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CERTIFICATE OF ANALYSIS FOR

NICKEL LATERITE ORE REFERENCE MATERIAL

OREAS 184

Constituent	Certified Value	1SD
Fusion XRF		
Nickel, Ni (wt.%)	1.02	0.01
Cobalt, Co (ppm)	903	23
Aluminium oxide, Al_2O_3 (wt.%)	4.62	0.04
Calcium oxide, CaO (wt.%)	0.216	0.008
Chlorine, Cl (ppm)	*<50*	IND
Copper, Cu (ppm)	70	18
Chromium oxide, Cr_2O_3 (wt.%)	1.75	0.028
Iron oxide, Fe_2O_3 (wt.%)	39.30	0.36
Potassium oxide, K_2O (wt.%)	*<0.01*	IND
Magnesium oxide, MgO (wt.%)	3.05	0.03
Manganese oxide, MnO (wt.%)	0.676	0.011
Sodium oxide, Na_2O (wt.%)	*<0.01*	IND
Phosphorus oxide, P_2O_5 (wt.%)	0.017	0.003
Silicon dioxide, SiO_2 (wt.%)	42.25	0.20
Sulphur oxide, SO_3 (wt.%)	*<0.01*	IND
Titanium oxide, TiO_2 (wt.%)	0.060	0.005
Zinc, Zn (ppm)	278	24
Loss on ignition, LOI (wt.%)	6.24	0.23
Fusion ICP		
Nickel, Ni (wt.%)	1.02	0.03
Cobalt, Co (ppm)	899	34
Aluminium oxide, Al_2O_3 (wt.%)	4.58	0.11
Calcium oxide, CaO (wt.%)	0.231	0.045
Copper, Cu (ppm)	60	7
Chromium oxide, Cr_2O_3 (wt.%)	1.75	0.06
Iron oxide, Fe_2O_3 (wt.%)	39.42	0.81
Potassium oxide, K_2O (wt.%)	*<0.1*	IND
Magnesium oxide, MgO (wt.%)	3.00	0.08
Manganese oxide, MnO (wt.%)	0.678	0.017
Sodium oxide, Na_2O (wt.%)	*<0.01*	IND
Phosphorus oxide, P_2O_5 (wt.%)	*~0.02*	IND
Silica dioxide, SiO_2 (wt.%)	42.19	1.01
Sulphur oxide, SO_3 (wt.%)	*<0.05*	IND
Titanium oxide, TiO_2 (wt.%)	0.058	0.005
Zinc, Zn (ppm)	287	17
IR Combustion Furnace		
Carbon, C (wt.%)	0.07	0.01
Sulphur, S (wt.%)	*<0.01*	IND

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

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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 184 is one of a suite of thirteen nickel laterite CRMs (OREAS 182 to OREAS 195) prepared from transitional ore source materials. These were supplied by Anglo American Brazil Limitada from the Barro Alto 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 184 was prepared in the following manner:

a) drying to constant mass at 105°C;
b) crushing;
c) milling to 98.1% 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 184

OREAS 184 is a nickel laterite reference material prepared by Ore Research & Exploration and has been certified for Ni, Co, Al_2O_3, C, CaO, Cl, Cu, Cr_2O_3, Fe_2O_3, K_2O, MgO, MnO, Na_2O, P_2O_5, SiO_2, S, SO_3, TiO_2 , 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, Al_2O_3, CaO, Cl, Cu, Cr_2O_3, Fe_2O_3, K_2O, MgO, MnO, Na_2O, P_2O_5, SiO_2, SO_3, TiO_2 and Zn by lithium borate fusion with X-ray fluorescence (17 laboratories)
- Ni, Co, Al_2O_3, CaO, Cu, Cr_2O_3, Fe_2O_3, K_2O, MgO, MnO, Na_2O, P_2O_5, SiO_2, SO_3, TiO_2 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, SO_3 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 (PDM^3) 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 PDM^3 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 184

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

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

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

where

x_{ij} *is the jth 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;*
$\ddot{x}$ *is the mean of means.*

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

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

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

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

$$S = 1.483 \underset{j=1.....n}{\text{median}} / x_j - \underset{i=1.....n}{\text{median}} (x_i) /$$

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

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 184.

Constituent	Certified Value	95% Confidence Interval	
		Low	High
Fusion XRF			
Nickel, Ni (wt.%)	1.02	1.01	1.02
Cobalt, Co (ppm)	903	889	916
Aluminium oxide, Al_2O_3 (wt.%)	4.62	4.60	4.64
Calcium oxide, CaO (wt.%)	0.216	0.213	0.220
Chlorine, Cl (ppm)	*<50*	IND	IND
Copper, Cu (ppm)	70	60	80
Chromium oxide, Cr_2O_3 (wt.%)	1.75	1.74	1.76
Iron oxide, Fe_2O_3 (wt.%)	39.30	39.13	39.47
Potassium oxide, K_2O (wt.%)	*<0.01*	IND	IND
Magnesium oxide, MgO (wt.%)	3.05	3.03	3.06
Manganese oxide, MnO (wt.%)	0.676	0.671	0.681
Sodium oxide, Na_2O (wt.%)	*<0.01*	IND	IND
Phosphorus oxide, P_2O_5 (wt.%)	0.017	0.016	0.018
Silicon dioxide, SiO_2 (wt.%)	42.25	42.18	42.33
Sulphur oxide, SO_3 (wt.%)	*<0.01*	IND	IND
Titanium oxide, TiO_2 (wt.%)	0.060	0.058	0.062
Zinc, Zn (ppm)	278	267	290
Loss on ignition, LOI (wt.%)	6.24	6.12	6.36
Fusion ICP			
Nickel, Ni (wt.%)	1.02	1.00	1.03
Cobalt, Co (ppm)	899	884	914
Aluminium oxide, Al_2O_3 (wt.%)	4.58	4.54	4.63
Calcium oxide, CaO (wt.%)	0.231	0.207	0.256
Copper, Cu (ppm)	60	56	64
Chromium oxide, Cr_2O_3 (wt.%)	1.75	1.72	1.77
Iron oxide, Fe_2O_3 (wt.%)	39.42	39.08	39.76
Potassium oxide, K_2O (wt.%)	*<0.1*	IND	IND
Magnesium oxide, MgO (wt.%)	3.00	2.96	3.03
Manganese oxide, MnO (wt.%)	0.678	0.670	0.685
Sodium oxide, Na_2O (wt.%)	*<0.01*	IND	IND
Phosphorus oxide, P_2O_5 (wt.%)	*~0.02*	IND	IND
Silica dioxide, SiO_2 (wt.%)	42.19	41.69	42.68
Sulphur oxide, SO_3 (wt.%)	*<0.05*	IND	IND
Titanium oxide, TiO_2 (wt.%)	0.058	0.056	0.060
Zinc, Zn (ppm)	287	273	300
IR Combustion Furnace			
Carbon, C (wt.%)	0.07	0.06	0.07
Sulphur, S (wt.%)	*<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 jth raw result reported by laboratory i*;
x'_{ij} *is the jth 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

$$\text{Lower limit is } \ddot{x} - k'_2(n, p, 1-\alpha)s''_g$$
$$\text{Upper limit is } \ddot{x} + k'_2(n, p, 1-\alpha)s''_g$$

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 1.01 and 1.02 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 (IS0 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

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

$$s'_g \text{ is the grand standard deviation computed from the transformed (i.e. means - adjusted) results}$$

according to the formula

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

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

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 184.

Constituent	Certified Value	Tolerance limits 1-α=0.99, ρ=0.95	
		Low	High
Fusion XRF			
Nickel, Ni (wt.%)	1.02	1.01	1.02
Cobalt, Co (ppm)	903	893	913
Aluminium oxide, Al_2O_3 (wt.%)	4.62	4.59	4.65
Calcium oxide, CaO (wt.%)	0.216	0.216	0.217
Chlorine, Cl (ppm)	*<50*	IND	IND
Copper, Cu (ppm)	70	IND	IND
Chromium oxide, Cr_2O_3 (wt.%)	1.75	1.74	1.76
Iron oxide, Fe_2O_3 (wt.%)	39.30	39.16	39.44
Potassium oxide, K_2O (wt.%)	*<0.01*	IND	IND
Magnesium oxide, MgO (wt.%)	3.05	3.03	3.06
Manganese oxide, MnO (wt.%)	0.676	0.674	0.678
Sodium oxide, Na_2O (wt.%)	*<0.01*	IND	IND
Phosphorus oxide, P_2O_5 (wt.%)	0.017	IND	IND
Silicon dioxide, SiO_2 (wt.%)	42.25	42.09	42.41
Sulphur oxide, SO_3 (wt.%)	*<0.01*	IND	IND
Titanium oxide, TiO_2 (wt.%)	0.060	0.057	0.063
Zinc, Zn (ppm)	278	275	281
Loss on ignition, LOI (wt.%)	6.24	6.21	6.27
Fusion ICP			
Nickel, Ni (wt.%)	1.02	1.00	1.03
Cobalt, Co (ppm)	899	880	918
Aluminium oxide, Al_2O_3 (wt.%)	4.58	4.51	4.66
Calcium oxide, CaO (wt.%)	0.231	0.219	0.244
Copper, Cu (ppm)	60	IND	IND
Chromium oxide, Cr_2O_3 (wt.%)	1.75	1.72	1.77
Iron oxide, Fe_2O_3 (wt.%)	39.42	38.98	39.86
Potassium oxide, K_2O (wt.%)	*<0.1*	IND	IND
Magnesium oxide, MgO (wt.%)	3.00	2.95	3.05
Manganese oxide, MnO (wt.%)	0.678	0.671	0.685
Sodium oxide, Na_2O (wt.%)	*<0.01*	IND	IND
Phosphorus oxide, P_2O_5 (wt.%)	*~0.02*	IND	IND
Silica dioxide, SiO_2 (wt.%)	42.19	41.68	42.70
Sulphur oxide, SO_3 (wt.%)	*<0.05*	IND	IND
Titanium oxide, TiO_2 (wt.%)	0.058	0.056	0.060
Zinc, Zn (ppm)	287	278	295
IR Combustion Furnace			
Carbon, C (wt.%)	0.07	IND	IND
Sulphur, S (wt.%)	*<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 184 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 184. 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 184. The test was performed using the following parameters:

- Significance Level α = 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, 0.961 for cobalt, 0.998 for iron oxide and 0.923 for magnesium oxide and indicates no evidence that between-unit variance is greater than within-unit variance. Conclusion: do not reject H_o.

Note that ANOVA is not an absolute measure of homogeneity. Rather, it establishes that the metals are distributed in a similar manner throughout OREAS 184 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 184

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.%)	1.02	0.01	0.99	1.05	0.973	1.06	1.47%	2.95%	4.42%
Co (ppm)	903	23	857	948	835	971	2.52%	5.04%	7.56%
Al_2O_3 (wt.%)	4.62	0.04	4.54	4.71	4.49	4.75	0.94%	1.87%	2.81%
CaO (wt.%)	0.216	0.008	0.200	0.233	0.192	0.241	3.74%	7.49%	11.23%
Cl (ppm)	*<50*	IND	IND	IND	IND	IND	IND	IND	IND
Cu (ppm)	70	18	34	106	16	123	25.61%	51.23%	76.84%
Cr_2O_3 (wt.%)	1.75	0.028	1.69	1.81	1.67	1.83	1.61%	3.22%	4.83%
Fe_2O_3 (wt.%)	39.30	0.36	38.59	40.01	38.23	40.36	0.90%	1.81%	2.71%
K_2O (wt.%)	*<0.01*	IND	IND	IND	IND	IND	IND	IND	IND
MgO (wt.%)	3.05	0.03	2.99	3.10	2.96	3.13	0.98%	1.96%	2.94%
MnO (wt.%)	0.676	0.011	0.655	0.698	0.644	0.709	1.59%	3.19%	4.78%
Na_2O (wt.%)	*<0.01*	IND	IND	IND	IND	IND	IND	IND	IND
P_2O_5 (wt.%)	0.017	0.003	0.012	0.023	0.009	0.026	16.47%	32.93%	49.40%
SiO_2 (wt.%)	42.25	0.20	41.84	42.66	41.64	42.87	0.48%	0.97%	1.45%
SO_3 (wt.%)	*<0.01*	IND	IND	IND	IND	IND	IND	IND	IND
TiO_2 (wt.%)	0.060	0.005	0.049	0.070	0.044	0.076	8.87%	17.74%	26.61%
Zn (ppm)	278	24	230	326	206	351	8.69%	17.39%	26.08%
LOI (wt.%)	6.24	0.23	5.79	6.69	5.56	6.92	3.62%	7.23%	10.85%
Fusion ICP									
Ni (wt.%)	1.02	0.03	0.96	1.07	0.94	1.09	2.55%	5.09%	7.64%
Co (ppm)	899	34	830	968	796	1002	3.83%	7.65%	11.48%
Al_2O_3 (wt.%)	4.58	0.11	4.36	4.81	4.24	4.92	2.48%	4.96%	7.44%
CaO (wt.%)	0.231	0.045	0.141	0.322	0.095	0.367	19.58%	39.17%	58.75%
Cu (ppm)	60	7	45	75	38	82	12.29%	24.58%	36.87%
Cr_2O_3 (wt.%)	1.75	0.06	1.63	1.86	1.57	1.92	3.33%	6.66%	9.99%
Fe_2O_3 (wt.%)	39.42	0.81	37.79	41.05	36.98	41.86	2.07%	4.13%	6.20%
K_2O (wt.%)	*<0.1*	IND	IND	IND	IND	IND	IND	IND	IND
MgO (wt.%)	3.00	0.08	2.84	3.15	2.76	3.23	2.59%	5.18%	7.77%
MnO (wt.%)	0.678	0.017	0.644	0.712	0.627	0.729	2.50%	5.00%	7.50%
Na_2O (wt.%)	*<0.01*	IND	IND	IND	IND	IND	IND	IND	IND
P_2O_5 (wt.%)	*~0.02*	IND	IND	IND	IND	IND	IND	IND	IND
SiO_2 (wt.%)	42.19	1.01	40.17	44.21	39.16	45.22	2.39%	4.79%	7.18%
SO_3 (wt.%)	*<0.05*	IND	IND	IND	IND	IND	IND	IND	IND
TiO_2 (wt.%)	0.058	0.005	0.049	0.067	0.044	0.072	7.83%	15.65%	23.48%
Zn (ppm)	287	17	253	320	237	337	5.82%	11.63%	17.45%
IR Combustion Furnace									
C (wt.%)	0.07	0.01	0.04	0.09	0.03	0.11	19.43%	38.85%	58.28%
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 184 has been prepared and certified and is supplied by:

