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CERTIFICATE OF ANALYSIS FOR

NICKEL LATERITE ORE REFERENCE MATERIAL

OREAS 193

Constituent	Certified Value	1SD
Fusion XRF		
Nickel, Ni (wt.%)	1.93	0.03
Cobalt, Co (ppm)	495	15
Aluminium oxide, Al_2O_3 (wt.%)	3.08	0.03
Calcium oxide, CaO (wt.%)	0.362	0.010
Chlorine, Cl (ppm)	*<50*	IND
Copper, Cu (ppm)	*<50*	IND
Chromium oxide, Cr_2O_3 (wt.%)	0.962	0.015
Iron oxide, Fe_2O_3 (wt.%)	19.51	0.18
Potassium oxide, K_2O (wt.%)	*<0.01*	IND
Magnesium oxide, MgO (wt.%)	20.25	0.22
Manganese oxide, MnO (wt.%)	0.317	0.006
Sodium oxide, Na_2O (wt.%)	*~0.03*	IND
Phosphorus oxide, P_2O_5 (wt.%)	0.012	0.002
Silicon dioxide, SiO_2 (wt.%)	42.72	0.38
Sulphur oxide, SO_3 (wt.%)	*<0.01*	IND
Titanium oxide, TiO_2 (wt.%)	0.053	0.004
Zinc, Zn (ppm)	219	13
Loss on ignition, LOI (wt.%)	9.87	0.22
Fusion ICP		
Nickel, Ni (wt.%)	1.91	0.04
Cobalt, Co (ppm)	483	18
Aluminium oxide, Al_2O_3 (wt.%)	3.05	0.08
Calcium oxide, CaO (wt.%)	0.373	0.033
Copper, Cu (ppm)	*~40*	IND
Chromium oxide, Cr_2O_3 (wt.%)	0.956	0.030
Iron oxide, Fe_2O_3 (wt.%)	19.49	0.64
Potassium oxide, K_2O (wt.%)	*~0.08*	IND
Magnesium oxide, MgO (wt.%)	20.26	0.59
Manganese oxide, MnO (wt.%)	0.316	0.009
Sodium oxide, Na_2O (wt.%)	0.030	0.004
Phosphorus oxide, P_2O_5 (wt.%)	*<0.02*	IND
Silica dioxide, SiO_2 (wt.%)	42.49	1.16
Sulphur oxide, SO_3 (wt.%)	*<0.05*	IND
Titanium oxide, TiO_2 (wt.%)	0.051	0.003
Zinc, Zn (ppm)	199	26
IR Combustion Furnace		
Carbon, C (wt.%)	0.07	0.02
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 193 has been prepared from saprolitic ore source material. It is one of a suite of thirteen nickel laterite CRMs (OREAS 182 to OREAS 195) sourced from Anglo American Brazil Limitada's Barro Alto Nickel Mine located in the state of Goiás, ~300 kms from the port of Santos, Brazil.

COMMINUTION AND HOMOGENISATION PROCEDURES

The material constituting OREAS 193 was prepared in the following manner:

a) drying to constant mass at 105°C;
b) crushing;
c) milling to 99.8% 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 193

OREAS 193 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 to characterize the 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, where a modified aqua regia digestion with ICP was employed to determine Ni, Co, Cu, SO_3 and Zn, and Lab H, where 4-acid digestion ICP was used 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 a 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 193

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 193.

Constituent	Certified Value	95% Confidence Interval	
		Low	High
Fusion XRF			
Nickel, Ni (wt.%)	1.93	1.91	1.94
Cobalt, Co (ppm)	495	492	499
Aluminium oxide, Al_2O_3 (wt.%)	3.08	3.06	3.09
Calcium oxide, CaO (wt.%)	0.362	0.358	0.367
Chlorine, Cl (ppm)	*<50*	IND	IND
Copper, Cu (ppm)	*<50*	IND	IND
Chromium oxide, Cr_2O_3 (wt.%)	0.962	0.955	0.969
Iron oxide, Fe_2O_3 (wt.%)	19.51	19.42	19.60
Potassium oxide, K_2O (wt.%)	*<0.01*	IND	IND
Magnesium oxide, MgO (wt.%)	20.25	20.15	20.34
Manganese oxide, MnO (wt.%)	0.317	0.314	0.319
Sodium oxide, Na_2O (wt.%)	*~0.03*	IND	IND
Phosphorus oxide, P_2O_5 (wt.%)	0.012	0.010	0.013
Silicon dioxide, SiO_2 (wt.%)	42.72	42.54	42.89
Sulphur oxide, SO_3 (wt.%)	*<0.01*	IND	IND
Titanium oxide, TiO_2 (wt.%)	0.053	0.050	0.055
Zinc, Zn (ppm)	219	212	227
Loss on ignition, LOI (wt.%)	9.87	9.74	10.00
Fusion ICP			
Nickel, Ni (wt.%)	1.91	1.89	1.93
Cobalt, Co (ppm)	483	480	487
Aluminium oxide, Al_2O_3 (wt.%)	3.05	3.01	3.10
Calcium oxide, CaO (wt.%)	0.373	0.355	0.391
Copper, Cu (ppm)	*~40*	IND	IND
Chromium oxide, Cr_2O_3 (wt.%)	0.956	0.942	0.970
Iron oxide, Fe_2O_3 (wt.%)	19.49	19.12	19.85
Potassium oxide, K_2O (wt.%)	*~0.08*	IND	IND
Magnesium oxide, MgO (wt.%)	20.26	19.96	20.56
Manganese oxide, MnO (wt.%)	0.316	0.312	0.320
Sodium oxide, Na_2O (wt.%)	0.030	0.028	0.031
Phosphorus oxide, P_2O_5 (wt.%)	*<0.02*	IND	IND
Silica dioxide, SiO_2 (wt.%)	42.49	41.89	43.09
Sulphur oxide, SO_3 (wt.%)	*<0.05*	IND	IND
Titanium oxide, TiO_2 (wt.%)	0.051	0.049	0.052
Zinc, Zn (ppm)	199	179	219
IR Combustion Furnace			
Carbon, C (wt.%)	0.07	0.06	0.09
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 1.92 and 1.94 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 193.

Constituent	Certified Value	Tolerance limits 1-α=0.99, ρ=0.95	
		Low	High
Fusion XRF			
Nickel, Ni (wt.%)	1.93	1.92	1.94
Cobalt, Co (ppm)	495	484	507
Aluminium oxide, Al_2O_3 (wt.%)	3.08	3.05	3.10
Calcium oxide, CaO (wt.%)	0.362	0.362	0.363
Chlorine, Cl (ppm)	*<50*	IND	IND
Copper, Cu (ppm)	*<50*	IND	IND
Chromium oxide, Cr_2O_3 (wt.%)	0.962	0.955	0.970
Iron oxide, Fe_2O_3 (wt.%)	19.51	19.44	19.58
Potassium oxide, K_2O (wt.%)	*<0.01*	IND	IND
Magnesium oxide, MgO (wt.%)	20.25	20.18	20.32
Manganese oxide, MnO (wt.%)	0.317	0.315	0.318
Sodium oxide, Na_2O (wt.%)	*~0.03*	IND	IND
Phosphorus oxide, P_2O_5 (wt.%)	0.012	IND	IND
Silicon dioxide, SiO_2 (wt.%)	42.72	42.57	42.86
Sulphur oxide, SO_3 (wt.%)	*<0.01*	IND	IND
Titanium oxide, TiO_2 (wt.%)	0.053	0.048	0.057
Zinc, Zn (ppm)	219	217	221
Loss on ignition, LOI (wt.%)	9.87	9.83	9.91
Fusion ICP			
Nickel, Ni (wt.%)	1.91	1.88	1.94
Cobalt, Co (ppm)	483	476	491
Aluminium oxide, Al_2O_3 (wt.%)	3.05	3.01	3.09
Calcium oxide, CaO (wt.%)	0.373	0.359	0.387
Copper, Cu (ppm)	*~40*	IND	IND
Chromium oxide, Cr_2O_3 (wt.%)	0.956	0.944	0.968
Iron oxide, Fe_2O_3 (wt.%)	19.49	19.21	19.76
Potassium oxide, K_2O (wt.%)	*~0.08*	IND	IND
Magnesium oxide, MgO (wt.%)	20.26	19.99	20.52
Manganese oxide, MnO (wt.%)	0.316	0.314	0.318
Sodium oxide, Na_2O (wt.%)	0.030	IND	IND
Phosphorus oxide, P_2O_5 (wt.%)	*<0.02*	IND	IND
Silica dioxide, SiO_2 (wt.%)	42.49	42.01	42.97
Sulphur oxide, SO_3 (wt.%)	*<0.05*	IND	IND
Titanium oxide, TiO_2 (wt.%)	0.051	0.050	0.052
Zinc, Zn (ppm)	199	188	211
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 193 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 193. 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 193. 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 0.940 for nickel, 1.00 for cobalt, 0.933 for iron oxide and 1.00 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 analytes are distributed in a similar manner throughout OREAS 193 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 193

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.%)	1.93	0.03	1.86	1.99	1.83	2.03	1.75%	3.50%	5.26%
Co (ppm)	495	15	466	525	451	539	2.96%	5.93%	8.89%
Al_2O_3 (wt.%)	3.08	0.03	3.01	3.15	2.98	3.18	1.10%	2.19%	3.29%
CaO (wt.%)	0.362	0.010	0.342	0.383	0.332	0.393	2.81%	5.62%	8.43%
Cl (ppm)	*<50*	IND	IND	IND	IND	IND	IND	IND	IND
Cu (ppm)	*<50*	IND	IND	IND	IND	IND	IND	IND	IND
Cr_2O_3 (wt.%)	0.962	0.015	0.932	0.993	0.916	1.008	1.59%	3.18%	4.78%
Fe_2O_3 (wt.%)	19.51	0.18	19.15	19.87	18.97	20.05	0.93%	1.86%	2.79%
K_2O (wt.%)	*<0.01*	IND	IND	IND	IND	IND	IND	IND	IND
MgO (wt.%)	20.25	0.22	19.81	20.68	19.59	20.90	1.08%	2.17%	3.25%
MnO (wt.%)	0.317	0.006	0.304	0.330	0.298	0.336	2.02%	4.04%	6.06%
Na_2O (wt.%)	*~0.03*	IND	IND	IND	IND	IND	IND	IND	IND
P_2O_5 (wt.%)	0.012	0.002	0.007	0.017	0.004	0.019	20.92%	41.84%	62.75%
SiO_2 (wt.%)	42.72	0.38	41.95	43.48	41.57	43.86	0.89%	1.79%	2.68%
SO_3 (wt.%)	*<0.01*	IND	IND	IND	IND	IND	IND	IND	IND
TiO_2 (wt.%)	0.053	0.004	0.044	0.061	0.040	0.065	7.81%	15.61%	23.42%
Zn (ppm)	219	13	193	246	179	259	6.07%	12.14%	18.20%
LOI (wt.%)	9.87	0.22	9.43	10.31	9.21	10.53	2.22%	4.44%	6.66%
Fusion ICP									
Ni (wt.%)	1.91	0.04	1.83	1.99	1.79	2.03	2.06%	4.12%	6.18%
Co (ppm)	483	18	448	519	430	537	3.71%	7.43%	11.14%
Al_2O_3 (wt.%)	3.05	0.08	2.89	3.22	2.80	3.31	2.74%	5.49%	8.23%
CaO (wt.%)	0.373	0.033	0.307	0.439	0.274	0.472	8.85%	17.70%	26.55%
Cu (ppm)	*~40*	IND	IND	IND	IND	IND	IND	IND	IND
Cr_2O_3 (wt.%)	0.956	0.030	0.896	1.016	0.867	1.045	3.11%	6.23%	9.34%
Fe_2O_3 (wt.%)	19.49	0.64	18.21	20.76	17.57	21.40	3.28%	6.56%	9.84%
K_2O (wt.%)	*~0.08*	IND	IND	IND	IND	IND	IND	IND	IND
MgO (wt.%)	20.26	0.59	19.08	21.43	18.50	22.02	2.90%	5.79%	8.69%
MnO (wt.%)	0.316	0.009	0.298	0.334	0.289	0.343	2.83%	5.67%	8.50%
Na_2O (wt.%)	0.030	0.004	0.022	0.037	0.019	0.041	12.51%	25.02%	37.53%
P_2O_5 (wt.%)	*<0.02*	IND	IND	IND	IND	IND	IND	IND	IND
SiO_2 (wt.%)	42.49	1.16	40.16	44.82	38.99	45.98	2.74%	5.48%	8.22%
SO_3 (wt.%)	*<0.05*	IND	IND	IND	IND	IND	IND	IND	IND
TiO_2 (wt.%)	0.051	0.003	0.045	0.056	0.042	0.059	5.88%	11.75%	17.63%
Zn (ppm)	199	26	148	251	122	277	12.97%	25.94%	38.91%
IR Combustion Furnace									
C (wt.%)	0.07	0.02	0.03	0.12	0.01	0.14	30.48%	60.97%	91.45%
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 193 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 193 is packaged in unit sizes of 10g (single-use laminated foil pouches) and 1kg (wide mouthed plastic jars).

