

Certification Report

Certified Reference Material

BAM-M109/109a

Refined Lead

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Summary

This report describes preparation, analysis and certification of the lead reference materials BAM-M109 and BAM-M109a.

The certified reference materials (CRM) are available in the form of discs (ca. 40 mm diameter and 40 mm height). They are intended for establishing and checking the calibration of optical emission for the analysis of samples of similar matrix composition. They are also suitable for wet chemical analysis.

The following mass fractions and uncertainties have been certified:

BAM-M109

Element	Mass fraction¹⁾ in %	Uncertainty²⁾ in %
As	0.0113	0.0006
Bi	0.0193	0.0006
Sb	0.0098	0.0003
Sn	0.115	0.004
	in mg/kg	in mg/kg
Ag	45.1	1.0
Cd	35.3	0.9
Cu	19.6	0.7
Ni	3.5	0.3
Te	30.6	1.5
Tl	3.0	0.5
Zn	31.8	2.1

BAM-M109a

Element	Mass fraction¹⁾ in %	Uncertainty²⁾ in %
As	0.0116	0.0006
Bi	0.0198	0.0005
Sb	0.0098	0.0006
Sn	0.119	0.009
	in mg/kg	in mg/kg
Ag	45.7	2.1
Cd	36.0	0.9
Cu	19.5	0.9
Ni	3.7	0.7
Te	30.5	1.8
Tl	3.3	0.7
Zn	35	4

- 1 Unweighted mean value of the means of accepted sets of data, each set being obtained by at least 5 laboratories and/or with different methods of measurement. The values are traceable to the SI (Système International d'Unités) by the use of pure substances of known stoichiometry for calibration.
- 2 Estimated expanded uncertainty U with a coverage factor of $k = 2$ corresponding to a level of confidence of about 95%, as defined in the ISO/IEC Guide 98-3:2008 [Uncertainty of measurement -- Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)].

This report contains detailed information on the preparation of the CRMs as well as on homogeneity investigations and on the analytical methods used for certification analysis.

The certified values are based on the results of eleven laboratories which participated in the certification inter-laboratory comparison.

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List of abbreviations

(if not explained elsewhere)

CRM	certified reference material
ETAAS	electrothermal atomic absorption spectrometry
FAAS	flame atomic absorption spectrometry
ICP-OES	inductively coupled plasma optical emission spectrometry
ICP-MS	inductively coupled plasma mass spectrometry
SOES	spark optical emission spectrometry
M	mean value
n	number of accepted data sets
s	standard deviation of an individual data set
S_M	standard deviation of laboratory means
S_{rel}	relative standard deviation
\bar{s}_i	square root of mean of variances of data sets under repeatability conditions
M_i	single result
I	ICP-OES (Tables 3 – 24)
I(R)	ICP-OES, revised value (Tables 3 – 24)
IMS	ICP-MS (Tables 3 – 24)
A	FAAS (Tables 3 – 24)
EA	ETAAS (Tables 3 – 24)

1. Introduction

In the metal-producing and metal-working industry mainly spark emission spectrometry (SOES) is used for reception inspection of raw materials, e.g. scrap, for quality control of end products and production control. This time-saving analytical technique requires suitable reference materials for calibration and recalibration. The certified reference materials BAM-M109/109a are based on refined lead and will replace BCR-288.

The idea to produce a succeeding reference material for BCR-288 was the outcome of the discussions within the working group „Lead“ of the Committee of Chemists within the Society of Metallurgists and Miners (GDMB). The needs are defined by this working group, since the members are potential users of the prepared CRMs. Participating laboratories were recruited from this group. Since all of these laboratories are highly experienced with lead analysis and had participated in earlier interlaboratory comparisons, there was no preceding round robin test for qualification necessary.

Certification was carried out on the basis of the relevant ISO-Guides [1-3], the „Guidelines for the development and production of BAM Reference Materials“ [4].

2. Companies/laboratories involved

Manufacturing of the material:

- SUS Nell, Oberhausen, Germany

Test for homogeneity:

- Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany
- SUS Nell, Oberhausen, Germany

Participants in the certification inter-laboratory comparison:

- Aurubis AG, Hamburg, Germany
- Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany
- Berzelius Stolberg, Stolberg, Germany
- Hoppecke Batterien GmbH & Co. KG, Brilon-Hoppecke, Germany
- Johnson Controls Sachsen-Batterien GmbH & Co. KG, Zwickau, Germany
- Johnson Controls, VB Autobatterie GmbH & Co. KGaA, Hannover, Germany
- Muldenhütten Recycling und Umwelttechnik GmbH, Freiberg, Germany
- Recyclex Harz-Metall GmbH, Goslar, Germany
- TAB-IPM d.o.o., Žerjav, Slovenia
- ThyssenKrupp Steel Europe, Duisburg, Germany
- WESER METALL GmbH, Nordenham, Germany

Statistical evaluation of the data:

- Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany

3. Candidate material

A refined lead was used as basic material for the preparation of the candidate material. This material was milled, melted and doped with the desired impurities by SUS Nell, Oberhausen.

From the melt rods with a length of 330 mm and a diameter of 50 mm were casted. in total 63 rods were casted each giving 10 discs with a diameter of ca. 40 mm and 40 mm height (in total 630 discs). A preliminary homogeneity test showed that the three batches differ slightly in the Sn- and Zn-content. Therefore, 22 rods were summarised to one batch which became BAM-M109 (Rods R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM) and another 17 rods were summarised to another batch which became BAM-M109a (Rods A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q).

In total, 220 discs of BAM-M109 and 170 discs of BAM-M109a with a diameter of ca. 40 mm and 40 mm height were obtained. The remaining discs from the third batch were not used.

4. Homogeneity testing

Possible reasons for an inhomogeneous distribution of elements in the raw material may be a change of the composition of the melt during the casting procedure because some elements may volatize or because of possible segregation during the solidification of the material. Since the raw material was produced by casting of a rod, concentration gradients can occur over the length of the rod (axial) as well as over the area of the rod (radial, see Figures 1 and 2):

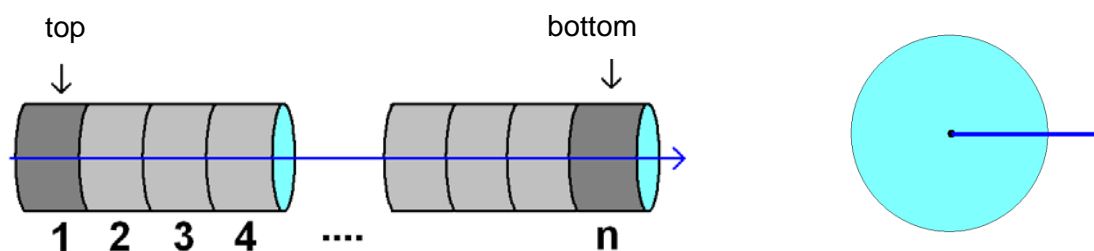


Fig. 2: Axial and radial composition gradient

Therefore, it is necessary to investigate the raw material for both axial and radial inhomogeneities. Radial as well as axial homogeneity testing of the candidate materials using spark emission spectrometry was performed at BAM. In total 40 discs of BAM-M109 and 13 discs of BAM-M109a were investigated.

Tab. 1a: Discs analysed for homogeneity testing of BAM-M109 (SOES), axial

R1	U4	X2	Z6	AB3	AD3	AF1	AH4	AJ3	AL1
R4	U7	X7	Z10	AB9	AD10	AF6	AH9	AJ9	AL7
T3	W6	Y1	AA4	AC2	AE2	AG1	AI4	AK3	AM7
T9	W8	Y3	AA7	AC6	AE8	AG3	AI7	AK6	AM10

Tab. 1b: Discs analysed for homogeneity testing of BAM-M109a (SOES), axial

J1	L8	N7	O1	P3	Q4
J8	M4	N10	O8	P9	Q10
K5					

The estimate of analyte-specific inhomogeneity contribution u_{bb} to be included into the total uncertainty budget was calculated according to ISO Guide 35 [4] using Eq. (1) and Eq. (2):

$$s_{bb} = \sqrt{\frac{MS_{among} - MS_{within}}{n}} \quad (1)$$

$$u_{bb}^* = \sqrt{\frac{MS_{within}}{n}} \sqrt[4]{\frac{2}{N(n-1)}} \quad (2)$$

where:

- MS_{among} mean of squared deviations between discs (from 1-way ANOVA, see Annex 1)
- MS_{within} mean of squared deviations within one disc (from 1-way ANOVA)
- n number of replicate measurements per disc
- N number of discs selected for homogeneity study

s_{bb} signifies the between-discs standard deviation whereas u_{bb}^* denotes the maximum heterogeneity that can potentially be hidden by an insufficient repeatability of the applied measurement method (which has to be considered as the minimum uncertainty contribution). In any case the larger of the two values was used as $u_{bb}(1)$. Eq. (1) does not apply if MS_{within} is larger than MS_{among} .

In addition to the tests performed over the length of the rods two discs were tested for homogeneity over the area (possible segregation from the outer part to the centre). To perform this test SOES analysis was carried out in circles (outer circle: 8 sparks, inner circle: 8 sparks; centre: 1 spark). This was performed five times on different days.

The analyte-specific within-disc uncertainty component $u_{bb}(2)$ was calculated in the same way as for the total batch. To calculate the necessary data an unbalanced ANOVA was carried out considering that the number of single measurements is different for the centre, the inner and the outer circle. For technical reasons, at r_0 (centre) only one measurement is possible. An ANOVA requires a minimum of two measurements per factor value. Thus, the value for r_0 should be replaced by a dummy. This dummy is defined as follows:

The two values replacing the one measured have a mean equal to the value measured, and a standard deviation equal to the average within-variation. This resembles the situation where one could take two independent measurements at the same place, with values deviating by the average standard deviation (non-destructive testing method). A first guess for the average standard deviation may be calculated from the data for r_in (inner circle), r_mean (mean circle) and r_out (outer circle). As results from these calculations an inhomogeneity component for the radius of the disc is obtained. From these values, a combined inhomogeneity component is calculated. This component is compared with the within standard deviation calculated from the ANOVA-data. The higher component is used for the uncertainty calculation. For uncertainty calculation the mean of five runs was used.

The results of the calculations are given in the annex.

5. Characterisation study

5.1 Analytical methods

Eleven laboratories participated in the certification inter-laboratory comparison. For some elements part of the laboratories used more than one analytical method reporting more than one data set. The laboratories were asked to analyse six subsamples. They were free to choose any suitable analytical method. Table 2 shows the analytical methods used by the participating laboratories.

For all analytical methods where a calibration was necessary this calibration was performed using liquid standard solutions. All participating laboratories were asked to use only standard solutions prepared from pure metals or stoichiometric compounds or well checked commercial calibration solutions.

Table 2: Analytical procedures used by the participating laboratories

Lab-No.	Element.	Sample mass	Sample pretreatment	Analytical method
1	As, Bi, Sn, Sb, Ag, Cd, Cu, Ni, Te, Tl, Zn	2 g	Dissolution with tartaric acid/HNO ₃ (acc. prEN 13800),	ICP-OES, calibration with commercial solutions (Spex certified)
2	As, Bi, Sn, Sb, Tl, Zn	2 g	Dissolution with tartaric acid/HNO ₃ (acc. prEN 13800)	ICP-OES with matrix matched standards, calibration with monoelemental solutions
	Ag, Cd, Cu, Ni, Te	2 g	Dissolution with tartaric acid/HNO ₃ (acc. prEN 13800)	ICP-OES with matrix matched standards, calibration with monoelemental solutions, prepared from pure metals or substances
	Te, Cd, Cu, Ni	1 g	Dissolution with HNO ₃ /HF	ETAAS, calibration with monoelemental solutions
	Sn	1 g	Dissolution with HNO ₃ /HF	FAAS, calibration with monoelemental solution
3	As, Bi, Sn, Sb, Ag, Cd, Cu, Ni, Te, Tl, Zn	0.5 g	Dissolution with HNO ₃ /HF	ICP-OES, with matrix matched standards, calibration with commercial solutions (NIST traceable)
4	As, Bi, Ag, Cd, Cu, Ni, Te, Tl, Zn	2 g	Dissolution with tartaric acid/HNO ₃ (acc. prEN 13800) Precipitation of Pb as sulfate	ICP-OES, calibration with commercial solutions (Merck certipur)
	Sb, Sn	1 g	Dissolution with tartaric acid/HNO ₃ (acc. prEN 13800)	ICP-OES, calibration with commercial solutions (Merck certipur)
5	As, Bi, Sn, Sb, Ag, Al, Cd, Cu, In, Ni, Te, Tl, Zn	2 g	Dissolution with tartaric acid/HNO ₃ (acc. prEN 13800)	ICP-OES with matrix matched standards, commercial mono-element solutions (Merck)
6	As, Bi, Sn, Sb, Ag, Al, Cd, Cu, Ni, Te, Tl, Zn	2 g	Dissolution with tartaric acid/HNO ₃	ICP-OES with matrix matched standards, calibration with commercial solutions (Kraft)
7	As, Bi, Ag, Al, Cd, Cu, Ni, Te, Tl, Zn	2 g	Dissolution with tartaric acid/HNO ₃	ICP-OES with matrix matched standards, calibration with commercial solutions (Merck, Kraft)
	Sn, Sb	2 g	Dissolution with tartaric acid/HNO ₃	ICP-OES, calibration with commercial solutions (Merck, Kraft)

Table 2 (cont.): Analytical procedures used by the participating laboratories

Lab-No.	Element.	Sample mass	Sample pretreatment	Analytical method
8	As, Bi, Sn, Sb, Al, Cd, Cu, Ni, Te, Tl, Zn	2.5 g	Dissolution with tartaric acid/HNO ₃	ICP-OES with matrix matched standards, calibration with mono-elemental solutions, prepared from pure metals
	Ag	2.5 g	Dissolution with tartaric acid/HNO ₃	FAAS with matrix matched standards, calibration with mono-elemental solutions, prepared from pure metals
9	As, Bi, Sn, Al, Cd, Cu, Ni, Te, Zn	2 g	Dissolution with HNO ₃	ICP-OES with matrix matched standards, commercial mono-element solutions
	Sb	0.1 g	Dissolution with HNO ₃	ICP-OES with matrix matched standards, calibration with mono-elemental solutions, prepared from pure metals
	Ag	2 g	Dissolution with HNO ₃	FAAS with matrix matched standards, commercial mono-element solutions
10	As, Bi, Sn, Sb, Ag, Al, Cd, Cu, In, Ni, Te, Zn	1 g	Dissolution with HNO ₃ /Tetraborate fusion	ICP-OES with matrix matched standards, commercial mono-element solutions
	Sn	1 g	Dissolution with HNO ₃ /Tetraborate fusion	ICP-OES with matrix matched standards, calibration with mono-elemental solutions, prepared from pure metal
	Tl	1 g	Dissolution with HNO ₃ /Tetraborate fusion	ICP-MS with matrix matched standards, commercial mono-element solutions
12	As, Bi, Sn, Sb, Ag, Al, Cd, Cu, In, Ni, Te, Zn	5 g	Dissolution with tartaric acid/HNO ₃ /HCl	ICP-OES, calibration with commercial solutions (J.T. Baker, Carlo Erba)

5.2 Analytical results and statistical evaluation

The analytical results of the certification inter-laboratory comparison are listed in Tables 3 to 24. These tables show the single results (M_i) of each laboratory, the respective laboratories' mean values (M), absolute and relative intra-laboratory standard deviation (s and s_{rel} , respectively), the standard deviation of laboratory means (s_M), and in addition the square root of mean of variances of data sets under repeatability conditions (\bar{s}_1) where n is the number of accepted data sets. The continuous line marks the certified value (mean of the laboratories' means), the broken lines mark the standard deviation, calculated from the laboratories' means.

In the related figures for each laboratory its mean value and single standard deviation is given. Outliers which have been excluded are highlighted in yellow.

Table 3: Results for As in BAM-M109

Lab./Meth.	4/I	10/I	12/I	8/I(R)	3/I(R)	5/I	2/I	7/I	1/I	9/I	6/I		
M_i [%]	0.0106	0.0106	0.0101	0.0112	0.0112	0.0111	0.0116	0.0116	0.011	0.0120	0.013		n 11
	0.0109	0.0109	0.0101	0.0112	0.0105	0.0108	0.0117	0.0117	0.012	0.0118	0.012		
	0.0107	0.0106	0.0109	0.0105	0.0110	0.0113	0.0117	0.0118	0.012	0.0120	0.012		
	0.0108	0.0107	0.0112	0.0111	0.0112	0.0114	0.0117	0.0117	0.012	0.0122	0.012		
	0.0104	0.0107	0.0113	0.0110	0.0112	0.0113	0.0116	0.0118	0.012	0.0116	0.012		
	0.0105	0.0109	0.0110	0.0111	0.0113	0.0114	0.0117	0.0118	0.012	0.0118	0.012		
M [%]	0.0107	0.0107	0.0108	0.0110	0.0110	0.0112	0.0117	0.0117	0.0118	0.0119	0.0122		0.0113
s [%]	0.0002	0.0001	0.0005	0.0003	0.0003	0.0002	0.0000	0.0001	0.0004	0.0002	0.0004	s_M [%]	0.00054
s_{rel}	0.018	0.011	0.049	0.024	0.027	0.021	0.004	0.006	0.034	0.018	0.034	\bar{s}_i [%]	0.00029
													0.04751

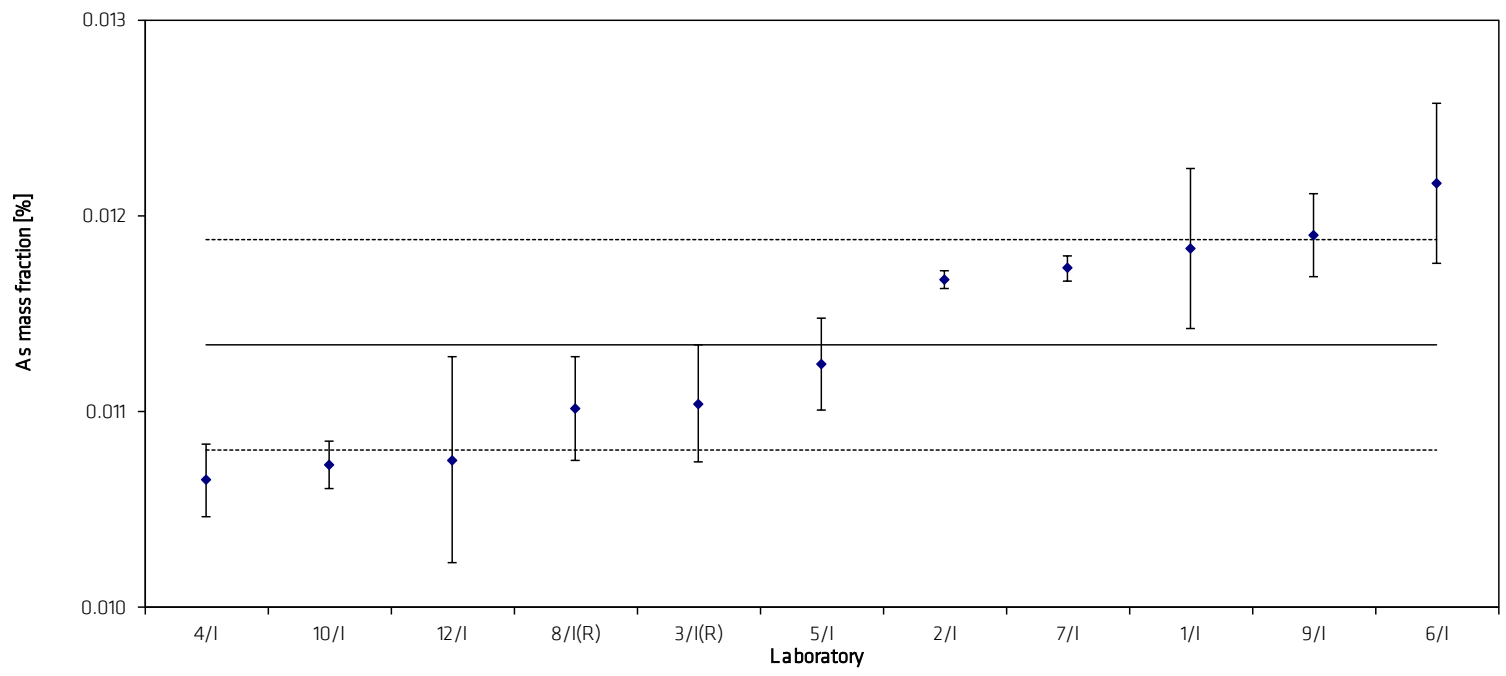


Table 4: Results for Bi in BAM-M109

Lab./Meth.	12/l	4/l	8/l(R)	1/l	5/l	2/l	3/l	9/l	6/l	7/l	10/l		
M_i [%]	0.0168	0.0191	0.0188	0.019	0.0191	0.0193	0.0199	0.0196	0.0210	0.0201	0.0205		n 11
	0.0165	0.0185	0.0187	0.019	0.0186	0.0193	0.0198	0.0193	0.0198	0.0202	0.0205		
	0.0181	0.0181	0.0176	0.019	0.0193	0.0193	0.0197	0.0196	0.0198	0.0202	0.0208		
	0.0179	0.0176	0.0186	0.019	0.0193	0.0193	0.0195	0.0199	0.0195	0.0206	0.0210		
	0.0181	0.0178	0.0185	0.019	0.0192	0.0193	0.0197	0.0205	0.0198	0.0206	0.0208		
	0.0180	0.0184	0.0186	0.019	0.0192	0.0193	0.0193	0.0203	0.0199	0.0206	0.0206		
M [%]	0.0176	0.0182	0.0185	0.0190	0.0191	0.0193	0.0197	0.0199	0.0200	0.0204	0.0207		0.0193
s [%]	0.0007	0.0005	0.0004	0.0000	0.0003	0.0000	0.0002	0.0005	0.0005	0.0002	0.0002	s_M [%]	0.00094
s_{rel}	0.041	0.029	0.024	0.000	0.014	0.002	0.011	0.023	0.026	0.012	0.009	\bar{s}_i [%]	0.00039
													0.04896

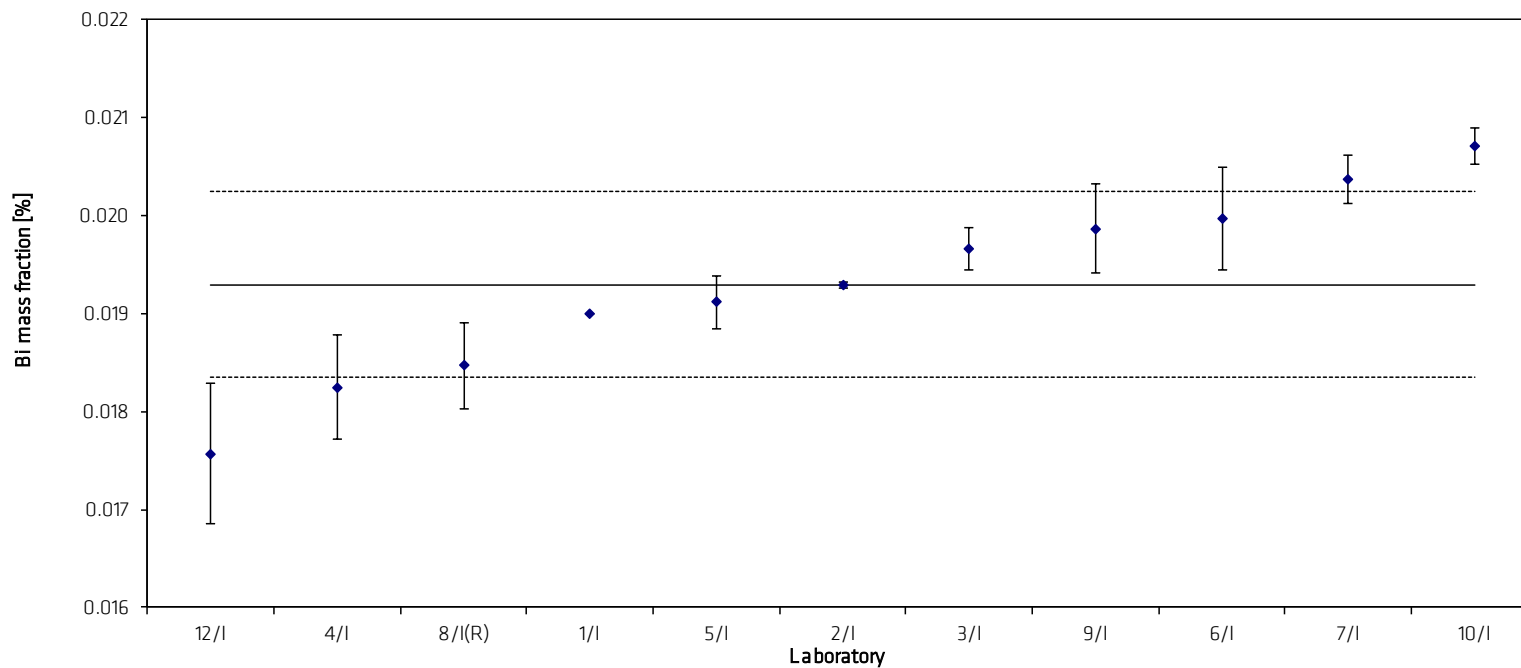


Table 5: Results for Sb in BAM-M109

Lab./Meth.	12/I	10/I	3/I	6/I	8/I(R)	4/I(R)	7/I	1/I	5/I(R)	9/I	2/I		
M_i [%]	0.0088	0.0098	0.0095	0.0101	0.0099	0.0095	0.0095	0.01	0.0101	0.0101	0.0104		n 11
	0.0089	0.0094	0.0095	0.0095	0.0099	0.0098	0.0096	0.01	0.0101	0.0105	0.0104		
	0.0096	0.0089	0.0094	0.0096	0.0093	0.0099	0.0096	0.01	0.0101	0.0102	0.0104		
	0.0096	0.0098	0.0095	0.0094	0.0098	0.0099	0.0099	0.01	0.0101	0.0104	0.0104		
	0.0099	0.0093	0.0097	0.0096	0.0098	0.0097	0.0100	0.01	0.0101	0.0102	0.0103		
	0.0093	0.0093	0.0095	0.0096	0.0097	0.0096	0.0100	0.01	0.0101	0.0105	0.0103		
M [%]	0.0093	0.0094	0.0095	0.0096	0.0097	0.0097	0.0098	0.0100	0.0101	0.0103	0.0104		0.0098
s [%]	0.0004	0.0004	0.0001	0.0002	0.0002	0.0002	0.0002	0.0000	0.0000	0.0002	0.0000	s_M [%]	0.00034
s_{rel}	0.046	0.037	0.009	0.024	0.023	0.017	0.022	0.000	0.002	0.017	0.003	\bar{s}_i [%]	0.00022
													0.03485

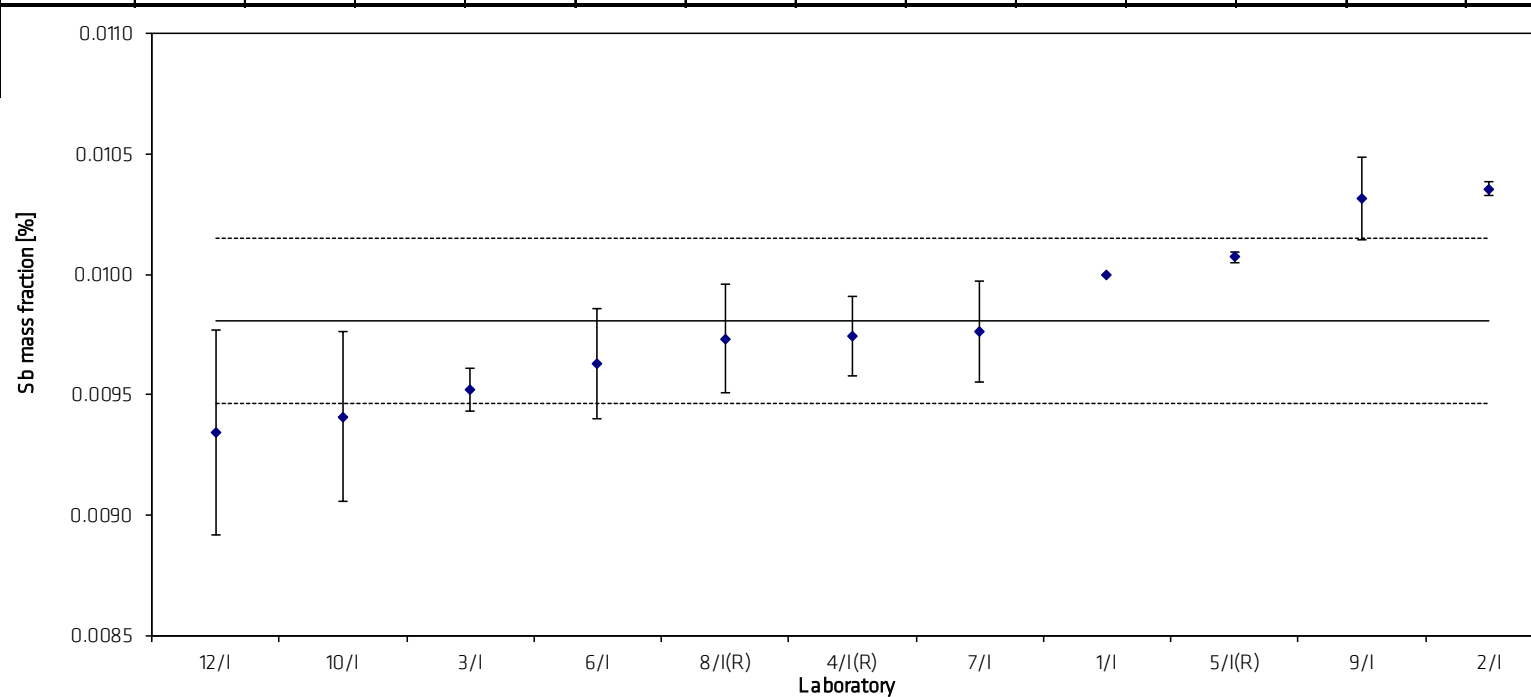


Table 6: Results for Sn in BAM-M109

Lab./Meth.	6/I(R)	12/I	9/I	8/I(R)	10/I	2/A	3/I	2/I	5/I(R)	7/I(R)	1/I	4/I(R)		
M_i [%]	0.1021	0.111	0.113	0.1153	0.1158	0.1130	0.1156	0.1152	0.1190	0.1189	0.1170	0.1218		n 12
	0.1026	0.110	0.111	0.1151	0.1117	0.1130	0.1144	0.1159	0.1168	0.1191	0.1190	0.1242		
	0.1072	0.111	0.110	0.1097	0.1105	0.1140	0.1138	0.1156	0.1158	0.1186	0.1180	0.1261		
	0.1079	0.109	0.114	0.1134	0.1132	0.1150	0.1131	0.1151	0.1186	0.1181	0.1210	0.1259		
	0.1063	0.108	0.112	0.1129	0.1165	0.1140	0.1144	0.1150	0.1167	0.1184	0.1210	0.1254		
	0.1072	0.112	0.112	0.1136	0.1148	0.1140	0.1121	0.1163	0.1152	0.1182	0.1200	0.1237		
M [%]	0.106	0.110	0.112	0.113	0.114	0.114	0.114	0.116	0.117	0.119	0.119	0.125		0.115
s [%]	0.0025	0.0017	0.0014	0.0020	0.0024	0.0008	0.0012	0.0005	0.0015	0.0004	0.0016	0.0016	s_M [%]	0.0048
s_{rel}	0.024	0.015	0.013	0.018	0.021	0.007	0.011	0.004	0.013	0.003	0.014	0.013	\bar{s}_i [%]	0.0016
														0.04175

