	19.17	17.79	17.95	16.70	18.13
2	17.65	17.72	17.60	16.95	18.48	18.21	17.85	18.99	17.87	17.85	17.00	18.14
3	17.55	17.88	17.90	18.15	18.47	18.15	17.98	19.53	18.35	17.90	16.80	18.22
4	17.70	17.85	17.60	16.90	18.32	18.33	18.02	18.66	18.02	17.90	15.90	18.23
5	18.20	19.09	17.90	18.25	17.97	17.73	18.27	19.27	17.24	18.20	NR	NR
6	18.15	18.99	17.70	17.00	17.85	17.78	18.19	19.05	17.31	18.15	NR	NR
7	17.95	19.53	17.90	18.55	18.12	17.71	17.76	18.82	18.69	18.10	NR	NR
8	18.05	19.42	17.60	16.45	17.90	17.73	17.71	18.51	18.66	18.15	NR	NR
9	18.35	18.09	17.70	19.15	18.35	17.94	17.02	19.64	16.69	17.60	NR	NR
10	18.00	18.35	17.90	17.55	18.25	17.62	17.56	19.45	17.36	17.55	NR	NR
11	17.55	17.65	17.70	18.80	18.44	17.55	17.50	18.99	18.27	17.60	NR	NR
12	18.05	18.15	17.90	18.30	18.38	17.64	17.37	18.70	17.04	17.65	NR	NR
Mean	17.92	18.37	17.75	17.73	18.24	17.89	17.77	19.06	17.77	17.88	16.60	18.18
Median	17.98	18.12	17.70	17.85	18.31	17.76	17.81	19.02	17.83	17.90	16.75	18.18
Std.Dev.	0.26	0.70	0.14	0.91	0.22	0.27	0.36	0.36	0.65	0.24	0.48	0.06
Rel.Std.Dev.	1.46%	3.80%	0.78%	5.12%	1.22%	1.53%	2.02%	1.88%	3.65%	1.33%	2.91%	0.30%
PDM ³	-0.19%	2.31%	-1.14%	-1.24%	1.56%	-0.39%	-1.05%	6.17%	-1.01%	-0.40%	-7.55%	1.26%

Table A29. Fusion ICP results for MnO in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A	Lab C	Lab D	Lab E	Lab G	Lab H	Lab I	Lab J	Lab M	Lab O	Lab P	Lab S
	PF*OES	PF*OES	PF*OES	PF*OES	MAR*OES	BF*OES	PF*ICP	BF*OES	PF*OES	PF*OES	PF*OES	PF*OES
1	0.350	0.358	0.346	0.330	0.360	0.350	0.362	0.351	0.338	0.360	0.331	0.366
2	0.350	0.360	0.348	0.340	0.360	0.350	0.360	0.347	0.335	0.360	0.342	0.365
3	0.340	0.359	0.352	0.350	0.360	0.350	0.362	0.354	0.330	0.360	0.337	0.367
4	0.350	0.360	0.346	0.310	0.360	0.350	0.360	0.342	0.334	0.360	0.335	0.361
5	0.370	0.356	0.364	0.350	0.350	0.360	0.362	0.364	0.372	0.360	NR	NR
6	0.370	0.357	0.358	0.330	0.350	0.350	0.361	0.360	0.369	0.360	NR	NR
7	0.360	0.368	0.356	0.360	0.350	0.360	0.368	0.357	0.365	0.360	NR	NR
8	0.360	0.366	0.354	0.320	0.350	0.350	0.354	0.358	0.369	0.360	NR	NR
9	0.360	0.353	0.356	0.350	0.360	0.360	0.357	0.374	0.355	0.360	NR	NR
10	0.350	0.363	0.358	0.320	0.360	0.350	0.360	0.373	0.363	0.360	NR	NR
11	0.350	0.346	0.358	0.350	0.360	0.360	0.360	0.359	0.363	0.360	NR	NR
12	0.350	0.353	0.366	0.340	0.360	0.350	0.348	0.359	0.354	0.360	NR	NR
Mean	0.355	0.358	0.355	0.338	0.357	0.353	0.360	0.358	0.354	0.360	0.336	0.365
Median	0.350	0.359	0.356	0.340	0.360	0.350	0.360	0.359	0.359	0.360	0.336	0.366
Std.Dev.	0.009	0.006	0.006	0.015	0.005	0.005	0.005	0.009	0.015	0.000	0.005	0.002
Rel.Std.Dev.	2.55%	1.69%	1.80%	4.58%	1.38%	1.39%	1.36%	2.62%	4.36%	0.00%	1.36%	0.66%
PDM ³	-0.97%	-0.10%	-0.92%	-5.85%	-0.50%	-1.43%	0.29%	-0.08%	-1.24%	0.43%	-6.20%	1.80%