INTENDED USE

OREAS 193 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 193 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 193

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 193 (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	1.89	1.96	1.90	1.89	1.96	1.90	1.92	1.97	1.95	1.97	1.89	1.92	1.91	1.90	1.96	1.94	1.90
2	1.89	1.96	1.90	1.90	1.98	1.91	1.92	1.98	1.94	1.99	1.91	1.89	1.95	1.91	1.96	1.94	1.90
3	1.86	1.96	1.90	1.91	1.97	1.91	1.92	1.97	1.95	1.97	1.90	1.90	1.88	1.90	1.97	1.94	1.87
4	1.87	1.96	1.91	1.90	1.97	1.92	1.91	1.98	1.94	1.99	1.90	1.90	1.89	1.90	1.96	1.95	1.88
5	1.93	1.97	1.90	1.91	1.99	1.91	1.95	1.97	1.94	1.96	1.89	1.90	1.88	1.90	NR	NR	NR
6	1.94	1.96	1.90	1.91	1.96	1.90	1.93	1.94	1.93	1.96	1.89	1.92	1.89	1.91	NR	NR	NR
7	1.94	1.98	1.90	1.91	1.97	1.90	1.93	1.95	1.95	1.96	1.89	1.91	1.86	1.89	NR	NR	NR
8	1.93	1.98	1.90	1.91	1.99	1.92	1.96	1.95	1.94	1.94	1.90	1.92	1.90	1.91	NR	NR	NR
9	1.93	1.98	1.91	1.90	1.86	1.90	1.93	1.97	1.94	1.99	1.90	1.93	1.90	1.89	NR	NR	NR
10	1.95	1.98	1.91	1.90	1.87	1.91	**1.99**	2.01	1.95	1.97	1.91	1.92	1.91	1.90	NR	NR	NR
11	1.94	1.98	1.91	1.90	1.87	1.90	1.94	1.97	1.93	1.97	1.89	1.93	1.90	1.90	NR	NR	NR
12	1.94	1.98	1.91	1.90	**1.97**	1.90	1.92	2.01	1.94	1.99	1.89	1.94	1.92	1.90	NR	NR	NR
Mean	1.91	1.97	1.90	1.90	1.94	1.91	1.94	1.97	1.94	1.97	1.89	1.92	1.90	1.90	1.96	1.94	1.89
Median	1.93	1.97	1.90	1.90	1.97	1.90	1.93	1.97	1.94	1.97	1.89	1.92	1.90	1.90	1.96	1.94	1.89
Std.Dev.	0.03	0.01	0.01	0.01	0.05	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01
Rel.Std.Dev.	1.63%	0.49%	0.28%	0.34%	2.57%	0.40%	1.16%	1.10%	0.37%	0.73%	0.36%	0.79%	1.20%	0.32%	0.25%	0.31%	0.79%
PDM[3]	-0.65%	2.18%	-1.13%	-1.19%	0.93%	-1.04%	0.45%	2.38%	0.80%	2.35%	-1.69%	-0.59%	-1.43%	-1.56%	1.88%	0.71%	-2.01%

Table A3. Fusion XRF results for Co in OREAS 193 (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	**480**	500	480	490	500	480	NR	**590**	490	460	490	500	510	500	500	479	500
2	**480**	500	480	500	520	480	NR	**580**	490	540	490	500	520	490	500	478	500
3	**460**	500	480	490	500	490	NR	**590**	510	440	480	500	500	500	500	490	500
4	**470**	500	490	490	510	490	NR	**590**	500	**590**	490	500	510	500	500	488	500
5	500	500	480	490	500	490	NR	**590**	510	460	490	500	500	500	NR	NR	NR
6	500	500	480	490	480	490	NR	**580**	510	**390**	490	500	500	500	NR	NR	NR
7	500	500	480	490	490	480	NR	**580**	490	530	490	500	480	490	NR	NR	NR
8	490	500	490	490	510	490	NR	**580**	500	**600**	490	500	490	500	NR	NR	NR
9	500	500	490	500	510	**480**	NR	**590**	500	440	490	500	500	490	NR	NR	NR
10	510	500	490	500	520	**480**	NR	**590**	520	550	490	500	500	500	NR	NR	NR
11	490	500	480	500	520	**480**	NR	**590**	490	550	480	500	500	500	NR	NR	NR
12	500	500	490	500	510	**480**	NR	**600**	490	460	480	500	510	490	NR	NR	NR
Mean	490	500	484	494	506	484		**588**	500	501	488	500	502	497	500	484	500
Median	495	500	480	490	510	480		590	500	495	490	500	500	500	500	484	500
Std.Dev.	15	0	5	5	12	5		6	10	67	5	0	10	5	0	6	0
Rel.Std.Dev.	3.01%	0.00%	1.06%	1.04%	2.45%	1.06%		1.06%	2.09%	13.42%	0.93%	0.00%	2.05%	0.99%	0.00%	1.27%	0.00%
PDM[3]	-1.09%	0.93%	-2.27%	-0.25%	2.11%	-2.27%		18.59%	0.93%	1.10%	-1.59%	0.93%	1.27%	0.26%	0.93%	-2.35%	0.93%

Table A4. Fusion XRF results for Al_2O_3 in OREAS 193 (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	3.08	**2.96**	3.05	3.07	3.12	3.03	**3.00**	**3.17**	**3.14**	3.13	3.08	3.11	3.09	3.10	3.09	3.10	3.09
2	3.10	**2.98**	3.06	3.09	3.11	3.05	**2.99**	3.10	**3.19**	3.03	3.07	3.07	3.11	3.10	3.10	3.08	3.11
3	3.04	**2.96**	3.08	3.09	3.12	3.03	**3.00**	3.10	**3.19**	**2.95**	3.08	3.09	3.04	3.09	3.07	3.08	3.06
4	3.06	**2.95**	3.07	3.08	3.11	3.06	**2.97**	3.12	**3.17**	**3.25**	3.07	3.09	3.05	3.10	3.11	3.10	3.10
5	3.10	**2.98**	3.05	3.08	3.07	3.06	3.02	3.12	**3.14**	**3.13**	3.07	3.09	3.06	3.08	NR	NR	NR
6	3.14	**2.95**	3.08	3.09	3.07	3.05	3.04	3.08	**3.23**	**3.10**	3.05	3.08	3.06	3.10	NR	NR	NR
7	3.11	**2.98**	3.06	3.07	3.08	3.04	3.05	3.08	**3.17**	**3.20**	3.07	3.07	**2.98**	3.09	NR	NR	NR
8	3.10	**2.98**	3.07	3.07	3.11	3.05	3.07	3.08	**3.19**	**3.30**	3.05	3.07	3.08	3.10	NR	NR	NR
9	3.08	**2.94**	3.07	3.08	3.19	3.02	3.01	3.12	**3.25**	3.00	3.08	3.09	3.11	3.12	NR	NR	NR
10	3.12	**2.94**	3.08	3.06	3.18	3.07	3.00	3.15	**3.21**	3.03	3.06	3.10	3.10	3.12	NR	NR	NR
11	3.07	**2.95**	3.05	3.08	3.15	3.05	3.00	3.09	**3.16**	3.01	3.08	3.12	3.13	3.09	NR	NR	NR
12	3.10	**2.95**	3.07	3.08	3.12	3.05	2.99	3.11	**3.17**	2.99	3.08	3.11	3.09	3.12	NR	NR	NR
Mean	3.09	**2.96**	3.07	3.08	3.12	3.05	3.01	3.11	**3.18**	3.09	3.07	3.09	3.08	3.10	3.09	3.09	3.09
Median	3.10	2.95	3.07	3.08	3.12	3.05	3.00	3.11	3.18	3.06	3.07	3.09	3.08	3.10	3.10	3.09	3.10
Std.Dev.	0.03	0.02	0.01	0.01	0.04	0.01	0.03	0.03	0.03	0.11	0.01	0.02	0.04	0.01	0.02	0.01	0.02
Rel.Std.Dev.	0.88%	0.52%	0.38%	0.30%	1.23%	0.42%	0.95%	0.91%	1.05%	3.61%	0.37%	0.54%	1.34%	0.42%	0.55%	0.45%	0.70%
PDM[3]	0.43%	-3.90%	-0.41%	0.00%	1.32%	-1.03%	-2.17%	1.03%	3.43%	0.42%	-0.27%	0.40%	-0.08%	0.73%	0.46%	0.35%	0.38%

Table A5. Fusion XRF results for CaO in OREAS 193 (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	0.360	0.340	0.360	0.370	0.350	0.356	0.360	0.360	0.380	0.373	0.370	0.360	0.373	0.370	0.360	**0.347**	0.360
2	0.360	0.340	0.360	0.370	0.350	0.360	0.360	0.360	0.380	0.369	0.370	0.360	**0.380**	0.370	0.360	**0.335**	0.360
3	0.350	0.340	0.360	0.370	0.350	0.360	0.360	0.350	0.380	0.349	0.370	0.360	0.369	0.370	0.370	**0.327**	0.360
4	0.350	0.340	0.360	0.370	0.350	0.359	0.360	0.360	0.380	0.359	0.370	0.360	0.371	0.370	0.370	**0.336**	0.360
5	0.370	0.345	0.360	0.370	0.350	0.363	0.370	0.350	**0.380**	0.357	0.370	0.370	0.369	0.360	NR	NR	NR
6	0.380	0.335	0.360	0.370	0.360	0.364	0.360	0.350	**0.390**	0.363	0.360	0.370	0.371	0.370	NR	NR	NR
7	0.370	0.340	0.360	0.370	0.350	0.361	0.370	0.350	**0.400**	0.347	0.360	0.370	**0.361**	0.360	NR	NR	NR
8	0.370	0.340	0.360	0.370	0.360	0.359	0.370	0.350	**0.380**	0.359	0.360	0.370	0.370	0.360	NR	NR	NR
9	0.370	0.340	0.360	0.370	0.350	0.359	0.360	0.360	0.380	0.361	0.360	0.370	0.369	0.370	NR	NR	NR
10	0.370	0.335	0.360	0.380	0.350	0.361	0.360	0.360	0.380	0.356	0.370	0.370	0.372	0.370	NR	NR	NR
11	0.370	0.340	0.360	0.370	0.350	0.361	0.360	0.350	0.380	0.359	0.360	0.360	0.375	0.370	NR	NR	NR
12	0.370	0.335	0.360	0.380	0.340	0.358	0.360	0.360	0.380	0.365	0.360	0.370	0.374	0.370	NR	NR	NR
Mean	0.366	0.339	0.360	0.372	0.351	0.360	0.363	0.355	0.383	0.360	0.365	0.366	0.371	0.368	0.365	0.336	0.360
Median	0.370	0.340	0.360	0.370	0.350	0.360	0.360	0.355	0.380	0.359	0.365	0.370	0.371	0.370	0.365	0.336	0.360
Std.Dev.	0.009	0.003	0.000	0.004	0.005	0.002	0.005	0.005	0.006	0.007	0.005	0.005	0.005	0.005	0.006	0.008	0.000
Rel.Std.Dev.	2.46%	0.85%	0.00%	1.05%	1.47%	0.60%	1.25%	1.47%	1.63%	2.06%	1.43%	1.41%	1.21%	1.23%	1.58%	2.41%	0.00%
PDM[3]	0.93%	-6.43%	-0.68%	2.54%	-3.21%	-0.66%	0.01%	-2.06%	5.53%	-0.75%	0.70%	0.93%	2.40%	1.39%	0.70%	-7.21%	-0.68%