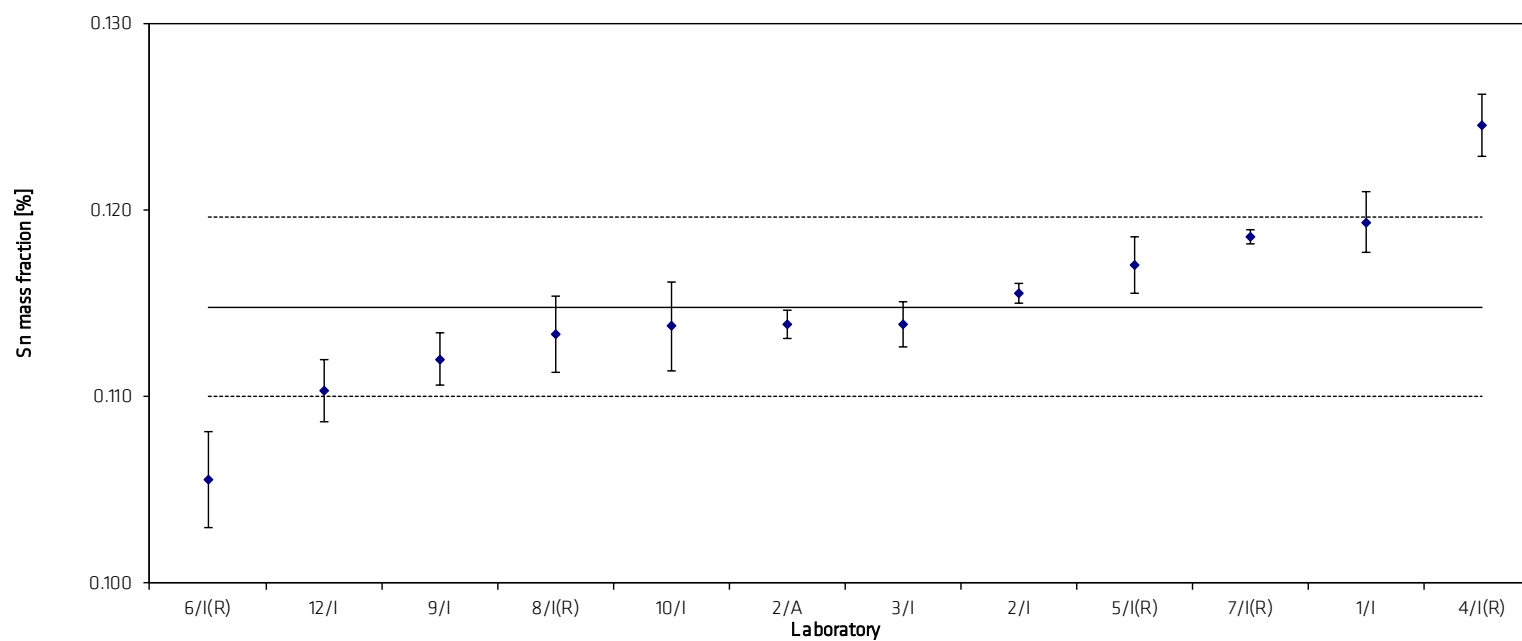


Table 7: Results for Ag in BAM-M109

Lab./Meth.	6/I	8/A(R)	1/I	7/I	2/I	3/I	5/I(R)	10/I	9/A		
M_i [mg/kg]	43.90	43	44.3	44.3	44.7	43.9	45.2	45.9	47		n
	44.00	45	44.7	44.6	44.9	45.2	44.8	46.0	47		9
	44.09	44	44.4	44.4	44.8	45.2	45.0	45.9	46		
	43.30	45	44.9	45.0	44.9	45.0	45.2	46.6	47		
	44.10	45	44.6	45.1	44.8	45.9	45.3	46.2	46		
	43.84	45	45.0	44.8	45.3	44.9	45.0	46.0	47		
M [mg/kg]	43.87	44.50	44.65	44.70	44.90	44.99	45.09	46.09	46.67		45.05
s [mg/kg]	0.298	0.837	0.274	0.322	0.210	0.634	0.170	0.245	0.516	s_M [mg/kg]	0.844
s_{rel}	0.007	0.019	0.006	0.007	0.005	0.014	0.004	0.005	0.011	\bar{s}_i [mg/kg]	0.443

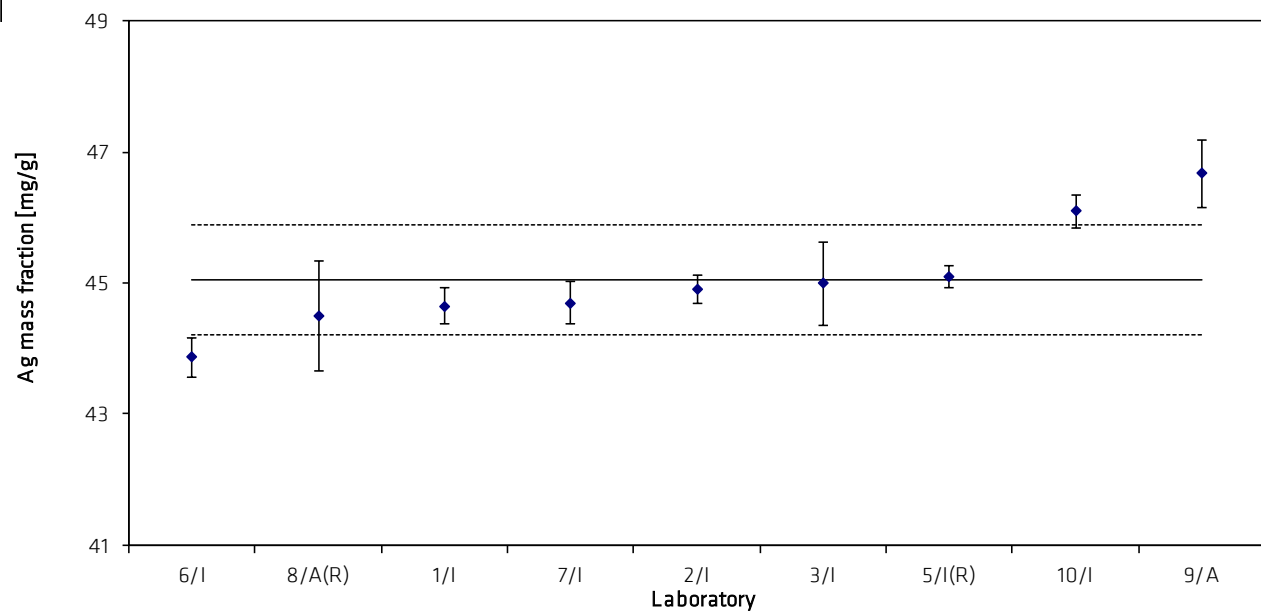


Table 8: Results for Cd in BAM-M109

Lab./Meth.	4/I	12/I	8/I(R)	3/I	1/I	5/I	10/I	2/I	9/I	2/EA	7/I	6/I		
M_i [mg/kg]	34.1	31.6	35.0	35.07	35.1	35.3	34.9	35.3	36.9	37.11	35.9	37.8		n
	33.6	32.5	35.0	34.70	35.2	33.4	35.2	35.6	36.1	36.43	36.1	36.5		12
	32.9	34.9	34.0	35.27	35.0	35.5	35.3	36.3	35.2	35.47	36.0	36.7		
	33.6	35.3	35.0	34.93	35.0	35.8	36.1	35.4	35.0	35.80	36.5	36.1		
	33.3	36.3	35.0	35.47	35.2	35.4	35.7	35.4	35.3	34.63	36.3	36.9		
	33.2	36.1	34.0	34.87	35.1	35.6	35.5	35.6	35.3	34.43	36.2	37.0		
M [mg/kg]	33.44	34.45	34.67	35.05	35.10	35.17	35.44	35.60	35.63	35.65	36.17	36.81		35.26
s [mg/kg]	0.403	1.952	0.516	0.279	0.089	0.887	0.409	0.363	0.726	1.032	0.216	0.586	s_M [mg/kg]	0.857
s_{rel}	0.012	0.057	0.015	0.008	0.003	0.025	0.012	0.010	0.020	0.029	0.006	0.016	\bar{s}_i [mg/kg]	0.785
														0.024

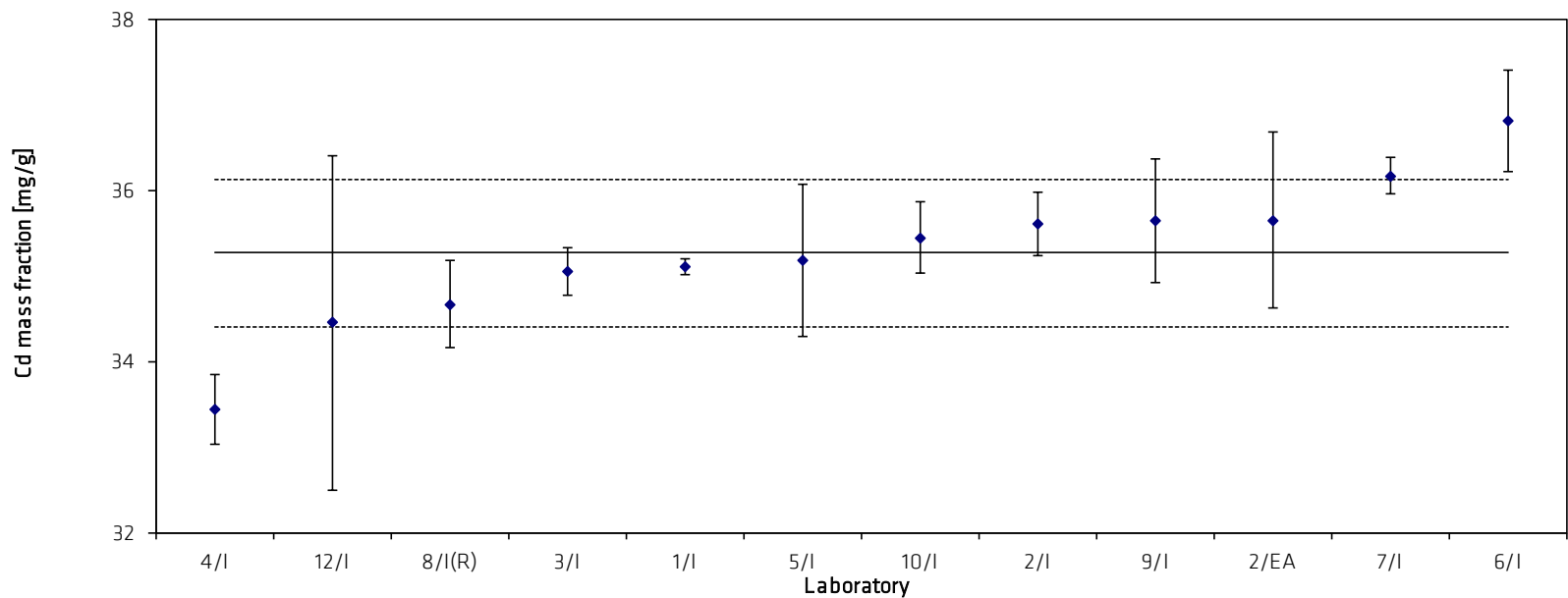


Table 9: Results for Cu in BAM-M109

Lab./Meth.	7/I	12/I	4/I	8/I(R)	6/I	5/I	2/EA	2/I	1/I	3/I	10/I	9/I(R)		
M_i [mg/kg]	18.2	18.5	19.17	19.0	18.9	19.5	20.3	19.8	20.0	20.8	20.8	19.9		n
	18.5	18.2	18.88	19.0	19.0	19.2	20.0	20.3	20.0	20.3	20.6	21.1		12
	18.4	19.0	18.42	19.0	19.0	19.6	19.4	19.8	19.9	20.4	20.9	21.4		
	18.6	18.7	18.95	19.0	18.5	19.5	19.6	19.8	20.0	20.1	21.2	21.6		
	18.5	18.8	18.74	19.0	18.9	19.2	20.1	19.7	20.1	19.2	20.9			
	18.5	18.4	18.70	18.0	19.0	19.4	20.0	19.9	20.2	20.6	21.2			
M [mg/kg]	18.45	18.61	18.81	18.83	18.88	19.40	19.87	19.88	20.03	20.25	20.93	21.00		19.58
s [mg/kg]	0.138	0.295	0.253	0.408	0.182	0.158	0.352	0.214	0.103	0.550	0.236	0.762	s_M [mg/kg]	0.882
s_{rel}	0.007	0.016	0.013	0.022	0.010	0.008	0.018	0.011	0.005	0.027	0.011	0.036	\bar{s}_i [mg/kg]	0.355
														0.045

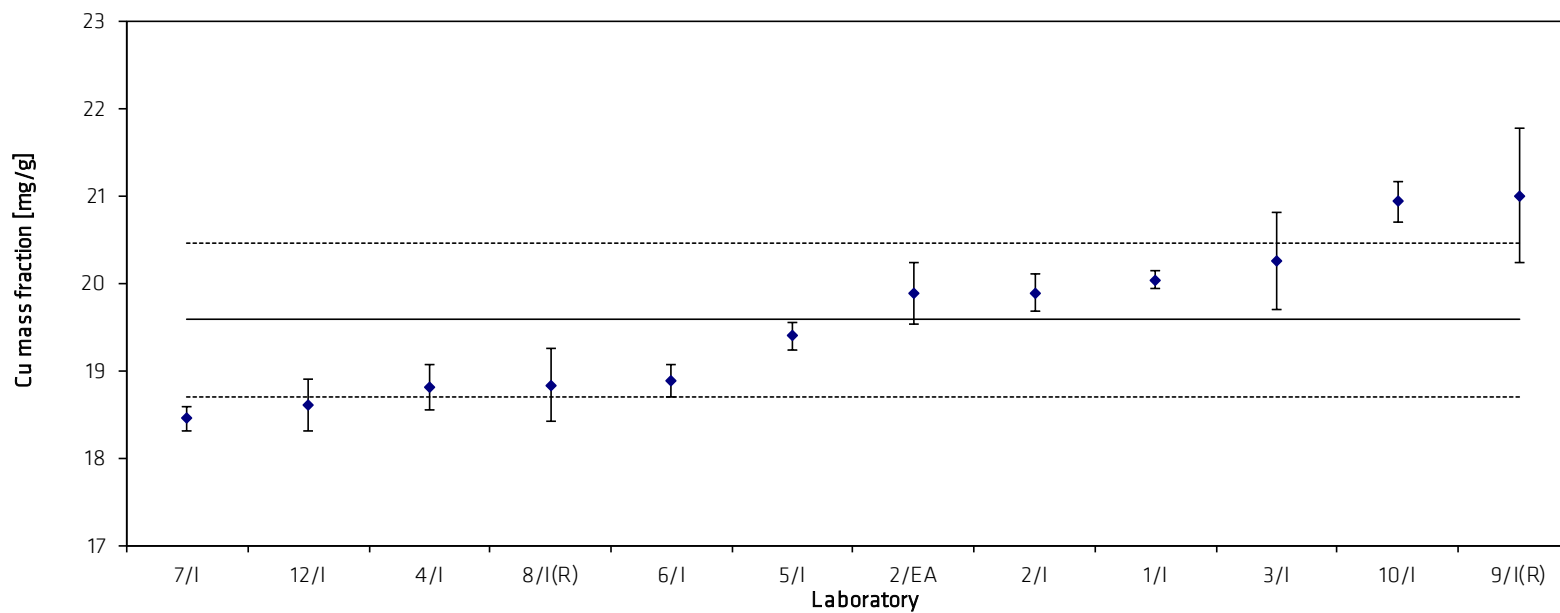


Table 10: Results for Ni in BAM-M109

Lab./Meth.	4/I	8/I(R)	7/I	5/I	12/I	9/I	2/I	6/I	2/EA	3/I(R)	10/I	1/I		
M_i [mg/kg]	3.1	3	3.1	3.3	3.1	3.6	3.3	3.5	3.77	4.0	4.1	3.8		n 12
	2.9	3	3.0	3.2	3.2	3.6	3.3	3.5	3.70	3.9	3.9	3.7		
	2.9	3	3.0	3.3	3.3	2.9	3.4	3.6	3.82	3.9	4.6	3.6		
	3.0	3	3.0	3.4	3.4	3.5	3.4	3.4	3.81	3.9	3.6	3.6		
	2.9	3	3.1	3.4	3.4	3.4	3.4	3.4	3.85	3.7	4.4	5.2		
	3.0	3	3.0	3.3	3.4	3.4	3.0	3.4	3.88	4.0	3.4	4.8		
M [mg/kg]	2.97	3.00	3.02	3.30	3.31	3.33	3.36	3.49	3.81	3.90	4.01	4.12		3.47
s [mg/kg]	0.053	0.000	0.040	0.102	0.131	0.308	0.023	0.078	0.063	0.110	0.456	0.700	s_M [mg/kg]	0.400
s_{rel}	0.018	0.000	0.013	0.031	0.040	0.092	0.007	0.022	0.017	0.028	0.114	0.170	\bar{s}_i [mg/kg]	0.266
														0.115

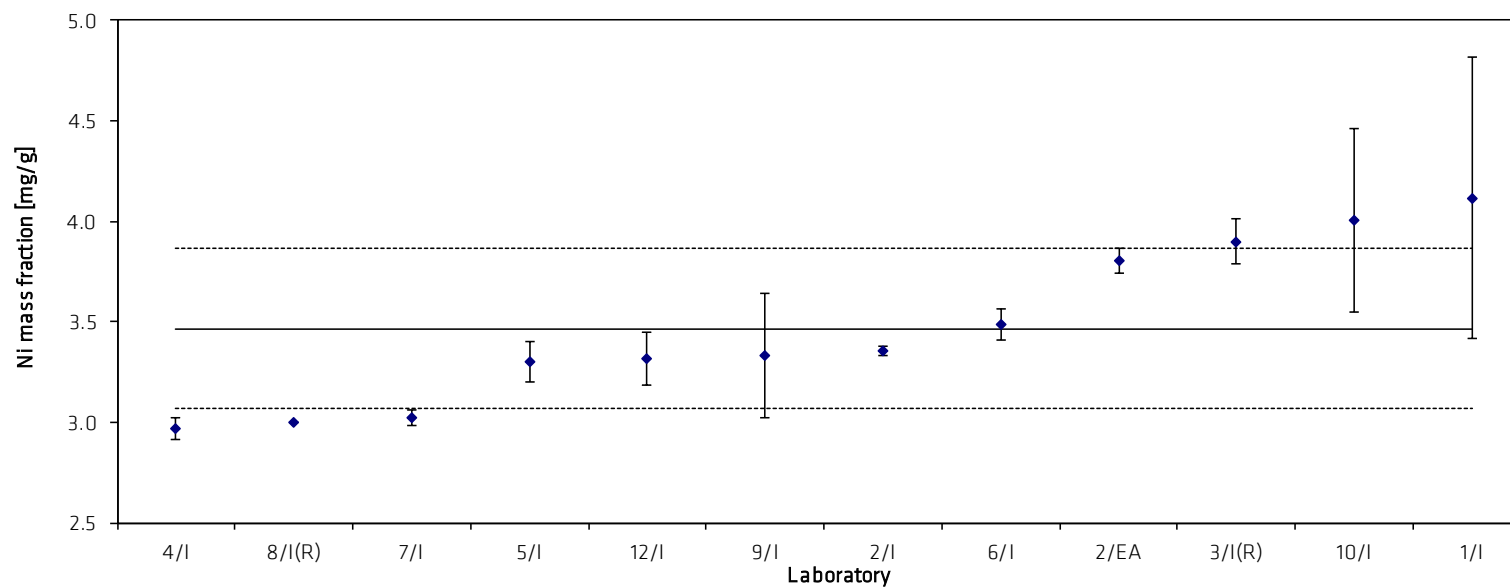


Table 11: Results for Te in BAM-M109

Lab./Meth.	12/I	10/I	3/I	8/I(R)	5/I	9/I	1/I	6/I	2/I	7/I	4/I	2/EA		
M_i [mg/kg]	24.2	28.2	29.5	30	29.76	29.6	30.6	31.7	31.0	31.1	33.5	34,47		n
	24.2	27.7	28.7	30	28.64	29.3	30.0	30.3	30.8	31.3	32.8	33.66		11
	25.9	28.4	29.1	28	29.96	30.9	30.0	30.5	30.9	31.2	31.7	33.45		
	25.1	28.3	30.1	30	29.99	30.9	30.5	29.7	30.4	31.3	32.0	33.14		
	25.8	28.4	29.8	30	29.91	30.4	30.6	30.3	30.5	31.3	31.7	34.40		
	24.9	30.5	29.4	30	29.99	31.1	30.7	30.4	31.2	31.8	31.5	33.92		
M [mg/kg]	25.02	28.58	29.40	29.67	29.71	30.37	30.40	30.48	30.80	31.33	32.19	33.71		30.60
s [mg/kg]	0.719	0.972	0.498	0.816	0.530	0.753	0.316	0.631	0.303	0.242	0.788	0.478	s_M [mg/kg]	1.418
s_{rel}	0.029	0.034	0.017	0.028	0.018	0.025	0.010	0.021	0.010	0.008	0.024	0.014	\bar{s}_i [mg/kg]	0.618
														0.046

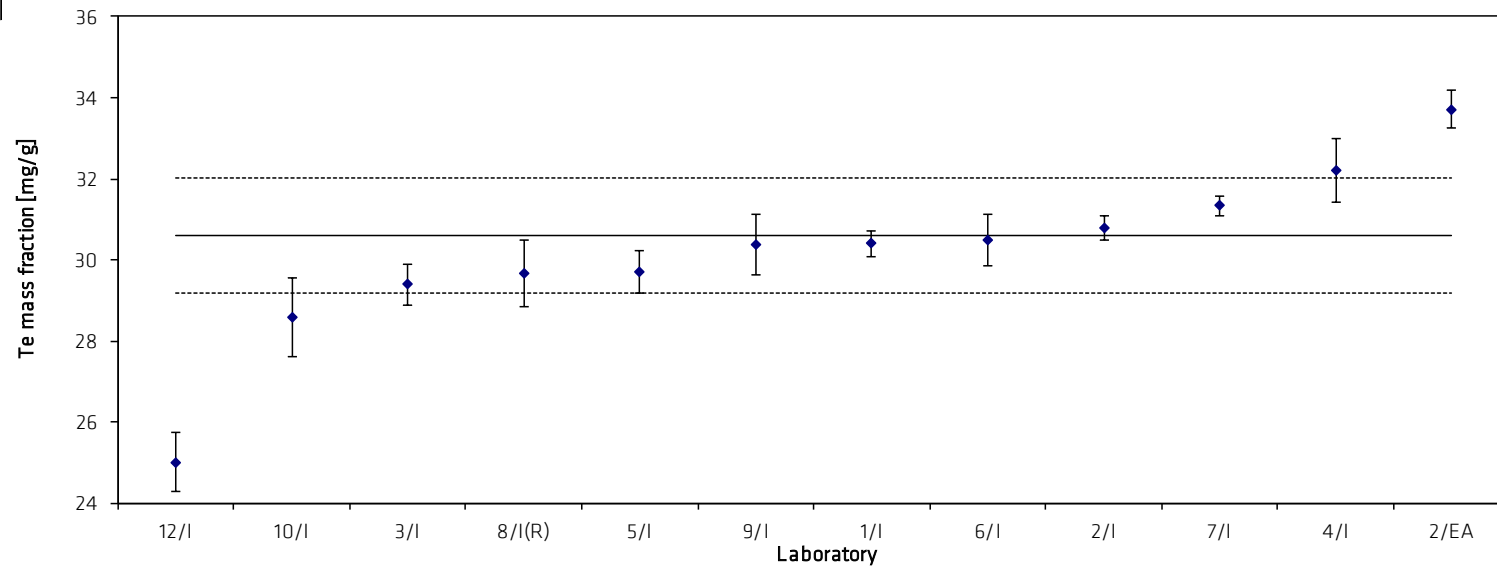


Table 12: Results for TI in BAM-M109

Lab./Meth.	5/I	2/I	7/I	1/I	3/I	2/EA	10/IMS	12/I		
M_i [mg/kg]	2.2	2.7	2.80	3	3.7	3.52	3.5	3.3		n
	2.1	2.5	1.86	3	3.0	3.29	3.3	3.9		8
	2.0	2.5	1.87	3	3.3	3.02	3.6	4.2		
	2.2	2.5	3.27	3	3.1	3.68	3.5	4.0		
	2.2	2.5	2.61	3	2.9	3.48	3.5	3.7		
	2.0	2.4	2.76	3	3.4	3.80	3.7	4.1		
M [mg/kg]	2.12	2.51	2.53	3.00	3.22	3.47	3.50	3.86		3.03
s [mg/kg]	0.092	0.109	0.559	0.000	0.293	0.279	0.111	0.318	s_M [mg/kg]	0.598
s_{rel}	0.044	0.043	0.221	0.000	0.091	0.080	0.032	0.082	\bar{s}_i [mg/kg]	0.276
										0.198

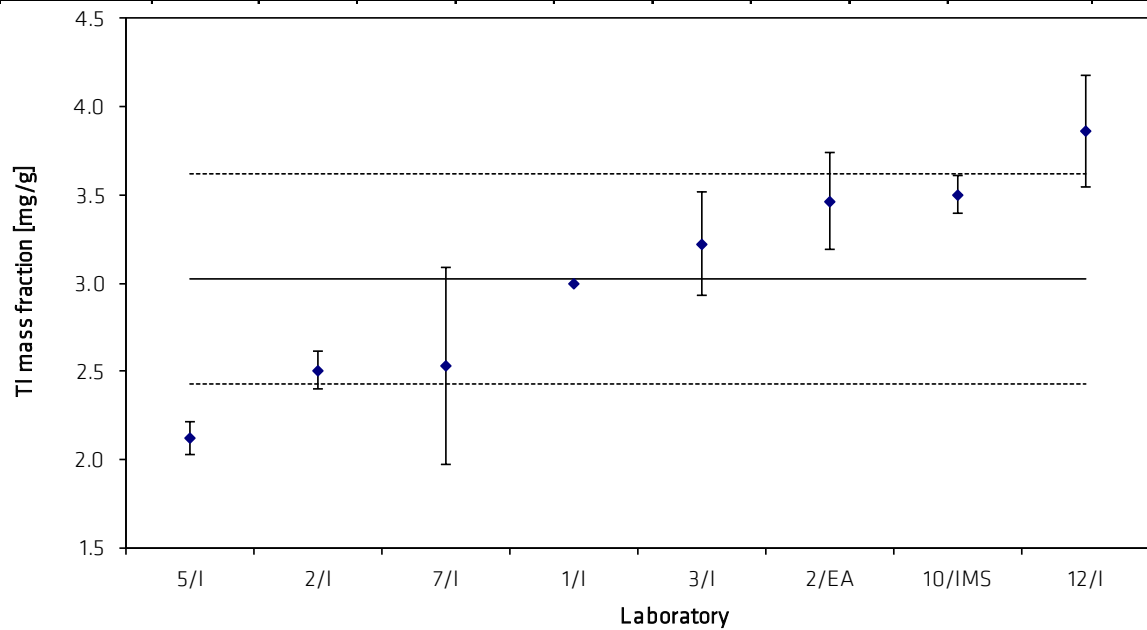


Table 13: Results for Zn in BAM-M109

Lab./Meth.	12/I	6/I	4/I	2/I	3/I(R)	5/I	2/A	1/I	7/I	9/I	10/I	8/I(R)		
M_i [mg/kg]	27.60	31.01	31.8	31.4	31.0	32.0	31.9	32.0	32.2	31.4	32.8	38		n
	27.90	30.34	31.5	31.4	33.1	29.3	32.0	32.8	32.3	34.1	32.2	37		11
	29.95	30.54	31.0	32.2	31.6	32.0	31.9	32.2	32.8	33.8	33.4	34		
	30.01	29.97	31.5	31.1	30.7	32.5	32.9	32.7	32.9	32.1	32.6	37		
	30.90	30.37	31.4	31.5	29.9	32.1	34.1	32.7	32.8	34.8	34.5	35		
	30.41	30.50	31.2	31.6	33.5	33.0	31.7	32.9	33.4	30.7	35.3	33		
M [mg/kg]	29.46	30.45	31.42	31.53	31.63	31.81	32.40	32.55	32.73	32.82	33.46	35.67		31.84
s [mg/kg]	1.373	0.337	0.298	0.367	1.408	1.267	0.950	0.362	0.437	1.646	1.190	1.966	s_M [mg/kg]	1.143
s_{rel}	0.047	0.011	0.009	0.012	0.045	0.040	0.029	0.011	0.013	0.050	0.036	0.055	\bar{s}_i [mg/kg]	1.007

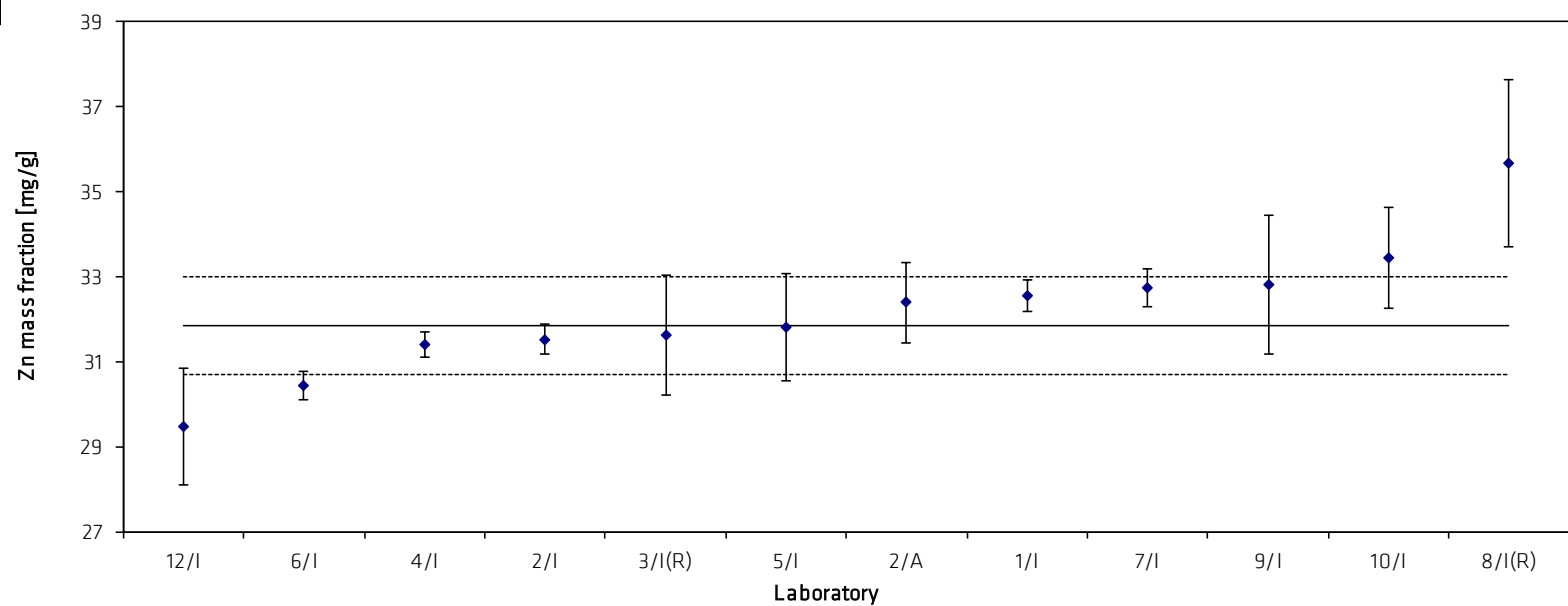


Table 14: Results for As in BAM-M109a

Lab./Meth.	12/I	10/I	5/I	4/I	7/I	3/I(R)	2/I	8/I(R)	1/I	9/I	6/I		
M_i [%]	0.0100	0.0109	0.0111	0.0110	0.0115	0.0114	0.0116	0.0115	0.012	0.0118	0.0119		n
	0.0097	0.0106	0.0113	0.0118	0.0113	0.0116	0.0117	0.0119	0.012	0.0118	0.0120		9
	0.0113	0.0108	0.0111	0.0113	0.0113	0.0116	0.0117	0.0113	0.012	0.0124	0.0120		
	0.0107	0.0104	0.0110	0.0113	0.0115	0.0115	0.0115	0.0119	0.012	0.0118	0.0120		
	0.0109	0.0106	0.0112	0.0115	0.0116	0.0115	0.0116	0.0118	0.012	0.0117	0.0120		
	0.0101	0.0108	0.0112	0.0112	0.0114	0.0118	0.0116	0.0122	0.012	0.0122	0.0121		
M [%]	0.0104	0.0107	0.0112	0.0114	0.0114	0.0116	0.0116	0.0118	0.0119	0.0120	0.0120		0.0116
s [%]	0.0006	0.0002	0.0001	0.0003	0.0001	0.0001	0.0001	0.0003	0.0002	0.0003	0.0001	s_M [%]	0.00029
s_{rel}	0.057	0.015	0.009	0.024	0.010	0.011	0.005	0.027	0.014	0.024	0.006	\bar{s}_i [%]	0.00019
													0.02514