Table A30. Fusion ICP results for Na₂O in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	NR	NR	NR	NR	0.020	0.020	0.020	<0.01	0.017	NR	NR	NR
2	NR	NR	NR	NR	0.020	0.010	0.020	<0.01	0.017	NR	NR	NR
3	NR	NR	NR	NR	0.020	0.010	0.020	<0.01	0.017	NR	NR	NR
4	NR	NR	NR	NR	0.020	0.010	0.020	<0.01	0.018	NR	NR	NR
5	NR	NR	NR	NR	0.020	0.010	0.020	0.026	0.019	NR	NR	NR
6	NR	NR	NR	NR	0.020	0.020	0.020	0.027	0.019	NR	NR	NR
7	NR	NR	NR	NR	0.020	0.020	0.010	0.025	0.019	NR	NR	NR
8	NR	NR	NR	NR	0.020	0.010	0.020	0.026	0.019	NR	NR	NR
9	NR	NR	NR	NR	0.020	0.010	0.010	0.038	0.026	NR	NR	NR
10	NR	NR	NR	NR	0.020	0.010	0.020	0.031	0.026	NR	NR	NR
11	NR	NR	NR	NR	0.030	0.010	0.020	0.022	0.026	NR	NR	NR
12	NR	NR	NR	NR	0.020	0.020	0.010	0.021	0.027	NR	NR	NR
Mean					0.021	0.013	0.018	0.027	0.021			
Median					0.020	0.010	0.020	0.026	0.019			
Std.Dev.					0.003	0.005	0.005	0.005	0.004			
Rel.Std.Dev.					13.86%	36.93%	25.84%	19.99%	19.07%			
PDM ³					6.61%	-31.77%	-10.44%	38.17%	5.47%			

Table A31. Fusion ICP results for P₂O₅ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	NR	<0.03	<0.02	0.020	<0.01	<0.01	<0.01	<0.01	0.030	NR	NR	0.007
2	NR	<0.03	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	0.021	NR	NR	0.008
3	NR	<0.03	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	0.027	NR	NR	0.009
4	NR	<0.03	<0.02	<0.02	<0.01	<0.01	0.010	<0.01	0.014	NR	NR	<0.003
5	NR	<0.03	<0.02	0.020	<0.01	<0.01	<0.01	<0.01	<0.01	NR	NR	NR
6	NR	<0.03	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	NR	NR	NR
7	NR	<0.03	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	NR	NR	NR
8	NR	<0.03	<0.02	<0.02	<0.01	0.010	<0.01	<0.01	<0.01	NR	NR	NR
9	NR	<0.03	0.020	<0.02	0.010	<0.01	<0.01	<0.01	<0.01	NR	NR	NR
10	NR	<0.03	0.020	<0.02	0.010	<0.01	<0.01	<0.01	<0.01	NR	NR	NR
11	NR	<0.03	<0.02	<0.02	0.010	<0.01	0.020	<0.01	<0.01	NR	NR	NR
12	NR	<0.03	0.020	<0.02	0.010	<0.01	<0.01	<0.01	<0.01	NR	NR	NR
Mean			0.020	0.020	0.010	0.010	0.015		0.023			0.008
Median			0.020	0.020	0.010	0.010	0.015		0.024			0.008
Std.Dev.			0.000	0.000	0.000		0.007		0.007			0.001
Rel.Std.Dev.			0.00%	0.00%	0.00%		47.14%		31.70%			12.50%
PDM ³			22.37%	22.37%	-38.81%	-38.81%	-8.22%		41.10%			-51.05%

