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ICP Forests

International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP-Forests)

Technical Report QA-RFoliar19

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Alfred Fürst

Federal Research and Training Centre for Forests, Natural Hazards and Landscape
Forest Foliar Co-ordinating Centre
Seckendorff-Gudent-Weg 8
A-1131 Vienna/Austria

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Austrian Federal Research and Training Centre for Forests, Natural Hazards and Landscape
Forest Foliar Co-ordinating Centre
Seckendorff-Gudent Weg 8
A-1131 Wien

Phone: +431-87838-1114
Fax: +431-87838-1250

URL: http://www.ffcc.at
e-Mail: alfred.fuerst@bfw.gv.at

Cover photos by Alfred Fürst

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1 INTRODUCTION

A high quality and comparable laboratory standard in all countries is indispensable for a European-wide survey of the state of forests, small changes in nature should be detected and not the changes in laboratory quality. Important steps on this way are method harmonisation, QA/QC in the laboratories in daily routine and an implementation of a regular performed Interlaboratory Comparison Tests programme.

This Needle/Leaf Interlaboratory Comparison Test programme starts with the first European Foliar-Interlaboratory Comparison Test on two certified standards (BCR 100-*beech leaves* and BCR 101 - *spruce needles*) in 1993. The data were submitted by post or fax and had to be rechecked from the laboratories. All the data collection and evaluation must be done manually. The final report was available after some month. The Interlaboratory Comparison Tests were performed biannually till 2002.

Beginning with 2003/2004 (6th Interlaboratory Comparison Test) an annual test program was set up and the test were performed from the Forest Foliar Co-ordinating Centre/Austria (FFCC). The data collection was done via internet. The Needle/Leaf Interlaboratory Comparison Test program was opened for every interested laboratory.

Beginning in 2012 an internet based web interface was used for the data collection, to collect the billing information for the participation fee, for the data evaluation and for the creation of online qualification reports. The interface offers the possibility for first data checks (decimal errors, non plausible results, max LOQ) immediately before the final evaluation. The results of the ringtest are available now within some days, so the laboratories can react - in case of unsatisfactory results – very fast. For this case a re-qualification procedure was set up, starting with the 11th Test in 2009 (see: http://bfw.ac.at/rz/bfwcms2.web?dok=7830). This feedback procedure is mandatory for all *ICP-Forests laboratories* and showed very a positive effect on the data quality.

To support the participating laboratories and to exchange knowledge between them regularly meetings of the heads of the laboratories are organized from the ICP-Forests Working Group on quality assurance and quality control in laboratories. Leaf and needle reference materials for method validation and method verification are offered by FFCC (see: http://bfw.ac.at/rz/bfwcms2.web?dok=5146).

Today this interlaboratory test program is open for every laboratory and is financed by participation fee, by advertising, by selling reference materials and by ringtest sample collection and/or sample preparation from participating laboratories.

2 TASK, MATERIAL, PARTICIPANTS AND EVALUATION

2.1 Task

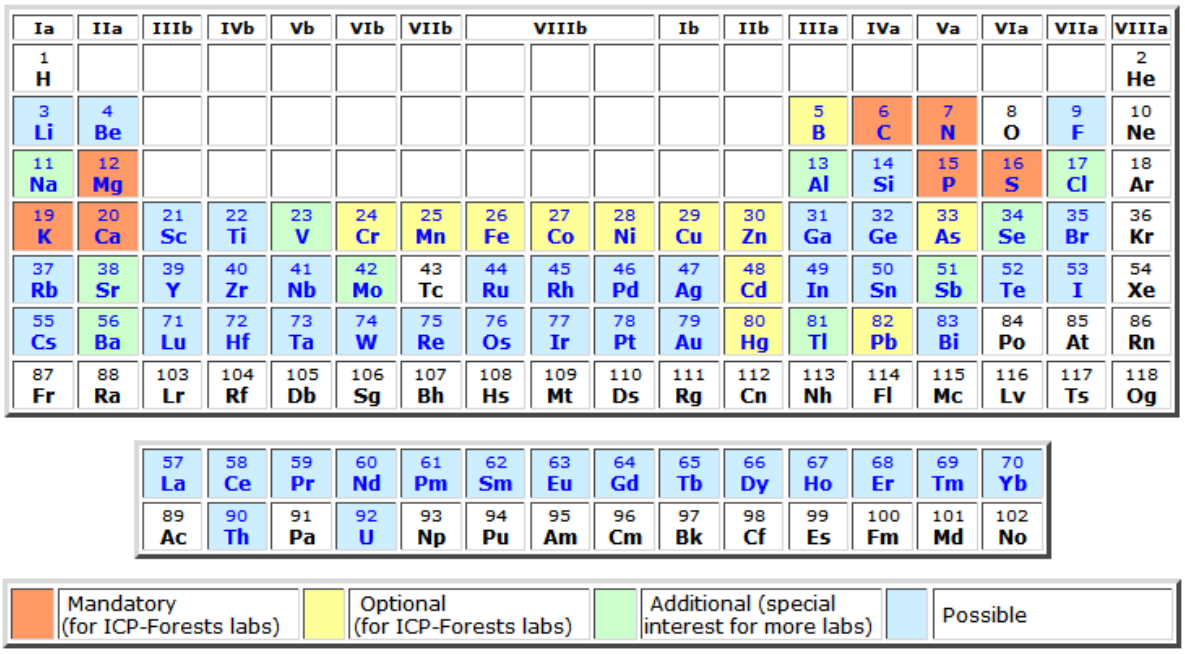
The Forest Foliar Co-ordinating Centre established the following timetable:

- Informing the participating labs (March 2018)
- Registration of the participants via internet (9th July 2018)
- Submission of the ring test samples (July 2018)
- Submission of the results from the labs (October-December 2018)
- Deadline of data input (1st January 2019)
- Evaluation according to DIN 38402-42:2005-09 (January 2019)
- Submission of the final report and the online qualification reports (February 2019)
- Re-qualification process finished (1st September 2019)

The mandatory parameters C, Ca, K, Mg, N, P and S must be analysed from all *ICP-Forests laboratories*, optional parameters As, B, Cd, Cr, Co, Cu, Fe, Hg, Mn, Ni, Pb and Zn can be analysed.

Results from a lot of other elements can be submitted too. All possible elements are shown in figure 1.

Figure 1: Possible elements



For each parameter four replicates per sample are necessary. Minimum sample weight for mandatory and optional elements should be per replicate 250 mg, because of the homogeneity of the sample material. All results must be calculated on dry weight (105°C).

In case that you need an extra milling step for C, N, S determination with an micro elemental-analyzers for C, N or S for solids (sample weight < 100mg) use a subsample for milling to avoid a possible contamination (Cr, Ni, Fe) of the whole sample.

The used pre-treatment method and the determination method must be specified by a code. This code was harmonized for all ringtests (foliage & litterfall, deposition & soil solution and soil) after the 4th Meeting of the Heads of the Laboratories in Zadar 2013.

For a deeper evaluation - all participant laboratories had to fill a questionnaire to get more information about the status of their quality control systems, about their instrumentation, about their sample number/year and about their methodical knowledge. *ICP-Forests laboratories* had to mark all parameters, if the plan to analyse and submit monitoring results to ICP-FORESTS PCC from the growing season 2018.

2.2 Material

In July 2018 the Austrian Federal Research Centre for Forests, Natural Hazards and Landscape (BFW) sent out four dried and powdered plant samples to 52 laboratories in 24 countries.

The samples consisted of:

1. Bears garlic (Switzerland) - same sample like in the 12th Test (Sample 3)
2. Spruce needles (Austria)
3. Spruce twigs (Austria)
4. Beech leaves (Austria)

Sample 1 was collected and prepared from Mr. Peter Waldner and his employees in Switzerland. **Sample 2** and **Sample 3** were collected from Mr. Walter Wuggenig and his employees in Austria/Arnoldstein. **Sample 4** was collected from Mrs. Katharina Keiblinger in Austria/Klausen-Leopoldsdorf.

Special thank to all colleagues for collecting and preparing samples for this ringtest. The further sample preparation (drying and grinding) - if necessary - was done in the BFW laboratory for air pollution monitoring and plant analyses. Before the samples were sent out they were once more homogenized and filled in PE-bags. Homogeneity was tested for these samples by analysing the B, Ca, Cr, Cu, Fe, K, Hg, Mg, Mn, N, Ni, S and Zn content in eight randomly selected sub samples. No significant variation (Kruskal-Wallis Test - 95% significance level) could be found between the results of these eight sub samples, and they were therefore considered to be homogeneous.

2.3 Participants

Table 1 shows the number of countries and laboratories taking part in the interlaboratory comparison test program.

Table 1: Number of countries and laboratories taking part in the interlaboratory comparison test program

Interlaboratory Comparison Test	Year	Number of countries	Number of laboratories
1st	1993/94	21	24
2nd	1995/96	25	39
3rd	1997/98	29	51
4th	1999/00	29	52
5th	2001/02	29	53
6th	2003/04	26	46
7th	2004/05	23	43
8th	2005/06	30	52
9th	2006/07	28	53
10th	2007/08	29	54
11th	2008/09	28	56
12th	2009/10	30	56
13th	2010/11	29	60
14th	2011/12	28	62
15th	2012/13	28	61
16th	2013/14	25	57
17th	2014/15	25	54
18th	2015/16	25	53
19th	2016/17	22	45
20th	2017/18	23	48
21th	2018/19	24	52

Two of the participating laboratories don't send any results till end of the deadline (A83, A95). With a few exceptions, all other laboratories analysed in the 21th Interlaboratory Comparison Test the complete list of mandatory elements (s. Table 2).

Table 2: Analysed elements from the participant laboratories (green); no results were submit (grey); red "X": monitoring samples will be analyzed from the growing season 2018 and these results will be sent to PCC in 2019 ("*ICP-Forests laboratory"*)

Labcode	N	S	P	Ca	Mg	K	C	Zn	Mn	Fe	Cu	Pb	Cd	B	As	Cr	Co	Hg	Ni
A36																			
A39																			
A42																			
A43																			
A45	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
A47	X	X	X	X	X	X	X	X	X	X	X			X					
A49							X												
A53																			
A56																			
A57																			
A59																			
A60	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
A61	X	X	X	X	X	X	X												
A62	X	X	X	X	X	X	X												
A65																			
A71																			
A79																			
A80																			
A82																			
A85	X	X	X	X	X	X	X												
A86	X	X					X												
A88																			
A90																			
A93																			
A94																			
F01	X		X	X	X	X													
F02	X	X	X	X	X	X	X	X	X	X	X			X		X		X	X
F03																			
F05	X	X	X	X	X	X	X	X	X	X									
F06	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X		X
F07	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
F08	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X		X
F09																			
F12	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X		X
F13	X	X	X	X	X	X	X	X	X	X	X	X	X						
F14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
F15	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
F16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
F18	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X
F19	X	X	X	X	X	X	X	X	X	X	X								
F21	X	X	X	X	X	X	X												
F24	X	X	X		X	X	X												
F25	X	X	X	X	X	X	X	X				X	X						

Labcode	N	S	P	Ca	Mg	K	C	Zn	Mn	Fe	Cu	Pb	Cd	B	As	Cr	Co	Hg	Ni
F26	X		X	X	X	X	X	X	X		X								
F27	X	X	X	X	X	X	X												
F28	X	X	X	X	X	X	X	X	X	X	X		X	X				X	
F29	X	X	X	X	X	X	X	X	X	X	X	X	X						
F32	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	
F33	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X
S22																			

2.4 Data Evaluation

Only four replicates above the quantification limits can be used for calculating an outlier free laboratory mean value. Results below the quantification limit are marked with "<" followed by the quantification limit of the laboratory (e.g. <0.1).

The results of the interlaboratory comparison test were evaluated according to DIN 38402-42:2005-09. This method identifies three types of outliers. With the Grubbs-test the four replicates from each laboratory can first be checked for outliers (outlier type 1). The next step is to compare the recalculated mean values of each lab with the mean value from all labs as well as with the Grubb-test for outliers (type 2). Now the outlier free total mean value and the outlier free maximum and minimum mean value of all labs can be calculated. Marked outliers type 1 between the outlier free maximum and minimum mean values are not longer outliers, they will be included and will be used for the further evaluation of the interlaboratory comparison test. Finally, the recalculated standard deviation from the laboratories must be compared with the total standard deviation (Cochran test) to eliminate laboratories with an excessive standard deviation (outlier type 3). In case of detected outliers type 3 a re-check for outliers type 2 must be performed. The last step is to calculate the outlier free statistical values.

With the outlier free mean value for each element/sample and the laboratory mean value the recovery must be calculated and compare with the tolerable limits from table 3 and 4. Laboratory results inside these tolerable limits are marked green (pass the test); outside they are marked orange (fail the test). This type of evaluation was fixed in the Foliar Expert Panel Meetings of As (1994) and Vienna (1997).

Table 3: Tolerable limits for **normal concentration** in foliage for the mandatory and optional elements

Element	Tolerable deviation from mean in %	Adopted by the Expert Panel Foliage and Litterfall
As	80-120	15th Meeting - Zagreb 2017
B	80-120	6th Meeting - Bonn 1999
C	95-105	6th Meeting - Bonn 1999
Ca	90-110	10th Meeting - Madrid 2007
Cd	70-130	6th Meeting - Bonn 1999
Co	75-125	15th Meeting - Zagreb 2017
Cr	75-125	15th Meeting - Zagreb 2017
Cu	80-120	8th Meeting - Prague 2003
Fe	80-120	6th Meeting - Bonn 1999
Hg	80-120	15th Meeting - Zagreb 2017
K	90-110	10th Meeting - Madrid 2007
Mg	90-110	10th Meeting - Madrid 2007
Mn	85-115	8th Meeting - Prague 2003
N	90-110	6th Meeting - Bonn 1999
Ni	80-120	15th Meeting - Zagreb 2017
P	90-110	10th Meeting - Madrid 2007
Pb	70-130	6th Meeting - Bonn 1999
S	85-115	10th Meeting - Madrid 2007
Zn	85-115	8th Meeting - Prague 2003

Table 4: Tolerable limits for **low concentrations** for the mandatory and optional elements (e.g. for non-foliage litterfall) the limits were fixed in Hamburg 2009 (11th Meeting of the Expert Panel Foliage and Litterfall) and in Zagreb 2017 (15th Meeting of the Expert Panel Foliage and Litterfall)

Element	Tolerable deviation from mean in %	for concentrations below
As	70-130	50 ng/g
B	70-130	5 µg/g
Ca	85-115	3 mg/g
Co	65-135	0.1 µg/g
Cr	65-135	1 µg/g
Fe	70-130	20 µg/g
Hg	70-130	50ng/g
K	85-115	1 mg/kg
Mg	85-115	0.5 mg/g
Mn	80-120	20 µg/g
N	85-115	5 mg/g
Ni	70-130	1 µg/g
P	85-115	0.5 mg/g
Pb	60-140	0.5 µg/g
S	80-120	0.5 mg/g
Zn	80-120	20 µg/g

If a limit of quantification (LOQ) is given from the laboratory, it will be checked first against the maximum acceptable LOQ from table 5. Is it higher than the maximum acceptable LOQ the lab will fail (marked in orange) - is it equal or lower it will be checked then against the outlier free mean. Is the submitted LOQ within the tolerable limits the lab will pass (marked in green), is it outside the lab will fail (marked in orange) for this parameter/sample combination. This evaluation of LOQ values was fixed in the 3rd Meeting of the Heads of the Laboratories in Arcachon (2011).

In case of very low concentrations interlaboratory comparison test samples will be excluded from evaluation (see table 5). This procedure is needed to avoid wrong qualification results influenced by inaccurate results. On the other hand there is often no practical need to detect these low concentrations in real samples, because it gives no additional information of the nutrient status (e.g. < 1 µg Cu/g is always deficiency) or of the pollution impact situation (e.g. < 20 ng Cd/g, < 1 µg Cu/g, < 0.2 µg Pb/g is always not polluted).

Table 5: Maximum acceptable limit of quantification and lowest evaluated interlaboratory sample result fixed in Arcachon 2011 (3rd Meeting of the Heads of the Laboratories) and in Pallanza 2017 (6th Meeting of the Heads of the Laboratories)

Element	Maximum acceptable limit of quantification	Lowest evaluated result
As	50 ng/g	20 ng/g
B	5 µg/g	-
Ca	3 mg/g	-
Co	0.1 µg/g	0.05 µg/g
Cr	1 µg/g	0.5 µg/g
Fe	20 µg/g	-
Hg	50 ng/g	10 ng/g
K	1 mg/kg	-
Mg	0.5 mg/g	-
Mn	20 µg/g	-
N	5 mg/g	-
Ni	1 µg/g	0.5 µg/g
P	0.5 mg/g	-
Pb	0.5 µg/g	0.20 µg/g
S	0.5 mg/g	-
Zn	20 µg/g	-

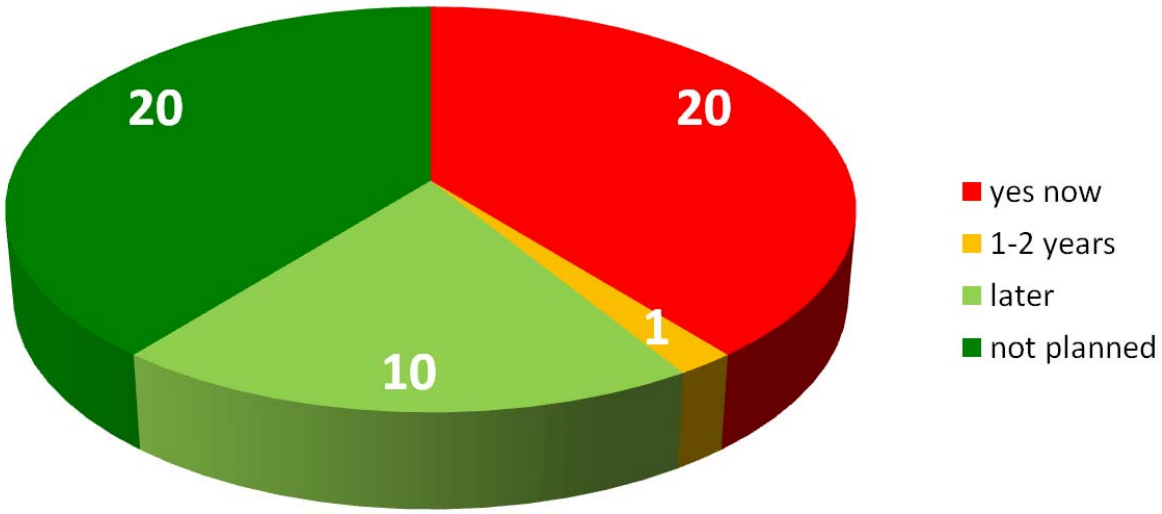
3 RESULTS

3.1 Main results of the questionnaire

All participating laboratories should fill a questionnaire in order to obtain information about the status and changes of their quality control systems and their instrumentation. 51 of the 52 laboratories submit this questionnaire.

The first questions dealt with the accreditation status of the laboratories and the summarized results are shown in figure 2.

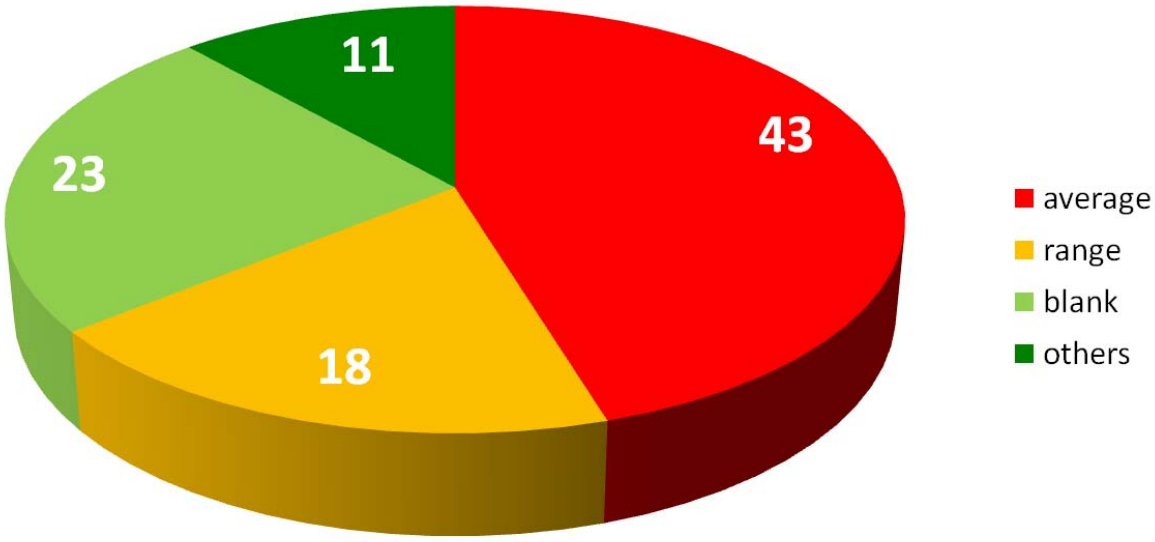
Figure 2: Accreditation status according EN 17025 (n=51)



41.2% of the laboratories are accredited now (20 labs) or plan an accreditation within 1-2 years (1 lab) - 20 laboratories don't plan an accreditation in future.

The next important question was about the usage of control charts for routine quality control (Hovind et al. 2007). 90.2% of these 51 laboratories (say that they) are using control charts, and most of them are using average control chart – 5 of this 51 laboratories are still using no control chart. Some of the laboratories are using more than one type of control charts (see Figure 3).

Figure 3: Types of control charts used in foliar laboratories



3.2 Results of the 21th Interlaboratory Comparison Test

Table 6a and 6b gives an overview which laboratories analysed the test samples well and which laboratory encountered quality problems. This evaluation is based on the tolerable limits from table 3 and table 4 and on the maximum acceptable limit of quantification (LOQ) from table 5. A green marked field means all samples are analysed well, a grey marked field means no results were sent from this laboratory till 1st of January 2019. The red marked "<" or ">" mean number of results lower or higher the tolerable limits.

If a LOQ is given from the laboratory, it will be first checked against the maximum acceptable LOQ from table 5. Is it higher than the maximum acceptable LOQ the lab will fail (marked with "L").

The following participants, which have a lower percentage of correct results (lower than 80% of correct results), have bigger QC/QA-problems in their laboratory:

A88 (79.5%), **F24** (79.2%), **F27** (79.0%), **A60** (78.6%), **A53** (78.1%), **A43** (70.8%), **A59** (70.8%), **A56** (67.9%), **A62** (53.6%), **F21** (46.4%), **S22** (37.5%) and **A85** (7.1%)

Some results are within the tolerable limits, but the statistical evaluation shows an excessive standard deviation (outlier type 1 or 3) or a high Vi (> 10%), that means these labs have e.g. contamination influences or methodical problems. These results are marked with "a" or with "c" or a red marked Vi in the detailed evaluation in the annex.

Table 6a: Results of the 21th Needle/Leaf Interlaboratory Comparison Test – results marked with the limits from tables 3 and 4 (green = all samples were analysed well; < = too low; > = too high; grey = no results were sent) and with the maximum acceptable LOQ from table 5 (L = too high LOQ)

Labcode	N	S	P	Ca	Mg	K	C	Zn	Mn	Fe
A36										
A39			>						>	
A42				>		>				
A43	<>>		<	>		<>				
A45										
A47										
A49						>	<			
A53			>>>	>	>	>>				
A56	>>>	<<					>>>>			
A57	<<			<						>
A59	<<<<	<	<	<	<	<	<<<<		<	
A60		>>>		<<<				<<<<		
A61	>									
A62	<<		>>>>	<<<<	<	<	<			
A65										
A71		<<							<	>
A79		>>		>	>					
A80										
A82	<					<<<<				
A85	>>>	<<<	<<<<	<<<<	<<<<	<<<<	>>>>			
A86										
A88	>>>>					<				<
A90										
A93										
A94			>		>		>>>>			
F01			>							
F02			>				<			
F03			>							
F05		>								
F06										
F07						<<				
F08						<		<		
F09		<	<>		<	>				
F12						>			<	
F13				>>		<>				
F14										
F15		>				>				
F16		>								
F18							>>			
F19										<
F21	>	>	>>	<<<	<<<<	<<<	>			
F24	>	<>>	<							

Labcode	N	S	P	Ca	Mg	K	C	Zn	Mn	Fe
F25										
F26	>		>		>			>>		
F27		>	<	<<<						
F28		>								
F29		>								>>
F32										
F33	>	<>	<	<		<<				<
S22	<<	<<<	<<<<	>>>	<<<<	<	<<	<	>	

Table 6b: Results of the 21th Needle/Leaf Interlaboratory Comparison Test – results marked with the limits from tables 3 and 4 (green = all samples were analysed well; < = too low; > = too high; grey = no results were sent) and with the maximum acceptable LOQ from table 5 (L = too high LOQ)

Labcode	Cu	Pb	Cd	B	As	Cr	Co	Hg	Ni
A36									
A39					>>>	>			
A42									
A43									
A45						<			<
A47									
A49			LLL				L>		
A53									
A56									
A57									
A59									
A60				<<		<	<		>
A61									
A62									
A65		>>	LLL			LL	L		
A71	>>>								
A79									
A80					>				
A82						>>>			>
A85									
A86									
A88		<L			<<<<		LL	<	
A90									>
A93									
A94									
F01									
F02									
F03		<				<>>			<
F05									
F06			>				<		

Labcode	Cu	Pb	Cd	B	As	Cr	Co	Hg	Ni
F07			>		>>>	<<<	<<		<<
F08						<		<>	
F09	<								
F12			>				L>		
F13									
F14									
F15	>		<	>>					
F16						>			
F18									
F19									
F21									
F24									
F25									
F26	>								
F27		>				<<<	LL		<<
F28			>						
F29			>						
F32									
F33						>			
S22	<<<<								

The following mean element concentrations were found in the test samples and the percentage of the laboratory results out of the tolerable limits are given in table 7.

Table 7: Mean element concentrations and percentage of non-tolerable results (results evaluated with the tolerable limits for low concentrations are marked in blue; not evaluated samples with very low concentrations are marked in grey)

Element	Unit	Sample 1 *Bears garlic*	Sample 2 *Spruce needles*	Sample 3 *Spruce twigs*	Sample 4 *Beech Leaves*
N	mg/g	49.85	12.22	9.18	7.84
	%	11.11	15.56	20.00	17.78
S	mg/g	11.30	0.91	0.64	0.69
	%	13.95	6.98	25.58	20.93
P	mg/g	3.85	1.41	1.54	0.52
	%	10.87	10.87	21.74	21.74
Ca	mg/g	5.81	4.15	4.69	22.30
	%	15.22	15.22	15.22	17,39
Mg	mg/g	2.18	0.84	1.07	2.28
	%	8.51	6.38	14.89	12.77
K	mg/g	25.63	5.44	6.93	2.26
	%	12.77	8.51	10.64	34.04
C	g/100g	48.21	51.83	53.01	47.59
	%	19.05	9.52	11.90	16,67
Zn	µg/g	31.47	131.23	53.18	38.31
	%	5.26	2.63	5.26	7.89
Mn	µg/g	55.93	672.28	144.50	743.76
	%	2.56	2.56	5.13	2.56
Fe	µg/g	141.75	88.08	67.07	1766.5
	%	2.86	2.86	8.57	5.71
Cu	µg/g	9.11	4.00	6.01	6.10
	%	2.70	5.41	8.11	10.81
Pb	µg/g	*0.25*	28.07	*0.18*	2.30
	%	10.71	0.00	-	10.71
Cd	ng/g	66.11	307.54	55.57	101.02
	%	6.90	0.00	17.24	17.24
B	µg/g	16.92	16.32	10.32	12.65
	%	4.35	8.70	4.35	0.00
As	ng/g	*36.81*	109.76	*26.82*	906.44
	%	28.57	14.29	21.43	14.29
Cr	µg/g	1.05	2.66	*0.66*	30.65
	%	21.74	17.39	30.43	17.39
Co	µg/g	*0,046*	0.133	0.42	1.05
	%	-	38.10	9.52	14.29
Hg	ng/g	*7.62*	*42.95*	*19.80*	51.77
	%	-	0.00	6.25	12.50
Ni	µg/g	4.20	3.59	2.36	18.99
	%	4.00	4.00	8.00	20.00

The cobalt and mercury concentrations of sample 1 and the lead concentration of sample 3 were too low for the evaluation. These sample results were excluded from the evaluation.

3.3 Comparison between the 21th Interlaboratory Comparison Test and former tests

Sample 1 of the 21th Interlaboratory Comparison Test and sample 3 of the 12th Interlaboratory Comparison Test are identical (*Bears garlic - Switzerland*). For most of the elements the mean values are identical (see Table 8). The results are good comparable and the sample is stable.

Arsenic was analyzed in the 12th test only from 2 laboratories now we have 14 laboratories – this explains the differences (appr. 20%) between the both results.

The ringtest is evaluated on the basis of fixed limits (table 3 and 4). These tolerable deviations from the mean were updated in Foliage Expert Panel Meetings in Bonn (1999), Prague (2003), Madrid (2007) and Zagreb (2017) and in the 1st Meeting of the Heads of the Laboratories in Hamburg (2009) for some elements. Maximum acceptable limit of quantification (table 5) defined in the 3rd Meeting of the Heads of the Laboratories in Arcachon (2011) and on the 6th Meeting of the Heads of the Laboratories in Pallanza (2017) and are used from the 14th to 21th ringtest. These changes of the tolerable limits from the 8th to the 21th test are shown in tables 9a and 9b.