Table A6. Fusion XRF results for Cl in OREAS 193 (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	70	NR	NR	50	20	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	60	<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	90	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
7	<50	NR	NR	50	80	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
8	120	NR	NR	<50	120	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
9	<50	NR	NR	<50	40	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
10	<50	NR	NR	<50	20	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
11	50	NR	NR	<50	20	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
12	60	NR	NR	<50	30	NR	NR	NR	NR	NR	<50	NR	NR	NR	NR	NR	NR
Mean	67			50	52										60		
Median	55			50	35										60		
Std.Dev.	27			0	39												
Rel.Std.Dev.	40.99%			0.00%	75.19%												
PDM[3]	20.48%			-9.64%	-6.02%										8.43%		

Table A7. Fusion XRF results for Cu in OREAS 193 (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	25	10	35	30	50	80	<100	20	70	NR	60	<100	<20	NR
2	50	<30	<50	30	40	34	20	20	80	<100	20	80	NR	60	<100	<20	NR
3	<50	<30	<50	30	20	34	30	40	70	<100	20	80	NR	50	<100	<20	NR
4	50	<30	<50	30	20	34	40	30	70	<100	20	80	NR	50	<100	29	NR
5	<50	<30	<50	25	30	34	20	<10	90	<100	<10	60	NR	60	NR	NR	NR
6	50	<30	<50	20	10	33	10	<10	90	<100	20	40	NR	60	NR	NR	NR
7	<50	<30	<50	25	20	33	20	<10	90	<100	<10	60	NR	50	NR	NR	NR
8	<50	<30	<50	25	50	35	30	<10	80	<100	10	60	NR	60	NR	NR	NR
9	<50	<30	<50	30	40	34	40	<10	<50	<100	20	90	NR	50	NR	NR	NR
10	<50	<30	<50	35	50	33	70	20	<50	<100	20	50	NR	60	NR	NR	NR
11	<50	<30	<50	35	50	34	30	10	<50	<100	20	40	NR	50	NR	NR	NR
12	50	<30	<50	30	40	33	20	80	<50	<100	10	30	NR	50	NR	NR	NR
Mean	50			28	32	34	30	36	81		18	62		55		29	
Median	50			30	35	34	30	30	80		20	60		55		29	
Std.Dev.	0			4	15	1	15	24	8		4	19		5			
Rel.Std.Dev.	0.00%			15.66%	48.24%	2.57%	51.25%	66.37%	10.27%		23.42%	30.79%		9.50%			
PDM[3]	21.08%			-31.39%	-23.32%	-18.59%	-27.35%	-13.52%	96.75%		-56.41%	49.33%		33.19%		-29.77%	

Table A8. Fusion XRF results for Cr_2O_3 in OREAS 193 (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	0.966	0.935	0.954	0.964	0.924	0.967	**1.389**	1.000	0.950	**1.025**	0.946	0.980	0.989	0.954	0.960	0.970	0.980
2	0.978	0.945	0.954	0.969	**0.962**	0.973	**1.403**	0.980	0.950	**1.024**	0.946	0.960	0.991	0.956	0.960	0.969	0.980
3	0.954	0.935	0.955	0.969	0.936	0.970	**1.418**	0.990	0.960	**1.012**	0.955	0.960	0.970	0.954	0.950	0.965	0.970
4	0.971	0.945	0.960	0.968	0.930	0.974	**1.403**	0.990	0.950	**1.015**	**0.974**	0.960	0.982	0.956	0.960	0.966	0.980
5	0.942	0.945	0.959	0.968	0.930	0.973	0.969	0.990	0.940	**1.016**	0.952	0.960	0.967	0.954	NR	NR	NR
6	0.980	0.940	0.959	0.973	0.934	0.967	0.971	0.980	0.960	**1.009**	0.943	0.980	0.970	0.950	NR	NR	NR
7	0.973	0.950	0.957	0.965	0.925	0.973	0.978	0.990	0.940	**1.008**	0.948	0.970	0.948	0.953	NR	NR	NR
8	0.964	0.945	0.958	0.967	**0.979**	0.970	0.976	0.970	0.950	**1.003**	0.943	0.960	0.969	0.947	NR	NR	NR
9	0.977	0.945	0.950	0.964	0.958	0.958	0.956	0.990	0.940	**1.016**	0.964	0.960	0.977	0.957	NR	NR	NR
10	**1.010**	0.945	0.956	0.958	0.962	0.962	0.963	0.990	0.950	**1.035**	0.959	0.950	0.987	0.957	NR	NR	NR
11	0.983	0.945	0.957	0.957	0.955	0.971	0.949	1.000	0.950	**1.035**	0.968	0.970	0.981	0.950	NR	NR	NR
12	0.984	0.935	0.964	0.960	**0.922**	0.966	0.959	**1.010**	0.950	**1.047**	0.959	0.990	0.990	0.953	NR	NR	NR
Mean	0.974	0.943	0.957	0.965	0.943	0.969	1.111	0.990	0.949	**1.020**	0.955	0.967	0.977	0.954	0.958	0.967	0.978
Median	0.975	0.945	0.957	0.966	0.935	0.970	0.973	0.990	0.950	1.016	0.954	0.960	0.979	0.954	0.960	0.967	0.980
Std.Dev.	0.017	0.005	0.004	0.005	0.019	0.005	0.216	0.010	0.007	0.013	0.010	0.012	0.013	0.003	0.005	0.002	0.005
Rel.Std.Dev.	1.73%	0.53%	0.37%	0.50%	2.02%	0.51%	19.44%	1.06%	0.70%	1.29%	1.07%	1.19%	1.29%	0.33%	0.52%	0.23%	0.51%
PDM[3]	1.16%	-2.06%	-0.56%	0.29%	-2.00%	0.66%	15.45%	2.87%	-1.37%	6.03%	-0.79%	0.45%	1.50%	-0.91%	-0.50%	0.53%	1.57%

Table A9. Fusion XRF results for Fe_2O_3 in OREAS 193 (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**	19.63	19.76	19.61	**19.00**	19.28	19.55	19.53	19.63	19.22	19.40	19.58	19.61	19.50	**20.10**	19.57	19.80
2	**19.20**	19.61	19.79	19.66	**19.10**	19.38	19.49	19.54	19.57	19.33	19.45	19.43	19.80	19.50	**20.10**	19.65	19.70
3	**18.85**	19.60	19.82	19.74	**19.05**	19.47	19.52	19.48	19.73	19.19	19.45	19.53	19.29	19.45	**20.10**	19.62	19.40
4	**19.05**	19.66	19.84	19.66	**19.15**	19.53	19.46	19.60	19.47	19.32	19.40	19.51	19.42	19.35	**20.10**	19.65	19.60
5	19.50	19.56	19.76	19.75	**19.05**	19.42	19.84	19.43	19.56	**18.97**	19.40	19.59	19.27	19.45	NR	NR	NR
6	19.55	19.53	19.85	19.77	**18.95**	19.29	19.84	19.13	19.48	**19.07**	19.45	19.56	19.38	19.40	NR	NR	NR
7	19.50	19.57	19.85	19.70	**19.05**	19.29	19.86	19.32	19.61	**19.05**	19.35	19.46	18.98	19.45	NR	NR	NR
8	19.50	19.60	19.77	19.75	**19.15**	19.45	19.94	19.29	19.61	**18.84**	19.45	19.55	19.47	19.35	NR	NR	NR
9	19.35	19.61	19.84	19.64	19.15	19.30	19.70	19.47	19.56	19.23	19.40	19.64	19.43	19.40	NR	NR	NR
10	19.60	19.63	19.80	19.65	19.15	19.35	19.71	19.69	19.53	19.25	19.45	19.59	19.47	19.45	NR	NR	NR
11	19.45	19.60	19.88	19.69	19.15	19.32	19.64	19.57	19.53	19.27	19.40	19.62	19.41	19.40	NR	NR	NR
12	19.45	19.64	19.83	19.61	19.05	19.33	19.60	19.88	19.58	19.38	19.45	19.59	19.46	19.45	NR	NR	NR
Mean	19.35	19.60	19.82	19.69	19.08	19.37	19.68	19.49	19.57	19.18	19.42	19.55	19.42	19.43	20.10	19.62	19.63
Median	19.45	19.61	19.83	19.68	19.08	19.34	19.67	19.51	19.57	19.23	19.43	19.57	19.42	19.45	20.10	19.63	19.65
Std.Dev.	0.23	0.04	0.04	0.06	0.07	0.08	0.16	0.19	0.07	0.16	0.03	0.06	0.20	0.05	0.00	0.04	0.17
Rel.Std.Dev.	1.20%	0.18%	0.20%	0.29%	0.36%	0.43%	0.82%	1.00%	0.36%	0.85%	0.17%	0.32%	1.01%	0.26%	0.00%	0.18%	0.87%
PDM[3]	-0.84%	0.47%	1.57%	0.90%	-2.19%	-0.74%	0.87%	-0.08%	0.31%	-1.71%	-0.46%	0.22%	-0.49%	-0.42%	3.02%	0.57%	0.59%

Table A10. Fusion XRF results for K_2O in OREAS 193 (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	0.01	0.00	NR	<0.001	0.01	0.01	<0.01	<0.01	<0.01	NR	0.01	<0.01	0.01	<0.01
2	<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
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	0.02	<0.01	<0.01	<0.01	NR	0.01	<0.01	0.01	<0.01
5	<0.01	<0.01	<0.05	0.01	0.01	NR	<0.001	<0.01	0.02	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
6	<0.01	0.01	<0.05	0.01	0.01	NR	<0.001	<0.01	0.02	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
7	<0.01	<0.01	<0.05	0.01	0.01	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	0.01	0.01	NR	<0.001	<0.01	0.02	<0.01	<0.01	<0.01	NR	0.01	NR	NR	NR
9	<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	NR	NR	NR
10	<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	NR	NR	NR
11	<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	NR	NR	NR
12	<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	NR	NR	NR
Mean		0.01		0.01	0.00			0.01	0.01	0.01				0.01		0.01	
Median		0.01		0.01	0.00			0.01	0.01	0.01				0.01		0.01	
Std.Dev.		0.00		0.00	0.00			0.00	0.01					0.00		0.00	
Rel.Std.Dev.		0.00%		13.86%	63.05%			0.00%	36.35%					0.00%		15.73%	
PDM[3]		-39.65%		-24.57%	-50.72%			20.69%	70.98%	44.83%				20.69%		-7.07%	

Table A11. Fusion XRF results for MgO in OREAS 193 (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	20.10	20.40	20.22	20.16	19.95	19.72	**19.35**	**20.78**	20.35	20.15	20.10	20.30	20.10	20.30	20.20	20.15	20.30
2	20.20	20.48	20.17	20.23	19.85	19.91	**19.28**	**20.74**	20.42	20.67	20.10	20.17	20.38	20.30	20.30	20.18	20.20
3	19.85	20.47	20.27	20.22	19.90	19.89	**19.29**	**20.80**	20.42	20.47	20.10	20.24	19.89	20.20	20.20	20.28	19.90
4	20.00	20.41	20.26	20.14	19.95	19.98	**19.28**	**20.74**	20.33	20.47	20.10	20.27	19.95	20.20	20.30	20.30	20.10
5	20.30	20.45	20.18	20.19	19.95	20.00	20.42	20.70	20.33	20.58	20.10	20.28	19.94	20.20	NR	NR	NR
6	20.30	20.51	20.24	20.24	20.00	19.91	20.45	20.65	20.37	20.52	20.10	20.26	20.00	20.30	NR	NR	NR
7	20.30	20.48	20.21	20.19	20.00	19.84	20.49	20.49	20.35	20.59	20.10	20.19	**19.62**	20.20	NR	NR	NR
8	20.20	20.47	20.19	20.23	19.80	19.93	20.65	20.60	20.28	20.23	20.10	20.21	20.04	20.20	NR	NR	NR
9	20.30	20.55	20.23	20.26	20.50	19.73	20.39	20.58	20.35	19.93	20.10	20.36	19.98	20.20	NR	NR	NR
10	20.40	20.55	20.23	20.27	20.40	19.80	20.35	20.78	20.34	20.34	20.10	20.35	20.13	20.10	NR	NR	NR
11	20.30	20.56	20.23	20.28	20.40	19.77	20.28	20.70	20.21	20.52	20.10	20.35	20.02	20.10	NR	NR	NR
12	20.30	20.54	20.16	20.25	20.60	19.86	20.25	20.87	20.33	20.68	20.10	20.34	20.04	20.20	NR	NR	NR
Mean	20.21	20.49	20.22	20.22	20.11	19.86	20.04	20.70	20.34	20.43	20.10	20.28	20.01	20.21	20.25	20.23	20.13
Median	20.30	20.48	20.23	20.23	19.98	19.87	20.32	20.72	20.35	20.49	20.10	20.28	20.01	20.20	20.25	20.23	20.15
Std.Dev.	0.16	0.05	0.03	0.04	0.28	0.09	0.56	0.11	0.06	0.23	0.00	0.07	0.17	0.07	0.06	0.07	0.17
Rel.Std.Dev.	0.78%	0.27%	0.17%	0.22%	1.40%	0.46%	2.77%	0.52%	0.28%	1.11%	0.00%	0.32%	0.87%	0.33%	0.29%	0.35%	0.85%
PDM[3]	-0.17%	1.19%	-0.15%	-0.12%	-0.68%	-1.89%	-1.02%	2.25%	0.46%	0.90%	-0.72%	0.15%	-1.19%	-0.19%	0.02%	-0.09%	-0.60%