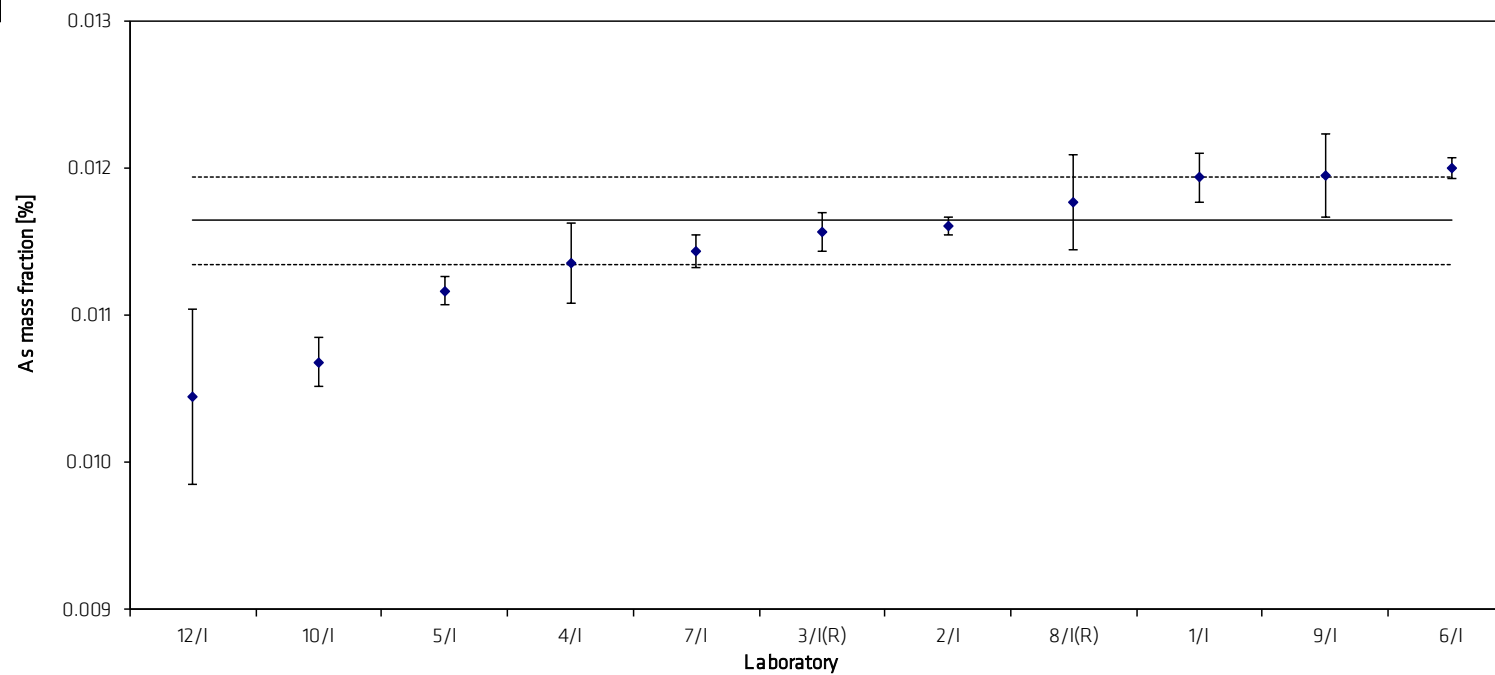


Table 15: Results for Bi in BAM-M109a

Lab./Meth.	12/I	4/I	1/I	5/I	2/I	6/I	9/I	3/I	8/I(R)	7/I	10/I		
M_i [%]	0.0165	0.0180	0.0190	0.0192	0.0192	0.0198	0.0195	0.0201	0.0194	0.0201	0.0200		n 9
	0.0162	0.0183	0.0190	0.0194	0.0193	0.0197	0.0200	0.0204	0.0203	0.0199	0.0209		
	0.0182	0.0176	0.0190	0.0192	0.0193	0.0198	0.0203	0.0196	0.0197	0.0200	0.0203		
	0.0179	0.0185	0.0190	0.0191	0.0192	0.0199	0.0197	0.0201	0.0205	0.0204	0.0208		
	0.0180	0.0194	0.0191	0.0190	0.0193	0.0196	0.0201	0.0199	0.0199	0.0204	0.0205		
	0.0164	0.0182	0.0190	0.0193	0.0193	0.0200	0.0196	0.0201	0.0206	0.0204	0.0205		
M [%]	0.0172	0.0183	0.0190	0.0192	0.0193	0.0198	0.0199	0.0201	0.0201	0.0202	0.0205		0.0198
s [%]	0.0009	0.0006	0.0000	0.0001	0.0001	0.0001	0.0003	0.0003	0.0005	0.0002	0.0003	s_M [%]	0.00051
s_{rel}	0.055	0.032	0.002	0.008	0.003	0.006	0.016	0.014	0.024	0.010	0.015	\bar{s}_i [%]	0.00039
													0.02564

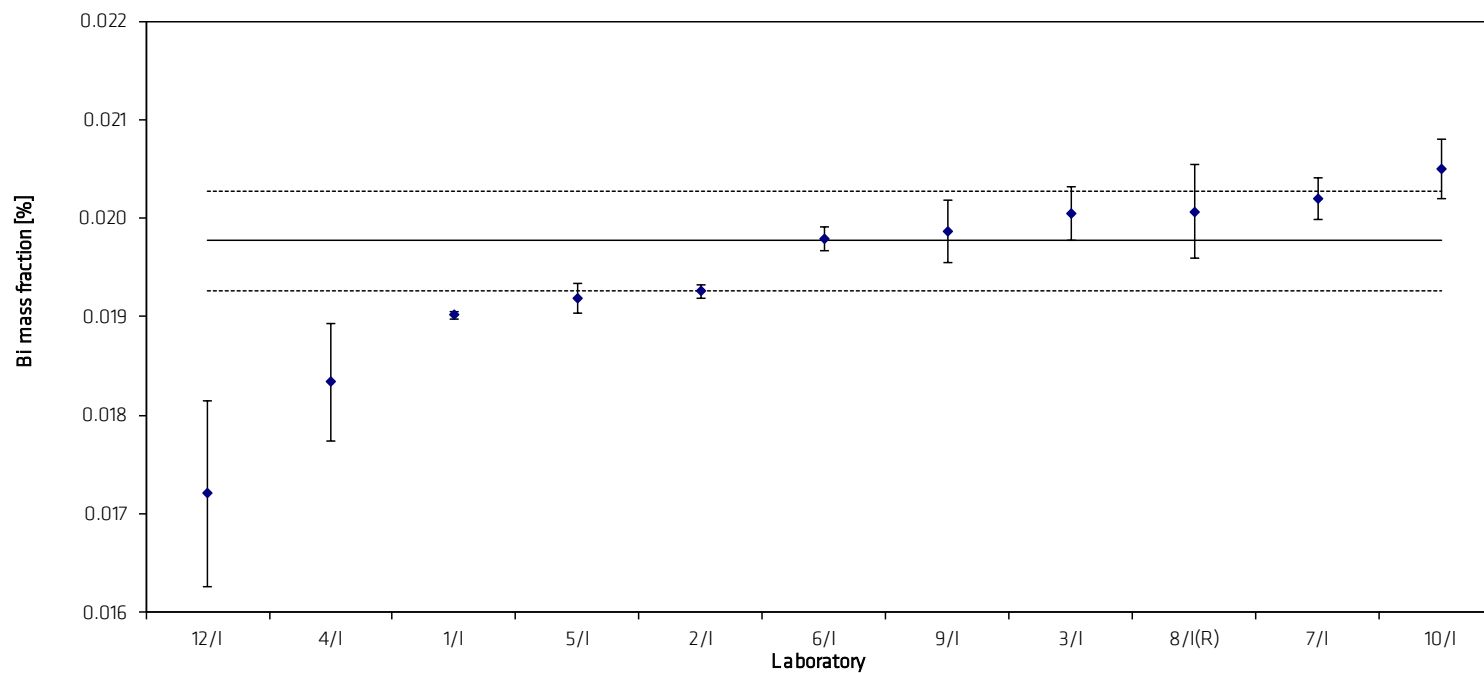


Table 16: Results for Sb in BAM-M109a

Lab./Meth.	12/I	4/I	3/I	6/I	7/I	10/I	8/I(R)	1/I	5/I(R)	2/I	9/I		
M_i [%]	0.0088	0.0092	0.0095	0.0095	0.0097	0.0098	0.0098	0.0100	0.0103	0.0103	0.0103		n 11
	0.0084	0.0096	0.0097	0.0095	0.0096	0.0097	0.0102	0.0100	0.0103	0.0103	0.0103		
	0.0094	0.0093	0.0096	0.0095	0.0096	0.0098	0.0090	0.0100	0.0103	0.0103	0.0105		
	0.0094	0.0094	0.0095	0.0096	0.0096	0.0096	0.0102	0.0100	0.0103	0.0102	0.0105		
	0.0093	0.0095	0.0095	0.0095	0.0095	0.0096	0.0098	0.0116	0.0103	0.0104	0.0103		
	0.0085	0.0092	0.0093	0.0096	0.0097	0.0094	0.0101	0.0100	0.0103	0.0104	0.0101		
M [%]	0.0090	0.0094	0.0095	0.0095	0.0096	0.0096	0.0099	0.0103	0.0103	0.0103	0.0103		0.0098
s [%]	0.0005	0.0002	0.0001	0.0001	0.0001	0.0001	0.0005	0.0007	0.0000	0.0001	0.0002	s_M [%]	0.00046
s_{rel}	0.051	0.017	0.015	0.006	0.006	0.014	0.046	0.064	0.004	0.005	0.015	\bar{s}_i [%]	0.00029
													0.04726

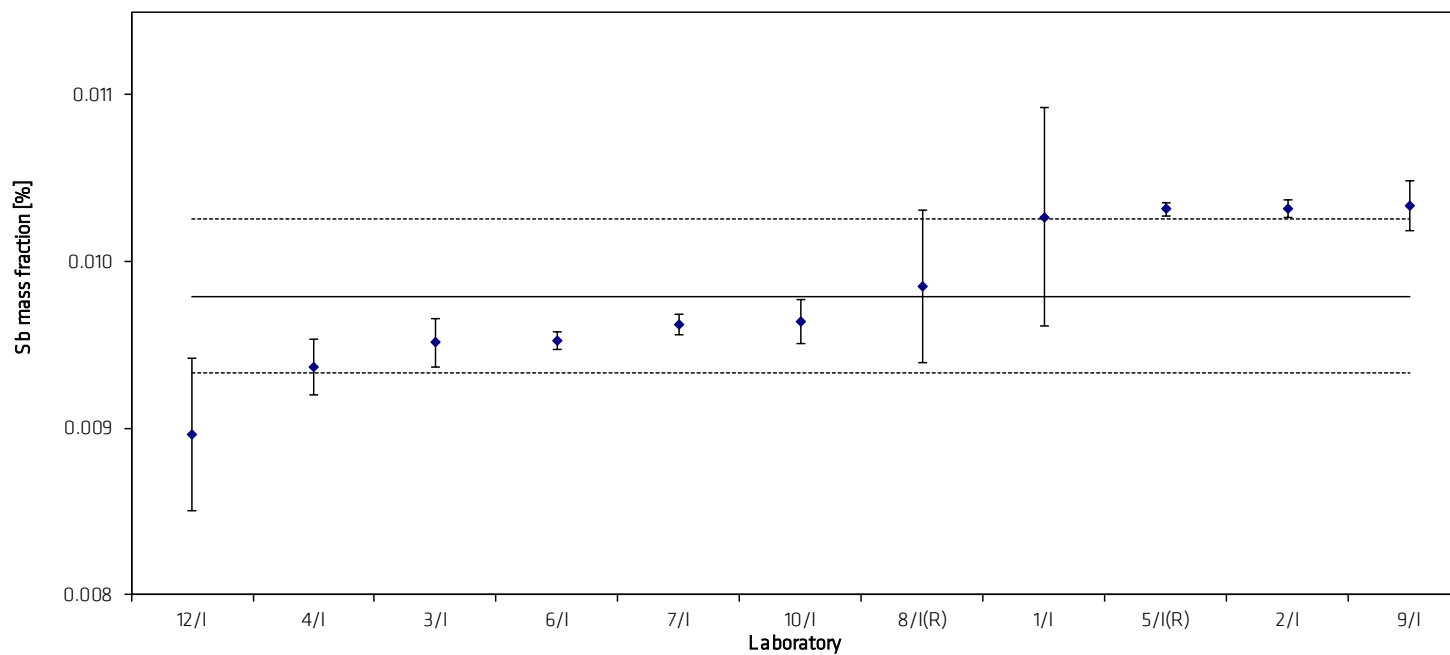


Table 17: Results for Sn in BAM-M109a

Lab./Meth.	12/I	2/A	2/I	5/I(R)	7/I(R)	10/I	9/I	6/I(R)	1/I	3/I	8/I(R)	4/I(R)		
M_i [%]	0.1090	0.114	0.1151	0.1186	0.1185	0.1221	0.1120	0.1184	0.121	0.1191	0.1156	0.1216		n 10
	0.1081	0.111	0.1151	0.1190	0.1187	0.1206	0.1140	0.1188	0.120	0.1211	0.1204	0.1214		
	0.1124	0.112	0.1154	0.1163	0.1185	0.1183	0.1150	0.1188	0.119	0.1178	0.1185	0.1218		
	0.1105	0.114	0.1148	0.1186	0.1186	0.1175	0.1210	0.1186	0.121	0.1195	0.1203	0.1245		
	0.1093	0.112	0.1153	0.1184	0.1183	0.1170	0.1270	0.1188	0.118	0.1180	0.1211	0.1244		
	0.1105	0.113	0.1154	0.1190	0.1182	0.1159	0.1230	0.1187	0.116	0.1198	0.1224	0.1228		
M [%]	0.1100	0.1127	0.1152	0.1183	0.1185	0.1186	0.1187	0.1187	0.1192	0.1192	0.1197	0.1228		0.1189
s [%]	0.0015	0.0012	0.0002	0.0010	0.0002	0.0024	0.0059	0.0002	0.0019	0.0012	0.0024	0.0014	s_M [%]	0.00183
s_{rel}	0.014	0.011	0.002	0.009	0.002	0.020	0.050	0.001	0.016	0.010	0.020	0.011	\bar{s}_i [%]	0.00233
														0.01542

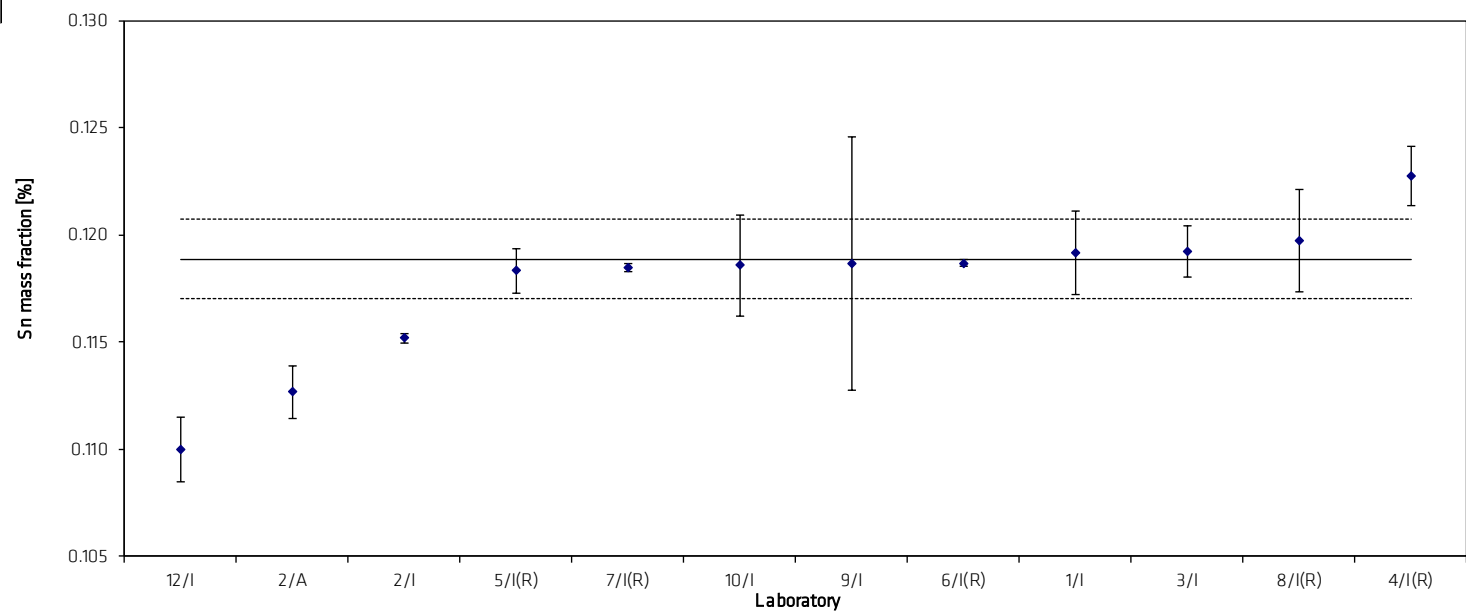


Table 18: Results for Ag in BAM-M109a

Lab./Meth.	8/A(R)	7/I	6/I	5/I(R)	2/I	10/I	1/I	9/A	3/I		
M_i [mg/kg]	44	43.8	43.88	45.1	45	46.2	47.2	48	48.65		n
	43	43.5	43.56	44.3	45	45.3	47.6	49	50.65		9
	41	43.2	43.80	44.6	45	48.1	47.5	48	47.85		
	43	43.8	44.11	44.4	45	45.7	47.3	50	48.45		
	43	44.0	43.38	44.8	45	45.8	47.7	47	47.80		
	45	43.4	43.91	44.6	45	46.0	47.6	47	50.55		
M [mg/kg]	43.17	43.62	43.77	44.64	44.85	46.18	47.48	48.17	48.99		45.65
s [mg/kg]	1.329	0.299	0.262	0.266	0.251	0.999	0.194	1.169	1.289	s_M [mg/kg]	2.140
s_{rel}	0.031	0.007	0.006	0.006	0.006	0.022	0.004	0.024	0.026	\bar{s}_i [mg/kg]	0.781
											0.047

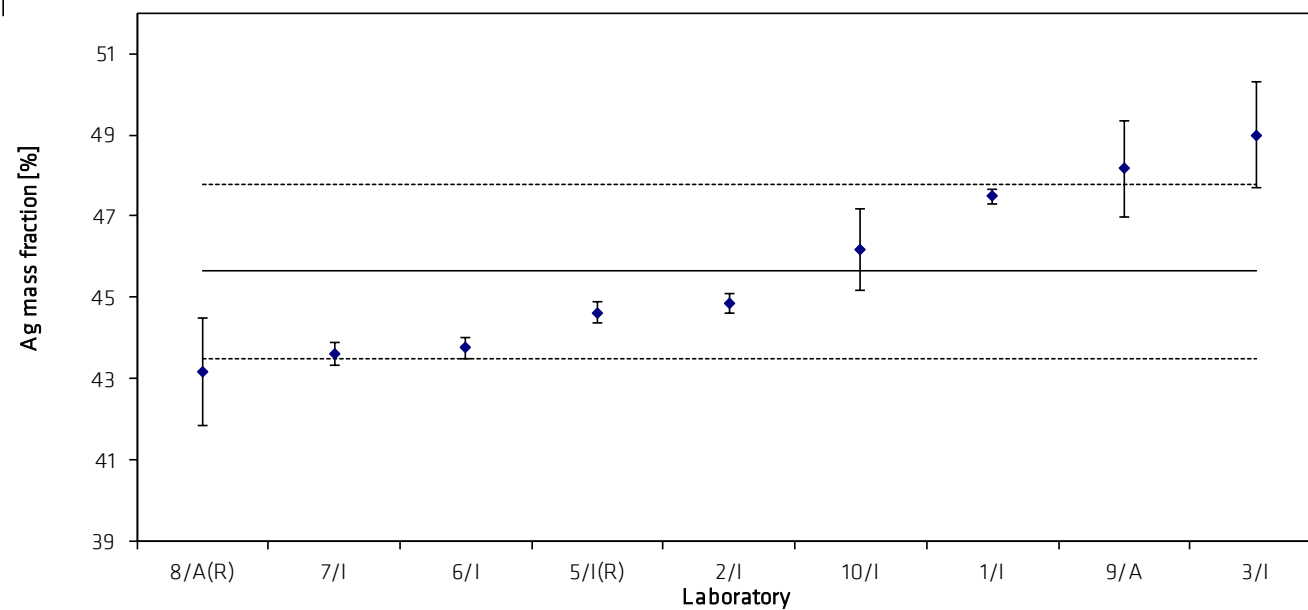


Table 19: Results for Cd in BAM-M109a

Lab./Meth.	4/I	1/I	2/I	5/I	7/I	10/I	9/I	3/I	12/I	8/I(R)	6/I	2/EA		
M_i [mg/kg]	33.5	35.2	35.0	35.4	35.6	35.9	35.6	36	36.0	36	36.8	36.9		n
	33.0	35.2	35.1	35.7	35.4	34.7	36.2	37	35.2	37	36.7	37.6		11
	33.3	35.2	35.1	35.4	35.5	37.1	36.2	37	36.7	36	36.8	36.7		
	33.4	34.8	35.0	35.1	35.8	35.7	35.8	37	36.2	37	37.0	37.4		
	33.6	34.9	35.2	35.2	35.9	35.5	35.9	36	37.2	36	36.5	37.0		
	33.0	34.6	35.1	35.5	35.8	35.3	36.2	36	36.7	37	37.1	37.1		
M [mg/kg]	33.29	34.98	35.08	35.35	35.67	35.71	35.98	36.30	36.32	36.50	36.84	37.12		35.99
s [mg/kg]	0.247	0.256	0.075	0.213	0.197	0.794	0.256	0.436	0.705	0.548	0.221	0.349	s_M [mg/kg]	0.699
s_{rel}	0.007	0.007	0.002	0.006	0.006	0.022	0.007	0.012	0.019	0.015	0.006	0.009	\bar{s}_i [mg/kg]	0.427
														0.019

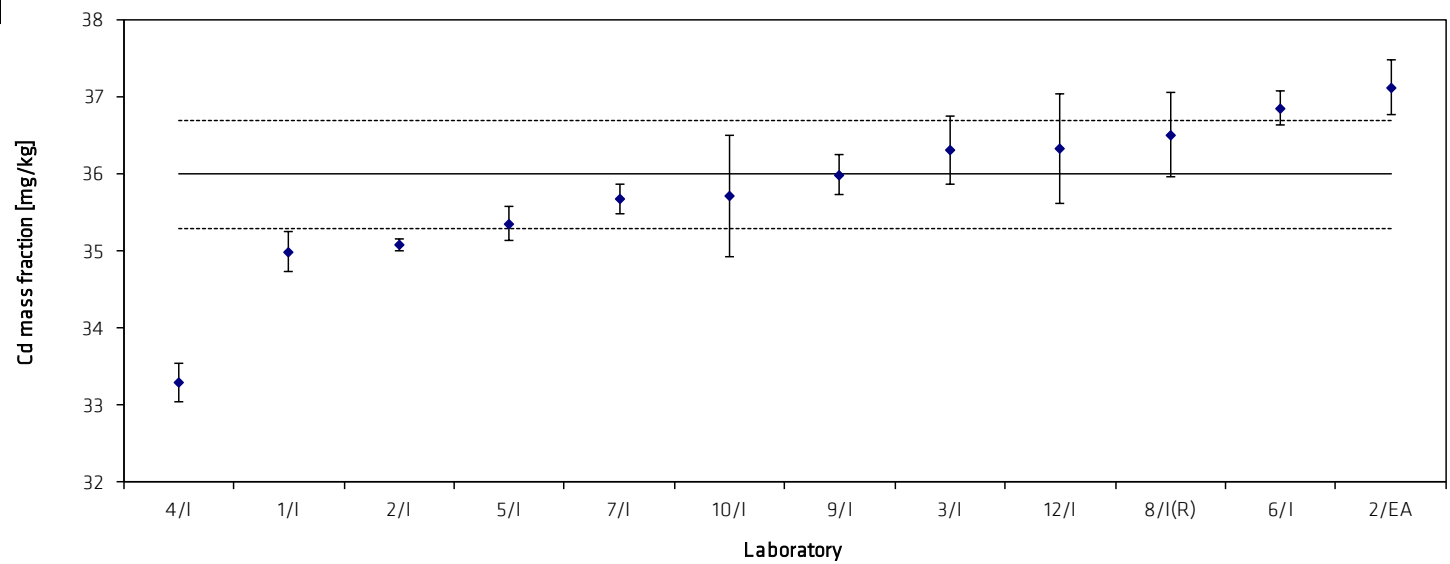


Table 20: Results for Cu in BAM-M109a

Lab./Meth.	7/I	12/I	6/I	4/I	5/I	8/I(R)	2/I	10/I	2/EA	3/I	1/I	9/I(R)		
M_i [mg/kg]	17.9	18.2	18.71	18.62	18.98	20	19.6	20.5	21.5	20.3	21.3	20.8		n
	17.8	17.6	18.47	18.41	19.42	20	19.5	20.1	21.2	21.0	21.4	24.6		11
	17.6	17.9	18.60	18.80	19.07	18	19.4	21.1	20.0	21.1	21.5	27.0		
	17.8	18.0	18.78	18.75	18.80	20	20.3	20.6	20.4	20.5	21.2	22.4		
	18.0	18.0	18.46	18.77	18.77	20	19.7	20.5	20.6	21.2	21.6			
	17.7	17.9	18.72	18.54	19.02	20	20.0	20.4	20.3	20.8	21.5			
M [mg/kg]	17.80	17.95	18.62	18.65	19.01	19.67	19.75	20.54	20.65	20.82	21.42	23.70		19.53
s [mg/kg]	0.141	0.182	0.136	0.153	0.234	0.816	0.339	0.340	0.571	0.352	0.147	2.696	s_M [mg/kg]	1.221
s_{rel}	0.008	0.010	0.007	0.008	0.012	0.042	0.017	0.017	0.028	0.017	0.007	0.114	\bar{s}_i [mg/kg]	0.372
														0.063

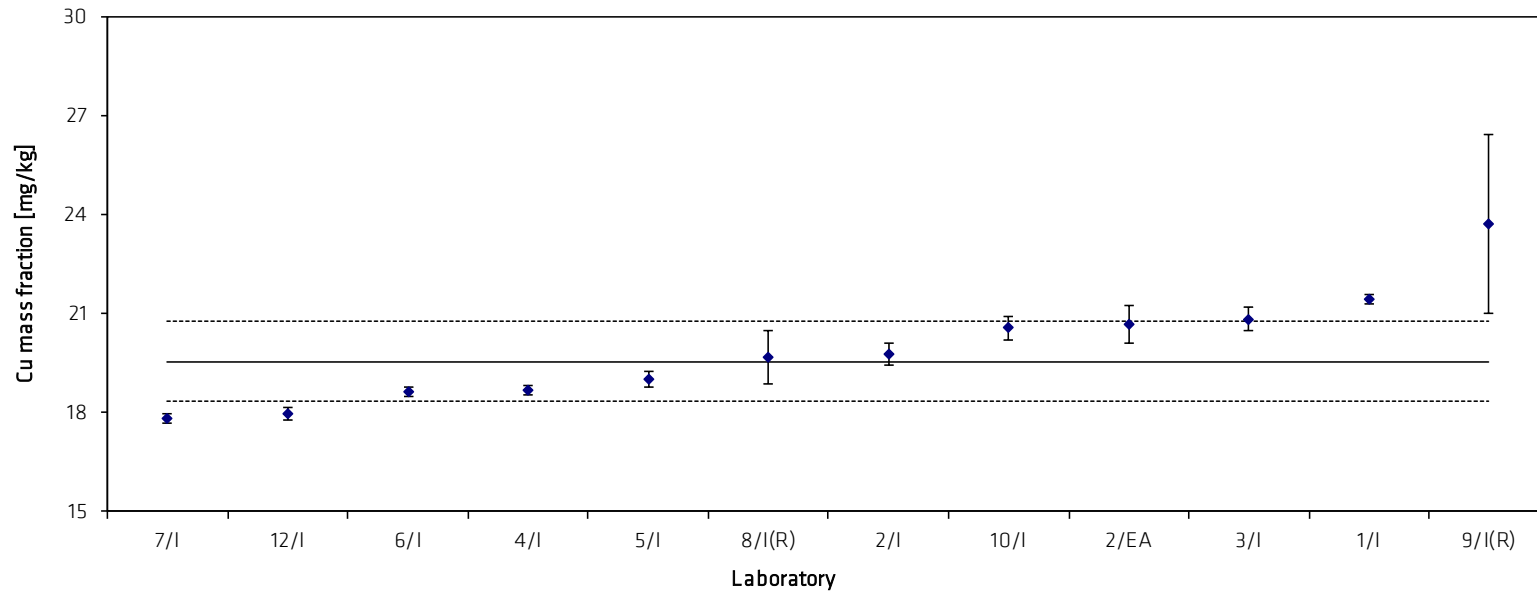


Table 21: Results for Ni in BAM-M109a

Lab./Meth.	8/I(R)	4/I	7/I	5/I	2/I	6/I	12/I	9/I	10/I	2/EA	1/I	3/I(R)			
M_i [mg/kg]	3	3.2	3.4	3.4	3.4	3.5	3.9	3.7	3.9	4.09	3.8	4.4		n 12	
	3	3.2	3.3	3.4	3.5	3.5	3.8	3.8	4.0	4.05	4.5	4.5			
	3	3.1	3.3	3.4	3.5	3.5	3.8	3.9	4.2	4.08	4.5	4.5			
	3	3.2	3.3	3.4	3.4	3.5	3.5	3.8	4.0	4.0	3.97	3.7	4.4		
	3	3.2	3.3	3.4	3.4	3.5	3.5	3.9	3.9	3.8	3.97	3.7	4.4		
	3	3.2	3.2	3.2	3.3	3.5	3.5	3.8	3.8	3.9	4.03	4.2	4.3		
M [mg/kg]	3.00	3.19	3.29	3.41	3.48	3.50	3.82	3.85	3.97	4.03	4.07	4.42		3.67	
s [mg/kg]	0.000	0.031	0.055	0.042	0.028	0.028	0.029	0.105	0.117	0.052	0.383	0.075	s_M [mg/kg]	0.422	
s_{rel}	0.000	0.010	0.017	0.012	0.008	0.008	0.007	0.027	0.029	0.013	0.094	0.017	\bar{s}_i [mg/kg]	0.125	
														0.115	