Table A32. Fusion ICP results for SiO₂ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	45.80	46.30	46.60	44.30	46.61	45.92	47.66	45.79	46.67	47.80	43.40	48.26
2	45.40	46.50	46.60	44.60	46.63	45.90	46.99	45.11	46.92	47.70	45.00	48.35
3	47.20	47.50	46.40	48.10	46.46	45.90	47.81	47.93	46.58	47.90	44.10	48.47
4	40.90	46.60	46.40	44.20	46.63	45.84	47.45	44.88	47.04	47.10	44.00	48.66
5	45.70	45.10	46.20	44.60	46.51	46.73	47.47	47.24	45.93	47.10	NR	NR
6	46.40	47.70	45.80	41.80	45.62	46.68	47.27	47.04	46.56	45.90	NR	NR
7	47.60	49.10	46.00	45.40	46.55	46.80	47.24	47.09	46.74	45.60	NR	NR
8	47.30	48.60	44.90	40.50	46.12	46.86	46.79	47.47	46.82	45.30	NR	NR
9	46.80	51.30	44.90	47.50	47.89	46.39	44.17	40.47	46.39	45.20	NR	NR
10	45.70	51.90	45.30	43.30	47.50	46.96	47.72	40.60	46.42	45.30	NR	NR
11	44.10	49.30	45.10	46.90	48.33	46.98	47.12	38.21	45.74	45.50	NR	NR
12	45.60	51.10	46.00	44.70	47.48	47.11	45.53	37.76	45.88	45.30	NR	NR
Mean	45.71	48.42	45.85	44.66	46.86	46.51	46.94	44.13	46.47	46.31	44.13	48.43
Median	45.75	48.15	46.00	44.60	46.62	46.71	47.26	45.45	46.57	45.75	44.05	48.41
Std.Dev.	1.80	2.19	0.64	2.20	0.78	0.49	1.06	3.79	0.42	1.11	0.66	0.17
Rel.Std.Dev.	3.95%	4.52%	1.41%	4.92%	1.66%	1.05%	2.26%	8.60%	0.91%	2.40%	1.50%	0.36%
PDM ³	-1.43%	4.41%	-1.13%	-3.70%	1.05%	0.29%	1.21%	-4.83%	0.22%	-0.14%	-4.85%	4.44%

Table A33. Fusion ICP results for SO₃ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	<0.02	<0.05	<0.1	<0.02	<0.01	NR	NR	NR	NR	0.025	<0.01	NR
2	0.020	<0.05	<0.1	<0.02	<0.01	NR	NR	NR	NR	0.050	<0.01	NR
3	<0.02	<0.05	<0.1	<0.02	<0.01	NR	NR	NR	NR	0.050	<0.01	NR
4	0.080	<0.05	<0.1	<0.02	<0.01	NR	NR	NR	NR	0.075	<0.01	NR
5	<0.02	<0.05	<0.02	<0.02	NR	NR	NR	NR	NR	0.100	NR	NR
6	<0.02	<0.05	<0.02	<0.02	NR	NR	NR	NR	NR	0.025	NR	NR
7	<0.02	<0.05	<0.02	<0.02	NR	NR	NR	NR	NR	<0.01	NR	NR
8	<0.02	<0.05	<0.02	0.020	NR	NR	NR	NR	NR	<0.01	NR	NR
9	0.020	<0.05	0.040	<0.02	<0.02	NR	NR	NR	NR	<0.01	NR	NR
10	0.020	<0.05	0.080	<0.02	<0.02	NR	NR	NR	NR	0.025	NR	NR
11	<0.02	<0.05	0.020	<0.02	<0.02	NR	NR	NR	NR	0.025	NR	NR
12	<0.02	<0.05	0.040	<0.02	<0.02	NR	NR	NR	NR	<0.01	NR	NR
Mean	0.035		0.045	0.020						0.047		
Median	0.020		0.040	0.020						0.037		
Std.Dev.	0.030		0.025							0.028		
Rel.Std.Dev.	85.71%		55.92%							60.05%		
PDM ³	3.59%		33.18%	-40.81%						38.57%		