Table 8: Comparison between the 12th and 21th Interlaboratory Comparison Test

Element (Unit)	12th Interlaboratory Comparison Test 2009/10 (Sample 3)		21th Interlaboratory Comparison Test 2018/19 (Sample 1)	
N mg/g	49.64	53	49.85	45
S mg/g	11.66	50	11.30	43
P mg/g	3.80	53	3.85	46
Ca mg/g	5.86	54	5.81	46
Mg mg/g	2.20	54	2.18	47
K mg/g	25.16	54	25.63	47
C g/100g	47.73	47	48.21	42
Zn µg/g	31.84	43	31.47	38
Mn µg/g	56.15	44	55.93	39
Fe µg/g	144.57	42	141.75	35
Cu µg/g	9.11	40	9.11	37
Pb µg/g	0.28	30	0.25	28
Cd ng/g	61.22	28	66.11	29
B µg/g	17.03	23	16.92	23
As ng/g	30.4	2	36.81	14
Cr µg/g	1.06	10	1.05	23
Co µg/g	0.049	7	0,046	21
Hg ng/g	8.06	7	7.62	16
Ni µg/g	4.24	11	4.20	25

Table 9a: Percentage of non tolerable results from 8th to 14th test

Element	Tolerable limits [1]	8th Labtest 2005/2006		9th Labtest 2006/2007		10th Labtest 2007/2008		11th Labtest 2008/2009		12th Labtest 2009/2010		13th Labtest 2010/2011		14th Labtest 2011/2012	
	normal (low) (± %)	Non tolerable (%)	Number	Non tolerable (%)	Number	Non tolerable (%)	Number	Non tolerable (%)	Number	Non tolerable (%)	Number	Non tolerable (%)	Number	Non tolerable (%)	Number
N	10 (15)	**7,3**	*192*	**6,1**	*196*	**2,6**	*196*	**10,9**	*192*	**7,6**	*212*	**4,9**	*224*	**8,9**	*224*
S	15 (20)	**10,6**	*188*	**8,3**	*196*	**15,4**	*188*	**14,4**	*188*	**16,5**	*200*	**13,9**	*208*	**12,7**	*220*
P	10 (15)	**9,7**	*196*	**4,3**	*208*	**13,2**	*204*	**14,2**	*204*	**13,7**	*212*	**7,4**	*216*	**15,9**	*220*
Ca	10 (15)	**10,2**	*196*	**4,3**	*208*	**17,2**	*204*	**19,1**	*204*	**9,7**	*216*	**8,0**	*212*	**14,7**	*224*
Mg	10 (15)	**5,9**	*188*	**4,3**	*208*	**10,8**	*204*	**18,6**	*204*	**14,4**	*216*	**5,7**	*212*	**19,3**	*228*
K	10 (15)	**5,6**	*196*	**3,3**	*212*	**16,8**	*208*	**17,5**	*200*	**6,0**	*216*	**8,5**	*212*	**21,0**	*228*
C	5	**4,3**	*140*	**11,1**	*144*	**3,2**	*156*	**16,9**	*148*	**8,5**	*188*	**6,3**	*192*	**15,4**	*208*
Zn	15 (20)	**4,5**	*156*	**8,9**	*168*	**10,2**	*176*	**6,7**	*164*	**6,4**	*172*	**9,7**	*176*	**4,4**	*184*
Mn	15 (20)	**7,0**	*172*	**0,0**	*176*	**2,8**	*180*	**6,5**	*168*	**2,7**	*176*	**4,8**	*188*	**6,8**	*192*
Fe	20 (30)	**7,1**	*168*	**9,9**	*172*	**5,7**	*176*	**13,1**	*160*	**4,8**	*168*	**0,0**	*180*	**14,1**	*184*
Cu	20	**8,9**	*146*	**10,8**	*148*	**4,9**	*164*	**17,1**	*164*	**21,3**	*160*	**9,1**	*176*	**10,3**	*184*
Pb	30 (40)	**34,7**	*72*	**24,0**	*104*	**13,0**	*100*	**9,8**	*92*	**13,3**	*120*	**12,5**	*112*	**15,6**	*128*
Cd	30	**10,3**	*97*	**7,1**	*112*	**17,0**	*100*	**7,7**	*104*	**10,7**	*112*	**9,5**	*116*	**10,0**	*140*
B	20 (30)	**12,8**	*86*	**8,3**	*84*	**13,5**	*96*	**12,5**	*88*	**5,4**	*92*	**3,3**	*92*	**12,0**	*100*

[1] special tolerable limits for low concentrations from the 11th till 14th test

Table 9b: Percentage of non tolerable results from the 15th to the 21th test

Element	Tolerable limits [1]	15th Labtest 2012/2013		16th Labtest 2013/2014		17th Labtest 2014/2015		18th Labtest 2015/2016		19th Labtest 2016/2017		20th Labtest 2017/2018		21th Labtest 2018/2019	
	normal (low) (± %)	Non tolerable (%)	Number	Non tolerable (%)	Number	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values
N	10 (15)	**6,0**	*216*	**3,1**	*196*	**2,1**	*192*	**7,9**	*164*	**4,6**	*152*	**3,7**	*164*	**16,1**	*180*
S	15 (20)	**13,9**	*208*	**14,8**	*196*	**9,9**	*192*	**6,4**	*156*	**7,4**	*148*	**16,7**	*156*	**16,9**	*172*
P	10 (15)	**9,4**	*224*	**18,8**	*208*	**14,7**	*204*	**15,5**	*168*	**15,4**	*164*	**18,3**	*180*	**16,3**	*184*
Ca	10 (15)	**12,1**	*224*	**16,3**	*208*	**17,7**	*212*	**9,1**	*176*	**11,3**	*168*	**12,0**	*184*	**15,8**	*184*
Mg	10 (15)	**5,9**	*220*	**8,8**	*204*	**12,3**	*212*	**14,2**	*176*	**13,1**	*168*	**10,9**	*184*	**10,1**	*188*
K	10 (15)	**18,0**	*228*	**9,1**	*208*	**11,5**	*208*	**15,6**	*180*	**16,7**	*168*	**14,7**	*184*	**16,5**	*188*
C	5	**7,7**	*196*	**10,0**	*180*	**7,8**	*180*	**9,5**	*148*	**8,1**	*136*	**7,9**	*152*	**14,3**	*168*
Zn	15 (20)	**5,4**	*184*	**5,6**	*180*	**8,1**	*172*	**13,5**	*148*	**12,1**	*132*	**6,3**	*144*	**5,3**	*152*
Mn	15 (20)	**0,5**	*188*	**8,7**	*184*	**3,9**	*180*	**6,1**	*148*	**8,8**	*136*	**10,5**	*152*	**3,2**	*156*
Fe	20 (30)	**3,7**	*188*	**9,4**	*180*	**6,5**	*168*	**12,2**	*148*	**13,3**	*128*	**4,2**	*144*	**5,0**	*140*
Cu	20	**9,1**	*176*	**14,5**	*172*	**15,7**	*172*	**4,2**	*144*	**15,2**	*132*	**8,8**	*136*	**6,8**	*148*
Pb	30 (40)	**8,6**	*105* [2]	**10,7**	*56* [2]	**7,8**	*87* [2]	**16,0**	*75* [2]	**7,7**	*24* [2]	**8,3**	*24* [2]	**7,1**	*84* [2]
Cd	30	**7,1**	*140*	**4,8**	*62* [2]	**14,3**	*112*	**8,0**	*112*	**2,1**	*96*	**2,7**	*75* [2]	**10,3**	*116*
B	20 (30)	**5,0**	*100*	**6,3**	*96*	**5,0**	*100*	**11,9**	*84*	**13,9**	*72*	**6,8**	*88*	**4,3**	*92*
As	20 (30)							**19,2**	*52*	**25,6**	*39* [2]	**48,7**	*39* [2]	**19,6**	*56*
Co	25 (35)							**13,2**	*68*	**4,4**	*68*	**11,8**	*51* [2]	**20,6**	*63* [2]
Cr	25 (35)							**10,9**	*46* [2]	**16,3**	*92*	**15,2**	*92*	**21,7**	*92*
Hg	20 (30)							**4,5**	*44*	**19,6**	*56*	**0,0**	*36* [2]	**6,3**	*48* [2]
Ni	20 (30)							**8,3**	*96*	**7,6**	*92*	**16,3**	*92*	**9,0**	*100*

[1] special tolerable limits for low concentrations

[2] sample/s excluded because of very low concentration

3.4 Evaluation by element

3.4.1 Nitrogen

The laboratories A43, A56, A59, A85 and A88 failed in analyzing three or four samples. In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results increased (4.6 → 3.7 → 16.1 %). A requalification is needed from the *ICP-Forests laboratory* A85.

3.4.2 Sulphur

The laboratories A60, A85, F24 and S22 failed in analyzing three or four samples. In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results is similar high (7.4 → 16.7 → 16.9 %). Laboratory A60 is using ICP-MS; especially sulphur is a problematic element with low sensitivity or with a lot of mass interferences in ICP-MS. A requalification is needed from the *ICP-Forests laboratories* A60, which failed in the last test too, F24 and A85.

3.4.3 Phosphorus

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results is constant high (15.4 → 18.3 → 16.3%). The laboratories A53, A62, A85 and S22 failed in analyzing three or all four samples. A re-qualification is needed for the *ICP-Forests laboratories* A62 and A85.

3.4.4 Calcium

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results are higher (11.3 → 12.0 → 15.8 %). The laboratories A60, A62, A85, F21, F27 and S22 fail in analyzing three or four samples.
A requalification is needed from the *ICP-Forests laboratories* A60, A62, A85, F21 and F27.
The labs A62 and F27 are using a Flame-AAS method. Matrix adapted standards and a buffer against chemical interferences must be added (La-nitrate or ETDA) to avoid chemical interferences, if a C_2H_2/air flame is used.
The laboratories A62 and F21 failed in the last test too – their methodical problems are still not solved!

3.4.5 Magnesium

In comparison with the last tests the percentage of non-tolerable results are slightly decreasing (13.1 → 10.9 → 10.1%). The laboratories A85, F21 and S22 failed with all four samples. A requalification is needed for the *ICP-Forests laboratories* A85 and F21.

3.4.6 Potassium

In comparison with the last tests the percentage of non-tolerable results is constant high (16.7 → 14.7 → 16.5%). The laboratories A82, A85 and F21 failed in analyzing three or all four samples.
A re-qualification is needed for the *ICP-Forests laboratories* A85 and F21. The laboratory A82 failed in the last test for potassium too – the methodical problem is still not solved!

3.4.7 Carbon

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results are higher (8.1 → 7.9 →14.3%). The laboratories A56, A59, A85 and A94 failed in analyzing all four samples. It seems that these laboratories have calibration problems with their element-analyzers. A re-qualification is needed for the *ICP-Forests laboratory* A85. The laboratory A56 failed in the last test for carbon too – the methodical problem is still not solved!

3.4.8 Zinc

Only 5.3% of non-tolerable results - this is a really good result. Only the laboratory A60 failed with all four samples and had to requalify as *ICP-Forests laboratory*.

3.4.9 Manganese

Only 3.2% of non-tolerable results - this is a really good result. No laboratory failed in analyzing three or four samples.

3.4.10 Iron

Only 5.0% of non-tolerable results; no laboratory failed with three or four samples.

3.4.11 Copper

In comparison with the last tests the percentage of non-tolerable results is decreasing (15.2 → 8.8 → 6.8%). The laboratories A71 and S22 failed with three or four samples.

3.4.12 Lead

Sample 3 was excluded from the ringtest evaluation, because of too low content. In comparison with the last tests the percentage of non-tolerable results is similar (7.7 → 8.3 → 7.1%). The laboratories A65 and A88 failed with this parameter (two of the three samples). The laboratory A65 failed in the last test for lead too – the methodical problem is still not solved! The laboratory A88 failed because of too high LOQ.

3.4.13 Cadmium

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results are higher (2.1 → 2.7 →10.3%). The laboratories A49 and A65 failed because of a too high LOQ.

3.4.14 Boron

Only 4.3% of non-tolerable results; no laboratory failed with three or four samples.

3.4.15 Arsenic

19.6% of non-tolerable results, this is better than in the test before (48.7%) but still high. The laboratories A39, A88 and F07 failed in analyzing three or four samples. A re-qualification is needed for the *ICP-Forests laboratory* F07. The laboratories A39 and F07 failed in the last test for arsenic too!

3.4.16 Cobalt

Sample 1 was excluded from the ringtest evaluation, because of too low content. In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results are higher (4.4 → 11.8 →20.6%). But this is influenced from the laboratories which failed, because of a too high LOQ (Laboratories A49, A88, F12 and F27). A LOQ from equal or lower than 0.1 can be usually reached (only) with ICP-MS. Laboratory F07 failed with two of the three samples. A re-qualification is needed for the *ICP-Forests laboratories* F07 and F12.

3.4.17 Chromium

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results are higher (16.3 → 15.2 →21.7%). The laboratories A82, F03, F07 and F27 failed with three or four samples. A re-qualification is needed for the *ICP-Forests laboratory* F07 – the methodical problem is still not solved!

3.4.18 Mercury

Sample 1 was excluded from the ringtest evaluation, because of too low content. Only 6.3% of non-tolerable results; only laboratory F08 failed with two of the three samples.

3.4.19 Nickel

9.0% of non-tolerable results; no laboratory failed with three or four samples.

4 CONCLUSIONS

52 laboratories in 24 countries participated in the 21th Needle/Leaf Interlaboratory Test, but only 50 laboratories submitted their results in time.

A new system for qualification and re-qualification started with the 11th test in 2009. This system was enlarged after the manual update in 2010 to all ICP-Forests partners (see König et al. 2010 and 2013, Rautio et al. 2010 and 2013 Pitman et al. 2010). With the ring test report, each participant received a qualification report which can be downloaded from the webpage (https://bfw.ac.at/ws/ring_nadel.login). It has been decided to qualify the results of each parameter separately. A laboratory is qualified when 50% or more (generally two, three or all four samples) of the results for this parameter for all the samples of the ring test are within the tolerable limits. Re-qualification is mandatory for all *ICP-Forests laboratories,* if monitoring results (foliage, litterfall, ground vegetation) from the vegetation period 2018 will be submitted to PCC.

The usage of maximum acceptable limits of quantification (LOQ) has been included since the 14th Interlaboratory Test. These limits are needed, because many laboratories are using multi element methods (mostly ICP-AES) with higher LOQs for some elements. But for evaluation and classification of the monitoring samples *real* measured results and lower LOQ are sometimes needed. The Working Group QA/QC in Laboratories received a task to fix this problem from the Expert Panel Foliage and Litterfall (12th Meeting - Tallinn 2011). Maximum acceptable LOQs for mandatory and optional parameters for foliage, litterfall and ground vegetation were discussed and accepted in the 3rd Meeting of the Heads of the Laboratories (Arcachon 2011) and in the 6rd Meeting of the Heads of the Laboratories (Pallanza 2017). This problem is more or less fixed now - only five laboratories submited LOQs higher than the maximum acceptable LOQs (**A49**: Cd, Co; **A65**: Cd, Cr, Co; **A88**: Pb, Co; **F12**: Co; and **F27**: Co).

In case of very low concentrations in the test samples, results of these samples will be excluded from the evaluation (this happened for **Pb**: sample 3; **Co**: sample 1 and **Hg**: sample 1). This procedure is needed to avoid wrong qualification results influenced by inaccurate measurements. And on the other hand there is no real need to detect these very low concentrations in real monitoring samples, because it gives no additional information of the nutrient status or of the pollution impact situation.

The following participating laboratories with a percentage of correct results below 80% have severe QC/QA-problems and/or methodical problems:

A88 (79.5%), **F24** (79.2%), **F27** (79.0%), **A60** (78.6%), **A53** (78.1%), **A43** (70.8%), **A59** (70.8%), **A56** (67.9%), **A62** (53.6%), **F21** (46.4%), **S22** (37.5%) and **A85** (7.1%).

Some of the *ICP-Forests laboratories* fail and have to do a re-qualification for certain parameters (**A60:** S, Ca, Zn; **A62:** P, Ca; **A85:** N, S, P, Ca, Mg, K, C; **F07:** As, Cr; **F21:** Ca, Mg, K; **F24:** S; **F27:** Ca). These (*ICP-Forests*) laboratories have to check and re-validate their method or employ a better method. FFCC offers old ringtest material if reference material is needed for this purpose (see: http://bfw.ac.at/rz/bfwcms2.web?dok=5146).

The laboratories **A39** (As), **A56** (C), **A60** (S), **A62** (Ca), **A82** (K), **F07** (As, Cr) and **F21** (Ca) failed with the same parameter in the last test. **Therefore, their QC/QA-problem or their methodical problem is still not solved!**

All laboratories are invited to take part in the re-qualification program that starts up from now till 1st of September 2019 (see details: http://bfw.ac.at/rz/bfwcms2.web?dok=7830).

Some words to the used analytical equipment. Microwave digestion method is the most used digestion method. A clear recommendation for ICP-AES as determination method can be given. Where ICP-AES is not sensitive enough, ICP-AES with ultrasonic nebulizer or better ICP-MS should be used. For nitrogen and carbon, element analyzers are the best choice.

5 OUTLOOK

More and more laboratories changed their method during the last years to microwave digestion and ICP-MS, so they are now able to determine heavy metals in one run simultaneously with the mandatory and optional elements with a sufficient accuracy. So it was possible to enlarge – in a first step – the parameter list with the elements As, Co, Cr, Hg and Ni and as it looks now the elements V and Mo can follow within the next years.

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List of participating laboratories

Austria

A 10 Land Steiermark
Referat Boden- und Pflanzenanalytik
Ragnitzstraße 193
8047 - Graz

BOKU University Vienna
Forest Ecology
Peter Jordan Straße 82
1190 - Vienna

Bundesforschungszentrum für Wald
Pflanzenanalyse
Seckendorff-Gudent-Weg 8
A-1131 - Vienna

Umweltbundesamt GmbH
Prüfstelle
Spittelauer Lände 5
1090 - Vienna

Belgium / Flanders

Research Institute for Nature and Forest
INBO laboratory
Gaverstraat 35
B-9500 - Geraardsbergen

Belgium/Wallonia

Earth and Life Institute (ELIE)
Recherche en Sciences Forestières
Croix du Sud 2- L7.05.09
B-1348 - Louvain-La-Neuve

Bulgaria

Exequtive environmental agensy
Qualiti of soil and waste characteristic
Tzar Boris III - 136
1618 - Sofia

Croatia

HRVATSKI SUMARSKI INSTITUT
Division for forest ecology
Cvjetno naselje 41
HR-10450 - Jastrebarsko

Czech Republic

Forestry and Game Management Res. Inst.
Testing Laboratories (25)
Strnady 136
CZ-15604 - Praha 5- Zbraslav

Denmark

Geosciences & Natural Resources Manageme
BioGeoLab
Rolighedsvej 23
DK-1958 - Frederiksberg C

Estonia

Estonian Environmental Research Centre
Tartu Department
Vaksali 17a
EST-50410 - Tartu

Finland

Natural Resources Institute Finland
Viikki B2
Latokartanonkaari 9
FIN-00790 - Helsinki

France

INRA
USRAVE
71, ave E. Bourlaux CS20032
33 882 - Villenave d'Ornon Cedex

Germany

BA für Materialforschung und -prüfung
Org. Spuren- und Lebensmittelanalytik
Richard-Willstätter-Str. 11
12489 - Berlin

Germany

Bay. LA f. Wald u. Forstwirtschaft
Abteilung 2 - Labor
Hans-Carl-von-Carlowitz-Platz 1
D-85354 - Freising

Bayerisches Landesamt für Umwelt
Referat 72 - Schwermetallanalytik
Bürgermeister-Ulrich-Straße 160
86179 - Augsburg

Berghof Analytik + Umweltengineering
GmbH
Ob dem Himmelreich 9
72074 - Tübingen

Fraunhofer IME
ESB and Elemental Analysis
Auf dem Aberg 1
57392 - Schmallenberg

FVA-Baden-Württemberg
Abt. Boden und Umwelt
Wonnhaldestraße 4
D-79100 - Freiburg

HNE Eberswalde
Zentrales Ökologisches Labor
Schicklerstraße 5
D-16225 - Eberswalde

LANUV Nordrhein-Westfalen
LANUV; FB 46
Wallneyer Str. 6
D-45133 - Essen

LECO Instrumente GmbH
LECO EATC Berlin
Max-Dohrn-Str. 8-10
10589 - Berlin

LMS Agrarberatung GmbH, LUFA Rostock
LUFA Rostock - nasschemische Daten
Graf-Lippe-Str. 1
D-18059 - Rostock

Germany

LMS Agrarberatung GmbH, LUFA Rostock
LUFA Rostock - RFA Daten
Graf-Lippe-Str. 1
D-18059 - Rostock

LUFA NRW
Zentrale anorganische Analytik
Nevinghoff 40
48147 - Münster

LUFA NRW
Spezielle Analytik
Nevinghoff 40
D-48147 - Münster

LUFA Speyer
Abt. 3 Referat 2
Obere Langgasse 40
D-67346 - Speyer

Nordwestdeutsche Forstl.Versuchsanstalt
Abt. D, Umweltanalytik
Grätzelstr. 2
D-37079 - Göttingen

Ökopedologie der gemäßigten Zonen (PGZ)
Zentrallabor
Büsgenweg 2
D-37077 - Göttingen

Saxon Public Enterprise-Sachsenforst
Dept. IV. Ref. 43
Bonnewitzer Str. 34
D-01796 - Pirna OT Graupa

Thuer. Landesanstalt. f. Landwirtschaft
Untersuchungswesen
Naumburger Str. 98
07743 - Jena

Thür. Landesanst. f. Landwirtschaft
Futtermittellabor
Naumburger Str.98
D-07743 - Jena

Germany

TU - München
Lehrgebiet Waldernährung+ Wasserhaushalt
H.C.v.Carlowitz-Platz 2
D-85354 - Freising

Greece

Forest Research Institute of Athens
Forest Soils
Terma Alkmanos
115 28 - Athens

Hungary

NARIC Forest Research Institute
Ecological Laboratory
Várkerület 30/A
H-9600 - Sárvár

Latvia

LSFRI Silava
Forest environment laboratory
Riga street 111
LV-2169 - Salaspils

Norway

Chemistry, NTNU
ICP-MS
Høgskoleringen 5
7034 -

Norwegian Institute of Bioeconomy Research
Chemical Laboratories
Pb 115
NO-1431 - As

Poland

Forest Research Institute
Lab. of Natural Environment Chemistry
3, Braci Lesnej
PL-05-090 - Sekocin Stary

Romania

Forest Research and Management
Soil and plants analyses
closca 13
500040 - Brasov

INCDS
Chemistry laboratory
Calea Bucovinei, 73 bis
725100 - Campulung Moldovenesc

INCDS MARIN DRACEA
Forestry-Ecology Laboratory
B-dul Eroilor, nr.128
RO-077190 - Voluntari-Jud. Ilfov

Russia

INEP
of terrestrial ecosystems
Akademgorodok
184209 - Apatity

Institute of Biology Komi SC UB RAS
Ecoanalytical laboratory
Kommunisticheskaya, 28
167982 - Syktyvkar

Serbia

Institute of forestry

Kneza Višeslava 3
11000 - Belgrade

Slovakia

National Forest Centre
Central Forest Laboratory
T.G.Masaryka 22
SK-96092 - Zvolen

Slovenia

Slovenian Forestry Institute
Laboratory for Forest Ecology
Vecna pot 2
SI-1000 - Ljubljana

Spain

Universidad de Navarra
Departamento de Química
Irunlarrea, 1
31008 - Pamplona (Navarra)

Switzerland

Eidg. Forschungsanstalt WSL
Zentrallabor
Zürcherstrasse 111
CH-8903 - Birmensdorf

University of Basel
Mercury Laboratory
Bernoullistrasse 30
4056 - Basel

Turkey

Ege Forestry Research Institute
Soil and Ecology Laboratory
Mustafa Kemal Blv. No: 75 Zeytinalani
35515 - Izmir

United Kingdom

Forest Research
Environmental Research Laboratory
Alice Holt Lodge
GU10 4LH - Farnham, Surrey

Method Code – Pretreatment (P)

Extraction methods	
PA06	Extraction with diluted HNO_3
PA99	Other extraction method
Digestion methods (open system)	
PB02	Open digestion with H_2SO_4/H_2O_2
PB03	Open digestion with HNO_3
PB04	Open digestion with HNO_3 /H_2SO_4
PB05	Open digestion with HNO_3/H_2O_2
PB06	Open digestion with $HNO_3/HClO_4$
PB07	Kjeldahl H_2SO_4 with Se or Cu catalyst
PB08	Modified Kjeldahl H_2SO_4 with Ti/Cu catalyst
PB99	Other digestion method (open system)
Pressure digestion methods	
PC01	Pressure digestion HNO_3
PC02	Pressure digestion HNO_3/H_2O_2
PC03	Pressure digestion HNO_3/HF (total digestion)
PC99	Other pressure digestion method
Microwave pressure digestion methods	
PD01	Microwave pressure digestion HNO_3
PD02	Microwave pressure digestion HNO_3/H_2O_2
PD03	Microwave pressure digestion HNO_3/H_2O_2/HCl
PD04	Microwave digestion $HNO_3/HClO_4$
PD05	Microwave pressure digestion HNO_3/HF (total digestion)
PD99	Other microwave pressure digestion method
Dry ashing digestion methods	
PE01	Oxygen ashing (Schöniger)
PE99	Other dry ashing method
Other methods	
PZ01	Material melted and formed (tablet) for XRF methods
PZ02	Material pressed (pellet) for XRF methods
PZ98	No pretreatment
PZ99	Pretreatment method not in this list

Method Code – Determination (D)

Element analyzer	
DA01	Macro Elemental-analyzers for C, N or S for solids (Sample > 100mg)
DA02	Micro Elemental-analyzers for C, N or S for solids (Sample $\leq$ 100mg) with an extra milling step
DA05	Hg-Analyzer
DA99	Other Element analyzer method
Atomic Absorption or Emission Spectroscopy	
DB01	AAS-flame technique (C_2H_2/Air)
DB02	AAS-flame technique (C_2H_2/N_2O)
DB03	AAS-cold vapor technique
DB04	AAS-hydride technique
DB05	AAS-flameless (electrothermal technique)
DB06	AES-Flame technique (Flame photometry)
DB07	AFS-hydride-technique
DB08	ICP-AES without Ultrasonic nebulisation
DB09	ICP-AES with Ultrasonic nebulisation
DB10	ICP-MS
DB99	Other Atomic Absorption or Emission Spectroscopy method
Physical techniques	
DD01	X-ray-energy dispersive
DD02	X-ray-wavelength dispersive
DD99	Other physical technique
UV-VIS Spectrophotometry techniques	
DE01	UV-VIS-spectrophotometry-technique
DE03	Continous flow UV-VIS-spectrophotometry-technique
DE05	Flow injection UV-VIS-spectrophotometry-technique
DE99	Other UV-VIS Spectrophotometry technique
Electrochemical methods	
DF03	Ion selective electrodes (except pH-Electrodes)
DF08	Other Potentiometric titration
DF99	Other Electrochemical method
Other methods	
DZ02	N-Determination (after Kjeldahl digestion)
DZ99	Detection method not in this list

List of abbreviation

No.	Number of result ordered by Lab. mean
Lab. Code	Code of the laboratory / Laboratory which are analysing level II samples are marked with x
P	Code for pre-treatment method (s. method code pre-treatment)
D	Code for determination method (s. method code determination)
Lab. mean	Mean of the results of each laboratory without outliers type 1
n	Number of all results from all laboratories without outliers type 1, 2, 3
l	Number of all laboratories without outliers type 2, 3
Mean	Total mean value from all results without outliers type 1, 2, 3
s_i	Standard deviation from each laboratory without outliers type 1
s_r	Mean Standard deviation for all laboratories without outliers type 1, 2, 3
V_i	s_i*100/Lab. Mean (marked in red if >10%)
CV_r	s_r*100/Mean
s_R	Standard deviation from all results without outliers
CV_R	s_R *100/Mean
Recovery %	Lab.mean * 100/Mean
a	Outlier type 1
b	Outlier type 2
c	Outlier type 3
*	Not tolerable mean value from one laboratory (see tables 3 & 4)
**	Higher than maximum acceptable limit of quantification (see table 5)

Annex - Results

Mandatory parameters (N, S, P, Ca, Mg, K, C)

Optional parameters (Zn, Mn, Fe, Cu, Pb, Cd, B, As, Cr, Co, Hg, Ni)

Additional parameters

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: N **Sample: 1** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A43	PB08	DZ02	25,00	25,20	24,60	24,90	0	24,93	*b*	*	0,25	1,00	50,00
2	S22	PB08	DZ02	42,65	42,50	42,24	42,70	0	42,52	*b*	*	0,21	0,49	85,30
3	A59	PZ98	DA02	45,14	43,76	45,09	44,78	0	44,69	*b*	*	0,64	1,44	89,65
4	A62x	PZ98	DA01	47,00	46,80	46,80	46,60	4	46,80			0,16	0,35	93,88
5	A61x	PZ98	DA02	47,21	47,34	46,98	47,31	4	47,21			0,16	0,35	94,70
6	A49	PZ98	DA02	47,90	47,50	47,40	47,80	4	47,65			0,24	0,50	95,59
7	F24x	PB08	DZ02	46,82	47,06	48,48	48,72	4	47,77			0,97	2,03	95,83
8	F29x	PB08	DF08	47,34	48,34	47,66	47,76	4	47,78			0,42	0,87	95,84
9	A86x	PZ98	DA01	48,28	48,09	48,05	48,35	4	48,19			0,15	0,30	96,67
10	A71	PB07	DZ02	48,51	48,49	48,26	48,28	4	48,38			0,14	0,28	97,06
11	F25x	PZ98	DA01	48,87	48,64	48,64	48,55	4	48,68			0,14	0,28	97,64
12	F07x	PZ98	DA01	48,79	49,32	48,41	48,75	4	48,82			0,38	0,77	97,93
13	F33x	PZ98	DA02	49,00	49,00	48,90	49,00	4	48,98			0,05	0,10	98,24
14	F13x	PZ98	DA01	49,04	49,03	49,14	49,26	4	49,12			0,11	0,22	98,53
15	A42	PZ98	DA01	49,24	49,08	49,17	49,23	4	49,18			0,07	0,15	98,65
16	F01x	PB07	DB01	49,17	49,17	49,23	49,17	4	49,19			0,03	0,06	98,66
17	A82	PZ98	DA02	49,00	49,80	49,25	49,00	4	49,26			0,38	0,77	98,82
18	A39	PZ98	DA02	49,61	49,12	49,41	49,34	4	49,37			0,20	0,41	99,04
19	F02x	PZ98	DA01	49,55	49,61	49,14	49,39	4	49,42			0,21	0,42	99,14
20	F28x	PZ98	DA02	49,90	49,30	49,50	49,30	4	49,50			0,28	0,57	99,30
21	A36	PB07	DZ02	50,58	50,25	48,93	49,15	4	49,73			0,81	1,63	99,75
22	F27x	PZ98	DA01	49,89	49,77	49,81	50,24	4	49,93			0,21	0,43	100,15
23	F18x	PB07	DZ02	49,71	49,54	50,13	50,77	4	50,04			0,55	1,09	100,38
24	F05x	PZ98	DA01	50,10	50,10	50,10	50,10	4	50,10			0,00	0,00	100,50
25	A45x	PZ98	DA01	50,20	50,30	50,20	50,10	4	50,20			0,08	0,16	100,70
26	F26x	PB08	DZ02	50,20	50,20	50,22	50,20	4	50,21			0,01	0,02	100,71
27	F21x	PZ98	DA01	50,41	50,34	50,39	50,43	4	50,39			0,04	0,08	101,09
28	F19x	PZ98	DA99	50,10	50,20	51,00	51,00	4	50,58			0,49	0,97	101,45
29	A94	PZ99	DZ99	52,60	47,90	50,60	51,50	0	50,65	*c*		2,01	3,96	101,60
30	A57	PZ98	DA01	50,41	50,26	51,08	50,93	4	50,67			0,40	0,78	101,64
31	F14x	PZ98	DA01	50,96	51,18	50,63	50,41	4	50,80			0,34	0,67	101,89
32	F08x	PZ99	DB08	51,30	50,07	51,10	51,20	4	50,92			0,57	1,12	102,14
33	F09	PZ98	DA01	51,30	50,70	51,10	51,20	4	51,08			0,26	0,51	102,46
34	F16x	PZ98	DA02	51,13	50,70	51,40	51,19	4	51,11			0,29	0,57	102,52
35	F12x	PZ98	DA02	50,81	51,54	51,36	51,10	4	51,20			0,32	0,62	102,71
36	F03	PZ98	DA01	51,22	51,51	51,15	51,01	4	51,22			0,21	0,41	102,75
37	A47x	PZ98	DA02	51,51	51,69	51,03	50,81	4	51,26			0,41	0,80	102,83
38	A65	PZ98	DA02	51,67	50,85	51,13	51,40	4	51,26			0,35	0,69	102,83
39	F32x	PZ98	DA01	51,50	51,80	51,10	51,10	4	51,38			0,34	0,66	103,06
40	F06x	PZ98	DA02	51,24	51,38	51,48	51,46	4	51,39			0,11	0,21	103,08
41	A60x	PZ98	DA02	51,40	51,70	51,20	51,40	4	51,43			0,21	0,40	103,16
42	F15x	PZ98	DA01	51,50	51,60	51,80	51,80	4	51,68			0,15	0,29	103,66
43	A56	PZ98	DA01	51,90	52,60	52,10	52,80	4	52,35			0,42	0,80	105,01
44	A85x	PZ98	DA01	55,88	55,92	56,17	55,79	0	55,94	*b*	*	0,16	0,29	112,22
45	A88	PB07	DZ02	437,00	439,00	438,00	439,00	0	438,25	*b*	*	0,96	0,22	879,13
46														
47														
48														
49														
50														
51														
52														
53														
54														
55														