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

Telephone	*(03) 9729 0333*	*International*	*+613-9729 0333*
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Email	*info@ore.com.au*	*Web*	*www.ore.com.au*

OREAS 184 is packaged in unit sizes of 10g (single-use laminated foil pouches) and 1kg (wide mouthed plastic jars).

INTENDED USE

OREAS 184 is intended for the following uses:

i) for the monitoring of laboratory performance in the analysis of Ni, Co, Al_2O_3, CaO, Cl, Cu, Cr_2O_3, Fe_2O_3, K_2O, MgO, MnO, Na_2O, P_2O_5, SiO_2, SO_3, TiO_2, Zn, LOI, C and S in geological samples
ii) for the verification of analytical methods for Ni, Co, Al_2O_3, CaO, Cl, Cu, Cr_2O_3, Fe_2O_3, K_2O, MgO, MnO, Na_2O, P_2O_5, SiO_2, SO_3, TiO_2, Zn, LOI, C and S
iii) for the calibration of instruments used in the determination of the concentration of Ni, Co, Al_2O_3, CaO, Cl, Cu, Cr_2O_3, Fe_2O_3, K_2O, MgO, MnO, Na_2O, P_2O_5, SiO_2, SO_3, TiO_2, Zn, LOI, C and S

STABILITY AND STORAGE INSTRUCTIONS

OREAS 184 has been sourced from a sample of transitional 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 184

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 184 (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	1.00	1.02	1.01	1.01	1.05	1.02	1.04	1.05	1.02	1.05	1.00	1.01	1.02	1.02	1.03	1.02	1.00
2	1.01	1.02	1.01	1.01	1.05	1.02	1.03	1.03	1.03	1.05	1.00	1.00	1.01	1.02	1.02	1.02	0.99
3	1.02	1.02	1.01	1.00	1.06	1.01	1.04	1.04	1.02	1.05	1.00	1.01	1.00	1.01	1.02	1.02	0.99
4	1.02	1.02	1.01	1.01	1.05	1.02	1.02	1.04	1.02	1.06	1.00	1.01	1.03	1.02	1.03	1.03	1.00
5	1.02	1.03	1.01	1.00	1.04	1.02	1.03	1.03	1.01	1.05	1.01	0.99	1.00	1.02	NR	NR	NR
6	1.02	1.02	1.01	1.00	**1.06**	1.03	1.04	1.03	1.02	1.04	1.00	1.01	1.01	1.02	NR	NR	NR
7	1.01	1.03	1.01	1.00	1.05	1.02	1.03	1.02	1.02	1.04	1.00	1.00	1.03	1.02	NR	NR	NR
8	1.01	1.02	1.02	1.00	1.04	1.02	1.02	1.03	1.02	1.03	1.00	1.02	1.03	1.02	NR	NR	NR
9	1.00	1.03	1.02	1.00	1.02	1.02	1.00	1.05	1.02	**1.05**	1.00	1.01	1.03	1.01	NR	NR	NR
10	1.00	1.03	1.02	1.00	1.01	1.02	**1.11**	1.03	1.01	**1.04**	1.00	1.00	1.03	1.01	NR	NR	NR
11	1.00	1.03	1.02	1.00	1.00	1.02	**1.33**	1.04	1.02	**1.07**	1.00	1.03	1.02	1.01	NR	NR	NR
12	0.99	1.02	1.01	1.00	1.01	1.02	1.01	1.04	1.02	**1.07**	1.00	1.01	1.03	1.01	NR	NR	NR
Mean	1.01	1.02	1.01	1.00	1.03	1.02	1.06	1.03	1.02	1.05	1.00	1.01	1.02	1.01	1.03	1.02	1.00
Median	1.01	1.02	1.01	1.00	1.04	1.02	1.03	1.03	1.02	1.05	1.00	1.01	1.02	1.02	1.03	1.02	1.00
Std.Dev.	0.01	0.00	0.00	0.00	0.02	0.00	0.09	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.01
Rel.Std.Dev.	1.06%	0.43%	0.35%	0.45%	2.10%	0.42%	8.48%	0.92%	0.51%	1.00%	0.28%	1.02%	1.19%	0.39%	0.56%	0.23%	0.58%
PDM[3]	-1.09%	0.40%	-0.55%	-1.49%	1.64%	0.01%	4.00%	1.69%	0.15%	3.07%	-1.86%	-0.92%	0.21%	-0.55%	0.72%	0.53%	-2.23%

Table A3. Fusion XRF results for Co in OREAS 184 (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	890	**1000**	870	930	930	900	NR	**1100**	930	890	890	900	**590**	890	900	864	**800**
2	890	**1000**	870	930	930	900	NR	**1090**	930	860	900	900	**590**	890	900	868	**900**
3	900	**1000**	880	910	940	890	NR	**1090**	920	840	900	900	**580**	890	900	879	**800**
4	910	**1000**	890	910	930	890	NR	**1090**	930	950	890	900	**600**	890	900	865	**800**
5	880	950	880	900	920	890	NR	**1080**	920	860	900	900	**550**	890	NR	NR	NR
6	880	950	890	910	950	910	NR	**1090**	920	910	900	900	**570**	900	NR	NR	NR
7	880	950	880	910	930	900	NR	**1080**	930	890	910	900	**610**	890	NR	NR	NR
8	870	**1000**	880	910	920	900	NR	**1080**	930	960	900	900	**600**	900	NR	NR	NR
9	880	**1000**	880	890	930	890	NR	**1090**	940	910	890	900	**610**	880	NR	NR	NR
10	870	**1000**	880	900	940	900	NR	**1080**	930	930	890	900	**590**	890	NR	NR	NR
11	880	**1000**	880	900	940	900	NR	**1100**	930	920	880	900	**590**	880	NR	NR	NR
12	870	**1000**	880	890	950	890	NR	**1100**	930	**770**	890	900	**600**	890	NR	NR	NR
Mean	883	988	880	908	934	897		**1089**	928	891	895	900	**590**	890	900	869	825
Median	880	1000	880	910	930	900		1090	930	900	895	900	590	890	900	867	800
Std.Dev.	12	23	6	13	10	7		8	6	53	8	0	17	6	0	7	50
Rel.Std.Dev.	1.39%	2.29%	0.69%	1.42%	1.07%	0.73%		0.73%	0.62%	5.91%	0.89%	0.00%	2.89%	0.68%	0.00%	0.79%	6.06%
PDM[3]	-2.15%	9.39%	-2.52%	0.53%	3.48%	-0.67%		20.65%	2.83%	-1.32%	-0.86%	-0.31%	-34.64%	-1.41%	-0.31%	-3.74%	-8.61%

Table A4. Fusion XRF results for Al_2O_3 in OREAS 184 (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	4.57	**4.43**	4.59	4.64	4.64	4.59	4.61	4.65	4.63	4.61	4.61	4.66	4.53	4.71	4.64	4.61	4.60
2	4.64	**4.47**	4.56	4.62	4.62	4.63	4.59	4.64	4.68	4.56	4.61	4.64	4.59	4.72	4.66	4.64	4.60
3	4.60	**4.45**	4.58	4.62	4.63	4.61	4.57	4.59	4.67	**4.47**	4.60	4.64	4.58	4.70	4.68	4.68	4.55
4	4.61	**4.45**	4.61	4.61	4.65	4.59	4.57	4.62	4.63	4.52	4.61	4.65	4.66	4.72	4.66	4.67	4.58
5	4.65	**4.45**	4.60	4.59	4.60	4.61	4.64	4.58	4.74	4.69	4.58	4.61	4.52	4.70	NR	NR	NR
6	4.65	**4.41**	4.59	4.58	4.57	4.66	4.63	4.62	4.71	4.62	4.58	4.61	4.65	4.72	NR	NR	NR
7	4.64	**4.48**	4.59	4.57	4.59	4.61	4.58	4.62	4.67	4.54	4.58	4.60	**4.78**	4.70	NR	NR	NR
8	4.64	**4.44**	4.62	4.60	4.58	4.61	4.57	4.58	4.63	4.59	4.59	4.62	4.71	4.71	NR	NR	NR
9	4.64	**4.45**	4.60	4.62	**4.75**	4.60	**4.47**	4.69	**4.73**	**4.43**	4.61	4.69	4.62	4.68	NR	NR	NR
10	4.65	**4.40**	4.61	4.60	**4.73**	4.58	**4.50**	4.62	**4.73**	**4.57**	4.63	4.65	4.61	4.69	NR	NR	NR
11	4.64	**4.43**	4.55	4.59	**4.77**	4.60	**4.51**	4.63	**4.72**	**4.45**	4.61	4.62	4.60	4.67	NR	NR	NR
12	4.61	**4.41**	4.55	4.59	**4.76**	4.58	**4.49**	4.64	**4.68**	**4.50**	4.61	4.63	4.67	4.68	NR	NR	NR
Mean	4.63	**4.44**	4.59	4.60	4.66	4.60	4.56	4.62	4.69	4.55	4.60	4.64	4.63	4.70	4.66	4.65	4.58
Median	4.64	4.44	4.59	4.60	4.64	4.60	4.57	4.62	4.68	4.55	4.61	4.64	4.61	4.70	4.66	4.66	4.59
Std.Dev.	0.03	0.02	0.02	0.02	0.07	0.02	0.06	0.03	0.04	0.08	0.02	0.03	0.07	0.02	0.02	0.03	0.02
Rel.Std.Dev.	0.54%	0.54%	0.51%	0.44%	1.60%	0.45%	1.23%	0.67%	0.88%	1.70%	0.34%	0.55%	1.56%	0.36%	0.35%	0.71%	0.52%
PDM[3]	0.13%	-4.02%	-0.75%	-0.43%	0.76%	-0.39%	-1.33%	0.02%	1.36%	-1.62%	-0.45%	0.28%	0.08%	1.68%	0.82%	0.63%	-0.86%