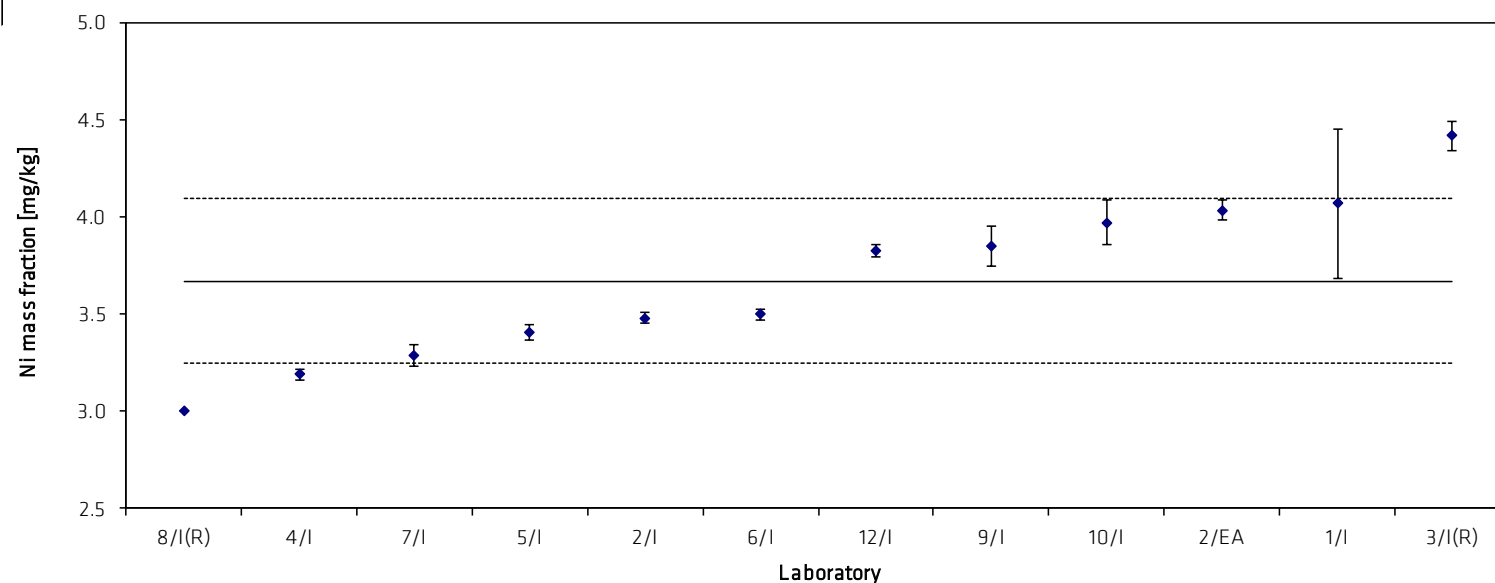


Table 22: Results for Te in BAM-M109a

Lab./Meth.	12/I	8/I(R)	10/I	5/I	6/I	9/I	1/I	2/I	7/I	2/EA	4/I	3/I		
M_i [mg/kg]	24.4	26	28.1	29.7	30.08	30.5	29.9	30.6	31.3	31.4	32.4	32.7		n 11
	24.7	29	27.6	30.0	30.09	31.1	31.1	30.6	30.8	31.9	32.1	34.6		
	24.8	28	29.4	29.8	30.02	30.1	30.7	30.6	30.3	31.5	31.3	33.5		
	24.8	28	28.3	29.7	30.10	30.7	30.9	30.3	30.7	31.4	31.9	33.6		
	25.1	27	29.1	30.2	29.91	31.1	30.3	31.0	31.2	32.2	32.0	34.3		
	24.9	28	28.7	29.9	30.47	29.4	30.7	30.7	31.1	31.5	31.4	33.3		
M [mg/kg]	24.78	27.67	28.54	29.87	30.11	30.48	30.60	30.63	30.90	31.65	31.84	33.65		30.54
s [mg/kg]	0.249	1.033	0.670	0.200	0.191	0.652	0.434	0.225	0.374	0.337	0.429	0.666	s_M [mg/kg]	1.600
s_{rel}	0.010	0.037	0.023	0.007	0.006	0.021	0.014	0.007	0.012	0.011	0.013	0.020	\bar{s}_i [mg/kg]	0.534
														0.052

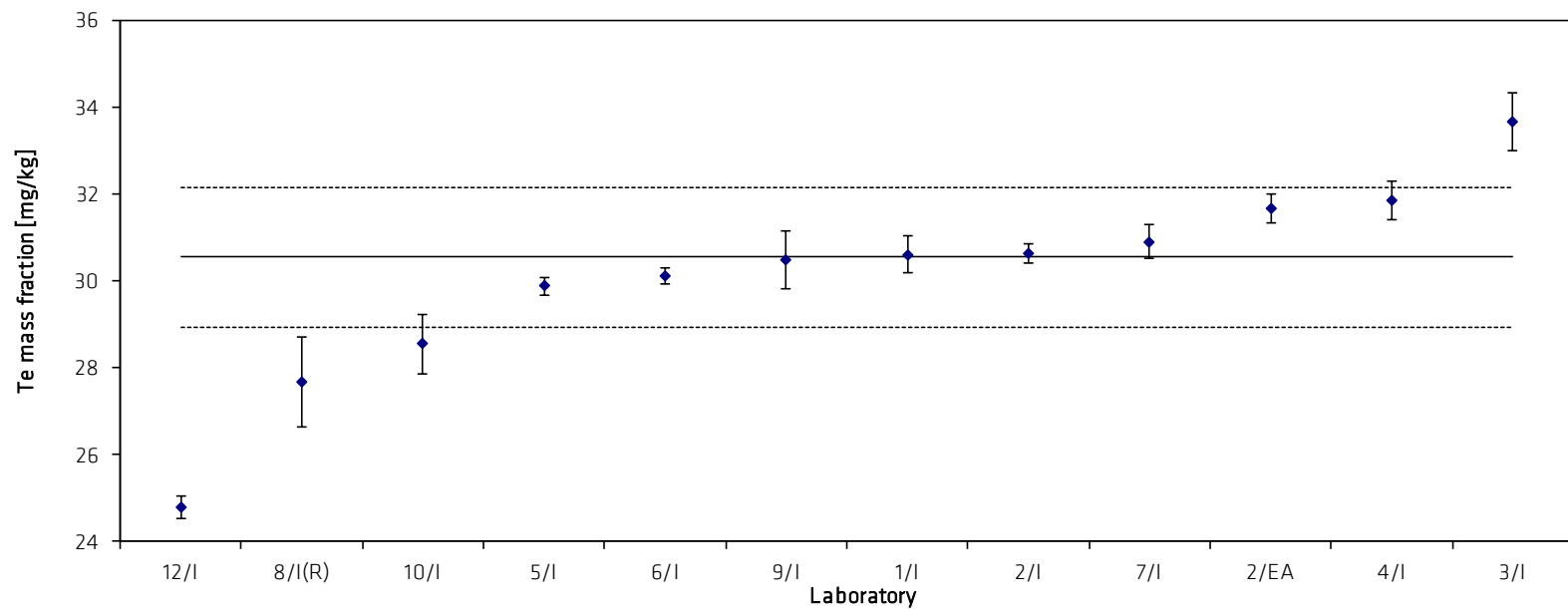


Table 23: Results for TI in BAM-M109a

Lab./Meth.	5/I	7/I	2/I	1/I	10/IMS	3/I	12/I	2/EA		
M_i [mg/kg]	2.4	2.6	2.50	3.0	3.7	3.7	3.5	4.7		n
	2.1	2.6	2.59	3.0	3.5	3.6	4.0	4.7		8
	2.2	2.4	2.52	3.0	3.6	3.3	4.5	4.7		
	2.2	2.2	2.30	3.0	3.5	3.8	4.1	4.9		
	1.9	2.5	2.46	2.8	3.5	4.3	4.4	5.0		
	2.2	2.7	2.66	3.0	3.6	3.3	3.9	5.1		
M [mg/kg]	2.16	2.50	2.51	2.97	3.57	3.67	4.05	4.82		3.28
s [mg/kg]	0.158	0.177	0.123	0.082	0.083	0.377	0.364	0.173	s_M [mg/kg]	0.908
									\bar{s}_i [mg/kg]	0.221
s_{rel}	0.073	0.071	0.049	0.028	0.023	0.103	0.090	0.036		0.277

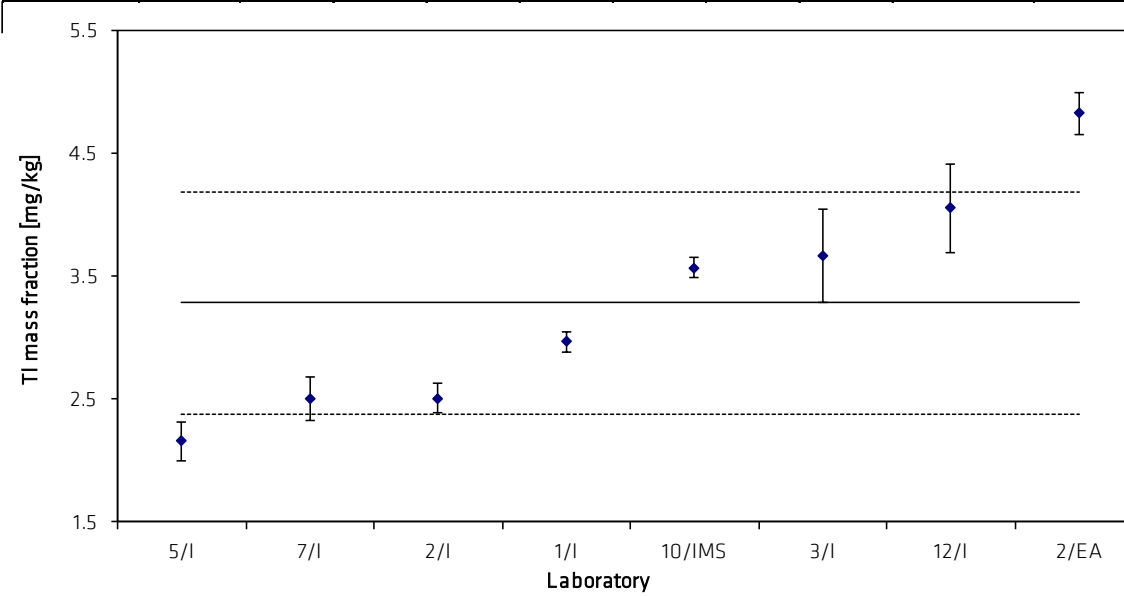
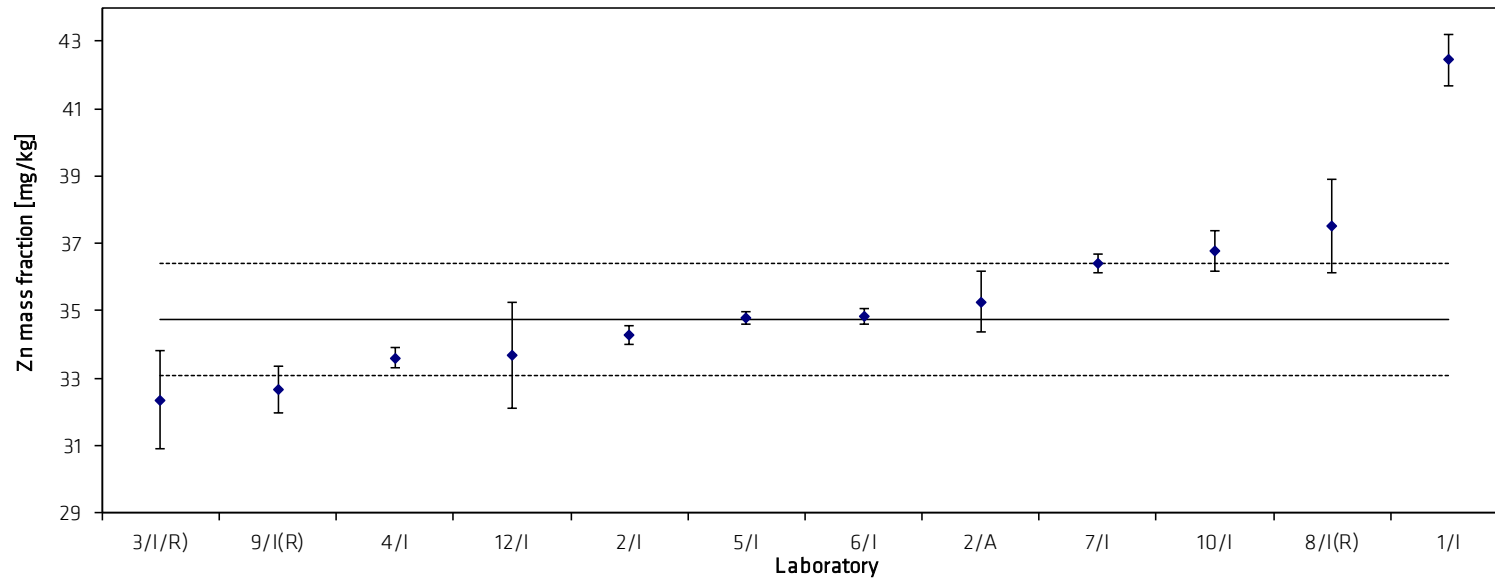


Table 24: Results for Zn in BAM-M109a

Lab./Meth.	3/I/R)	9/I(R)	4/I	12/I	2/I	5/I	6/I	2/A	7/I	10/I	8/I(R)	1/I		
M_i [mg/kg]	32.1	32.5	33.66	32.96	34.6	34.6	34.8	36.72	36.4	36.9	37	41.9		n
	30.7	33.4	33.19	32.22	34.4	35.1	34.8	34.83	36.2	37.7	39	42.4		11
	34.0	33.0	33.60	33.17	34.4	34.7	34.9	34.38	36.0	35.9	38	42.0		
	32.0	31.8	33.81	32.94	33.8	34.7	34.9	35.99	36.6	36.8	39	41.8		
	31.1		34.00	36.56	34.3	35.0	34.5	35.04	36.7	37.0	36	42.6		
	34.2		33.40	34.26	34.2	34.7	35.2	34.61	36.6	36.5	36	43.9		
M [mg/kg]	32.35	32.68	33.61	33.69	34.28	34.80	34.85	35.26	36.42	36.79	37.50	42.43		34.75
s [mg/kg]	1.457	0.690	0.290	1.556	0.271	0.195	0.224	0.907	0.271	0.603	1.378	0.781	s_M [mg/kg]	1.658
s_{rel}	0.045	0.021	0.009	0.046	0.008	0.006	0.006	0.026	0.007	0.016	0.037	0.018	\bar{s}_i [mg/kg]	0.875
														0.048



The statistical evaluation of the data was performed using the software program SoftCRM 1.2.2. [5]. The following results were obtained:

Table 25: Outcome of statistical tests of results obtained for As in BAM-M109

Number of data sets	11
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	---
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

Table 26: Outcome of statistical tests of results obtained for Bi in BAM-M109

Number of data sets	11
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	Lab. 12
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

The straggler (Lab. 12) was not removed.

Table 27: Outcome of statistical tests of results obtained for Sb in BAM-M109

Number of data sets	11
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	---
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

Table 28: Outcome of statistical tests of results obtained for Sn in BAM-M109

Number of data sets	12
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	Labs. 4 and 6
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

The stragglers (Labs. 4 and 6) were not removed.

Table 29: Outcome of statistical tests of results obtained for Ag in BAM-M109

Number of data sets	9
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	Lab. 9
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

The straggler (Lab. 9) was not removed.

Table 30: Outcome of statistical tests of results obtained for Cd in BAM-M109

Number of data sets	12
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	Lab. 4
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

The straggler (Lab. 4) was not removed.

Table 31: Outcome of statistical tests of results obtained for Cu in BAM-M109

Number of data sets	12
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	---
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

Table 32: Outcome of statistical tests of results obtained for Ni in BAM-M109

Number of data sets	12
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	---
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

Table 33: Outcome of statistical tests of results obtained for Te in BAM-M109

Number of data sets	12 (1 st run)	11 (2 nd run)
Snedecor-F-Test and Bartlett-Test	Pooling not allowed	Pooling not allowed
Dixon ($\alpha = 0.05$)	Lab. 12	Lab. 2/EA
Dixon ($\alpha = 0.01$)	---	---
Nalimov ($\alpha = 0.05$)	Lab. 12	Lab. 2/EA
Nalimov ($\alpha = 0.01$)	Lab. 12	Lab. 2/EA
Grubbs ($\alpha = 0.05$)	Lab. 12	---
Grubbs ($\alpha = 0.01$)	---	---
Grubbs Pair ($\alpha = 0.05$)	---	---
Grubbs Pair ($\alpha = 0.01$)	---	---
Cochran	---	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: not normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal

The outlier (Lab. 12, 1st run) was removed, the straggler (Lab. 2/EA, 2nd run) was not removed.

Table 34: Outcome of statistical tests of results obtained for Zn in BAM-M109

Number of data sets	12 (1 st run)	11 (2 nd run)
Snedecor-F-Test and Bartlett-Test	Pooling not allowed	Pooling not allowed
Dixon ($\alpha = 0.05$)	Lab. 8	Lab. 12
Dixon ($\alpha = 0.01$)	---	---
Nalimov ($\alpha = 0.05$)	Lab. 8	Lab. 12
Nalimov ($\alpha = 0.01$)	Lab. 8	---
Grubbs ($\alpha = 0.05$)	---	---
Grubbs ($\alpha = 0.01$)	---	---
Grubbs Pair ($\alpha = 0.05$)	---	---
Grubbs Pair ($\alpha = 0.01$)	---	---
Cochran	---	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal

The outlier (Lab. 8, 1st run) was removed, the straggler (Lab. 12, 2nd run) was not removed.

Table 35: Outcome of statistical tests of results obtained for TI in BAM-M109

Number of data sets	8
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	---
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

Table 36: Outcome of statistical tests of results obtained for As in BAM-M109a

Number of data sets	11 (1 st run)	9 (2 nd run)
Snedecor-F-Test and Bartlett-Test	Pooling not allowed	Pooling not allowed
Dixon ($\alpha = 0.05$)	---	---
Dixon ($\alpha = 0.01$)	---	---
Nalimov ($\alpha = 0.05$)	---	---
Nalimov ($\alpha = 0.01$)	---	---
Grubbs ($\alpha = 0.05$)	---	---
Grubbs ($\alpha = 0.01$)	---	---
Grubbs Pair ($\alpha = 0.05$)	Labs. 10 and 12	---
Grubbs Pair ($\alpha = 0.01$)	Labs. 10 and 12	---
Cochran	---	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal

The outliers (Labs. 10 and 12) were removed.

Table 37: Outcome of statistical tests of results obtained for Bi in BAM-M109a

Number of data sets	11 (1 st run)	9 (2 nd run)
Snedecor-F-Test and Bartlett-Test	Pooling not allowed	Pooling not allowed
Dixon ($\alpha = 0.05$)	Lab. 12	---
Dixon ($\alpha = 0.01$)	---	---
Nalimov ($\alpha = 0.05$)	Lab. 12	---
Nalimov ($\alpha = 0.01$)	Lab. 12	---
Grubbs ($\alpha = 0.05$)	Lab. 12	---
Grubbs ($\alpha = 0.01$)	---	---
Grubbs Pair ($\alpha = 0.05$)	Labs. 12 and 4	---
Grubbs Pair ($\alpha = 0.01$)	Labs. 12 and 4	---
Cochran	---	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal

The outliers (Labs. 12 and 4) were removed.

Table 38: Outcome of statistical tests of results obtained for Sb in BAM-M109a

Number of data sets	11
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	---
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

Table 39: Outcome of statistical tests of results obtained for Sn in BAM-M109a

Number of data sets	12 (1 st run)	10 (2 nd run)
Snedecor-F-Test and Bartlett-Test	Pooling not allowed	Pooling not allowed
Dixon ($\alpha = 0.05$)	Lab. 12	Labs 2/1 and 4
Dixon ($\alpha = 0.01$)	---	Labs 2/1 and 4
Nalimov ($\alpha = 0.05$)	Lab. 12	Labs 2/1 and 4
Nalimov ($\alpha = 0.01$)	---	---
Grubbs ($\alpha = 0.05$)	---	---
Grubbs ($\alpha = 0.01$)	---	---
Grubbs Pair ($\alpha = 0.05$)	Labs. 12 and 2A	---
Grubbs Pair ($\alpha = 0.01$)	---	---
Cochran	---	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: not normal	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: not normal	Distribution: not normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal	Distribution: not normal

The outliers (Labs.12 and 2A, 1st run) were removed.

The stragglers (Labs.2/1 and 4, 2nd run) were not removed.

Table 40: Outcome of statistical tests of results obtained for Ag in BAM-M109a

Number of data sets	9
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	---
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

Table 41: Outcome of statistical tests of results obtained for Cd in BAM-M109a

Number of data sets	12 (1 st run)	11 (2 nd run)
Snedecor-F-Test and Bartlett-Test	Pooling not allowed	Pooling not allowed
Dixon ($\alpha = 0.05$)	---	---
Dixon ($\alpha = 0.01$)	---	---
Nalimov ($\alpha = 0.05$)	Lab. 4	---
Nalimov ($\alpha = 0.01$)	Lab. 4	---
Grubbs ($\alpha = 0.05$)	Lab. 4	---
Grubbs ($\alpha = 0.01$)	---	---
Grubbs Pair ($\alpha = 0.05$)	---	---
Grubbs Pair ($\alpha = 0.01$)	---	---
Cochran	---	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal

The outlier (Lab. 4, 1st run) was removed.

Table 42: Outcome of statistical tests of results obtained for Cu in BAM-M109a

Number of data sets	12 (1 st run)	11 (2 nd run)
Snedecor-F-Test and Bartlett-Test	Pooling not allowed	Pooling not allowed
Dixon ($\alpha = 0.05$)	---	---
Dixon ($\alpha = 0.01$)	---	---
Nalimov ($\alpha = 0.05$)	Lab. 9	---
Nalimov ($\alpha = 0.01$)	Lab. 9	---
Grubbs ($\alpha = 0.05$)	---	---
Grubbs ($\alpha = 0.01$)	---	---
Grubbs Pair ($\alpha = 0.05$)	---	---
Grubbs Pair ($\alpha = 0.01$)	---	---
Cochran	Lab. 9	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal

The outlier (Lab. 9, 1st run) was removed as Cochran-outlier.

Table 43: Outcome of statistical tests of results obtained for Ni in BAM-M109a

Number of data sets	12
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	---
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

Table 44: Outcome of statistical tests of results obtained for Te in BAM-M109a

Number of data sets	12 (1 st run)	11 (2 nd run)
Snedecor-F-Test and Bartlett-Test	Pooling not allowed	Pooling not allowed
Dixon ($\alpha = 0.05$)	Lab. 12	---
Dixon ($\alpha = 0.01$)	---	---
Nalimov ($\alpha = 0.05$)	Lab. 12	Lab. 3
Nalimov ($\alpha = 0.01$)	Lab. 12	---
Grubbs ($\alpha = 0.05$)	Lab. 12	---
Grubbs ($\alpha = 0.01$)	---	---
Grubbs Pair ($\alpha = 0.05$)	---	---
Grubbs Pair ($\alpha = 0.01$)	---	---
Cochran	---	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal

The outlier (Lab. 12, 1st run) was removed, the straggler (Lab. 3, 2nd run) was not removed.

Table 45: Outcome of statistical tests of results obtained for Zn in BAM-M109a

Number of data sets	12 (1 st run)	11 (2 nd run)
Snedecor-F-Test and Bartlett-Test	Pooling not allowed	Pooling not allowed
Dixon ($\alpha = 0.05$)	Lab. 1	---
Dixon ($\alpha = 0.01$)	---	---
Nalimov ($\alpha = 0.05$)	Lab. 1	---
Nalimov ($\alpha = 0.01$)	Lab. 1	---
Grubbs ($\alpha = 0.05$)	Lab. 1	---
Grubbs ($\alpha = 0.01$)	Lab. 1	---
Grubbs Pair ($\alpha = 0.05$)	---	---
Grubbs Pair ($\alpha = 0.01$)	---	---
Cochran	---	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: not normal	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: not normal	Distribution: normal

The outlier (Lab. 1) was removed.

Table 46: Outcome of statistical tests of results obtained for Tl in BAM-M109a

Number of data sets	8
Snedecor-F-Test and Bartlett-Test	Pooling not allowed
Dixon ($\alpha = 0.05$)	---
Dixon ($\alpha = 0.01$)	---
Nalimov ($\alpha = 0.05$)	---
Nalimov ($\alpha = 0.01$)	---
Grubbs ($\alpha = 0.05$)	---
Grubbs ($\alpha = 0.01$)	---
Grubbs Pair ($\alpha = 0.05$)	---
Grubbs Pair ($\alpha = 0.01$)	---
Cochran	---
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.05$)	Distribution: normal
Kolmogorov-Smirnov-Lilliefors Test ($\alpha = 0.01$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.05$)	Distribution: normal
Skewness & Kurtosis Test ($\alpha = 0.01$)	Distribution: normal

The certified mass fractions of all elements were calculated as mean of the accepted data sets. These values are given in Tables 47 and 48.

The resp. combined uncertainties were calculated from the spread resulting from the certification inter-laboratory comparison (u_{ilc}) and the uncertainty contributions from possible inhomogeneity over the length ($u_{bb}(1)$) and over area ($u_{bb}(2)$) of the material using Equation 3.

$$U_{\text{combined}} = \sqrt{u_{ilc}^2 + u_{bb}^2(1) + u_{bb}^2(2)} \quad (3)$$

with

$$u_{ilc} = \sqrt{\frac{s_M^2}{n}}$$

: uncertainty contribution resulting from inter-laboratory comparison

n : number of data sets used for calculating the certified mass fraction of each element

Table 47: Uncertainty calculation for BAM-M109

	uncertainty contribution from						u(comb)	U	u _{bb} (rel)	
	M	n	s _M	u _{ilc}	u _{bb} (1)	u _{bb} (2)			Length	Area
	%		%	%	%	%				
As	0.0113	11	0.0005	0.0002	0.0001	0.0002	0.0003	0.00059	0.8765	1.9702
Bi	0.0193	11	0.0009	0.0003	0.0000	0.0000	0.0003	0.00058	0.2403	0.2410
Sb	0.0098	11	0.0003	0.0001	0.0000	0.0001	0.0001	0.00024	0.2246	0.6124
Sn	0.1150	12	0.0048	0.0014	0.0003	0.0007	0.0016	0.00315	0.2388	0.6070
	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Ag	45.05	9	0.8440	0.2813	0.1331	0.3399	0.4609	0.9217	0.2956	0.7545
Cd	35.26	12	0.8570	0.2474	0.0870	0.3309	0.4222	0.8445	0.2467	0.9385
Cu	19.58	12	0.8820	0.2546	0.0598	0.2160	0.3392	0.6785	0.3055	1.1034
Ni	3.47	12	0.4000	0.1155	0.0360	0.0573	0.1338	0.2676	1.0368	1.6503
Te	30.60	11	1.4180	0.4275	0.2432	0.5493	0.7373	1.4746	0.7947	1.7951
Tl	3.03	8	0.5980	0.2114	0.0007	0.0037	0.2115	0.4229	0.0233	0.1220
Zn	31.84	11	1.1430	0.3446	0.6648	0.6637	1.0007	2.0013	2.0880	2.0846
Al	1.37	3	0.7340	0.4238	0.0075	0.0341	0.4252	0.8504	0.5488	2.4873

Table 48: Uncertainty calculation for BAM-M109a

	uncertainty contribution from						u(comb)	U	u _{bb} (rel)	
	M	n	s _M	u _{ilc}	u _{bb} (1)	u _{bb} (2)			Length	Area
	%		%	%	%	%				
As	0.0116	9	0.0003	0.0001	0.0001	0.0002	0.0003	0.00058	1.2050	2.0519
Bi	0.0198	9	0.0005	0.0002	0.0001	0.0001	0.0002	0.00044	0.3256	0.6316
Sb	0.0098	11	0.0005	0.0001	0.0002	0.0001	0.0003	0.00054	2.3080	0.6331
Sn	0.1189	10	0.0018	0.0006	0.0041	0.0004	0.0042	0.00834	3.4570	0.3375
	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Ag	45.65	9	2.1400	0.7133	0.7108	0.2515	1.0379	2.0759	1.5570	0.5509
Cd	35.99	11	0.6990	0.2108	0.2197	0.2990	0.4267	0.8534	0.6105	0.8308
Cu	19.53	11	1.2210	0.3681	0.1756	0.1557	0.4366	0.8732	0.8991	0.7973
Ni	3.67	12	0.4220	0.1218	0.2763	0.0605	0.3080	0.6159	7.5290	1.6474
Te	30.54	11	1.6000	0.4824	0.3327	0.6710	0.8909	1.7817	1.0894	2.1971
Zn	34.75	11	1.6580	0.4999	1.7837	0.2038	1.8636	3.7273	5.1330	0.5866
Tl	3.28	8	0.9080	0.3210	0.0019	0.0040	0.3211	0.6421	0.0570	0.1220
Al	1.39	3	0.9250	0.5340	0.0082	0.0279	0.5348	1.0697	0.5927	2.0090

The expanded uncertainties U are calculated by multiplication of $u_{combined}$ with a coverage factor of $k = 2$ using Equation 4.

$$U = k \cdot u_{combined} \quad (4)$$

The calculated mass fractions and their resp. expanded uncertainties are given on Pages 3 and 4 of this report.

In addition to the wet chemical characterization some of the laboratories analysed the material with spark emission to check if there is agreement between SOES and wet chemistry. Tab. 49 shows the mean values of wet chemical and spark emission results as well as their standard deviations. The agreement between wet chemistry and SOES is good for all elements.

Tab. 49: Comparison wet chemistry vs. SOES (BAM-M109)

Element	Wet chemical analysis			Spark emission		
	Mass fraction in %	Std.-dev. in %	<i>n</i>	Mass fraction in %	Std.-dev. in %	<i>n</i>
As	0.0113	0.0006	11	0.0111	0.0008	20
Bi	0.0193	0.0010	11	0.0197	0.0006	21
Sb	0.0098	0.0004	11	0.0104	0.0008	20
Sn	0.115	0.005	12	0.118	0.007	22
	in mg/kg	in mg/kg		in mg/kg	in mg/kg	
Ag	45.1	0.9	9	44.9	2.4	22
Cd	35.3	0.9	12	34.6	3.2	22
Cu	19.6	0.9	12	20.3	1.6	21
Ni	3.5	0.4	12	3.9	0.5	21
Te	30.6	1.5	11	30.1	3.9	21
Tl	3.0	0.6	8	3.9	1.0	15
Zn	31.8	1.2	11	34.1	4.8	22
Al	1.37	0.74	3	0.60	0.29	5
In	0.3	---	1	0.25	0.06	2

6. Instructions for users and stability

The certified reference materials BAM-M109/109a are intended for the calibration and quality control of spark emission spectrometers used for the analysis of similar materials. They are also suitable for wet chemical analysis.

An area 8mm in diameter in the centre of the discs should be avoided for spark optical emission spectrometry.

The surface of the material should be cleaned by turning or milling before analysis.

If chips prepared from the compact material are used for wet chemical analysis, a minimum sample intake of 0.1 g has to be used.

The materials will remain stable provided that they are not subjected to excessive heat (eg, during preparation of the working surface).

7. References

- [1] ISO Guide 31, Reference materials - Contents of certificates, labels and accompanying documentation, 2015
- [2] ISO Guide 34, General requirements for the competence of reference material producers, 2009
- [3] ISO Guide 35, Reference materials - General and statistical principles for certification. Third edition, 2006
- [4] Guidelines for the development and production of BAM Reference Materials, 2016
- [5] Bonas G, Zervou M, Papaeoannou T, Lees M: Accred Qual Assur (2003) 8:101-107

8. Information on and purchase of the CRM

Certified reference materials BAM-M109/109a are supplied by

Bundesanstalt für Materialforschung und -prüfung (BAM)

Division 1.6 „Inorganic Reference Materials“

Richard-Willstätter-Str. 11, D-12489 Berlin, Germany

Phone: +49 30 - 8104 2061

Fax: +49 30 - 8104 72061

E-mail: sales.crm@bam.de

Each disc of BAM-M109/109a will be distributed together with a detailed certificate containing the certified values and their uncertainties, the mean values and standard deviations of all accepted data sets and information on the analytical methods used and the names of the participating laboratories. Information on certified reference materials can be obtained from BAM, <https://www.bam.de>.

Tel. +49 30 8104 1111.