Table A12. Fusion XRF results for MnO in OREAS 193 (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	0.309	0.310	0.320	0.320	0.312	0.308	0.320	0.320	0.317	**0.328**	0.316	0.330	0.323	0.320	0.320	0.315	0.330
2	0.306	0.315	0.310	0.320	0.314	0.310	0.320	0.310	0.315	**0.332**	0.316	0.320	0.325	0.323	0.320	0.312	0.320
3	0.301	0.310	0.310	0.320	0.312	0.311	0.320	0.320	0.316	**0.330**	0.313	0.330	0.310	0.322	0.320	0.316	0.310
4	0.308	0.315	0.310	0.320	0.313	0.314	0.320	0.310	0.313	**0.334**	0.312	0.330	0.314	0.322	0.320	0.316	0.320
5	0.318	0.305	0.310	0.320	0.317	0.310	0.330	0.310	0.317	0.326	0.312	0.320	0.318	0.322	NR	NR	NR
6	0.317	0.300	0.310	0.310	0.310	0.310	0.330	0.310	0.317	0.321	0.312	0.310	0.314	0.327	NR	NR	NR
7	0.317	0.315	0.310	0.320	0.313	0.309	0.330	0.320	0.319	0.327	0.312	0.310	**0.307**	0.322	NR	NR	NR
8	0.316	0.310	0.320	0.310	0.317	0.309	0.330	0.310	0.316	0.327	0.312	0.320	0.318	0.320	NR	NR	NR
9	0.308	0.310	0.320	0.320	0.307	0.310	0.320	0.310	0.316	0.326	0.315	0.320	0.319	0.327	NR	NR	NR
10	0.311	0.310	0.310	0.320	0.307	0.312	0.320	0.320	0.316	0.328	0.314	0.320	0.316	0.329	NR	NR	NR
11	0.308	0.310	0.310	0.320	0.309	0.308	0.320	0.310	0.317	0.327	0.313	0.320	0.316	0.325	NR	NR	NR
12	0.310	0.305	0.320	0.320	0.314	0.310	0.320	0.320	0.316	0.331	0.314	0.320	0.319	0.327	NR	NR	NR
Mean	0.311	0.310	0.313	0.318	0.312	0.310	0.323	0.314	0.316	0.328	0.313	0.321	0.317	0.324	0.320	0.315	0.320
Median	0.310	0.310	0.310	0.320	0.313	0.310	0.320	0.310	0.316	0.328	0.313	0.320	0.317	0.322	0.320	0.315	0.320
Std.Dev.	0.005	0.005	0.005	0.004	0.003	0.002	0.005	0.005	0.001	0.003	0.002	0.007	0.005	0.003	0.000	0.002	0.008
Rel.Std.Dev.	1.69%	1.45%	1.57%	1.22%	1.07%	0.54%	1.52%	1.64%	0.45%	1.03%	0.50%	2.08%	1.58%	0.95%	0.00%	0.48%	2.55%
PDM[3]	-1.89%	-2.26%	-1.07%	0.50%	-1.47%	-2.10%	2.08%	-0.81%	-0.15%	3.58%	-1.05%	1.29%	-0.06%	2.19%	1.03%	-0.66%	1.03%

Table A13. Fusion XRF results for Na_2O in OREAS 193 (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	0.048	0.010	0.030	NR	**0.120**	NR	<0.01	0.040	0.020	<0.1	0.025	0.030	NR	0.040	0.040	0.044	0.020
2	0.065	0.010	0.030	NR	**0.131**	NR	<0.01	0.040	0.030	<0.1	0.024	0.040	NR	0.040	0.030	0.035	0.030
3	0.056	0.010	0.040	NR	**0.124**	NR	<0.01	0.040	0.030	<0.1	0.027	0.030	NR	0.040	0.040	0.025	0.020
4	0.058	0.010	0.040	NR	**0.122**	NR	<0.01	0.030	0.060	<0.1	0.026	0.040	NR	0.040	0.040	0.048	0.030
5	0.056	0.010	0.030	NR	**0.137**	NR	<0.01	0.040	0.020	<0.1	0.024	0.050	NR	0.040	NR	NR	NR
6	0.057	0.010	0.030	NR	**0.130**	NR	<0.01	0.020	0.020	<0.1	0.021	0.020	NR	0.040	NR	NR	NR
7	0.059	0.010	0.030	NR	**0.134**	NR	<0.01	0.020	0.020	<0.1	0.021	0.060	NR	0.040	NR	NR	NR
8	0.058	0.010	0.040	NR	**0.148**	NR	<0.01	0.020	0.040	<0.1	0.020	0.040	NR	0.040	NR	NR	NR
9	0.067	0.010	0.040	NR	**0.178**	NR	<0.01	0.040	0.030	<0.1	0.021	0.040	NR	0.050	NR	NR	NR
10	0.064	0.010	0.040	NR	**0.174**	NR	<0.01	0.040	0.030	<0.1	0.029	0.040	NR	0.050	NR	NR	NR
11	0.063	0.010	0.030	NR	**0.176**	NR	<0.01	0.030	0.020	<0.1	0.024	0.030	NR	0.050	NR	NR	NR
12	0.070	0.010	0.040	NR	**0.150**	NR	<0.01	0.020	0.030	<0.1	0.025	0.040	NR	0.050	NR	NR	NR
Mean	0.060	0.010	0.035		**0.144**			0.032	0.029		0.024	0.038		0.043	0.038	0.038	0.025
Median	0.059	0.010	0.035		0.136			0.035	0.030		0.024	0.040		0.040	0.040	0.039	0.025
Std.Dev.	0.006	0.000	0.005		0.022			0.009	0.012		0.003	0.010		0.005	0.005	0.011	0.006
Rel.Std.Dev.	9.95%	0.00%	14.92%		14.99%			29.60%	39.93%		11.48%	26.87%		11.36%	13.33%	27.93%	23.09%
PDM[3]	77.75%	-70.42%	3.54%		325%			-6.32%	-13.71%		-29.25%	13.40%		28.20%	10.94%	11.90%	-26.04%

Table A14. Fusion XRF results for P_2O_5 in OREAS 193 (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	0.013	0.010	0.011	0.015	0.009	NR	0.010	0.010	**0.020**	<0.01	0.011	0.010	NR	0.010	0.010	0.008	0.010
2	0.013	0.015	0.013	0.015	0.011	NR	0.010	<0.01	**0.020**	**0.027**	0.011	0.010	NR	0.010	0.010	0.008	0.010
3	0.013	0.010	0.014	0.016	0.010	NR	0.010	0.010	**0.020**	0.011	0.010	0.010	NR	0.010	0.020	0.008	0.010
4	0.013	0.015	0.014	0.015	0.010	NR	0.010	0.010	**0.020**	0.010	0.010	0.010	NR	0.010	0.020	0.009	0.010
5	0.016	0.010	0.014	0.016	0.009	NR	0.010	0.010	**0.020**	0.014	0.013	0.010	NR	0.010	NR	NR	NR
6	0.015	0.010	0.014	0.016	0.014	NR	0.010	0.010	**0.020**	0.015	0.013	0.010	NR	0.010	NR	NR	NR
7	0.016	0.010	0.013	0.016	0.014	NR	0.010	0.010	**0.020**	0.014	0.013	0.010	NR	0.010	NR	NR	NR
8	0.015	0.010	0.014	0.016	0.013	NR	0.010	0.010	**0.020**	0.010	0.012	0.010	NR	0.010	NR	NR	NR
9	0.015	0.010	0.014	**0.017**	0.011	NR	0.010	0.010	**0.020**	<0.01	0.011	0.010	NR	0.010	NR	NR	NR
10	0.016	0.010	0.015	**0.017**	0.011	NR	0.010	0.010	**0.010**	0.013	0.012	0.010	NR	0.010	NR	NR	NR
11	0.016	0.010	0.013	**0.018**	0.011	NR	0.010	0.010	**0.020**	<0.01	0.011	0.010	NR	0.010	NR	NR	NR
12	0.016	0.010	0.015	**0.016**	0.010	NR	0.010	0.010	**0.020**	<0.01	0.010	0.010	NR	0.010	NR	NR	NR
Mean	0.015	0.011	0.014	0.016	0.011		0.010	0.010	**0.019**	0.014	0.011	0.010		0.010	0.015	0.008	0.010
Median	0.015	0.010	0.014	0.016	0.011		0.010	0.010	0.020	0.014	0.011	0.010		0.010	0.015	0.008	0.010
Std.Dev.	0.001	0.002	0.001	0.001	0.002		0.000	0.000	0.003	0.005	0.001	0.000		0.000	0.006	0.000	0.000
Rel.Std.Dev.	9.20%	17.97%	7.85%	5.60%	15.61%		0.00%	0.00%	15.06%	38.57%	10.20%	0.00%		0.00%	38.49%	4.88%	0.00%
PDM[3]	26.68%	-6.96%	17.38%	38.14%	-4.81%		-14.11%	-14.11%	64.62%	22.39%	-1.94%	-14.11%		-14.11%	28.83%	-29.57%	-14.11%

Table A15. Fusion XRF results for SiO_2 in OREAS 193 (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	42.90	43.01	42.87	42.91	42.00	42.14	43.34	43.30	42.55	42.03	43.10	42.86	42.65	43.10	42.80	42.73	42.80
2	43.10	43.13	42.78	42.79	41.90	42.41	43.27	42.90	42.67	42.27	43.00	42.58	42.66	43.10	42.70	42.84	42.60
3	42.40	43.06	42.97	42.81	42.00	42.48	43.25	43.00	42.77	41.92	43.00	42.78	41.77	43.00	42.80	42.98	42.10
4	42.70	43.04	42.93	42.79	41.90	42.71	43.13	42.90	42.80	42.17	43.10	42.75	41.92	43.20	42.70	42.86	42.40
5	43.00	42.65	42.79	42.81	42.20	42.70	42.76	42.80	42.40	**41.73**	42.80	42.64	41.89	43.10	NR	NR	NR
6	43.00	42.67	42.77	42.84	42.30	42.51	42.83	42.60	42.57	**41.58**	42.80	42.64	42.07	43.20	NR	NR	NR
7	43.00	43.10	42.85	42.84	42.20	42.38	43.32	42.50	42.65	**42.31**	42.60	42.42	**40.85**	43.10	NR	NR	NR
8	42.80	43.03	42.83	42.85	41.90	42.52	43.40	42.60	42.49	**41.37**	42.70	42.59	42.27	43.00	NR	NR	NR
9	42.90	43.02	42.91	42.86	42.50	42.23	43.58	42.90	42.56	42.09	42.90	42.70	42.19	43.40	NR	NR	NR
10	43.30	43.06	42.93	42.87	42.20	42.31	43.51	43.20	42.27	42.29	42.90	42.75	42.30	43.50	NR	NR	NR
11	43.00	42.94	42.90	42.89	42.40	42.43	43.36	42.80	42.41	42.30	43.00	42.74	42.14	43.40	NR	NR	NR
12	43.20	42.96	42.88	42.91	42.30	42.41	43.40	43.10	42.55	42.51	43.00	42.64	42.19	43.50	NR	NR	NR
Mean	42.94	42.97	42.87	42.85	42.15	42.44	43.26	42.88	42.56	42.05	42.91	42.67	42.07	43.22	42.75	42.85	42.48
Median	43.00	43.02	42.88	42.85	42.20	42.42	43.33	42.90	42.56	42.13	42.95	42.67	42.16	43.15	42.75	42.85	42.50
Std.Dev.	0.24	0.16	0.06	0.04	0.21	0.17	0.25	0.24	0.15	0.34	0.16	0.12	0.47	0.19	0.06	0.10	0.30
Rel.Std.Dev.	0.55%	0.36%	0.15%	0.10%	0.49%	0.39%	0.57%	0.57%	0.36%	0.80%	0.36%	0.27%	1.12%	0.43%	0.14%	0.23%	0.70%
PDM[3]	0.53%	0.59%	0.35%	0.31%	-1.33%	-0.66%	1.28%	0.39%	-0.37%	-1.56%	0.45%	-0.10%	-1.50%	1.17%	0.08%	0.32%	-0.56%