Table A5. Fusion XRF results for CaO in OREAS 184 (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	0.220	0.205	0.210	0.210	0.200	0.215	0.220	0.200	0.230	0.220	0.220	0.210	**0.165**	0.220	0.220	**0.206**	0.210
2	0.220	0.200	0.220	0.210	0.210	0.218	0.210	0.210	0.230	0.214	0.220	0.210	**0.162**	0.220	0.220	**0.202**	0.210
3	0.220	0.210	0.220	0.210	0.210	0.214	0.220	0.210	0.240	0.224	0.220	0.210	**0.162**	0.220	0.220	**0.177**	0.210
4	0.230	0.205	0.220	0.220	0.210	0.215	0.210	0.210	0.230	0.231	0.230	0.210	**0.165**	0.220	0.220	**0.188**	0.210
5	0.220	0.200	0.210	0.220	0.210	0.216	0.220	0.210	0.240	0.217	0.220	0.210	**0.159**	0.220	NR	NR	NR
6	0.220	0.205	0.220	0.220	0.220	0.219	0.220	0.210	0.240	**0.211**	0.220	0.220	**0.164**	0.220	NR	NR	NR
7	0.220	0.205	0.220	0.220	0.210	0.217	0.220	0.210	0.230	0.216	0.220	0.210	**0.166**	0.220	NR	NR	NR
8	0.220	0.210	0.220	0.220	0.210	0.218	0.210	0.200	0.230	0.217	0.210	0.220	**0.167**	0.220	NR	NR	NR
9	0.220	0.205	0.210	0.220	0.210	0.217	0.210	0.210	0.220	0.215	0.210	0.230	**0.166**	0.220	NR	NR	NR
10	0.220	0.200	0.220	0.220	0.200	0.216	0.210	0.210	0.230	0.217	0.210	0.230	**0.165**	0.220	NR	NR	NR
11	0.220	0.205	0.220	0.220	0.200	0.217	0.210	0.210	0.220	0.227	0.210	0.230	**0.167**	0.220	NR	NR	NR
12	0.220	0.205	0.220	0.220	0.210	0.217	0.210	0.210	0.230	0.234	0.210	0.230	**0.167**	0.220	NR	NR	NR
Mean	0.221	0.205	0.218	0.218	0.208	0.217	0.214	0.208	0.231	0.220	0.217	0.218	**0.165**	0.220	0.220	0.193	0.210
Median	0.220	0.205	0.220	0.220	0.210	0.217	0.210	0.210	0.230	0.217	0.220	0.215	0.165	0.220	0.220	0.195	0.210
Std.Dev.	0.003	0.003	0.005	0.005	0.006	0.001	0.005	0.004	0.007	0.007	0.007	0.009	0.002	0.000	0.000	0.013	0.000
Rel.Std.Dev.	1.31%	1.63%	2.08%	2.08%	2.77%	0.67%	2.40%	1.87%	2.90%	3.26%	3.01%	4.29%	1.50%	0.00%	0.00%	6.73%	0.00%
PDM[3]	2.09%	-5.42%	0.55%	0.55%	-3.69%	0.12%	-0.99%	-3.69%	6.71%	1.82%	0.16%	0.93%	-23.92%	1.70%	1.70%	-10.73%	-2.92%

Table A6. Fusion XRF results for Cl in OREAS 184 (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	<10	NR	NR	NR	NR	NR	<50	<50	NR	NR	<50	<50	NR
2	<50	NR	NR	<50	<10	NR	NR	NR	NR	NR	<50	<50	NR	NR	<50	<50	NR
3	<50	NR	NR	<50	<10	NR	NR	NR	NR	NR	<50	<50	NR	NR	<50	<50	NR
4	<50	NR	NR	<50	<10	NR	NR	NR	NR	NR	<50	<50	NR	NR	<50	<50	NR
5	<50	NR	NR	<50	90	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
6	<50	NR	NR	<50	100	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
7	<50	NR	NR	50	90	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
8	<50	NR	NR	50	90	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
9	<50	NR	NR	50	10	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
10	80	NR	NR	50	10	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
11	50	NR	NR	50	30	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
12	<50	NR	NR	50	30	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
Mean	65			50	56												
Median	65			50	60												
Std.Dev.	21			0	40												
Rel.Std.Dev.	32.64%			0.00%	70.43%												
PDM[3]	13.04%			-13.04%	-2.17%												

Table A7. Fusion XRF results for Cu in OREAS 184 (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	80	62	50	75	100	65	70	100	100	<100	30	110	NR	60	<100	50	NR
2	60	60	<50	75	100	63	70	70	90	<100	60	100	NR	60	<100	45	NR
3	80	59	50	65	110	62	70	110	100	<100	60	100	NR	70	<100	55	NR
4	90	54	50	70	100	62	60	80	90	<100	60	110	NR	60	<100	40	NR
5	80	56	<50	65	100	64	70	70	80	<100	50	80	NR	60	NR	NR	NR
6	70	63	60	65	120	63	60	40	90	<100	50	80	NR	60	NR	NR	NR
7	70	53	<50	70	110	63	60	60	100	<100	60	80	NR	60	NR	NR	NR
8	70	55	50	65	100	61	70	50	100	<100	50	80	NR	70	NR	NR	NR
9	70	62	50	70	**120**	65	**60**	70	<50	<100	**10**	80	NR	70	NR	NR	NR
10	80	50	<50	70	**110**	64	**1300**	60	50	<100	50	90	NR	70	NR	NR	NR
11	80	61	<50	70	**110**	62	**310**	110	<50	<100	50	90	NR	70	NR	NR	NR
12	60	58	<50	75	**120**	62	**70**	**130**	<50	<100	70	90	NR	70	NR	NR	NR
Mean	74	58	52	70	108	63	189	79	89		50	91		65		48	
Median	75	58	50	70	110	63	70	70	90		50	90		65		48	
Std.Dev.	9	4	4	4	8	1	357	27	16		16	12		5		6	
Rel.Std.Dev.	12.14%	7.03%	7.90%	5.70%	7.71%	1.94%	188%	34.68%	18.18%		31.91%	12.82%		8.03%		13.59%	
PDM[3]	6.24%	-17.64%	-25.99%	-0.33%	55.18%	-9.79%	170%	13.40%	27.33%		-28.38%	30.11%		-6.89%		-31.96%	

Table A8. Fusion XRF results for Cr_2O_3 in OREAS 184 (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	1.78	1.72	1.74	1.75	1.71	1.78	**2.60**	1.82	1.71	**1.88**	1.72	1.75	1.70	1.74	1.75	1.77	1.77
2	1.78	1.74	1.74	1.76	1.71	1.78	**2.57**	1.81	1.72	**1.88**	1.74	1.74	1.73	1.74	1.74	1.75	1.76
3	1.76	1.74	1.74	1.75	1.72	1.77	**2.59**	1.82	1.70	**1.87**	1.71	1.77	1.71	1.74	1.75	1.76	1.76
4	1.74	1.73	1.75	1.76	1.69	1.77	**2.59**	1.81	1.73	**1.88**	1.71	1.75	1.75	1.73	1.74	1.77	1.77
5	1.79	1.73	1.75	1.75	1.72	1.77	1.78	1.79	1.72	**1.84**	1.73	1.73	1.70	1.74	NR	NR	NR
6	1.79	1.72	1.75	1.75	1.72	1.79	1.78	1.81	1.75	**1.86**	1.73	1.74	1.72	1.75	NR	NR	NR
7	1.79	1.72	1.74	1.76	1.71	1.78	1.77	1.79	1.72	**1.82**	1.72	1.76	1.78	1.74	NR	NR	NR
8	1.79	1.73	1.75	1.76	**1.67**	1.77	1.76	1.80	1.71	**1.83**	1.73	1.76	1.75	1.74	NR	NR	NR
9	1.79	1.72	1.75	1.76	1.75	1.76	1.73	1.80	1.72	**1.88**	1.74	1.75	1.73	1.74	NR	NR	NR
10	1.80	1.73	1.75	1.76	1.75	1.76	1.74	1.80	1.71	**1.86**	1.74	1.76	1.75	1.75	NR	NR	NR
11	1.80	1.72	1.76	1.75	1.76	1.77	1.74	1.82	1.72	**2.03**	1.72	1.74	1.73	1.75	NR	NR	NR
12	1.79	1.73	1.74	1.76	1.76	1.76	1.74	1.83	1.71	**1.99**	1.74	1.71	1.76	1.74	NR	NR	NR
Mean	1.78	1.72	1.75	1.76	1.72	1.77	2.03	1.81	1.72	**1.88**	1.72	1.75	1.73	1.74	1.75	1.76	1.77
Median	1.79	1.73	1.75	1.76	1.72	1.77	1.78	1.81	1.72	1.87	1.73	1.75	1.73	1.74	1.75	1.76	1.77
Std.Dev.	0.02	0.01	0.01	0.01	0.03	0.01	0.41	0.01	0.01	0.06	0.01	0.02	0.02	0.00	0.01	0.01	0.01
Rel.Std.Dev.	0.94%	0.41%	0.44%	0.31%	1.71%	0.52%	20.17%	0.70%	0.74%	3.27%	0.57%	0.92%	1.33%	0.24%	0.33%	0.44%	0.33%
PDM[3]	1.71%	-1.50%	-0.29%	0.30%	-1.71%	1.27%	16.14%	3.33%	-1.81%	7.67%	-1.50%	-0.19%	-0.93%	-0.54%	-0.29%	0.69%	0.86%

Table A9. Fusion XRF results for Fe_2O_3 in OREAS 184 (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	38.30	39.16	39.48	39.54	39.00	39.41	39.84	39.54	39.31	38.58	39.10	39.39	38.52	39.30	40.00	39.50	39.70
2	38.90	39.51	39.56	39.48	39.00	39.71	39.65	39.19	39.58	38.75	39.30	39.24	38.50	39.30	39.80	39.47	39.50
3	38.70	39.47	39.61	39.41	39.10	39.33	39.50	39.42	39.34	38.70	39.20	39.22	38.38	39.30	39.90	39.46	39.60
4	39.00	39.55	39.57	39.44	38.90	39.47	39.45	39.54	39.06	38.95	39.30	39.43	38.84	39.30	39.90	39.50	39.60
5	38.90	39.40	39.63	39.58	38.90	39.62	39.99	38.76	38.93	**37.93**	39.10	39.35	**37.83**	39.40	NR	NR	NR
6	39.10	39.44	39.73	39.58	39.00	40.05	40.07	39.19	39.04	**37.98**	39.20	39.41	38.55	39.20	NR	NR	NR
7	38.90	39.37	39.56	39.51	38.90	39.60	39.54	38.73	39.25	**38.06**	39.10	39.27	39.48	39.30	NR	NR	NR
8	38.90	39.36	39.74	39.64	38.90	39.61	39.58	38.98	39.22	**38.16**	39.10	39.40	39.04	39.20	NR	NR	NR
9	38.50	39.48	39.62	39.51	39.20	39.53	38.78	39.46	39.08	38.60	39.10	39.08	38.90	39.30	NR	NR	NR
10	38.80	39.52	39.53	39.46	39.20	39.73	39.49	39.09	38.91	38.60	39.10	39.18	38.86	39.00	NR	NR	NR
11	38.70	39.53	39.57	39.54	39.10	39.56	39.44	39.49	39.15	38.64	39.10	39.45	38.70	39.20	NR	NR	NR
12	38.20	39.38	39.59	39.52	39.30	39.48	39.01	39.52	39.23	38.94	39.00	39.52	38.93	39.10	NR	NR	NR
Mean	38.74	39.43	39.60	39.52	39.04	39.59	39.53	39.24	39.18	38.49	39.14	39.33	38.71	39.24	39.90	39.48	39.60
Median	38.85	39.46	39.58	39.52	39.00	39.58	39.52	39.31	39.19	38.60	39.10	39.37	38.77	39.30	39.90	39.48	39.60
Std.Dev.	0.28	0.11	0.08	0.06	0.14	0.19	0.37	0.30	0.19	0.36	0.09	0.13	0.41	0.11	0.08	0.02	0.08
Rel.Std.Dev.	0.72%	0.27%	0.19%	0.16%	0.35%	0.47%	0.92%	0.76%	0.48%	0.94%	0.23%	0.33%	1.05%	0.28%	0.20%	0.05%	0.21%
PDM[3]	-1.42%	0.33%	0.77%	0.56%	-0.65%	0.75%	0.59%	-0.14%	-0.31%	-2.05%	-0.40%	0.08%	-1.50%	-0.14%	1.53%	0.47%	0.77%

Table A10. Fusion XRF results for K_2O in OREAS 184 (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	0.003	<0.001	NR	<0.001	0.020	<0.01	0.011	<0.01	<0.01	NR	0.010	<0.01	0.004	<0.01
2	<0.01	<0.01	<0.01	0.003	<0.001	NR	<0.001	0.010	0.010	<0.01	<0.01	<0.01	NR	0.010	<0.01	0.006	<0.01
3	<0.01	<0.01	<0.01	0.003	<0.001	NR	<0.001	<0.01	0.010	0.013	<0.01	<0.01	NR	0.010	<0.01	0.005	<0.01
4	<0.01	<0.01	<0.01	0.002	<0.001	NR	<0.001	<0.01	0.010	0.012	<0.01	<0.01	NR	0.010	<0.01	0.006	<0.01
5	<0.01	<0.01	<0.05	0.002	0.003	NR	<0.001	<0.01	0.010	<0.01	<0.01	<0.01	NR	0.010	NR	NR	NR
6	<0.01	<0.01	<0.05	0.001	0.005	NR	<0.001	<0.01	0.010	<0.01	<0.01	<0.01	NR	0.010	NR	NR	NR
7	<0.01	<0.01	<0.05	0.002	0.004	NR	<0.001	<0.01	0.010	<0.01	<0.01	<0.01	NR	0.010	NR	NR	NR
8	<0.01	<0.01	<0.05	0.001	0.003	NR	<0.001	0.010	0.010	<0.01	<0.01	<0.01	NR	0.010	NR	NR	NR
9	<0.01	<0.01	<0.01	0.003	<0.001	NR	<0.001	0.020	0.010	<0.01	<0.01	<0.01	NR	0.010	NR	NR	NR
10	<0.01	<0.01	<0.01	0.001	<0.001	NR	<0.001	0.010	0.010	<0.01	<0.01	<0.01	NR	0.010	NR	NR	NR
11	<0.01	<0.01	<0.01	0.002	<0.001	NR	<0.001	<0.01	0.010	<0.01	<0.01	<0.01	NR	0.010	NR	NR	NR
12	<0.01	<0.01	<0.01	0.002	<0.001	NR	<0.001	<0.01	0.010	<0.01	<0.01	<0.01	NR	0.010	NR	NR	NR
Mean				0.002	0.004			0.014	0.010	0.012				0.010		0.005	
Median				0.002	0.004			0.010	0.010	0.012				0.010		0.006	
Std.Dev.				0.001	0.001			0.005	0.000	0.001				0.000		0.001	
Rel.Std.Dev.				38.06%	25.53%			39.12%	0.00%	8.33%				0.00%		14.31%	
PDM[3]				-72.96%	-51.32%			81.73%	29.81%	55.77%				29.81%		-29.58%	