Annex 1: Calculation of uncertainty contribution of potential inhomogeneity (length) Arsenic in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	579.2454	96.5409	58.09582
R4	6	606.1487	101.0248	32.13283
T3	6	603.9838	100.6640	36.17572
T9	6	592.9058	98.8176	15.87413
U4	6	590.2864	98.3811	51.72425
U7	6	583.9134	97.3189	22.67263
W6	6	592.5750	98.7625	20.91802
W8	6	592.9279	98.8213	12.01561
X2	6	590.2769	98.3795	47.26561
X7	6	576.8896	96.1483	35.70660
Y1	6	603.6934	100.6156	29.66256
Y3	6	587.1540	97.8590	30.11803
Z6	6	595.1479	99.1913	23.59808
Z10	6	603.9956	100.6659	79.73824
AA4	6	592.7101	98.7850	15.62000
AA7	6	591.1783	98.5297	58.53487
AB3	6	620.3653	103.3942	22.23994
AB9	6	604.4831	100.7472	43.15878
AC2	6	587.5880	97.9313	35.67888
AC6	6	591.2304	98.5384	50.48091
AD3	6	611.5758	101.9293	15.20641
AD10	6	585.5508	97.5918	35.98496
AE2	6	593.4096	98.9016	39.63177
AE8	6	597.7975	99.6329	33.50700
AF1	6	600.9567	100.1594	22.73788
AF8	6	604.6184	100.7697	34.20165
AG1	6	609.1574	101.5262	45.06705
AG3	6	577.7076	96.2846	52.26073
AH4	6	607.4297	101.2383	57.07048
AH9	6	599.9581	99.9930	21.91153
AI4	6	585.6694	97.6116	51.25904
AI7	6	604.4710	100.7452	48.17932
AJ3	6	592.0313	98.6719	49.05784
AJ9	6	593.8283	98.9714	25.46721
AK3	6	579.3826	96.5638	32.33763
AK6	6	591.9756	98.6626	63.96149
AL1	6	588.7442	98.1240	39.74198
AL7	6	596.4947	99.4158	52.71811
AM7	6	609.8121	101.6353	43.08878
AM10	6	608.1571	101.3595	29.52605
			99.2726	

Source of variation	sums of squares	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	673.705987	39	17.27451248	0.45629501	0.99770036	1.46005356
Within groups	7571.64212	200	37.85821058			
Total	8245.3481	239				
within-sd	6.152903					
effective n	5.00					
s_bb	0					
s_bb_min	0.870152					
u_bb	0.870152	870.15183				
u_bb(rel.)	0.87652758					

Bismuth in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	1165.1733	194.1956	12.99739
R4	6	1181.6879	196.9480	4.67006
T3	6	1181.2007	196.8668	11.80861
T9	6	1176.8704	196.1451	9.18371
U4	6	1180.4047	196.7341	19.92166
U7	6	1180.2655	196.7109	14.04917
W6	6	1179.7825	196.6304	8.12803
W8	6	1177.4628	196.2438	4.56305
X2	6	1178.9847	196.4975	15.95083
X7	6	1181.6167	196.9361	8.12129
Y1	6	1177.0885	196.1814	12.26757
Y3	6	1175.7002	195.9500	8.67723
Z6	6	1178.3163	196.3860	13.52732
Z10	6	1182.2972	197.0495	23.23552
AA4	6	1181.4078	196.9013	6.92503
AA7	6	1175.3442	195.8907	4.84797
AB3	6	1192.9411	198.8235	6.83507
AB9	6	1181.5740	196.9290	14.18644
AC2	6	1179.4851	196.5809	9.63117
AC6	6	1172.0917	195.3486	7.25469
AD3	6	1187.3950	197.8992	3.45564
AD10	6	1180.1388	196.6898	15.99420
AE2	6	1179.6760	196.6127	17.21691
AE8	6	1188.0940	198.0157	10.99573
AF1	6	1180.3429	196.7238	11.00917
AF8	6	1177.9479	196.3246	9.12633
AG1	6	1183.4698	197.2450	4.63601
AG3	6	1173.7753	195.6292	8.61195
AH4	6	1182.1783	197.0297	15.80481
AH9	6	1186.2260	197.7043	8.23741
AI4	6	1177.4740	196.2457	12.42155
AI7	6	1176.4754	196.0792	10.97885
AJ3	6	1174.2695	195.7116	12.18369
AJ9	6	1185.9213	197.6535	4.96568
AK3	6	1174.2796	195.7133	18.97425
AK6	6	1185.3136	197.5523	14.49319
AL1	6	1178.5850	196.4308	16.74366
AL7	6	1182.8464	197.1411	15.27323
AM7	6	1184.2371	197.3728	10.58637
AM10	6	1182.0551	197.0092	8.35080
			196.6683	

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	155.775822	39	3.994251846	0.35755446	0.99985712	1.46005356
Within groups	2234.20614	200	11.17103068			
Total	2389.98196	239				
within-sd	3.342309					
effective n	5.00					
s_bb	0					
s_bb_min	0.472674					
u_bb	0.472674	472.6739				
u_bb(rel.)	0.24034064					

Antimony in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	683.9687	113.9948	1.37299
R4	6	687.3362	114.5560	2.78375
T3	6	692.4294	115.4049	3.04764
T9	6	692.3836	115.3973	3.54364
U4	6	689.2078	114.8680	0.93392
U7	6	701.8007	116.9668	2.94207
W6	6	695.1225	115.8538	5.20336
W8	6	692.1731	115.3622	1.09103
X2	6	693.1282	115.5214	3.25685
X7	6	689.7936	114.9656	1.85878
Y1	6	692.7975	115.4663	4.54034
Y3	6	689.8542	114.9757	0.74635
Z6	6	698.4658	116.4110	2.62846
Z10	6	696.0941	116.0157	3.97613
AA4	6	697.0062	116.1677	1.47654
AA7	6	691.6096	115.2683	2.48009
AB3	6	690.4856	115.0809	1.27619
AB9	6	692.9593	115.4932	3.56211
AC2	6	694.2614	115.7102	6.75107
AC6	6	689.9479	114.9913	2.98088
AD3	6	691.1900	115.1983	2.89378
AD10	6	692.0983	115.3497	4.50059
AE2	6	690.9377	115.1563	0.77632
AE8	6	692.7402	115.4567	6.54919
AF1	6	684.1621	114.0270	2.87071
AF8	6	687.3890	114.5648	2.65672
AG1	6	696.1190	116.0198	3.54604
AG3	6	689.9174	114.9862	4.80506
AH4	6	693.7828	115.6305	3.60490
AH9	6	688.9489	114.8248	3.10274
AI4	6	683.7642	113.9607	1.76492
AI7	6	686.5973	114.4329	8.49351
AJ3	6	683.3245	113.8874	3.44103
AJ9	6	691.9642	115.3274	0.94963
AK3	6	685.0500	114.1750	4.20832
AK6	6	691.6459	115.2743	6.67855
AL1	6	686.4858	114.4143	4.08786
AL7	6	687.8756	114.6459	4.05298
AM7	6	682.4142	113.7357	5.45557
AM10	6	685.5500	114.2583	2.70542
			115.0949	

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	124.419979	39	3.190255877	0.95519473	0.55092725	1.46005356
Within groups	667.980208	200	3.339901041			
Total	792.400187	239				
within-sd	1.82754					
effective n	5.00					
s_bb	0					
s_bb_min	0.258453					
u_bb	0.258453	258.45313				
u_bb(rel.)	0.22455649					

Tin in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	7408.6206	1234.7701	540.59341
R4	6	7501.9500	1250.3250	273.86958
T3	6	7612.9724	1268.8287	419.80434
T9	6	7599.0304	1266.5051	373.99019
U4	6	7534.6147	1255.7691	450.11814
U7	6	7651.8923	1275.3154	136.59534
W6	6	7627.0525	1271.1754	246.63761
W8	6	7540.1545	1256.6924	159.88045
X2	6	7608.1369	1268.0228	311.46904
X7	6	7557.4329	1259.5722	405.04980
Y1	6	7563.9932	1260.6655	537.66074
Y3	6	7539.9327	1256.6555	370.62239
Z6	6	7522.8233	1253.8039	963.77054
Z10	6	7563.2109	1260.5351	1933.87579
AA4	6	7600.4995	1266.7499	199.36580
AA7	6	7574.4708	1262.4118	293.89717
AB3	6	7603.2600	1267.2100	455.08063
AB9	6	7583.8271	1263.9712	563.48241
AC2	6	7600.6414	1266.7736	219.34013
AC6	6	7496.0983	1249.3497	1164.22008
AD3	6	7577.6708	1262.9451	311.47343
AD10	6	7589.3862	1264.8977	249.82978
AE2	6	7547.2384	1257.8731	1027.54943
AE8	6	7560.9397	1260.1566	598.06659
AF1	6	7527.6217	1254.6036	190.52903
AF8	6	7535.8243	1255.9707	311.30952
AG1	6	7630.9518	1271.8253	808.02346
AG3	6	7474.7581	1245.7930	449.46915
AH4	6	7599.1258	1266.5210	476.30892
AH9	6	7541.9350	1256.9892	230.89874
AI4	6	7521.7600	1253.6267	270.07576
AI7	6	7506.4367	1251.0728	622.64894
AJ3	6	7524.4436	1254.0739	261.10848
AJ9	6	7565.0912	1260.8485	87.66193
AK3	6	7516.7778	1252.7963	274.48299
AK6	6	7635.5585	1272.5931	556.11038
AL1	6	7513.8871	1252.3145	302.48883
AL7	6	7597.0378	1266.1730	328.59593
AM7	6	7516.1750	1252.6958	414.26692
AM10	6	7540.9693	1256.8282	313.05104
			1259.6425	

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	15779.6332	39	404.60598	0.89399521	0.65173343	1.46005356
Within groups	90516.3642	200	452.5818212			
Total	106295.997	239				
within-sd	21.27397					
effective n	5.00					
s_bb	0					
s_bb_min	3.008594					
u_bb	3.008594	3008.5938				
u_bb(rel.)	0.23884505					

Silver in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	228.4917	38.0820	0.25188
R4	6	230.2433	38.3739	0.59400
T3	6	227.9727	37.9955	0.50685
T9	6	227.9770	37.9962	0.31084
U4	6	228.9288	38.1548	0.40486
U7	6	228.2552	38.0425	0.27434
W6	6	228.2742	38.0457	0.40739
W8	6	227.9105	37.9851	0.60943
X2	6	226.3165	37.7194	1.39107
X7	6	227.8385	37.9731	0.58022
Y1	6	228.2477	38.0413	1.05147
Y3	6	228.7110	38.1185	0.32017
Z6	6	228.5329	38.0888	0.46456
Z10	6	231.0764	38.5127	1.13708
AA4	6	229.2551	38.2092	0.30941
AA7	6	227.5104	37.9184	0.35803
AB3	6	228.1381	38.0230	0.45387
AB9	6	228.9469	38.1578	0.52013
AC2	6	227.4825	37.9138	0.35184
AC6	6	229.0850	38.1808	0.36308
AD3	6	228.5783	38.0964	0.44555
AD10	6	228.4558	38.0760	0.50009
AE2	6	228.5577	38.0930	0.41652
AE8	6	229.0813	38.1802	0.60986
AF1	6	228.1104	38.0184	0.28581
AF8	6	229.3873	38.2312	0.40984
AG1	6	228.3800	38.0633	0.83368
AG3	6	229.7124	38.2854	0.22846
AH4	6	228.3794	38.0632	0.49202
AH9	6	229.8563	38.3094	0.67189
AI4	6	228.1265	38.0211	0.26709
AI7	6	226.5352	37.7559	1.44544
AJ3	6	228.6769	38.1128	0.42940
AJ9	6	228.9071	38.1512	0.23898
AK3	6	228.1622	38.0270	0.48815
AK6	6	227.5357	37.9226	2.00373
AL1	6	228.4831	38.0805	0.35961
AL7	6	224.4283	37.4047	3.74677
AM7	6	227.5654	37.9276	0.45338
AM10	6	228.9126	38.1521	0.32395

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	7.71917831	39	0.197927649	0.31279624	0.99997376	1.46005356
Within groups	126.553726	200	0.632768631			
Total	134.272905	239				
within-sd	0.795468					
effective n	5.00					
s_bb	0					
s_bb_min	0.112496					
u_bb	0.112496	112.4961				
u_bb(rel.)	0.29555539					

Cadmium in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	220.7154	36.7859	0.29465
R4	6	222.5229	37.0872	0.16103
T3	6	222.9621	37.1603	0.24889
T9	6	222.0697	37.0116	0.19504
U4	6	222.4207	37.0701	0.09957
U7	6	222.7661	37.1277	0.17093
W6	6	225.3450	37.5575	0.04385
W8	6	222.2173	37.0362	0.20810
X2	6	224.4598	37.4100	0.43769
X7	6	221.3607	36.8934	0.18322
Y1	6	222.9046	37.1508	0.12357
Y3	6	221.9815	36.9969	0.10136
Z6	6	223.0179	37.1697	0.33018
Z10	6	225.8180	37.6363	0.56602
AA4	6	224.1984	37.3664	0.16925
AA7	6	223.6100	37.2683	0.26554
AB3	6	225.1161	37.5194	0.26287
AB9	6	223.9288	37.3215	0.30107
AC2	6	223.3419	37.2237	0.21736
AC6	6	222.4313	37.0719	0.40471
AD3	6	224.3525	37.3921	0.06958
AD10	6	223.5792	37.2632	0.06906
AE2	6	224.5367	37.4228	0.36051
AE8	6	222.3672	37.0612	0.53578
AF1	6	223.3583	37.2264	0.10992
AF8	6	224.2591	37.3765	0.29501
AG1	6	224.9651	37.4942	0.26674
AG3	6	221.0844	36.8474	0.13529
AH4	6	223.8342	37.3057	0.08116
AH9	6	224.5260	37.4210	0.08627
AI4	6	223.2582	37.2097	0.08475
AI7	6	220.9991	36.8332	0.44961
AJ3	6	223.3176	37.2196	0.22904
AJ9	6	224.2196	37.3699	0.03821
AK3	6	222.8499	37.1416	0.18530
AK6	6	225.6954	37.6159	0.29982
AL1	6	222.7294	37.1216	0.38227
AL7	6	222.0897	37.0150	0.15892
AM7	6	223.1258	37.1876	0.33349
AM10	6	224.2994	37.3832	0.12215
			37.2193	

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	10.4948642	39	0.269099083	1.1857522	0.22509365	1.46005356
Within groups	45.3887556	200	0.226943778			
Total	55.8836198	239				
within-sd	0.476386					
effective n	5.00					
s_bb	0.091821					
s_bb_min	0.067371					
u_bb	0.091821	91.820809				
u_bb(rel.)	0.24670207					

Copper in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	117.4440	19.5740	0.21943
R4	6	119.2142	19.8690	0.06653
T3	6	119.3980	19.8997	0.25235
T9	6	118.8285	19.8047	0.14367
U4	6	119.6119	19.9353	0.16478
U7	6	119.8067	19.9678	0.07101
W6	6	120.6442	20.1074	0.02475
W8	6	118.9576	19.8263	0.09079
X2	6	119.2064	19.8677	0.22416
X7	6	118.4701	19.7450	0.13999
Y1	6	119.1769	19.8628	0.16234
Y3	6	119.3667	19.8944	0.17276
Z6	6	119.0525	19.8421	0.12232
Z10	6	120.9491	20.1582	0.21673
AA4	6	120.1141	20.0190	0.05203
AA7	6	119.7533	19.9589	0.15253
AB3	6	120.8092	20.1349	0.15175
AB9	6	119.7519	19.9587	0.22506
AC2	6	119.8328	19.9721	0.24226
AC6	6	118.4854	19.7476	0.19371
AD3	6	120.2042	20.0340	0.18313
AD10	6	119.9300	19.9883	0.14344
AE2	6	120.0860	20.0143	0.12912
AE8	6	119.6355	19.9393	0.23363
AF1	6	119.2854	19.8809	0.11701
AF8	6	119.9073	19.9846	0.19094
AG1	6	120.9461	20.1577	0.26661
AG3	6	117.9715	19.6619	0.20353
AH4	6	119.9569	19.9928	0.15860
AH9	6	119.9219	19.9870	0.14719
AI4	6	119.0624	19.8437	0.19244
AI7	6	118.0801	19.6800	0.27469
AJ3	6	119.2801	19.8800	0.15852
AJ9	6	119.9304	19.9884	0.05228
AK3	6	119.1239	19.8540	0.18871
AK6	6	120.4317	20.0720	0.42541
AL1	6	118.9675	19.8279	0.15991
AL7	6	117.9206	19.6534	0.64257
AM7	6	119.5550	19.9258	0.21342
AM10	6	119.8174	19.9696	0.23149
			19.9120	

Source of variation	sums of squares	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	4.29646719	39	0.110165825	0.59536407	0.97214815	1.46005356
Within groups	37.0078851	200	0.185039425			
Total	41.3043523	239				
within-sd	0.430162					
effective n	5.00					
s_bb	0					
s_bb_min	0.060834					
u_bb	0.060834	60.834106				
u_bb(rel.)	0.30551434					

Nickel in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	19.4145	3.2357	0.01163
R4	6	19.5792	3.2632	0.01577
T3	6	20.9643	3.4941	0.01515
T9	6	20.7413	3.4569	0.00363
U4	6	20.6754	3.4459	0.01553
U7	6	20.9463	3.4910	0.01305
W6	6	20.7650	3.4608	0.01258
W8	6	20.4743	3.4124	0.00441
X2	6	20.6055	3.4342	0.01345
X7	6	20.3778	3.3963	0.01056
Y1	6	20.4542	3.4090	0.02310
Y3	6	20.3021	3.3837	0.00820
Z6	6	20.7900	3.4650	0.01913
Z10	6	20.6370	3.4395	0.01758
AA4	6	20.9431	3.4905	0.04712
AA7	6	20.5004	3.4167	0.00548
AB3	6	20.5500	3.4250	0.00960
AB9	6	21.0172	3.5029	0.00919
AC2	6	20.7402	3.4567	0.00429
AC6	6	20.3438	3.3906	0.00720
AD3	6	20.9317	3.4886	0.00479
AD10	6	20.7308	3.4551	0.02998
AE2	6	20.6018	3.4336	0.00425
AE8	6	20.3848	3.3975	0.01209
AF1	6	20.5246	3.4208	0.00286
AF8	6	20.6343	3.4391	0.00812
AG1	6	21.0627	3.5105	0.03907
AG3	6	20.4928	3.4155	0.00853
AH4	6	20.5614	3.4269	0.00848
AH9	6	20.2958	3.3826	0.00298
AI4	6	20.4663	3.4110	0.02201
AI7	6	20.3364	3.3894	0.01037
AJ3	6	20.9246	3.4874	0.01473
AJ9	6	20.5396	3.4233	0.00571
AK3	6	20.3206	3.3868	0.00420
AK6	6	20.9073	3.4846	0.00648
AL1	6	20.4896	3.4149	0.00955
AL7	6	21.0394	3.5066	0.01063
AM7	6	20.3204	3.3867	0.01630
AM10	6	20.6193	3.4366	0.02578

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	0.74722109	39	0.019159515	1.49223836	0.04090153	1.46005356
Within groups	2.56788935	200	0.012839447			
Total	3.31511044	239				
within-sd	0.113311					
effective n	5.00					
s_bb	0.035553					
s_bb_min	0.016025					
u_bb	0.035553	35.55297				
u_bb(rel.)	1.03677442					

Tellurium in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	163.6629	27.2772	3.81666
R4	6	170.4700	28.4117	2.13030
T3	6	170.4614	28.4102	2.14314
T9	6	167.7231	27.9538	1.52747
U4	6	166.0333	27.6722	2.51726
U7	6	165.2523	27.5421	1.46159
W6	6	168.8117	28.1353	2.05156
W8	6	167.4835	27.9139	0.64830
X2	6	169.4127	28.2354	3.12391
X7	6	162.9860	27.1643	2.79619
Y1	6	170.2073	28.3679	1.26390
Y3	6	165.9577	27.6596	1.79619
Z6	6	167.4550	27.9092	1.83294
Z10	6	169.2375	28.2063	4.78357
AA4	6	167.7360	27.9560	1.81595
AA7	6	167.7763	27.9627	4.12843
AB3	6	174.2456	29.0409	1.73203
AB9	6	169.1476	28.1913	2.59988
AC2	6	165.5076	27.5846	1.64026
AC6	6	166.8133	27.8022	4.77633
AD3	6	172.1558	28.6926	1.13742
AD10	6	165.5863	27.5977	2.45545
AE2	6	167.4646	27.9108	2.70378
AE8	6	167.8067	27.9678	2.21087
AF1	6	169.2213	28.2035	1.24465
AF8	6	170.6214	28.4369	1.74354
AG1	6	172.5860	28.7643	3.17292
AG3	6	162.6183	27.1031	3.11787
AH4	6	170.8350	28.4725	3.79865
AH9	6	169.0107	28.1684	2.08687
AI4	6	164.9124	27.4854	3.41352
AI7	6	171.2720	28.5453	3.27039
AJ3	6	166.9107	27.8185	3.31086
AJ9	6	168.2625	28.0438	2.39508
AK3	6	163.9482	27.3247	2.56212
AK6	6	166.7229	27.7871	2.95055
AL1	6	166.0077	27.6680	2.68642
AL7	6	170.3031	28.3838	1.66563
AM7	6	171.3788	28.5631	2.49694
AM10	6	173.1079	28.8513	2.22407
			28.0296	

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	50.8926951	39	1.3049409	0.52600832	0.99059204	1.46005356
Within groups	496.167395	200	2.480836973			
Total	547.06009	239				
within-sd	1.575067					
effective n	5.00					
s_bb	0					
s_bb_min	0.222748					
u_bb	0.222748	222.74815				
u_bb(rel.)	0.79468798					

Thallium in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	14.3855	2.3976	0.0000140
R4	6	14.3967	2.3994	0.0000099
T3	6	14.3882	2.3980	0.0000219
T9	6	14.3976	2.3996	0.0000036
U4	6	14.3992	2.3999	0.0000018
U7	6	14.3996	2.3999	0.0000031
W6	6	14.4058	2.4010	0.0000023
W8	6	14.3964	2.3994	0.0000085
X2	6	14.3984	2.3997	0.0000191
X7	6	14.3892	2.3982	0.0000107
Y1	6	14.3989	2.3998	0.0000249
Y3	6	14.3952	2.3992	0.0000125
Z6	6	14.3929	2.3988	0.0000248
Z10	6	14.3946	2.3991	0.0000528
AA4	6	14.3956	2.3993	0.0000018
AA7	6	14.4079	2.4013	0.0000069
AB3	6	14.4119	2.4020	0.0000133
AB9	6	14.3972	2.3995	0.0000325
AC2	6	14.4026	2.4004	0.0000274
AC6	6	14.3871	2.3978	0.0000227
AD3	6	14.4025	2.4004	0.0000091
AD10	6	14.4017	2.4003	0.0000057
AE2	6	14.4017	2.4003	0.0000326
AE8	6	14.3915	2.3986	0.0000247
AF1	6	14.4008	2.4001	0.0000054
AF8	6	14.4004	2.4001	0.0000192
AG1	6	14.4071	2.4012	0.0000210
AG3	6	14.3871	2.3978	0.0000232
AH4	6	14.3986	2.3998	0.0000211
AH9	6	14.4065	2.4011	0.0000141
AI4	6	14.3942	2.3990	0.0000259
AI7	6	14.3863	2.3977	0.0000224
AJ3	6	14.3972	2.3995	0.0000143
AJ9	6	14.4058	2.4010	0.0000017
AK3	6	14.3944	2.3991	0.0000208
AK6	6	14.4060	2.4010	0.0000046
AL1	6	14.3981	2.3997	0.0000081
AL7	6	14.4044	2.4007	0.0000029
AM7	6	14.3933	2.3989	0.0000199
AM10	6	14.4010	2.4002	0.0000142

2.3997

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	0.00027114	39	6.95236E-06	0.44479909	0.99824477	1.46005356
Within groups	0.00312607	200	1.56303E-05			
Total	0.00339721	239				
within-sd	0.003954					
effective n	5.00					
s_bb	0					
s_bb_min	0.000559					
u_bb	0.000559	0.5591124				
u_bb(rel.)	0.02329961					

Zinc in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	229.7508	38.2918	1.44630
R4	6	228.7771	38.1295	2.52855
T3	6	252.2712	42.0452	1.61818
T9	6	241.5607	40.2601	2.96178
U4	6	233.0329	38.8388	2.57779
U7	6	256.9955	42.8326	1.82752
W6	6	244.3067	40.7178	1.30858
W8	6	240.9624	40.1604	0.90388
X2	6	246.8829	41.1472	5.03050
X7	6	249.1890	41.5315	2.22867
Y1	6	241.1838	40.1973	5.22326
Y3	6	243.0975	40.5162	3.37162
Z6	6	248.4058	41.4010	0.70969
Z10	6	249.6741	41.6123	3.29705
AA4	6	250.1372	41.6895	7.19223
AA7	6	242.3475	40.3913	3.29256
AB3	6	238.1600	39.6933	3.92837
AB9	6	248.9400	41.4900	6.24136
AC2	6	248.4503	41.4084	8.05288
AC6	6	243.1046	40.5174	2.61444
AD3	6	240.1483	40.0247	5.89030
AD10	6	242.2546	40.3758	0.65199
AE2	6	242.3942	40.3990	0.25584
AE8	6	244.2140	40.7023	4.65311
AF1	6	231.3900	38.5650	1.23886
AF8	6	240.9991	40.1665	6.72866
AG1	6	245.3027	40.8838	1.76698
AG3	6	238.1339	39.6890	2.50548
AH4	6	244.3364	40.7227	3.19415
AH9	6	235.1989	39.1998	3.17036
AI4	6	240.0015	40.0003	6.39742
AI7	6	242.7318	40.4553	18.24991
AJ3	6	232.9785	38.8298	3.08036
AJ9	6	238.8804	39.8134	3.02624
AK3	6	234.0625	39.0104	2.11283
AK6	6	248.8246	41.4708	2.86168
AL1	6	232.6271	38.7712	4.14975
AL7	6	240.5578	40.0930	3.51425
AM7	6	234.2467	39.0411	5.23823
AM10	6	235.3957	39.2326	1.05590
			40.2580	

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	280.340432	39	7.188216205	1.96805985	0.00140411	1.46005356
Within groups	730.487563	200	3.652437816			
Total	1010.828	239				
within-sd	1.911135					
effective n	5.00					
s_bb	0.840925					
s_bb_min	0.270275					
u_bb	0.840925	840.92549				
u_bb(rel.)	2.08884314					

Aluminium in BAM-M109:

Sample	Number	Sum	Mean	Variance
R1	6	4.9157	0.8193	0.00085
R4	6	5.0642	0.8440	0.00097
T3	6	4.9408	0.8235	0.00035
T9	6	4.9808	0.8301	0.00117
U4	6	5.0225	0.8371	0.00059
U7	6	5.0403	0.8401	0.00098
W6	6	5.1567	0.8594	0.00144
W8	6	5.0058	0.8343	0.00037
X2	6	5.1569	0.8595	0.00141
X7	6	4.8731	0.8122	0.00036
Y1	6	4.9975	0.8329	0.00029
Y3	6	4.9352	0.8225	0.00030
Z6	6	4.9750	0.8292	0.00094
Z10	6	5.0391	0.8398	0.00203
AA4	6	5.0312	0.8385	0.00080
AA7	6	5.1504	0.8584	0.00150
AB3	6	5.1325	0.8554	0.00050
AB9	6	5.0646	0.8441	0.00160
AC2	6	4.9583	0.8264	0.00037
AC6	6	4.9642	0.8274	0.00163
AD3	6	5.0542	0.8424	0.00032
AD10	6	5.1092	0.8515	0.00100
AE2	6	5.0791	0.8465	0.00180
AE8	6	5.0512	0.8419	0.00224
AF1	6	5.0725	0.8454	0.00119
AF8	6	5.0633	0.8439	0.00323
AG1	6	5.0925	0.8487	0.00072
AG3	6	5.0640	0.8440	0.00189
AH4	6	5.0258	0.8376	0.00063
AH9	6	5.1206	0.8534	0.00110
AI4	6	4.9179	0.8197	0.00053
AI7	6	4.8860	0.8143	0.00107
AJ3	6	4.9964	0.8327	0.00073
AJ9	6	5.0400	0.8400	0.00111
AK3	6	5.0026	0.8338	0.00088
AK6	6	5.1712	0.8619	0.00194
AL1	6	4.9925	0.8321	0.00090
AL7	6	5.0322	0.8387	0.00085
AM7	6	5.0050	0.8342	0.00138
AM10	6	5.0507	0.8418	0.00039

Source of variation	squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value
Between groups	0.03575053	39	0.00091668	0.86600797	0.69653324	1.46005356
Within groups	0.21170252	200	0.001058513			
Total	0.24745306	239				
within-sd	0.032535					
effective n	5.00					
s_bb	0					
s_bb_min	0.004601					
u_bb	0.004601	4.6011142				
u_bb(rel.)	0.54875441					

Arsenic in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.056955	0.0094925	3.427E-07
J8	6	0.059465	0.00991083	4.9292E-07
K5	6	0.055608	0.009268	4.1131E-07
L8	6	0.055371	0.0092285	2.9509E-07
M4	6	0.055248	0.009208	3.2769E-07
N10	6	0.055288	0.00921467	3.3332E-07
N7	6	0.05496	0.00916	2.6591E-07
O1	6	0.055469	0.00924483	2.9495E-07
O8	6	0.057239	0.00953983	4.754E-07
P3	6	0.055159	0.00919317	3.9617E-07
P9	6	0.055608	0.009268	3.5663E-07
Q10	6	0.055807	0.00930117	2.7911E-07
Q4	6	0.05544	0.00924	4.0502E-07
			0.00932842	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	3.10653E-06	12	2.58878E-07	0.71968479	0.72701203	1.90436961
Within groups	2.33811E-05	65	3.5971E-07			
Total	2.64877E-05	77				
within-sd	0.00059976					
effective n	5.00					
s_bb	0					
s_bb_min	0.00011234					
u_bb	0.00011234	0.11233635				
u_bb(rel.)	1.204237343					

Bismuth in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.115512	0.019252	9.8841E-08
J8	6	0.115815	0.0193025	6.8686E-08
K5	6	0.114843	0.0191405	1.4592E-07
L8	6	0.11428	0.01904667	1.033E-07
M4	6	0.114395	0.01906583	1.076E-07
N10	6	0.114536	0.01908933	7.0988E-08
N7	6	0.114778	0.01912967	6.7615E-08
O1	6	0.113827	0.01897117	1.3666E-07
O8	6	0.115131	0.0191885	1.3718E-07
P3	6	0.114462	0.019077	1.2887E-07
P9	6	0.114473	0.01907883	1.3746E-07
Q10	6	0.114302	0.01905033	1.1581E-07
Q4	6	0.114494	0.01908233	1.1597E-07
			0.01911344	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	5.79574E-07	12	4.82978E-08	0.43757174	0.94209703	1.90436961
Within groups	7.1745E-06	65	1.10377E-07			
Total	7.75407E-06	77				
within-sd	0.00033223					
effective n	5.00					
s_bb	0					
s_bb_min	6.2228E-05					
u_bb	6.2228E-05	0.06222762				
u_bb(rel.)	0.325570018					

Antimony in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.070031	0.01167183	2.5926E-09
J8	6	0.070337	0.01172283	7.2162E-09
K5	6	0.069295	0.01154917	5.0858E-09
L8	6	0.068931	0.0114885	1.5506E-08
M4	6	0.068788	0.01146467	1.7585E-08
N10	6	0.071146	0.01185767	6.4991E-09
N7	6	0.072292	0.01204867	1.7211E-09
O1	6	0.068595	0.0114325	2.13E-08
O8	6	0.07378	0.01229667	4.0882E-07
P3	6	0.06988	0.01164667	8.2695E-09
P9	6	0.068791	0.01146517	2.2773E-08
Q10	6	0.06901	0.01150167	1.6998E-08
Q4	6	0.069224	0.01153733	1.0227E-08
			0.01166795	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	4.85164E-06	12	4.04304E-07	9.65118449	1.994E-10	1.90436961
Within groups	2.72295E-06	65	4.18916E-08			
Total	7.5746E-06	77				
within-sd	0.00020467					
effective n	5.00					
s_bb	0.00026923					
s_bb_min	3.8336E-05					
u_bb	0.00026923	0.26922552				
u_bb(rel.)	2.307393795					

Tin in BAM-M109a:

<i>Gruppen</i>	<i>Anzahl</i>	<i>Summe</i>	<i>Mittelwert</i>	<i>Varianz</i>
J1	6	0.764701	0.12745017	4.4697E-06
J8	6	0.842358	0.140393	3.0039E-05
K5	6	0.750602	0.12510033	5.3833E-06
L8	6	0.75935	0.12655833	6.8057E-06
M4	6	0.759189	0.1265315	8.566E-06
N10	6	0.755169	0.1258615	5.8201E-06
N7	6	0.753809	0.12563483	6.3191E-06
O1	6	0.787822	0.13130367	4.5508E-05
P3	6	0.757053	0.1261755	5.1326E-06
P9	6	0.759763	0.12662717	5.6607E-06
Q10	6	0.75539	0.12589833	6.9603E-06
Q4	6	0.757897	0.12631617	5.2574E-06
			0.12782088	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	0.001198163	11	0.000108924	9.616399025	1.0354E-09	1.95221194
Within groups	0.000679614	60	1.13269E-05			
Total	0.001877777	71				
within-sd	0.00336555					
effective n	5.00					
s_bb	0.00441808					
s_bb_min	0.00064312					
u_bb	0.00441808	4.418077378				
u_bb(rel.)	3.45645997					

Silver in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.023816	0.00396933	1.6683E-09
J8	6	0.024216	0.004036	4.9304E-09
K5	6	0.023452	0.00390867	1.1663E-09
L8	6	0.023104	0.00385067	4.4419E-09
M4	6	0.023178	0.003863	2.9324E-09
N10	6	0.023307	0.0038845	2.9071E-09
N7	6	0.023283	0.0038805	1.8219E-09
O1	6	0.022743	0.0037905	4.0155E-09
O8	6	0.023531	0.00392183	1.0417E-08
P3	6	0.023109	0.0038515	3.6695E-09
P9	6	0.02317	0.00386167	4.2279E-09
Q10	6	0.023204	0.00386733	3.8567E-09
Q4	6	0.023264	0.00387733	3.1603E-09
			0.00388945	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	2.65342E-07	12	2.21119E-08	5.84083845	9.599E-07	1.90436961
Within groups	2.46073E-07	65	3.78574E-09			
Total	5.11415E-07	77				
within-sd	6.1528E-05					
effective n	5.00					
s_bb	6.0541E-05					
s_bb_min	1.1524E-05					
u_bb	6.0541E-05	0.06054112				
u_bb(rel.)	1.556547576					

Cadmium in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.022429	0.00373817	2.261E-09
J8	6	0.022916	0.00381933	3.9027E-09
K5	6	0.022185	0.0036975	4.2083E-09
L8	6	0.022362	0.003727	4.8532E-09
M4	6	0.022503	0.0037505	3.7355E-09
N10	6	0.022256	0.00370933	2.5983E-09
N7	6	0.022158	0.003693	4.8264E-09
O1	6	0.022306	0.00371767	5.7719E-09
O8	6	0.022523	0.00375383	3.7394E-09
P3	6	0.022229	0.00370483	2.7686E-09
P9	6	0.02236	0.00372667	2.6095E-09
Q10	6	0.02232	0.00372	3.6548E-09
Q4	6	0.022397	0.00373283	4.5734E-09
			0.00373005	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	7.68081E-08	12	6.40068E-09	1.68089315	0.09181484	1.90436961
Within groups	2.47514E-07	65	3.8079E-09			
Total	3.24322E-07	77				
within-sd	6.1708E-05					
effective n	5.00					
s_bb	2.2772E-05					
s_bb_min	1.1558E-05					
u_bb	2.2772E-05	0.0227718				
u_bb(rel.)	0.610495676					

Copper in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.012	0.002	2.882E-09
J8	6	0.012321	0.0020535	1.5231E-09
K5	6	0.011823	0.0019705	2.3135E-09
L8	6	0.011865	0.0019775	3.1739E-09
M4	6	0.011903	0.00198383	3.3082E-09
N10	6	0.011914	0.00198567	2.1439E-09
N7	6	0.011938	0.00198967	2.6003E-09
O1	6	0.0117	0.00195	1.898E-09
O8	6	0.012184	0.00203067	3.0419E-09
P3	6	0.01194	0.00199	1.936E-09
P9	6	0.011913	0.0019855	2.4075E-09
Q10	6	0.011858	0.00197633	2.8803E-09
Q4	6	0.011929	0.00198817	2.235E-09
			0.00199087	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	4.90797E-08	12	4.08998E-09	1.64391172	0.10127972	1.90436961
Within groups	1.61717E-07	65	2.48795E-09			
Total	2.10797E-07	77				
within-sd	4.9879E-05					
effective n	5.00					
s_bb	1.79E-05					
s_bb_min	9.3425E-06					
u_bb	1.79E-05	0.01789985				
u_bb(rel.)	0.899095926					

Nickel in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.002441	0.00040683	6.8967E-11
J8	6	0.002587	0.00043117	1.3577E-10
K5	6	0.002189	0.00036483	6.3767E-11
L8	6	0.002407	0.00040117	7.8377E-10
M4	6	0.002355	0.0003925	1.3755E-09
N10	6	0.002105	0.00035083	1.0577E-10
N7	6	0.002082	0.000347	8.32E-11
O1	6	0.002426	0.00040433	2.7027E-10
O8	6	0.002554	0.00042567	1.2067E-09
P3	6	0.002153	0.00035883	7.1767E-11
P9	6	0.002226	0.000371	4.424E-10
Q10	6	0.002241	0.0003735	1.091E-10
Q4	6	0.002239	0.00037317	6.1367E-11
			0.00038468	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	5.47375E-08	12	4.56146E-09	12.4100505	1.2561E-12	1.90436961
Within groups	2.38915E-08	65	3.67562E-10			
Total	7.8629E-08	77				
within-sd	1.9172E-05					
effective n	5.00					
s_bb	2.8962E-05					
s_bb_min	3.5909E-06					
u_bb	2.8962E-05	0.02896168				
u_bb(rel.)	7.528783066					

Tellurium in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.015397	0.00256617	2.5541E-08
J8	6	0.01638	0.00273	2.6262E-08
K5	6	0.015684	0.002614	3.0046E-08
L8	6	0.015827	0.00263783	1.9269E-08
M4	6	0.015821	0.00263683	2.542E-08
N10	6	0.015872	0.00264533	2.5177E-08
N7	6	0.015661	0.00261017	2.2794E-08
O1	6	0.015551	0.00259183	1.507E-08
O8	6	0.015466	0.00257767	2.4355E-08
P3	6	0.015796	0.00263267	2.6858E-08
P9	6	0.015813	0.0026355	1.7223E-08
Q10	6	0.015863	0.00264383	1.8979E-08
Q4	6	0.015831	0.0026385	2.6661E-08
			0.00262772	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	1.16976E-07	12	9.74798E-09	0.41733117	0.95143789	1.90436961
Within groups	1.51826E-06	65	2.33579E-08			
Total	1.63524E-06	77				
within-sd	0.00015283					
effective n	5.00					
s_bb	0					
s_bb_min	2.8626E-05					
u_bb	2.8626E-05	0.02862603				
u_bb(rel.)	1.089387478					

Thallium in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.001437	0.0002395	3E-13
J8	6	0.001437	0.0002395	3E-13
K5	6	0.001437	0.0002395	3E-13
L8	6	0.001438	0.00023967	2.6667E-13
M4	6	0.00144	0.00024	8E-13
N10	6	0.001437	0.0002395	3E-13
N7	6	0.001437	0.0002395	3E-13
O1	6	0.001439	0.00023983	5.6667E-13
O8	6	0.001438	0.00023967	2.6667E-13
P3	6	0.001439	0.00023983	5.6667E-13
P9	6	0.001439	0.00023983	5.6667E-13
Q10	6	0.001439	0.00023983	5.6667E-13
Q4	6	0.00144	0.00024	8E-13
			0.00023971	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	2.71795E-12	12	2.26496E-13	0.49905838	0.90786886	1.90436961
Within groups	2.95E-11	65	4.53846E-13			
Total	3.22179E-11	77				
within-sd	6.7368E-07					
effective n	5.00					
s_bb	0					
s_bb_min	1.2618E-07					
u_bb	1.2618E-07	0.00012618				
u_bb(rel.)	0.05264064					

Zinc in BAM-M109a:

<i>Sample</i>	<i>Number</i>	<i>Sum</i>	<i>Mean</i>	<i>Variance</i>
J1	6	0.023309	0.00388483	6.875E-09
K5	6	0.025961	0.00432683	2.339E-09
L8	6	0.027641	0.00460683	5.0442E-09
M4	6	0.026525	0.00442083	4.3134E-09
N10	6	0.025403	0.00423383	1.4734E-09
N7	6	0.025391	0.00423183	4.513E-09
O1	6	0.027856	0.00464267	4.178E-07
O8	6	0.02385	0.003975	8.5004E-09
P3	6	0.025718	0.00428633	2.7639E-09
P9	6	0.025943	0.00432383	3.975E-09
Q10	6	0.026052	0.004342	3.7832E-09
Q4	6	0.026061	0.0043435	5.8615E-09
			0.00430153	

<i>Source of variation</i>	<i>sums of squares (SS)</i>	<i>degrees of freedom (df)</i>	<i>Mean squares (MS)</i>	<i>F-value</i>	<i>P-value</i>	<i>critical F-value</i>
Between groups	3.1097E-06	11	2.827E-07	7.260468003	1.0591E-07	1.95221194
Within groups	2.33622E-06	60	3.89369E-08			
Total	5.44592E-06	71				
within-sd	0.00019732					
effective n	5.00					
s_bb	0.0002208					
s_bb_min	3.7706E-05					
u_bb	0.0002208	0.220800102				
u_bb(rel.)	5.133062331					

Annex 2: Calculation of uncertainty contribution of potential inhomogeneity (area) Arsenic in BAM-M109:

at: AG3-1													
r_0	0.010342844	0.010549156											
r_in	0.010856	0.010752	0.010699	0.010571	0.010631	0.01078	0.010707						
r_out	0.010927	0.010934	0.011153	0.0109	0.011087	0.010765	0.011084	0.01061	0.011123	0.011132	0.010845	0.010859	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	5.66238E-07	2	2.83119E-07	13.12658464	0.000304757	3.554557146							
Within groups	3.88231E-07	18	2.15684E-08										
Total	9.54469E-07	20											
within-sd	0.000146862												
effective n	5.81												
s_bb	0.000212182			u_bb(rel.)	1.960262314								
s_bb_min	3.51785E-05												
u_bb	0.000212182			0.010824143									
at: AG3-3													
r_0	0.009238858	0.009455142											
r_in	0.009275	0.009306	0.009204	0.009415	0.00961	0.009341	0.009367	0.009141					
r_out	0.009636	0.009554	0.009311	0.00922	0.009581	0.009255	0.009518	0.009251	0.009374	0.009132	0.009366	0.009368	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	1.14861E-08	2	5.74304E-09	0.244978238	0.785155995	3.521893261							
Within groups	4.45418E-07	19	2.34431E-08										
Gesamt	4.56904E-07	21											
within-sd	0.000153111												
effective n	6.18												
s_bb	0			u_bb(rel.)	0.374752384								
s_bb_min	3.50767E-05												
u_bb	3.50767E-05			0.009359955									
at: AG3-4													
r_0	0.008771997	0.009110003											
r_in	0.008329	0.00884	0.008338	0.008413	0.008459	0.008469	0.008673	0.008186					
r_out	0.009307	0.008518	0.008628	0.008266	0.008787	0.008582	0.008878	0.00856	0.008552	0.008501	0.00863	0.008502	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	4.03199E-07	2	2.01599E-07	3.513624642	0.050302623	3.521893261							
Within groups	1.09015E-06	19	5.73765E-08										
Total	1.49335E-06	21											
within-sd	0.000239534												
effective n	6.18												
s_bb	0.000152742			u_bb(rel.)	1.77513353								
s_bb_min	5.48754E-05												
u_bb	0.000152742			0.008604545									
at: AG3-5													
r_0	0.010032634	0.010245366											
r_in	0.009517	0.009244	0.009556	0.009357	0.009426	0.009293	0.009266	0.009278					
r_out	0.009819	0.009881	0.009585	0.009372	0.00935	0.009503	0.00949	0.009631	0.009569	0.009402	0.009478	0.009425	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	9.55577E-07	2	4.77788E-07	20.980842	1.54924E-05	3.521893261							
Within groups	4.32679E-07	19	2.27726E-08										
Total	1.38826E-06	21											
within-sd	0.000150906												
effective n	6.18												
s_bb	0.000271303			u_bb(rel.)	2.846019708								
s_bb_min	3.45714E-05												
u_bb	0.000271303			0.009532727									
at: AG3-6													
r_0	0.010013037	0.010264963											
r_in	0.010218	0.010147	0.010292	0.010255	0.010379	0.010256	0.01042	0.010443					
r_out	0.010612	0.010855	0.010679	0.010616	0.010777	0.01079	0.0107	0.010225	0.010387	0.010245	0.010776	0.010495	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	6.27571E-07	2	3.13786E-07	9.7747726	0.00120497	3.521893261							
Within groups	6.0993E-07	19	3.21016E-08										
Total	1.2375E-06	21											
within-sd	0.000179169												
effective n	6.18												
s_bb	0.000213463			u_bb(rel.)	2.043198564								
s_bb_min	4.10463E-05												
u_bb	0.000213463			0.0104475									
								Mean:	1.9702109				

Bismuth in BAM-M109:

at: AG3-1												
r_0	0.019572105	0.019737895										
r_in	0.01985	0.019679	0.019808	0.019781	0.01986	0.019794	0.019898					
r_out	0.019896	0.019965	0.019965	0.019785	0.019674	0.019924	0.019965	0.019808	0.019639	0.02014	0.019845	0.019857
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	8.5126E-08	2	4.2563E-08	3.052181418	0.072209052	3.554557146						
Within groups	2.51012E-07	18	1.39451E-08									
Total	3.36138E-07	20										
within-sd	0.000118089											
effective n	5.81											
s_bb	7.01857E-05			u_bb(rel.)	0.353925921							
s_bb_min	2.82866E-05											
u_bb	7.01857E-05			0.019830619								
at: AG3-3												
r_0	0.019248897	0.019399103										
r_in	0.019109	0.019304	0.019296	0.019242	0.019469	0.019423	0.019303	0.019243				
r_out	0.019437	0.019288	0.019367	0.019256	0.019471	0.019393	0.019505	0.0192	0.01924	0.01932	0.019333	0.019491
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.73607E-08	2	8.68033E-09	0.770814394	0.476571295	3.521893261						
Within groups	2.13964E-07	19	1.12612E-08									
Total	2.31324E-07	21										
within-sd	0.000106119											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.12574558							
s_bb_min	2.43111E-05											
u_bb	2.43111E-05			0.019333545								
at: AG3-4												
r_0	0.019488854	0.01966346										
r_in	0.019423	0.019663	0.019482	0.019484	0.019362	0.019377	0.01957	0.019266				
r_out	0.019554	0.019416	0.019611	0.019417	0.019413	0.01936	0.019769	0.019538	0.019502	0.01932	0.019551	0.019466
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.53165E-08	2	1.26582E-08	0.827742124	0.452192223	3.521893261						
Within groups	2.90557E-07	19	1.52925E-08									
Total	3.15874E-07	21										
within-sd	0.000123663											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.145386264							
s_bb_min	2.83302E-05											
u_bb	2.83302E-05			0.019486182								
at: AG3-5												
r_0	0.01964774	0.01975826										
r_in	0.019796	0.019783	0.019905	0.0198	0.019744	0.019753	0.019581	0.019794				
r_out	0.019831	0.01995	0.01984	0.01972	0.019858	0.019833	0.019854	0.019967	0.019867	0.01976	0.019804	0.019867
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	5.09797E-08	2	2.54898E-08	4.19857624	0.030899941	3.521893261						
Within groups	1.1535E-07	19	6.07107E-09									
Total	1.6633E-07	21										
within-sd	7.79171E-05											
effective n	6.18											
s_bb	5.6047E-05			u_bb(rel.)	0.28299249							
s_bb_min	1.78502E-05											
u_bb	5.6047E-05			0.019805136								
at: AG3-6												
r_0	0.01963741	0.01976859										
r_in	0.019789	0.019908	0.019844	0.01985	0.019931	0.019748	0.019852	0.0198				
r_out	0.019851	0.019863	0.019884	0.019889	0.020112	0.019839	0.019851	0.019655	0.019891	0.019879	0.019859	0.019712
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	4.08365E-08	2	2.04183E-08	2.349535019	0.122521362	3.521893261						
Within groups	1.65117E-07	19	8.69034E-09									
Total	2.05953E-07	21										
within-sd	9.3222E-05											
effective n	6.18											
s_bb	4.35564E-05			u_bb(rel.)	0.219572257							
s_bb_min	2.13565E-05											
u_bb	4.35564E-05			0.019836955								
							Mean:	0.2410433				

Antimony in BAM-M109:

at: AG3-1												
r_0	0.011450765	0.011565235										
r_in	0.011664	0.011473	0.011622	0.011649	0.011776	0.011705	0.01165					
r_out	0.011722	0.011821	0.011714	0.011729	0.011784	0.011635	0.011639	0.011761	0.011847	0.011697	0.011758	0.011611
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	9.209E-08	2	4.6045E-08	7.07740175	0.005398086	3.554557146						
Within groups	1.17106E-07	18	6.50592E-09									
Total	2.09196E-07	20										
within-sd	8.06593E-05											
effective n	5.81											
s_bb	8.24979E-05			u_bb(rel.)	0.706337817							
s_bb_min	1.93207E-05											
u_bb	8.24979E-05			0.011679667								
at: AG3-3												
r_0	0.011420013	0.011543987										
r_in	0.011363	0.011317	0.011464	0.011556	0.011619	0.011554	0.011521	0.011476				
r_out	0.011697	0.011481	0.011628	0.011617	0.011552	0.011573	0.011583	0.011581	0.011452	0.011612	0.011436	0.011529
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Unterschiede	3.34888E-08	2	1.67444E-08	2.192426341	0.139084952	3.521893261						
Innerhalb de	1.4511E-07	19	7.63739E-09									
Gesamt	1.78599E-07	21										
within-sd	8.73922E-05											
effective n	6.18											
s_bb	3.83822E-05			u_bb(rel.)	0.333001713							
s_bb_min	2.00209E-05											
u_bb	3.83822E-05			0.011526136								
at: AG3-4												
r_0	0.011205445	0.011360555										
r_in	0.011239	0.011354	0.01145	0.011367	0.011462	0.011414	0.011224	0.011348				
r_out	0.011565	0.011268	0.011504	0.011122	0.011409	0.011391	0.011295	0.011283	0.011359	0.011356	0.011248	0.011233
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	9.03854E-09	2	4.51927E-09	0.373386106	0.693339756	3.521893261						
Within groups	2.29966E-07	19	1.21035E-08									
Total	2.39005E-07	21										
within-sd	0.000110016											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.222276212							
s_bb_min	2.52038E-05											
u_bb	2.52038E-05			0.011338955								
at: AG3-5												
r_0	0.011098544	0.011233456										
r_in	0.01124	0.011232	0.011164	0.011197	0.011205	0.011139	0.01108	0.011381				
r_out	0.011541	0.011249	0.011403	0.01145	0.011258	0.011383	0.011193	0.011385	0.011274	0.011252	0.011351	0.011361
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.16558E-07	2	5.82788E-08	6.387907294	0.007555107	3.521893261						
Within groups	1.73343E-07	19	9.1233E-09									
Total	2.899E-07	21										
within-sd	9.5516E-05											
effective n	6.18											
s_bb	8.91719E-05			u_bb(rel.)	0.790817865							
s_bb_min	2.1882E-05											
u_bb	8.91719E-05			0.011275909								
at: AG3-6												
r_0	0.011102526	0.011229474										
r_in	0.011407	0.011477	0.011404	0.011547	0.011379	0.011421	0.011336	0.011376				
r_out	0.01144	0.011306	0.011443	0.011261	0.011278	0.011536	0.011251	0.011338	0.01133	0.011213	0.01136	0.01119
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.10234E-07	2	5.51169E-08	6.785263855	0.005974804	3.521893261						
Within groups	1.54338E-07	19	8.12303E-09									
Total	2.64571E-07	21										
within-sd	9.01278E-05											
effective n	6.18											
s_bb	8.71892E-05			u_bb(rel.)	0.768417151							
s_bb_min	2.06476E-05											
u_bb	8.71892E-05			0.011346591								
											Mean:	0.6123835

Tin in BAM-M109:

at: AG3-1											
r_0	0.124124694	0.125013306									
r_in	0.124864	0.12381	0.123305	0.124629	0.124567	0.124381	0.124526				
r_out	0.126872	0.125993	0.126398	0.125713	0.124756	0.12589	0.125935	0.126271	0.12663	0.126248	0.12518
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	1.2257E-05	2	6.12851E-06	15.43446786	0.000124783	3.554557146					
Within groups	7.1472E-06	18	3.97067E-07								
Total	1.94042E-05	20									
within-sd	0.000630132										
effective n	5.81										
s_bb	0.000993257			u_bb(rel.)	0.793109768						
s_bb_min	0.000150939										
u_bb	0.000993257			0.12523581							
at: AG3-3											
r_0	0.121337017	0.121952983									
r_in	0.121676	0.122235	0.121804	0.122862	0.121435	0.121963	0.122267	0.122109			
r_out	0.123408	0.122701	0.123417	0.123429	0.123654	0.123163	0.124083	0.123342	0.123286	0.124304	0.123987
reunungsursachdratsummen (Heitsgrade (e Quadratsumröße (F) P-Wert kritischer F-Wert											
Unterschiede	1.3493E-05	2	6.74651E-06	35.5637511	3.77585E-07	3.521893261					
Innerhalb de	3.60434E-06	19	1.89702E-07								
Gesamt	1.70974E-05	21									
within-sd	0.000435548										
effective n	6.18										
s_bb	0.001029884			u_bb(rel.)	0.838573021						
s_bb_min	9.97808E-05										
u_bb	0.001029884			0.122813864							
at: AG3-4											
r_0	0.122115734	0.122768266									
r_in	0.123102	0.12318	0.122936	0.123308	0.12282	0.122168	0.124024	0.122975			
r_out	0.123841	0.12356	0.123836	0.123078	0.122674	0.123325	0.123153	0.12332	0.122576	0.122787	0.123019
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	9.19338E-07	2	4.59669E-07	2.169113596	0.141747206	3.521893261					
Within groups	4.0264E-06	19	2.11916E-07								
Total	4.94573E-06	21									
within-sd	0.000460343										
effective n	6.18										
s_bb	0.000200194			u_bb(rel.)	0.162670138						
s_bb_min	0.000105461										
u_bb	0.000200194			0.123067636							
at: AG3-5											
r_0	0.123250817	0.124261183									
r_in	0.123143	0.121904	0.12304	0.123223	0.122681	0.121479	0.122079	0.121397			
r_out	0.124391	0.124895	0.122334	0.124617	0.124049	0.123347	0.123413	0.123817	0.123728	0.123272	0.123376
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	9.50989E-06	2	4.75494E-06	9.331351616	0.001503142	3.521893261					
Within groups	9.68176E-06	19	5.09567E-07								
Total	1.91917E-05	21									
within-sd	0.000713839										
effective n	6.18										
s_bb	0.000828705			u_bb(rel.)	0.672443152						
s_bb_min	0.000163535										
u_bb	0.000828705			0.123237955							
at: AG3-6											
r_0	0.123215395	0.124296605									
r_in	0.125694	0.125171	0.126245	0.12473	0.124602	0.124608	0.123933	0.123461			
r_out	0.124057	0.124675	0.125772	0.123508	0.124979	0.125093	0.124448	0.125433	0.123799	0.124414	0.124403
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	1.76781E-06	2	8.83907E-07	1.522402078	0.243640724	3.521893261					
Within groups	1.10314E-05	19	5.806E-07								
Total	1.27992E-05	21									
within-sd	0.000761971										
effective n	6.18										
s_bb	0.000221505			u_bb(rel.)	0.17775417						
s_bb_min	0.000174562										
u_bb	0.000221505			0.124612909							
Mean:	0.6070364										

Silver in BAM-M109:

at: AG3-1												
r_0	0.003828442	0.003855558										
r_in	0.003855	0.003854	0.003823	0.003795	0.003838	0.003842	0.003864					
r_out	0.003874	0.003853	0.003875	0.003828	0.003855	0.003884	0.003865	0.003854	0.00387	0.003844	0.003861	0.003829
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.10638E-09	2	5.5319E-10	1.522293229	0.245012918	3.554557146						
Within groups	6.54107E-09	18	3.63393E-10									
Total	7.64745E-09	20										
within-sd	1.90629E-05											
effective n	5.81											
s_bb	5.71577E-06			u_bb(rel.)	0.148548041							
s_bb_min	4.56622E-06											
u_bb	5.71577E-06			0.003847762								
at: AG3-3												
r_0	0.003864388	0.003899612										
r_in	0.00386	0.00386	0.003889	0.003885	0.003915	0.003915	0.003886	0.00383				
r_out	0.003901	0.003899	0.003873	0.003893	0.003886	0.003839	0.003895	0.003905	0.00386	0.003859	0.00389	0.003854
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.08182E-11	2	5.40909E-12	0.008773963	0.99126843	3.521893261						
Within groups	1.17134E-08	19	6.16494E-10									
Total	1.17242E-08	21										
within-sd	2.48293E-05											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.146606656							
s_bb_min	5.6882E-06											
u_bb	5.6882E-06			0.003879909								
at: AG3-4												
r_0	0.003763981	0.003790019										
r_in	0.003849	0.003875	0.003886	0.003861	0.003865	0.003867	0.003861	0.003853				
r_out	0.003878	0.003876	0.003864	0.003865	0.003869	0.003844	0.003834	0.003882	0.003906	0.00387	0.003895	0.003838
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.47636E-08	2	7.38179E-09	21.55164655	1.29888E-05	3.521893261						
Within groups	6.50781E-09	19	3.42516E-10									
Total	2.12714E-08	21										
within-sd	1.85072E-05											
effective n	6.18											
s_bb	3.37447E-05			u_bb(rel.)	0.874503616							
s_bb_min	4.23986E-06											
u_bb	3.37447E-05			0.003858727								
at: AG3-5												
r_0	0.003746214	0.003777786										
r_in	0.003891	0.00388	0.003889	0.003871	0.003904	0.003814	0.003861	0.003876				
r_out	0.00392	0.003895	0.003885	0.003883	0.003882	0.003869	0.003847	0.00389	0.003862	0.003881	0.00389	0.003871
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.47937E-08	2	1.23969E-08	25.09458311	4.65369E-06	3.521893261						
Within groups	9.38611E-09	19	4.94006E-10									
Total	3.41799E-08	21										
within-sd	2.22262E-05											
effective n	6.18											
s_bb	4.38801E-05			u_bb(rel.)	1.134585922							
s_bb_min	5.09187E-06											
u_bb	4.38801E-05			0.0038675								
at: AG3-6												
r_0	0.003747767	0.003776233										
r_in	0.003869	0.003859	0.003837	0.003867	0.003857	0.003814	0.003866	0.003839				
r_out	0.003875	0.003863	0.003842	0.00386	0.003833	0.003855	0.003879	0.003862	0.00384	0.003811	0.00387	0.003829
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.45169E-08	2	7.25847E-09	17.89182044	4.27539E-05	3.521893261						
Within groups	7.70805E-09	19	4.05687E-10									
Total	2.2225E-08	21										
within-sd	2.01417E-05											
effective n	6.18											
s_bb	3.32947E-05			u_bb(rel.)	0.86632217							
s_bb_min	4.61431E-06											
u_bb	3.32947E-05			0.003843227								
							Mean:	0.7544688				

Cadmium in BAM-M109:

at: AG3-1											
r_0	0.00361647	0.00367553									
r_in	0.003657	0.003648	0.003576	0.003661	0.003632	0.003719	0.003729				
r_out	0.003746	0.003714	0.003724	0.003714	0.003647	0.003711	0.003693	0.00372	0.003784	0.003698 0.003712 0.003671	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	1.53449E-08	2	7.67245E-09	4.456253328	0.026783368	3.554557146					
Within groups	3.09911E-08	18	1.72173E-09								
Total	4.6336E-08	20									
within-sd	4.14937E-05										
effective n	5.81										
s_bb	3.20048E-05			u_bb(rel.)	0.867808237						
s_bb_min	9.9392E-06										
u_bb	3.20048E-05			0.003688							
at: AG3-3											
r_0	0.003633892	0.003674108									
r_in	0.003647	0.003669	0.003629	0.003651	0.003651	0.003649	0.003654	0.003637			
r_out	0.003716	0.003702	0.003737	0.003752	0.003782	0.003684	0.003716	0.003801	0.003693	0.003755 0.003754 0.003739	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	4.07843E-08	2	2.03921E-08	24.85659326	4.96911E-06	3.521893261					
Within groups	1.55874E-08	19	8.20392E-10								
Total	5.63717E-08	21									
within-sd	2.86425E-05										
effective n	6.18										
s_bb	5.62674E-05			u_bb(rel.)	1.522124126						
s_bb_min	6.56178E-06										
u_bb	5.62674E-05			0.003696636							
at: AG3-4											
r_0	0.003696745	0.003733255									
r_in	0.003633	0.003674	0.003654	0.003656	0.003641	0.003636	0.003706	0.003662			
r_out	0.00373	0.003703	0.003726	0.003705	0.00367	0.003667	0.003688	0.003678	0.003674	0.003669 0.003674 0.003635	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	6.59145E-09	2	3.29572E-09	4.932596629	0.018819226	3.521893261					
Within groups	1.26949E-08	19	6.68152E-10								
Total	1.92863E-08	21									
within-sd	2.58486E-05										
effective n	6.18										
s_bb	2.06167E-05			u_bb(rel.)	0.560575718						
s_bb_min	5.92173E-06										
u_bb	2.06167E-05			0.003677773							
at: AG3-5											
r_0	0.003611955	0.003676045									
r_in	0.003665	0.003688	0.003671	0.003671	0.003671	0.003624	0.003609	0.003614			
r_out	0.003747	0.003798	0.003603	0.003749	0.003758	0.003641	0.003686	0.003711	0.003719	0.003709 0.003718 0.003681	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	1.9664E-08	2	9.83199E-09	4.742571053	0.021344427	3.521893261					
Within groups	3.93896E-08	19	2.07314E-09								
Total	5.90536E-08	21									
within-sd	4.55317E-05										
effective n	6.18										
s_bb	3.54275E-05			u_bb(rel.)	0.961979642						
s_bb_min	1.0431E-05										
u_bb	3.54275E-05			0.003682773							
at: AG3-6											
r_0	0.003617881	0.003670119									
r_in	0.003689	0.003727	0.003756	0.003658	0.003683	0.003679	0.003699	0.003608			
r_out	0.003635	0.003629	0.003697	0.003629	0.003692	0.003716	0.003641	0.003692	0.003649	0.003635 0.003661 0.003685	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	4.2843E-09	2	2.14215E-09	1.582017421	0.231470356	3.521893261					
Within groups	2.57272E-08	19	1.35406E-09								
Total	3.00115E-08	21									
within-sd	3.67976E-05										
effective n	6.18										
s_bb	1.12909E-05			u_bb(rel.)	0.307623886						
s_bb_min	8.43005E-06										
u_bb	1.12909E-05			0.003670364							
							Mean:	0.9385345			