	n	Mean	s_r	CV_r
all labs	**156**	**49,85**	**0,273**	**0,548**
10	% from the mean			
	l		s_R	CV_R
	39		**1,373**	**2,753**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: N **Sample: 2** Unit: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					s_i	V_i	%
1	A82	PZ98	DA02	10,65	10,95	11,00	10,70	4	10,83		*	0,18	1,62	88,59
2	A59	PZ98	DA02	11,05	10,84	10,95	11,13	4	10,99		*	0,13	1,14	89,96
3	S22	PB08	DZ02	11,60	10,60	11,19	10,88	4	11,07			0,43	3,88	90,57
4	A62x	PZ98	DA01	11,40	11,40	11,40	11,40	4	11,40			0,00	0,00	93,29
5	F28x	PZ98	DA02	11,10	11,30	11,50	11,80	4	11,43			0,30	2,61	93,50
6	F12x	PZ98	DA02	11,24	11,41	11,63	11,59	4	11,47			0,18	1,56	93,85
7	F13x	PZ98	DA01	11,45	11,54	11,54	11,55	4	11,52			0,05	0,41	94,27
8	A65	PZ98	DA02	11,22	11,80	11,71	11,61	4	11,59			0,26	2,20	94,81
9	A57	PZ98	DA01	11,59	11,67	11,77	11,76	4	11,70			0,08	0,72	95,73
10	F25x	PZ98	DA01	11,83	11,85	11,79	11,76	4	11,81			0,04	0,34	96,63
11	A47x	PZ98	DA02	11,99	11,59	11,24	12,49	4	11,83			0,54	4,54	96,79
12	F07x	PZ98	DA01	11,94	11,51	12,24	12,10	4	11,95			0,32	2,65	97,77
13	A71	PB07	DZ02	11,85	11,83	12,10	12,05	4	11,96			0,14	1,17	97,85
14	A61x	PZ98	DA02	12,01	12,03	11,81	12,20	4	12,01			0,16	1,33	98,31
15	F02x	PZ98	DA01	11,92	12,27	11,98	11,94	4	12,03			0,16	1,36	98,43
16	A86x	PZ98	DA01	12,10	12,02	12,08	11,97	4	12,04			0,06	0,49	98,55
17	A42	PZ98	DA01	12,11	12,08	12,11	12,01	4	12,08			0,05	0,40	98,85
18	F01x	PB07	DB01	12,19	12,02	12,07	12,13	4	12,10			0,07	0,62	99,04
19	F33x	PZ98	DA02	12,00	12,40	12,20	11,90	4	12,13			0,22	1,83	99,23
20	F03	PZ98	DA01	12,11	12,04	12,26	12,09	4	12,13			0,09	0,78	99,23
21	F29x	PB08	DF08	12,04	11,97	12,20	12,32	4	12,13			0,16	1,30	99,29
22	A45x	PZ98	DA01	12,10	12,30	12,10	12,20	4	12,18			0,10	0,79	99,63
23	F19x	PZ98	DA99	12,20	12,10	12,10	12,30	4	12,18			0,10	0,79	99,63
24	F16x	PZ98	DA02	12,46	12,35	12,13	12,17	4	12,28			0,15	1,26	100,47
25	A39	PZ98	DA02	12,33	12,40	12,04	12,36	4	12,28			0,16	1,34	100,51
26	A49	PZ98	DA02	12,00	12,20	12,50	12,50	4	12,30			0,24	1,99	100,66
27	F27x	PZ98	DA01	12,38	12,35	12,38	12,18	4	12,32			0,10	0,78	100,84
28	F05x	PZ98	DA01	12,40	12,40	12,40	12,30	4	12,38			0,05	0,40	101,27
29	F06x	PZ98	DA02	12,42	12,36	12,49	12,36	4	12,40			0,06	0,52	101,52
30	F15x	PZ98	DA01	12,40	12,50	12,40	12,50	4	12,45			0,06	0,46	101,89
31	F21x	PZ98	DA01	12,52	12,56	12,46	12,49	4	12,51			0,04	0,34	102,36
32	A60x	PZ98	DA02	12,60	12,60	12,50	12,40	4	12,53			0,10	0,76	102,50
33	F18x	PB07	DZ02	12,64	12,23	12,69	12,79	4	12,59			0,25	1,96	103,01
34	F09	PZ98	DA01	12,70	12,50	12,80	12,80	4	12,70			0,14	1,11	103,93
35	F08x	PZ99	DB08	12,70	12,50	12,80	12,80	4	12,70			0,14	1,11	103,93
36	A36	PB07	DZ02	12,73	12,52	12,41	13,27	4	12,73			0,38	3,00	104,20
37	F32x	PZ98	DA01	12,85	12,74	12,74	12,63	4	12,74			0,09	0,70	104,26
38	A94	PZ99	DZ99	13,30	13,10	12,00	13,10	4	12,88			0,59	4,59	105,36
39	F14x	PZ98	DA01	13,07	13,07	13,07	12,97	4	13,05			0,05	0,38	106,75
40	F26x	PB08	DZ02	13,30	13,29	13,31	13,30	4	13,30			0,01	0,06	108,84
41	F24x	PB08	DZ02	13,57	13,02	13,14	14,56	4	13,57		*	0,70	5,15	111,07
42	A56	PZ98	DA01	13,70	13,50	13,60	13,60	4	13,60		*	0,08	0,60	111,30
43	A85x	PZ98	DA01	13,53	13,72	13,63	13,64	4	13,63		*	0,08	0,57	111,54
44	A43	PB08	DZ02	17,30	15,10	14,70	15,70	0	15,70	*b*	*	1,14	7,28	128,48
45	A88	PB07	DZ02	111,00	112,00	113,00	112,00	0	112,00	*b*	*	0,82	0,73	916,56
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	n	Mean	s_r	CV_r
all labs	**172**	**12,22**	**0,169**	**1,386**
10	% from the mean			
	l		s_R	CV_R
	43		**0,653**	**5,342**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: N **Sample: 3** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A59	PZ98	DA02	7,95	8,13	7,88	7,29	4	7,81	*	0,36	4,66	85,06
2	A57	PZ98	DA01	8,19	7,74	7,90	7,70	4	7,88	*	0,22	2,82	85,82
3	A62x	PZ98	DA01	8,39	8,71	7,84	7,59	4	8,13	*	0,51	6,27	88,54
4	A65	PZ98	DA02	8,15	9,05	8,41	8,08	4	8,42		0,44	5,25	91,70
5	F27x	PZ98	DA01	9,50	8,34	7,02	8,84	4	8,43		1,05	**12,47**	91,73
6	F13x	PZ98	DA01	8,42	8,54	8,50	8,44	4	8,48		0,06	0,65	92,27
7	A86x	PZ98	DA01	8,71	8,58	8,45	8,75	4	8,62		0,14	1,59	93,89
8	A45x	PZ98	DA01	8,86	8,64	8,61	8,44	4	8,64		0,17	2,00	94,04
9	F29x	PB08	DF08	8,74	8,59	8,78	8,68	4	8,70		0,08	0,95	94,70
10	S22	PB08	DZ02	8,80	8,46	9,34	8,43	4	8,76		0,42	4,83	95,35
11	F12x	PZ98	DA02	8,63	8,61	9,00	8,80	4	8,76		0,18	2,06	95,37
12	F07x	PZ98	DA01	8,47	8,70	9,16	8,84	4	8,79		0,29	3,28	95,73
13	F02x	PZ98	DA01	8,68	8,65	8,85	9,01	4	8,80		0,16	1,85	95,77
14	F03	PZ98	DA01	8,73	8,87	8,62	9,00	4	8,81		0,17	1,88	95,87
15	A47x	PZ98	DA02	9,30	9,01	8,18	9,00	4	8,87		0,48	5,43	96,60
16	F25x	PZ98	DA01	9,32	8,21	8,94	9,17	4	8,91		0,49	5,52	97,01
17	F16x	PZ98	DA02	8,88	8,81	8,98	9,00	4	8,92		0,09	0,98	97,07
18	F08x	PZ99	DB08	8,71	8,86	9,44	8,68	4	8,92		0,35	3,97	97,15
19	F09	PZ98	DA01	8,71	8,86	9,44	8,68	4	8,92		0,35	3,97	97,15
20	A42	PZ98	DA01	9,07	8,98	9,01	8,92	4	8,99		0,06	0,68	97,93
21	F24x	PB08	DZ02	8,80	8,87	8,90	9,52	4	9,02		0,33	3,71	98,23
22	A71	PB07	DZ02	9,12	9,09	9,00	8,97	4	9,04		0,07	0,76	98,47
23	A82	PZ98	DA02	9,40	9,35	8,40	9,05	4	9,05		0,46	5,08	98,53
24	F06x	PZ98	DA02	9,18	9,13	9,21	9,22	4	9,18		0,04	0,47	100,00
25	F15x	PZ98	DA01	9,30	9,30	9,00	9,20	4	9,20		0,14	1,54	100,17
26	F01x	PB07	DB01	9,39	9,22	9,10	9,10	4	9,20		0,14	1,49	100,18
27	F19x	PZ98	DA99	10,00	8,94	8,73	9,58	4	9,31		0,58	6,27	101,39
28	A60x	PZ98	DA02	9,31	9,49	9,30	9,29	4	9,35		0,10	1,02	101,77
29	F14x	PZ98	DA01	9,56	9,34	9,13	9,45	4	9,37		0,18	1,96	102,02
30	A49	PZ98	DA02	8,30	10,60	9,60	9,20	4	9,43		0,95	**10,12**	102,62
31	F32x	PZ98	DA01	9,71	9,50	9,61	9,18	4	9,50		0,23	2,42	103,43
32	A36	PB07	DZ02	9,28	9,28	9,81	9,71	4	9,52		0,28	2,94	103,65
33	F05x	PZ98	DA01	9,63	9,48	9,56	9,61	4	9,57		0,07	0,70	104,20
34	A94	PZ99	DZ99	9,75	9,92	8,81	10,20	4	9,67		0,60	6,23	105,28
35	F18x	PB07	DZ02	9,36	10,07	9,93	9,58	4	9,74		0,32	3,33	105,99
36	A43	PB08	DZ02	9,93	8,73	10,84	9,83	4	9,83		0,86	8,79	107,05
37	F28x	PZ98	DA02	9,98	9,85	10,10	9,64	4	9,89		0,20	1,99	107,71
38	A39	PZ98	DA02	9,11	10,47	10,76	9,44	4	9,95		0,79	7,99	108,28
39	F21x	PZ98	DA01	10,19	9,79	9,92	10,20	4	10,03		0,20	2,03	109,15
40	F26x	PB08	DZ02	10,49	10,48	10,49	10,50	4	10,49	*	0,01	0,08	114,21
41	A61x	PZ98	DA02	10,71	9,91	10,57	10,81	4	10,50	*	0,41	3,86	114,32
42	A85x	PZ98	DA01	10,58	10,78	10,62	10,21	4	10,55	*	0,24	2,29	114,84
43	A56	PZ98	DA01	11,30	11,50	10,50	10,70	4	11,00	*	0,48	4,33	119,76
44	F33x	PZ98	DA02	11,60	11,50	11,10	11,80	0	11,50	*b* *	0,29	2,56	125,21
45	A88	PB07	DZ02	73,00	80,00	77,00	78,00	0	77,00	*b* *	2,94	3,82	838,35
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	n	Mean	s_r	CV_r
all labs	**172**	**9,18**	**0,320**	**3,489**
10	% from the mean			

l	s_R	CV_R
43	**0,696**	**7,573**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: N **Sample: 4** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A59	PZ98	DA02	6,77	6,85	6,42	6,72	4	6,69	*	0,19	2,81	85,31
2	S22	PB08	DZ02	6,85	6,72	6,58	6,66	4	6,70	*	0,11	1,70	85,47
3	A62x	PZ98	DA01	7,48	6,71	6,73	6,79	4	6,93	*	0,37	5,34	88,34
4	A57	PZ98	DA01	6,87	7,01	7,10	7,24	4	7,06	*	0,16	2,20	89,96
5	A47x	PZ98	DA02	7,60	7,05	7,45	7,58	4	7,42		0,26	3,44	94,62
6	F12x	PZ98	DA02	7,51	7,34	7,53	7,48	4	7,47		0,09	1,15	95,19
7	F24x	PB08	DZ02	6,77	7,49	7,67	8,06	4	7,50		0,54	7,21	95,61
8	F13x	PZ98	DA01	7,51	7,52	7,47	7,52	4	7,51		0,02	0,32	95,70
9	F02x	PZ98	DA01	7,63	7,57	7,62	7,50	4	7,58		0,06	0,81	96,65
10	A86x	PZ98	DA01	7,60	7,66	7,53	7,55	4	7,58		0,06	0,77	96,72
11	A65	PZ98	DA02	7,84	7,55	7,72	7,38	4	7,62		0,20	2,63	97,20
12	A36	PB07	DZ02	7,69	7,58	7,58	7,79	4	7,66		0,10	1,32	97,68
13	F25x	PZ98	DA01	7,60	7,67	7,67	7,73	4	7,67		0,05	0,69	97,78
14	F03	PZ98	DA01	7,71	7,62	7,78	7,62	4	7,68		0,08	1,01	97,97
15	F07x	PZ98	DA01	7,73	7,55	7,78	7,73	4	7,70		0,10	1,31	98,16
16	A45x	PZ98	DA01	7,78	7,62	7,75	7,68	4	7,71		0,07	0,93	98,29
17	F29x	PB08	DF08	7,68	7,72	7,77	7,72	4	7,72		0,04	0,48	98,48
18	A82	PZ98	DA02	7,75	7,60	7,80	7,85	4	7,75		0,11	1,39	98,83
19	A61x	PZ98	DA02	7,85	7,67	7,65	7,87	4	7,76		0,12	1,50	98,96
20	F16x	PZ98	DA02	7,94	7,78	7,84	7,68	4	7,81		0,11	1,41	99,59
21	F28x	PZ98	DA02	7,79	7,88	7,83	7,81	4	7,83		0,04	0,49	99,82
22	F27x	PZ98	DA01	7,83	7,91	7,74	7,86	4	7,84		0,07	0,91	99,91
23	F19x	PZ98	DA99	7,82	7,82	7,82	7,93	4	7,85		0,05	0,70	100,07
24	F15x	PZ98	DA01	7,70	7,90	7,90	7,90	4	7,85		0,10	1,27	100,10
25	F33x	PZ98	DA02	7,90	8,00	7,70	7,80	4	7,85		0,13	1,64	100,10
26	A39	PZ98	DA02	7,89	7,89	7,91	7,73	4	7,86		0,08	1,07	100,17
27	F01x	PB07	DB01	7,87	7,93	7,87	7,76	4	7,86		0,07	0,94	100,21
28	A71	PB07	DZ02	7,89	7,83	7,81	7,91	4	7,86		0,05	0,59	100,22
29	A60x	PZ98	DA02	7,90	7,98	7,92	7,77	4	7,89		0,09	1,12	100,64
30	F06x	PZ98	DA02	8,03	7,86	7,90	7,90	4	7,92		0,07	0,93	101,01
31	F05x	PZ98	DA01	7,94	7,94	7,94	7,93	4	7,94		0,01	0,06	101,22
32	A94	PZ99	DZ99	8,50	7,37	7,78	8,22	4	7,97		0,50	6,23	101,60
33	A42	PZ98	DA01	7,86	8,07	8,08	7,96	4	7,99		0,10	1,27	101,90
34	A49	PZ98	DA02	8,10	7,80	8,20	7,90	4	8,00		0,18	2,28	102,02
35	F18x	PB07	DZ02	8,25	7,91	7,94	8,11	4	8,05		0,16	1,97	102,69
36	F32x	PZ98	DA01	8,32	8,32	8,21	8,21	4	8,27		0,06	0,77	105,39
37	F14x	PZ98	DA01	8,68	8,15	8,15	8,58	4	8,39		0,28	3,34	106,99
38	F26x	PB08	DZ02	8,40	8,39	8,39	8,39	4	8,39		0,00	0,06	107,02
39	F09	PZ98	DA01	8,32	8,43	8,43	8,40	4	8,40		0,05	0,62	107,05
40	F08x	PZ99	DB08	8,32	8,43	8,43	8,40	4	8,40		0,05	0,62	107,05
41	A85x	PZ98	DA01	8,75	8,66	8,59	8,49	4	8,62		0,11	1,28	109,95
42	F21x	PZ98	DA01	8,85	8,80	8,80	8,79	4	8,81	*	0,03	0,31	112,34
43	A43	PB08	DZ02	8,70	8,39	9,46	8,85	4	8,85	*	0,45	5,08	112,85
44	A56	PZ98	DA01	8,80	9,00	8,80	8,90	4	8,88	*	0,10	1,08	113,17
45	A88	PB07	DZ02	75,00	72,00	72,00	75,00	0	73,50	*b* *	1,73	2,36	937,27
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53													
54													
55													

	n	Mean	s_r	CV_r
all labs	**176**	**7,84**	**0,129**	**1,643**
10	% from the mean			

l	s_R	CV_R
44	**0,485**	**6,188**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: S **Sample: 1** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A71	PB03	DE01	4,76	4,71	4,74	4,66	0	4,72	*b*	*	0,05	0,97	41,75
2	F33x	PD01	DB10	7,90	8,61	8,82	7,99	4	8,33		*	0,45	5,44	73,69
3	S22	PB06	DB08	8,50	8,34	8,43	8,55	4	8,46		*	0,09	1,08	74,81
4	F21x	PZ98	DA01	9,84	10,03	9,83	9,85	4	9,89			0,10	0,96	87,48
5	A59	PC01	DB08	8,79	10,70	10,41	10,42	0	10,08	*c*		0,87	8,64	89,19
6	A56	PC01	DB08	10,19	10,25	10,31	10,30	4	10,26			0,06	0,54	90,80
7	A49	PC03	DB08	10,32	10,26	10,31	10,16	4	10,26			0,07	0,71	90,80
8	F07x	PD02	DB08	10,78	9,83	10,55	10,11	4	10,32			0,43	4,15	91,28
9	F16x	PC01	DB08	10,45	10,27	10,11	10,57	4	10,35			0,20	1,95	91,57
10	A62x	PZ98	DA01	10,20	10,30	10,60	10,40	4	10,38			0,17	1,65	91,80
11	F08x	PZ99	DB08	10,78	10,67	10,75	10,77	4	10,74			0,05	0,46	95,05
12	F19x	PD02	DB08	10,70	10,80	10,80	10,80	4	10,78			0,05	0,46	95,33
13	F27x	PZ98	DA01	10,79	10,40	10,59	11,40	4	10,80			0,43	4,02	95,51
14	A86x	PZ98	DA01	10,91	10,83	10,83	10,87	4	10,86			0,04	0,35	96,09
15	A82	PC01	DB08	11,20	11,30	10,60	10,70	4	10,95			0,35	3,21	96,88
16	A57	PZ02	DD02	10,90	10,91	11,01	11,00	4	10,96			0,06	0,53	96,93
17	A36	PD02	DB09	10,94	10,93	11,00	11,39	4	11,07			0,22	1,98	97,90
18	A39	PD02	DB08	10,98	11,13	11,20	11,18	4	11,12			0,10	0,89	98,39
19	F06x	PD02	DB08	11,30	11,36	11,10	11,23	4	11,25			0,11	0,99	99,52
20	A61x	PD01	DB08	11,38	11,16	11,39	11,44	4	11,34			0,12	1,10	100,36
21	A94	PB06	DB08	11,40	11,50	11,40	11,40	4	11,43			0,05	0,44	101,09
22	F25x	PB06	DB08	11,55	11,57	11,60	11,27	4	11,50			0,15	1,33	101,73
23	F18x	PD99	DB08	11,60	11,60	11,60	11,70	4	11,63			0,05	0,43	102,86
24	A45x	PC99	DB08	11,60	11,60	11,70	11,70	4	11,65			0,06	0,50	103,08
25	F28x	PZ98	DA02	11,90	12,20	11,30	11,60	4	11,75			0,39	3,30	103,96
26	A79	PD03	DB99	11,69	11,87	11,76	11,70	4	11,76			0,08	0,70	104,01
27	F29x	PZ98	DA99	11,93	11,84	11,94	11,42	4	11,78			0,25	2,09	104,25
28	A85x	PZ98	DA01	11,73	12,03	11,71	11,82	4	11,82			0,15	1,24	104,60
29	F13x	PD01	DB08	11,92	11,90	11,85	11,69	4	11,84			0,10	0,88	104,76
30	F12x	PC01	DB08	11,98	11,90	11,89	11,67	4	11,86			0,13	1,12	104,93
31	A90	PD01	DB10	11,87	12,14	11,65	11,81	4	11,87			0,21	1,74	105,01
32	F32x	PD02	DB08	11,90	11,80	11,90	11,90	4	11,88			0,05	0,42	105,07
33	A65	PD01	DB08	11,90	12,02	11,96	11,96	4	11,96			0,05	0,41	105,82
34	F05x	PZ98	DA01	12,00	12,00	12,00	12,00	4	12,00			0,00	0,00	106,17
35	A88	PZ98	DA01	12,16	12,17	11,96	11,87	4	12,04			0,15	1,24	106,53
36	F02x	PZ98	DA01	12,30	12,20	12,10	12,20	4	12,20			0,08	0,67	107,94
37	F14x	PC01	DB08	12,23	12,33	12,12	12,13	4	12,20			0,10	0,82	107,96
38	F03	PD02	DB08	12,73	12,71	12,70	12,67	4	12,70			0,03	0,20	112,39
39	A47x	PD01	DB08	12,91	12,80	12,88	12,71	4	12,83			0,09	0,70	113,47
40	F09	PZ02	DD02	12,80	12,85	12,93	13,03	4	12,90			0,10	0,78	114,16
41	F15x	PC01	DB08	13,18	13,05	13,07	13,16	4	13,12		*	0,06	0,49	116,04
42	A60x	PD01	DB10	14,90	15,10	14,60	14,70	0	14,83	*b*	*	0,22	1,50	131,17
43	F24x	PZ98	DA01	15,66	16,70	16,18	16,21	0	16,19	*b*	*	0,42	2,61	143,21
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	n	Mean	s_r	CV_r
all labs	**156**	**11,30**	**0,139**	**1,232**
15	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
39	**1,037**	**9,176**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: S **Sample: 2** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A85x	PZ98	DA01	0,72	0,67	0,82	0,81	4	0,76	*	0,07	9,58	83,30
2	S22	PB06	DB08	0,72	0,88	0,78	0,73	4	0,78		0,07	9,41	85,78
3	F07x	PD02	DB08	0,83	0,78	0,81	0,78	4	0,80		0,03	3,21	88,15
4	A56	PC01	DB08	0,81	0,82	0,81	0,80	4	0,81		0,01	0,93	89,04
5	A36	PD02	DB09	0,83	0,82	0,84	0,83	4	0,83		0,01	0,98	91,57
6	A59	PC01	DB08	0,78	0,87	0,88	0,80	4	0,83		0,05	6,00	91,85
7	A49	PC03	DB08	0,84	0,84	0,86	0,85	4	0,85		0,01	1,13	93,50
8	F19x	PD02	DB08	0,85	0,84	0,85	0,85	4	0,85		0,01	0,77	93,59
9	A90	PD01	DB10	0,84	0,85	0,85	0,88	4	0,85		0,02	1,91	94,19
10	A82	PC01	DB08	0,85	0,85	0,85	0,87	4	0,86		0,01	1,27	94,58
11	A61x	PD01	DB08	0,85	0,86	0,87	0,88	4	0,87		0,01	1,33	95,46
12	F08x	PZ99	DB08	0,82	0,80	0,97	0,88	4	0,87		0,07	8,59	95,52
13	A62x	PZ98	DA01	0,88	0,86	0,90	0,87	4	0,88		0,02	1,95	96,81
14	F06x	PD02	DB08	0,88	0,88	0,88	0,87	4	0,88		0,00	0,52	96,87
15	A94	PB06	DB08	0,88	0,88	0,89	0,88	4	0,88		0,00	0,27	97,25
16	F12x	PC01	DB08	0,90	0,89	0,88	0,87	4	0,88		0,01	1,67	97,48
17	A39	PD02	DB08	0,87	0,90	0,89	0,89	4	0,89		0,01	1,19	97,81
18	F16x	PC01	DB08	0,92	0,88	0,91	0,88	4	0,90		0,02	2,15	98,88
19	F14x	PC01	DB08	0,90	0,89	0,90	0,90	4	0,90		0,01	0,79	99,08
20	A45x	PC99	DB08	0,90	0,90	0,90	0,89	4	0,90		0,00	0,47	99,19
21	F33x	PD01	DB10	0,97	0,89	0,89	0,85	4	0,90		0,05	5,30	99,30
22	A57	PZ02	DD02	0,88	0,98	0,87	0,88	4	0,90		0,05	5,75	99,57
23	F32x	PD02	DB08	0,90	0,91	0,90	0,91	4	0,90		0,01	0,79	99,74
24	A86x	PZ98	DA01	0,91	0,90	0,91	0,90	4	0,90		0,00	0,11	99,79
25	A71	PB03	DE01	0,86	0,83	1,08	0,87	0	0,91	*c*	0,11	**12,45**	100,39
26	F13x	PD01	DB08	0,92	0,92	0,91	0,90	4	0,91		0,01	1,05	100,68
27	F03	PD02	DB08	0,93	0,92	0,91	0,91	4	0,92		0,01	1,04	101,23
28	A65	PD01	DB08	0,93	0,92	0,93	0,94	4	0,93		0,01	0,88	102,61
29	F29x	PZ98	DA99	0,94	0,92	0,93	0,95	4	0,94		0,01	1,38	103,16
30	F02x	PZ98	DA01	0,90	0,99	0,90	0,96	4	0,94		0,05	4,80	103,43
31	A47x	PD01	DB08	0,95	0,99	0,91	0,92	4	0,94		0,04	3,81	103,99
32	F15x	PC01	DB08	0,97	0,94	0,94	0,94	4	0,95		0,02	1,58	104,54
33	A88	PZ98	DA01	0,97	0,99	0,94	0,93	4	0,96		0,03	2,88	105,64
34	F18x	PD99	DB08	0,97	0,97	0,97	0,97	4	0,97		0,00	0,13	106,72
35	F25x	PB06	DB08	0,97	0,97	0,97	0,97	4	0,97		0,00	0,13	106,99
36	A60x	PD01	DB10	*1,41a*	1,03	0,93	0,99	3	0,98		0,05	5,05	108,45
37	F05x	PZ98	DA01	1,01	0,99	1,00	1,00	4	1,00		0,01	0,83	110,11
38	F28x	PZ98	DA02	0,98	0,99	1,00	1,03	4	1,00		0,02	2,25	110,14
39	A79	PD03	DB99	1,02	1,02	1,01	1,00	4	1,01		0,01	0,67	111,65
40	F09	PZ02	DD02	1,01	1,01	1,01	1,03	4	1,02		0,01	0,99	111,98
41	F21x	PZ98	DA01	1,04	1,00	1,02	1,03	4	1,02		0,02	1,67	112,81
42	F27x	PZ98	DA01	1,10	1,16	1,03	1,05	4	1,09	*	0,06	5,35	119,71
43	F24x	PZ98	DA01	1,28	1,23	1,21	1,24	0	1,24	*b* *	0,03	2,36	136,70
44													
45													
46													
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49													
50													
51													
52													
53													
54													
55													

	n	Mean	s_r	CV_r
all labs	**163**	**0,91**	**0,022**	**2,400**
15	% from the mean			

l	s_R	CV_R
41	**0,070**	**7,757**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: S **Sample: 3** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F09	PZ02	DD02	0,42	0,42	0,43	0,44	4	0,43	*	0,01	2,24	66,28
2	A71	PB03	DE01	0,44	0,48	0,41	0,41	4	0,43	*	0,04	8,35	67,40
3	A85x	PZ98	DA01	0,44	0,47	0,49	0,47	4	0,47	*	0,02	4,41	72,49
4	S22	PB06	DB08	0,49	0,46	0,45	0,48	4	0,47	*	0,02	3,88	72,87
5	A56	PC01	DB08	0,48	0,58	0,54	0,52	4	0,53	*	0,04	7,49	82,22
6	F07x	PD02	DB08	0,62	0,54	0,59	0,55	4	0,57		0,04	7,00	89,08
7	A90	PD01	DB10	0,58	0,58	0,60	0,54	4	0,57		0,03	4,97	89,11
8	A82	PC01	DB08	0,57	0,54	0,58	0,63	4	0,58		0,04	6,17	89,58
9	A59	PC01	DB08	0,53	0,63	0,60	0,57	4	0,58		0,04	7,33	90,32
10	A49	PC03	DB08	0,59	0,60	0,58	0,61	4	0,60		0,01	2,17	92,25
11	A36	PD02	DB09	0,60	0,60	0,59	0,60	4	0,60		0,01	0,84	92,64
12	A57	PZ02	DD02	0,65	0,64	0,57	0,56	4	0,61		0,05	7,69	93,81
13	F18x	PD99	DB08	0,60	0,60	0,62	0,61	4	0,61		0,01	1,06	94,00
14	F19x	PD02	DB08	0,58	0,60	0,64	0,62	4	0,61		0,02	3,91	94,50
15	F27x	PZ98	DA01	0,71	0,43	0,57	0,75	0	0,62	*c*	0,15	**23,66**	95,36
16	A61x	PD01	DB08	0,62	0,62	0,61	0,63	4	0,62		0,01	1,25	95,98
17	A47x	PD01	DB08	0,62	0,60	0,62	0,64	4	0,62		0,02	2,63	96,13
18	F06x	PD02	DB08	0,62	0,61	0,63	0,62	4	0,62		0,01	1,39	96,44
19	F12x	PC01	DB08	0,63	0,64	0,63	0,64	4	0,63		0,01	1,13	98,22
20	A62x	PZ98	DA01	0,59	0,64	0,71	0,60	4	0,64		0,05	8,58	98,46
21	F13x	PD01	DB08	0,65	0,64	0,64	0,63	4	0,64		0,01	1,28	99,23
22	F02x	PZ98	DA01	0,61	0,59	0,69	0,68	4	0,64		0,05	7,77	99,62
23	A39	PD02	DB08	0,66	0,65	0,67	0,65	4	0,66		0,01	1,44	102,24
24	F32x	PD02	DB08	0,66	0,66	0,67	0,66	4	0,66		0,01	0,83	102,80
25	F14x	PC01	DB08	0,69	0,67	0,62	0,68	4	0,66		0,03	4,51	102,91
26	A65	PD01	DB08	0,65	0,69	0,65	0,68	4	0,67		0,02	3,09	103,50
27	F16x	PC01	DB08	0,66	0,65	0,69	0,68	4	0,67		0,02	3,03	104,00
28	A94	PB06	DB08	0,67	0,68	0,68	0,66	4	0,67		0,01	1,50	104,19
29	A45x	PC99	DB08	0,68	0,67	0,66	0,67	4	0,67		0,01	1,11	104,19
30	F15x	PC01	DB08	0,68	0,68	0,67	0,68	4	0,68		0,01	0,74	105,05
31	F03	PD02	DB08	0,70	0,68	0,68	0,67	4	0,68		0,01	1,84	105,82
32	F08x	PZ99	DB08	0,66	0,68	0,70	0,68	4	0,68		0,02	2,57	105,86
33	A88	PZ98	DA01	0,70	0,69	0,70	0,68	4	0,69		0,01	1,38	107,37
34	A86x	PZ98	DA01	0,71	0,71	0,69	0,70	4	0,70		0,01	1,20	108,91
35	F25x	PB06	DB08	0,72	0,70	0,72	0,71	4	0,71		0,01	1,07	110,24
36	F05x	PZ98	DA01	0,70	0,70	0,72	0,73	4	0,71		0,01	2,08	110,28
37	F24x	PZ98	DA01	0,73	0,72	0,72	0,73	4	0,73		0,01	0,81	112,68
38	A79	PD03	DB99	0,77	0,75	0,74	0,77	4	0,76	*	0,02	2,11	117,58
39	F21x	PZ98	DA01	0,77	0,77	0,76	0,78	4	0,77	*	0,01	1,06	119,39
40	F33x	PD01	DB10	0,80	0,84	0,83	0,74	4	0,80	*	0,04	5,53	124,31
41	F28x	PZ98	DA02	0,89	0,88	0,91	0,89	4	0,89	*	0,01	1,29	138,11
42	F29x	PZ98	DA99	0,95	0,89	0,87	0,90	4	0,90	*	0,03	3,77	139,93
43	A60x	PD01	DB10	1,10	0,74	1,07	0,90	0	0,96	*c* *	0,17	**17,40**	148,11
44													
45													
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53													
54													
55													

	n	Mean	s_r	CV_r
all labs	**164**	**0,64**	**0,020**	**3,092**
15	% from the mean			
	l		s_R	CV_R
	41		**0,101**	**15,592**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: S **Sample: 4** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	S22	PB06	DB08	0,44	0,50	0,47	0,45	0	0,47	*b*	*	0,03	5,69	67,15
2	F24x	PZ98	DA01	0,51	0,44	0,53	0,50	0	0,50	*b*	*	0,04	8,35	71,52
3	A85x	PZ98	DA01	0,56	0,51	0,53	0,52	0	0,53	*b*	*	0,02	4,08	76,53
4	A56	PC01	DB08	0,57	0,58	0,57	0,56	4	0,57		*	0,01	1,30	82,53
5	A59	PC01	DB08	0,50	0,61	0,64	0,56	4	0,58		*	0,06	**10,62**	83,39
6	F09	PZ02	DD02	0,62	0,62	0,63	0,62	4	0,62			0,01	0,80	89,89
7	F02x	PZ98	DA01	0,65	0,65	0,63	0,61	4	0,64			0,02	3,02	91,70
8	A57	PZ02	DD02	0,64	0,65	0,64	0,65	4	0,65			0,01	0,90	93,14
9	F07x	PD02	DB08	0,67	0,63	0,67	0,61	4	0,65			0,03	4,69	93,28
10	A62x	PZ98	DA01	0,61	0,72	0,66	0,64	4	0,66			0,05	7,07	94,94
11	F18x	PD99	DB08	0,67	0,67	0,67	0,67	4	0,67			0,00	0,43	96,50
12	A36	PD02	DB09	0,67	0,68	0,65	0,68	4	0,67			0,01	2,11	96,75
13	F06x	PD02	DB08	0,68	0,68	0,68	0,67	4	0,68			0,01	0,84	97,90
14	A49	PC03	DB08	0,68	0,67	0,68	0,69	4	0,68			0,01	1,20	98,19
15	F19x	PD02	DB08	0,68	0,67	0,69	0,69	4	0,68			0,01	0,97	98,66
16	F29x	PZ98	DA99	0,69	0,67	0,68	0,70	4	0,69			0,01	1,88	98,92
17	F08x	PZ99	DB08	0,72	0,65	0,69	0,68	4	0,69			0,03	3,96	98,99
18	F03	PD02	DB08	0,68	0,67	0,71	0,69	4	0,69			0,02	2,48	99,28
19	A82	PC01	DB08	0,69	0,69	0,69	0,68	4	0,69			0,00	0,65	99,38
20	F32x	PD02	DB08	0,69	0,69	0,69	0,69	4	0,69			0,00	0,42	99,60
21	F12x	PC01	DB08	0,67	0,70	0,69	0,70	4	0,69			0,01	1,65	99,60
22	A71	PB03	DE01	0,64	0,69	0,78	0,66	4	0,69			0,06	8,84	100,05
23	A45x	PC99	DB08	0,70	0,70	0,70	0,70	4	0,70			0,00	0,14	100,47
24	A47x	PD01	DB08	0,70	0,71	0,70	0,70	4	0,70			0,01	0,71	101,44
25	F14x	PC01	DB08	0,70	0,70	0,70	0,71	4	0,70			0,00	0,71	101,55
26	A39	PD02	DB08	0,70	0,71	0,71	0,70	4	0,70			0,01	0,78	101,71
27	A94	PB06	DB08	0,70	0,71	0,71	0,71	4	0,71			0,00	0,65	101,98
28	F28x	PZ98	DA02	0,71	0,71	0,71	0,72	4	0,71			0,00	0,64	102,53
29	A86x	PZ98	DA01	0,71	0,72	0,71	0,71	4	0,71			0,00	0,39	103,12
30	F13x	PD01	DB08	0,72	0,72	0,72	0,70	4	0,72			0,01	1,40	103,25
31	F33x	PD01	DB10	0,69	0,74	0,74	0,70	4	0,72			0,02	3,46	103,54
32	F27x	PZ98	DA01	0,77	0,80	0,58	0,72	0	0,72	*c*		0,10	**13,58**	103,61
33	A88	PZ98	DA01	0,72	0,71	0,73	0,71	4	0,72			0,01	1,33	103,61
34	A90	PD01	DB10	0,73	0,72	0,71	0,73	4	0,72			0,01	0,93	104,37
35	A65	PD01	DB08	0,72	0,73	0,72	0,75	4	0,73			0,01	1,94	105,41
36	F25x	PB06	DB08	0,75	0,70	0,76	0,75	4	0,74			0,03	3,49	107,04
37	F15x	PC01	DB08	0,76	0,73	0,74	0,74	4	0,74			0,01	1,69	107,22
38	A61x	PD01	DB08	0,76	0,75	0,76	0,75	4	0,76			0,00	0,66	109,35
39	F21x	PZ98	DA01	0,77	0,76	0,77	0,79	4	0,77			0,01	1,63	111,55
40	F05x	PZ98	DA01	0,83	0,82	0,83	0,82	4	0,83		*	0,01	0,80	119,17
41	A60x	PD01	DB10	0,91	0,98	0,98	1,01	0	0,97	*b*	*	0,04	4,30	140,29
42	F16x	PC01	DB08	*1,039a*	1,06	1,06	1,05	0	1,06	*b*	*	0,00	0,20	152,54
43	A79	PD03	DB99	1,36	1,33	1,34	1,35	0	1,34	*b*	*	0,01	0,93	194,04
44														
45														
46														
47														
48														
49														
50														
51														
52														
53														
54														
55														