Table A11. Fusion XRF results for MgO in OREAS 184 (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	3.03	3.03	3.02	3.08	3.02	**2.87**	**2.93**	3.12	3.06	3.10	3.02	3.06	3.01	3.04	3.07	3.03	3.04
2	3.05	3.05	3.04	3.06	3.01	**2.93**	**2.90**	3.10	3.06	3.10	3.03	3.05	3.02	3.05	3.03	3.05	3.00
3	3.07	3.06	3.04	3.09	3.00	**2.87**	**2.88**	3.10	3.06	3.10	3.02	3.05	3.03	3.04	3.04	2.99	3.01
4	3.07	3.06	3.04	3.07	3.02	**2.93**	**2.89**	3.11	**3.14**	3.09	3.02	3.07	**3.11**	3.04	3.05	3.04	3.02
5	3.05	3.01	3.03	3.07	3.02	**2.89**	3.07	3.07	3.05	3.02	3.05	3.08	2.98	3.03	NR	NR	NR
6	3.06	3.01	3.03	3.09	3.01	**2.92**	3.05	3.10	3.06	3.04	3.05	3.09	3.02	3.04	NR	NR	NR
7	3.05	3.03	3.03	3.09	3.03	**2.87**	3.00	3.08	3.07	3.02	3.04	3.08	3.07	3.04	NR	NR	NR
8	3.05	3.06	3.05	3.09	3.03	**2.87**	3.01	3.07	3.06	3.02	3.06	3.08	3.10	3.03	NR	NR	NR
9	3.06	3.05	3.05	3.04	3.07	**2.85**	2.99	3.10	3.05	3.01	3.04	3.09	**3.04**	3.08	NR	NR	NR
10	3.07	3.03	3.05	3.03	3.06	**2.88**	2.99	3.08	3.03	3.11	3.03	3.04	**3.16**	3.09	NR	NR	NR
11	3.05	3.06	3.04	3.02	3.08	**2.87**	3.00	3.10	3.04	2.99	3.02	3.08	**3.13**	3.09	NR	NR	NR
12	3.04	3.04	3.03	3.02	3.07	**2.91**	2.98	3.10	3.03	3.09	3.03	3.07	**3.18**	3.07	NR	NR	NR
Mean	3.05	3.04	3.04	3.06	3.04	**2.89**	2.97	3.09	3.06	3.06	3.03	3.07	3.07	3.05	3.05	3.02	3.02
Median	3.05	3.04	3.04	3.07	3.03	2.88	2.99	3.10	3.06	3.06	3.03	3.08	3.06	3.04	3.05	3.03	3.02
Std.Dev.	0.01	0.02	0.01	0.03	0.03	0.03	0.06	0.02	0.03	0.04	0.01	0.02	0.06	0.02	0.02	0.03	0.02
Rel.Std.Dev.	0.41%	0.57%	0.32%	0.91%	0.91%	0.89%	2.06%	0.51%	0.93%	1.40%	0.45%	0.54%	2.05%	0.74%	0.56%	0.83%	0.57%
PDM[3]	0.30%	-0.19%	-0.25%	0.57%	-0.33%	-5.19%	-2.33%	1.61%	0.46%	0.38%	-0.36%	0.82%	0.79%	0.27%	0.08%	-0.70%	-0.90%

Table A12. Fusion XRF results for MnO in OREAS 184 (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	0.648	0.655	0.670	0.670	0.677	0.675	**0.710**	0.680	0.669	**0.706**	0.681	0.680	**0.635**	0.695	0.680	0.683	0.680
2	0.656	0.665	0.670	0.670	0.677	0.682	**0.700**	0.670	0.676	**0.703**	0.682	0.680	**0.637**	0.696	0.670	0.681	0.670
3	0.656	0.650	0.670	0.670	0.678	0.672	**0.700**	0.680	0.674	**0.694**	0.685	0.680	**0.637**	0.693	0.680	0.685	0.680
4	0.663	0.655	0.670	0.670	0.679	0.674	**0.700**	0.680	0.668	**0.707**	0.686	0.680	**0.633**	0.693	0.680	0.686	0.680
5	0.671	0.650	0.670	0.670	0.679	0.676	**0.710**	0.660	0.666	0.687	0.679	0.680	**0.622**	0.693	NR	NR	NR
6	0.677	0.660	0.670	0.680	0.682	0.685	**0.710**	0.670	0.672	0.684	0.676	0.680	**0.639**	0.693	NR	NR	NR
7	0.673	0.655	0.670	0.680	0.679	0.679	**0.700**	0.660	0.681	0.687	0.675	0.680	**0.642**	0.693	NR	NR	NR
8	0.672	0.660	0.670	0.670	0.680	0.678	**0.700**	0.670	0.671	0.692	0.678	0.680	**0.646**	0.695	NR	NR	NR
9	0.659	0.650	0.670	0.670	0.664	0.674	0.680	0.680	0.670	**0.703**	0.678	0.670	**0.643**	0.699	NR	NR	NR
10	0.659	0.660	0.670	0.670	0.662	0.680	0.690	0.660	0.668	**0.700**	0.680	0.670	**0.648**	0.695	NR	NR	NR
11	0.662	0.660	0.670	0.680	0.660	0.677	0.690	0.670	0.673	**0.697**	0.681	0.680	**0.642**	0.695	NR	NR	NR
12	0.651	0.650	0.670	0.670	0.667	0.675	0.690	0.680	0.670	**0.711**	0.677	0.680	**0.639**	0.695	NR	NR	NR
Mean	0.662	0.656	0.670	0.673	0.674	0.677	0.698	0.672	0.672	0.698	0.680	0.678	**0.638**	0.695	0.678	0.684	0.678
Median	0.661	0.655	0.670	0.670	0.678	0.677	0.700	0.670	0.671	0.699	0.680	0.680	0.639	0.695	0.680	0.684	0.680
Std.Dev.	0.009	0.005	0.000	0.005	0.008	0.004	0.009	0.008	0.004	0.009	0.003	0.004	0.007	0.002	0.005	0.002	0.005
Rel.Std.Dev.	1.39%	0.79%	0.00%	0.67%	1.18%	0.55%	1.34%	1.24%	0.61%	1.27%	0.50%	0.57%	1.05%	0.22%	0.74%	0.33%	0.74%
PDM[3]	-2.08%	-3.03%	-0.94%	-0.57%	-0.40%	0.13%	3.25%	-0.69%	-0.72%	3.14%	0.52%	0.29%	-5.60%	2.69%	0.17%	1.14%	0.17%

Table A13. Fusion XRF results for Na_2O in OREAS 184 (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	0.037	0.020	<0.01	NR	0.027	NR	<0.01	0.020	<0.01	<0.1	0.009	<0.01	NR	0.010	<0.01	0.011	<0.01
2	0.034	0.015	<0.01	NR	0.030	NR	<0.01	0.040	<0.01	<0.1	0.006	<0.01	NR	0.010	<0.01	0.015	<0.01
3	0.036	0.020	<0.01	NR	0.029	NR	<0.01	0.020	<0.01	<0.1	0.006	<0.01	NR	0.010	<0.01	0.020	<0.01
4	0.034	0.020	<0.01	NR	0.029	NR	<0.01	0.010	<0.01	<0.1	<0.005	<0.01	NR	0.010	<0.01	0.020	<0.01
5	**0.087**	0.020	<0.05	NR	0.034	NR	<0.01	<0.01	<0.01	<0.1	0.006	0.030	NR	0.010	NR	NR	NR
6	**0.078**	0.020	<0.05	NR	0.043	NR	<0.01	<0.01	<0.01	<0.1	<0.005	<0.01	NR	0.010	NR	NR	NR
7	**0.069**	0.020	<0.05	NR	0.042	NR	<0.01	<0.01	<0.01	<0.1	<0.005	0.010	NR	0.010	NR	NR	NR
8	**0.078**	0.020	0.010	NR	0.036	NR	<0.01	<0.01	0.010	<0.1	<0.005	0.010	NR	0.010	NR	NR	NR
9	**0.088**	0.020	<0.01	NR	**0.083**	NR	<0.01	0.030	<0.01	<0.1	0.009	<0.01	NR	0.020	NR	NR	NR
10	**0.080**	0.020	<0.01	NR	**0.077**	NR	<0.01	0.010	<0.01	<0.1	0.007	0.020	NR	0.020	NR	NR	NR
11	**0.081**	0.020	<0.01	NR	**0.086**	NR	<0.01	0.010	<0.01	<0.1	0.009	0.040	NR	0.020	NR	NR	NR
12	**0.080**	0.020	<0.01	NR	**0.082**	NR	<0.01	<0.01	<0.01	<0.1	0.009	0.020	NR	0.010	NR	NR	NR
Mean	0.065	0.020	0.010		0.050			0.020	0.010		0.008	0.022		0.013		0.017	
Median	0.078	0.020	0.010		0.039			0.020	0.010		0.008	0.020		0.010		0.018	
Std.Dev.	0.023	0.001			0.024			0.012			0.002	0.012		0.005		0.004	
Rel.Std.Dev.	34.68%	7.37%			48.83%			57.74%			19.75%	53.96%		36.18%		26.87%	
PDM[3]	248%	4.77%	-46.50%		166%			6.99%	-46.50%		-59.21%	15.91%		-33.13%		-11.46%	

Table A14. Fusion XRF results for P_2O_5 in OREAS 184 (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	0.017	0.015	0.019	0.016	0.013	NR	0.020	0.020	0.020	**0.027**	0.015	0.020	NR	0.020	0.020	0.013	0.020
2	0.017	0.015	0.016	0.016	0.014	NR	0.020	0.010	0.020	**0.017**	0.015	0.020	NR	0.020	0.020	0.016	0.010
3	0.017	0.015	0.017	0.016	0.014	NR	0.020	0.020	0.020	**0.026**	0.015	0.020	NR	0.020	0.020	0.015	0.010
4	0.017	0.020	0.017	0.017	0.014	NR	0.020	0.020	0.020	**0.030**	0.015	0.020	NR	0.020	0.020	0.015	0.020
5	0.018	0.020	0.017	0.017	0.013	NR	0.020	0.020	0.020	0.016	0.017	0.020	NR	0.020	NR	NR	NR
6	0.018	0.020	0.016	0.017	0.015	NR	0.020	0.020	0.020	0.015	0.017	0.020	NR	0.020	NR	NR	NR
7	0.017	0.010	0.020	0.016	0.014	NR	0.020	0.020	0.020	0.016	0.017	0.020	NR	0.020	NR	NR	NR
8	0.018	0.015	0.016	0.017	0.016	NR	0.020	0.010	0.020	0.017	0.017	0.020	NR	0.020	NR	NR	NR
9	0.017	0.015	0.018	0.016	0.015	NR	0.020	0.020	0.020	0.014	0.015	0.020	NR	0.020	NR	NR	NR
10	0.018	0.020	0.017	0.016	0.016	NR	0.020	0.020	0.020	0.010	0.015	0.020	NR	0.020	NR	NR	NR
11	0.018	0.010	0.018	0.015	0.014	NR	0.020	0.020	0.020	0.013	0.015	0.020	NR	0.020	NR	NR	NR
12	0.018	0.015	0.019	0.014	0.015	NR	0.020	0.020	0.020	**0.032**	0.016	0.010	NR	0.020	NR	NR	NR
Mean	0.018	0.016	0.018	0.016	0.014		0.020	0.018	0.020	0.019	0.016	0.019		0.020	0.020	0.015	0.015
Median	0.018	0.015	0.017	0.016	0.014		0.020	0.020	0.020	0.017	0.015	0.020		0.020	0.020	0.015	0.015
Std.Dev.	0.001	0.004	0.001	0.001	0.001		0.000	0.004	0.000	0.007	0.001	0.003		0.000	0.000	0.001	0.006
Rel.Std.Dev.	2.98%	22.67%	7.51%	5.60%	6.91%		0.00%	21.23%	0.00%	37.56%	6.13%	15.06%		0.00%	0.00%	7.64%	38.49%
PDM[3]	1.44%	-8.22%	1.44%	-6.77%	-16.43%		15.94%	6.28%	15.94%	12.56%	-8.70%	11.11%		15.94%	15.94%	-14.50%	-13.05%