Copper in BAM-M109:

at: AG3-1										
r_0	0.00194115	0.00196485								
r_in	0.001962	0.00193	0.001913	0.001934	0.001951	0.00195	0.00196			
r_out	0.002	0.001983	0.001999	0.001971	0.001947	0.001983	0.00199	0.001987	0.00199	0.001972 0.001966 0.00196
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	6.06638E-09	2	3.03319E-09	10.83342503	0.000815836	3.554557146				
Within groups	5.03972E-09	18	2.79984E-10							
Total	1.11061E-08	20								
within-sd	1.67327E-05									
effective n	5.81									
s_bb	2.17695E-05			u_bb(rel.)	1.108159614					
s_bb_min	4.00808E-06									
u_bb	2.17695E-05			0.001964476						
at: AG3-3										
r_0	0.001904364	0.001921636								
r_in	0.001913	0.00192	0.001916	0.001944	0.001917	0.001932	0.001923	0.001911		
r_out	0.001957	0.001955	0.001952	0.001959	0.001964	0.00193	0.001974	0.001966	0.001942	0.001973 0.001967 0.001948
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	7.61707E-09	2	3.80853E-09	25.44896457	4.22424E-06	3.521893261				
Within groups	2.84342E-09	19	1.49654E-10							
Total	1.04605E-08	21								
within-sd	1.22333E-05									
effective n	6.18									
s_bb	2.43285E-05			u_bb(rel.)	1.253783893					
s_bb_min	2.80256E-06									
u_bb	2.43285E-05			0.001940409						
at: AG3-4										
r_0	0.001877022	0.001892978								
r_in	0.001937	0.001948	0.001947	0.001935	0.00193	0.001929	0.001957	0.001936		
r_out	0.00196	0.001968	0.001966	0.001956	0.001932	0.001944	0.001939	0.001955	0.001953	0.001943 0.001958 0.001933
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	7.38257E-09	2	3.69129E-09	28.87269948	1.73845E-06	3.521893261				
Within groups	2.42909E-09	19	1.27847E-10							
Total	9.81166E-09	21								
within-sd	1.13069E-05									
effective n	6.18									
s_bb	2.40091E-05			u_bb(rel.)	1.237120618					
s_bb_min	2.59034E-06									
u_bb	2.40091E-05			0.001940727						
at: AG3-5										
r_0	0.001920086	0.001949914								
r_in	0.001931	0.001923	0.001933	0.001934	0.001942	0.001869	0.001911	0.001895		
r_out	0.001979	0.00198	0.001924	0.00197	0.001959	0.001955	0.001927	0.001955	0.001936	0.001945 0.001945 0.001944
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	5.6729E-09	2	2.83645E-09	6.416339648	0.007427863	3.521893261				
Within groups	8.39927E-09	19	4.42067E-10							
Total	1.40722E-08	21								
within-sd	2.10254E-05									
effective n	6.18									
s_bb	1.96806E-05			u_bb(rel.)	1.015726293					
s_bb_min	4.81676E-06									
u_bb	1.96806E-05			0.001937591						
at: AG3-6										
r_0	0.001923161	0.001946839								
r_in	0.002009	0.001983	0.002009	0.001974	0.001979	0.001965	0.001975	0.001953		
r_out	0.001972	0.001979	0.002009	0.001979	0.001988	0.002	0.001989	0.001998	0.001956	0.001975 0.001975 0.001976
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	4.06372E-09	2	2.03186E-09	7.296118643	0.004455427	3.521893261				
Within groups	5.29121E-09	19	2.78485E-10							
Total	9.35493E-09	21								
within-sd	1.66879E-05									
effective n	6.18									
s_bb	1.68414E-05			u_bb(rel.)	0.851496211					
s_bb_min	3.82307E-06									
u_bb	1.68414E-05			0.001977864						
							Mean:	1.1033771		

Nickel in BAM-M109:

at: AG3-1												
r_0	0.000319548	0.000334452										
r_in	0.00034	0.00035	0.000344	0.000336	0.000359	0.000339	0.000339					
r_out	0.000339	0.00034	0.000335	0.000339	0.000347	0.000347	0.000373	0.00034	0.000346	0.000335	0.000333	0.000328
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	4.87286E-10	2	2.43643E-10	2.179230938	0.14206112	3.554557146						
Within groups	2.01244E-09	18	1.11802E-10									
Total	2.49973E-09	20										
within-sd	1.05737E-05											
effective n	5.81											
s_bb	4.76381E-06			u_bb(rel.)	1.395647289							
s_bb_min	2.53276E-06											
u_bb	4.76381E-06			0.000341333								
at: AG3-3												
r_0	0.000313558	0.000326442										
r_in	0.000337	0.000332	0.00033	0.00033	0.000339	0.000324	0.000353	0.000344				
r_out	0.00035	0.000336	0.000337	0.000352	0.000332	0.000329	0.000332	0.000344	0.000356	0.000343	0.000332	0.000334
reunungsursache	dratsummen	(heitsgrade	(e Quadratsum	rüfgröße (F)	P-Wert	tischer F-Wert						
Unterschiede	6.71966E-10	2	3.35983E-10	4.050264717	0.034266547	3.521893261						
Innerhalb de	1.57611E-09	19	8.29533E-11									
Gesamt	2.24808E-09	21										
within-sd	9.10787E-06											
effective n	6.18											
s_bb	6.39775E-06			u_bb(rel.)	1.900494176							
s_bb_min	2.08655E-06											
u_bb	6.39775E-06			0.000336636								
at: AG3-4												
r_0	0.000313521	0.000346479										
r_in	0.000339	0.000337	0.000341	0.000329	0.000333	0.000325	0.00034	0.000429				
r_out	0.000361	0.000331	0.000353	0.000331	0.00034	0.000323	0.000332	0.00033	0.000329	0.000344	0.000322	0.000326
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	8.03049E-10	2	4.01525E-10	0.753800698	0.484136658	3.521893261						
Within groups	1.01207E-08	19	5.32667E-10									
Total	1.09237E-08	21										
within-sd	2.30796E-05											
effective n	6.18											
s_bb	0			u_bb(rel.)	1.560320595							
s_bb_min	5.28736E-06											
u_bb	5.28736E-06			0.000338864								
at: AG3-5												
r_0	0.000340785	0.000353215										
r_in	0.000324	0.000339	0.000326	0.000338	0.000322	0.00031	0.000319	0.000323				
r_out	0.000341	0.000327	0.000327	0.000328	0.000324	0.000331	0.00035	0.000331	0.000324	0.000344	0.000331	0.000331
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	8.12027E-10	2	4.06013E-10	5.272737578	0.015083249	3.521893261						
Within groups	1.46304E-09	19	7.70024E-11									
Total	2.27507E-09	21										
within-sd	8.7751E-06											
effective n	6.18											
s_bb	7.29536E-06			u_bb(rel.)	2.203432591							
s_bb_min	2.01031E-06											
u_bb	7.29536E-06			0.000331091								
at: AG3-6												
r_0	0.000337652	0.000356348										
r_in	0.000339	0.000341	0.000348	0.000366	0.000336	0.000334	0.000345	0.000342				
r_out	0.000347	0.000335	0.000344	0.000378	0.000366	0.000347	0.000338	0.000336	0.000336	0.000342	0.000373	0.000344
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.18049E-10	2	5.90246E-11	0.335236244	0.719314287	3.521893261						
Within groups	3.34531E-09	19	1.76069E-10									
Total	3.46336E-09	21										
within-sd	1.32691E-05											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.876381767							
s_bb_min	3.03985E-06											
u_bb	3.03985E-06			0.000346864								
							Mean:	1.6503012				

Tellurium in BAM-M109:

at: AG3-1												
r_0	0.002958783	0.003025217										
r_in	0.003002	0.003001	0.002988	0.003035	0.002973	0.003028	0.003046					
r_out	0.003091	0.003068	0.003154	0.003066	0.003055	0.003032	0.003126	0.00301	0.003104	0.00313	0.003044	0.002958
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.12656E-08	2	1.06328E-08	4.743706915	0.022143569	3.554557146						
Within groups	4.03461E-08	18	2.24145E-09									
Total	6.16117E-08	20										
within-sd	4.7344E-05											
effective n	5.81											
s_bb	3.80054E-05			u_bb(rel.)	1.249101355							
s_bb_min	1.13405E-05											
u_bb	3.80054E-05			0.003042619								
at: AG3-3												
r_0	0.00262771	0.00269229										
r_in	0.002654	0.002675	0.002639	0.002627	0.00273	0.00269	0.002667	0.002585				
r_out	0.002797	0.002695	0.002726	0.002666	0.002768	0.002678	0.002692	0.002705	0.002683	0.002635	0.002734	0.002652
Unterschiede	Quadratsummen (SS)	Freiheitsgrade (df)	Quadratsumme Prüfgröße (F)	P-Wert	tischer F-Wert							
Unterschiede	1.05083E-08	2	5.25415E-09	2.515458387	0.107359625	3.521893261						
Innerhalb der	3.96861E-08	19	2.08874E-09									
Gesamt	5.01944E-08	21										
within-sd	4.57028E-05											
effective n	6.18											
s_bb	2.26285E-05			u_bb(rel.)	0.843518741							
s_bb_min	1.04702E-05											
u_bb	2.26285E-05			0.002682636								
at: AG3-4												
r_0	0.002513662	0.002586338										
r_in	0.002299	0.002431	0.002438	0.002379	0.002394	0.002366	0.002389	0.002393				
r_out	0.002556	0.002483	0.0024	0.002398	0.002404	0.002454	0.002526	0.002439	0.002459	0.002391	0.002441	0.002371
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	4.62689E-08	2	2.31344E-08	8.713577244	0.002063571	3.521893261						
Within groups	5.04448E-08	19	2.65499E-09									
Total	9.67137E-08	21										
within-sd	5.15266E-05											
effective n	6.18											
s_bb	5.75574E-05			u_bb(rel.)	2.366359657							
s_bb_min	1.18044E-05											
u_bb	5.75574E-05			0.002432318								
at: AG3-5												
r_0	0.002793765	0.002856235										
r_in	0.002686	0.002665	0.002691	0.002606	0.002632	0.002668	0.002592	0.002615				
r_out	0.002765	0.00275	0.002672	0.002678	0.002738	0.002671	0.002717	0.002625	0.002656	0.002684	0.002686	0.002608
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	5.24679E-08	2	2.62339E-08	13.383905	0.00023596	3.521893261						
Within groups	3.72421E-08	19	1.96011E-09									
Total	8.971E-08	21										
within-sd	4.42731E-05											
effective n	6.18											
s_bb	6.2663E-05			u_bb(rel.)	2.334409867							
s_bb_min	1.01426E-05											
u_bb	6.2663E-05			0.002684318								
at: AG3-6												
r_0	0.002799244	0.002850756										
r_in	0.002811	0.002825	0.002821	0.002853	0.002824	0.002774	0.002852	0.002792				
r_out	0.002878	0.002898	0.002905	0.002981	0.002895	0.002931	0.002929	0.002871	0.002872	0.00281	0.002899	0.002876
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	3.09169E-08	2	1.54585E-08	11.56086181	0.000519219	3.521893261						
Within groups	2.54056E-08	19	1.33714E-09									
Total	5.63226E-08	21										
within-sd	3.65669E-05											
effective n	6.18											
s_bb	4.77947E-05			u_bb(rel.)	1.670426641							
s_bb_min	8.37721E-06											
u_bb	4.77947E-05			0.002861227								
							Mean:	1.7950616				

Thallium in BAM-M109:

at: AG3-1												
r_0	0.000239791	0.000240209										
r_in	0.00024	0.000239	0.000239	0.00024	0.00024	0.00024	0.00024	0.00024				
r_out	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	3.80952E-13	2	1.90476E-13	2.261157025	0.13302567	3.554557146						
Within groups	1.51629E-12	18	8.42384E-14									
Total	1.89724E-12	20										
within-sd	2.90238E-07											
effective n	5.81											
s_bb	1.35229E-07			u_bb(rel.)	0.056367715							
s_bb_min	6.95223E-08											
u_bb	1.35229E-07			0.000239905								
at: AG3-3												
r_0	0.000238703	0.000239297										
r_in	0.000239	0.00024	0.000239	0.000239	0.000239	0.000239	0.00024	0.000239	0.00024	0.000239		
r_out	0.000239	0.000239	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.28788E-12	2	1.14394E-12	6.501035867	0.007062644	3.521893261						
Within groups	3.34329E-12	19	1.75963E-13									
Gesamt	5.63117E-12	21										
within-sd	4.19479E-07											
effective n	6.18											
s_bb	3.95708E-07			u_bb(rel.)	0.165191013							
s_bb_min	9.60995E-08											
u_bb	3.95708E-07			0.000239545								
at: AG3-4												
r_0	0.00023974	0.00024026										
r_in	0.000239	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024		
r_out	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.74242E-13	2	8.71212E-14	0.648532904	0.534002439	3.521893261						
Within groups	2.55238E-12	19	1.34336E-13									
Total	2.72662E-12	21										
within-sd	3.66519E-07											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.035006002							
s_bb_min	8.39667E-08											
u_bb	8.39667E-08			0.000239864								
at: AG3-5												
r_0	0.000239752	0.000240248										
r_in	0.000239	0.000239	0.000239	0.000239	0.000239	0.000239	0.000239	0.000239	0.000239	0.000239		
r_out	0.00024	0.00024	0.000239	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.000239
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	3.25E-12	2	1.625E-12	13.01245211	0.00027565	3.521893261						
Within groups	2.37273E-12	19	1.2488E-13									
Total	5.62273E-12	21										
within-sd	3.53384E-07											
effective n	6.18											
s_bb	4.92612E-07			u_bb(rel.)	0.205683434							
s_bb_min	8.09577E-08											
u_bb	4.92612E-07			0.0002395								
at: AG3-6												
r_0	0.000239842	0.000240158										
r_in	0.00024	0.00024	0.000241	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024		
r_out	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	7.95455E-14	2	3.97727E-14	0.816953317	0.45670454	3.521893261						
Within groups	9.25E-13	19	4.86842E-14									
Total	1.00455E-12	21										
within-sd	2.20645E-07											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.021057731							
s_bb_min	5.05481E-08											
u_bb	5.05481E-08			0.000240045								
											Mean :	0.1220163

Zinc in BAM-M109:

at: AG3-1													
r_0	0.003840814	0.003905186											
r_in	0.003858	0.003872	0.003803	0.003802	0.003823	0.003865	0.003846						
r_out	0.003782	0.00377	0.003767	0.003681	0.003684	0.003751	0.003766	0.003766	0.003824	0.00378	0.003756	0.003878	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	3.39783E-08	2	1.69892E-08	8.089550004	0.003116068	3.554557146							
Within groups	3.78025E-08	18	2.10014E-09										
Total	7.17808E-08	20											
within-sd	4.58272E-05												
effective n	5.81												
s_bb	5.06247E-05			u_bb(rel.)	1.331896319								
s_bb_min	1.09772E-05												
u_bb	5.06247E-05			0.003800952									
at: AG3-3													
r_0	0.003888678	0.003960322											
r_in	0.003937	0.003935	0.00396	0.003972	0.003947	0.00392	0.003983	0.003924					
r_out	0.003921	0.003913	0.003969	0.00401	0.003956	0.003854	0.003916	0.003909	0.003919	0.004088	0.003939	0.00401	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	1.10165E-09	2	5.50826E-10	0.217711042	0.806336705	3.521893261							
Within groups	4.80715E-08	19	2.53008E-09										
Total	4.91731E-08	21											
within-sd	5.02999E-05												
effective n	6.18												
s_bb	0			u_bb(rel.)	0.291958251								
s_bb_min	1.15233E-05												
u_bb	1.15233E-05			0.003946909									
at: AG3-4													
r_0	0.00412731	0.00417069											
r_in	0.003999	0.004024	0.004006	0.004055	0.00404	0.004053	0.004101	0.00404					
r_out	0.004003	0.003997	0.004017	0.004059	0.004001	0.003997	0.004009	0.004077	0.004026	0.003972	0.004036	0.003993	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	3.06471E-08	2	1.53235E-08	16.31323505	7.514E-05	3.521893261							
Within groups	1.78473E-08	19	9.39332E-10										
Total	4.84944E-08	21											
within-sd	3.06485E-05												
effective n	6.18												
s_bb	4.82375E-05			u_bb(rel.)	1.19503098								
s_bb_min	7.02135E-06												
u_bb	4.82375E-05			0.0040365									
at: AG3-5													
r_0	0.003631316	0.003734684											
r_in	0.004044	0.004065	0.004255	0.004131	0.004132	0.004362	0.004048	0.00414					
r_out	0.003992	0.004045	0.004034	0.004009	0.004045	0.004038	0.004016	0.004069	0.004016	0.004062	0.004088	0.004054	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	3.45936E-07	2	1.72968E-07	33.12380738	6.40734E-07	3.521893261							
Within groups	9.92154E-08	19	5.22186E-09										
Total	4.45152E-07	21											
within-sd	7.22625E-05												
effective n	6.18												
s_bb	0.000164728			u_bb(rel.)	4.071432134								
s_bb_min	1.65548E-05												
u_bb	0.000164728			0.004045955									
at: AG3-6													
r_0	0.003641479	0.003724521											
r_in	0.003811	0.00379	0.003819	0.003764	0.003769	0.003735	0.003734	0.003706					
r_out	0.003547	0.003647	0.003718	0.003612	0.003612	0.003678	0.003682	0.00381	0.003677	0.0037	0.003742	0.003713	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	3.86998E-08	2	1.93499E-08	5.559003953	0.012569266	3.521893261							
Within groups	6.61356E-08	19	3.48082E-09										
Total	1.04835E-07	21											
within-sd	5.89985E-05												
effective n	6.18												
s_bb	5.06661E-05			u_bb(rel.)	1.36546294								
s_bb_min	1.35161E-05												
u_bb	5.06661E-05			0.003710545									
								Mean:	2.0846266				

Aluminium in BAM-M109:

at: AG3-1													
r_0	7.89899E-05	8.70101E-05											
r_in	0.000087	0.000109	0.000083	0.000085	0.000085	0.000086	0.000088						
r_out	0.000089	0.000088	0.00009	0.000088	0.000086	0.000087	0.000087	0.000088	0.000092	0.000091	0.000089	0.000085	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	5.82857E-11	2	2.91429E-11	0.938699675	0.40946471	3.554557146							
Within groups	5.58828E-10	18	3.1046E-11										
Total	6.17113E-10	20											
within-sd	5.57189E-06												
effective n	5.81												
s_bb	0			u_bb(rel.)	1.515842985								
s_bb_min	1.33466E-06												
u_bb	1.33466E-06			8.80476E-05									
at: AG3-3													
r_0	8.52739E-05	8.67261E-05											
r_in	0.000084	0.000084	0.000083	0.000084	0.000085	0.000083	0.000083	0.000084	0.000088	0.000086	0.000087	0.000088	
r_out	0.000086	0.000086	0.000086	0.000086	0.000088	0.000089	0.000089	0.000087	0.000088	0.000086	0.000087	0.000088	
reunungsursachdratssummen (e)	heitsgrade	Quadratsum	rüfgröße (F)	P-Wert	tischer F-Wert								
Unterschiede	5.61061E-11	2	2.8053E-11	26.35883411	3.30911E-06	3.521893261							
Innerhalb de	2.02212E-11	19	1.06427E-12										
Gesamt	7.63273E-11	21											
within-sd	1.03164E-06												
effective n	6.18												
s_bb	2.08946E-06			u_bb(rel.)	2.434747959								
s_bb_min	2.3634E-07												
u_bb	2.08946E-06			8.58182E-05									
at: AG3-4													
r_0	7.61692E-05	9.38308E-05											
r_in	0.000082	0.000085	0.000085	0.000083	0.000083	0.000082	0.000084	0.000085					
r_out	0.000088	0.000085	0.000087	0.000083	0.000084	0.00014	0.000086	0.000083	0.000083	0.000085	0.000085	0.000098	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	2.46663E-10	2	1.23331E-10	0.7772758	0.473732459	3.521893261							
Within groups	3.01476E-09	19	1.58671E-10										
Total	3.26142E-09	21											
within-sd	1.25965E-05												
effective n	6.18												
s_bb	0			u_bb(rel.)	3.296299844								
s_bb_min	2.88576E-06												
u_bb	2.88576E-06			8.75455E-05									
at: AG3-5													
r_0	8.63826E-05	8.96174E-05											
r_in	0.000084	0.000085	0.000084	0.000081	0.000082	0.000076	0.000079	0.00008					
r_out	0.000088	0.000087	0.000085	0.000087	0.000086	0.000084	0.000085	0.000085	0.000087	0.000085	0.000082	0.000085	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	1.12989E-10	2	5.64943E-11	10.94105451	0.000689593	3.521893261							
Within groups	9.81068E-11	19	5.16352E-12										
Total	2.11095E-10	21											
within-sd	2.27234E-06												
effective n	6.18												
s_bb	2.88158E-06			u_bb(rel.)	3.421197691								
s_bb_min	5.20576E-07												
u_bb	2.88158E-06			8.42273E-05									
at: AG3-6													
r_0	8.69959E-05	8.90041E-05											
r_in	0.000087	0.000088	0.000088	0.000089	0.000089	0.000086	0.000086	0.000089					
r_out	0.000089	0.000084	0.000089	0.000087	0.000089	0.000088	0.000088	0.000088	0.000086	0.000087	0.000088	0.000086	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	9.01515E-13	2	4.50758E-13	0.222840167	0.802304742	3.521893261							
Within groups	3.84329E-11	19	2.02278E-12										
Total	3.93344E-11	21											
within-sd	1.42225E-06												
effective n	6.18												
s_bb	0			u_bb(rel.)	0.371986116								
s_bb_min	3.25826E-07												
u_bb	3.25826E-07			8.75909E-05									
								Mean:	2.4873415				

Arsenic in BAM-M109a:

at: N7-1												
r_0	0.008234614	0.008461386										
r_in	0.008508	0.008259	0.008361	0.008102	0.008106	0.00819	0.008176					
r_out	0.008634	0.008793	0.008518	0.008441	0.00841	0.008281	0.00871	0.008577	0.008334	0.00834	0.008679	0.008397
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	3.20923E-07	2	1.60461E-07	6.218249591	0.008849124	3.554557146						
Within groups	4.64488E-07	18	2.58049E-08									
Total	7.85411E-07	20										
within-sd	0.000160639											
effective n	5.81											
s_bb	0.000152245			u_bb(rel.)	1.811291857							
s_bb_min	3.84787E-05											
u_bb	0.000152245			0.008405333								
at: N7-3												
r_0	0.008989677	0.009296323										
r_in	0.009317	0.009416	0.009002	0.009175	0.009225	0.009319	0.0096	0.00915				
r_out	0.009741	0.009487	0.009488	0.008938	0.009591	0.009271	0.009851	0.009378	0.009234	0.009406	0.009372	0.009417
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.09097E-07	2	1.04549E-07	2.212234355	0.13686632	3.521893261						
Within groups	8.97927E-07	19	4.72593E-08									
Total	1.10702E-06	21										
within-sd	0.000217392											
effective n	6.18											
s_bb	9.62673E-05			u_bb(rel.)	1.02977409							
s_bb_min	4.98029E-05											
u_bb	9.62673E-05			0.009348364								
at: N7-4												
r_0	0.008544072	0.008815928										
r_in	0.008459	0.008432	0.008888	0.008391	0.008451	0.008645	0.0088	0.008219				
r_out	0.009047	0.008608	0.008684	0.008817	0.00874	0.008952	0.008697	0.008558	0.00897	0.008634	0.008858	0.008551
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.41114E-07	2	1.20557E-07	3.283000045	0.059615987	3.521893261						
Within groups	6.97712E-07	19	3.67217E-08									
Total	9.38826E-07	21										
within-sd	0.000191629											
effective n	6.18											
s_bb	0.000116454			u_bb(rel.)	1.343040411							
s_bb_min	4.39008E-05											
u_bb	0.000116454			0.008670955								
at: N7-5												
r_0	0.009232744	0.009403256										
r_in	0.008687	0.008685	0.008717	0.008791	0.008752	0.008888	0.008848	0.008945				
r_out	0.009271	0.00905	0.00917	0.009003	0.008974	0.009024	0.009266	0.009192	0.009008	0.009196	0.008991	0.008838
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	6.38308E-07	2	3.19154E-07	21.81780128	1.19773E-05	3.521893261						
Within groups	2.77935E-07	19	1.46281E-08									
Total	9.16243E-07	21										
within-sd	0.000120947											
effective n	6.18											
s_bb	0.000221949			u_bb(rel.)	2.466951704							
s_bb_min	2.7708E-05											
u_bb	0.000221949			0.008996909								
at: N7-6												
r_0	0.009218254	0.009417746										
r_in	0.009606	0.009729	0.009814	0.009753	0.009466	0.009577	0.009533	0.009504				
r_out	0.010184	0.010266	0.009904	0.009933	0.010003	0.010103	0.009911	0.009952	0.009959	0.009968	0.009765	0.009765
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.08476E-06	2	5.42382E-07	27.17049419	2.67525E-06	3.521893261						
Within groups	3.79281E-07	19	1.99622E-08									
Total	1.46404E-06	21										
within-sd	0.000141288											
effective n	6.18											
s_bb	0.000290704			u_bb(rel.)	2.97007712							
s_bb_min	3.23679E-05											
u_bb	0.000290704			0.009787773								
							Mean:	2.051935				

Bismuth in BAM-M109a:

at: N7-1													
r_0	0.019006035	0.019165965											
r_in	0.019241	0.019166	0.019088	0.019075	0.019042	0.019218	0.018833						
r_out	0.01928	0.019278	0.019313	0.019173	0.019263	0.019116	0.019313	0.019312	0.019368	0.019204	0.019425	0.019111	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	1.49136E-07	2	7.45678E-08	5.895867985	0.010729766	3.554557146							
Within groups	2.27654E-07	18	1.26475E-08										
Total	3.7679E-07	20											
within-sd	0.000112461												
effective n	5.81												
s_bb	0.00010324			u_bb(rel.)	0.537985051								
s_bb_min	2.69383E-05												
u_bb	0.00010324			0.019190048									
at: N7-3													
r_0	0.019002594	0.019139406											
r_in	0.018974	0.019224	0.019006	0.019044	0.018996	0.019054	0.019039	0.019245					
r_out	0.019199	0.019272	0.019234	0.0192	0.019387	0.019097	0.019304	0.019186	0.019076	0.019242	0.019092	0.019161	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Unterschiede	9.47092E-08	2	4.73546E-08	5.072715087	0.017168792	3.521893261							
Innerhalb de	1.77368E-07	19	9.33516E-09										
Gesamt	2.72077E-07	21											
within-sd	9.66186E-05												
effective n	6.18												
s_bb	7.84232E-05			u_bb(rel.)	0.409643315								
s_bb_min	2.21346E-05												
u_bb	7.84232E-05			0.019144273									
at: N7-4													
r_0	0.01857425	0.01866375											
r_in	0.018873	0.018637	0.018805	0.018823	0.018752	0.018888	0.019009	0.018772					
r_out	0.018882	0.018868	0.018832	0.018932	0.018848	0.018894	0.018877	0.018865	0.019044	0.018858	0.018822	0.018822	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	1.08181E-07	2	5.40905E-08	9.114336982	0.001678117	3.521893261							
Within groups	1.12759E-07	19	5.93466E-09										
Total	2.2094E-07	21											
within-sd	7.70368E-05												
effective n	6.18												
s_bb	8.82605E-05			u_bb(rel.)	0.468545294								
s_bb_min	1.76486E-05												
u_bb	8.82605E-05			0.018837136									
at: N7-5													
r_0	0.019064633	0.019201367											
r_in	0.018507	0.018637	0.018532	0.018587	0.018532	0.018642	0.018714	0.018672					
r_out	0.018968	0.018635	0.018885	0.018782	0.018701	0.01867	0.018776	0.018818	0.0187	0.018602	0.018667	0.018672	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	4.54815E-07	2	2.27408E-07	24.1577376	6.04043E-06	3.521893261							
Within groups	1.78856E-07	19	9.41345E-09										
Total	6.33671E-07	21											
within-sd	9.70229E-05												
effective n	6.18												
s_bb	0.000187786			u_bb(rel.)	1.002828535								
s_bb_min	2.22272E-05												
u_bb	0.000187786			0.018725682									
at: N7-6													
r_0	0.019031176	0.019234824											
r_in	0.019129	0.019288	0.019277	0.01958	0.019169	0.019424	0.019072	0.019104					
r_out	0.019444	0.019496	0.019251	0.01945	0.019417	0.019437	0.01946	0.019272	0.019437	0.019639	0.019301	0.01923	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	1.85203E-07	2	9.26016E-08	4.50390393	0.02506153	3.521893261							
Within groups	3.90646E-07	19	2.05603E-08										
Total	5.75849E-07	21											
within-sd	0.000143389												
effective n	6.18												
s_bb	0.000107952			u_bb(rel.)	0.55862498								
s_bb_min	3.28493E-05												
u_bb	0.000107952			0.019324682									
								Mean:	0.6315849				

Antimony in BAM-M109a:

at: N7-1													
r_0	0.011865293	0.012014707											
r_in	0.012134	0.011913	0.012212	0.012082	0.011991	0.012129	0.01201						
r_out	0.012088	0.01204	0.01215	0.01204	0.011905	0.012111	0.012136	0.012212	0.012304	0.012021	0.012234	0.012067	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	5.04026E-08	2	2.52013E-08	2.254074989	0.133780971	3.554557146							
Within groups	2.01246E-07	18	1.11803E-08										
Total	2.51648E-07	20											
within-sd	0.000105737												
effective n	5.81												
s_bb	4.91268E-05			u_bb(rel.)	0.406712643								
s_bb_min	2.53277E-05												
u_bb	4.91268E-05			0.012079									
at: N7-3													
r_0	0.011886031	0.012003969											
r_in	0.011994	0.011961	0.01187	0.012049	0.012083	0.012119	0.011971	0.011832					
r_out	0.012072	0.012013	0.011964	0.011918	0.012032	0.012057	0.012112	0.012174	0.012057	0.012004	0.012033	0.011949	
reunungsursachen	dratsummen	Heightsgrade	Quadratsum	Prüfgröße (F)	P-Wert	tischer F-Wert							
Unterschiede	1.91542E-08	2	9.5771E-09	1.387281654	0.273929873	3.521893261							
Innerhalb der	1.31167E-07	19	6.9035E-09										
Gesamt	1.50321E-07	21											
within-sd	8.30873E-05												
effective n	6.18												
s_bb	2.07965E-05			u_bb(rel.)	0.173203084								
s_bb_min	1.90347E-05												
u_bb	2.07965E-05			0.012007									
at: N7-4													
r_0	0.011810638	0.011947362											
r_in	0.012021	0.012021	0.01181	0.011892	0.011924	0.011914	0.011861	0.012008					
r_out	0.011852	0.011893	0.012164	0.011904	0.01203	0.01198	0.012012	0.012089	0.01206	0.011865	0.012101	0.011867	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	2.66262E-08	2	1.33131E-08	1.416061301	0.267145323	3.521893261							
Within groups	1.78629E-07	19	9.40151E-09										
Total	2.05255E-07	21											
within-sd	9.69614E-05												
effective n	6.18												
s_bb	2.51547E-05			u_bb(rel.)	0.210398885								
s_bb_min	2.22131E-05												
u_bb	2.51547E-05			0.011955727									
at: N7-5													
r_0	0.011666372	0.011807628											
r_in	0.011991	0.012063	0.012005	0.012086	0.011996	0.012027	0.011894	0.011961					
r_out	0.011946	0.012031	0.012137	0.012148	0.011951	0.012195	0.012164	0.01224	0.012169	0.011891	0.012025	0.011936	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	1.91278E-07	2	9.56391E-08	9.479376115	0.001395391	3.521893261							
Within groups	1.91694E-07	19	1.00892E-08										
Total	3.82973E-07	21											
within-sd	0.000100445												
effective n	6.18												
s_bb	0.000117639			u_bb(rel.)	0.979101989								
s_bb_min	2.30112E-05												
u_bb	0.000117639			0.012015									
at: N7-6													
r_0	0.011680006	0.011793994											
r_in	0.012031	0.011978	0.012023	0.012107	0.011957	0.011871	0.011877	0.012029					
r_out	0.011965	0.011994	0.01207	0.012109	0.011994	0.011982	0.011957	0.012085	0.012223	0.012046	0.012083	0.011951	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value							
Between groups	1.562E-07	2	7.81001E-08	12.02340097	0.000422397	3.521893261							
Within groups	1.23418E-07	19	6.49567E-09										
Total	2.79618E-07	21											
within-sd	8.05957E-05												
effective n	6.18												
s_bb	0.000107625			u_bb(rel.)	0.89753162								
s_bb_min	1.84639E-05												
u_bb	0.000107625			0.011991182									
							Mean:	0.6330696					