Table A16. Fusion XRF results for SO_3 in OREAS 193 (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	0.007	<0.01	0.002	0.001	<0.001	NR	<0.001	<0.002	NR	NR	0.007	NR	NR	NR	<0.01	0.006	NR
2	0.008	<0.01	0.002	0.002	<0.001	NR	<0.001	<0.002	NR	NR	0.003	NR	NR	NR	<0.01	<0.002	NR
3	**0.016**	<0.01	<0.002	<0.001	<0.001	NR	<0.001	<0.002	NR	NR	0.005	NR	NR	NR	<0.01	<0.002	NR
4	0.007	<0.01	<0.002	0.001	<0.001	NR	<0.001	<0.002	NR	NR	0.004	NR	NR	NR	<0.01	0.002	NR
5	0.001	<0.01	0.003	0.004	<0.001	NR	<0.001	<0.002	NR	NR	0.006	NR	NR	NR	NR	NR	NR
6	0.002	<0.01	0.002	0.003	<0.001	NR	<0.001	0.007	NR	NR	0.004	NR	NR	NR	NR	NR	NR
7	0.002	<0.01	<0.002	0.003	<0.001	NR	<0.001	<0.002	NR	NR	0.005	NR	NR	NR	NR	NR	NR
8	0.002	<0.01	0.002	0.003	<0.001	NR	0.007	<0.002	NR	NR	0.006	NR	NR	NR	NR	NR	NR
9	**0.014**	<0.01	0.003	0.002	**0.019**	NR	<0.001	<0.002	NR	NR	0.009	NR	NR	NR	NR	NR	NR
10	**0.018**	<0.01	0.004	0.001	**0.020**	NR	0.005	<0.002	NR	NR	0.009	NR	NR	NR	NR	NR	NR
11	**0.016**	<0.01	0.003	0.003	**0.017**	NR	<0.001	<0.002	NR	NR	0.005	NR	NR	NR	NR	NR	NR
12	**0.017**	<0.01	0.003	0.003	**0.026**	NR	0.004	<0.002	NR	NR	0.005	NR	NR	NR	NR	NR	NR
Mean	0.009		0.003	0.002	0.021		0.005	0.007			0.006					0.004	
Median	0.008		0.003	0.003	0.020		0.005	0.007			0.005					0.004	
Std.Dev.	0.007		0.001	0.001	0.004		0.002				0.002					0.003	
Rel.Std.Dev.	72.64%		26.52%	43.45%	18.89%		28.64%				33.09%					70.71%	
PDM[3]	105%		-40.12%	-46.92%	360%		19.76%	57.19%			27.25%					-10.18%	

Table A17. Fusion XRF results for TiO_2 in OREAS 193 (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**	0.055	0.050	0.052	0.050	NR	0.050	**0.080**	0.050	0.045	0.060	**0.060**	NR	0.050	0.060	0.051	0.050
2	**0.070**	0.050	0.050	0.052	0.050	NR	0.050	**0.080**	0.060	0.057	0.060	**0.070**	NR	0.050	0.050	0.044	0.050
3	**0.070**	0.050	0.050	0.053	0.050	NR	0.050	**0.090**	0.050	0.049	0.060	**0.060**	NR	0.050	0.060	0.046	0.060
4	**0.060**	0.055	0.050	0.051	0.060	NR	0.050	**0.070**	0.050	0.044	0.050	**0.070**	NR	0.050	0.050	**0.029**	0.050
5	**0.070**	0.055	0.050	0.054	0.050	NR	0.050	**0.080**	0.060	0.046	0.050	**0.080**	NR	0.050	NR	NR	NR
6	**0.070**	0.050	0.050	0.054	0.050	NR	0.050	**0.120**	0.050	0.046	0.050	**0.060**	NR	0.050	NR	NR	NR
7	**0.070**	0.055	0.050	0.053	0.050	NR	0.050	**0.090**	0.050	0.055	0.050	**0.070**	NR	0.050	NR	NR	NR
8	**0.070**	0.050	0.050	0.051	0.050	NR	0.050	**0.100**	0.060	0.052	0.050	**0.060**	NR	0.050	NR	NR	NR
9	**0.080**	0.055	0.050	0.051	0.050	NR	0.050	**0.070**	0.060	0.048	0.050	0.060	NR	0.050	NR	NR	NR
10	**0.070**	0.050	0.050	0.054	0.050	NR	0.050	0.060	0.060	0.053	0.050	0.060	NR	0.050	NR	NR	NR
11	**0.070**	0.055	0.050	0.054	0.050	NR	0.050	0.060	0.050	0.056	0.050	0.060	NR	0.040	NR	NR	NR
12	**0.070**	0.055	0.050	0.052	0.050	NR	0.050	**0.030**	0.060	0.053	0.050	0.060	NR	0.050	NR	NR	NR
Mean	**0.070**	0.053	0.050	0.053	0.051		0.050	0.078	0.055	0.050	0.053	0.064		0.049	0.055	0.042	0.053
Median	0.070	0.055	0.050	0.053	0.050		0.050	0.080	0.055	0.051	0.050	0.060		0.050	0.055	0.045	0.050
Std.Dev.	0.004	0.003	0.000	0.001	0.003		0.000	0.023	0.005	0.005	0.005	0.007		0.003	0.006	0.009	0.005
Rel.Std.Dev.	6.09%	4.87%	0.00%	2.36%	5.68%		0.00%	29.18%	9.50%	9.06%	8.61%	10.42%		5.87%	10.50%	22.21%	9.52%
PDM[3]	32.86%	0.43%	-5.10%	-0.20%	-3.52%		-5.10%	47.09%	4.39%	-4.47%	-0.36%	21.79%		-6.68%	4.39%	-19.62%	-0.36%

Table A18. Fusion XRF results for Zn in OREAS 193 (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	210	221	220	210	220	216	**120**	230	230	250	200	**280**	NR	240	**100**	208	NR
2	210	217	220	215	240	218	**140**	240	220	230	200	**280**	NR	240	**100**	211	NR
3	200	221	220	215	220	214	**130**	240	220	220	200	**280**	NR	240	**100**	**228**	NR
4	210	**204**	220	215	220	218	**130**	230	230	250	200	**280**	NR	250	**100**	208	NR
5	210	219	230	215	230	215	**130**	230	230	230	200	200	NR	240	NR	NR	NR
6	210	209	220	215	210	215	**120**	220	220	240	200	200	NR	250	NR	NR	NR
7	210	211	220	215	220	214	**140**	230	230	230	200	200	NR	240	NR	NR	NR
8	210	214	220	215	240	215	**110**	230	**190**	230	200	200	NR	240	NR	NR	NR
9	210	**206**	220	220	220	214	**110**	230	230	210	210	200	NR	240	NR	NR	NR
10	220	221	220	210	230	215	**80**	230	220	230	220	200	NR	250	NR	NR	NR
11	210	219	230	210	230	214	**80**	240	220	240	210	200	NR	230	NR	NR	NR
12	210	217	220	210	250	214	**90**	240	230	230	210	190	NR	240	NR	NR	NR
Mean	210	215	222	214	228	215	**115**	233	223	233	204	226		242	100	214	
Median	210	217	220	215	225	215	120	230	225	230	200	200		240	100	210	
Std.Dev.	4	6	4	3	11	1	22	6	11	11	7	40		6	0	10	
Rel.Std.Dev.	2.03%	2.84%	1.76%	1.45%	5.00%	0.62%	18.72%	2.67%	5.12%	4.90%	3.27%	17.76%		2.39%	0.00%	4.49%	
PDM[3]	-4.18%	-2.01%	1.15%	-2.47%	3.81%	-1.76%	-47.53%	6.09%	1.53%	6.09%	-6.84%	3.05%		10.27%	-54.37%	-2.47%	

Table A19. Results for LOI at 1000°C in OREAS 193 (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	9.78	10.06	9.85	9.96	10.05	**11.15**	NR	10.04	9.60	**11.49**	10.06	10.00	**11.26**	9.28	10.00	10.13	9.75
2	9.83	10.04	9.87	9.95	10.00	**10.76**	NR	10.03	9.59	**11.46**	10.06	10.10	**11.17**	9.36	10.00	10.14	9.66
3	9.80	10.05	9.92	9.95	10.00	**10.55**	NR	9.95	9.60	**11.50**	10.10	10.10	**11.26**	9.45	9.98	10.14	9.59
4	9.83	10.06	9.87	9.95	9.91	**10.61**	NR	9.83	9.59	**11.56**	10.05	10.00	**11.18**	9.40	10.00	10.11	9.57
5	9.77	10.12	9.89	9.81	9.69	**10.57**	9.87	9.88	9.67	**11.06**	10.47	9.80	9.45	**9.29**	NR	NR	NR
6	9.81	10.13	9.90	9.75	9.69	**10.79**	10.00	9.91	9.71	**11.01**	10.35	10.00	**9.07**	**9.27**	NR	NR	NR
7	9.83	10.12	**9.61**	9.78	9.69	**10.69**	9.99	9.91	9.68	**11.01**	**10.69**	10.10	9.55	**9.37**	NR	NR	NR
8	9.79	10.12	9.87	9.77	9.72	**11.02**	**11.19**	9.92	9.67	**11.15**	10.52	10.00	9.45	**9.39**	NR	NR	NR
9	9.90	10.12	9.94	9.94	10.10	**11.03**	10.06	10.19	9.64	**11.18**	10.26	9.60	**11.20**	**9.16**	NR	NR	NR
10	9.92	10.12	9.97	9.91	**10.35**	**10.90**	10.14	10.09	9.64	**11.12**	10.25	9.70	**11.24**	**9.28**	NR	NR	NR
11	9.97	10.12	9.97	9.88	10.15	**11.18**	10.04	10.05	9.73	**11.10**	10.28	9.70	**11.15**	**9.29**	NR	NR	NR
12	9.92	10.16	9.97	9.91	10.10	**10.93**	10.07	**10.47**	9.65	**11.11**	10.15	9.70	**11.17**	**9.26**	NR	NR	NR
Mean	9.85	10.10	9.89	9.88	9.95	**10.85**	10.17	10.02	9.65	**11.23**	10.27	9.90	10.60	9.32	10.00	10.13	9.64
Median	9.83	10.12	9.90	9.91	10.00	10.84	10.05	9.99	9.65	11.13	10.26	10.00	11.17	9.29	10.00	10.13	9.63
Std.Dev.	0.07	0.04	0.10	0.08	0.22	0.22	0.42	0.17	0.05	0.21	0.21	0.19	0.91	0.08	0.01	0.02	0.08
Rel.Std.Dev.	0.66%	0.38%	0.98%	0.81%	2.18%	2.05%	4.12%	1.73%	0.48%	1.86%	2.00%	1.88%	8.55%	0.85%	0.10%	0.16%	0.84%
PDM[3]	-0.25%	2.33%	0.15%	0.09%	0.84%	9.90%	3.03%	1.54%	-2.26%	13.76%	4.04%	0.30%	7.35%	-5.61%	1.26%	2.60%	-2.31%