	n	Mean	s_r	CV_r
all labs	**144**	**0,69**	**0,014**	**2,031**
15	% from the mean			

l	s_R	CV_R
36	**0,048**	**6,985**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: P **Sample: 1** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A85x	PC02	DB08	2,71	2,97	2,71	2,85	0	2,81	*b*	*	0,13	4,49	73,03
2	S22	PB06	DB08	2,89	*2,82a*	2,89	2,88	0	2,89	*b*	*	0,01	0,20	74,98
3	F33x	PD01	DB10	3,01	3,35	2,96	3,39	0	3,18	*b*	*	0,23	7,15	82,56
4	A59	PC01	DB08	*2,87a*	3,60	3,50	3,48	3	3,53			0,06	1,82	91,60
5	F27x	PD01	DE01	3,57	3,54	3,50	3,50	4	3,53			0,03	0,92	91,62
6	A43	PB06	DE01	3,60	3,62	3,43	3,55	4	3,55			0,08	2,33	92,22
7	A49	PC03	DB08	3,53	3,51	3,59	3,58	4	3,55			0,04	1,09	92,27
8	A71	PB03	DE01	3,58	3,58	3,57	3,58	4	3,58			0,01	0,17	92,86
9	A61x	PB02	DB08	3,66	3,68	3,67	3,68	4	3,67			0,01	0,26	95,39
10	F28x	PD02	DB08	3,68	3,71	3,57	3,75	4	3,68			0,07	2,02	95,50
11	A57	PZ02	DD02	3,64	3,65	3,71	3,72	4	3,68			0,04	1,11	95,59
12	F29x	PD01	DE01	3,80	3,47	3,64	3,93	4	3,71			0,20	5,37	96,36
13	F19x	PD02	DB08	3,71	3,76	3,71	3,73	4	3,73			0,02	0,63	96,82
14	A53	PZ02	DD02	3,72	3,75	3,73	3,75	4	3,74			0,01	0,40	97,08
15	A56	PC01	DB08	3,72	3,77	3,74	3,75	4	3,74			0,02	0,50	97,23
16	F06x	PD02	DB08	3,78	3,76	3,72	3,75	4	3,75			0,03	0,69	97,42
17	F07x	PD02	DB08	4,06	3,35	4,02	3,70	0	3,78	*c*		0,33	8,68	98,27
18	F21x	PD02	DE01	3,78	3,84	3,80	3,74	4	3,79			0,04	1,10	98,44
19	A45x	PB99	DB08	3,85	3,89	3,56	3,88	4	3,80			0,16	4,15	98,57
20	A88	PD01	DB08	3,82	3,77	3,79	3,81	4	3,80			0,02	0,61	98,64
21	A82	PC01	DB08	3,91	3,83	3,77	3,69	4	3,80			0,09	2,45	98,70
22	A36	PD02	DB08	3,81	3,76	3,75	4,03	4	3,84			0,13	3,41	99,68
23	F25x	PB06	DB08	3,85	3,83	3,88	3,83	4	3,85			0,03	0,69	99,95
24	F01x	PB04	DE01	3,85	3,87	3,84	3,86	4	3,85			0,01	0,36	100,06
25	A79	PD03	DB99	3,88	3,88	3,85	3,85	4	3,86			0,02	0,47	100,30
26	A60x	PD01	DB10	3,81	3,90	3,94	3,81	4	3,87			0,07	1,70	100,39
27	F05x	PD02	DB08	3,89	3,89	3,87	3,90	4	3,89			0,01	0,32	100,98
28	F13x	PD01	DB08	3,94	3,91	3,90	3,84	4	3,90			0,04	1,08	101,23
29	A94	PB06	DB08	3,89	3,91	3,92	3,88	4	3,90			0,02	0,47	101,30
30	F02x	PD02	DB08	3,85	3,95	3,96	3,85	4	3,90			0,06	1,56	101,36
31	F32x	PD02	DB08	3,92	3,90	3,93	3,91	4	3,92			0,01	0,33	101,69
32	F08x	PZ99	DB08	3,87	3,91	3,88	4,02	4	3,92			0,07	1,76	101,82
33	F26x	PC02	DB08	3,93	3,97	3,90	3,89	4	3,92			0,04	0,92	101,88
34	A90	PD01	DB10	4,00	3,97	3,94	3,86	4	3,94			0,06	1,56	102,41
35	F12x	PC01	DB08	4,02	3,96	3,93	3,87	4	3,95			0,06	1,58	102,47
36	A47x	PD01	DB08	4,01	3,96	3,96	3,87	4	3,95			0,06	1,48	102,60
37	F09	PZ02	DD02	3,82	3,92	4,00	4,08	4	3,96			0,11	2,81	102,73
38	F18x	PD99	DB08	3,98	3,95	3,95	3,98	4	3,97			0,02	0,44	102,99
39	F24x	PB03	DE01	3,91	3,95	4,00	4,02	4	3,97			0,05	1,29	103,09
40	F14x	PC01	DB08	4,02	4,05	4,01	4,00	4	4,02			0,02	0,48	104,39
41	A39	PD02	DB08	4,20	4,17	4,11	3,95	4	4,10			0,11	2,74	106,58
42	A65	PD01	DB08	4,11	4,14	4,11	4,12	4	4,12			0,01	0,34	107,01
43	F16x	PC01	DB08	4,13	4,24	3,99	4,16	4	4,13			0,10	2,51	107,25
44	F15x	PC01	DB08	4,20	4,16	4,18	4,17	4	4,18			0,02	0,41	108,51
45	F03	PD02	DB08	4,29	4,29	4,28	4,22	4	4,27		*	0,03	0,79	110,91
46	A62x	PC02	DE01	6,07	5,49	5,91	5,99	0	5,87	*b*	*	0,26	4,41	152,34
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	n	Mean	s_r	CV_r
all labs	**163**	**3,85**	**0,052**	**1,340**
10	% from the mean			

l	s_R	CV_R
41	**0,177**	**4,594**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: P **Sample: 2** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A85x	PC02	DB08	1,03	1,03	1,00	0,98	0	1,01	*b*	*	0,02	2,48	71,85
2	S22	PB06	DB08	1,14	1,15	1,13	1,10	0	1,13	*b*	*	0,02	1,91	80,41
3	A43	PB06	DE01	1,20	1,27	1,36	1,27	4	1,27			0,07	5,13	90,66
4	F27x	PD01	DE01	1,28	1,33	1,28	1,26	4	1,29			0,03	2,45	91,74
5	A49	PC03	DB08	1,24	1,28	1,33	1,31	4	1,29			0,04	3,04	91,79
6	A59	PC01	DB08	1,20	1,37	1,38	1,28	4	1,31			0,08	6,47	93,04
7	F29x	PD01	DE01	1,28	1,32	1,40	1,30	4	1,33			0,05	3,97	94,29
8	F21x	PD02	DE01	1,26	1,36	1,35	1,38	4	1,34			0,05	3,97	95,17
9	A61x	PB02	DB08	1,33	1,34	1,34	1,34	4	1,34			0,01	0,37	95,17
10	F24x	PB03	DE01	1,28	1,30	1,40	1,40	4	1,34			0,06	4,82	95,64
11	F19x	PD02	DB08	1,35	1,34	1,35	1,36	4	1,35			0,01	0,60	96,06
12	A36	PD02	DB08	1,35	1,34	1,37	1,37	4	1,36			0,02	1,10	96,60
13	F06x	PD02	DB08	1,36	1,37	1,36	1,36	4	1,36			0,01	0,60	96,83
14	F28x	PD02	DB08	1,36	1,38	1,32	1,42	4	1,37			0,04	3,19	97,38
15	A90	PD01	DB10	1,33	1,35	1,35	1,44	4	1,37			0,05	3,51	97,42
16	A56	PC01	DB08	1,37	1,37	1,38	1,37	4	1,38			0,00	0,27	97,88
17	A60x	PD01	DB10	1,36	1,41	1,37	1,38	4	1,38			0,02	1,57	98,20
18	F07x	PD02	DB08	1,48	1,26	1,46	1,33	0	1,38	*c*		0,11	7,75	98,34
19	F08x	PZ99	DB08	1,36	1,38	1,39	1,40	4	1,38			0,02	1,24	98,38
20	F33x	PD01	DB10	1,43	1,35	1,37	1,38	4	1,38			0,03	2,41	98,48
21	F12x	PC01	DB08	1,43	1,40	1,37	1,36	4	1,39			0,03	2,28	98,91
22	A82	PC01	DB08	1,39	1,39	1,39	1,40	4	1,39			0,01	0,36	99,09
23	F32x	PD02	DB08	1,40	1,39	1,40	1,40	4	1,40			0,01	0,36	99,44
24	A45x	PB99	DB08	1,42	1,40	1,41	1,40	4	1,41			0,01	0,68	100,16
25	F03	PD02	DB08	1,41	1,43	1,43	1,42	4	1,42			0,01	0,67	101,22
26	A47x	PD01	DB08	1,45	1,41	1,42	1,41	4	1,42			0,02	1,33	101,22
27	F13x	PD01	DB08	1,44	1,43	1,43	1,41	4	1,43			0,01	0,88	101,58
28	A71	PB03	DE01	1,44	1,43	1,43	1,42	4	1,43			0,01	0,53	101,81
29	F16x	PC01	DB08	1,41	1,42	1,48	1,45	4	1,44			0,03	2,00	102,36
30	A79	PD03	DB99	1,45	1,45	1,44	1,42	4	1,44			0,02	1,18	102,42
31	F18x	PD99	DB08	1,44	1,44	1,44	1,45	4	1,44			0,01	0,35	102,65
32	A57	PZ02	DD02	1,42	1,54	1,41	1,42	4	1,45			0,06	4,27	103,00
33	F02x	PD02	DB08	1,46	1,45	1,42	1,49	4	1,46			0,03	1,98	103,54
34	F25x	PB06	DB08	1,47	1,48	1,46	1,41	4	1,46			0,03	2,37	103,59
35	F05x	PD02	DB08	1,46	1,46	1,46	1,46	4	1,46			0,00	0,00	103,89
36	F14x	PC01	DB08	1,47	1,45	1,46	1,46	4	1,46			0,01	0,46	103,91
37	A39	PD02	DB08	1,51	1,47	1,44	1,44	4	1,46			0,03	1,98	104,21
38	A88	PD01	DB08	1,44	1,50	1,47	1,46	4	1,47			0,02	1,63	104,35
39	F15x	PC01	DB08	1,51	1,45	1,47	1,46	4	1,47			0,03	1,79	104,78
40	F01x	PB04	DE01	1,47	1,48	1,47	1,49	4	1,48			0,01	0,66	105,01
41	A65	PD01	DB08	1,46	1,48	1,49	1,50	4	1,48			0,02	1,15	105,49
42	F26x	PC02	DB08	1,47	1,49	1,50	1,49	4	1,49			0,01	0,85	105,85
43	A94	PB06	DB08	1,54	1,53	1,54	1,52	4	1,53			0,01	0,62	109,05
44	A53	PZ02	DD02	1,55	1,55	1,55	*1,56a*	3	1,55		*	0,00	0,00	110,30
45	F09	PZ02	DD02	1,63	1,64	1,65	1,67	0	1,65	*b*	*	0,02	1,04	117,23
46	A62x	PC02	DE01	1,62	1,68	1,67	1,79	0	1,69	*b*	*	0,07	4,24	120,26
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	n	Mean	s_r	CV_r
all labs	**163**	**1,41**	**0,025**	**1,746**
10	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
41	**0,065**	**4,645**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: P **Sample: 3** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	S22	PB06	DB08	1,24	1,29	1,24	1,23	4	1,25	*	0,03	2,17	81,24
2	A85x	PC02	DB08	1,20	1,32	1,20	1,38	4	1,27	*	0,09	6,88	82,83
3	F09	PZ02	DD02	1,25	1,26	1,28	1,31	4	1,28	*	0,03	2,08	82,87
4	F27x	PD01	DE01	1,34	1,35	1,38	1,42	4	1,37	*	0,04	2,60	89,21
5	A49	PC03	DB08	1,35	1,40	1,39	1,41	4	1,39		0,03	1,90	90,18
6	A59	PC01	DB08	1,21	1,60	1,44	1,38	4	1,41		0,16	**11,45**	91,48
7	A43	PB06	DE01	1,43	1,31	1,50	1,42	4	1,41		0,08	5,47	91,95
8	A82	PC01	DB08	1,45	1,35	1,41	1,59	4	1,45		0,10	7,03	94,24
9	F29x	PD01	DE01	1,43	1,42	1,52	1,49	4	1,47		0,05	3,27	95,22
10	F06x	PD02	DB08	1,47	1,45	1,51	1,46	4	1,47		0,03	1,70	95,69
11	F24x	PB03	DE01	1,34	1,42	1,53	1,61	4	1,48		0,12	8,10	96,00
12	A90	PD01	DB10	1,53	1,51	1,52	1,39	4	1,49		0,07	4,52	96,60
13	F33x	PD01	DB10	1,66	1,40	1,53	1,35	4	1,49		0,14	9,23	96,61
14	F19x	PD02	DB08	1,41	1,47	1,55	1,52	4	1,49		0,06	4,12	96,68
15	A36	PD02	DB08	1,49	1,48	1,50	1,51	4	1,50		0,01	0,86	97,17
16	A47x	PD01	DB08	1,48	1,47	1,59	1,46	4	1,50		0,06	4,04	97,49
17	A57	PZ02	DD02	1,64	1,61	1,40	1,37	4	1,51		0,14	9,28	97,82
18	F28x	PD02	DB08	1,57	1,50	1,53	1,44	4	1,51		0,06	3,72	98,01
19	A71	PB03	DE01	1,53	1,52	1,53	1,51	4	1,52		0,01	0,72	98,95
20	F12x	PC01	DB08	1,52	1,54	1,49	1,54	4	1,52		0,02	1,55	98,95
21	F32x	PD02	DB08	1,55	1,49	1,53	1,55	4	1,53		0,03	1,85	99,44
22	A60x	PD01	DB10	1,52	1,54	1,55	1,51	4	1,53		0,02	1,19	99,44
23	A56	PC01	DB08	1,39	1,73	1,55	1,48	4	1,54		0,15	9,44	100,06
24	F07x	PD02	DB08	1,69	1,42	1,61	1,45	4	1,54		0,13	8,42	100,27
25	F18x	PD99	DB08	1,55	1,52	1,56	1,55	4	1,55		0,02	1,12	100,42
26	F13x	PD01	DB08	1,57	1,55	1,56	1,53	4	1,55		0,02	1,10	100,90
27	F08x	PZ99	DB08	1,54	1,53	1,57	1,58	4	1,56		0,02	1,53	101,07
28	F01x	PB04	DE01	1,59	1,56	1,60	1,58	4	1,58		0,02	1,00	102,87
29	A79	PD03	DB99	1,62	1,58	1,55	1,62	4	1,59		0,03	2,04	103,44
30	F16x	PC01	DB08	1,61	1,55	1,65	1,56	4	1,59		0,05	2,97	103,65
31	F26x	PC02	DB08	1,58	1,60	1,63	1,58	4	1,60		0,02	1,48	103,83
32	A61x	PB02	DB08	1,57	1,62	1,67	1,60	4	1,62		0,04	2,60	104,96
33	A45x	PB99	DB08	1,61	1,63	1,61	1,61	4	1,62		0,01	0,62	104,96
34	A88	PD01	DB08	1,60	1,64	1,62	1,61	4	1,62		0,02	1,21	104,98
35	F15x	PC01	DB08	1,64	1,64	1,60	1,60	4	1,62		0,02	1,43	105,29
36	F05x	PD02	DB08	1,62	1,63	1,62	1,62	4	1,62		0,00	0,31	105,45
37	A65	PD01	DB08	1,58	1,71	1,60	1,65	4	1,64		0,06	3,55	106,26
38	F03	PD02	DB08	1,59	1,65	1,63	1,73	4	1,65		0,06	3,57	107,24
39	F25x	PB06	DB08	1,68	1,65	1,69	1,64	4	1,66		0,02	1,29	108,15
40	F14x	PC01	DB08	1,71	1,72	1,56	1,74	4	1,68		0,08	4,86	109,37
41	A39	PD02	DB08	1,69	1,66	1,69	1,73	4	1,69	*	0,03	1,83	110,01
42	A53	PZ02	DD02	1,73	1,68	1,70	1,69	4	1,70	*	0,02	1,27	110,49
43	F02x	PD02	DB08	1,68	1,70	1,74	1,76	4	1,72	*	0,04	2,12	111,79
44	F21x	PD02	DE01	1,64	1,79	1,79	1,68	4	1,73	*	0,08	4,45	112,11
45	A94	PB06	DB08	1,74	1,80	1,77	1,73	4	1,76	*	0,03	1,80	114,39
46	A62x	PC02	DE01	3,01	3,28	3,01	3,25	0	3,14	*b* *	0,15	4,71	203,92
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	n	Mean	s_r	CV_r
all labs	**180**	**1,54**	**0,052**	**3,354**
10	% from the mean			
	l		s_R	CV_R
	45		**0,118**	**7,645**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: P **Sample: 4** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A85x	PC02	DB08	0,43	0,41	0,44	0,42	4	0,42	*	0,02	3,61	80,63
2	S22	PB06	DB08	0,42	0,43	0,43	0,41	4	0,42	*	0,01	2,27	80,63
3	A59	PC01	DB08	0,35	0,46	0,47	0,42	4	0,43	*	0,05	**12,82**	81,10
4	A43	PB06	DE01	0,47	0,42	0,47	0,45	4	0,45	*	0,03	5,58	86,59
5	F24x	PB03	DE01	0,42	0,53	0,47	0,47	4	0,47	*	0,04	9,35	89,98
6	F08x	PZ99	DB08	0,51	0,49	0,48	0,48	4	0,49		0,02	3,09	93,08
7	A49	PC03	DB08	0,52	0,48	0,51	0,49	4	0,50		0,02	3,65	95,42
8	F06x	PD02	DB08	0,51	0,50	0,50	0,50	4	0,50		0,00	0,87	95,74
9	F33x	PD01	DB10	0,52	0,49	0,49	0,52	4	0,50		0,02	3,29	96,08
10	A61x	PB02	DB08	0,52	0,50	0,51	0,50	4	0,51		0,01	1,89	96,85
11	A36	PD02	DB08	0,50	0,51	0,50	0,53	4	0,51		0,01	2,77	97,32
12	A60x	PD01	DB10	0,52	0,51	0,52	0,52	4	0,51		0,00	0,75	98,18
13	A88	PD01	DB08	0,47	0,57	0,52	0,50	4	0,51		0,04	7,79	98,22
14	F32x	PD02	DB08	0,51	0,52	0,52	0,52	4	0,52		0,00	0,47	98,47
15	A56	PC01	DB08	0,52	0,53	0,50	0,51	4	0,52		0,01	2,33	98,66
16	F29x	PD01	DE01	0,49	0,55	0,60	0,43	0	0,52	*c*	0,07	**14,23**	98,75
17	F12x	PC01	DB08	0,51	0,53	0,51	0,52	4	0,52		0,01	1,30	99,18
18	A82	PC01	DB08	0,54	0,52	0,51	0,51	4	0,52		0,01	2,40	99,33
19	F19x	PD02	DB08	0,52	0,52	0,53	0,53	4	0,52		0,01	1,03	99,57
20	A71	PB03	DE01	0,53	0,52	0,52	0,52	4	0,52		0,00	0,58	99,62
21	A47x	PD01	DB08	0,52	0,53	0,53	0,51	4	0,52		0,01	1,83	99,71
22	A45x	PB99	DB08	0,52	0,52	0,52	0,53	4	0,52		0,00	0,37	99,71
23	F03	PD02	DB08	0,51	0,55	0,51	0,54	4	0,53		0,02	3,91	100,66
24	F25x	PB06	DB08	0,53	0,53	0,53	0,53	4	0,53		0,00	0,47	100,81
25	A90	PD01	DB10	0,53	0,52	0,52	0,54	4	0,53		0,01	1,42	100,81
26	A57	PZ02	DD02	0,53	0,53	0,53	0,53	4	0,53		0,00	0,00	101,14
27	F02x	PD02	DB08	0,52	0,52	0,55	0,55	4	0,54		0,02	3,24	102,09
28	F05x	PD02	DB08	0,54	0,54	0,54	0,54	4	0,54		0,00	0,18	102,52
29	F13x	PD01	DB08	0,54	0,54	0,54	0,53	4	0,54		0,01	0,93	102,57
30	F16x	PC01	DB08	0,53	0,53	0,55	0,54	4	0,54		0,01	1,61	103,22
31	F18x	PD99	DB08	0,54	0,55	0,54	0,54	4	0,54		0,00	0,49	103,29
32	F07x	PD02	DB08	0,58	0,49	0,59	0,51	4	0,54		0,05	9,09	103,43
33	A79	PD03	DB99	0,56	0,54	0,54	0,53	4	0,54		0,01	1,84	103,62
34	F14x	PC01	DB08	0,54	0,54	0,55	0,55	4	0,54		0,00	0,92	103,67
35	A39	PD02	DB08	0,55	0,54	0,55	0,55	4	0,55		0,00	0,70	104,11
36	F15x	PC01	DB08	0,56	0,55	0,55	0,56	4	0,56		0,01	1,04	105,91
37	F27x	PD01	DE01	0,60	0,62	0,54	0,48	4	0,56		0,06	**11,09**	107,10
38	F28x	PD02	DB08	0,59	0,57	0,53	0,56	4	0,56		0,03	4,86	107,25
39	A65	PD01	DB08	0,55	0,56	0,57	0,57	4	0,56		0,01	1,70	107,34
40	A94	PB06	DB08	0,57	0,56	0,56	0,56	4	0,56		0,00	0,70	107,68
41	F09	PZ02	DD02	0,56	0,56	0,57	0,57	4	0,57		0,01	1,02	107,82
42	A53	PZ02	DD02	0,58	0,60	0,58	0,60	4	0,59	*	0,01	1,96	112,59
43	F26x	PC02	DB08	0,58	0,60	0,59	0,59	4	0,59	*	0,01	1,38	112,59
44	F01x	PB04	DE01	0,60	0,61	0,61	0,61	4	0,61	*	0,01	0,96	115,74
45	F21x	PD02	DE01	0,91	0,82	0,90	0,86	0	0,87	*b* *	0,04	4,71	166,50
46	A62x	PC02	DE01	1,07	0,88	1,05	0,99	0	1,00	*b* *	0,09	8,56	190,35
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	n	Mean	s_r	CV_r
all labs	**172**	**0,52**	**0,014**	**2,653**
10	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
43	**0,040**	**7,705**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Ca **Sample: 1** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A62x	PD02	DB01	3,76	3,76	3,56	3,41	0	3,62	*b*	*	0,17	4,70	62,37
2	A60x	PD01	DB10	4,01	4,19	3,91	3,70	0	3,95	*b*	*	0,20	5,17	68,06
3	A85x	PC02	DB08	4,51	4,82	4,59	4,66	0	4,65	*b*	*	0,13	2,83	79,98
4	F21x	PD02	DB09	4,79	4,89	4,85	4,80	0	4,83	*b*	*	0,05	0,96	83,21
5	F27x	PD01	DB01	5,03	5,13	5,10	5,23	4	5,12		*	0,08	1,60	88,23
6	F33x	PD01	DB10	4,57	5,23	5,67	5,22	0	5,17	*c*	*	0,45	8,76	89,05
7	F07x	PD02	DB08	5,21	5,79	5,13	5,55	4	5,42			0,31	5,64	93,28
8	F14x	PC01	DB08	5,42	5,48	5,41	5,40	4	5,42			0,03	0,64	93,41
9	A42	PB04	DA01	5,41	5,47	5,50	5,46	4	5,46			0,04	0,71	94,01
10	F19x	PD02	DB08	5,42	5,49	5,46	5,48	4	5,46			0,03	0,57	94,06
11	F03	PD02	DB08	5,45	5,44	5,48	5,50	4	5,47			0,03	0,50	94,14
12	A88	PD01	DB08	5,59	5,50	5,54	5,57	4	5,55			0,04	0,70	95,55
13	A59	PC01	DB08	*4,8a*	5,61	5,52	5,55	3	5,56			0,05	0,82	95,73
14	F01x	PB04	DB01	5,50	5,55	5,70	5,63	4	5,60			0,09	1,58	96,34
15	A49	PD05	DB08	5,58	5,58	5,65	5,64	4	5,61			0,04	0,67	96,64
16	F13x	PZ02	DD01	5,68	5,69	5,69	5,70	4	5,69			0,01	0,14	97,97
17	A43	PB06	DB01	5,11	5,83	6,16	5,70	0	5,70	*c*		0,44	7,69	98,14
18	A82	PC01	DB09	5,87	5,82	5,74	5,52	4	5,73			0,15	2,69	98,74
19	F02x	PD02	DB08	5,71	5,65	5,77	5,90	4	5,76			0,11	1,86	99,13
20	F25x	PB06	DB08	5,73	5,78	5,77	5,77	4	5,76			0,02	0,34	99,21
21	F15x	PC01	DB08	5,89	5,68	5,76	5,77	4	5,78			0,09	1,50	99,44
22	A57	PZ02	DD02	5,77	5,70	5,79	5,88	4	5,79			0,07	1,28	99,61
23	F06x	PC02	DB08	5,84	5,79	5,75	5,77	4	5,79			0,04	0,62	99,64
24	A56	PC01	DB08	5,81	5,81	5,77	5,82	4	5,80			0,02	0,32	99,90
25	A79	PD03	DB10	5,69	5,68	5,91	5,93	4	5,80			0,14	2,39	99,90
26	A45x	PB99	DB08	5,82	5,81	5,82	5,81	4	5,82			0,01	0,10	100,12
27	F32x	PD02	DB08	5,74	5,89	5,85	5,84	4	5,83			0,06	1,09	100,38
28	F08x	PZ99	DB08	5,78	5,87	5,89	5,82	4	5,84			0,05	0,85	100,55
29	F29x	PD02	DB01	5,75	5,91	5,77	5,94	4	5,84			0,10	1,65	100,60
30	A90	PD01	DB10	5,91	5,87	5,78	5,82	4	5,84			0,05	0,94	100,62
31	A61x	PB02	DB08	5,87	5,86	5,82	5,86	4	5,85			0,02	0,38	100,77
32	F05x	PD02	DB08	5,85	5,89	5,89	5,86	4	5,87			0,02	0,35	101,11
33	A36	PD02	DB08	5,90	5,85	5,88	6,17	4	5,95			0,15	2,49	102,45
34	F12x	PC01	DB08	6,05	5,99	5,96	5,87	4	5,97			0,07	1,26	102,75
35	A53	PZ02	DD02	5,99	5,97	5,96	5,96	4	5,97			0,01	0,24	102,79
36	F28x	PD02	DB08	6,12	5,90	6,01	5,96	4	6,00			0,09	1,54	103,23
37	A47x	PD02	DB08	6,16	5,94	5,91	6,13	4	6,04			0,13	2,12	103,91
38	F26x	PC02	DB08	6,01	6,05	6,02	6,09	4	6,04			0,04	0,59	104,04
39	A65	PD01	DB08	6,04	6,06	6,11	6,05	4	6,07			0,03	0,51	104,43
40	A71	PB03	DB02	6,21	6,10	6,00	6,00	4	6,08			0,10	1,63	104,67
41	A94	PB06	DB08	6,13	6,02	6,10	6,07	4	6,08			0,05	0,77	104,69
42	F18x	PD99	DB08	6,11	6,08	6,06	6,11	4	6,09			0,02	0,40	104,86
43	F16x	PC01	DB08	6,10	6,08	6,14	6,08	4	6,10			0,03	0,48	105,02
44	F09	PZ02	DD02	6,12	6,17	6,29	6,39	4	6,24			0,12	1,95	107,49
45	A39	PD02	DB08	6,32	6,27	6,37	6,48	4	6,36			0,09	1,41	109,52
46	S22	PB06	DB08	7,80	7,78	7,72	7,79	0	7,77	*b*	*	0,04	0,46	133,83
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48														
49														
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	n	Mean	s_r	CV_r
all labs	**155**	**5,81**	**0,067**	**1,158**
10	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
39	**0,254**	**4,379**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Ca **Sample: 2** Unit: mg/g

No.	Lab. Code	Method code P	D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A60x	PD01	DB10	2,97	3,00	2,91	2,92	0	2,95	*b*	*	0,04	1,44	71,09
2	A62x	PD02	DB01	3,20	3,19	3,28	3,36	0	3,26	*b*	*	0,08	2,43	78,51
3	A85x	PC02	DB08	3,30	3,33	3,24	3,22	0	3,27	*b*	*	0,05	1,60	78,87
4	F21x	PD02	DB09	3,53	3,54	3,54	3,55	4	3,54		*	0,01	0,23	85,31
5	F27x	PD01	DB01	3,71	3,71	3,72	3,64	4	3,69		*	0,04	1,05	89,00
6	F03	PD02	DB08	3,75	3,76	3,79	3,76	4	3,77			0,02	0,46	90,74
7	F07x	PD02	DB08	3,70	4,22	3,61	3,88	0	3,85	*c*		0,27	6,95	92,83
8	F14x	PC01	DB08	3,86	3,84	3,88	3,88	4	3,86			0,02	0,50	93,10
9	A88	PD01	DB08	3,83	3,87	3,92	3,85	4	3,87			0,04	0,97	93,21
10	A90	PD01	DB10	3,87	3,93	3,98	4,02	4	3,95			0,07	1,66	95,21
11	A59	PC01	DB08	4,04	4,01	3,98	3,82	4	3,96			0,10	2,48	95,50
12	F19x	PD02	DB08	3,99	3,96	3,99	4,03	4	3,99			0,03	0,72	96,22
13	A82	PC01	DB09	4,04	3,99	3,99	4,03	4	4,01			0,03	0,65	96,70
14	A43	PB06	DB01	3,95	4,00	4,27	4,07	4	4,07			0,14	3,45	98,15
15	F18x	PD99	DB08	4,08	4,10	4,08	4,09	4	4,09			0,01	0,23	98,51
16	A56	PC01	DB08	4,12	4,12	4,08	4,04	4	4,09			0,04	0,93	98,54
17	F12x	PC01	DB08	4,19	4,12	4,06	4,00	4	4,09			0,08	1,99	98,63
18	F28x	PD02	DB08	4,14	4,01	4,10	4,13	4	4,09			0,06	1,39	98,65
19	A49	PD05	DB08	4,05	4,12	4,09	4,12	4	4,10			0,03	0,81	98,69
20	F33x	PD01	DB10	4,19	4,09	4,16	4,01	4	4,11			0,08	1,97	99,03
21	F15x	PC01	DB08	4,13	4,13	4,10	4,09	4	4,11			0,02	0,50	99,11
22	F25x	PB06	DB08	4,17	4,12	4,12	4,10	4	4,13			0,03	0,73	99,44
23	F06x	PC02	DB08	4,14	4,15	4,11	4,10	4	4,13			0,02	0,58	99,45
24	A61x	PB02	DB08	4,11	4,17	4,12	4,14	4	4,14			0,03	0,64	99,65
25	F29x	PD02	DB01	4,05	4,19	4,09	4,22	4	4,14			0,08	1,95	99,71
26	A45x	PB99	DB08	4,16	4,15	4,16	4,13	4	4,15			0,01	0,34	100,01
27	F32x	PD02	DB08	4,21	4,15	4,13	4,14	4	4,16			0,04	0,86	100,20
28	F08x	PZ99	DB08	4,17	4,19	4,16	4,15	4	4,17			0,02	0,41	100,44
29	A65	PD01	DB08	4,12	4,15	4,19	4,21	4	4,17			0,04	0,97	100,44
30	F05x	PD02	DB08	4,16	4,18	4,18	4,16	4	4,17			0,01	0,28	100,50
31	A36	PD02	DB08	4,16	4,13	4,19	4,21	4	4,17			0,04	0,84	100,56
32	A47x	PD02	DB08	4,24	4,10	4,20	4,17	4	4,18			0,06	1,41	100,68
33	F16x	PC01	DB08	4,20	4,22	4,13	4,16	4	4,18			0,04	1,00	100,68
34	A79	PD03	DB10	4,04	4,11	4,33	4,32	4	4,20			0,15	3,50	101,24
35	F02x	PD02	DB08	4,25	4,14	4,16	4,43	4	4,25			0,13	3,12	102,30
36	A71	PB03	DB02	4,25	4,25	4,30	4,30	4	4,28			0,03	0,69	103,07
37	A94	PB06	DB08	4,33	4,28	4,31	4,33	4	4,31			0,02	0,55	103,93
38	F01x	PB04	DB01	4,33	4,34	4,30	4,29	4	4,32			0,02	0,55	103,99
39	A57	PZ02	DD02	4,32	4,25	4,38	4,41	4	4,34			0,07	1,63	104,59
40	A39	PD02	DB08	4,38	4,36	4,59	4,32	4	4,42			0,12	2,71	106,41
41	A53	PZ02	DD02	4,48	4,47	4,49	4,47	4	4,48			0,01	0,21	107,91
42	A42	PB04	DA01	4,53	4,55	4,45	4,57	4	4,52			0,05	1,13	109,02
43	F26x	PC02	DB08	4,55	4,44	4,67	4,51	4	4,54			0,10	2,12	109,47
44	F09	PZ02	DD02	4,56	4,51	4,57	4,60	4	4,56			0,04	0,82	109,90
45	F13x	PZ02	DD01	4,64	4,65	4,66	4,66	4	4,65		*	0,01	0,21	112,13
46	S22	PB06	DB08	6,45	6,36	6,56	6,50	0	6,47	*b*	*	0,08	1,31	155,87
47														
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52														
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	n	Mean	s_r	CV_r
all labs	**164**	**4,15**	**0,048**	**1,157**
10	% from the mean			