Tin in BAM-M109a:

at: N7-1												
r_0	0.124905135	0.125768865										
r_in	0.126254	0.126815	0.12554	0.125374	0.125741	0.126477	0.126018					
r_out	0.12549	0.125727	0.125307	0.125137	0.125652	0.126161	0.126527	0.125566	0.127474	0.126017	0.126319	0.125324
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	7.50947E-07	2	3.75474E-07	1.000202953	0.387349731	3.554557146						
Within groups	6.75716E-06	18	3.75398E-07									
Total	7.5081E-06	20										
within-sd	0.000612697											
effective n	5.81											
s_bb	3.62137E-06			u_bb(rel.)	0.116584108							
s_bb_min	0.000146762											
u_bb	0.000146762			0.125885429								
at: N7-3												
r_0	0.127113579	0.127976421										
r_in	0.12738	0.128221	0.128021	0.128679	0.127749	0.128226	0.12781	0.128169				
r_out	0.129016	0.129754	0.129488	0.129468	0.12778	0.128515	0.130194	0.129601	0.130215	0.129488	0.128745	0.128669
unterschiede	Quadratsummen (F)	freiheitsgrade (e)	Quadratsumme	Prüfgröße (F)	P-Wert	tischer F-Wert						
Unterschiede	9.73863E-06	2	4.86932E-06	12.94656614	0.000283433	3.521893261						
Innerhalb der	7.14606E-06	19	3.76109E-07									
Gesamt	1.68847E-05	21										
within-sd	0.000613277											
effective n	6.18											
s_bb	0.00085255			u_bb(rel.)	0.662694948							
s_bb_min	0.000140497											
u_bb	0.00085255			0.128649								
at: N7-4												
r_0	0.122820084	0.123861916										
r_in	0.122681	0.123254	0.123404	0.123854	0.122724	0.121721	0.122236	0.122549				
r_out	0.123796	0.123762	0.123054	0.122544	0.122091	0.123492	0.123159	0.124121	0.122286	0.12391	0.124514	0.122673
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.22221E-06	2	6.11106E-07	1.123171478	0.345907061	3.521893261						
Within groups	1.03377E-05	19	5.44089E-07									
Total	1.15599E-05	21										
within-sd	0.000737624											
effective n	6.18											
s_bb	0.000104119			u_bb(rel.)	0.137258352							
s_bb_min	0.000168984											
u_bb	0.000168984			0.123113955								
at: N7-5												
r_0	0.12255661	0.12327739										
r_in	0.123725	0.123693	0.122937	0.123064	0.124219	0.123453	0.122604	0.122474				
r_out	0.123377	0.122981	0.123219	0.12349	0.122729	0.123876	0.123358	0.124188	0.123616	0.12364	0.123913	0.124057
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	8.19012E-07	2	4.09506E-07	1.587681273	0.230349506	3.521893261						
Within groups	4.90062E-06	19	2.57927E-07									
Total	5.71963E-06	21										
within-sd	0.000507865											
effective n	6.18											
s_bb	0.000156589			u_bb(rel.)	0.12691198							
s_bb_min	0.000116348											
u_bb	0.000156589			0.123383955								
at: N7-6												
r_0	0.12256978	0.12326422										
r_in	0.124096	0.122893	0.122891	0.123665	0.123645	0.12355	0.123212	0.123583				
r_out	0.124227	0.123825	0.124332	0.124334	0.124388	0.123598	0.123583	0.123386	0.124096	0.123621	0.124471	0.12266
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.03045E-06	2	1.01523E-06	4.18949662	0.031095189	3.521893261						
Within groups	4.6042E-06	19	2.42326E-07									
Total	6.63466E-06	21										
within-sd	0.000492267											
effective n	6.18											
s_bb	0.000353593			u_bb(rel.)	0.286005734							
s_bb_min	0.000112775											
u_bb	0.000353593			0.123631364								
										Mean:	0.3374914	

Silver in BAM-M109a:

at: N7-1											
r_0	0.003813632	0.003852368									
r_in	0.003873	0.003789	0.003838	0.00385	0.003812	0.003862	0.003826				
r_out	0.003873	0.003861	0.003852	0.003837	0.00381	0.003836	0.003872	0.003857	0.003839	0.003867	0.003915 0.003872
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	2.60861E-09	2	1.3043E-09	1.744164636	0.203062016	3.554557146					
Within groups	1.34606E-08	18	7.4781E-10								
Total	1.60692E-08	20									
within-sd	2.73461E-05										
effective n	5.81										
s_bb	9.78723E-06			u_bb(rel.)	0.254349074						
s_bb_min	6.55035E-06										
u_bb	9.78723E-06			0.003847952							
at: N7-3											
r_0	0.003828994	0.003853006									
r_in	0.003867	0.003862	0.003814	0.003872	0.003849	0.003847	0.003862	0.003844			
r_out	0.003837	0.003844	0.003867	0.003861	0.00382	0.003853	0.003869	0.003842	0.003836	0.003832	0.003867 0.003858
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Unterschiede	2.04231E-10	2	1.02116E-10	0.355293202	0.705526826	3.521893261					
Innerhalb der	5.46083E-09	19	2.87412E-10								
Gesamt	5.66506E-09	21									
within-sd	1.69532E-05										
effective n	6.18										
s_bb	0			u_bb(rel.)	0.100897318						
s_bb_min	3.88386E-06										
u_bb	3.88386E-06			0.003849318							
at: N7-4											
r_0	0.003831914	0.003856086									
r_in	0.00391	0.003896	0.003902	0.003901	0.003873	0.003932	0.003905	0.003883			
r_out	0.003903	0.003928	0.003932	0.003907	0.003895	0.003939	0.003918	0.003887	0.003909	0.003914	0.003928 0.003893
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	8.1392E-09	2	4.0696E-09	13.94732408	0.000167279	3.521893261					
Within groups	5.54389E-09	19	2.91784E-10								
Total	1.36831E-08	21									
within-sd	1.70817E-05										
effective n	6.18										
s_bb	2.47208E-05			u_bb(rel.)	0.633549025						
s_bb_min	3.91329E-06										
u_bb	2.47208E-05			0.003901955							
at: N7-5											
r_0	0.003831306	0.003860694									
r_in	0.003897	0.003862	0.003924	0.00391	0.003887	0.003932	0.003879	0.003908			
r_out	0.003922	0.00387	0.003943	0.003909	0.003888	0.003919	0.003922	0.003902	0.00391	0.003923	0.00391 0.003923
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	7.44233E-09	2	3.72116E-09	8.657070713	0.002125393	3.521893261					
Within groups	8.16698E-09	19	4.29841E-10								
Total	1.56093E-08	21									
within-sd	2.07326E-05										
effective n	6.18										
s_bb	2.30742E-05			u_bb(rel.)	0.591426298						
s_bb_min	4.74969E-06										
u_bb	2.30742E-05			0.003901455							
at: N7-6											
r_0	0.003831277	0.003860723									
r_in	0.0039	0.003844	0.00387	0.003925	0.003911	0.003878	0.003924	0.003898			
r_out	0.00394	0.003944	0.003893	0.003932	0.003922	0.003932	0.003937	0.003939	0.003926	0.00393	0.003923 0.003913
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	1.39142E-08	2	6.95709E-09	16.28303057	7.59804E-05	3.521893261					
Within groups	8.11794E-09	19	4.2726E-10								
Total	2.20321E-08	21									
within-sd	2.06703E-05										
effective n	6.18										
s_bb	3.25007E-05			u_bb(rel.)	0.83167439						
s_bb_min	4.7354E-06										
u_bb	3.25007E-05			0.003907864							
							Mean:	0.5509493			

Cadmium in BAM-M109a:

at: N7-1											
r_0	0.003532076	0.003583924									
r_in	0.003662	0.003649	0.003647	0.003652	0.003609	0.003615	0.003644				
r_out	0.003687	0.003662	0.003623	0.003625	0.003633	0.003657	0.003747	0.003664	0.003675	0.003672 0.003691 0.003571	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	1.75655E-08	2	8.78273E-09	6.428879588	0.007819394	3.554557146					
Within groups	2.45905E-08	18	1.36614E-09								
Total	4.21559E-08	20									
within-sd	3.69613E-05										
effective n	5.81										
s_bb	3.57299E-05		u_bb(rel.)	0.980808435							
s_bb_min	8.85353E-06										
u_bb	3.57299E-05		0.003642905								
at: N7-3											
r_0	0.003715168	0.003762832									
r_in	0.003775	0.003787	0.003732	0.003804	0.003748	0.003805	0.00373	0.003779			
r_out	0.003755	0.003827	0.003834	0.003774	0.003794	0.003787	0.003848	0.003862	0.003843	0.003821 0.003839 0.003764	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	1.43857E-08	2	7.19285E-09	6.309350772	0.007919375	3.521893261					
Within groups	2.16606E-08	19	1.144003E-09								
Total	3.60463E-08	21									
within-sd	3.37643E-05										
effective n	6.18										
s_bb	3.12911E-05		u_bb(rel.)	0.825563065							
s_bb_min	7.73516E-06										
u_bb	3.12911E-05		0.003790273								
at: N7-4											
r_0	0.003612932	0.003667068									
r_in	0.003534	0.003578	0.00364	0.003607	0.003558	0.003501	0.003559	0.003605			
r_out	0.00365	0.00365	0.003597	0.003633	0.00363	0.003691	0.003605	0.003665	0.003602	0.003664 0.003659 0.00358	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	2.04933E-08	2	1.02467E-08	7.035546639	0.005168898	3.521893261					
Within groups	2.76718E-08	19	1.45641E-09								
Total	4.81652E-08	21									
within-sd	3.8163E-05										
effective n	6.18										
s_bb	3.77088E-05		u_bb(rel.)	1.043670776							
s_bb_min	8.74285E-06										
u_bb	3.77088E-05		0.003613091								
at: N7-5											
r_0	0.003574861	0.003617139									
r_in	0.003647	0.00361	0.003627	0.003615	0.003683	0.003613	0.003594	0.003596			
r_out	0.003607	0.00359	0.00359	0.003649	0.003602	0.003687	0.003664	0.003653	0.003634	0.00364 0.003631 0.003642	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	2.35857E-09	2	1.17929E-09	1.318998026	0.290801978	3.521893261					
Within groups	1.69875E-08	19	8.94077E-10								
Total	1.9346E-08	21									
within-sd	2.99011E-05										
effective n	6.18										
s_bb	6.7924E-06		u_bb(rel.)	0.188931054							
s_bb_min	6.85012E-06										
u_bb	6.85012E-06		0.003625727								
at: N7-6											
r_0	0.003573466	0.003618534									
r_in	0.00366	0.003666	0.003664	0.003718	0.003637	0.003733	0.003664	0.00362			
r_out	0.003691	0.003699	0.003719	0.003668	0.003724	0.003654	0.003672	0.00364	0.003695	0.00369 0.003708 0.003652	
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value					
Between groups	1.33871E-08	2	6.69355E-09	6.639135565	0.006508961	3.521893261					
Within groups	1.91557E-08	19	1.0082E-09								
Total	3.25428E-08	21									
within-sd	3.17521E-05										
effective n	6.18										
s_bb	3.03264E-05		u_bb(rel.)	0.826066187							
s_bb_min	7.27417E-06										
u_bb	3.03264E-05		0.003671182								
							Mean:	0.8307669			

Copper in BAM-M109a:

at: N7-1												
r_0	0.001955268	0.001974732										
r_in	0.002007	0.001986	0.001966	0.001974	0.001972	0.001989	0.001973					
r_out	0.001999	0.001986	0.001987	0.001977	0.001971	0.001992	0.002	0.001981	0.002011	0.001987	0.002011	0.001972
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.14567E-09	2	5.72833E-10	3.026923478	0.0735854	3.554557146						
Within groups	3.40643E-09	18	1.89246E-10									
Total	4.5521E-09	20										
within-sd	1.37567E-05											
effective n	5.81											
s_bb	8.12572E-06			u_bb(rel.)	0.409493677							
s_bb_min	3.29521E-06											
u_bb	8.12572E-06			0.001984333								
at: N7-3												
r_0	0.002005825	0.002030175										
r_in	0.002035	0.002039	0.002013	0.002057	0.002065	0.002023	0.002048	0.002031				
r_out	0.002055	0.002064	0.002072	0.002061	0.002024	0.002061	0.002092	0.002076	0.002073	0.00206	0.00205	0.002045
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	4.49403E-09	2	2.24701E-09	7.580113376	0.003799375	3.521893261						
Within groups	5.63227E-09	19	2.96435E-10									
Gesamt	1.01263E-08	21										
within-sd	1.72173E-05											
effective n	6.18											
s_bb	1.77633E-05			u_bb(rel.)	0.86688665							
s_bb_min	3.94435E-06											
u_bb	1.77633E-05			0.002049091								
at: N7-4												
r_0	0.001901448	0.001924552										
r_in	0.001926	0.00193	0.001938	0.001945	0.001903	0.001927	0.001917	0.001913				
r_out	0.001963	0.001965	0.001946	0.001928	0.001922	0.001959	0.001947	0.001947	0.001927	0.001963	0.001967	0.001919
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	3.2593E-09	2	1.62965E-09	6.072795392	0.009138855	3.521893261						
Within groups	5.0987E-09	19	2.68352E-10									
Total	8.358E-09	21										
within-sd	1.63815E-05											
effective n	6.18											
s_bb	1.48395E-05			u_bb(rel.)	0.766753519							
s_bb_min	3.75287E-06											
u_bb	1.48395E-05			0.001935364								
at: N7-5												
r_0	0.00189621	0.00191579										
r_in	0.001939	0.001926	0.001932	0.001938	0.001948	0.001947	0.001922	0.001923				
r_out	0.001954	0.001915	0.001942	0.001943	0.001916	0.001953	0.001946	0.001961	0.001939	0.001962	0.001947	0.001961
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.72266E-09	2	1.36133E-09	7.046880729	0.005135361	3.521893261						
Within groups	3.67046E-09	19	1.93182E-10									
Total	6.39312E-09	21										
within-sd	1.3899E-05											
effective n	6.18											
s_bb	1.37465E-05			u_bb(rel.)	0.709478378							
s_bb_min	3.18416E-06											
u_bb	1.37465E-05			0.001937545								
at: N7-6												
r_0	0.001897388	0.001914612										
r_in	0.00194	0.00191	0.001909	0.001937	0.001939	0.001928	0.001934	0.001935				
r_out	0.001962	0.001962	0.001948	0.001962	0.001969	0.001948	0.001947	0.001956	0.001959	0.001943	0.001968	0.001928
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	5.7337E-09	2	2.86685E-09	19.3499602	2.61213E-05	3.521893261						
Within groups	2.815E-09	19	1.48158E-10									
Total	8.5487E-09	21										
within-sd	1.2172E-05											
effective n	6.18											
s_bb	2.09711E-05			u_bb(rel.)	1.080580865							
s_bb_min	2.78852E-06											
u_bb	2.09711E-05			0.001940727								
							Mean:	0.7972582				

Nickel in BAM-M109a:

at: N7-1												
r_0	0.000322646	0.000377354										
r_in	0.000342	0.000338	0.000506	0.000404	0.000341	0.000338	0.000353					
r_out	0.000345	0.00034	0.000356	0.000342	0.000335	0.000337	0.000357	0.000353	0.000354	0.000331	0.000347	0.000332
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	4.16061E-09	2	2.0803E-09	1.444034206	0.262040256	3.554557146						
Within groups	2.59311E-08	18	1.44062E-09									
Total	3.00918E-08	20										
within-sd	3.79555E-05											
effective n	5.81											
s_bb	1.04933E-05			u_bb(rel.)	2.957449203							
s_bb_min	9.09167E-06											
u_bb	1.04933E-05			0.00035481								
at: N7-3												
r_0	0.00034464	0.00035736										
r_in	0.000338	0.00035	0.000356	0.000366	0.000362	0.000349	0.00036	0.000352				
r_out	0.000363	0.000381	0.00035	0.000359	0.000352	0.000349	0.000356	0.000366	0.00036	0.000351	0.000352	0.000354
reunungsursach	dratsummen	freiheitsgrade	(e	Quadratsum	rüfgröße (F)	P-Wert	ritischer F-Wert					
Unterschiede	1.14148E-10	2	5.70739E-11	0.705059896	0.506554816	3.521893261						
Innerhalb de	1.53803E-09	19	8.0949E-11									
Gesamt	1.65218E-09	21										
within-sd	8.99716E-06											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.579279926							
s_bb_min	2.06118E-06											
u_bb	2.06118E-06			0.000355818								
at: N7-4												
r_0	0.000331045	0.000338955										
r_in	0.000331	0.00034	0.000331	0.000345	0.000335	0.000327	0.000327	0.000331				
r_out	0.000347	0.000329	0.000344	0.00034	0.00034	0.000336	0.000339	0.000334	0.000336	0.000336	0.000332	0.000334
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	7.29659E-11	2	3.6483E-11	1.172085203	0.331135737	3.521893261						
Within groups	5.91404E-10	19	3.11265E-11									
Total	6.6437E-10	21										
within-sd	5.57912E-06											
effective n	6.18											
s_bb	9.30849E-07			u_bb(rel.)	0.380809161							
s_bb_min	1.27813E-06											
u_bb	1.27813E-06			0.000335636								
at: N7-5												
r_0	0.000330266	0.000341734										
r_in	0.000335	0.00034	0.000342	0.000328	0.000331	0.000334	0.000336	0.00033				
r_out	0.000335	0.00036	0.000338	0.000338	0.000336	0.00034	0.000353	0.000357	0.000354	0.000359	0.000345	0.000339
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	7.08333E-10	2	3.54167E-10	5.326152133	0.014574045	3.521893261						
Within groups	1.26342E-09	19	6.64958E-11									
Total	1.97175E-09	21										
within-sd	8.15449E-06											
effective n	6.18											
s_bb	6.82166E-06			u_bb(rel.)	2.000485738							
s_bb_min	1.86813E-06											
u_bb	6.82166E-06			0.000341								
at: N7-6												
r_0	0.000332012	0.000339988										
r_in	0.000343	0.000336	0.000333	0.000348	0.000359	0.000341	0.000339	0.000343				
r_out	0.000335	0.000339	0.000333	0.000338	0.00034	0.000338	0.000343	0.000342	0.000341	0.000343	0.000337	0.000336
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.11205E-10	2	5.56023E-11	1.77984695	0.195656276	3.521893261						
Within groups	5.9355E-10	19	3.12399E-11									
Total	7.04763E-10	21										
within-sd	5.58927E-06											
effective n	6.18											
s_bb	1.98519E-06			u_bb(rel.)	0.583956726							
s_bb_min	1.28046E-06											
u_bb	1.98519E-06			0.000339955								
							Mean:	1.6474244				

Tellurium in BAM-M109a:

at: N7-1												
r_0	0.00231299	0.00237301										
r_in	0.002346	0.002366	0.002325	0.002363	0.002337	0.002306	0.002252					
r_out	0.002445	0.00247	0.002377	0.002341	0.002427	0.002347	0.002445	0.002442	0.002407	0.002358	0.00241	0.002364
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.66687E-08	2	1.33344E-08	7.379646539	0.004565011	3.554557146						
Within groups	3.25244E-08	18	1.80691E-09									
Total	5.91931E-08	20										
within-sd	4.25078E-05											
effective n	5.81											
s_bb	4.45447E-05			u_bb(rel.)	1.87786377							
s_bb_min	1.01821E-05											
u_bb	4.45447E-05			0.002372095								
at: N7-3												
r_0	0.002593365	0.002678635										
r_in	0.002633	0.002683	0.002602	0.002603	0.002682	0.002727	0.002723	0.002631				
r_out	0.002778	0.002731	0.002746	0.002582	0.002796	0.002684	0.002813	0.002747	0.002639	0.002687	0.002692	0.002706
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.13567E-08	2	1.06784E-08	2.921542284	0.07829009	3.521893261						
Within groups	6.94457E-08	19	3.65504E-09									
Gesamt	9.08025E-08	21										
within-sd	6.04569E-05											
effective n	6.18											
s_bb	3.37064E-05			u_bb(rel.)	1.253514702							
s_bb_min	1.38502E-05											
u_bb	3.37064E-05			0.002688955								
at: N7-4												
r_0	0.002478904	0.002569096										
r_in	0.002425	0.002433	0.002428	0.002491	0.002416	0.002361	0.00252	0.002362				
r_out	0.002636	0.002458	0.00253	0.002546	0.002429	0.002519	0.002487	0.002417	0.002552	0.002509	0.00247	0.002386
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.60909E-08	2	1.30455E-08	3.193624013	0.063725135	3.521893261						
Within groups	7.76121E-08	19	4.08485E-09									
Total	1.03703E-07	21										
within-sd	6.39128E-05											
effective n	6.18											
s_bb	3.80725E-05			u_bb(rel.)	1.539044635							
s_bb_min	1.4642E-05											
u_bb	3.80725E-05			0.002473773								
at: N7-5												
r_0	0.002547577	0.002612423										
r_in	0.002478	0.002476	0.002508	0.002505	0.002549	0.002531	0.00257	0.002552				
r_out	0.002652	0.002578	0.002649	0.002547	0.002578	0.002543	0.002694	0.00258	0.002641	0.002612	0.002602	0.00252
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	2.98612E-08	2	1.49306E-08	7.049380446	0.005127997	3.521893261						
Within groups	4.02421E-08	19	2.118E-09									
Total	7.01033E-08	21										
within-sd	4.60218E-05											
effective n	6.18											
s_bb	4.55261E-05			u_bb(rel.)	1.771914763							
s_bb_min	1.05432E-05											
u_bb	4.55261E-05			0.002569318								
at: N7-6												
r_0	0.002534784	0.002625216										
r_in	0.002722	0.002802	0.002733	0.002779	0.002656	0.002732	0.002608	0.002645				
r_out	0.002921	0.002861	0.002816	0.002758	0.002825	0.002854	0.002853	0.002766	0.002921	0.002806	0.002798	0.00272
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.3566E-07	2	6.78298E-08	16.62198947	6.71143E-05	3.521893261						
Within groups	7.75338E-08	19	4.08073E-09									
Total	2.13193E-07	21										
within-sd	6.38806E-05											
effective n	6.18											
s_bb	0.00010155			u_bb(rel.)	3.678368823							
s_bb_min	1.46346E-05											
u_bb	0.00010155			0.002760727								
							Mean:	2.1971076				

Thallium in BAM-M109a:

at: N7-1												
r_0	0.000239791	0.000240209										
r_in	0.00024	0.000239	0.000239	0.00024	0.00024	0.00024	0.00024					
r_out	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	3.80952E-13	2	1.90476E-13	2.261157025	0.13302567	3.554557146						
Within groups	1.51629E-12	18	8.42384E-14									
Total	1.89724E-12	20										
within-sd	2.90238E-07											
effective n	5.81											
s_bb	1.35229E-07			u_bb(rel.)	0.056367715							
s_bb_min	6.95223E-08											
u_bb	1.35229E-07			0.000239905								
at: N7-3												
r_0	0.000238703	0.000239297										
r_in	0.000239	0.00024	0.000239	0.000239	0.000239	0.000239	0.00024	0.000239				
r_out	0.000239	0.000239	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Unterschiede	2.28788E-12	2	1.14394E-12	6.501035867	0.007062644	3.521893261						
Innerhalb der	3.34329E-12	19	1.75963E-13									
Gesamt	5.63117E-12	21										
within-sd	4.19479E-07											
effective n	6.18											
s_bb	3.95708E-07			u_bb(rel.)	0.165191013							
s_bb_min	9.60995E-08											
u_bb	3.95708E-07			0.000239545								
at: N7-4												
r_0	0.00023974	0.00024026										
r_in	0.000239	0.00024	0.00024	0.00024	0.00024	0.000239	0.00024	0.00024				
r_out	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.000239	0.00024	0.00024	0.00024
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	1.74242E-13	2	8.71212E-14	0.648532904	0.534002439	3.521893261						
Within groups	2.55238E-12	19	1.34336E-13									
Total	2.72662E-12	21										
within-sd	3.66519E-07											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.035006002							
s_bb_min	8.39667E-08											
u_bb	8.39667E-08			0.000239864								
at: N7-5												
r_0	0.000239752	0.000240248										
r_in	0.000239	0.000239	0.000239	0.000239	0.000239	0.000239	0.000239	0.000239	0.000239			
r_out	0.00024	0.00024	0.000239	0.00024	0.00024	0.000239	0.00024	0.00024	0.00024	0.00024	0.00024	0.000239
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	3.25E-12	2	1.625E-12	13.01245211	0.00027565	3.521893261						
Within groups	2.37273E-12	19	1.2488E-13									
Total	5.62273E-12	21										
within-sd	3.53384E-07											
effective n	6.18											
s_bb	4.92612E-07			u_bb(rel.)	0.205683434							
s_bb_min	8.09577E-08											
u_bb	4.92612E-07			0.0002395								
at: N7-6												
r_0	0.000239842	0.000240158										
r_in	0.00024	0.00024	0.000241	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024			
r_out	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value						
Between groups	7.95455E-14	2	3.97727E-14	0.816953317	0.45670454	3.521893261						
Within groups	9.25E-13	19	4.86842E-14									
Total	1.00455E-12	21										
within-sd	2.20645E-07											
effective n	6.18											
s_bb	0			u_bb(rel.)	0.021057731							
s_bb_min	5.05481E-08											
u_bb	5.05481E-08			0.000240045								
											Mean:	0.1220163

Zinc in BAM-M109a:

at: N7-1										
r_0	0.004151238	0.004224762								
r_in	0.00433	0.004282	0.004321	0.004216	0.004243	0.004176	0.004213			
r_out	0.004213	0.004195	0.004269	0.00417	0.00418	0.004213	0.004333	0.004185	0.004234	0.004254
										0.004258
										0.004182
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	8.15357E-09	2	4.07679E-09	1.517344287	0.246052492	3.554557146				
Within groups	4.83622E-08	18	2.68679E-09							
Total	5.65158E-08	20								
within-sd	5.18343E-05									
effective n	5.81									
s_bb	1.54681E-05			u_bb(rel.)	0.365622165					
s_bb_min	1.24161E-05									
u_bb	1.54681E-05			0.004230619						
at: N7-3										
r_0	0.0043357	0.0044263								
r_in	0.004344	0.004381	0.004305	0.004338	0.004334	0.004353	0.004332	0.004437		
r_out	0.004262	0.004556	0.004373	0.00431	0.004326	0.004307	0.004428	0.004392	0.004356	0.004306
										0.004355
										0.004346
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	8.15357E-09	2	4.07679E-09	1.517344287	0.246052492	3.554557146				
Within groups	4.83622E-08	18	2.68679E-09							
Total	5.65158E-08	20								
within-sd	5.18343E-05									
effective n	6.18									
s_bb	0			u_bb(rel.)	0.338467002					
s_bb_min	1.47545E-05									
u_bb	1.47545E-05			0.004359227						
at: N7-4										
r_0	0.004192286	0.004261714								
r_in	0.004122	0.004186	0.004282	0.004253	0.004167	0.004158	0.004333	0.004187		
r_out	0.004215	0.004185	0.004175	0.004202	0.004143	0.004177	0.00416	0.004202	0.004149	0.004199
										0.004201
										0.004146
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	6.97736E-09	2	3.48868E-09	1.476175942	0.253564926	3.521893261				
Within groups	4.49032E-08	19	2.36332E-09							
Total	5.18805E-08	21								
within-sd	4.8614E-05									
effective n	6.18									
s_bb	1.34923E-05			u_bb(rel.)	0.321608139					
s_bb_min	1.11371E-05									
u_bb	1.34923E-05			0.004195273						
at: N7-5										
r_0	0.004130054	0.004189946								
r_in	0.004218	0.004261	0.00425	0.004214	0.004267	0.004245	0.004177	0.004169		
r_out	0.004222	0.00414	0.004151	0.004177	0.004095	0.004148	0.004204	0.004139	0.004133	0.004246
										0.004221
										0.004199
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	1.51606E-08	2	7.58029E-09	4.209629783	0.030664073	3.521893261				
Within groups	3.42133E-08	19	1.8007E-09							
Total	4.93739E-08	21								
within-sd	4.24347E-05									
effective n	6.18									
s_bb	3.05767E-05			u_bb(rel.)	0.729626841					
s_bb_min	9.72147E-06									
u_bb	3.05767E-05			0.004190727						
at: N7-6										
r_0	0.004128026	0.004191974								
r_in	0.004263	0.004209	0.004253	0.004287	0.004232	0.004368	0.004257	0.004288		
r_out	0.004218	0.004245	0.004242	0.004198	0.004209	0.004198	0.004174	0.004181	0.00426	0.004185
										0.00433
										0.004233
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	2.26237E-08	2	1.13118E-08	5.542898694	0.01269769	3.521893261				
Within groups	3.87749E-08	19	2.04078E-09							
Total	6.13985E-08	21								
within-sd	4.5175E-05									
effective n	6.18									
s_bb	3.87264E-05			u_bb(rel.)	0.914632263					
s_bb_min	1.03493E-05									
u_bb	3.87264E-05			0.004234091						
							Mean:	0.5866138		

Aluminium in BAM-M109a:

at: N7-1										
r_0	7.51223E-05	7.68777E-05								
r_in	0.000076	0.000077	0.000076	0.000077	0.000076	0.000076	0.000077			
r_out	0.000078	0.000081	0.000077	0.000076	0.000079	0.000078	0.000081	0.00008	0.000078	0.000078
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	2.44286E-11	2	1.22143E-11	7.781188766	0.003670947	3.554557146				
Within groups	2.8255E-11	18	1.56972E-12							
Total	5.26835E-11	20								
within-sd	1.25288E-06									
effective n	5.81									
s_bb	1.35361E-06			u_bb(rel.)	1.744985896					
s_bb_min	3.0011E-07									
u_bb	1.35361E-06			7.75714E-05						
at: N7-3										
r_0	7.99652E-05	8.20348E-05								
r_in	0.000081	0.000081	0.00008	0.000082	0.000081	0.000081	0.000082	0.000081		
r_out	0.000085	0.000085	0.000085	0.000083	0.000083	0.000083	0.000088	0.000083	0.000084	0.000085
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Unterschiede	5.41477E-11	2	2.70739E-11	12.46538186	0.000348222	3.521893261				
Innerhalb de	4.12666E-11	19	2.17192E-12							
Gesamt	9.54143E-11	21								
within-sd	1.47374E-06									
effective n	6.18									
s_bb	2.00705E-06			u_bb(rel.)	2.423442843					
s_bb_min	3.37624E-07									
u_bb	2.00705E-06			8.28182E-05						
at: N7-4										
r_0	7.48936E-05	7.71064E-05								
r_in	0.000073	0.000074	0.000074	0.000076	0.000076	0.000074	0.000072	0.000076		
r_out	0.00008	0.000077	0.000076	0.000076	0.000076	0.000078	0.000077	0.000076	0.000076	0.000078
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	3.96932E-11	2	1.98466E-11	8.096639827	0.002862804	3.521893261				
Within groups	4.65731E-11	19	2.45121E-12							
Total	8.62662E-11	21								
within-sd	1.56564E-06									
effective n	6.18									
s_bb	1.67749E-06			u_bb(rel.)	2.204580919					
s_bb_min	3.58675E-07									
u_bb	1.67749E-06			7.60909E-05						
at: N7-5										
r_0	7.44112E-05	7.5588E-05								
r_in	0.000076	0.000075	0.000076	0.000076	0.000076	0.000077	0.000076	0.000077		
r_out	0.000077	0.000077	0.000076	0.000076	0.000076	0.000077	0.000078	0.000079	0.000077	0.000078
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	1.07765E-11	2	5.38826E-12	7.736352484	0.003484522	3.521893261				
Within groups	1.32332E-11	19	6.96486E-13							
Total	2.40097E-11	21								
within-sd	8.34557E-07									
effective n	6.18									
s_bb	8.71185E-07			u_bb(rel.)	1.137452091					
s_bb_min	1.91191E-07									
u_bb	8.71185E-07			7.65909E-05						
at: N7-6										
r_0	7.40865E-05	7.59135E-05								
r_in	0.000078	0.000077	0.000075	0.000076	0.000076	0.000078	0.000075	0.000076		
r_out	0.00008	0.00008	0.000078	0.000078	0.000079	0.00008	0.000079	0.000078	0.00008	0.000078
Source of variation	sums of squares (SS)	degrees of freedom (df)	Mean squares (MS)	F-value	P-value	critical F-value				
Between groups	4.13295E-11	2	2.06648E-11	12.3492724	0.000366204	3.521893261				
Within groups	3.17938E-11	19	1.67336E-12							
Total	7.31234E-11	21								
within-sd	1.29358E-06									
effective n	6.18									
s_bb	1.75275E-06			u_bb(rel.)	2.260290093					
s_bb_min	2.9635E-07									
u_bb	1.75275E-06			7.75455E-05						
							Mean:	2.0090265		