Table A20. Fusion ICP results for Ni in OREAS 193 (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	1.87	1.94	1.88	1.90	1.94	1.89	1.89	**1.74**	1.93	1.89	2.01	1.87
2	1.89	1.97	1.90	1.86	1.94	1.89	1.92	**1.58**	1.98	1.91	1.93	1.92
3	1.91	1.99	1.88	1.94	1.92	1.88	1.95	**1.82**	1.90	1.89	**2.05**	1.88
4	1.92	1.92	1.88	1.93	1.93	1.88	1.94	**1.71**	1.96	1.91	1.91	1.88
5	1.87	**2.00**	1.84	1.87	1.90	1.92	1.97	**1.62**	**1.97**	1.89	NR	NR
6	1.86	1.94	1.87	1.94	1.86	1.90	1.95	**1.71**	**2.02**	1.89	NR	NR
7	1.88	1.91	1.84	2.02	1.91	1.90	1.98	**1.57**	**1.95**	1.89	NR	NR
8	1.86	1.94	1.83	1.92	1.87	1.88	1.98	**1.79**	**2.08**	1.89	NR	NR
9	1.91	1.84	1.93	1.90	1.94	1.84	1.90	**1.65**	1.97	1.88	NR	NR
10	1.90	**1.94**	1.91	1.82	1.93	1.87	1.91	**1.91**	1.97	1.91	NR	NR
11	1.89	1.87	1.89	1.95	1.91	1.84	1.88	**1.58**	1.97	1.89	NR	NR
12	1.89	1.86	1.91	1.88	1.92	1.84	1.90	**1.88**	1.95	1.91	NR	NR
Mean	1.89	1.93	1.88	1.91	1.91	1.88	1.93	**1.71**	1.97	1.89	1.98	1.89
Median	1.89	1.94	1.88	1.91	1.92	1.88	1.93	1.71	1.97	1.89	1.97	1.88
Std.Dev.	0.02	0.05	0.03	0.05	0.03	0.03	0.04	0.12	0.04	0.01	0.07	0.02
Rel.Std.Dev.	1.05%	2.60%	1.65%	2.75%	1.35%	1.34%	1.84%	6.95%	2.21%	0.55%	3.35%	1.06%
PDM[3]	-1.25%	0.95%	-1.52%	0.01%	0.27%	-1.59%	1.15%	-10.21%	3.24%	-0.84%	3.46%	-1.22%

Table A21. Fusion ICP results for Co in OREAS 193 (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	440	457	480	460	511	500	490	**593**	484	480	511	482
2	480	460	480	470	505	490	490	**553**	**440**	490	478	484
3	460	464	480	490	503	490	490	**570**	468	480	493	482
4	480	453	500	480	512	470	490	**562**	471	500	461	481
5	**470**	492	480	490	491	470	500	**569**	492	490	NR	NR
6	520	480	480	490	484	470	500	**597**	506	490	NR	NR
7	500	494	500	**540**	496	470	500	**583**	496	490	NR	NR
8	520	506	500	520	485	490	500	**590**	506	490	NR	NR
9	490	504	**540**	460	482	470	460	**539**	488	480	NR	NR
10	450	**537**	**520**	450	473	460	460	**575**	484	490	NR	NR
11	430	511	**540**	470	474	470	450	**532**	486	490	NR	NR
12	470	505	**560**	440	484	470	460	**586**	**468**	490	NR	NR
Mean	476	489	505	480	492	477	483	**571**	483	488	486	482
Median	475	493	500	475	488	470	490	572	485	490	486	482
Std.Dev.	29	26	28	29	14	12	19	21	19	6	21	1
Rel.Std.Dev.	6.04%	5.33%	5.63%	5.96%	2.76%	2.58%	3.96%	3.68%	3.84%	1.18%	4.39%	0.21%
PDM[3]	-1.57%	1.06%	4.46%	-0.71%	1.70%	-1.40%	-0.19%	18.06%	-0.19%	1.01%	0.48%	-0.27%

Table A22. Fusion ICP results for Al_2O_3 in OREAS 193 (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	2.95	3.04	2.99	3.07	3.20	3.08	3.15	2.99	3.00	2.91	3.12	3.00
2	3.05	3.08	2.97	**2.89**	3.19	3.11	3.21	2.93	3.02	2.96	3.04	2.98
3	3.03	3.11	2.99	3.10	3.19	3.08	3.18	3.00	**3.18**	2.97	3.08	3.02
4	3.21	3.03	2.95	3.05	3.23	3.11	3.29	2.91	3.01	2.95	3.06	3.02
5	3.08	3.03	3.00	3.01	3.11	3.12	3.09	2.95	3.13	3.02	NR	NR
6	3.08	3.02	2.95	3.08	3.13	3.07	3.06	2.99	3.15	3.06	NR	NR
7	3.08	3.03	3.00	3.09	3.14	3.13	3.19	2.98	3.17	3.04	NR	NR
8	3.06	3.04	2.95	3.03	3.11	3.09	3.20	2.93	3.06	3.08	NR	NR
9	3.03	2.91	2.95	3.11	3.20	3.10	3.07	2.96	3.13	2.99	NR	NR
10	3.03	3.05	2.95	3.00	3.27	3.16	3.12	2.99	3.08	2.99	NR	NR
11	3.02	2.98	3.00	**3.27**	3.22	3.07	3.13	2.99	3.10	2.99	NR	NR
12	3.04	2.94	2.91	3.01	3.24	3.04	**2.91**	**3.12**	3.08	2.95	NR	NR
Mean	3.06	3.02	2.97	3.06	3.19	3.10	3.13	2.98	3.09	2.99	3.08	3.01
Median	3.05	3.03	2.96	3.06	3.20	3.10	3.14	2.98	3.09	2.99	3.07	3.01
Std.Dev.	0.06	0.06	0.03	0.09	0.05	0.03	0.10	0.05	0.06	0.05	0.03	0.02
Rel.Std.Dev.	1.98%	1.83%	0.97%	2.93%	1.65%	1.03%	3.07%	1.77%	1.92%	1.66%	1.11%	0.62%
PDM[3]	0.01%	-1.08%	-2.85%	0.15%	4.29%	1.37%	2.57%	-2.57%	1.23%	-2.04%	0.66%	-1.62%

Table A23. Fusion ICP results for CaO in OREAS 193 (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	**0.420**	0.400	0.400	0.340	0.360	0.350	0.390	0.388	0.337	0.350	0.400	0.432
2	**0.470**	0.400	0.400	0.280	0.360	0.360	0.370	0.382	0.330	0.380	0.400	0.404
3	**0.500**	0.390	0.400	0.340	0.370	0.360	0.350	0.385	0.326	0.400	0.400	0.428
4	**0.460**	0.380	0.400	0.300	0.360	0.370	0.350	0.395	0.324	0.340	0.400	0.448
5	**0.440**	0.390	0.300	0.300	0.370	0.360	0.380	0.387	0.359	0.310	NR	NR
6	**0.440**	0.350	0.400	0.320	0.380	0.360	0.380	0.398	0.369	0.340	NR	NR
7	**0.470**	0.360	0.300	0.360	0.370	0.360	0.380	0.376	0.359	0.350	NR	NR
8	**0.430**	0.360	0.300	0.290	0.360	0.360	0.380	0.379	0.369	0.350	NR	NR
9	0.410	**0.320**	0.400	0.310	0.370	0.360	0.380	0.378	0.332	0.450	NR	NR
10	0.400	**0.350**	0.400	0.270	0.370	0.370	0.380	0.385	0.322	0.390	NR	NR
11	0.360	**0.360**	0.400	0.310	0.360	0.360	0.380	0.386	**0.353**	0.470	NR	NR
12	0.380	**0.340**	0.400	0.260	0.370	0.350	0.360	**0.403**	0.332	0.360	NR	NR
Mean	0.432	0.367	0.375	0.307	0.367	0.360	0.373	0.387	0.343	0.374	0.400	0.428
Median	0.435	0.360	0.400	0.305	0.370	0.360	0.380	0.386	0.335	0.355	0.400	0.430
Std.Dev.	0.040	0.025	0.045	0.030	0.007	0.006	0.013	0.008	0.018	0.047	0.000	0.018
Rel.Std.Dev.	9.36%	6.91%	12.06%	9.77%	1.78%	1.68%	3.49%	2.12%	5.21%	12.56%	0.00%	4.27%
PDM[3]	15.76%	-1.67%	0.56%	-17.76%	-1.67%	-3.46%	0.11%	3.73%	-8.09%	0.34%	7.26%	14.82%

Table A24. Fusion ICP results for Cu in OREAS 193 (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	41	50	<50	<50	60	<50	25	32	<50	27	58
2	<50	43	50	<50	<50	50	<50	29	37	<50	28	**216**
3	<50	38	50	<50	<50	50	<50	35	33	<50	40	49
4	<50	43	50	<50	<50	40	<50	34	32	<50	26	35
5	<50	23	**100**	<50	<50	50	<50	<10	33	<50	NR	NR
6	<50	23	50	<50	<50	50	<50	<10	34	<50	NR	NR
7	<50	28	50	<50	<50	40	<50	<10	41	<50	NR	NR
8	<50	20	<50	<50	<50	60	<50	<10	34	<50	NR	NR
9	<50	27	<50	<50	<50	40	<50	<10	47	<50	NR	NR
10	<50	30	<50	<50	<50	30	<50	<10	34	<50	NR	NR
11	<50	31	<50	<50	<50	40	<50	<10	34	<50	NR	NR
12	<50	29	<50	<50	50	40	<50	<10	39	<50	NR	NR
Mean		31	57		50	46		31	36		30	90
Median		30	50		50	45		31	34		28	54
Std.Dev.		8	19			9		5	4		7	85
Rel.Std.Dev.		25.72%	33.07%			19.64%		16.24%	12.43%		21.66%	94.95%
PDM[3]		-21.99%	42.27%		24.49%	14.12%		-23.67%	-10.67%		-24.68%	123%

Table A25. Fusion ICP results for Cr_2O_3 in OREAS 193 (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	0.910	0.994	0.985	0.890	0.944	0.939	0.920	0.980	0.968	0.965	0.998	**1.059**
2	0.950	1.016	0.980	0.880	0.946	0.946	0.920	0.938	0.903	0.965	0.967	**1.047**
3	0.950	1.026	0.995	0.920	0.933	0.932	0.920	0.969	0.886	0.965	1.040	**1.062**
4	0.950	0.986	0.980	0.920	0.948	0.945	0.920	0.946	0.983	0.965	0.976	**1.050**
5	0.990	0.960	0.915	0.900	0.935	0.948	**1.060**	0.960	0.975	0.950	NR	NR
6	0.960	0.953	0.950	0.920	0.928	0.926	**1.080**	0.957	0.962	0.965	NR	NR
7	0.980	0.937	0.930	**0.990**	0.943	0.934	**1.060**	0.963	0.949	0.965	NR	NR
8	0.950	0.958	0.935	0.890	0.923	0.941	**1.090**	0.960	0.983	0.965	NR	NR
9	0.980	0.945	0.920	0.950	0.966	0.956	1.010	0.954	0.946	0.965	NR	NR
10	0.960	**1.002**	0.915	0.890	0.965	0.953	1.010	0.980	0.965	0.965	NR	NR
11	0.960	0.963	0.915	0.960	0.953	0.967	1.000	0.957	0.961	0.965	NR	NR
12	0.960	0.964	**0.885**	0.890	0.972	0.932	1.000	1.000	0.962	0.965	NR	NR
Mean	0.958	0.975	0.942	0.917	0.946	0.943	0.999	0.964	0.953	0.963	0.995	1.055
Median	0.960	0.963	0.933	0.910	0.945	0.943	1.005	0.960	0.962	0.965	0.987	1.055
Std.Dev.	0.020	0.029	0.035	0.034	0.016	0.012	0.066	0.017	0.030	0.004	0.033	0.007
Rel.Std.Dev.	2.13%	2.95%	3.75%	3.73%	1.64%	1.24%	6.58%	1.73%	3.17%	0.44%	3.27%	0.68%
PDM[3]	0.24%	2.01%	-1.46%	-4.12%	-1.02%	-1.34%	4.51%	0.80%	-0.27%	0.78%	4.10%	10.31%