l	s_R	CV_R
41	**0,226**	**5,456**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Ca **Sample: 3** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A85x	PC02	DB08	4,00	3,74	3,88	4,07	4	3,92	*	0,15	3,71	83,63
2	A62x	PD02	DB01	3,94	3,72	4,28	3,95	4	3,97	*	0,23	5,81	84,69
3	F21x	PD02	DB09	4,02	3,87	4,20	4,00	4	4,02	*	0,14	3,37	85,76
4	F27x	PD01	DB01	4,14	4,25	3,88	4,24	4	4,13	*	0,17	4,22	88,03
5	A60x	PD01	DB10	4,22	4,35	4,39	4,22	4	4,30		0,09	2,05	91,57
6	F07x	PD02	DB08	4,24	4,58	4,10	4,36	4	4,32		0,20	4,68	92,10
7	A82	PC01	DB09	4,29	4,26	4,13	4,61	4	4,32		0,20	4,64	92,17
8	A59	PC01	DB08	4,00	4,61	4,50	4,26	4	4,34		0,27	6,24	92,58
9	A90	PD01	DB10	4,40	4,56	4,62	4,20	4	4,45		0,19	4,22	94,78
10	A49	PD05	DB08	4,68	4,69	4,24	4,38	4	4,50		0,22	4,98	95,89
11	A47x	PD02	DB08	4,40	4,54	4,58	4,61	4	4,53		0,09	2,05	96,63
12	F03	PD02	DB08	4,66	4,54	4,51	4,58	4	4,57		0,07	1,42	97,49
13	F18x	PD99	DB08	4,58	4,56	4,56	4,59	4	4,57		0,02	0,33	97,49
14	F14x	PC01	DB08	4,70	4,57	4,38	4,68	4	4,58		0,15	3,19	97,68
15	F29x	PD02	DB01	4,52	4,75	4,62	4,48	4	4,59		0,12	2,62	97,91
16	F19x	PD02	DB08	4,48	4,59	4,71	4,61	4	4,60		0,09	2,05	98,02
17	F12x	PC01	DB08	4,62	4,66	4,57	4,65	4	4,63		0,04	0,87	98,61
18	A88	PD01	DB08	4,73	4,52	4,62	4,68	4	4,64		0,09	1,95	98,85
19	F28x	PD02	DB08	4,66	4,52	4,64	4,74	4	4,64		0,09	1,90	98,88
20	F16x	PC01	DB08	4,70	4,64	4,69	4,60	4	4,66		0,05	1,04	99,30
21	F06x	PC02	DB08	4,67	4,66	4,71	4,68	4	4,68		0,02	0,53	99,78
22	A36	PD02	DB08	4,63	4,71	4,65	4,74	4	4,68		0,05	1,09	99,83
23	A71	PB03	DB02	4,64	4,69	4,74	4,79	4	4,71		0,07	1,40	100,47
24	F15x	PC01	DB08	4,67	4,80	4,66	4,77	4	4,73		0,07	1,49	100,74
25	F09	PZ02	DD02	4,72	4,67	4,73	4,81	4	4,73		0,06	1,22	100,90
26	F32x	PD02	DB08	4,62	4,77	4,80	4,81	4	4,75		0,09	1,86	101,27
27	A43	PB06	DB01	4,84	4,52	4,89	4,75	4	4,75		0,16	3,45	101,27
28	F25x	PB06	DB08	4,79	4,72	4,80	4,71	4	4,75		0,05	0,98	101,31
29	A56	PC01	DB08	4,82	4,95	4,72	4,58	4	4,77		0,15	3,24	101,61
30	A79	PD03	DB10	4,51	4,74	4,86	5,14	4	4,81		0,26	5,42	102,61
31	A45x	PB99	DB08	4,87	4,85	4,82	4,85	4	4,85		0,02	0,43	103,35
32	F08x	PZ99	DB08	4,79	4,94	4,87	4,80	4	4,85		0,07	1,44	103,40
33	A65	PD01	DB08	4,78	4,95	4,90	4,91	4	4,89		0,07	1,50	104,15
34	F05x	PD02	DB08	4,92	4,90	4,92	4,91	4	4,91		0,01	0,19	104,74
35	A57	PZ02	DD02	5,10	5,08	4,90	4,74	4	4,96		0,17	3,42	105,64
36	F02x	PD02	DB08	4,95	4,79	5,30	5,02	4	5,02		0,21	4,25	106,92
37	F01x	PB04	DB01	4,98	5,07	5,12	4,92	4	5,02		0,09	1,78	107,08
38	F33x	PD01	DB10	4,99	5,24	5,08	4,79	4	5,02		0,19	3,75	107,12
39	A42	PB04	DA01	5,14	4,96	5,06	4,97	4	5,03		0,09	1,69	107,28
40	A61x	PB02	DB08	5,11	5,17	5,12	5,02	4	5,11		0,06	1,22	108,84
41	F26x	PC02	DB08	5,14	5,12	5,18	5,00	4	5,11		0,08	1,52	108,95
42	A94	PB06	DB08	5,19	5,16	5,13	5,03	4	5,13		0,07	1,35	109,32
43	A39	PD02	DB08	5,12	5,15	5,20	5,04	4	5,13		0,07	1,36	109,32
44	F13x	PZ02	DD01	5,30	5,16	5,15	5,19	4	5,20	*	0,07	1,32	110,86
45	A53	PZ02	DD02	5,28	5,22	5,24	5,12	4	5,22	*	0,07	1,31	111,18
46	S22	PB06	DB08	7,29	7,30	7,22	7,04	0	7,21	*b* *	0,12	1,67	153,77
47													
48													
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52													
53													
54													
55													

	n	Mean	s_r	CV_r
all labs	**180**	**4,69**	**0,111**	**2,359**
10	% from the mean			

l	s_R	CV_R
45	**0,322**	**6,862**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Ca **Sample: 4** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A85x	PC02	DB08	15,62	17,85	16,03	16,78	0	16,57	*b*	*	0,98	5,91	74,29
2	A57	PZ02	DD02	17,68	17,77	17,67	17,75	4	17,72		*	0,05	0,28	79,43
3	A59	PC01	DB08	15,90	19,10	20,30	17,90	0	18,30	*c*	*	1,88	**10,25**	82,05
4	A60x	PD01	DB10	18,70	18,90	18,90	19,00	4	18,88		*	0,13	0,67	84,62
5	A62x	PD02	DB01	19,64	18,80	18,53	19,44	4	19,10		*	0,52	2,74	85,64
6	A53	PZ02	DD02	20,30	20,30	20,50	20,40	4	20,38			0,10	0,47	91,35
7	F21x	PD02	DB09	21,49	19,77	20,03	20,50	4	20,45			0,76	3,71	91,67
8	F27x	PD01	DB01	21,29	20,26	20,19	20,10	4	20,46			0,56	2,74	91,73
9	A49	PD05	DB08	20,23	20,35	20,39	21,03	4	20,50			0,36	1,76	91,91
10	F09	PZ02	DD02	20,64	20,58	20,73	20,89	4	20,71			0,13	0,65	92,85
11	A56	PC01	DB08	21,01	20,48	20,68	20,84	4	20,75			0,23	1,09	93,04
12	F16x	PC01	DB08	20,26	21,14	20,93	20,75	4	20,77			0,38	1,81	93,12
13	A82	PC01	DB09	20,47	20,86	21,90	21,08	4	21,08			0,60	2,86	94,49
14	A71	PB03	DB02	21,56	21,36	20,94	20,73	4	21,15			0,38	1,79	94,82
15	F33x	PD01	DB10	20,58	21,39	22,54	20,75	4	21,31			0,89	4,17	95,56
16	A88	PD01	DB08	21,32	22,15	21,74	21,53	4	21,68			0,35	1,64	97,22
17	F13x	PZ02	DD01	21,65	21,80	21,90	21,88	4	21,81			0,11	0,52	97,77
18	F07x	PD02	DB08	23,28	22,77	19,26	22,08	0	21,85	*c*		1,79	8,20	97,95
19	F06x	PC02	DB08	22,11	22,15	22,31	22,14	4	22,18			0,09	0,41	99,43
20	A61x	PB02	DB08	22,58	22,28	22,33	22,24	4	22,36			0,15	0,68	100,24
21	A36	PD02	DB08	22,50	21,87	22,88	22,25	4	22,38			0,42	1,90	100,32
22	A39	PD02	DB08	22,98	22,87	22,33	21,58	4	22,44			0,64	2,84	100,62
23	F28x	PD02	DB08	22,67	22,13	22,06	22,93	4	22,45			0,42	1,88	100,64
24	F19x	PD02	DB08	22,80	22,20	22,80	22,60	4	22,60			0,28	1,25	101,33
25	A45x	PB99	DB08	22,50	22,60	22,40	23,00	4	22,63			0,26	1,16	101,44
26	F25x	PB06	DB08	22,42	22,77	22,56	22,79	4	22,64			0,18	0,78	101,48
27	F14x	PC01	DB08	22,13	23,16	23,44	22,09	4	22,71			0,70	3,07	101,80
28	S22	PB06	DB08	22,49	23,19	23,15	22,04	4	22,72			0,55	2,44	101,85
29	F18x	PD99	DB08	23,00	22,70	23,00	22,70	4	22,85			0,17	0,76	102,45
30	A90	PD01	DB10	24,49	21,63	22,88	22,65	4	22,91			1,19	5,17	102,73
31	F12x	PC01	DB08	22,76	22,99	22,78	23,26	4	22,95			0,23	1,01	102,88
32	F08x	PZ99	DB08	22,50	22,89	23,35	23,13	4	22,97			0,36	1,58	102,97
33	F29x	PD02	DB01	23,85	23,11	21,99	23,02	4	22,99			0,76	3,33	103,08
34	F02x	PD02	DB08	22,20	23,37	23,23	23,26	4	23,02			0,55	2,38	103,19
35	F03	PD02	DB08	23,33	22,69	23,22	22,98	4	23,06			0,28	1,23	103,37
36	A47x	PD02	DB08	22,83	23,69	23,61	23,06	4	23,30			0,42	1,80	104,45
37	A65	PD01	DB08	23,68	22,95	23,31	23,87	4	23,45			0,41	1,74	105,15
38	A94	PB06	DB08	23,80	23,70	23,40	23,90	4	23,70			0,22	0,91	106,26
39	F01x	PB04	DB01	24,01	23,66	23,65	24,18	4	23,88			0,26	1,10	107,04
40	F32x	PD02	DB08	23,90	24,20	23,90	24,30	4	24,08			0,21	0,86	107,94
41	F26x	PC02	DB08	24,03	24,14	24,02	24,18	4	24,09			0,08	0,33	108,02
42	F05x	PD02	DB08	24,20	24,30	24,10	24,50	4	24,28			0,17	0,70	108,83
43	F15x	PC01	DB08	24,45	24,14	23,95	25,17	4	24,43			0,54	2,19	109,52
44	A42	PB04	DA01	24,38	24,48	24,85	24,81	4	24,63		*	0,24	0,96	110,43
45	A79	PD03	DB10	24,39	24,17	25,49	26,07	4	25,03		*	0,90	3,60	112,22
46	A43	PB06	DB01	25,20	25,20	26,60	25,70	4	25,68		*	0,66	2,57	115,11
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	n	Mean	s_r	CV_r
all labs	**172**	**22,30**	**0,393**	**1,761**
10	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
43	**1,676**	**7,516**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Mg **Sample: 1** Unit: mg/g

No.	Lab. Code	Method code P	D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F21x	PD02	DB09	1,46	1,49	1,47	1,48	0	1,48	*b* *	0,01	0,88	67,52
2	A85x	PC02	DB08	1,59	1,74	1,60	1,67	0	1,65	*b* *	0,07	4,25	75,38
3	S22	PB06	DB08	1,68	1,66	1,67	1,69	0	1,68	*b* *	0,01	0,77	76,67
4	A90	PD01	DB09	2,30	*0,222a*	2,29	2,19	3	2,26		0,06	2,66	103,31
5	A59	PC01	DB08	*1,72a*	2,05	2,00	2,00	3	2,02		0,03	1,43	92,31
6	A62x	PD02	DB01	2,07	1,93	2,00	1,87	4	1,97		0,09	4,40	90,06
7	A49	PD05	DB08	2,00	1,99	2,00	1,99	4	2,00		0,01	0,29	91,32
8	F24x	PB03	DB01	1,96	1,98	2,03	2,05	4	2,00		0,04	2,20	91,75
9	F33x	PD01	DB10	2,21	1,93	2,07	1,94	0	2,04	*c*	0,13	6,62	93,30
10	F27x	PD01	DB01	2,09	2,12	2,02	2,08	4	2,08		0,04	1,90	95,02
11	A56	PC01	DB08	2,08	2,09	2,09	2,10	4	2,09		0,01	0,36	95,55
12	F19x	PD02	DB08	2,08	2,12	2,08	2,09	4	2,09		0,02	0,90	95,78
13	F32x	PD02	DB08	2,12	2,09	2,11	2,13	4	2,11		0,02	0,81	96,70
14	F07x	PD02	DB08	2,09	2,12	2,05	2,21	4	2,12		0,07	3,31	96,99
15	A61x	PB02	DB08	2,13	2,11	2,12	2,12	4	2,12		0,01	0,39	97,04
16	F29x	PD02	DB01	2,13	2,15	2,17	2,11	4	2,14		0,03	1,21	97,95
17	F13x	PD01	DB08	2,18	2,12	2,15	2,15	4	2,15		0,02	1,14	98,41
18	F06x	PD02	DB08	2,15	2,16	2,16	2,18	4	2,16		0,01	0,47	98,97
19	A36	PD02	DB08	2,11	2,22	2,10	2,22	4	2,16		0,07	3,08	98,98
20	A43	PB06	DB01	2,00	2,22	2,28	2,16	4	2,17		0,12	5,56	99,10
21	F02x	PD02	DB08	2,21	2,11	2,23	2,13	4	2,17		0,06	2,71	99,33
22	F25x	PB06	DB08	2,18	2,20	2,17	2,14	4	2,17		0,02	1,13	99,42
23	A45x	PB99	DB08	2,19	2,17	2,18	2,18	4	2,18		0,01	0,37	99,79
24	A47x	PD01	DB08	2,18	2,21	2,17	2,17	4	2,18		0,02	0,87	99,90
25	F03	PD02	DB08	2,16	2,15	2,23	2,19	4	2,18		0,04	1,65	99,90
26	F05x	PD02	DB08	2,20	2,19	2,20	2,20	4	2,20		0,01	0,23	100,59
27	F18x	PD99	DB08	2,21	2,20	2,19	2,20	4	2,20		0,01	0,37	100,70
28	A57	PZ02	DD02	2,18	2,18	2,20	2,25	4	2,20		0,03	1,50	100,82
29	A82	PC01	DB08	2,26	2,24	2,21	2,12	4	2,21		0,06	2,80	101,04
30	A65	PD01	DB08	2,19	2,21	2,23	2,20	4	2,21		0,02	0,80	101,08
31	A71	PB03	DB02	2,21	2,19	2,23	2,21	4	2,21		0,02	0,76	101,15
32	A79	PD03	DB10	2,16	2,17	2,27	2,27	4	2,22		0,06	2,74	101,62
33	F14x	PC01	DB08	2,22	2,23	2,23	2,22	4	2,22		0,01	0,30	101,78
34	F12x	PC01	DB08	2,25	2,23	2,23	2,19	4	2,23		0,03	1,13	101,85
35	A39	PD02	DB08	2,24	2,20	2,26	2,21	4	2,23		0,03	1,26	101,85
36	F28x	PD02	DB08	2,23	2,25	2,27	2,19	4	2,23		0,03	1,37	102,26
37	F01x	PB04	DB01	2,26	2,25	2,24	2,25	4	2,25		0,01	0,36	102,99
38	F08x	PZ99	DB09	2,27	2,28	2,29	2,17	4	2,25		0,06	2,47	103,10
39	A88	PD01	DB08	2,26	2,27	2,26	2,26	4	2,26		0,01	0,29	103,55
40	F16x	PC01	DB08	2,33	2,24	2,25	2,32	4	2,29		0,05	1,98	104,59
41	A94	PB06	DB08	2,30	2,27	2,29	2,28	4	2,29		0,01	0,56	104,59
42	A53	PZ02	DD02	2,28	2,30	2,29	2,29	4	2,29		0,01	0,36	104,82
43	A42	PB04	DB01	2,27	2,26	2,32	2,31	4	2,29		0,03	1,22	104,83
44	A60x	PD01	DB10	2,30	2,32	2,29	2,27	4	2,30		0,02	0,91	105,05
45	F15x	PC01	DB08	2,31	2,30	2,30	2,31	4	2,31		0,01	0,25	105,51
46	F09	PZ02	DD02	2,28	2,32	2,38	2,42	4	2,35		0,06	2,65	107,57
47	F26x	PD02	DB08	2,61	2,50	2,56	2,46	0	2,53	*b* *	0,07	2,61	115,92
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	n	Mean	s_r	CV_r
all labs	**166**	**2,18**	**0,032**	**1,446**
10	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
42	**0,088**	**4,042**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Mg **Sample: 2** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	F21x	PD02	DB09	0,47	0,47	0,46	0,46	0	0,47	*b*	*	0,01	1,24	55,59
2	A85x	PC02	DB08	0,62	*0,638a*	0,62	0,62	0	0,62	*b*	*	0,00	0,16	74,24
3	S22	PB06	DB08	0,71	0,73	0,72	0,71	0	0,72	*b*	*	0,01	1,33	85,77
4	F28x	PD02	DB08	0,77	0,78	0,75	0,74	4	0,76			0,02	2,38	90,65
5	F24x	PB03	DB01	0,76	0,77	0,79	0,79	4	0,78			0,01	1,52	92,98
6	A49	PD05	DB08	0,78	0,78	0,78	0,78	4	0,78			0,00	0,00	93,25
7	A56	PC01	DB08	0,77	0,78	0,79	0,79	4	0,78			0,01	1,06	93,40
8	A59	PC01	DB08	0,75	0,81	0,80	0,77	4	0,78			0,03	3,52	93,55
9	F27x	PD01	DB01	0,79	0,78	0,78	0,80	4	0,79			0,01	1,26	94,01
10	F19x	PD02	DB08	0,80	0,79	0,80	0,80	4	0,80			0,01	0,70	95,31
11	A61x	PB02	DB08	0,80	0,80	0,79	0,80	4	0,80			0,01	0,63	95,34
12	F07x	PD02	DB08	0,79	0,83	0,77	0,84	4	0,81			0,03	4,07	96,56
13	F29x	PD02	DB01	0,82	0,80	0,82	0,80	4	0,81			0,01	1,43	96,83
14	A36	PD02	DB08	0,81	0,81	0,82	0,81	4	0,81			0,00	0,62	97,13
15	A62x	PD02	DB01	0,83	0,85	0,78	0,84	4	0,83			0,03	3,77	98,63
16	F03	PD02	DB08	0,82	0,82	0,83	0,83	4	0,83			0,01	0,70	98,63
17	F32x	PD02	DB08	0,82	0,84	0,82	0,82	4	0,83			0,01	1,20	98,72
18	A82	PC01	DB08	0,83	0,83	0,83	0,83	4	0,83			0,00	0,33	99,10
19	F13x	PD01	DB08	0,83	0,83	0,83	0,83	4	0,83			0,00	0,00	99,22
20	F06x	PD02	DB08	0,83	0,84	0,83	0,83	4	0,83			0,00	0,54	99,37
21	F16x	PC01	DB08	0,83	0,84	0,83	0,82	4	0,83			0,01	1,12	99,39
22	F12x	PC01	DB08	0,85	0,84	0,82	0,82	4	0,83			0,02	1,91	99,58
23	A57	PZ02	DD02	0,82	0,88	0,81	0,83	4	0,84			0,03	3,72	99,82
24	F18x	PD99	DB08	0,84	0,84	0,84	0,84	4	0,84			0,00	0,18	100,03
25	A65	PD01	DB08	0,82	0,85	0,84	0,85	4	0,84			0,01	1,36	100,15
26	F33x	PD01	DB10	0,88	0,82	0,82	0,84	4	0,84			0,03	3,45	100,21
27	A39	PD02	DB08	0,84	0,84	0,85	0,83	4	0,84			0,01	1,17	100,41
28	A60x	PD01	DB10	0,83	0,85	0,83	0,85	4	0,84			0,01	1,44	100,42
29	F14x	PC01	DB08	0,84	0,84	0,85	0,84	4	0,84			0,00	0,24	100,75
30	A45x	PB99	DB08	0,85	0,85	0,85	0,84	4	0,85			0,00	0,32	101,02
31	A47x	PD01	DB08	0,83	0,85	0,84	0,87	4	0,85			0,02	2,02	101,32
32	A43	PB06	DB01	0,87	0,87	0,81	0,85	4	0,85			0,03	3,01	101,35
33	F02x	PD02	DB08	0,84	0,86	0,83	0,87	4	0,85			0,02	2,15	101,61
34	F05x	PD02	DB08	0,86	0,85	0,85	0,85	4	0,85			0,00	0,24	102,00
35	A42	PB04	DB01	0,85	0,85	0,86	0,87	4	0,86			0,01	1,35	102,51
36	A94	PB06	DB08	0,86	0,87	0,86	0,86	4	0,86			0,00	0,34	103,05
37	F08x	PZ99	DB09	0,86	0,87	0,88	0,84	4	0,86			0,02	1,98	103,11
38	A79	PD03	DB10	0,84	0,84	0,89	0,89	4	0,86			0,03	2,91	103,26
39	A90	PD01	DB09	0,85	0,87	0,83	0,92	4	0,87			0,04	4,30	103,56
40	F25x	PB06	DB08	0,87	0,87	0,87	0,87	4	0,87			0,00	0,27	103,95
41	F15x	PC01	DB08	0,88	0,86	0,87	0,87	4	0,87			0,01	0,94	104,01
42	A88	PD01	DB08	0,86	0,89	0,87	0,87	4	0,87			0,01	1,37	104,13
43	A71	PB03	DB02	0,85	0,87	0,89	0,89	4	0,87			0,02	2,21	104,33
44	F01x	PB04	DB01	0,86	0,88	0,89	0,87	4	0,88			0,01	1,48	104,60
45	F09	PZ02	DD02	0,88	0,88	0,89	0,89	4	0,89			0,01	0,65	105,80
46	A53	PZ02	DD02	0,89	0,89	0,91	0,89	4	0,90			0,01	1,12	106,99
47	F26x	PD02	DB08	0,93	0,94	0,90	0,91	4	0,92			0,02	1,98	109,98
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	n	Mean	s_r	CV_r
all labs	**176**	**0,84**	**0,013**	**1,521**
10	% from the mean			
	l		s_R	CV_R
	44		**0,034**	**4,083**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Mg **Sample: 3** Unit: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					s_i	V_i	%
1	F21x	PD02	DB09	0,62	0,57	0,64	0,60	0	0,61	*b*	*	0,03	4,92	56,64
2	A85x	PC02	DB08	0,85	0,93	0,87	0,98	4	0,91		*	0,06	6,29	84,56
3	A62x	PD02	DB01	0,96	0,90	1,00	0,85	4	0,93		*	0,07	7,12	86,47
4	S22	PB06	DB08	0,95	0,96	0,95	0,92	4	0,95		*	0,02	1,83	88,10
5	F09	PZ02	DD02	0,94	0,95	0,96	0,98	4	0,96		*	0,02	1,78	89,27
6	A59	PC01	DB08	0,88	1,07	1,01	0,94	4	0,98			0,08	8,48	90,90
7	A49	PD05	DB08	0,95	0,99	0,96	1,01	4	0,98			0,03	2,82	91,13
8	F27x	PD01	DB01	1,00	0,98	0,97	0,98	4	0,98			0,01	1,43	91,54
9	F28x	PD02	DB08	1,02	0,99	1,02	1,04	4	1,02			0,02	2,27	94,81
10	A82	PC01	DB08	1,04	0,96	0,99	1,09	4	1,02			0,06	5,86	95,00
11	F07x	PD02	DB08	1,05	1,00	0,99	1,06	4	1,02			0,03	3,33	95,26
12	F19x	PD02	DB08	0,97	1,02	1,06	1,05	4	1,03			0,04	3,90	95,58
13	A36	PD02	DB08	1,04	1,03	1,03	1,04	4	1,04			0,01	0,56	96,49
14	F32x	PD02	DB08	1,04	1,03	1,03	1,04	4	1,04			0,01	0,56	96,49
15	F18x	PD99	DB08	1,04	1,06	1,07	1,05	4	1,06			0,01	1,22	98,35
16	F06x	PD02	DB08	1,06	1,05	1,08	1,05	4	1,06			0,01	1,16	98,66
17	F13x	PD01	DB08	1,06	1,06	1,06	1,06	4	1,06			0,00	0,00	98,82
18	A90	PD01	DB09	1,10	1,07	1,11	0,98	4	1,06			0,06	5,28	99,22
19	F29x	PD02	DB01	1,06	1,08	1,08	1,04	4	1,07			0,02	1,80	99,29
20	F12x	PC01	DB08	1,06	1,07	1,05	1,08	4	1,07			0,01	1,21	99,29
21	F16x	PC01	DB08	1,06	1,10	1,04	1,07	4	1,07			0,03	2,40	99,78
22	A43	PB06	DB01	1,08	1,02	1,13	1,08	4	1,08			0,04	4,10	100,34
23	A65	PD01	DB08	1,05	1,10	1,06	1,09	4	1,08			0,02	2,12	100,48
24	A47x	PD01	DB08	1,06	1,06	1,09	1,11	4	1,08			0,02	2,27	100,69
25	A60x	PD01	DB10	1,08	1,08	1,09	1,08	4	1,08			0,01	0,46	100,92
26	A39	PD02	DB08	1,08	1,08	1,11	1,07	4	1,09			0,02	1,75	101,15
27	A56	PC01	DB08	1,08	1,19	1,06	1,01	4	1,09			0,08	6,97	101,27
28	F24x	PB03	DB01	0,96	1,12	1,12	1,17	4	1,09			0,09	8,44	101,59
29	F01x	PB04	DB01	1,11	1,11	1,10	1,07	4	1,10			0,02	1,72	102,32
30	A71	PB03	DB02	1,10	1,12	1,08	1,10	4	1,10			0,02	1,48	102,34
31	F03	PD02	DB08	1,09	1,07	1,12	1,13	4	1,10			0,03	2,50	102,78
32	A42	PB04	DB01	1,09	1,12	1,11	1,10	4	1,11			0,01	1,00	103,06
33	A79	PD03	DB10	1,07	1,09	1,11	1,17	4	1,11			0,04	3,94	103,39
34	F14x	PC01	DB08	1,15	1,13	1,03	1,13	4	1,11			0,05	4,78	103,62
35	A61x	PB02	DB08	1,08	1,11	1,18	1,09	4	1,12			0,05	4,04	103,95
36	F08x	PZ99	DB09	1,11	1,16	1,14	1,06	4	1,12			0,04	3,89	104,18
37	F05x	PD02	DB08	1,12	1,12	1,10	1,13	4	1,12			0,01	1,13	104,18
38	F15x	PC01	DB08	1,13	1,13	1,11	1,13	4	1,13			0,01	0,89	104,88
39	F33x	PD01	DB10	1,11	1,17	1,16	1,07	4	1,13			0,05	4,08	105,02
40	A45x	PB99	DB08	1,13	1,15	1,11	1,13	4	1,13			0,02	1,45	105,35
41	F26x	PD02	DB08	1,12	1,16	1,13	1,11	4	1,13			0,02	1,91	105,35
42	F25x	PB06	DB08	1,15	1,16	1,12	1,14	4	1,14			0,02	1,52	106,61
43	F02x	PD02	DB08	1,10	1,16	1,12	1,21	4	1,15			0,05	4,29	106,91
44	A88	PD01	DB08	1,15	1,15	1,15	1,15	4	1,15			0,00	0,23	107,14
45	A57	PZ02	DD02	1,22	1,21	1,09	1,08	4	1,15			0,08	6,55	107,21
46	A94	PB06	DB08	1,19	1,20	1,19	1,15	4	1,18		*	0,02	1,88	110,24
47	A53	PZ02	DD02	1,25	1,24	1,24	1,25	4	1,25		*	0,01	0,46	116,07
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	n	Mean	s_r	CV_r
all labs	**184**	**1,07**	**0,031**	**2,858**
10	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
46	**0,068**	**6,345**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Mg **Sample: 4** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	F21x	PD02	DB09	1,67	1,60	1,57	1,59	0	1,61	*b*	*	0,04	2,71	70,63
2	A85x	PC02	DB08	1,64	1,77	1,69	1,72	0	1,70	*b*	*	0,05	3,09	74,87
3	A59	PC01	DB08	1,60	2,02	2,08	1,84	0	1,89	*b*	*	0,22	**11,44**	82,82
4	S22	PB06	DB08	1,93	1,96	1,99	1,87	0	1,94	*b*	*	0,05	2,64	85,13
5	F33x	PD01	DB10	2,03	2,11	2,13	2,05	4	2,08			0,05	2,43	91,33
6	A62x	PD02	DB01	2,05	2,07	2,07	2,20	4	2,10			0,07	3,29	92,16
7	F27x	PD01	DB01	2,11	2,09	2,15	2,06	4	2,10			0,04	1,76	92,38
8	A61x	PB02	DB08	2,12	2,09	2,12	2,10	4	2,11			0,02	0,71	92,60
9	A36	PD02	DB08	2,13	2,19	2,14	2,22	4	2,17			0,04	1,96	95,35
10	A43	PB06	DB01	2,18	2,18	2,23	2,20	4	2,20			0,02	1,08	96,56
11	F19x	PD02	DB08	2,20	2,16	2,23	2,21	4	2,20			0,03	1,34	96,67
12	F03	PD02	DB08	2,18	2,17	2,23	2,22	4	2,20			0,03	1,34	96,67
13	F07x	PD02	DB08	2,19	2,25	2,18	2,20	4	2,20			0,03	1,48	96,76
14	F08x	PZ99	DB09	2,30	2,25	2,18	2,12	4	2,21			0,08	3,50	97,26
15	F02x	PD02	DB08	2,24	2,26	2,25	2,21	4	2,24			0,02	0,96	98,42
16	A39	PD02	DB08	2,31	2,23	2,22	2,22	4	2,24			0,04	1,88	98,59
17	A47x	PD01	DB08	2,23	2,23	2,27	2,25	4	2,25			0,02	0,85	98,64
18	A42	PB04	DB01	2,23	2,21	2,29	2,26	4	2,25			0,03	1,51	98,79
19	A88	PD01	DB08	2,23	2,28	2,26	2,24	4	2,25			0,02	1,00	99,04
20	F29x	PD02	DB01	2,27	2,28	2,24	2,24	4	2,26			0,02	0,91	99,19
21	F32x	PD02	DB08	2,28	2,26	2,27	2,26	4	2,27			0,01	0,42	99,63
22	F28x	PD02	DB08	2,25	2,26	2,29	2,30	4	2,28			0,02	1,05	99,97
23	F18x	PD99	DB08	2,28	2,29	2,26	2,29	4	2,28			0,01	0,62	100,18
24	A82	PC01	DB08	2,26	2,29	2,35	2,23	4	2,28			0,05	2,24	100,29
25	F13x	PD01	DB08	2,30	2,29	2,27	2,28	4	2,29			0,01	0,56	100,40
26	F06x	PD02	DB08	2,27	2,29	2,30	2,29	4	2,29			0,01	0,55	100,44
27	A56	PC01	DB08	2,33	2,28	2,29	2,25	4	2,29			0,03	1,39	100,44
28	F01x	PB04	DB01	2,28	2,30	2,26	2,31	4	2,29			0,02	0,97	100,51
29	F26x	PD02	DB08	2,31	2,28	2,28	2,30	4	2,29			0,02	0,65	100,73
30	A65	PD01	DB08	2,29	2,27	2,29	2,34	4	2,30			0,03	1,13	100,98
31	F24x	PB03	DB01	2,26	2,29	2,36	2,30	4	2,30			0,05	1,97	101,10
32	A60x	PD01	DB10	2,32	2,23	2,30	2,36	4	2,30			0,05	2,36	101,17
33	F05x	PD02	DB08	2,29	2,32	2,31	2,32	4	2,31			0,01	0,61	101,50
34	A53	PZ02	DD02	2,34	2,32	2,31	2,33	4	2,33			0,01	0,56	102,16
35	F25x	PB06	DB08	2,33	2,32	2,33	2,32	4	2,33			0,00	0,17	102,23
36	F16x	PC01	DB08	2,33	2,32	2,34	2,33	4	2,33			0,01	0,26	102,37
37	A94	PB06	DB08	2,34	2,34	2,33	2,32	4	2,33			0,01	0,41	102,49
38	A45x	PB99	DB08	2,36	2,35	2,32	2,33	4	2,34			0,02	0,78	102,82
39	F12x	PC01	DB08	2,32	2,36	2,32	2,37	4	2,34			0,03	1,12	102,93
40	A49	PD05	DB08	2,28	2,24	2,53	2,33	4	2,35			0,13	5,49	103,04
41	F14x	PC01	DB08	2,37	2,34	2,36	2,35	4	2,35			0,01	0,55	103,37
42	A90	PD01	DB09	2,43	2,32	2,44	2,31	4	2,37			0,07	2,91	104,29
43	A71	PB03	DB02	2,46	2,44	2,37	2,39	4	2,41			0,04	1,55	106,09
44	A57	PZ02	DD02	2,40	2,42	2,42	2,43	4	2,42			0,01	0,52	106,22
45	F15x	PC01	DB08	2,46	2,45	2,45	*2,5a*	3	2,45			0,01	0,24	107,80
46	F09	PZ02	DD02	2,43	2,46	2,49	2,49	4	2,47			0,03	1,16	108,42
47	A79	PD03	DB10	2,63	2,61	2,70	2,70	0	2,66	*b*	*	0,05	1,85	116,87
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	n	Mean	s_r	CV_r
all labs	**167**	**2,28**	**0,030**	**1,331**
10	% from the mean			
	l		s_R	CV_R
	42		**0,089**	**3,900**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: K **Sample: 1** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A43	PB06	DB01	12,25	13,52	14,99	13,59	0	13,59	*b*	*	1,12	8,24	53,00
2	S22	PB06	DB08	18,26	18,10	18,09	18,50	0	18,24	*b*	*	0,19	1,05	71,14
3	F33x	PD01	DB10	19,66	21,93	19,09	21,69	0	20,60	*b*	*	1,43	6,94	80,34
4	A85x	PC02	DB08	20,02	21,56	20,02	20,97	0	20,64	*b*	*	0,76	3,67	80,53
5	A82	PC01	DB08	23,10	22,10	21,20	22,10	0	22,13	*b*	*	0,78	3,51	86,31
6	F13x	PZ02	DD01	22,95	23,00	22,97	22,98	4	22,98		*	0,02	0,09	89,62
7	F25x	PB06	DB08	23,39	23,70	23,56	23,82	4	23,62			0,19	0,78	92,13
8	A59	PC01	DB08	*20,4a*	23,90	23,60	23,70	3	23,73			0,15	0,64	92,58
9	A79	PD03	DB10	24,82	24,85	23,91	23,41	4	24,25			0,71	2,93	94,59
10	A49	PD05	DB08	24,52	24,37	24,33	24,08	4	24,33			0,18	0,75	94,89
11	A88	PD01	DB08	24,38	24,30	24,34	24,36	4	24,34			0,03	0,13	94,96
12	A62x	PD02	DB01	26,23	24,13	23,62	24,53	4	24,63			1,13	4,59	96,07
13	F21x	PD02	DB09	25,12	24,64	24,95	24,75	4	24,87			0,21	0,86	97,00
14	F19x	PD02	DB08	24,60	25,30	24,70	24,90	4	24,88			0,31	1,24	97,04
15	A65	PC01	DB08	25,02	24,97	25,15	25,05	4	25,05			0,08	0,30	97,71
16	A36	PD02	DB08	24,60	24,52	25,12	26,00	4	25,06			0,68	2,72	97,76
17	F27x	PD01	DB06	24,64	25,10	24,96	25,73	4	25,11			0,46	1,81	97,95
18	F24x	PB03	DB01	24,76	25,04	25,32	25,32	4	25,11			0,27	1,08	97,96
19	A61x	PB02	DB08	25,22	25,22	25,18	25,27	4	25,22			0,04	0,15	98,39
20	A57	PZ02	DD02	25,16	24,98	25,32	25,45	4	25,23			0,20	0,81	98,41
21	A71	PB03	DB01	25,29	25,41	25,16	25,66	4	25,38			0,21	0,83	99,00
22	F28x	PD02	DB08	25,25	25,79	25,42	25,10	4	25,39			0,30	1,17	99,05
23	A42	PB04	DB01	25,49	25,68	25,44	25,39	4	25,50			0,12	0,49	99,47
24	A47x	PD01	DB08	25,50	25,55	25,79	25,70	4	25,64			0,13	0,52	100,00
25	A56	PC01	DB08	25,92	25,83	25,42	25,42	4	25,65			0,27	1,04	100,05
26	F07x	PD02	DB08	25,20	26,25	26,44	24,81	4	25,68			0,79	3,09	100,16
27	F29x	PD02	DB01	25,86	25,55	25,99	25,38	4	25,70			0,28	1,09	100,24
28	A53	PZ02	DD02	25,70	25,70	25,80	25,80	4	25,75			0,06	0,22	100,45
29	F01x	PB04	DB01	26,03	26,01	25,44	25,60	4	25,77			0,30	1,15	100,53
30	F08x	PZ99	DB08	26,36	26,10	25,65	25,42	4	25,88			0,43	1,64	100,97
31	A90	PD01	DB10	26,66	25,50	26,02	25,45	4	25,91			0,57	2,18	101,06
32	A39	PD02	DB08	26,01	25,87	26,40	25,73	4	26,00			0,29	1,11	101,44
33	F32x	PD02	DB08	26,00	25,80	25,90	26,40	4	26,03			0,26	1,01	101,52
34	F05x	PD02	DB08	26,40	26,00	26,30	25,50	4	26,05			0,40	1,55	101,62
35	F09	PZ02	DD02	25,35	25,93	26,39	26,85	4	26,13			0,64	2,45	101,93
36	A45x	PB99	DB08	26,20	26,30	26,10	26,20	4	26,20			0,08	0,31	102,21
37	F26x	PC02	DB08	26,22	26,18	26,29	26,24	4	26,23			0,05	0,17	102,33
38	A94	PB06	DB08	26,40	26,40	26,30	26,20	4	26,33			0,10	0,36	102,69
39	F06x	PD02	DB08	26,77	26,43	26,02	26,40	4	26,41			0,31	1,16	103,00
40	F02x	PD02	DB08	26,60	25,69	26,78	26,72	4	26,45			0,51	1,93	103,17
41	F18x	PD99	DB08	26,50	26,60	26,50	26,70	4	26,58			0,10	0,36	103,67
42	F03	PD02	DB08	26,77	26,63	27,13	26,84	4	26,84			0,21	0,78	104,71
43	F15x	PC01	DB08	26,75	26,96	27,04	26,99	4	26,94			0,13	0,47	105,07
44	F16x	PC01	DB08	26,99	27,00	27,42	26,38	4	26,95			0,43	1,59	105,12
45	F12x	PC01	DB08	27,55	27,06	26,91	26,68	4	27,05			0,37	1,36	105,52
46	A60x	PD01	DB10	27,40	27,60	27,10	26,80	4	27,23			0,35	1,29	106,20
47	F14x	PC01	DB08	28,19	28,51	27,98	28,02	4	28,17			0,24	0,85	109,90
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	n	Mean	s_r	CV_r
all labs	**167**	**25,63**	**0,299**	**1,167**
10	% from the mean			