Table A15. Fusion XRF results for SiO_2 in OREAS 184 (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	41.90	42.32	42.17	42.43	**41.40**	42.10	**43.07**	42.50	42.20	41.78	42.70	42.44	**41.74**	**43.30**	42.10	42.30	42.20
2	42.10	42.62	42.28	42.47	**41.20**	42.47	**43.03**	42.30	42.63	42.10	42.50	42.20	**41.72**	**43.00**	42.20	42.39	42.10
3	42.40	42.59	42.25	42.49	**41.20**	42.05	**42.77**	42.00	42.35	42.02	42.60	42.34	**41.50**	**43.00**	42.20	42.23	42.00
4	42.20	42.62	42.34	42.43	**41.30**	42.18	**43.11**	42.30	42.32	42.06	42.50	42.33	**42.11**	**43.00**	42.10	42.33	42.10
5	42.20	42.29	42.31	42.32	**41.70**	42.25	42.51	41.80	42.30	**41.21**	42.30	42.00	**40.99**	**43.20**	NR	NR	NR
6	42.40	42.50	42.47	42.34	**41.40**	42.76	42.08	42.20	42.26	**41.71**	42.40	42.17	41.93	**43.00**	NR	NR	NR
7	42.30	42.48	42.41	42.35	**41.60**	42.28	42.00	42.10	42.32	**41.37**	42.20	41.99	**42.98**	**43.30**	NR	NR	NR
8	42.30	42.45	42.53	42.38	**41.70**	42.31	42.06	41.90	42.33	**41.69**	42.40	42.11	42.53	**43.00**	NR	NR	NR
9	42.30	42.40	42.29	42.33	42.00	42.16	42.76	42.60	42.14	**41.76**	42.60	42.58	42.18	**43.30**	NR	NR	NR
10	42.50	42.51	42.18	42.36	41.90	42.08	42.58	42.30	42.21	**41.91**	42.50	42.88	42.22	**42.90**	NR	NR	NR
11	42.40	42.30	42.22	42.36	42.10	42.20	42.31	42.40	42.21	**41.35**	42.50	42.25	41.93	**43.10**	NR	NR	NR
12	42.00	42.43	42.06	42.38	42.00	42.11	42.52	42.50	42.14	**41.85**	42.60	42.40	42.29	**43.10**	NR	NR	NR
Mean	42.25	42.46	42.29	42.39	41.63	42.25	42.57	42.24	42.28	41.73	42.48	42.31	42.01	**43.10**	42.15	42.31	42.10
Median	42.30	42.46	42.29	42.37	41.65	42.19	42.55	42.30	42.28	41.77	42.50	42.29	42.02	43.05	42.15	42.31	42.10
Std.Dev.	0.18	0.12	0.13	0.06	0.33	0.20	0.40	0.25	0.13	0.29	0.14	0.25	0.51	0.14	0.06	0.07	0.08
Rel.Std.Dev.	0.42%	0.28%	0.31%	0.13%	0.78%	0.47%	0.93%	0.59%	0.31%	0.70%	0.33%	0.60%	1.21%	0.33%	0.14%	0.16%	0.19%
PDM[3]	0.00%	0.49%	0.10%	0.32%	-1.48%	-0.01%	0.75%	-0.02%	0.08%	-1.23%	0.55%	0.13%	-0.57%	2.01%	-0.24%	0.14%	-0.36%

Table A16. Fusion XRF results for SO_3 in OREAS 184 (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	0.008	<0.01	0.006	0.006	<0.001	NR	0.001	<0.002	NR	NR	0.008	NR	NR	NR	**0.020**	<0.002	NR
2	0.004	<0.01	0.006	0.007	<0.001	NR	0.001	<0.002	NR	NR	0.007	NR	NR	NR	**0.010**	<0.002	NR
3	0.007	<0.01	0.003	0.005	<0.001	NR	0.001	<0.002	NR	NR	0.008	NR	NR	NR	**<0.01**	<0.002	NR
4	0.010	<0.01	0.005	0.005	<0.001	NR	0.002	<0.002	NR	NR	0.009	NR	NR	NR	**0.010**	<0.002	NR
5	0.012	<0.01	0.006	0.008	<0.001	NR	0.002	<0.002	NR	NR	0.009	NR	NR	NR	NR	NR	NR
6	0.010	<0.01	0.004	0.008	<0.001	NR	0.001	<0.002	NR	NR	0.006	NR	NR	NR	NR	NR	NR
7	0.009	<0.01	0.005	0.008	<0.001	NR	0.002	<0.002	NR	NR	0.005	NR	NR	NR	NR	NR	NR
8	0.010	<0.01	0.005	0.008	<0.001	NR	<0.001	<0.002	NR	NR	0.005	NR	NR	NR	NR	NR	NR
9	**0.015**	<0.01	0.006	0.003	**0.015**	NR	0.007	<0.002	NR	NR	0.003	NR	NR	NR	NR	NR	NR
10	**0.017**	<0.01	0.007	0.003	**0.014**	NR	0.009	<0.002	NR	NR	0.004	NR	NR	NR	NR	NR	NR
11	**0.016**	0.005	0.007	0.003	**0.015**	NR	**0.034**	<0.002	NR	NR	<0.001	NR	NR	NR	NR	NR	NR
12	**0.015**	<0.01	0.007	0.004	**0.017**	NR	0.005	<0.002	NR	NR	0.004	NR	NR	NR	NR	NR	NR
Mean	0.011	0.005	0.006	0.006	0.015		0.006				0.006				0.013		
Median	0.010	0.005	0.006	0.006	0.015		0.002				0.006				0.010		
Std.Dev.	0.004		0.001	0.002	0.001		0.010				0.002				0.006		
Rel.Std.Dev.	35.98%		22.21%	37.12%	8.25%		164%				34.56%				43.30%		
PDM[3]	93.98%	-12.49%	-2.28%	-0.82%	166%		3.42%				8.19%				133%		

Table A17. Fusion XRF results for TiO_2 in OREAS 184 (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	0.070	0.060	0.060	0.058	0.050	NR	0.060	**0.040**	0.060	0.054	0.070	0.060	NR	**0.050**	0.060	0.057	0.060
2	0.060	0.060	0.060	0.057	0.060	NR	0.060	0.070	0.060	0.054	0.070	0.050	NR	**0.050**	0.060	0.053	0.050
3	0.070	0.060	0.060	0.056	0.060	NR	0.060	0.050	0.060	0.056	0.070	0.060	NR	**0.050**	0.060	0.059	0.060
4	0.070	0.060	0.060	0.057	0.070	NR	0.060	0.050	0.060	0.056	0.060	0.060	NR	**0.050**	0.060	0.060	0.050
5	0.060	0.060	0.060	0.058	0.050	NR	0.060	0.070	0.060	0.062	0.070	0.060	NR	**0.050**	NR	NR	NR
6	0.060	0.065	0.060	0.058	0.060	NR	0.060	0.060	0.060	0.064	0.060	0.060	NR	**0.050**	NR	NR	NR
7	0.060	0.060	0.060	0.059	0.050	NR	0.060	**0.100**	0.060	0.058	0.070	0.060	NR	**0.040**	NR	NR	NR
8	0.070	0.065	0.060	0.058	0.050	NR	0.060	0.070	0.060	0.060	0.070	0.070	NR	**0.050**	NR	NR	NR
9	0.070	0.060	0.060	0.057	0.060	NR	0.060	0.050	0.060	0.059	**0.080**	0.070	NR	**0.050**	NR	NR	NR
10	0.060	0.065	0.060	0.057	0.050	NR	0.060	0.060	0.060	0.053	**0.080**	0.070	NR	**0.050**	NR	NR	NR
11	0.070	0.065	0.050	0.058	0.060	NR	0.060	0.050	0.060	0.056	**0.090**	0.060	NR	**0.050**	NR	NR	NR
12	0.070	0.060	0.060	0.055	0.060	NR	0.060	0.050	0.060	0.057	**0.090**	0.060	NR	**0.050**	NR	NR	NR
Mean	0.066	0.062	0.059	0.057	0.057		0.060	0.060	0.060	0.057	0.073	0.062		**0.049**	0.060	0.057	0.055
Median	0.070	0.060	0.060	0.058	0.060		0.060	0.055	0.060	0.057	0.070	0.060		0.050	0.060	0.058	0.055
Std.Dev.	0.005	0.002	0.003	0.001	0.007		0.000	0.016	0.000	0.003	0.010	0.006		0.003	0.000	0.003	0.006
Rel.Std.Dev.	7.82%	3.99%	4.88%	1.87%	11.49%		0.00%	26.59%	0.00%	5.82%	13.43%	9.36%		5.87%	0.00%	5.38%	10.50%
PDM[3]	10.05%	3.08%	-1.10%	-4.16%	-5.28%		0.30%	0.30%	0.30%	-4.02%	22.58%	3.08%		-17.81%	0.30%	-4.26%	-8.06%

Table A18. Fusion XRF results for Zn in OREAS 184 (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	260	281	280	285	320	302	280	290	280	250	260	330	NR	280	**200**	267	NR
2	260	271	280	285	330	302	280	290	290	240	260	330	NR	280	**200**	270	NR
3	270	269	280	275	330	300	270	290	290	250	270	330	NR	290	**200**	276	NR
4	260	275	280	280	320	301	280	280	290	250	260	340	NR	290	**200**	256	NR
5	270	277	290	275	320	304	250	270	290	250	260	250	NR	310	NR	NR	NR
6	270	273	280	275	340	307	260	280	290	250	260	250	NR	300	NR	NR	NR
7	270	276	280	275	320	304	270	290	290	250	260	250	NR	300	NR	NR	NR
8	270	**264**	260	270	320	303	280	290	280	260	250	250	NR	300	NR	NR	NR
9	250	273	280	280	320	305	240	290	280	240	270	240	NR	290	NR	NR	NR
10	260	271	280	275	320	303	230	300	290	250	260	240	NR	280	NR	NR	NR
11	250	276	280	275	320	305	220	280	290	230	260	250	NR	290	NR	NR	NR
12	240	274	280	275	330	301	230	300	290	260	260	240	NR	280	NR	NR	NR
Mean	261	273	279	277	324	303	258	288	288	248	261	275		291	200	267	
Median	260	273	280	275	320	303	265	290	290	250	260	250		290	200	269	
Std.Dev.	10	4	7	5	7	2	23	9	5	8	5	43		10	0	8	
Rel.Std.Dev.	3.82%	1.58%	2.39%	1.62%	2.06%	0.64%	8.78%	3.01%	1.57%	3.36%	1.97%	15.54%		3.43%	0.00%	3.14%	
PDM[3]	-6.20%	-1.84%	0.39%	-0.36%	16.58%	9.03%	-7.40%	3.39%	3.39%	-10.69%	-6.20%	-1.10%		4.59%	-28.08%	-3.89%	

Table A19. Results for LOI at 1000°C in OREAS 184 (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	6.03	6.29	6.14	6.13	6.16	6.68	NR	6.20	5.84	**7.28**	6.34	6.30	**7.65**	5.90	6.31	6.36	5.92
2	5.99	6.33	6.16	6.15	6.29	6.63	NR	6.26	5.85	**7.36**	6.30	6.30	**7.70**	5.87	6.33	6.38	5.83
3	5.97	6.32	6.16	6.14	6.17	6.58	NR	6.14	5.90	**7.37**	6.39	6.30	**7.62**	5.91	6.30	6.39	5.84
4	5.94	6.32	6.15	6.13	6.25	**6.89**	NR	6.24	5.92	**7.36**	6.31	6.30	**7.65**	5.95	6.29	6.37	5.83
5	6.05	6.42	6.15	6.16	5.95	**7.12**	6.33	6.18	5.92	**7.29**	6.75	6.40	6.30	5.81	NR	NR	NR
6	6.09	6.43	6.14	6.17	6.01	**6.86**	6.26	6.24	5.92	**7.33**	6.66	6.50	6.34	5.82	NR	NR	NR
7	6.08	6.42	6.17	6.18	5.96	**6.86**	6.24	6.20	5.94	**7.46**	6.84	6.40	6.40	5.83	NR	NR	NR
8	6.12	6.44	6.16	6.16	6.02	**6.86**	6.38	6.32	5.93	**7.36**	6.71	6.40	6.51	5.91	NR	NR	NR
9	6.22	6.43	6.26	6.20	6.39	**7.27**	6.58	6.34	6.05	**7.27**	6.44	6.20	**7.73**	5.79	NR	NR	NR
10	6.29	6.46	6.27	6.19	6.53	**7.28**	6.48	6.34	5.97	**7.20**	6.54	6.10	**7.81**	5.81	NR	NR	NR
11	6.30	6.44	6.26	6.18	6.38	**7.23**	6.32	6.31	5.90	**7.26**	6.60	6.20	**7.79**	5.80	NR	NR	NR
12	6.21	6.45	6.26	6.21	6.28	**7.30**	6.31	6.42	5.89	**7.28**	6.53	6.20	**7.80**	5.78	NR	NR	NR
Mean	6.11	6.39	6.19	6.17	6.20	6.96	6.36	6.27	5.92	**7.32**	6.53	6.30	7.28	5.85	6.31	6.38	5.86
Median	6.09	6.42	6.16	6.17	6.21	6.87	6.33	6.25	5.92	7.31	6.54	6.30	7.65	5.83	6.31	6.37	5.84
Std.Dev.	0.12	0.06	0.05	0.03	0.19	0.27	0.11	0.08	0.05	0.07	0.18	0.11	0.66	0.06	0.02	0.01	0.04
Rel.Std.Dev.	2.00%	0.95%	0.88%	0.43%	3.02%	3.83%	1.81%	1.30%	0.92%	0.93%	2.78%	1.79%	9.07%	0.97%	0.27%	0.21%	0.74%
PDM[3]	-2.13%	2.46%	-0.80%	-1.18%	-0.66%	11.60%	1.96%	0.41%	-5.14%	17.27%	4.71%	0.96%	16.60%	-6.28%	1.08%	2.16%	-6.17%