Table A34. Fusion ICP results for TiO₂ in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	<0.01	0.030	0.030	0.030	0.032	0.030	0.034	0.021	0.030	0.030	0.030	0.037
2	<0.01	0.030	0.030	0.030	0.033	0.030	0.034	0.022	0.029	0.030	0.030	0.036
3	<0.01	0.030	0.030	0.030	0.032	0.030	0.034	0.026	0.028	0.030	0.030	0.038
4	<0.01	0.030	0.030	0.030	0.033	0.030	0.033	0.022	0.029	0.030	0.030	0.037
5	<0.01	0.040	0.030	0.030	0.034	0.030	0.033	0.035	0.032	0.030	NR	NR
6	<0.01	0.040	0.030	0.030	0.034	0.030	0.033	0.035	0.031	0.030	NR	NR
7	<0.01	0.030	0.030	0.030	0.034	0.030	0.033	0.032	0.032	0.030	NR	NR
8	<0.01	0.030	0.030	0.030	0.034	0.030	0.032	0.035	0.033	0.030	NR	NR
9	<0.01	0.030	0.030	0.030	0.035	0.030	0.031	0.028	0.035	0.030	NR	NR
10	<0.01	0.030	0.030	0.030	0.034	0.030	0.033	0.028	0.041	0.030	NR	NR
11	<0.01	0.030	0.030	0.030	0.036	0.030	0.032	0.026	0.038	0.030	NR	NR
12	<0.01	0.030	0.030	0.030	0.036	0.030	0.032	0.028	0.036	0.030	NR	NR
Mean		0.032	0.030	0.030	0.034	0.030	0.033	0.028	0.033	0.030	0.030	0.037
Median		0.030	0.030	0.030	0.034	0.030	0.033	0.028	0.032	0.030	0.030	0.037
Std.Dev.		0.004	0.000	0.000	0.001	0.000	0.001	0.005	0.004	0.000	0.000	0.001
Rel.Std.Dev.		12.29%	0.00%	0.00%	3.87%	0.00%	2.86%	18.28%	12.32%	0.00%	0.00%	1.61%
PDM ³		2.82%	-2.60%	-2.60%	10.12%	-2.60%	6.60%	-8.55%	6.18%	-2.60%	-2.60%	20.48%

Table A35. Fusion ICP results for Zn in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A PF*OES	Lab C PF*OES	Lab D PF*OES	Lab E PF*OES	Lab G MAR*OES	Lab H BF*OES	Lab I PF*ICP	Lab J BF*OES	Lab M PF*OES	Lab O PF*OES	Lab P PF*OES	Lab S PF*OES
1	200	197	150	200	120	NR	300	195	144	200	136	NR
2	200	187	150	200	120	NR	200	191	145	200	115	NR
3	200	195	200	200	190	NR	200	190	113	200	90	NR
4	200	189	200	200	120	NR	200	182	182	200	133	NR
5	200	209	250	200	130	NR	200	187	145	200	NR	NR
6	200	197	200	200	140	NR	200	198	145	200	NR	NR
7	200	194	250	200	140	NR	200	183	134	200	NR	NR
8	200	192	200	200	130	NR	200	186	134	200	NR	NR
9	200	180	250	200	130	NR	200	184	163	200	NR	NR
10	200	179	250	200	130	NR	200	188	162	200	NR	NR
11	200	173	250	200	130	NR	200	177	212	200	NR	NR
12	200	177	250	200	130	NR	200	174	165	200	NR	NR
Mean	200	189	217	200	134		208	186	154	200	119	
Median	200	191	225	200	130		200	187	145	200	124	
Std.Dev.	0	10	39	0	19		29	7	26	0	21	
Rel.Std.Dev.	0.00%	5.48%	17.97%	0.00%	14.02%		13.86%	3.70%	16.63%	0.00%	17.84%	
PDM ³	5.13%	-0.60%	13.90%	5.13%	-29.47%		9.51%	-2.05%	-19.20%	5.13%	-37.71%	

Table A36. Results for C in OREAS 187 (abbreviations as in Table A1; values in wt. %).