l	s_R	CV_R
42	**1,036**	**4,041**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: K **Sample: 2** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A85x	PC02	DB08	4,33	4,39	4,26	4,24	0	4,31	*b*	*	0,07	1,60	79,16
2	F21x	PD02	DB09	4,52	4,55	4,48	4,50	0	4,51	*b*	*	0,03	0,66	82,94
3	A82	PC01	DB08	4,63	4,61	4,68	4,76	4	4,67		*	0,07	1,43	85,84
4	S22	PB06	DB08	4,85	4,95	4,96	4,85	4	4,90			0,06	1,24	90,11
5	F07x	PD02	DB08	5,02	5,08	4,97	4,84	4	4,97			0,10	2,04	91,44
6	A49	PD05	DB08	5,01	5,04	4,99	5,03	4	5,02			0,02	0,44	92,22
7	F27x	PD01	DB06	5,14	5,10	5,02	5,23	4	5,12			0,09	1,71	94,11
8	A59	PC01	DB08	4,90	5,30	5,30	5,00	4	5,13			0,21	4,02	94,20
9	A88	PD01	DB08	5,15	5,32	5,23	5,19	4	5,22			0,07	1,40	95,98
10	F19x	PD02	DB08	5,21	5,19	5,23	5,26	4	5,22			0,03	0,57	95,99
11	A36	PD02	DB08	5,19	5,21	5,28	5,25	4	5,23			0,04	0,77	96,18
12	F26x	PC02	DB08	5,32	5,17	5,29	5,17	4	5,24			0,08	1,51	96,27
13	F33x	PD01	DB10	5,40	5,14	5,29	5,20	4	5,26			0,11	2,10	96,63
14	A79	PD03	DB10	5,22	5,52	5,13	5,46	4	5,33			0,19	3,50	97,99
15	A47x	PD01	DB08	5,38	5,29	5,32	5,35	4	5,34			0,04	0,73	98,06
16	A61x	PB02	DB08	5,34	5,36	5,32	5,38	4	5,35			0,03	0,48	98,34
17	A57	PZ02	DD02	5,32	5,47	5,34	5,36	4	5,37			0,07	1,25	98,75
18	F06x	PD02	DB08	5,39	5,40	5,37	5,35	4	5,38			0,02	0,42	98,83
19	F18x	PD99	DB08	5,41	5,42	5,38	5,42	4	5,41			0,02	0,35	99,39
20	F29x	PD02	DB01	5,50	5,43	5,47	5,35	4	5,44			0,07	1,20	99,94
21	F28x	PD02	DB08	5,64	5,43	5,43	5,28	4	5,44			0,15	2,71	100,05
22	A56	PC01	DB08	5,49	5,45	5,52	5,43	4	5,47			0,04	0,73	100,56
23	A65	PC01	DB08	5,40	5,48	5,47	5,56	4	5,48			0,07	1,20	100,68
24	F16x	PC01	DB08	5,50	5,54	5,42	5,49	4	5,48			0,05	0,93	100,81
25	A39	PD02	DB08	5,52	5,48	5,39	5,56	4	5,49			0,07	1,30	100,91
26	A71	PB03	DB01	5,48	5,43	5,59	5,48	4	5,49			0,07	1,23	100,98
27	F01x	PB04	DB01	5,52	5,47	5,54	5,45	4	5,50			0,04	0,76	101,00
28	F08x	PZ99	DB08	5,45	5,43	5,47	5,72	4	5,52			0,14	2,46	101,41
29	F05x	PD02	DB08	5,52	5,55	5,52	5,54	4	5,53			0,02	0,27	101,69
30	A45x	PB99	DB08	5,52	5,58	5,57	5,51	4	5,55			0,04	0,63	101,92
31	A90	PD01	DB10	5,43	5,58	5,54	5,69	4	5,56			0,11	1,89	102,16
32	A62x	PD02	DB01	5,58	5,49	5,67	5,52	4	5,57			0,08	1,43	102,29
33	F12x	PC01	DB08	5,68	5,61	5,52	5,47	4	5,57			0,09	1,68	102,38
34	F24x	PB03	DB01	5,56	5,56	5,57	5,61	4	5,57			0,02	0,41	102,42
35	A94	PB06	DB08	5,58	5,60	5,55	5,56	4	5,57			0,02	0,37	102,44
36	F15x	PC01	DB08	5,68	5,53	5,54	5,58	4	5,58			0,07	1,23	102,61
37	A60x	PD01	DB10	5,50	5,66	5,55	5,69	4	5,60			0,09	1,60	102,93
38	A42	PB04	DB01	5,61	5,70	5,56	5,67	4	5,63			0,06	1,13	103,55
39	F25x	PB06	DB08	5,63	5,68	5,65	5,65	4	5,65			0,02	0,37	103,92
40	F03	PD02	DB08	5,60	5,74	5,72	5,56	4	5,66			0,09	1,57	103,94
41	F09	PZ02	DD02	5,58	5,62	5,69	5,75	4	5,66			0,08	1,33	104,03
42	F14x	PC01	DB08	5,73	5,63	5,67	5,63	4	5,66			0,05	0,81	104,10
43	A53	PZ02	DD02	5,65	5,69	5,71	5,69	4	5,69			0,03	0,44	104,49
44	F32x	PD02	DB08	5,91	5,97	5,75	5,80	4	5,86			0,10	1,72	107,66
45	F13x	PZ02	DD01	5,88	5,92	5,93	5,93	4	5,92			0,02	0,40	108,72
46	F02x	PD02	DB08	6,19	6,26	5,72	5,63	0	5,95	*c*		0,32	5,39	109,36
47	A43	PB06	DB01	6,29	6,10	5,90	6,10	4	6,10		*	0,16	2,61	112,07
48														
49														
50														
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	n	Mean	s_r	CV_r
all labs	**176**	**5,44**	**0,069**	**1,276**
10	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
44	**0,265**	**4,869**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: K **Sample: 3** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F21x	PD02	DB09	5,73	5,56	5,89	5,69	4	5,72	*	0,14	2,38	82,52
2	A82	PC01	DB08	5,85	5,74	5,76	6,34	4	5,92	*	0,28	4,77	85,48
3	A85x	PC02	DB08	5,78	6,45	6,01	6,38	4	6,15	*	0,32	5,13	88,80
4	F07x	PD02	DB08	6,38	6,16	6,33	6,04	4	6,23	*	0,16	2,49	89,90
5	A49	PD05	DB08	6,27	6,44	6,29	6,38	4	6,35		0,08	1,25	91,58
6	S22	PB06	DB08	6,19	6,49	6,46	6,41	4	6,39		0,14	2,13	92,19
7	F33x	PD01	DB10	7,18	6,09	6,51	5,98	0	6,44	*c*	0,55	8,47	92,93
8	F27x	PD01	DB06	6,59	6,27	6,58	6,32	4	6,44		0,17	2,65	92,95
9	A59	PC01	DB08	5,90	6,70	6,80	6,50	4	6,48		0,40	6,23	93,45
10	A36	PD02	DB08	6,69	6,71	6,62	6,61	4	6,66		0,05	0,75	96,09
11	F26x	PC02	DB08	6,50	6,55	6,78	6,86	4	6,67		0,17	2,62	96,31
12	F19x	PD02	DB08	6,53	6,67	6,76	6,81	4	6,69		0,12	1,84	96,59
13	A79	PD03	DB10	7,10	6,80	6,43	6,64	4	6,74		0,28	4,18	97,32
14	A47x	PD01	DB08	6,59	6,65	6,91	6,88	4	6,76		0,16	2,38	97,53
15	F29x	PD02	DB01	6,73	7,05	6,62	6,67	4	6,77		0,19	2,86	97,68
16	A62x	PD02	DB01	6,87	6,59	7,28	6,45	4	6,80		0,37	5,38	98,11
17	F06x	PD02	DB08	6,83	6,75	6,82	6,79	4	6,80		0,03	0,49	98,13
18	F16x	PC01	DB08	6,75	6,75	6,88	6,86	4	6,81		0,07	1,01	98,32
19	F01x	PB04	DB01	6,83	6,95	6,73	6,77	4	6,82		0,10	1,41	98,43
20	A56	PC01	DB08	6,78	7,10	6,83	6,61	4	6,83		0,20	2,98	98,53
21	A42	PB04	DB01	6,79	6,96	6,94	6,95	4	6,91		0,08	1,18	99,75
22	A88	PD01	DB08	7,00	6,85	6,93	6,96	4	6,94		0,07	0,97	100,09
23	F18x	PD99	DB08	6,94	6,92	6,94	6,94	4	6,94		0,01	0,14	100,09
24	F09	PZ02	DD02	6,80	6,88	6,96	7,11	4	6,94		0,13	1,91	100,13
25	F08x	PZ99	DB08	6,98	6,95	7,05	6,86	4	6,96		0,08	1,13	100,45
26	F28x	PD02	DB08	7,10	6,72	6,99	7,08	4	6,97		0,18	2,51	100,60
27	A65	PC01	DB08	6,88	7,10	6,95	7,11	4	7,01		0,11	1,62	101,18
28	A90	PD01	DB10	7,31	6,94	7,37	6,91	4	7,13		0,24	3,43	102,93
29	F24x	PB03	DB01	7,06	7,17	7,24	7,18	4	7,16		0,08	1,07	103,37
30	F12x	PC01	DB08	7,15	7,27	7,11	7,13	4	7,17		0,07	1,00	103,41
31	A71	PB03	DB01	7,12	7,18	7,29	7,07	4	7,17		0,10	1,33	103,43
32	A60x	PD01	DB10	7,10	7,19	7,20	7,21	4	7,18		0,05	0,71	103,56
33	F15x	PC01	DB08	7,20	7,27	6,94	7,32	4	7,18		0,17	2,35	103,67
34	F05x	PD02	DB08	7,17	7,17	7,19	7,20	4	7,18		0,02	0,21	103,67
35	A57	PZ02	DD02	7,35	7,33	7,25	6,96	4	7,22		0,18	2,50	104,24
36	A61x	PB02	DB08	7,14	7,24	7,41	7,12	4	7,23		0,13	1,83	104,32
37	A39	PD02	DB08	7,37	7,05	7,26	7,24	4	7,23		0,13	1,82	104,37
38	A45x	PB99	DB08	7,24	7,27	7,27	7,18	4	7,24		0,04	0,59	104,50
39	F25x	PB06	DB08	7,27	7,24	7,23	7,30	4	7,26		0,03	0,43	104,76
40	F14x	PC01	DB08	7,35	7,35	7,11	7,34	4	7,29		0,12	1,65	105,16
41	F03	PD02	DB08	7,31	7,37	7,25	7,40	4	7,33		0,07	0,91	105,83
42	A94	PB06	DB08	7,40	7,36	7,39	7,26	4	7,35		0,06	0,87	106,12
43	F02x	PD02	DB08	7,34	7,50	7,42	7,50	4	7,44		0,08	1,03	107,38
44	A43	PB06	DB01	7,55	7,22	7,68	7,48	4	7,48		0,19	2,59	108,00
45	F32x	PD02	DB08	7,55	7,41	7,56	7,52	4	7,51		0,07	0,92	108,39
46	F13x	PZ02	DD01	7,65	7,47	7,45	7,49	4	7,52		0,09	1,22	108,47
47	A53	PZ02	DD02	7,80	7,86	7,80	7,64	4	7,78	*	0,09	1,21	112,22
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49													
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	n	Mean	s_r	CV_r
all labs	**184**	**6,93**	**0,133**	**1,915**
10	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
46	**0,430**	**6,206**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: K **Sample: 4** Unit: mg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A82	PC01	DB08	1,76	1,73	1,74	1,71	4	1,74	*	0,02	1,20	76,80
2	A85x	PC02	DB08	1,76	1,77	1,79	1,70	4	1,76	*	0,04	2,25	77,72
3	A62x	PD02	DB01	1,76	1,79	1,71	1,94	4	1,80	*	0,10	5,50	79,68
4	F07x	PD02	DB08	1,87	1,91	1,86	1,84	4	1,87	*	0,03	1,70	82,71
5	F33x	PD01	DB10	1,96	1,88	1,89	1,98	4	1,93	*	0,05	2,66	85,29
6	F08x	PZ99	DB08	1,98	1,98	1,92	1,89	4	1,94	*	0,05	2,32	85,99
7	A59	PC01	DB08	1,70	2,10	2,20	2,00	0	2,00	c *	0,22	10,80	88,53
8	F21x	PD02	DB09	2,04	2,04	2,00	2,03	4	2,03	*	0,02	0,93	89,75
9	A88	PD01	DB08	1,98	2,09	2,04	2,01	4	2,03	*	0,04	2,12	89,79
10	F03	PD02	DB08	2,05	2,04	2,07	2,05	4	2,05		0,01	0,61	90,85
11	A94	PB06	DB08	2,08	2,08	2,08	2,06	4	2,08		0,01	0,48	91,85
12	F19x	PD02	DB08	2,11	2,06	2,10	2,09	4	2,09		0,02	1,03	92,51
13	F27x	PD01	DB06	2,10	2,20	2,12	2,10	4	2,13		0,05	2,24	94,26
14	A43	PB06	DB01	2,16	2,09	2,16	2,14	4	2,14		0,03	1,55	94,62
15	A36	PD02	DB08	2,14	2,15	2,10	2,17	4	2,14		0,03	1,38	94,73
16	F18x	PD99	DB08	2,14	2,15	2,14	2,15	4	2,15		0,01	0,27	94,95
17	F05x	PD02	DB08	2,15	2,14	2,15	2,16	4	2,15		0,01	0,38	95,17
18	A39	PD02	DB08	2,16	2,18	2,15	2,13	4	2,16		0,02	0,99	95,45
19	S22	PB06	DB08	2,15	2,16	2,19	2,16	4	2,17		0,02	0,80	95,83
20	F24x	PB03	DB01	2,16	2,19	2,21	2,19	4	2,19		0,02	0,88	96,73
21	A60x	PD01	DB10	2,22	2,16	2,22	2,26	4	2,22		0,04	1,86	98,05
22	A71	PB03	DB01	2,19	2,24	2,24	2,19	4	2,22		0,03	1,37	98,10
23	A57	PZ02	DD02	2,25	2,26	2,25	2,27	4	2,26		0,01	0,42	99,93
24	F29x	PD02	DB01	2,31	2,34	2,22	2,24	4	2,28		0,06	2,49	100,81
25	F06x	PD02	DB08	2,27	2,34	2,32	2,27	4	2,30		0,04	1,60	101,80
26	F28x	PD02	DB08	2,27	2,31	2,33	2,35	4	2,31		0,03	1,40	102,45
27	A47x	PD01	DB08	2,35	2,35	2,27	2,29	4	2,32		0,04	1,78	102,47
28	A56	PC01	DB08	2,40	2,43	2,28	2,36	4	2,36		0,07	2,79	104,63
29	F25x	PB06	DB08	2,37	2,37	2,37	2,39	4	2,38		0,01	0,44	105,13
30	F02x	PD02	DB08	2,38	2,45	2,23	2,55	4	2,40		0,13	5,60	106,35
31	A65	PC01	DB08	2,39	2,35	2,43	2,49	4	2,42		0,06	2,47	106,90
32	F32x	PD02	DB08	2,42	2,43	2,40	2,44	4	2,42		0,02	0,70	107,23
33	F01x	PB04	DB01	2,48	2,37	2,34	2,55	4	2,44		0,10	4,00	107,79
34	F26x	PC02	DB08	2,48	2,58	2,39	2,31	4	2,44		0,12	4,77	108,01
35	A90	PD01	DB10	2,43	2,44	2,50	2,45	4	2,46		0,03	1,27	108,75
36	F16x	PC01	DB08	2,42	2,50	2,46	2,47	4	2,46		0,03	1,38	108,94
37	A79	PD03	DB10	2,47	2,47	2,46	2,46	4	2,47		0,01	0,26	109,20
38	A61x	PB02	DB08	2,48	2,50	2,49	2,43	4	2,48		0,03	1,26	109,56
39	F14x	PC01	DB08	2,52	2,47	2,47	2,45	4	2,48		0,03	1,29	109,65
40	A45x	PB99	DB08	2,51	2,49	2,52	2,41	4	2,48		0,05	2,01	109,89
41	F12x	PC01	DB08	2,48	2,54	2,50	2,54	4	2,52	*	0,03	1,19	111,33
42	A53	PZ02	DD02	2,48	2,55	2,49	2,55	4	2,52	*	0,04	1,50	111,44
43	F15x	PC01	DB08	2,59	2,51	2,50	2,52	4	2,53	*	0,04	1,61	111,99
44	A42	PB04	DB01	2,45	2,59	2,42	2,67	4	2,53	*	0,12	4,63	112,20
45	A49	PD05	DB08	2,50	2,48	2,61	2,56	4	2,54	*	0,06	2,33	112,32
46	F09	PZ02	DD02	2,55	2,55	2,57	2,59	4	2,57	*	0,02	0,75	113,54
47	F13x	PZ02	DD01	2,62	2,64	2,65	2,65	4	2,64	*	0,01	0,54	116,86
48													
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	n	Mean	s_r	CV_r
all labs	**184**	**2,26**	**0,040**	**1,759**
10	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
46	**0,233**	**10,320**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: C **Sample: 1** Unit: g/100g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A59	PZ98	DA02	43,39	*42,24a*	43,50	43,39	3	43,43	*	0,06	0,15	90,07
2	S22	PZ98	DZ99	44,16	43,94	43,81	45,13	4	44,26	*	0,60	1,35	91,80
3	A62x	PZ98	DA01	45,56	45,30	45,19	45,21	4	45,32	*	0,17	0,38	93,99
4	A49x	PZ98	DA99	45,75	45,80	45,72	45,77	4	45,76	*	0,03	0,07	94,91
5	A86x	PZ98	DA01	45,95	45,96	46,02	45,96	4	45,97		0,03	0,07	95,35
6	A71	PB99	DZ99	46,90	46,92	46,89	46,76	4	46,87		0,07	0,16	97,21
7	F02x	PZ98	DA01	48,83	46,52	45,94	46,31	4	46,90		1,31	2,79	97,28
8	F07x	PZ98	DA01	47,03	47,59	46,41	46,94	4	46,99		0,48	1,03	97,47
9	F25x	PZ98	DA01	47,29	47,10	47,10	47,10	4	47,15		0,10	0,20	97,80
10	F33x	PZ98	DA02	47,35	47,32	47,23	47,37	4	47,32		0,06	0,13	98,14
11	F24x	PZ98	DA01	44,62	50,17	46,89	47,74	0	47,36	*c*	2,29	4,84	98,22
12	A82	PZ98	DA02	47,39	47,50	47,39	47,38	4	47,42		0,06	0,12	98,35
13	F06x	PZ98	DA02	47,46	47,45	47,50	47,48	4	47,47		0,02	0,05	98,47
14	F28x	PZ98	DA02	47,60	47,80	48,00	47,20	4	47,65		0,34	0,72	98,83
15	A88	PZ98	DA01	47,34	48,61	47,45	47,52	4	47,73		0,59	1,24	99,00
16	F13x	PZ98	DA01	47,85	47,78	47,85	47,85	4	47,83		0,04	0,07	99,21
17	A61x	PZ98	DA02	47,91	47,89	47,75	47,93	4	47,87		0,08	0,17	99,29
18	A39	PZ98	DA02	47,88	47,94	48,08	47,79	4	47,92		0,12	0,25	99,40
19	F09	PZ98	DA01	48,10	48,00	48,00	48,00	4	48,03		0,05	0,10	99,61
20	F08x	PZ99	DB08	48,10	48,00	48,00	48,00	4	48,03		0,05	0,10	99,61
21	F05x	PZ98	DA01	48,10	48,10	48,10	48,10	4	48,10		0,00	0,00	99,77
22	F27x	PZ98	DA01	48,19	48,36	47,74	48,14	4	48,11		0,26	0,55	99,78
23	F32x	PZ98	DA01	48,30	48,40	48,10	48,10	4	48,23		0,15	0,31	100,03
24	F29x	PZ98	DA99	47,75	48,23	49,05	48,16	4	48,30		0,54	1,13	100,18
25	A45x	PZ98	DA01	48,60	48,50	48,40	48,30	4	48,45		0,13	0,27	100,49
26	F14x	PZ98	DA01	48,50	48,50	48,40	48,40	4	48,45		0,06	0,12	100,49
27	A47x	PZ98	DA02	48,52	48,51	48,85	48,62	4	48,63		0,16	0,32	100,86
28	F12x	PZ98	DA02	48,31	49,10	48,86	48,75	4	48,76		0,33	0,68	101,13
29	F19x	PZ98	DA99	48,40	48,50	49,20	49,10	4	48,80		0,41	0,84	101,22
30	F16x	PZ98	DA02	49,20	49,14	49,24	49,14	4	49,18		0,05	0,10	102,01
31	F26x	PZ98	DA02	49,07	49,22	49,29	49,18	4	49,19		0,09	0,19	102,03
32	A42	PZ98	DA01	49,30	49,38	49,30	49,36	4	49,33		0,04	0,08	102,33
33	F03	PZ98	DA01	49,46	49,30	49,34	49,48	4	49,40		0,09	0,18	102,45
34	F21x	PZ98	DA01	49,38	49,43	49,41	49,37	4	49,40		0,03	0,06	102,46
35	A65	PZ98	DA02	49,69	49,41	49,67	49,59	4	49,59		0,13	0,26	102,86
36	A57	PZ98	DA01	49,60	49,86	49,50	49,42	4	49,60		0,19	0,39	102,87
37	F15x	PZ98	DA01	49,70	49,70	49,70	49,60	4	49,68		0,05	0,10	103,03
38	A60x	PZ98	DA02	50,12	50,23	50,37	50,44	4	50,29		0,14	0,28	104,31
39	A56	PZ98	DA01	51,34	51,73	51,82	51,61	4	51,63	*	0,21	0,40	107,08
40	F18x	PZ98	DA99	51,98	51,92	51,89	52,08	4	51,97	*	0,08	0,16	107,79
41	A85x	PZ98	DA01	52,16	52,52	52,40	52,25	4	52,33	*	0,16	0,30	108,55
42	A94	PZ99	DZ99	56,50	55,20	57,70	52,30	0	55,43	*b* *	2,32	4,19	114,96
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	n	Mean	s_r	CV_r
all labs	**159**	**48,21**	**0,189**	**0,393**
* = non tolerable mean because more than +/- **5** % from the mean				

l	s_R	CV_R
40	**1,804**	**3,744**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: C **Sample: 2** Unit: g/100g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A59	PZ98	DA02	*49,35a*	48,21	48,20	48,17	0	48,19	*b*	*	0,02	0,04	92,98
2	F28x	PZ98	DA02	50,80	50,30	49,90	50,10	4	50,28			0,39	0,77	97,00
3	A49x	PZ98	DA99	50,37	50,14	50,45	50,32	4	50,32			0,13	0,26	97,08
4	A62x	PZ98	DA01	50,61	50,32	50,32	50,44	4	50,42			0,14	0,27	97,28
5	S22	PZ98	DZ99	50,37	50,92	50,85	50,21	4	50,59			0,35	0,69	97,60
6	F24x	PZ98	DA01	50,52	49,99	50,87	51,28	4	50,67			0,55	1,08	97,75
7	A86x	PZ98	DA01	50,92	50,92	50,94	51,00	4	50,95			0,04	0,07	98,29
8	F06x	PZ98	DA02	51,10	51,08	51,10	51,03	4	51,08			0,03	0,06	98,55
9	F07x	PZ98	DA01	51,37	50,80	50,89	51,30	4	51,09			0,29	0,56	98,57
10	A82	PZ98	DA02	51,26	50,97	51,40	51,52	4	51,29			0,24	0,47	98,95
11	F25x	PZ98	DA01	51,33	51,42	51,43	51,45	4	51,41			0,05	0,10	99,18
12	F33x	PZ98	DA02	51,61	51,87	51,59	51,40	4	51,62			0,19	0,37	99,59
13	A71	PB99	DZ99	51,94	51,75	51,55	51,53	4	51,69			0,19	0,37	99,73
14	F32x	PZ98	DA01	51,90	51,80	51,60	51,60	4	51,73			0,15	0,29	99,80
15	F02x	PZ98	DA01	50,94	51,24	51,45	53,50	0	51,78	*c*		1,16	2,25	99,91
16	A61x	PZ98	DA02	51,81	51,77	51,80	51,78	4	51,79			0,02	0,03	99,92
17	A88	PZ98	DA01	51,35	51,30	51,79	52,73	4	51,79			0,66	1,28	99,93
18	F09	PZ98	DA01	51,80	51,80	51,80	51,80	4	51,80			0,00	0,00	99,94
19	F08x	PZ99	DB08	51,80	51,80	51,80	51,80	4	51,80			0,00	0,00	99,94
20	A39	PZ98	DA02	51,85	52,00	51,82	51,83	4	51,88			0,08	0,16	100,08
21	F29x	PZ98	DA99	52,04	51,70	51,52	52,28	4	51,89			0,34	0,66	100,10
22	F13x	PZ98	DA01	51,92	51,87	51,94	51,91	4	51,91			0,03	0,06	100,15
23	A45x	PZ98	DA01	52,00	52,00	52,00	52,00	4	52,00			0,00	0,00	100,33
24	A57	PZ98	DA01	52,20	51,94	51,96	51,94	4	52,01			0,13	0,24	100,34
25	F12x	PZ98	DA02	52,07	51,92	52,19	52,07	4	52,06			0,11	0,21	100,45
26	F14x	PZ98	DA01	52,10	52,00	52,10	52,10	4	52,08			0,05	0,10	100,47
27	A47x	PZ98	DA02	51,71	52,21	52,39	52,09	4	52,10			0,29	0,55	100,52
28	F27x	PZ98	DA01	52,39	52,45	52,18	52,15	4	52,29			0,15	0,29	100,89
29	F16x	PZ98	DA02	52,36	52,32	52,36	52,35	4	52,35			0,02	0,04	101,00
30	F03	PZ98	DA01	52,26	52,22	52,48	52,53	4	52,37			0,16	0,30	101,04
31	F05x	PZ98	DA01	52,30	52,40	52,40	52,40	4	52,38			0,05	0,10	101,05
32	F26x	PZ98	DA02	52,87	52,90	52,90	50,90	0	52,39	*c*		1,00	1,90	101,08
33	F18x	PZ98	DA99	52,68	52,27	52,65	52,29	4	52,47			0,22	0,42	101,24
34	A42	PZ98	DA01	52,53	52,57	52,64	52,46	4	52,55			0,08	0,14	101,39
35	F19x	PZ98	DA99	52,40	52,40	52,70	52,80	4	52,58			0,21	0,39	101,43
36	A65	PZ98	DA02	52,93	52,84	52,92	52,88	4	52,89			0,04	0,08	102,05
37	A60x	PZ98	DA02	53,14	53,28	53,15	53,21	4	53,20			0,06	0,12	102,63
38	F15x	PZ98	DA01	53,20	53,30	53,20	53,10	4	53,20			0,08	0,15	102,64
39	F21x	PZ98	DA01	53,43	53,47	53,41	53,45	4	53,44			0,03	0,05	103,10
40	A85x	PZ98	DA01	55,34	55,40	55,63	55,61	0	55,50	*b*	*	0,15	0,26	107,07
41	A56	PZ98	DA01	*54,96a*	55,81	55,87	55,72	0	55,80	*b*	*	0,08	0,14	107,66
42	A94	PZ99	DZ99	58,60	58,50	57,00	56,30	0	57,60	*b*	*	1,13	1,97	111,13
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	n	Mean	s_r	CV_r
all labs	**144**	**51,83**	**0,154**	**0,297**
5	% from the mean			