Table A20. Fusion ICP results for Ni in OREAS 184 (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	**1.11**	1.03	1.01	1.05	1.01	1.00	1.03	1.01	1.02	1.00	1.05	1.00
2	1.02	1.03	1.01	1.00	1.00	1.00	1.03	1.02	1.04	1.00	1.00	0.99
3	1.04	1.02	1.02	0.99	0.99	1.00	1.02	1.03	1.04	0.99	1.04	0.99
4	1.04	1.04	1.01	1.04	1.00	0.99	1.03	1.03	1.05	1.00	**1.10**	1.00
5	0.98	1.05	1.02	1.01	1.02	0.99	1.05	1.05	1.03	1.01	NR	NR
6	0.99	1.06	1.01	1.01	0.99	1.00	1.05	1.03	1.06	1.01	NR	NR
7	0.99	1.08	1.00	1.01	0.99	0.99	1.07	1.07	1.07	1.01	NR	NR
8	0.98	1.07	1.02	1.05	1.01	1.00	1.08	0.98	1.03	1.01	NR	NR
9	1.03	0.99	1.02	1.02	1.01	0.97	1.03	**1.09**	1.08	0.99	NR	NR
10	1.02	0.99	1.03	0.98	1.01	0.97	1.03	**1.08**	1.01	1.00	NR	NR
11	1.03	1.00	1.01	1.02	1.00	0.97	1.03	**1.10**	1.05	0.98	NR	NR
12	1.04	1.02	**1.07**	0.97	1.01	0.97	1.03	**1.07**	1.05	0.99	NR	NR
Mean	1.02	1.03	1.02	1.01	1.00	0.99	1.04	1.05	1.04	1.00	1.05	0.99
Median	1.02	1.03	1.02	1.01	1.00	0.99	1.03	1.04	1.04	1.00	1.05	0.99
Std.Dev.	0.03	0.03	0.02	0.02	0.01	0.01	0.02	0.04	0.02	0.01	0.04	0.00
Rel.Std.Dev.	3.41%	2.78%	1.75%	2.45%	0.89%	1.46%	1.79%	3.51%	1.84%	0.84%	4.06%	0.26%
PDM[3]	0.44%	1.58%	0.33%	-0.64%	-1.24%	-2.89%	2.38%	2.95%	2.80%	-1.78%	3.03%	-2.09%

Table A21. Fusion ICP results for Co in OREAS 184 (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	870	839	920	910	908	920	910	**974**	867	870	896	892
2	880	847	920	880	915	860	890	**961**	837	880	875	887
3	870	840	940	860	908	880	910	**984**	856	880	899	895
4	880	831	900	900	909	890	910	**997**	852	890	934	891
5	920	936	920	900	893	860	910	**1051**	877	880	NR	NR
6	1000	944	900	880	894	870	900	**1004**	896	890	NR	NR
7	940	958	900	870	904	880	940	**1036**	900	890	NR	NR
8	890	950	940	920	910	890	920	**959**	882	890	NR	NR
9	900	925	940	850	911	890	850	954	904	890	NR	NR
10	880	981	960	820	933	860	830	930	843	900	NR	NR
11	900	950	940	870	912	890	840	952	887	850	NR	NR
12	900	936	**1000**	820	925	860	850	968	875	880	NR	NR
Mean	903	911	932	873	910	879	888	981	873	883	901	891
Median	895	936	930	875	910	880	905	971	876	885	898	892
Std.Dev.	37	55	29	32	11	18	36	36	22	13	24	3
Rel.Std.Dev.	4.10%	6.05%	3.10%	3.70%	1.23%	2.08%	4.07%	3.64%	2.57%	1.46%	2.71%	0.39%
PDM[3]	0.38%	1.37%	3.62%	-2.86%	1.23%	-2.22%	-1.20%	9.09%	-2.90%	-1.84%	0.21%	-0.88%

Table A22. Fusion ICP results for Al_2O_3 in OREAS 184 (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	4.58	4.55	4.59	4.77	4.78	4.61	4.58	4.50	4.43	4.47	4.42	4.51
2	4.54	4.56	4.52	4.62	4.63	4.61	4.70	4.49	4.41	4.43	4.47	4.47
3	4.59	4.52	4.48	4.61	4.83	4.62	4.63	4.52	4.76	4.47	4.79	4.48
4	4.59	4.60	4.46	4.77	4.54	4.61	4.68	4.59	4.67	4.43	4.89	4.58
5	4.56	4.72	4.46	4.72	4.63	4.63	4.70	4.49	4.77	4.56	NR	NR
6	4.60	4.61	4.38	4.74	4.62	4.65	4.63	4.48	4.77	4.57	NR	NR
7	4.56	4.63	4.44	4.79	4.59	4.61	4.67	4.57	4.71	4.65	NR	NR
8	4.57	4.67	4.38	4.63	**4.76**	4.64	4.63	**4.20**	4.63	4.48	NR	NR
9	4.66	4.33	**4.29**	4.81	4.65	4.55	4.62	4.72	4.57	4.42	NR	NR
10	4.62	4.41	**4.46**	4.51	4.78	4.53	4.65	4.64	4.61	4.45	NR	NR
11	4.60	4.42	**4.18**	4.70	4.73	4.54	4.70	4.70	4.58	4.38	NR	NR
12	4.61	4.45	**4.52**	4.35	4.62	4.51	4.71	4.55	4.64	4.43	NR	NR
Mean	4.59	4.54	4.43	4.67	4.68	4.59	4.66	4.54	4.63	4.48	4.64	4.51
Median	4.59	4.56	4.46	4.71	4.64	4.61	4.66	4.54	4.63	4.46	4.63	4.49
Std.Dev.	0.03	0.12	0.11	0.13	0.09	0.05	0.04	0.13	0.12	0.08	0.23	0.05
Rel.Std.Dev.	0.70%	2.58%	2.49%	2.87%	1.96%	1.02%	0.88%	2.95%	2.59%	1.72%	5.01%	1.10%
PDM[3]	0.13%	-0.98%	-3.36%	1.84%	2.10%	0.19%	1.62%	-1.05%	0.96%	-2.30%	1.28%	-1.68%

Table A23. Fusion ICP results for CaO in OREAS 184 (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	**0.270**	0.270	0.300	0.190	0.220	0.210	0.230	0.221	0.192	**0.380**	<0.3	0.311
2	**0.330**	0.230	0.100	0.180	0.210	0.220	0.200	0.244	0.181	0.260	<0.3	0.291
3	**0.350**	0.240	0.300	0.170	0.220	0.210	0.200	0.243	0.191	0.220	<0.3	0.284
4	**0.360**	0.240	0.300	0.200	0.210	0.220	0.200	0.234	0.190	0.260	<0.3	0.322
5	0.290	0.220	0.300	0.180	0.220	0.210	0.230	**0.294**	0.219	0.180	NR	NR
6	0.230	0.240	0.100	0.210	0.220	0.210	0.240	0.225	0.240	0.170	NR	NR
7	0.320	0.250	0.100	0.170	0.230	0.210	0.250	0.233	0.219	**0.320**	NR	NR
8	0.330	0.240	0.100	0.210	0.220	0.210	0.250	0.235	0.219	0.160	NR	NR
9	**0.340**	0.190	0.300	0.190	0.220	0.210	0.250	0.244	0.196	0.210	NR	NR
10	**0.340**	0.180	0.300	0.140	0.220	0.210	0.250	0.242	0.185	**0.310**	NR	NR
11	**0.320**	0.160	0.300	0.190	0.210	0.210	0.240	0.246	0.185	0.240	NR	NR
12	**0.300**	0.210	0.300	0.160	0.210	0.210	0.250	0.240	0.185	0.220	NR	NR
Mean	0.315	0.223	0.233	0.183	0.218	0.212	0.233	0.242	0.200	0.244		0.302
Median	0.325	0.235	0.300	0.185	0.220	0.210	0.240	0.241	0.192	0.230		0.301
Std.Dev.	0.037	0.032	0.098	0.021	0.006	0.004	0.021	0.018	0.019	0.066		0.018
Rel.Std.Dev.	11.76%	14.36%	42.20%	11.24%	2.86%	1.84%	9.01%	7.54%	9.38%	27.08%		5.91%
PDM[3]	36.16%	-3.82%	0.86%	-21.11%	-5.99%	-8.51%	0.50%	4.50%	-13.48%	5.54%		30.47%

Table A24. Fusion ICP results for Cu in OREAS 184 (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	69	**100**	60	<50	80	<50	57	66	60	**53**	65
2	<50	70	**100**	60	<50	60	<50	54	65	60	68	64
3	<50	68	50	60	<50	70	60	53	73	60	67	**227**
4	<50	67	50	60	50	70	50	51	72	80	69	68
5	<50	54	50	70	60	60	<50	**38**	60	60	NR	NR
6	<50	50	50	60	50	60	<50	**25**	59	60	NR	NR
7	<50	52	50	60	50	50	70	**37**	57	60	NR	NR
8	<50	57	<50	70	60	60	50	**39**	54	60	NR	NR
9	<50	58	<50	60	60	60	<50	**32**	60	60	NR	NR
10	<50	57	<50	60	60	60	50	**31**	62	80	NR	NR
11	<50	58	<50	70	60	60	<50	**33**	63	80	NR	NR
12	<50	60	50	60	60	60	<50	**34**	62	60	NR	NR
Mean		60	63	63	57	63	56	40	63	65	64	106
Median		58	50	60	60	60	50	37	62	60	68	66
Std.Dev.		7	23	5	5	8	9	10	6	9	8	81
Rel.Std.Dev.		11.46%	37.03%	7.24%	8.82%	12.06%	15.97%	25.87%	8.81%	13.92%	11.74%	76.20%
PDM[3]		-0.35%	3.80%	3.80%	-5.89%	3.80%	-7.00%	-32.89%	3.92%	7.95%	6.70%	75.67%

Table A25. Fusion ICP results for Cr_2O_3 in OREAS 184 (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	1.74	1.81	1.80	1.71	1.74	1.70	1.72	1.76	1.68	1.72	1.77	1.78
2	1.72	1.81	1.75	1.65	1.70	1.70	1.71	1.74	1.71	1.72	1.66	1.77
3	1.74	1.79	1.83	1.61	1.71	1.71	1.72	1.74	1.63	1.75	1.72	1.73
4	1.74	1.84	1.81	1.74	1.63	1.71	1.71	1.80	1.67	1.75	1.83	1.80
5	1.75	1.79	1.70	1.65	1.71	1.69	**1.94**	1.78	1.76	1.77	NR	NR
6	1.78	1.77	1.70	1.65	1.71	1.68	**1.91**	1.80	1.74	1.72	NR	NR
7	1.77	1.81	1.70	1.58	1.69	1.68	**1.97**	1.83	1.75	1.77	NR	NR
8	1.78	1.78	1.71	1.69	**1.78**	1.69	**1.98**	**1.67**	1.78	1.74	NR	NR
9	1.81	**1.71**	1.64	1.75	1.78	1.72	1.80	1.86	1.75	1.78	NR	NR
10	1.80	1.76	1.68	1.67	1.82	1.72	1.85	1.83	1.73	1.77	NR	NR
11	1.78	1.79	1.61	1.75	1.77	1.73	1.83	1.88	1.74	1.86	NR	NR
12	1.81	1.78	1.71	1.64	1.73	1.73	1.86	1.78	1.70	1.74	NR	NR
Mean	1.77	1.79	1.72	1.67	1.73	1.71	1.83	1.79	1.72	1.76	1.75	1.77
Median	1.78	1.79	1.71	1.66	1.72	1.71	1.84	1.79	1.73	1.75	1.75	1.78
Std.Dev.	0.03	0.03	0.07	0.06	0.05	0.02	0.10	0.06	0.04	0.04	0.07	0.03
Rel.Std.Dev.	1.70%	1.78%	3.88%	3.29%	2.98%	1.04%	5.59%	3.22%	2.48%	2.08%	4.15%	1.52%
PDM[3]	1.25%	2.27%	-1.51%	-4.14%	-0.86%	-2.31%	4.98%	2.44%	-1.58%	0.71%	-0.08%	1.39%