Table A26. Fusion ICP results for Fe_2O_3 in OREAS 193 (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	18.85	19.75	19.40	19.35	20.02	19.75	19.10	20.27	20.53	19.45	19.40	20.62
2	19.20	20.19	19.40	18.85	19.80	19.70	19.84	20.15	19.40	19.70	18.80	20.80
3	19.25	20.22	19.30	19.80	19.46	19.77	19.15	20.11	19.37	19.45	18.50	20.82
4	19.35	19.60	19.20	19.70	19.79	19.96	18.21	19.89	20.40	19.65	19.10	20.98
5	19.15	19.45	18.70	18.00	19.24	20.06	18.56	20.55	20.22	19.40	NR	NR
6	19.05	18.98	19.20	18.50	19.00	19.93	**17.81**	20.51	20.33	19.50	NR	NR
7	19.10	18.78	18.90	**19.50**	19.13	20.03	18.75	20.27	19.81	19.55	NR	NR
8	18.90	19.02	18.60	18.45	19.30	19.74	18.93	20.11	20.62	19.50	NR	NR
9	18.65	19.48	20.00	19.00	19.57	20.01	18.81	18.40	19.16	19.50	NR	NR
10	18.55	20.63	19.60	18.15	19.41	20.06	18.37	19.01	19.29	19.75	NR	NR
11	18.50	19.96	20.00	19.55	19.41	19.94	18.22	18.81	19.23	19.55	NR	NR
12	18.45	19.84	19.20	17.95	19.50	19.91	19.23	19.46	19.13	19.75	NR	NR
Mean	18.92	19.66	19.29	18.90	19.47	19.91	18.75	19.80	19.79	19.56	18.95	20.81
Median	18.98	19.68	19.25	18.93	19.44	19.94	18.78	20.11	19.60	19.53	18.95	20.81
Std.Dev.	0.31	0.56	0.44	0.68	0.29	0.13	0.55	0.71	0.59	0.12	0.39	0.15
Rel.Std.Dev.	1.66%	2.82%	2.28%	3.60%	1.51%	0.66%	2.95%	3.57%	2.97%	0.62%	2.04%	0.71%
PDM[3]	-2.92%	0.89%	-0.99%	-3.00%	-0.08%	2.15%	-3.78%	1.59%	1.57%	0.40%	-2.75%	6.78%

Table A27. Fusion ICP results for K_2O in OREAS 193 (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	<0.1	<0.2	0.08
2	<0.1	<0.1	<0.02	<0.1	0.02	<0.01	0.02	<0.1	0.02	0.12	<0.2	0.06
3	0.10	<0.1	<0.02	<0.1	0.01	<0.01	<0.01	<0.1	0.01	0.12	<0.2	0.08
4	<0.1	<0.1	<0.02	<0.1	0.02	<0.01	0.01	<0.1	<0.01	0.12	<0.2	0.09
5	<0.1	<0.1	0.10	<0.1	0.01	<0.01	<0.01	<0.1	0.01	<0.1	NR	NR
6	<0.1	0.10	0.10	<0.1	0.01	<0.01	0.03	0.11	0.01	0.12	NR	NR
7	<0.1	0.20	<0.1	<0.1	0.01	<0.01	0.01	0.11	0.01	0.12	NR	NR
8	<0.1	0.10	0.10	<0.1	0.01	<0.01	0.02	<0.1	0.01	0.12	NR	NR
9	<0.1	0.16	<0.1	<0.1	<0.01	<0.01	<0.01	0.11	0.01	0.12	NR	NR
10	<0.1	0.19	<0.1	<0.1	<0.01	<0.01	<0.01	<0.1	0.01	0.12	NR	NR
11	<0.1	0.24	<0.1	<0.1	0.01	<0.01	<0.01	<0.1	0.01	0.12	NR	NR
12	<0.1	0.25	<0.1	<0.1	0.01	<0.01	<0.01	0.15	0.01	0.12	NR	NR
Mean	0.10	0.18	0.10		0.01		0.02	0.12	0.01	0.12		0.08
Median	0.10	0.19	0.10		0.01		0.02	0.11	0.01	0.12		0.08
Std.Dev.		0.06	0.00		0.00		0.01	0.02	0.00	0.00		0.01
Rel.Std.Dev.		34.79%	0.00%		35.14%		46.48%	16.66%	38.10%	0.00%		14.75%
PDM[3]	22.51%	117%	22.51%		-85.30%		-77.95%	46.40%	-88.54%	47.57%		-4.79%

Table A28. Fusion ICP results for MgO in OREAS 193 (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	18.85	19.85	20.10	20.70	20.26	20.22	20.24	21.40	**18.34**	19.65	**18.50**	20.26
2	19.20	20.17	19.90	20.20	20.16	20.26	20.76	21.63	20.97	19.90	**18.20**	20.23
3	19.25	20.34	19.70	21.10	20.28	20.28	20.33	21.73	19.71	19.80	**18.30**	20.34
4	19.30	19.71	19.70	21.00	20.45	20.23	20.61	21.08	18.60	19.80	**18.70**	20.47
5	20.70	21.76	19.40	19.35	20.33	20.07	20.33	**21.48**	19.89	20.10	NR	NR
6	20.50	21.18	20.20	19.80	20.21	20.01	20.04	**21.82**	19.74	20.10	NR	NR
7	20.60	20.64	19.90	**20.70**	20.41	20.07	20.95	**21.70**	20.37	20.10	NR	NR
8	20.40	20.95	19.60	19.80	20.42	20.06	20.79	**21.49**	20.08	20.00	NR	NR
9	20.50	20.23	19.60	20.70	20.89	19.89	19.59	20.97	19.73	19.70	NR	NR
10	20.50	**21.46**	19.40	19.95	20.76	19.76	19.86	21.31	19.44	19.85	NR	NR
11	20.30	20.64	19.70	21.60	20.84	20.05	19.62	21.11	19.43	19.85	NR	NR
12	20.50	20.57	**18.70**	20.00	20.82	19.85	19.50	**21.96**	19.83	19.90	NR	NR
Mean	20.05	20.63	19.66	20.41	20.49	20.06	20.22	21.47	19.68	19.90	18.43	20.33
Median	20.45	20.61	19.70	20.45	20.42	20.07	20.29	21.48	19.73	19.88	18.40	20.30
Std.Dev.	0.68	0.62	0.39	0.66	0.27	0.17	0.50	0.31	0.70	0.15	0.22	0.11
Rel.Std.Dev.	3.39%	3.03%	1.98%	3.23%	1.31%	0.83%	2.48%	1.46%	3.58%	0.77%	1.20%	0.52%
PDM[3]	-1.02%	1.81%	-2.96%	0.74%	1.13%	-0.96%	-0.19%	5.99%	-2.86%	-1.78%	-9.05%	0.34%

Table A29. Fusion ICP results for MnO in OREAS 193 (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	0.300	0.316	0.310	0.310	0.310	0.310	0.320	0.314	0.322	0.320	0.321	0.327
2	0.300	0.321	0.310	0.300	0.310	0.310	0.335	0.316	0.304	0.320	0.305	0.329
3	0.300	0.326	0.310	0.320	0.310	0.310	0.329	0.317	0.302	0.320	0.330	0.331
4	0.300	0.313	0.308	0.320	0.320	0.320	0.333	0.310	0.322	0.320	0.305	0.333
5	0.320	0.315	0.318	0.290	0.310	0.320	0.319	0.303	0.328	0.320	NR	NR
6	0.310	0.312	0.316	0.300	0.310	0.310	0.316	0.305	0.327	0.310	NR	NR
7	0.320	0.305	0.322	0.310	0.310	0.320	0.326	0.306	0.324	0.320	NR	NR
8	0.320	0.313	0.318	0.300	0.310	0.320	0.327	0.306	0.331	0.320	NR	NR
9	0.310	0.313	0.316	0.310	0.330	0.310	0.317	0.319	0.322	0.320	NR	NR
10	0.310	0.329	0.308	0.300	0.330	0.310	0.321	0.321	0.322	0.320	NR	NR
11	0.310	0.320	0.312	0.310	0.320	0.310	0.321	0.321	0.318	0.320	NR	NR
12	0.310	0.319	0.302	0.290	0.320	0.310	**0.306**	**0.341**	0.324	0.320	NR	NR
Mean	0.309	0.317	0.313	0.305	0.316	0.313	0.323	0.315	0.321	0.319	0.315	0.330
Median	0.310	0.315	0.311	0.305	0.310	0.310	0.321	0.315	0.322	0.320	0.313	0.330
Std.Dev.	0.008	0.006	0.006	0.010	0.008	0.005	0.008	0.010	0.009	0.003	0.012	0.002
Rel.Std.Dev.	2.56%	2.05%	1.79%	3.28%	2.51%	1.57%	2.49%	3.32%	2.74%	0.90%	3.93%	0.76%
PDM[3]	-2.22%	0.19%	-1.16%	-3.53%	-0.11%	-0.90%	2.00%	-0.40%	1.39%	0.95%	-0.29%	4.36%

Table A30. Fusion ICP results for Na_2O in OREAS 193 (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	0.030	0.030	0.030	**0.035**	0.027	NR	NR	NR
2	NR	NR	NR	NR	0.030	0.030	0.040	**0.018**	0.026	NR	NR	NR
3	NR	NR	NR	NR	0.030	0.030	0.030	**0.019**	0.027	NR	NR	NR
4	NR	NR	NR	NR	0.030	0.030	0.030	**0.019**	0.027	NR	NR	NR
5	NR	NR	NR	NR	0.030	**0.030**	0.030	**0.014**	0.028	NR	NR	NR
6	NR	NR	NR	NR	0.030	**0.020**	0.030	**0.011**	0.028	NR	NR	NR
7	NR	NR	NR	NR	0.030	**0.020**	0.030	**<0.01**	0.030	NR	NR	NR
8	NR	NR	NR	NR	0.030	**0.020**	0.040	**0.015**	0.028	NR	NR	NR
9	NR	NR	NR	NR	0.030	0.030	0.030	0.026	0.029	NR	NR	NR
10	NR	NR	NR	NR	0.030	0.020	0.020	0.029	0.029	NR	NR	NR
11	NR	NR	NR	NR	0.030	0.030	**0.050**	0.030	0.031	NR	NR	NR
12	NR	NR	NR	NR	0.030	0.030	0.020	0.039	0.030	NR	NR	NR
Mean					0.030	0.027	0.032	0.023	0.029			
Median					0.030	0.030	0.030	0.019	0.028			
Std.Dev.					0.000	0.005	0.008	0.009	0.001			
Rel.Std.Dev.					0.00%	18.46%	26.36%	39.53%	4.90%			
PDM[3]					1.15%	-10.09%	6.77%	-21.84%	-3.77%			

Table A31. Fusion ICP results for P_2O_5 in OREAS 193 (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	<0.03	<0.02	<0.02	<0.01	0.020	0.020	<0.01	0.039	NR	NR	0.002	<0.03
2	<0.03	<0.02	<0.02	0.010	0.010	0.020	<0.01	0.018	NR	NR	0.018	<0.03
3	<0.03	<0.02	<0.02	0.010	0.010	<0.01	<0.01	0.026	NR	NR	0.008	<0.03
4	<0.03	<0.02	<0.02	0.010	0.020	0.010	<0.01	0.010	NR	NR	0.004	<0.03
5	NR	<0.03	<0.02	0.020	<0.01	0.010	0.020	<0.01	0.011	NR	NR	NR
6	NR	<0.03	0.040	<0.02	<0.01	<0.01	<0.01	<0.01	0.014	NR	NR	NR
7	NR	0.040	<0.02	0.020	0.010	<0.01	<0.01	<0.01	0.009	NR	NR	NR
8	NR	<0.03	0.040	0.020	0.020	<0.01	0.030	<0.01	0.011	NR	NR	NR
9	NR	<0.03	0.040	<0.02	0.020	0.030	0.030	<0.01	0.012	NR	NR	NR
10	NR	<0.03	0.040	<0.02	0.020	0.020	0.020	<0.01	0.017	NR	NR	NR
11	NR	<0.03	0.020	<0.02	0.010	<0.01	0.030	<0.01	0.017	NR	NR	NR
12	NR	<0.03	0.040	<0.02	0.020	0.020	0.020	<0.01	0.010	NR	NR	NR
Mean		0.040	0.037	0.020	0.014	0.018	0.022		0.016			0.008
Median		0.040	0.040	0.020	0.010	0.020	0.020		0.013			0.006
Std.Dev.			0.008	0.000	0.005	0.007	0.007		0.009			0.007
Rel.Std.Dev.			22.27%	0.00%	36.49%	40.41%	30.00%		53.57%			88.98%
PDM[3]		83.04%	67.78%	-8.48%	-33.90%	-19.92%	1.69%		-26.80%			-63.39%