l	s_R	CV_R
36	**0,798**	**1,540**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: C **Sample: 3** Unit: g/100g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A59	PZ98	DA02	48,96	49,72	48,61	48,21	0	48,88	*b*	*	0,64	1,31	92,20
2	F02x	PZ98	DA01	51,04	50,74	49,59	49,60	4	50,24		*	0,76	1,51	94,78
3	F28x	PZ98	DA02	51,20	51,00	50,80	51,60	4	51,15			0,34	0,67	96,50
4	A62x	PZ98	DA01	51,39	51,39	51,38	51,29	4	51,36			0,05	0,09	96,90
5	F29x	PZ98	DA99	51,33	51,36	51,57	52,33	4	51,65			0,47	0,90	97,43
6	S22	PZ98	DZ99	51,68	52,18	52,83	51,33	4	52,01			0,65	1,25	98,11
7	F07x	PZ98	DA01	52,25	52,56	51,89	51,46	4	52,04			0,47	0,91	98,18
8	F18x	PZ98	DA99	52,21	52,43	51,90	51,91	4	52,11			0,26	0,49	98,31
9	A86x	PZ98	DA01	52,15	52,14	52,11	52,16	4	52,14			0,02	0,04	98,36
10	A49x	PZ98	DA99	52,12	52,27	52,31	52,17	4	52,22			0,09	0,17	98,51
11	F06x	PZ98	DA02	52,50	52,42	52,32	52,45	4	52,42			0,08	0,14	98,90
12	F25x	PZ98	DA01	52,57	52,55	52,53	52,52	4	52,54			0,02	0,05	99,12
13	A82	PZ98	DA02	52,95	52,50	52,86	52,57	4	52,72			0,22	0,41	99,45
14	F33x	PZ98	DA02	53,57	52,69	52,75	52,86	4	52,97			0,41	0,77	99,93
15	A88	PZ98	DA01	52,97	52,96	52,89	53,07	4	52,97			0,07	0,14	99,93
16	F32x	PZ98	DA01	53,20	53,10	52,80	52,90	4	53,00			0,18	0,34	99,99
17	F05x	PZ98	DA01	53,00	53,00	53,00	53,00	4	53,00			0,00	0,00	99,99
18	F24x	PZ98	DA01	52,67	53,74	53,29	52,40	4	53,03			0,61	1,14	100,03
19	F14x	PZ98	DA01	53,00	53,10	53,10	52,90	4	53,03			0,10	0,18	100,03
20	A57	PZ98	DA01	53,18	53,31	52,84	53,01	4	53,09			0,20	0,38	100,15
21	F16x	PZ98	DA02	53,17	53,10	53,18	53,14	4	53,15			0,04	0,07	100,26
22	F03	PZ98	DA01	53,26	53,40	52,75	53,21	4	53,16			0,28	0,53	100,28
23	A61x	PZ98	DA02	53,18	53,01	53,36	53,17	4	53,18			0,14	0,27	100,32
24	F26x	PZ98	DA02	53,20	53,20	53,16	53,15	4	53,18			0,03	0,05	100,32
25	F13x	PZ98	DA01	53,26	53,12	53,18	53,22	4	53,20			0,06	0,11	100,35
26	A45x	PZ98	DA01	53,30	53,20	53,20	53,30	4	53,25			0,06	0,11	100,46
27	A42	PZ98	DA01	53,22	53,33	53,24	53,34	4	53,28			0,06	0,11	100,52
28	F09	PZ98	DA01	53,40	53,50	53,50	53,40	4	53,45			0,06	0,11	100,84
29	F08x	PZ99	DB08	53,40	53,50	53,50	53,40	4	53,45			0,06	0,11	100,84
30	F12x	PZ98	DA02	53,41	53,41	53,64	53,44	4	53,48			0,11	0,21	100,88
31	A71	PB99	DZ99	54,10	53,78	53,35	53,48	4	53,68			0,33	0,62	101,26
32	F27x	PZ98	DA01	53,81	53,88	53,47	53,57	4	53,68			0,19	0,36	101,27
33	A47x	PZ98	DA02	53,58	53,27	54,26	53,72	4	53,71			0,41	0,77	101,32
34	A39	PZ98	DA02	53,95	53,51	53,80	54,03	4	53,82			0,23	0,43	101,54
35	F19x	PZ98	DA99	53,80	53,90	54,10	54,30	4	54,03			0,22	0,41	101,92
36	A65	PZ98	DA02	53,69	54,57	54,34	54,24	4	54,21			0,37	0,69	102,27
37	A60x	PZ98	DA02	54,15	54,14	54,27	54,28	4	54,21			0,08	0,14	102,27
38	F15x	PZ98	DA01	55,20	55,10	55,10	55,00	4	55,10			0,08	0,15	103,95
39	F21x	PZ98	DA01	55,43	55,38	55,41	55,40	4	55,41			0,02	0,04	104,52
40	A56	PZ98	DA01	56,19	56,36	56,88	56,99	0	56,61	*b*	*	0,39	0,69	106,79
41	A85x	PZ98	DA01	57,10	57,14	57,07	56,91	0	57,06	*b*	*	0,10	0,18	107,64
42	A94	PZ99	DZ99	59,40	59,90	57,70	57,60	0	58,65	*b*	*	1,17	2,00	110,65
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	n	Mean	s_r	CV_r
all labs	**152**	**53,01**	**0,206**	**0,389**
5	% from the mean			
	l		s_R	CV_R
	38		**1,006**	**1,897**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: C **Sample: 4** Unit: g/100g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A59	PZ98	DA02	43,47	43,23	43,14	43,20	4	43,26	*	0,14	0,33	90,90
2	S22	PZ98	DZ99	43,26	43,95	42,95	43,28	4	43,36	*	0,42	0,97	91,11
3	A62x	PZ98	DA01	46,40	45,08	45,03	45,24	4	45,44		0,65	1,43	95,48
4	A86x	PZ98	DA01	45,83	45,90	45,88	45,79	4	45,85		0,05	0,11	96,34
5	A57	PZ98	DA01	46,00	45,91	45,92	45,98	4	45,95		0,04	0,10	96,56
6	A49x	PZ98	DA99	46,30	46,00	45,67	46,19	4	46,04		0,28	0,60	96,74
7	A71	PB99	DZ99	46,70	46,38	46,10	46,57	4	46,44		0,26	0,56	97,58
8	A88	PZ98	DA01	46,13	46,75	46,44	47,01	4	46,58		0,38	0,82	97,88
9	F07x	PZ98	DA01	46,68	47,26	46,27	46,15	4	46,59		0,50	1,08	97,90
10	A82	PZ98	DA02	46,55	46,89	46,40	46,77	4	46,65		0,22	0,47	98,02
11	F06x	PZ98	DA02	46,78	46,77	46,78	46,80	4	46,78		0,01	0,03	98,30
12	F26x	PZ98	DA02	46,80	46,90	46,90	46,80	4	46,85		0,06	0,12	98,44
13	A42	PZ98	DA01	46,96	47,12	47,17	46,98	4	47,06		0,10	0,22	98,88
14	F25x	PZ98	DA01	47,03	47,14	47,16	47,22	4	47,14		0,08	0,17	99,05
15	F16x	PZ98	DA02	47,48	47,05	47,38	47,23	4	47,29		0,19	0,40	99,36
16	F28x	PZ98	DA02	47,40	47,20	47,60	47,10	4	47,33		0,22	0,47	99,44
17	F14x	PZ98	DA01	47,40	47,30	47,40	47,20	4	47,33		0,10	0,20	99,44
18	F32x	PZ98	DA01	47,70	47,60	47,20	47,30	4	47,45		0,24	0,50	99,70
19	A61x	PZ98	DA02	47,52	47,65	47,71	47,16	4	47,51		0,25	0,52	99,83
20	A45x	PZ98	DA01	47,60	47,50	47,50	47,70	4	47,58		0,10	0,20	99,97
21	F12x	PZ98	DA02	47,48	47,66	47,50	47,67	4	47,58		0,10	0,21	99,97
22	F24x	PZ98	DA01	47,73	49,60	46,52	46,63	0	47,62	*c*	1,43	3,00	100,06
23	A39	PZ98	DA02	47,53	47,83	48,09	47,16	4	47,65		0,40	0,84	100,13
24	F13x	PZ98	DA01	47,84	47,69	47,81	47,84	4	47,80		0,07	0,15	100,43
25	F05x	PZ98	DA01	47,80	47,80	47,80	47,80	4	47,80		0,00	0,00	100,44
26	F29x	PZ98	DA99	47,78	48,09	48,22	47,40	4	47,87		0,37	0,76	100,59
27	F33x	PZ98	DA02	48,07	48,15	47,67	47,81	4	47,93		0,22	0,47	100,70
28	F09	PZ98	DA01	48,10	48,00	47,90	48,00	4	48,00		0,08	0,17	100,86
29	F08x	PZ99	DB08	48,10	48,00	47,90	48,00	4	48,00		0,08	0,17	100,86
30	A47x	PZ98	DA02	48,36	47,25	48,10	48,41	4	48,03		0,54	1,12	100,92
31	F03	PZ98	DA01	48,05	48,06	48,37	48,00	4	48,12		0,17	0,35	101,11
32	F02x	PZ98	DA01	47,79	48,57	47,81	48,81	4	48,25		0,52	1,08	101,37
33	A65	PZ98	DA02	48,28	48,26	48,27	48,34	4	48,29		0,04	0,07	101,46
34	A60x	PZ98	DA02	48,19	48,29	48,40	48,50	4	48,35		0,13	0,28	101,58
35	F19x	PZ98	DA99	48,10	48,40	48,40	48,60	4	48,38		0,21	0,43	101,65
36	F27x	PZ98	DA01	48,68	48,44	48,46	48,41	4	48,50		0,12	0,25	101,91
37	F15x	PZ98	DA01	49,20	49,20	49,30	49,30	4	49,25		0,06	0,12	103,49
38	F21x	PZ98	DA01	49,96	49,97	50,08	49,93	4	49,99	*	0,07	0,13	105,03
39	A56	PZ98	DA01	50,09	50,37	50,71	50,09	4	50,32	*	0,29	0,59	105,72
40	A94	PZ99	DZ99	52,00	50,80	49,90	50,40	4	50,78	*	0,90	1,76	106,69
41	F18x	PZ98	DA99	50,84	50,91	51,07	50,99	4	50,95	*	0,10	0,20	107,06
42	A85x	PZ98	DA01	51,03	50,96	50,91	50,96	4	50,97	*	0,05	0,10	107,09
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	n	Mean	s_r	CV_r
all labs	**164**	**47,59**	**0,215**	**0,451**
5	% from the mean			

l	s_R	CV_R
41	**1,646**	**3,458**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Zn **Sample: 1** Unit: µg/g

No.	Lab. Code	Method code P	D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A60x	PD01	DB10	18,60	18,90	*20,2a*	18,50	0	18,67	*b* *	0,21	1,12	59,32
2	S22	PB06	DB08	23,37	*22,77a*	23,51	23,38	0	23,42	*b* *	0,08	0,33	74,42
3	F09	PZ02	DD02	33,20	26,70	26,60	27,20	0	28,43	*c*	3,19	**11,24**	90,33
4	F19x	PD02	DB08	28,90	28,80	28,50	28,70	4	28,73		0,17	0,59	91,28
5	F33x	PD01	DB10	28,10	28,92	30,56	27,69	4	28,82		1,27	4,40	91,57
6	A59	PC01	DB08	25,40	29,70	29,90	30,40	4	28,85		2,32	8,04	91,68
7	F07x	PD02	DB08	29,37	29,09	28,72	29,08	4	29,07		0,27	0,92	92,37
8	A49	PC03	DB08	29,40	29,20	29,50	29,00	4	29,28		0,22	0,76	93,03
9	F27	PD01	DB01	28,84	30,48	29,94	29,27	4	29,63		0,72	2,44	94,16
10	F08x	PZ99	DB08	29,20	29,00	31,80	29,90	4	29,98		1,28	4,26	95,25
11	F13x	PZ02	DD01	30,00	30,00	29,90	30,10	4	30,00		0,08	0,27	95,33
12	F06x	PD02	DB08	30,80	29,70	30,40	30,00	4	30,23		0,48	1,58	96,05
13	F26x	PC02	DB08	30,22	30,08	30,23	30,39	4	30,23		0,13	0,42	96,06
14	A71	PB03	DB01	29,39	30,11	30,64	30,90	4	30,26		0,67	2,20	96,16
15	A90	PD01	DB10	30,30	30,20	31,50	30,10	4	30,53		0,66	2,15	97,00
16	A82	PC01	DB08	30,60	30,60	30,60	30,40	4	30,55		0,10	0,33	97,08
17	A79	PD03	DB10	30,79	30,91	30,87	31,05	4	30,90		0,11	0,35	98,20
18	F32x	PD02	DB08	30,80	31,20	31,60	31,50	4	31,28		0,36	1,15	99,38
19	A80	PD03	DB10	30,30	30,80	30,10	34,10	4	31,33		1,87	5,98	99,54
20	A45x	PB99	DB08	31,60	31,10	31,60	31,20	4	31,38		0,26	0,84	99,70
21	F02x	PD02	DB08	31,30	31,30	32,00	31,70	4	31,58		0,34	1,08	100,34
22	A39	PD02	DB08	31,62	31,91	31,48	31,40	4	31,60		0,22	0,71	100,42
23	A88	PD01	DB08	32,00	31,30	31,70	31,80	4	31,70		0,29	0,93	100,73
24	F29x	PD02	DB01	30,16	33,71	31,56	32,41	4	31,96		1,49	4,66	101,56
25	F05x	PD02	DB08	31,70	31,90	31,90	32,40	4	31,98		0,30	0,93	101,61
26	A36	PD02	DB08	31,80	31,80	31,20	33,30	4	32,03		0,90	2,80	101,77
27	A65	PD01	DB08	32,60	32,50	32,70	32,50	4	32,58		0,10	0,29	103,51
28	A53	PZ02	DD02	32,60	32,70	32,40	32,90	4	32,65		0,21	0,64	103,75
29	F12x	PC01	DB09	33,40	33,00	32,80	32,10	4	32,83		0,54	1,66	104,31
30	A47x	PD01	DB08	32,72	32,95	32,81	32,84	4	32,83		0,09	0,29	104,32
31	F14x	PC01	DB08	32,40	33,17	32,95	32,84	4	32,84		0,32	0,99	104,36
32	A57	PZ02	DD02	33,00	32,30	32,70	34,20	4	33,05		0,82	2,48	105,02
33	F28x	PC02	DB08	33,49	34,19	32,44	32,86	4	33,25		0,76	2,30	105,64
34	F18x	PD99	DB10	34,60	33,00	33,30	33,30	4	33,55		0,71	2,13	106,61
35	F16x	PC01	DB08	33,87	32,61	34,40	33,61	4	33,62		0,75	2,23	106,84
36	F15x	PC01	DB08	34,00	34,00	33,00	34,00	4	33,75		0,50	1,48	107,25
37	F03	PD02	DB08	33,61	33,80	34,35	34,01	4	33,94		0,32	0,93	107,86
38	F25x	PB06	DB08	33,94	35,14	35,09	34,59	4	34,69		0,56	1,61	110,24
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	n	Mean	s_r	CV_r
all labs	**140**	**31,47**	**0,577**	**1,833**
15	% from the mean			

l	s_R	CV_R
35	**1,643**	**5,222**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Zn **Sample: 2** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A60x	PD01	DB10	85,10	86,50	*78,5a*	84,90	0	85,50	*b* *	0,87	1,02	65,15
2	F09	PZ02	DD02	134,00	105,20	105,80	106,30	0	112,83	*c*	14,12	**12,52**	85,97
3	F19x	PD02	DB08	118,00	116,00	118,00	118,00	4	117,50		1,00	0,85	89,54
4	F28x	PC02	DB08	116,30	117,10	118,50	119,20	4	117,78		1,31	1,12	89,75
5	F07x	PD02	DB08	118,64	121,20	115,28	116,67	4	117,95		2,57	2,18	89,88
6	F03	PD02	DB08	119,02	118,80	118,42	119,96	4	119,05		0,66	0,55	90,72
7	F08x	PZ99	DB08	119,70	116,30	124,20	118,10	4	119,58		3,38	2,83	91,12
8	F27	PD01	DB01	115,00	124,00	123,60	120,50	4	120,78		4,16	3,44	92,03
9	F06x	PD02	DB08	124,00	124,00	123,00	124,00	4	123,75		0,50	0,40	94,30
10	A90	PD01	DB10	120,80	124,80	123,00	129,20	4	124,45		3,56	2,86	94,83
11	A49	PC03	DB08	124,00	125,00	127,00	127,00	4	125,75		1,50	1,19	95,82
12	A59	PC01	DB08	116,00	129,00	128,00	130,00	4	125,75		6,55	5,21	95,82
13	S22	PB06	DB08	126,03	125,55	125,90	126,55	4	126,01		0,41	0,33	96,02
14	A80	PD03	DB10	125,00	126,00	125,00	137,00	4	128,25		5,85	4,56	97,73
15	A79	PD03	DB10	130,50	128,80	127,50	127,40	4	128,55		1,45	1,13	97,96
16	F05x	PD02	DB08	130,00	128,00	130,00	128,00	4	129,00		1,15	0,90	98,30
17	A36	PD02	DB08	130,50	128,40	128,40	130,50	4	129,45		1,21	0,94	98,64
18	A39	PD02	DB08	130,48	127,83	130,94	129,85	4	129,78		1,37	1,06	98,89
19	F32x	PD02	DB08	132,00	130,00	130,00	130,00	4	130,50		1,00	0,77	99,44
20	A82	PC01	DB08	130,00	131,00	131,00	131,00	4	130,75		0,50	0,38	99,63
21	F18x	PD99	DB10	128,00	127,00	142,00	127,00	4	131,00		7,35	5,61	99,82
22	F12x	PC01	DB09	134,20	132,40	129,20	128,40	4	131,05		2,72	2,08	99,86
23	A45x	PB99	DB08	133,00	131,00	132,00	131,00	4	131,75		0,96	0,73	100,40
24	A88	PD01	DB08	132,90	132,20	132,60	132,70	4	132,60		0,29	0,22	101,04
25	A65	PD01	DB08	131,60	133,40	134,30	135,00	4	133,58		1,47	1,10	101,79
26	A47x	PD01	DB08	133,00	134,00	133,00	138,00	4	134,50		2,38	1,77	102,49
27	F16x	PC01	DB08	137,50	135,80	133,00	135,00	4	135,33		1,87	1,38	103,12
28	A71	PB03	DB01	136,96	136,29	135,84	135,25	4	136,08		0,72	0,53	103,70
29	F13x	PZ02	DD01	136,30	137,30	136,60	137,10	4	136,83		0,46	0,33	104,26
30	F14x	PC01	DB08	137,01	137,32	137,43	137,54	4	137,33		0,23	0,17	104,64
31	F02x	PD02	DB08	138,70	138,00	134,70	142,50	4	138,48		3,20	2,31	105,52
32	F33x	PD01	DB10	141,32	139,16	140,58	141,85	4	140,73		1,17	0,83	107,24
33	A53	PZ02	DD02	140,00	141,00	141,00	142,00	4	141,00		0,82	0,58	107,44
34	A57	PZ02	DD02	142,80	142,10	143,70	143,40	4	143,00		0,71	0,49	108,97
35	F25x	PB06	DB08	142,60	143,90	144,20	142,40	4	143,28		0,91	0,63	109,18
36	F26x	PC02	DB08	145,60	143,00	144,80	143,70	4	144,28		1,15	0,80	109,94
37	F29x	PD02	DB01	*147,57a*	145,26	145,55	145,54	3	145,45		0,16	0,11	110,84
38	F15x	PC01	DB08	149,00	145,00	147,00	147,00	4	147,00		1,63	1,11	112,02
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	n	Mean	s_r	CV_r
all labs	**143**	**131,23**	**1,843**	**1,404**
15	% from the mean			
	l		s_R	CV_R
	36		**8,325**	**6,339**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Zn **Sample: 3** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A60x	PD01	DB10	47,00	47,80	47,50	45,70	4	47,00	*	0,93	1,97	83,66
2	F07x	PD02	DB08	52,95	49,03	49,09	49,23	4	50,07		1,92	3,83	89,13
3	A82	PC01	DB08	50,20	48,00	48,30	54,10	4	50,15		2,81	5,60	89,26
4	F19x	PD02	DB08	48,40	50,50	52,70	51,80	4	50,85		1,87	3,67	90,51
5	A59	PC01	DB08	46,90	54,70	53,30	49,00	4	50,98		3,64	7,14	90,73
6	F09	PZ02	DD02	60,40	47,60	47,70	48,70	0	51,10	*c*	6,22	**12,17**	90,96
7	A80	PD03	DB10	49,50	52,00	50,90	53,20	4	51,40		1,58	3,07	91,49
8	A49	PC03	DB08	52,80	53,40	50,20	52,80	4	52,30		1,43	2,73	93,09
9	F27	PD01	DB01	55,45	48,60	51,09	54,13	4	52,32		3,08	5,88	93,12
10	F06x	PD02	DB08	52,90	52,10	53,30	52,60	4	52,73		0,51	0,96	93,85
11	A47x	PD01	DB08	53,43	51,21	51,70	55,33	4	52,92		1,87	3,53	94,19
12	F18x	PD99	DB10	52,70	52,30	54,60	52,70	4	53,08		1,03	1,95	94,47
13	A90	PD01	DB10	52,40	53,80	53,40	*46,7a*	3	53,20		0,72	1,36	94,69
14	S22	PB06	DB08	53,28	54,70	53,01	53,00	4	53,50		0,81	1,52	95,22
15	F08x	PZ99	DB08	54,40	53,30	53,60	54,70	4	54,00		0,66	1,22	96,12
16	A39	PD02	DB08	55,15	54,94	54,86	54,06	4	54,75		0,48	0,87	97,46
17	A79	PD03	DB10	55,72	55,12	53,19	56,47	4	55,13		1,40	2,55	98,12
18	A36	PD02	DB08	55,10	56,10	54,80	55,20	4	55,30		0,56	1,01	98,43
19	F32x	PD02	DB08	54,20	55,10	56,40	56,60	4	55,58		1,13	2,04	98,92
20	F12x	PC01	DB09	55,90	56,10	54,70	56,60	4	55,83		0,81	1,44	99,37
21	F28x	PC02	DB08	56,99	52,94	57,76	55,73	4	55,86		2,12	3,79	99,42
22	F13x	PZ02	DD01	58,70	56,90	56,50	57,00	4	57,28		0,97	1,70	101,95
23	F16x	PC01	DB08	56,53	56,88	58,13	58,72	4	57,57		1,03	1,79	102,46
24	A65	PD01	DB08	55,60	58,50	57,30	59,00	4	57,60		1,51	2,63	102,52
25	F03	PD02	DB08	56,74	56,17	59,07	58,60	4	57,65		1,41	2,44	102,61
26	A71	PB03	DB01	57,02	58,14	58,57	58,52	4	58,06		0,72	1,24	103,35
27	A88	PD01	DB08	58,20	58,20	58,20	58,20	4	58,20		0,00	0,00	103,59
28	A45x	PB99	DB08	58,60	59,10	58,30	57,20	4	58,30		0,80	1,38	103,77
29	F29x	PD02	DB01	58,67	58,72	57,08	58,79	4	58,32		0,82	1,41	103,80
30	F33x	PD01	DB10	61,89	59,78	59,30	54,42	4	58,85		3,16	5,37	104,75
31	F05x	PD02	DB08	59,00	59,10	58,80	58,60	4	58,88		0,22	0,38	104,79
32	F15x	PC01	DB08	61,00	60,00	59,00	60,00	4	60,00		0,82	1,36	106,80
33	F14x	PC01	DB08	64,24	60,84	55,75	62,44	4	60,82		3,65	6,01	108,25
34	A57	PZ02	DD02	63,90	63,70	62,00	59,20	4	62,20		2,17	3,50	110,71
35	A53	PZ02	DD02	64,10	62,40	63,30	61,90	4	62,93		0,97	1,55	112,00
36	F25x	PB06	DB08	64,76	61,29	64,09	63,65	4	63,45		1,51	2,38	112,93
37	F02x	PD02	DB08	62,00	61,10	66,60	64,70	4	63,60		2,52	3,96	113,20
38	F26x	PC02	DB08	67,78	67,18	68,54	66,01	4	67,38	*	1,07	1,59	119,93
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	n	Mean	s_r	CV_r
all labs	**147**	**56,18**	**1,424**	**2,535**
15	% from the mean			
	l		s_R	CV_R
	37		**4,451**	**7,925**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Zn **Sample: 4** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A60x	PD01	DB10	30,00	29,70	29,80	30,20	4	29,93	*	0,22	0,74	78,12
2	F08x	PZ99	DB08	30,60	29,70	30,40	30,10	4	30,20	*	0,39	1,30	78,84
3	A59	PC01	DB08	27,30	34,70	36,50	32,70	0	32,80	*c*	3,98	**12,14**	85,63
4	F09	PZ02	DD02	40,10	30,90	31,00	31,00	0	33,25	*c*	4,57	**13,74**	86,80
5	S22	PB06	DB08	32,93	33,53	34,75	32,11	4	33,33		1,11	3,33	87,01
6	F33x	PD01	DB10	33,16	36,93	35,13	33,47	4	34,67		1,74	5,01	90,52
7	A57	PZ02	DD02	35,50	34,80	34,60	35,20	4	35,03		0,40	1,15	91,44
8	F19x	PD02	DB08	36,20	35,50	36,00	35,90	4	35,90		0,29	0,82	93,72
9	A88	PD01	DB08	35,80	36,20	36,00	35,90	4	35,98		0,17	0,47	93,92
10	F07x	PD02	DB08	36,61	37,23	36,05	34,75	4	36,16		1,06	2,92	94,39
11	F27	PD01	DB01	37,55	35,69	36,38	35,62	4	36,31		0,89	2,46	94,79
12	A49	PC03	DB08	36,70	36,60	37,40	36,70	4	36,85		0,37	1,00	96,20
13	F06x	PD02	DB08	37,20	37,70	37,10	37,70	4	37,43		0,32	0,86	97,70
14	A82	PC01	DB08	37,40	37,70	37,70	37,20	4	37,50		0,24	0,65	97,90
15	A36	PD02	DB08	36,80	38,40	37,10	38,90	4	37,80		1,01	2,67	98,68
16	A47x	PD01	DB08	37,70	39,39	38,16	37,89	4	38,29		0,76	1,99	99,95
17	A79	PD03	DB10	39,14	39,19	37,30	38,98	4	38,65		0,91	2,34	100,91
18	A45x	PB99	DB08	38,90	38,80	38,70	38,80	4	38,80		0,08	0,21	101,29
19	A80	PD03	DB10	38,80	39,00	38,40	39,40	4	38,90		0,42	1,07	101,55
20	F18x	PD99	DB10	38,80	38,90	39,10	38,90	4	38,93		0,13	0,32	101,62
21	F02x	PD02	DB08	38,80	38,10	39,70	39,40	4	39,00		0,71	1,81	101,81
22	A90	PD01	DB10	39,40	37,80	39,50	39,30	4	39,00		0,80	2,06	101,81
23	A71	PB03	DB01	38,42	38,89	39,43	39,62	4	39,09		0,55	1,40	102,05
24	F32x	PD02	DB08	39,30	39,20	39,30	39,10	4	39,23		0,10	0,24	102,40
25	A65	PD01	DB08	38,30	40,00	39,10	39,70	4	39,28		0,75	1,91	102,53
26	F12x	PC01	DB09	38,80	39,60	38,90	39,80	4	39,28		0,50	1,27	102,53
27	A53	PZ02	DD02	39,20	39,40	39,40	39,70	4	39,43		0,21	0,52	102,92
28	A39	PD02	DB08	41,45	39,41	38,96	38,83	4	39,66		1,22	3,07	103,54
29	F28x	PC02	DB08	41,64	39,27	40,44	39,48	4	40,21		1,08	2,69	104,97
30	F14x	PC01	DB08	40,64	39,67	40,64	39,99	4	40,24		0,49	1,21	105,04
31	F05x	PD02	DB08	40,80	40,30	40,40	40,20	4	40,43		0,26	0,65	105,53
32	F16x	PC01	DB08	41,29	40,83	40,49	40,12	4	40,68		0,50	1,22	106,21
33	F03	PD02	DB08	40,73	40,61	41,12	41,00	4	40,87		0,24	0,58	106,68
34	F13x	PZ02	DD01	40,90	41,30	41,50	41,50	4	41,30		0,28	0,68	107,82
35	F29x	PD02	DB01	41,66	41,20	41,64	41,42	4	41,48		0,22	0,52	108,29
36	F15x	PC01	DB08	42,00	41,00	41,00	42,00	4	41,50		0,58	1,39	108,34
37	F25x	PB06	DB08	41,52	42,23	42,58	42,93	4	42,32		0,60	1,42	110,47
38	F26x	PC02	DB08	45,68	45,04	45,12	45,75	4	45,40	*	0,37	0,81	118,51
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	n	Mean	s_r	CV_r
all labs	**144**	**38,31**	**0,554**	**1,447**
15	% from the mean			