Table A26. Fusion ICP results for Fe_2O_3 in OREAS 184 (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	39.40	40.43	39.60	41.50	39.55	39.70	37.81	**41.24**	40.23	39.30	**36.60**	39.32
2	39.10	40.56	39.80	39.50	39.28	39.64	38.94	**39.76**	40.07	39.10	**35.80**	39.89
3	39.30	40.73	39.30	39.10	39.93	39.88	38.70	**41.27**	39.35	39.40	**37.50**	39.89
4	39.50	40.49	39.20	41.00	38.91	39.54	38.44	**41.34**	39.20	39.60	**38.60**	40.54
5	38.20	39.56	38.60	**37.40**	39.22	39.71	38.64	**42.16**	40.82	39.90	NR	NR
6	38.80	39.88	37.90	**37.20**	38.69	39.83	39.36	**41.14**	40.09	39.60	NR	NR
7	38.40	40.37	38.20	**35.90**	39.27	39.55	38.05	**42.11**	40.49	40.00	NR	NR
8	38.30	40.26	38.80	**38.70**	39.13	39.64	39.56	**40.02**	41.11	39.60	NR	NR
9	38.10	40.03	39.20	39.40	39.25	39.88	38.68	39.04	38.79	39.20	NR	NR
10	38.10	40.51	40.20	37.90	39.20	39.92	39.28	39.36	38.67	39.60	NR	NR
11	38.00	40.89	38.60	39.50	38.91	39.91	39.27	39.69	38.76	**38.00**	NR	NR
12	38.40	41.40	41.00	37.40	39.13	39.93	39.20	38.30	38.23	39.20	NR	NR
Mean	38.63	40.43	39.20	38.71	39.21	39.76	38.83	40.45	39.65	39.38	37.13	39.91
Median	38.40	40.46	39.20	38.90	39.21	39.77	38.82	40.58	39.71	39.50	37.05	39.89
Std.Dev.	0.56	0.48	0.87	1.63	0.32	0.15	0.54	1.25	0.94	0.51	1.20	0.49
Rel.Std.Dev.	1.44%	1.18%	2.22%	4.21%	0.81%	0.37%	1.40%	3.10%	2.37%	1.30%	3.24%	1.24%
PDM[3]	-2.00%	2.55%	-0.56%	-1.81%	-0.54%	0.86%	-1.50%	2.62%	0.59%	-0.12%	-5.82%	1.25%

Table A27. Fusion ICP results for K_2O in OREAS 184 (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	<0.1	<0.1	<0.02	<0.1	<0.01	<0.01	<0.01	<0.1	<0.01	0.120	<0.2	0.079
2	<0.1	<0.1	<0.02	<0.1	<0.01	<0.01	<0.01	<0.1	<0.01	<0.1	<0.2	0.072
3	<0.1	<0.1	<0.02	<0.1	0.010	<0.01	<0.01	<0.1	0.027	0.120	<0.2	0.068
4	<0.1	<0.1	<0.02	<0.1	0.010	<0.01	<0.01	<0.1	0.025	0.120	<0.2	0.089
5	<0.1	0.100	0.100	<0.1	0.020	<0.01	0.010	0.125	0.006	0.120	NR	NR
6	<0.1	0.100	0.100	<0.1	0.010	<0.01	<0.01	<0.1	0.006	0.120	NR	NR
7	<0.1	0.100	<0.1	<0.1	0.010	<0.01	<0.01	0.129	0.006	0.120	NR	NR
8	<0.1	<0.1	0.100	<0.1	0.010	<0.01	<0.01	0.168	0.006	<0.1	NR	NR
9	0.100	0.169	<0.1	<0.1	0.010	<0.01	<0.01	0.100	0.006	0.120	NR	NR
10	0.100	0.193	<0.1	<0.1	0.010	<0.01	0.010	<0.1	0.006	0.120	NR	NR
11	0.100	0.169	<0.1	<0.1	0.010	<0.01	<0.01	<0.1	0.006	0.120	NR	NR
12	0.100	0.253	<0.1	<0.1	0.010	<0.01	<0.01	0.117	0.006	<0.1	NR	NR
Mean	0.100	0.155	0.100		0.011		0.010	0.128	0.010	0.120		0.077
Median	0.100	0.169	0.100		0.010		0.010	0.125	0.006	0.120		0.075
Std.Dev.	0.000	0.058	0.000		0.003		0.000	0.025	0.008	0.000		0.009
Rel.Std.Dev.	0.00%	37.75%	0.00%		28.75%		0.00%	19.62%	83.51%	0.00%		11.70%
PDM[3]	26.58%	95.83%	26.58%		-86.08%		-87.34%	61.77%	-87.19%	52.48%		-2.63%

Table A28. Fusion ICP results for MgO in OREAS 184 (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	2.87	3.02	3.00	3.13	2.96	3.09	2.96	**3.30**	**2.75**	2.92	2.98	3.03
2	2.83	3.00	2.98	2.98	2.89	3.11	2.99	**3.24**	2.79	2.91	3.02	3.05
3	2.87	2.96	2.93	2.96	3.03	3.10	2.94	**3.22**	3.04	2.91	3.15	3.03
4	2.86	3.03	2.95	3.06	2.89	3.07	2.96	**3.24**	2.93	2.89	3.16	**3.13**
5	2.98	**3.25**	3.08	2.85	2.99	3.03	3.04	**3.34**	3.03	2.96	NR	NR
6	3.01	**3.26**	3.00	2.86	3.04	3.09	3.01	**3.29**	3.01	2.96	NR	NR
7	2.98	**3.26**	2.97	2.78	3.01	3.03	2.98	**3.38**	2.95	2.99	NR	NR
8	2.98	**3.25**	3.15	2.99	3.04	3.05	2.98	**3.07**	2.90	2.93	NR	NR
9	3.08	3.05	2.92	3.08	3.07	3.04	2.99	**3.50**	2.93	2.88	NR	NR
10	3.02	3.07	2.95	2.93	3.11	2.98	2.99	**3.31**	2.95	2.93	NR	NR
11	3.02	3.11	2.92	3.01	3.04	3.01	3.02	**3.38**	2.91	2.85	NR	NR
12	3.06	3.14	2.97	2.86	2.94	3.02	3.00	**3.27**	2.97	2.91	NR	NR
Mean	2.96	3.12	2.99	2.96	3.00	3.05	2.99	**3.29**	2.93	2.92	3.08	3.06
Median	2.98	3.09	2.97	2.97	3.02	3.05	2.99	3.29	2.94	2.92	3.09	3.04
Std.Dev.	0.08	0.11	0.07	0.11	0.07	0.04	0.03	0.10	0.09	0.04	0.09	0.05
Rel.Std.Dev.	2.85%	3.61%	2.28%	3.57%	2.30%	1.32%	0.92%	3.17%	3.02%	1.31%	2.96%	1.50%
PDM[3]	-1.14%	3.97%	-0.42%	-1.34%	0.11%	1.80%	-0.31%	9.91%	-2.26%	-2.59%	2.66%	2.02%

Table A29. Fusion ICP results for MnO in OREAS 184 (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	0.660	0.677	0.668	0.690	0.670	0.670	0.678	0.674	0.674	0.680	0.666	0.695
2	0.650	0.674	0.666	0.670	0.650	0.670	0.714	0.683	0.669	0.680	0.643	0.695
3	0.660	0.673	0.668	0.660	0.680	0.660	0.706	0.678	0.652	0.680	0.668	0.691
4	0.660	0.681	0.658	0.690	0.640	0.670	0.711	0.674	0.645	0.690	0.697	0.702
5	0.680	0.683	0.660	**0.630**	0.680	0.670	0.695	0.680	0.706	0.690	NR	NR
6	0.680	0.691	0.680	**0.640**	0.680	0.670	0.688	0.668	0.692	0.680	NR	NR
7	0.680	0.696	0.660	**0.600**	0.670	0.680	0.708	0.691	0.698	0.700	NR	NR
8	0.680	0.692	0.674	**0.640**	0.700	0.670	0.692	**0.628**	0.706	0.680	NR	NR
9	0.670	0.677	0.660	0.660	0.700	0.660	0.688	**0.722**	0.669	0.690	NR	NR
10	0.670	0.695	0.668	0.640	0.720	0.660	0.691	**0.724**	0.669	0.700	NR	NR
11	0.670	0.690	0.660	0.660	0.700	0.660	0.697	**0.731**	0.669	0.670	NR	NR
12	0.670	0.704	0.680	0.630	0.680	0.660	0.701	**0.709**	0.669	0.680	NR	NR
Mean	0.669	0.686	0.667	0.651	0.681	0.667	0.697	0.689	0.676	0.685	0.669	0.696
Median	0.670	0.687	0.667	0.650	0.680	0.670	0.696	0.682	0.669	0.680	0.667	0.695
Std.Dev.	0.010	0.010	0.008	0.026	0.022	0.007	0.011	0.029	0.020	0.009	0.022	0.005
Rel.Std.Dev.	1.49%	1.44%	1.17%	4.01%	3.28%	0.98%	1.55%	4.23%	2.95%	1.32%	3.31%	0.66%
PDM[3]	-1.27%	1.22%	-1.62%	-3.98%	0.45%	-1.64%	2.89%	1.58%	-0.20%	1.06%	-1.37%	2.66%

Table A30. Fusion ICP results for Na_2O in OREAS 184 (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	<0.01	<0.01	<0.01	<0.01	0.004	NR	NR	NR
2	NR	NR	NR	NR	<0.01	<0.01	<0.01	<0.01	0.004	NR	NR	NR
3	NR	NR	NR	NR	0.010	<0.01	<0.01	<0.01	0.003	NR	NR	NR
4	NR	NR	NR	NR	0.010	<0.01	<0.01	<0.01	0.003	NR	NR	NR
5	NR	NR	NR	NR	0.010	<0.01	<0.01	<0.01	0.003	NR	NR	NR
6	NR	NR	NR	NR	0.010	<0.01	<0.01	<0.01	0.004	NR	NR	NR
7	NR	NR	NR	NR	0.010	<0.01	<0.01	<0.01	0.006	NR	NR	NR
8	NR	NR	NR	NR	<0.01	<0.01	<0.01	<0.01	0.003	NR	NR	NR
9	NR	NR	NR	NR	<0.01	<0.01	<0.01	<0.01	0.005	NR	NR	NR
10	NR	NR	NR	NR	<0.01	<0.01	<0.01	<0.01	0.004	NR	NR	NR
11	NR	NR	NR	NR	<0.01	<0.01	<0.01	<0.01	0.005	NR	NR	NR
12	NR	NR	NR	NR	<0.01	<0.01	<0.01	<0.01	0.004	NR	NR	NR
Mean					0.010				0.004			
Median					0.010				0.004			
Std.Dev.					0.000				0.001			
Rel.Std.Dev.					0.00%				24.43%			
PDM[3]					143%				0.00%			

Table A31. Fusion ICP results for P_2O_5 in OREAS 184 (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	<0.02	0.030	0.020	0.020	<0.01	0.018	NR	NR	0.018
2	NR	<0.03	<0.02	<0.02	0.030	0.030	0.040	<0.01	0.007	NR	NR	0.017
3	NR	<0.03	<0.02	0.020	0.020	0.020	0.020	<0.01	0.018	NR	NR	0.001
4	NR	<0.03	<0.02	<0.02	0.020	0.010	0.020	<0.01	**0.051**	NR	NR	0.009
5	NR	0.030	<0.02	<0.02	0.020	<0.01	0.020	<0.01	0.011	NR	NR	NR
6	NR	<0.03	<0.02	0.020	0.030	0.010	0.010	<0.01	0.013	NR	NR	NR
7	NR	0.040	<0.02	0.020	0.030	<0.01	0.020	<0.01	0.009	NR	NR	NR
8	NR	<0.03	0.040	0.020	0.030	0.010	0.020	<0.01	0.011	NR	NR	NR
9	NR	<0.03	0.040	0.020	0.030	0.020	0.020	<0.01	0.019	NR	NR	NR
10	NR	<0.03	0.020	<0.02	0.030	0.010	0.030	<0.01	0.016	NR	NR	NR
11	NR	<0.03	0.020	0.020	0.030	<0.01	0.030	<0.01	0.014	NR	NR	NR
12	NR	<0.03	0.020	0.050	0.030	0.010	0.020	<0.01	0.014	NR	NR	NR
Mean		0.035	0.028	0.024	0.028	0.016	0.023		0.017			0.011
Median		0.035	0.020	0.020	0.030	0.010	0.020		0.014			0.013
Std.Dev.		0.007	0.011	0.011	0.005	0.007	0.008		0.011			0.008
Rel.Std.Dev.		20.20%	39.12%	46.69%	16.45%	46.70%	33.50%		66.74%			70.51%
PDM[3]		57.38%	25.90%	9.20%	23.66%	-30.05%	1.17%		-24.10%			-49.41%