Table A32. Fusion ICP results for SiO_2 in OREAS 193 (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	42.60	42.90	41.90	41.00	43.27	42.30	42.86	42.53	42.31	41.80	43.60	43.89
2	42.00	43.30	41.90	39.30	43.73	42.29	43.60	42.97	41.59	42.80	41.30	43.66
3	40.60	44.30	41.70	41.80	43.01	42.28	43.22	43.24	42.50	42.80	45.30	43.75
4	42.30	43.20	41.50	40.90	44.42	42.22	43.61	42.06	42.29	42.80	41.20	44.50
5	40.60	43.30	40.90	41.50	42.88	42.21	43.46	41.29	42.66	42.90	NR	NR
6	41.50	42.90	41.90	42.30	42.67	42.47	43.27	41.86	43.08	43.30	NR	NR
7	43.00	43.20	41.50	**45.10**	43.01	42.25	43.34	41.45	42.99	43.40	NR	NR
8	41.40	43.70	40.60	42.20	42.94	42.60	43.48	41.03	42.08	43.60	NR	NR
9	40.80	**46.70**	41.10	40.60	43.09	42.20	42.70	43.70	42.79	41.40	NR	NR
10	40.40	**49.00**	40.40	39.00	43.42	42.35	43.11	44.21	42.67	41.60	NR	NR
11	40.60	**47.40**	41.10	42.30	43.46	42.29	42.61	43.96	42.77	41.40	NR	NR
12	40.70	**46.40**	39.10	39.00	42.94	42.20	**40.57**	**47.18**	42.71	41.50	NR	NR
Mean	41.38	44.69	41.13	41.25	43.24	42.31	42.99	42.96	42.54	42.44	42.85	43.95
Median	41.10	43.50	41.30	41.25	43.05	42.29	43.25	42.75	42.67	42.80	42.45	43.82
Std.Dev.	0.90	2.10	0.82	1.73	0.47	0.12	0.83	1.71	0.41	0.84	1.97	0.38
Rel.Std.Dev.	2.18%	4.71%	1.99%	4.19%	1.10%	0.28%	1.93%	3.97%	0.97%	1.98%	4.61%	0.87%
PDM[3]	-2.62%	5.19%	-3.19%	-2.91%	1.76%	-0.43%	1.17%	1.10%	0.12%	-0.11%	0.85%	3.44%

Table A33. Fusion ICP results for SO_3 in OREAS 193 (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	<0.05	<0.1	<0.02	<0.01	NR	NR	NR	NR	0.025	0.050	NR
2	<0.02	<0.05	<0.1	<0.02	<0.01	NR	NR	NR	NR	0.050	0.050	NR
3	0.050	<0.05	0.100	<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	0.025	<0.01	NR
5	<0.02	<0.05	<0.02	<0.02	NR	NR	NR	NR	NR	0.075	NR	NR
6	<0.02	<0.05	<0.02	0.020	NR	NR	NR	NR	NR	0.050	NR	NR
7	<0.02	<0.05	0.020	<0.02	NR	NR	NR	NR	NR	0.075	NR	NR
8	0.020	<0.05	0.020	<0.02	NR	NR	NR	NR	NR	0.050	NR	NR
9	<0.02	<0.05	0.040	<0.02	<0.02	NR	NR	NR	NR	0.025	NR	NR
10	<0.02	<0.05	0.040	0.020	0.025	NR	NR	NR	NR	0.025	NR	NR
11	<0.02	<0.05	0.040	0.020	0.025	NR	NR	NR	NR	0.100	NR	NR
12	<0.02	<0.05	0.040	0.020	0.025	NR	NR	NR	NR	0.025	NR	NR
Mean	0.057		0.043	0.020	0.025					0.050	0.050	
Median	0.050		0.040	0.020	0.025					0.050	0.050	
Std.Dev.	0.040		0.027	0.000	0.000					0.026	0.000	
Rel.Std.Dev.	71.32%		62.78%	0.00%	0.00%					52.22%	0.00%	
PDM[3]	39.13%		5.23%	-50.89%	-38.69%					22.62%	22.62%	

Table A34. Fusion ICP results for TiO_2 in OREAS 193 (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**	0.050	0.050	0.050	0.055	0.050	0.052	**0.048**	0.049	0.050	0.050	**0.062**
2	**<0.01**	0.050	0.050	0.050	0.054	0.050	0.055	0.043	0.047	0.050	0.050	**0.061**
3	**<0.01**	0.050	0.050	0.050	0.054	0.050	0.052	0.043	0.047	0.050	0.050	**0.063**
4	**<0.01**	0.050	0.050	0.050	0.055	0.050	0.054	0.042	0.049	0.050	**0.040**	**0.063**
5	**0.010**	0.060	**0.050**	0.050	0.054	0.050	0.053	0.042	0.054	0.050	NR	NR
6	**0.010**	0.050	**0.070**	0.050	0.055	0.050	0.052	0.044	0.054	0.050	NR	NR
7	**<0.01**	0.050	**0.050**	0.050	0.053	0.050	0.054	0.043	0.053	0.050	NR	NR
8	**0.010**	0.050	**0.070**	0.050	0.054	0.050	0.053	0.046	0.054	0.060	NR	NR
9	**<0.01**	0.050	0.050	0.050	0.055	0.050	0.051	0.052	0.052	0.050	NR	NR
10	**<0.01**	0.050	0.050	0.050	0.055	0.050	0.052	0.053	0.051	0.050	NR	NR
11	**0.020**	0.050	0.050	0.050	0.055	0.050	0.051	0.052	0.051	0.050	NR	NR
12	**<0.01**	0.050	0.050	**0.040**	0.055	0.050	0.050	**0.055**	0.051	0.050	NR	NR
Mean	**0.013**	0.051	0.053	0.049	0.055	0.050	0.052	0.047	0.051	0.051	0.048	0.063
Median	0.010	0.050	0.050	0.050	0.055	0.050	0.052	0.045	0.051	0.050	0.050	0.063
Std.Dev.	0.005	0.003	0.008	0.003	0.001	0.000	0.001	0.005	0.002	0.003	0.005	0.001
Rel.Std.Dev.	40.00%	5.68%	14.60%	5.87%	1.24%	0.00%	2.75%	10.34%	4.83%	5.68%	10.53%	1.51%
PDM[3]	-75.27%	0.56%	5.50%	-2.74%	7.81%	-1.09%	3.69%	-7.19%	0.76%	0.56%	-6.04%	23.76%

Table A35. Fusion ICP results for Zn in OREAS 193 (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	221	250	200	140	NR	200	225	177	200	**106**	NR
2	200	216	250	200	140	NR	200	209	153	200	**101**	NR
3	200	212	250	200	140	NR	200	219	161	200	**107**	NR
4	200	207	200	200	140	NR	200	209	183	200	**106**	NR
5	**300**	**410**	**300**	200	150	NR	200	216	148	200	NR	NR
6	**300**	248	**300**	200	160	NR	200	216	137	200	NR	NR
7	**300**	233	**300**	200	160	NR	200	220	148	200	NR	NR
8	**300**	224	**300**	200	150	NR	200	224	148	200	NR	NR
9	200	204	**300**	200	160	NR	**300**	213	189	200	NR	NR
10	200	218	**250**	200	160	NR	**300**	216	190	200	NR	NR
11	200	216	**300**	200	170	NR	200	225	192	200	NR	NR
12	200	202	**250**	200	170	NR	200	230	**172**	200	NR	NR
Mean	233	234	271	200	153		217	219	166	200	105	
Median	200	217	275	200	155		200	217	167	200	106	
Std.Dev.	49	57	33	0	12		39	7	20	0	3	
Rel.Std.Dev.	21.10%	24.25%	12.34%	0.00%	7.53%		17.97%	3.06%	11.81%	0.00%	2.58%	
PDM[3]	17.09%	17.55%	35.91%	0.36%	-23.05%		8.73%	9.66%	-16.51%	0.36%	-47.31%	

Table A36. Results for C in OREAS 193 (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	0.060	0.070	0.060	**0.010**	0.070	0.030	0.120	0.050	0.120	0.068	0.060
2	0.080	0.070	0.060	**0.010**	0.070	0.040	0.098	0.050	0.110	0.061	0.060
3	0.080	0.080	0.060	**0.010**	0.070	0.030	0.131	0.050	0.110	0.072	0.060
4	0.060	0.100	0.060	**0.020**	0.070	0.020	0.122	0.050	0.120	0.066	0.070
5	0.070	0.090	0.060	0.050	0.100	0.070	**0.163**	0.060	0.100	0.075	0.070
6	0.050	0.090	0.060	0.040	0.100	0.040	0.119	0.060	0.090	0.077	0.080
7	0.060	0.080	0.060	0.050	0.090	0.100	0.093	0.060	0.100	0.065	0.080
8	0.060	0.080	0.060	0.060	0.090	0.060	0.097	0.060	0.090	0.063	0.060
9	0.070	0.070	0.050	0.050	0.100	0.050	0.109	0.060	0.100	0.069	0.060
10	0.070	0.090	0.050	0.050	0.100	0.070	**0.157**	0.050	0.100	0.069	0.050
11	0.070	0.080	0.040	0.060	0.100	0.080	0.122	0.050	0.090	0.071	0.060
12	0.080	0.070	0.050	0.060	0.100	0.070	0.095	0.050	0.100	**0.101**	0.050
Mean	0.068	0.081	0.056	0.039	0.088	0.055	0.119	0.054	0.103	0.071	0.063
Median	0.070	0.080	0.060	0.050	0.095	0.055	0.120	0.050	0.100	0.069	0.060
Std.Dev.	0.010	0.010	0.007	0.021	0.014	0.024	0.023	0.005	0.011	0.010	0.010
Rel.Std.Dev.	14.30%	12.32%	11.97%	52.73%	15.89%	43.51%	19.36%	9.51%	10.30%	14.47%	15.55%
PDM[3]	-7.10%	11.25%	-23.16%	-46.10%	21.57%	-24.30%	63.55%	-25.45%	41.07%	-1.84%	-12.83%

Table A37. Results for S in OREAS 193 (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	0.020	0.010	<0.01	0.003	<0.01
2	0.010	<0.005	<0.01	<0.01	<0.02	<0.01	0.040	<0.01	<0.01	<0.003	<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	0.010	<0.005	<0.01	<0.01	<0.02	<0.01	0.030	<0.01	<0.01	<0.003	<0.01
5	0.010	0.013	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	<0.01	<0.003	<0.01
6	<0.01	0.013	<0.01	0.040	<0.02	<0.01	0.020	<0.01	<0.01	0.003	<0.01
7	<0.01	<0.005	<0.01	0.010	<0.02	<0.01	0.020	<0.01	<0.01	<0.003	0.010
8	0.010	0.012	<0.01	0.030	<0.02	<0.01	0.020	<0.01	<0.01	<0.003	<0.01
9	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	<0.01	0.005	<0.01
10	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	<0.01	0.005	0.010
11	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.020	<0.01	<0.01	0.005	<0.01
12	<0.01	<0.005	<0.01	<0.01	<0.02	<0.01	0.010	<0.01	<0.01	0.008	0.010
Mean	0.010	0.013		0.027			0.022	0.010		0.005	0.010
Median	0.010	0.013		0.030			0.020	0.010		0.005	0.010
Std.Dev.	0.000	0.001		0.015			0.007			0.002	0.000
Rel.Std.Dev.	0.00%	4.56%		57.28%			33.13%			38.32%	0.00%
PDM[3]	-9.67%	14.42%		140%			95.71%	-9.67%		-54.77%	-9.67%