Replicate No.	Lab A IRC	Lab C IRC	Lab D IRC	Lab E IRC	Lab H IRC	Lab I IRC	Lab J IRC	Lab K IRC	Lab L IRC	Lab M IRC	Lab O IRC
1	0.100	0.110	0.090	0.090	0.160	0.100	0.128	0.080	0.140	0.102	0.100
2	0.100	0.180	0.100	0.090	0.190	0.100	0.150	0.070	0.120	0.113	0.100
3	0.110	0.130	0.070	0.080	0.190	0.100	0.145	0.070	0.110	0.113	0.100
4	0.120	0.120	0.110	0.080	0.180	0.110	0.166	0.070	0.130	0.103	0.100
5	0.090	0.120	0.100	0.070	0.130	0.100	0.109	0.080	0.140	0.114	0.100
6	0.100	0.120	0.090	0.070	0.120	0.080	0.144	0.090	0.130	0.114	0.110
7	0.090	0.130	0.090	0.080	0.130	0.100	0.132	0.090	0.130	0.114	0.100
8	0.090	0.120	0.090	0.080	0.130	0.110	0.132	0.090	0.130	0.114	0.110
9	0.100	0.100	0.070	0.090	0.120	0.070	0.136	0.080	0.130	0.113	0.080
10	0.110	0.110	0.070	0.090	0.120	0.110	0.126	0.080	0.120	0.113	0.080
11	0.100	0.090	0.070	0.090	0.130	0.100	0.124	0.090	0.120	0.113	0.080
12	0.110	0.100	0.070	0.090	0.150	0.100	0.128	0.080	0.120	0.113	0.090
Mean	0.102	0.119	0.085	0.083	0.146	0.098	0.135	0.081	0.127	0.111	0.096
Median	0.100	0.120	0.090	0.085	0.130	0.100	0.132	0.080	0.130	0.113	0.100
Std.Dev.	0.009	0.023	0.014	0.008	0.027	0.012	0.015	0.008	0.009	0.004	0.011
Rel.Std.Dev.	9.22%	19.09%	17.01%	9.34%	18.83%	12.14%	10.85%	9.81%	7.01%	3.72%	11.31%
PDM ³	-3.63%	12.96%	-19.43%	-21.01%	38.24%	-6.79%	27.97%	-23.38%	20.07%	5.60%	-9.16%

Table A37. Results for S in OREAS 187 (abbreviations as in Table A1; values in wt.%).

Replicate No.	Lab A IRC	Lab C IRC	Lab D IRC	Lab E IRC	Lab H IRC	Lab I IRC	Lab J IRC	Lab K IRC	Lab L IRC	Lab M IRC	Lab O IRC
1	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.003	<0.01
2	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	<0.01	0.004	<0.01
3	0.010	<0.005	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	<0.01	<0.003	<0.01
4	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	0.020	0.003	<0.01
5	<0.01	0.016	<0.01	0.020	<0.02	<0.01	0.020	<0.01	<0.01	0.072	<0.01
6	0.010	0.013	<0.01	0.030	<0.02	<0.01	<0.01	0.010	<0.01	0.057	<0.01
7	0.010	0.015	<0.01	0.020	<0.02	<0.01	0.010	0.010	<0.01	0.051	<0.01
8	<0.01	<0.005	<0.01	0.030	<0.02	<0.01	0.010	<0.01	<0.01	0.055	0.010
9	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.010	<0.01	<0.01	0.021	<0.01
10	0.010	<0.005	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	0.018	<0.01
11	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.010	<0.01	<0.01	0.021	<0.01
12	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	0.020	<0.01
Mean	0.010	0.015		0.025			0.015	0.010	0.020	0.032	0.010
Median	0.010	0.015		0.025			0.015	0.010	0.020	0.021	0.010
Std.Dev.	0.000	0.002		0.006			0.005	0.000		0.024	
Rel.Std.Dev.	0.00%	10.41%		23.09%			35.63%	0.00%		74.80%	
PDM ³	-15.83%	23.45%		110.42%			26.25%	-15.83%	68.34%	172.21%	-15.83%