Table A32. Fusion ICP results for SiO_2 in OREAS 184 (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	42.00	42.00	41.50	42.30	42.35	42.12	42.52	42.30	40.99	42.30	41.20	44.17
2	41.40	42.30	41.70	40.60	42.87	42.11	43.01	42.06	41.05	41.90	41.00	42.71
3	43.40	42.20	42.10	40.40	43.45	41.96	42.56	42.23	41.30	42.40	42.30	43.69
4	43.40	42.10	41.70	41.90	42.54	42.26	42.81	42.47	41.58	42.40	43.80	44.76
5	42.30	43.60	40.90	41.80	41.96	42.20	43.00	41.90	41.96	43.10	NR	NR
6	43.80	43.80	41.10	40.60	42.09	41.95	42.99	41.30	42.49	42.90	NR	NR
7	43.10	44.30	40.40	40.50	42.82	42.39	43.19	42.56	42.28	43.80	NR	NR
8	41.10	44.30	41.50	**44.00**	43.01	42.11	42.64	**38.82**	41.72	42.30	NR	NR
9	40.40	**46.20**	39.80	**41.00**	42.04	41.96	43.14	**45.81**	41.66	40.70	NR	NR
10	40.10	**46.80**	41.10	**38.70**	41.92	41.97	43.14	**45.36**	41.85	41.20	NR	NR
11	40.60	**47.00**	40.00	**40.70**	41.69	41.97	42.77	**46.01**	41.76	39.60	NR	NR
12	41.00	**47.70**	41.50	**38.00**	41.54	41.84	43.11	**45.81**	42.17	40.60	NR	NR
Mean	41.88	44.36	41.11	40.88	42.36	42.07	42.91	43.05	41.73	41.93	42.08	43.83
Median	41.70	44.05	41.30	40.65	42.22	42.04	43.00	42.39	41.74	42.30	41.75	43.93
Std.Dev.	1.30	2.09	0.72	1.57	0.59	0.16	0.24	2.22	0.46	1.20	1.28	0.87
Rel.Std.Dev.	3.10%	4.71%	1.74%	3.85%	1.38%	0.37%	0.56%	5.16%	1.11%	2.86%	3.05%	1.98%
PDM[3]	-0.72%	5.15%	-2.56%	-3.11%	0.40%	-0.28%	1.70%	2.05%	-1.08%	-0.60%	-0.27%	3.90%

Table A33. Fusion ICP results for SO_3 in OREAS 184 (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	**0.200**	<0.02	<0.01	NR	NR	NR	NR	0.050	<0.01	NR
2	<0.02	<0.05	**<0.1**	<0.02	<0.01	NR	NR	NR	NR	0.025	0.100	NR
3	<0.02	<0.05	**<0.1**	<0.02	<0.01	NR	NR	NR	NR	0.075	<0.01	NR
4	<0.02	<0.05	**<0.1**	<0.02	<0.01	NR	NR	NR	NR	0.100	0.050	NR
5	<0.02	<0.05	<0.02	<0.02	NR	NR	NR	NR	NR	0.050	NR	NR
6	<0.02	<0.05	<0.02	<0.02	NR	NR	NR	NR	NR	**0.125**	NR	NR
7	0.020	<0.05	<0.02	<0.02	NR	NR	NR	NR	NR	0.075	NR	NR
8	<0.02	<0.05	<0.02	<0.02	NR	NR	NR	NR	NR	0.050	NR	NR
9	<0.02	<0.05	0.080	0.020	0.025	NR	NR	NR	NR	0.025	NR	NR
10	0.070	<0.05	0.040	<0.02	0.025	NR	NR	NR	NR	0.050	NR	NR
11	<0.02	<0.05	0.040	<0.02	0.025	NR	NR	NR	NR	0.025	NR	NR
12	<0.02	<0.05	0.040	0.020	0.025	NR	NR	NR	NR	<0.01	NR	NR
Mean	0.045		0.080	0.020	0.025					0.059	0.075	
Median	0.045		0.040	0.020	0.025					0.050	0.075	
Std.Dev.	0.035		0.069	0.000	0.000					0.032	0.035	
Rel.Std.Dev.	78.57%		86.60%	0.00%	0.00%					54.42%	47.14%	
PDM[3]	1.00%		79.56%	-55.11%	-43.95%					32.47%	68.14%	

Table A34. Fusion ICP results for TiO_2 in OREAS 184 (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	**0.020**	0.060	0.070	**0.050**	0.060	0.060	0.058	**0.048**	0.053	0.060	0.050	0.061
2	**<0.01**	0.060	0.070	**0.050**	0.059	0.060	0.058	**0.056**	0.054	0.060	0.050	0.062
3	**<0.01**	0.060	0.050	**0.050**	0.062	0.060	0.057	**0.048**	0.053	0.060	0.050	0.061
4	**<0.01**	0.060	0.050	**0.050**	0.059	0.060	0.059	**0.049**	0.055	0.060	0.060	0.063
5	**0.010**	0.060	**0.070**	0.050	0.060	0.060	0.060	0.052	0.058	0.060	NR	NR
6	**0.050**	0.060	**0.070**	0.050	0.060	0.060	0.059	0.051	0.058	0.060	NR	NR
7	**0.020**	0.060	**0.070**	0.050	0.061	0.060	0.059	0.051	0.060	0.060	NR	NR
8	**<0.01**	0.060	**0.070**	0.060	0.061	0.060	0.060	**0.046**	0.058	0.060	NR	NR
9	**<0.01**	0.050	0.050	**0.050**	0.062	0.060	0.058	0.064	0.060	0.060	NR	NR
10	**<0.01**	0.050	0.070	**0.050**	0.064	0.060	0.058	0.062	0.057	0.060	NR	NR
11	**<0.01**	0.060	0.050	**0.050**	0.062	0.060	0.060	0.064	0.059	0.060	NR	NR
12	**<0.01**	0.050	0.070	**0.050**	0.061	0.060	0.058	0.062	0.059	0.060	NR	NR
Mean	**0.025**	0.058	0.063	0.051	0.061	0.060	0.059	0.054	0.057	0.060	0.053	0.062
Median	0.020	0.060	0.070	0.050	0.061	0.060	0.059	0.052	0.058	0.060	0.050	0.062
Std.Dev.	0.017	0.005	0.010	0.003	0.001	0.000	0.001	0.007	0.002	0.000	0.005	0.001
Rel.Std.Dev.	69.28%	7.87%	15.55%	5.68%	2.37%	0.00%	1.68%	12.55%	4.27%	0.00%	9.52%	1.79%
PDM[3]	-56.97%	-1.02%	9.02%	-12.50%	4.86%	3.28%	0.99%	-6.33%	-1.68%	3.28%	-9.63%	6.44%

Table A35. Fusion ICP results for Zn in OREAS 184 (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	300	274	250	300	**140**	NR	300	274	246	300	**89**	NR
2	300	278	250	300	**140**	NR	**200**	267	255	300	**99**	NR
3	300	265	300	300	**130**	NR	300	292	237	300	**101**	NR
4	300	276	300	300	**140**	NR	**200**	290	269	300	**88**	NR
5	300	**387**	**350**	300	**180**	NR	300	291	**135**	300	NR	NR
6	300	**331**	**350**	300	**170**	NR	**200**	282	**146**	300	NR	NR
7	300	**509**	**350**	300	**160**	NR	300	289	**125**	300	NR	NR
8	300	**340**	**350**	300	**160**	NR	300	272	**135**	300	NR	NR
9	300	277	**350**	300	**150**	NR	**200**	278	275	300	NR	NR
10	300	296	**350**	300	**150**	NR	300	289	248	300	NR	NR
11	300	281	**350**	300	**150**	NR	300	286	261	300	NR	NR
12	300	277	**350**	300	**150**	NR	**200**	280	264	300	NR	NR
Mean	300	316	325	300	152		258	283	216	300	94	
Median	300	280	350	300	150		300	284	247	300	94	
Std.Dev.	0	71	40	0	14		51	8	61	0	7	
Rel.Std.Dev.	0.00%	22.42%	12.27%	0.00%	9.25%		19.93%	2.94%	28.12%	0.00%	7.11%	
PDM[3]	4.68%	10.24%	13.41%	4.68%	-47.08%		-9.86%	-1.37%	-24.47%	4.68%	-67.11%	

Table A36. Results for C in OREAS 184 (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	0.070	0.070	0.060	**0.030**	0.070	**0.030**	**0.126**	0.050	**0.120**	0.061	0.060
2	0.070	0.070	0.070	**0.030**	0.080	**0.020**	**0.101**	0.050	**0.110**	0.067	0.060
3	0.070	**0.150**	0.070	**0.030**	0.070	**0.020**	**0.110**	0.060	**0.120**	0.071	0.070
4	0.070	0.090	0.060	**0.030**	0.070	**0.030**	**0.106**	0.050	**0.120**	0.073	0.060
5	0.070	0.080	0.060	0.050	0.080	0.050	**0.101**	0.070	0.090	0.064	0.070
6	0.060	0.090	0.060	0.060	0.090	0.060	**0.115**	0.060	0.090	0.066	0.070
7	0.070	0.090	0.070	0.050	0.090	0.080	**0.113**	0.060	0.080	0.065	0.060
8	0.070	0.080	0.060	0.050	0.090	0.060	**0.109**	0.060	0.080	0.067	0.070
9	0.060	0.060	0.040	0.060	0.080	0.070	**0.104**	0.050	0.080	0.061	0.050
10	0.070	0.080	0.040	0.060	0.090	0.060	**0.124**	0.060	0.090	0.068	0.040
11	0.070	0.060	0.040	0.060	0.080	0.070	**0.108**	0.050	0.090	0.075	0.050
12	0.060	0.090	0.050	0.060	0.090	0.050	**0.096**	0.050	0.080	0.075	0.050
Mean	0.068	0.084	0.057	0.048	0.082	0.050	**0.109**	0.056	0.096	0.068	0.059
Median	0.070	0.080	0.060	0.050	0.080	0.055	0.109	0.055	0.090	0.067	0.060
Std.Dev.	0.005	0.024	0.012	0.014	0.008	0.020	0.009	0.007	0.017	0.005	0.010
Rel.Std.Dev.	6.70%	27.96%	20.38%	28.56%	10.22%	40.90%	8.25%	11.97%	17.49%	7.45%	16.84%
PDM[3]	0.71%	25.57%	-15.46%	-29.13%	21.84%	-25.40%	63.24%	-16.70%	42.98%	0.71%	-11.73%

Table A37. Results for S in OREAS 184 (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	0.010	<0.005	<0.01	<0.01	<0.02	<0.01	0.030	<0.01	<0.01	<0.003	<0.01
2	0.010	<0.005	<0.01	<0.01	<0.02	0.010	0.020	<0.01	<0.01	<0.003	<0.01
3	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	<0.01	<0.003	<0.01
4	0.010	<0.005	<0.01	<0.01	<0.02	<0.01	0.030	<0.01	<0.01	<0.003	<0.01
5	<0.01	0.015	<0.01	<0.01	<0.02	<0.01	0.010	<0.01	<0.01	0.003	0.010
6	0.010	0.017	<0.01	<0.01	<0.02	<0.01	0.010	<0.01	<0.01	0.008	<0.01
7	<0.01	0.015	<0.01	0.010	<0.02	<0.01	<0.01	<0.01	<0.01	0.004	<0.01
8	<0.01	0.015	<0.01	<0.01	<0.02	<0.01	0.010	<0.01	<0.01	<0.003	<0.01
9	0.010	<0.005	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	<0.01	0.008	<0.01
10	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.010	<0.01	<0.01	0.008	<0.01
11	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	<0.01	0.006	<0.01
12	0.010	<0.005	<0.01	<0.01	<0.02	<0.01	0.010	<0.01	<0.01	0.008	<0.01
Mean	0.010	0.016		0.010		0.010	0.017			0.007	0.010
Median	0.010	0.015		0.010		0.010	0.020			0.008	0.010
Std.Dev.	0.000	0.001					0.008			0.002	
Rel.Std.Dev.	0.00%	6.45%					45.52%			33.19%	
PDM[3]	-6.67%	44.67%		-6.67%		-6.67%	61.21%			-38.01%	-6.67%