l	s_R	CV_R
36	**3,100**	**8,094**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Mn **Sample: 1** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A71	PB03	DB99	42,18	43,59	45,00	43,59	0	43,59	*b* *	1,15	2,63	77,93
2	F19x	PD02	DB08	48,90	49,60	49,00	49,00	4	49,13		0,32	0,65	87,83
3	A59	PC01	DB08	*44,1a*	52,60	51,20	51,00	3	51,60		0,87	1,69	92,25
4	F07x	PD02	DB08	50,36	50,92	49,84	50,17	4	50,32		0,45	0,90	89,97
5	F33x	PD01	DB10	48,50	51,80	55,68	48,54	0	51,13	*c*	3,40	6,66	91,41
6	F13x	PZ02	DD01	51,80	52,10	51,80	52,30	4	52,00		0,24	0,47	92,97
7	F03	PD02	DB08	52,54	52,39	52,61	52,33	4	52,47		0,13	0,25	93,80
8	A49	PC03	DB08	53,00	52,00	53,00	52,00	4	52,50		0,58	1,10	93,86
9	A47x	PD01	DB08	52,92	53,46	52,06	51,82	4	52,57		0,76	1,45	93,98
10	A88	PD01	DB08	52,50	52,70	52,60	52,60	4	52,60		0,08	0,16	94,04
11	A79	PD03	DB10	52,90	53,38	52,59	53,27	4	53,04		0,36	0,68	94,82
12	F08	PZ99	DB08	55,10	54,90	51,00	51,50	4	53,13		2,18	4,10	94,98
13	A82	PC01	DB08	53,50	53,40	53,20	53,80	4	53,48		0,25	0,47	95,60
14	F09	PC01	DB10	55,70	53,40	55,70	53,40	4	54,55		1,33	2,43	97,53
15	F14x	PC01	DB08	55,03	55,47	54,59	54,81	4	54,98		0,38	0,68	98,29
16	A45x	PB99	DB08	54,70	55,20	55,00	55,10	4	55,00		0,22	0,39	98,33
17	F06x	PD02	DB08	55,78	55,45	54,61	55,57	4	55,35		0,51	0,93	98,96
18	F15x	PC01	DB08	57,00	55,00	55,00	55,00	4	55,50		1,00	1,80	99,22
19	F18x	PD99	DB08	55,40	55,40	55,60	55,60	4	55,50		0,12	0,21	99,22
20	A57	PZ02	DD02	55,20	55,40	55,40	56,20	4	55,55		0,44	0,80	99,31
21	F12x	PC01	DB09	57,10	56,50	56,10	55,20	4	56,23		0,80	1,42	100,52
22	F02x	PD02	DB08	57,00	55,00	58,00	57,00	4	56,75		1,26	2,22	101,46
23	A53	PZ02	DD02	56,40	56,90	56,60	57,50	4	56,85		0,48	0,84	101,64
24	F05x	PD02	DB08	56,80	57,10	56,80	57,40	4	57,03		0,29	0,50	101,95
25	F27	PD01	DB01	53,50	60,10	58,80	56,30	4	57,18		2,91	5,10	102,22
26	F28x	PD02	DB08	58,13	56,27	56,81	57,66	4	57,22		0,84	1,46	102,29
27	F16x	PC01	DB08	58,08	57,61	57,11	56,13	4	57,23		0,83	1,46	102,32
28	A43	PB06	DB01	61,80	54,60	55,80	57,40	4	57,40		3,15	5,49	102,62
29	A65	PD01	DB08	57,00	58,00	58,00	57,00	4	57,50		0,58	1,00	102,80
30	A39	PD02	DB08	57,51	58,70	57,47	57,12	4	57,70		0,69	1,19	103,16
31	F32x	PD02	DB08	58,60	57,50	58,20	58,80	4	58,28		0,57	0,98	104,18
32	A60x	PD01	DB10	56,80	58,80	59,70	58,70	4	58,50		1,22	2,08	104,59
33	A94	PB06	DB08	59,40	58,10	59,00	58,50	4	58,75		0,57	0,97	105,03
34	A80	PD03	DB10	58,50	59,40	58,20	60,20	4	59,08		0,91	1,54	105,62
35	A36	PD02	DB08	58,20	58,30	57,60	62,50	4	59,15		2,25	3,81	105,75
36	A90	PD01	DB10	64,30	59,10	60,60	58,30	4	60,58		2,66	4,39	108,30
37	F26x	PC02	DB08	60,36	61,23	61,93	60,23	4	60,94		0,80	1,31	108,95
38	F29x	PD02	DB01	57,58	63,33	62,26	63,44	4	61,65		2,77	4,49	110,22
39	S22	PB06	DB08	63,14	62,36	63,56	*68,96a*	3	63,02		0,61	0,97	112,67
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	n	Mean	s_r	CV_r
all labs	**146**	**55,93**	**0,930**	**1,662**
15	% from the mean			
	l		s_R	CV_R
	37		**3,207**	**5,732**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Mn **Sample: 2** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F12x	PC01	DB09	68,90	67,90	66,70	65,90	0	67,35	*b* *	1,32	1,96	10,02
2	F08	PZ99	DB08	626,00	638,00	647,00	622,00	4	633,25		11,41	1,80	94,19
3	F09	PC01	DB10	634,00	616,00	651,00	637,00	4	634,50		14,39	2,27	94,38
4	A43	PB06	DB01	654,00	636,00	636,00	642,00	4	642,00		8,49	1,32	95,50
5	F07x	PD02	DB08	642,80	662,30	629,60	645,50	4	645,05		13,44	2,08	95,95
6	A59	PC01	DB08	630,00	666,00	659,00	635,00	4	647,50		17,67	2,73	96,31
7	A79	PD03	DB10	663,30	655,50	644,90	639,20	4	650,73		10,77	1,65	96,79
8	F28x	PD02	DB08	628,80	642,30	658,50	678,00	4	651,90		21,22	3,25	96,97
9	F06x	PD02	DB08	653,80	657,50	650,40	652,20	4	653,48		3,02	0,46	97,20
10	F29x	PD02	DB01	651,58	628,79	682,95	652,64	4	653,99		22,22	3,40	97,28
11	F13x	PZ02	DD01	654,10	658,40	656,30	657,80	4	656,65		1,92	0,29	97,68
12	F27	PD01	DB01	620,10	683,60	687,80	639,40	0	657,73	*c*	33,29	5,06	97,84
13	F18x	PD99	DB08	659,00	660,00	658,00	661,00	4	659,50		1,29	0,20	98,10
14	F19x	PD02	DB08	659,00	653,00	663,00	666,00	4	660,25		5,62	0,85	98,21
15	A80	PD03	DB10	659,00	663,00	661,00	*722a*	3	661,00		2,00	0,30	98,32
16	F33x	PD01	DB10	672,73	661,10	672,43	645,99	4	663,06		12,60	1,90	98,63
17	F15x	PC01	DB08	671,00	658,00	664,00	667,00	4	665,00		5,48	0,82	98,92
18	A65	PD01	DB08	650,00	669,00	668,00	675,00	4	665,50		10,79	1,62	98,99
19	A82	PC01	DB08	666,00	673,00	666,00	671,00	4	669,00		3,56	0,53	99,51
20	A88	PD01	DB08	662,40	679,80	671,10	666,70	4	670,00		7,44	1,11	99,66
21	F14x	PC01	DB08	669,61	670,68	672,80	672,80	4	671,47		1,59	0,24	99,88
22	A45x	PB99	DB08	673,00	675,00	674,00	674,00	4	674,00		0,82	0,12	100,26
23	A49	PC03	DB08	640,00	683,00	691,00	688,00	4	675,50		23,90	3,54	100,48
24	F16x	PC01	DB08	678,20	680,10	663,60	684,70	4	676,65		9,12	1,35	100,65
25	F03	PD02	DB08	670,93	675,76	678,82	682,21	4	676,93		4,79	0,71	100,69
26	F02x	PD02	DB08	671,00	692,00	657,00	689,00	4	677,25		16,38	2,42	100,74
27	A36	PD02	DB08	681,00	677,00	678,00	695,00	4	682,75		8,34	1,22	101,56
28	A47x	PD01	DB08	692,00	674,00	681,00	689,00	4	684,00		8,12	1,19	101,74
29	A71	PB03	DB99	686,90	683,93	688,51	691,92	4	687,81		3,33	0,48	102,31
30	A57	PZ02	DD02	682,70	692,10	688,30	692,70	4	688,95		4,60	0,67	102,48
31	A39	PD02	DB08	682,20	688,90	697,40	691,10	4	689,90		6,27	0,91	102,62
32	F05x	PD02	DB08	694,00	692,00	694,00	695,00	4	693,75		1,26	0,18	103,19
33	A53	PZ02	DD02	694,00	696,00	695,00	698,00	4	695,75		1,71	0,25	103,49
34	F26x	PC02	DB08	695,40	699,80	700,70	704,30	4	700,05		3,66	0,52	104,13
35	A60x	PD01	DB10	701,00	718,00	706,00	700,00	4	706,25		8,26	1,17	105,05
36	F32x	PD02	DB08	711,00	709,00	707,00	709,00	4	709,00		1,63	0,23	105,46
37	A90	PD01	DB10	694,00	719,00	708,00	724,00	4	711,25		13,30	1,87	105,80
38	S22	PB06	DB08	727,68	707,74	726,85	699,71	4	715,50		13,98	1,95	106,43
39	A94	PB06	DB08	746,00	751,00	758,00	746,00	0	750,25	*b*	5,68	0,76	111,60
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	n	Mean	s_r	CV_r
all labs	**143**	**672,28**	**8,455**	**1,258**
15	% from the mean			

l	s_R	CV_R
36	**21,711**	**3,230**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Mn **Sample: 3** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	F19x	PD02	DB08	125,00	127,00	133,00	134,00	4	129,75			4,43	3,41	89,79
2	A59	PC01	DB08	123,00	147,00	134,00	123,00	0	131,75	*c*		11,41	8,66	91,17
3	F07x	PD02	DB08	132,20	132,80	131,60	133,60	4	132,55			0,85	0,64	91,73
4	F03	PD02	DB08	135,72	134,24	134,38	131,64	4	134,00			1,71	1,27	92,73
5	F13x	PZ02	DD01	139,10	132,50	131,70	133,10	4	134,10			3,38	2,52	92,80
6	A49	PC03	DB08	137,00	137,00	131,00	133,00	4	134,50			3,00	2,23	93,08
7	A80	PD03	DB10	131,00	137,00	132,00	139,00	4	134,75			3,86	2,87	93,25
8	A82	PC01	DB08	133,00	134,00	130,00	142,00	4	134,75			5,12	3,80	93,25
9	F18x	PD99	DB08	138,00	134,00	134,00	135,00	4	135,25			1,89	1,40	93,60
10	A47x	PD01	DB08	134,00	137,00	143,00	139,00	4	138,25			3,77	2,73	95,67
11	A79	PD03	DB10	140,80	139,10	134,70	140,50	4	138,78			2,82	2,03	96,04
12	F09	PC01	DB10	138,00	138,00	137,00	144,00	4	139,25			3,20	2,30	96,36
13	F08	PZ99	DB08	137,00	136,00	143,00	141,00	4	139,25			3,30	2,37	96,36
14	F06x	PD02	DB08	139,80	138,40	142,20	138,60	4	139,75			1,75	1,25	96,71
15	F28x	PD02	DB08	145,10	137,60	140,20	144,10	4	141,75			3,48	2,46	98,09
16	F29x	PD02	DB01	143,94	136,65	142,85	144,29	4	141,93			3,57	2,52	98,22
17	F27	PD01	DB01	139,30	144,50	149,10	139,80	4	143,18			4,59	3,21	99,08
18	F12x	PC01	DB09	143,20	144,30	140,30	145,00	4	143,20			2,07	1,45	99,10
19	A60x	PD01	DB10	144,00	144,00	145,00	142,00	4	143,75			1,26	0,88	99,48
20	F15x	PC01	DB08	139,00	146,00	147,00	143,00	4	143,75			3,59	2,50	99,48
21	F16x	PC01	DB08	140,30	144,90	147,60	143,00	4	143,95			3,08	2,14	99,62
22	A45x	PB99	DB08	147,00	146,00	146,00	146,00	4	146,25			0,50	0,34	101,21
23	A88	PD01	DB08	149,60	142,00	145,80	147,70	4	146,28			3,24	2,22	101,23
24	A90	PD01	DB10	144,00	147,00	160,00	142,00	4	148,25			8,10	5,46	102,59
25	A57	PZ02	DD02	152,70	151,20	147,20	142,30	4	148,35			4,65	3,14	102,66
26	F14x	PC01	DB08	156,10	148,70	140,20	150,80	4	148,95			6,61	4,44	103,08
27	A36	PD02	DB08	150,90	146,70	150,90	148,80	4	149,33			2,01	1,35	103,34
28	A65	PD01	DB08	153,00	146,00	150,00	151,00	4	150,00			2,94	1,96	103,80
29	F05x	PD02	DB08	152,00	152,00	152,00	152,00	4	152,00			0,00	0,00	105,19
30	F33x	PD01	DB10	150,19	156,07	156,37	145,48	4	152,03			5,21	3,43	105,21
31	F32x	PD02	DB08	148,00	153,00	155,00	154,00	4	152,50			3,11	2,04	105,53
32	A43	PB06	DB01	154,00	151,00	153,00	153,00	4	152,75			1,26	0,82	105,71
33	F26x	PC02	DB08	151,30	158,60	154,10	154,70	4	154,68			3,01	1,94	107,04
34	F02x	PD02	DB08	152,00	152,00	157,00	158,00	4	154,75			3,20	2,07	107,09
35	A53	PZ02	DD02	158,00	154,00	157,00	153,00	4	155,50			2,38	1,53	107,61
36	A71	PB03	DB99	163,44	156,62	159,70	160,68	4	160,11			2,82	1,76	110,80
37	A94	PB06	DB08	164,00	166,00	164,00	162,00	4	164,00			1,63	1,00	113,49
38	A39	PD02	DB08	181,80	174,80	185,10	177,10	0	179,70	*b*	*	4,63	2,58	124,36
39	S22	PB06	DB08	193,37	170,28	184,88	179,98	0	182,13	*b*	*	9,64	5,29	126,04
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	n	Mean	s_r	CV_r
all labs	**144**	**144,50**	**3,095**	**2,142**
15	% from the mean			
	l		s_R	CV_R
	36		**8,332**	**5,766**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Mn **Sample: 4** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A59	PC01	DB08	556,00	647,00	691,00	620,00	0	628,50	*b* *	56,50	8,99	84,50
2	A57	PZ02	DD02	668,50	673,20	680,00	668,60	4	672,58		5,41	0,80	90,43
3	A71	PB03	DB99	680,36	710,60	650,12	680,36	4	680,36		24,69	3,63	91,48
4	F09	PC01	DB10	680,00	585,00	737,00	725,00	0	681,75	*c*	69,01	**10,12**	91,66
5	F07x	PD02	DB08	683,50	704,40	682,70	686,80	4	689,35		10,19	1,48	92,69
6	F33x	PD01	DB10	686,26	701,84	705,69	684,88	4	694,67		10,64	1,53	93,40
7	A88	PD01	DB08	705,10	707,80	706,40	705,70	4	706,25		1,16	0,16	94,96
8	A80	PD03	DB10	716,00	716,00	693,00	733,00	4	714,50		16,42	2,30	96,07
9	A49	PC03	DB08	715,00	713,00	720,00	726,00	4	718,50		5,80	0,81	96,60
10	F08	PZ99	DB08	723,00	710,00	728,00	718,00	4	719,75		7,68	1,07	96,77
11	F12x	PC01	DB09	708,70	729,10	719,10	731,00	4	721,98		10,27	1,42	97,07
12	F06x	PD02	DB08	723,60	725,30	724,50	719,40	4	723,20		2,63	0,36	97,24
13	F27	PD01	DB01	717,10	717,70	758,50	723,30	4	729,15		19,76	2,71	98,04
14	F02x	PD02	DB08	722,00	712,00	769,00	734,00	4	734,25		24,85	3,38	98,72
15	F14x	PC01	DB08	739,80	731,20	739,80	733,40	4	736,05		4,42	0,60	98,96
16	F13x	PZ02	DD01	731,90	737,70	741,30	738,90	4	737,45		3,99	0,54	99,15
17	A39	PD02	DB08	736,70	747,10	733,10	734,30	4	737,80		6,38	0,86	99,20
18	F19x	PD02	DB08	737,00	727,00	747,00	744,00	4	738,75		8,88	1,20	99,33
19	F18x	PD99	DB08	746,00	739,00	740,00	742,00	4	741,75		3,10	0,42	99,73
20	F15x	PC01	DB08	745,00	738,00	735,00	750,00	4	742,00		6,78	0,91	99,76
21	A36	PD02	DB08	736,80	740,90	729,70	766,60	4	743,50		16,08	2,16	99,97
22	F16x	PC01	DB08	748,70	736,40	744,10	766,30	4	748,88		12,68	1,69	100,69
23	A45x	PB99	DB08	751,00	747,00	748,00	751,00	4	749,25		2,06	0,28	100,74
24	A79	PD03	DB10	763,80	749,10	746,60	739,70	4	749,80		10,14	1,35	100,81
25	F05x	PD02	DB08	755,00	750,00	753,00	753,00	4	752,75		2,06	0,27	101,21
26	A53	PZ02	DD02	757,00	753,00	753,00	754,00	4	754,25		1,89	0,25	101,41
27	A82	PC01	DB08	753,00	763,00	758,00	753,00	4	756,75		4,79	0,63	101,75
28	F03	PD02	DB08	760,06	760,36	755,81	755,00	4	757,81		2,80	0,37	101,89
29	A47x	PD01	DB08	760,00	756,00	761,00	760,00	4	759,25		2,22	0,29	102,08
30	F28x	PD02	DB08	755,80	760,00	785,50	736,90	4	759,55		20,01	2,63	102,12
31	A65	PD01	DB08	753,00	765,00	745,00	778,00	4	760,25		14,41	1,90	102,22
32	F32x	PD02	DB08	770,00	772,00	770,00	769,00	4	770,25		1,26	0,16	103,56
33	F29x	PD02	DB01	760,51	774,33	774,00	773,86	4	770,68		6,78	0,88	103,62
34	F26x	PC02	DB08	773,10	780,90	769,70	767,40	4	772,78		5,90	0,76	103,90
35	A43	PB06	DB01	746,00	776,00	822,00	781,00	4	781,25		31,26	4,00	105,04
36	A90	PD01	DB10	796,00	783,00	818,00	778,00	4	793,75		17,86	2,25	106,72
37	A60x	PD01	DB10	802,00	776,00	791,00	812,00	4	795,25		15,44	1,94	106,92
38	S22	PB06	DB08	801,38	*878,87a*	806,59	817,83	3	808,60		8,41	1,04	108,72
39	A94	PB06	DB08	812,00	809,00	808,00	820,00	4	812,25		5,44	0,67	109,21
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	n	Mean	s_r	CV_r
all labs	**147**	**743,76**	**9,582**	**1,288**
15	% from the mean			

l	s_R	CV_R
37	**32,671**	**4,390**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Fe **Sample: 1** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F33x	PD01	DB10	116,27	125,43	132,87	116,36	4	122,73		8,01	6,53	86,58
2	F19x	PD02	DB08	124,00	126,00	124,00	127,00	4	125,25		1,50	1,20	88,36
3	A59	PC01	DB08	*117a*	135,00	134,00	132,00	3	133,67		1,53	1,14	94,30
4	F07x	PD02	DB08	122,13	134,26	123,14	139,06	4	129,65		8,34	6,43	91,46
5	F29x	PD02	DB01	131,03	134,70	128,45	130,27	4	131,11		2,63	2,00	92,49
6	F08x	PZ99	DB08	139,00	136,00	127,00	130,00	4	133,00		5,48	4,12	93,83
7	F27	PD01	DB01	127,30	127,40	140,80	137,60	4	133,28		6,97	5,23	94,02
8	F09	PC01	DB10	144,00	136,00	130,00	134,00	4	136,00		5,89	4,33	95,94
9	F06x	PD02	DB08	139,80	137,10	134,40	137,60	4	137,23		2,22	1,62	96,81
10	F12x	PC01	DB08	140,70	138,20	137,70	134,80	4	137,85		2,42	1,76	97,25
11	A79	PD03	DB10	139,20	137,20	138,60	137,80	4	138,20		0,88	0,64	97,49
12	F13x	PD01	DB08	141,32	138,04	139,78	138,47	4	139,40		1,48	1,06	98,34
13	F03	PD02	DB08	140,84	141,01	137,19	139,57	4	139,65		1,76	1,26	98,52
14	A53	PZ02	DD02	139,00	142,00	140,00	140,00	4	140,25		1,26	0,90	98,94
15	A47x	PD01	DB08	140,00	142,00	141,00	141,00	4	141,00		0,82	0,58	99,47
16	A90	PD01	DB10	143,00	138,00	147,00	139,00	4	141,75		4,11	2,90	100,00
17	A49	PC03	DB08	145,00	144,00	143,00	144,00	4	144,00		0,82	0,57	101,59
18	A45x	PB99	DB08	144,00	145,00	143,00	144,00	4	144,00		0,82	0,57	101,59
19	A82	PC01	DB08	144,00	145,00	143,00	145,00	4	144,25		0,96	0,66	101,76
20	F14x	PC01	DB08	143,66	145,53	144,98	144,10	4	144,57		0,84	0,58	101,99
21	F02x	PD02	DB08	142,00	144,00	145,00	149,00	4	145,00		2,94	2,03	102,29
22	A36	PD02	DB08	142,90	144,00	142,90	151,70	4	145,38		4,25	2,92	102,56
23	F05x	PD02	DB08	146,00	145,00	146,00	145,00	4	145,50		0,58	0,40	102,64
24	F28x	PD02	DB08	146,90	143,10	145,20	148,80	4	146,00		2,43	1,66	103,00
25	A60x	PD01	DB10	143,00	148,00	151,00	150,00	4	148,00		3,56	2,40	104,41
26	F32x	PD02	DB08	148,00	148,00	149,00	151,00	4	149,00		1,41	0,95	105,11
27	F18x	PD99	DB08	149,00	150,00	150,00	149,00	4	149,50		0,58	0,39	105,47
28	F16x	PC01	DB08	147,50	152,90	146,50	152,10	4	149,75		3,22	2,15	105,64
29	A80	PD03	DB10	151,00	153,00	150,00	151,33	4	151,33		1,25	0,82	106,76
30	A57	PZ02	DD02	150,70	151,90	152,90	151,90	4	151,85		0,90	0,59	107,12
31	A39	PD02	DB08	150,20	153,60	151,50	154,00	4	152,33		1,79	1,18	107,46
32	A88	PD01	DB08	153,40	151,00	152,20	152,80	4	152,35		1,02	0,67	107,48
33	A65	PD01	DB08	152,10	154,90	154,20	150,60	4	152,95		1,97	1,29	107,90
34	F15x	PC01	DB08	144,00	172,00	154,00	165,00	0	158,75	*c*	12,31	7,76	111,99
35	A71	PB03	DB01	175,97	176,71	177,10	*181,373a*	0	176,59	*b* *	0,57	0,32	124,58
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	n	Mean	s_r	CV_r
all labs	**131**	**141,75**	**2,564**	**1,809**
* = non tolerable mean because more than +/- **20** % from the mean				

l	s_R	CV_R
33	**7,985**	**5,636**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Fe **Sample: 2** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					s_i	V_i	%
1	A88	PD01	DB08	74,30	74,80	74,60	74,50	4	74,55			0,21	0,28	84,64
2	F08x	PZ99	DB08	72,90	70,40	78,70	79,20	4	75,30			4,34	5,77	85,49
3	F19x	PD02	DB08	77,20	77,10	78,50	79,20	4	78,00			1,02	1,31	88,55
4	F07x	PD02	DB08	75,22	86,19	71,91	80,17	0	78,37	*c*		6,22	7,94	88,97
5	F03	PD02	DB08	84,61	82,47	81,30	81,48	4	82,47			1,52	1,84	93,62
6	F33x	PD01	DB10	82,63	84,20	82,95	80,63	4	82,60			1,48	1,79	93,78
7	F28x	PD02	DB08	84,78	80,20	82,58	83,16	4	82,68			1,90	2,29	93,87
8	F12x	PC01	DB08	85,20	85,60	85,00	83,80	4	84,90			0,77	0,91	96,39
9	F27	PD01	DB01	80,60	87,50	83,90	91,50	4	85,88			4,69	5,46	97,49
10	A47x	PD01	DB08	87,10	86,50	86,10	86,60	4	86,58			0,41	0,48	98,29
11	A60x	PD01	DB10	85,40	89,00	88,90	88,00	4	87,83			1,68	1,91	99,71
12	A79	PD03	DB10	91,36	89,60	85,17	85,29	4	87,86			3,12	3,55	99,74
13	F09	PC01	DB10	88,20	83,20	91,40	88,90	4	87,93			3,44	3,91	99,82
14	A53	PZ02	DD02	87,30	87,80	88,10	88,60	4	87,95			0,54	0,62	99,85
15	A59	PC01	DB08	90,00	87,30	88,90	86,10	4	88,08			1,72	1,95	99,99
16	A49	PC03	DB08	87,00	88,00	90,00	88,00	4	88,25			1,26	1,43	100,19
17	F06x	PD02	DB08	88,14	88,82	88,25	88,00	4	88,30			0,36	0,41	100,25
18	A45x	PB99	DB08	88,80	89,30	88,20	88,30	4	88,65			0,51	0,57	100,64
19	A82	PC01	DB08	88,60	89,00	*59,7a*	88,90	3	88,83			0,21	0,23	100,85
20	A90	PD01	DB10	86,90	90,50	89,10	90,10	4	89,15			1,61	1,81	101,21
21	F05x	PD02	DB08	89,10	89,60	89,10	89,60	4	89,35			0,29	0,32	101,44
22	F13x	PD01	DB08	89,68	88,79	90,51	89,16	4	89,54			0,75	0,83	101,65
23	A36	PD02	DB08	88,80	91,30	88,70	90,20	4	89,75			1,24	1,38	101,89
24	F18x	PD99	DB08	89,50	89,30	90,00	90,90	4	89,93			0,71	0,79	102,09
25	F14x	PC01	DB08	90,45	90,34	92,58	90,45	4	90,96			1,08	1,19	103,26
26	A80	PD03	DB10	91,70	91,60	91,10	*98,4a*	3	91,47			0,32	0,35	103,84
27	F16x	PC01	DB08	90,23	95,49	91,62	92,55	4	92,47			2,23	2,41	104,98
28	A65	PD01	DB08	91,70	93,20	93,00	94,50	4	93,10			1,15	1,23	105,70
29	A39	PD02	DB08	91,08	94,57	95,11	91,70	4	93,12			2,02	2,17	105,71
30	F02x	PD02	DB08	93,00	91,00	91,00	98,00	4	93,25			3,30	3,54	105,87
31	A57	PZ02	DD02	95,40	97,20	96,40	97,60	4	96,65			0,97	1,00	109,73
32	F32x	PD02	DB08	96,80	96,70	97,20	96,80	4	96,88			0,22	0,23	109,98
33	F15x	PC01	DB08	100,00	93,00	98,00	99,00	4	97,50			3,11	3,19	110,69
34	A71	PB03	DB01	103,46	103,59	106,19	107,55	0	105,20	*b*		2,01	1,91	119,43
35	F29x	PD02	DB01	115,87	117,20	112,62	113,79	0	114,87	*b*	*	2,05	1,79	130,41
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		n	Mean		s_r	CV_r
	all labs	**126**	**88,08**		**1,506**	**1,709**
* = non tolerable mean because more than +/-	**20**	% from the mean				
		l			s_R	CV_R
		32			**5,459**	**6,196**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Fe **Sample: 3** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A88	PD01	DB08	49,70	49,70	49,70	49,70	4	49,70	*	0,00	0,00	74,11
2	F19x	PD02	DB08	52,80	55,90	62,70	60,50	4	57,98		4,46	7,70	86,44
3	F07x	PD02	DB08	59,36	59,16	56,24	61,08	4	58,96		2,01	3,41	87,91
4	F08x	PZ99	DB08	57,80	57,90	60,60	60,00	4	59,08		1,44	2,43	88,08
5	F27	PD01	DB01	65,10	54,80	59,90	60,20	4	60,00		4,21	7,01	89,46
6	F09	PC01	DB10	62,90	56,40	63,80	58,80	4	60,48		3,48	5,76	90,17
7	A82	PC01	DB08	58,70	58,70	58,30	66,90	4	60,65		4,17	6,88	90,43
8	A47x	PD01	DB08	60,00	58,40	59,60	65,50	4	60,88		3,16	5,19	90,77
9	A49	PC03	DB08	64,00	67,00	56,00	59,00	4	61,50		4,93	8,02	91,70
10	A90	PD01	DB10	59,70	62,60	69,40	54,40	4	61,53		6,25	10,16	91,74
11	A59	PC01	DB08	64,70	64,30	61,40	57,30	4	61,93		3,42	5,52	92,33
12	F18x	PD99	DB08	61,30	62,00	61,10	63,30	4	61,93		0,99	1,61	92,33
13	A80	PD03	DB10	59,70	62,70	58,90	68,00	4	62,33		4,12	6,61	92,93
14	F28x	PD02	DB08	62,49	65,63	63,67	64,46	4	64,06		1,32	2,06	95,52
15	A36	PD02	DB08	64,00	65,70	64,10	64,40	4	64,55		0,79	1,22	96,25
16	F12x	PC01	DB08	66,60	65,50	64,90	65,90	4	65,73		0,71	1,09	98,00
17	F06x	PD02	DB08	66,22	64,85	66,71	65,97	4	65,94		0,79	1,19	98,32
18	F03	PD02	DB08	66,94	65,13	66,59	66,65	4	66,33		0,81	1,23	98,90
19	A60x	PD01	DB10	66,50	67,50	67,50	66,60	4	67,03		0,55	0,82	99,94
20	A79	PD03	DB10	64,33	66,36	66,14	71,54	4	67,09		3,10	4,62	100,04
21	F13x	PD01	DB08	67,36	68,00	66,79	67,04	4	67,30		0,52	0,78	100,34
22	F33x	PD01	DB10	70,55	70,15	71,40	66,03	4	69,53		2,39	3,44	103,68
23	F05x	PD02	DB08	72,70	71,40	70,00	70,00	4	71,03		1,30	1,83	105,90
24	A53	PZ02	DD02	73,10	70,90	72,70	68,00	4	71,18		2,32	3,26	106,13
25	A45x	PB99	DB08	72,00	71,60	71,90	71,00	4	71,63		0,45	0,63	106,80
26	F32x	PD02	DB08	75,20	71,50	71,40	76,70	4	73,70		2,67	3,62	109,89
27	A39	PD02	DB08	73,56	75,53	72,98	73,67	4	73,94		1,11	1,50	110,24
28	A65	PD01	DB08	64,10	79,00	74,30	78,80	4	74,05		6,98	9,43	110,41
29	F16x	PC01	DB08	73,96	73,90	76,94	75,60	4	75,10		1,46	1,94	111,98
30	F14x	PC01	DB08	83,57	73,59	68,49	81,34	4	76,75		6,97	9,08	114,44
31	A71	PB03	DB01	77,03	77,04	76,41	76,86	4	76,83		0,29	0,38	114,57
32	F15x	PC01	DB08	86,00	75,00	78,00	77,00	4	79,00		4,83	6,11	117,79
33	F02x	PD02	DB08	80,00	73,00	85,00	79,00	4	79,25		4,92	6,21	118,17
34	A57	PZ02	DD02	85,80	85,30	83,40	78,90	4	83,35	*	3,14	3,77	124,28
35	F29x	PD02	DB01	97,57	102,50	92,79	94,83	0	96,92	*b* *	4,20	4,34	144,52
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	n	Mean	s_r	CV_r
all labs	**136**	**67,07**	**2,649**	**3,950**
20 % from the mean				
	l		s_R	CV_R
	34		**7,491**	**11,170**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Fe **Sample: 4** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F19x	PD02	DB08	1380,00	1400,00	1400,00	1380,00	4	1390,00	*	11,55	0,83	78,69
2	F33x	PD01	DB10	1353,03	1401,31	1419,60	1387,93	4	1390,47	*	28,13	2,02	78,71
3	F08x	PZ99	DB08	1413,00	1490,00	1436,00	1380,00	4	1429,75		46,28	3,24	80,94
4	A57	PZ02	DD02	1444,20	1458,60	1448,00	1548,40	4	1474,80		49,44	3,35	83,49
5	F07x	PD02	DB08	1481,39	1651,82	1379,66	1504,68	4	1504,39		112,28	7,46	85,16
6	F03	PD02	DB08	1535,00	1503,00	1477,00	1560,00	4	1518,75		36,32	2,39	85,98
7	A59	PC01	DB08	1267,00	1569,00	1888,00	1490,00	0	1553,50	c	257,06	**16,55**	87,94
8	F09	PC01	DB10	1503,00	1417,00	1677,00	1664,00	4	1565,25		126,61	8,09	88,61
9	A80	PD03	DB10	1652,00	1688,00	1611,00	1713,00	4	1666,00		44,40	2,67	94,31
10	F27	PD01	DB01	1703,00	1674,00	1649,00	1730,00	4	1689,00		35,13	2,08	95,61
11	A36	PD02	DB08	1679,00	1724,00	1730,00	1665,00	4	1699,50		32,36	1,90	96,21
12	F02x	PD02	DB08	1719,00	1656,00	1793,00	1666,00	4	1708,50		62,75	3,67	96,72
13	F28x	PD02	DB08	1668,50	1712,70	1699,10	1756,90	4	1709,30		36,72	2,15	96,76
14	A53	PZ02	DD02	1720,00	1710,00	1740,00	1750,00	4	1730,00		18,26	1,06	97,94
15	A60x	PD01	DB10	1752,00	1678,00	1726,00	1779,00	4	1733,75		43,01	2,48	98,15
16	F05x	PD02	DB08	1741,00	1761,00	1792,00	1772,00	4	1766,50		21,30	1,21	100,00
17	F18x	PD99	DB08	1770,00	1760,00	1780,00	1770,00	4	1770,00		8,16	0,46	100,20
18	A45x	PB99	DB08	1720,00	1850,00	1870,00	1730,00	4	1792,50		78,48	4,38	101,47
19	A39	PD02	DB08	1826,00	1800,00	1798,00	1798,00	4	1805,50		13,70	0,76	102,21
20	A47x	PD01	DB08	1780,00	1781,00	1859,00	1821,00	4	1810,25		37,70	2,08	102,48
21	F06x	PD02	DB08	1835,00	1837,00	1821,00	1776,00	4	1817,25		28,41	1,56	102,87
22	A82	PC01	DB08	1811,00	1921,00	1814,00	1756,00	4	1825,50		69,02	3,78	103,34
23	F12x	PC01	DB08	1823,00	1812,00	1813,00	1872,00	4	1830,00		28,44	1,55	103,60
24	F29x	PD02	DB01	1821,00	1894,40	1818,04	1817,00	4	1837,61		37,90	2,06	104,03
25	F13x	PD01	DB08	1950,38	1886,81	1880,81	1892,37	4	1902,59		32,21	1,69	107,71
26	A65	PD01	DB08	1841,00	1859,00	1923,00	1995,00	4	1904,50		69,85	3,67	107,81
27	A88	PD01	DB08	1857,10	1984,60	1920,90	1889,10	4	1912,93		54,42	2,84	108,29
28	A79	PD03	DB10	1971,00	1895,00	1907,00	1922,00	4	1923,75		33,38	1,74	108,90
29	F32x	PD02	DB08	1911,00	1922,00	1922,00	1944,00	4	1924,75		13,84	0,72	108,96
30	A49	PC03	DB08	1912,00	1924,00	1976,00	1968,00	4	1945,00		31,73	1,63	110,11
31	F14x	PC01	DB08	1995,35	1953,53	1995,35	1959,96	4	1976,05		22,44	1,14	111,86
32	F16x	PC01	DB08	2013,00	1914,00	2005,00	1981,00	4	1978,25		44,94	2,27	111,99
33	F15x	PC01	DB08	1987,00	1992,00	2046,00	2069,00	4	2023,50		40,42	2,00	114,55
34	A90	PD01	DB10	2021,00	1947,00	2040,00	2121,00	4	2032,25		71,49	3,52	115,05
35	A71	PB03	DB01	2082,77	2063,18	2058,28	2082,91	4	2071,78		12,92	0,62	117,28
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	n	Mean	s_r	CV_r
all labs	**136**	**1766,47**	**42,175**	**2,388**
20	% from the mean			

l	s_R	CV_R
34	**187,519**	**10,615**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cu **Sample: 1** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	S22	PB06	DB08	5,41	5,65	5,65	5,98	0	5,67	*b* *	0,23	4,13	62,29
2	F07x	PD02	DB08	7,18	7,68	7,14	7,88	4	7,47		0,37	4,90	82,04
3	F27	PD01	DB05	7,39	7,37	7,73	7,87	4	7,59		0,25	3,31	83,33
4	F33x	PD01	DB10	7,72	8,74	7,47	8,37	4	8,08		0,58	7,23	88,67
5	F19x	PD02	DB08	8,23	8,29	8,10	8,13	4	8,19		0,09	1,08	89,90
6	F06x	PD02	DB08	8,70	8,51	8,58	8,66	4	8,61		0,08	0,98	94,57
7	A60x	PD01	DB10	8,24	8,52	9,10	*11,8a*	3	8,62		0,44	5,09	94,65
8	A59	PC01	DB08	7,81	8,90	8,93	8,89	4	8,63		0,55	6,36	94,79
9	F05	PD02	DB08	8,62	9,35	8,38	8,55	4	8,73		0,43	4,91	95,81
10	A47x	PD01	DB08	8,57	8,73	8,87	8,95	4	8,78		0,17	1,90	96,41
11	A49	PC03	DB08	8,85	8,81	8,83	8,80	4	8,82		0,02	0,25	96,88
12	F12x	PC01	DB09	8,84	8,79	8,85	9,11	4	8,90		0,14	1,62	97,70
13	A79	PD03	DB10	8,89	8,84	8,99	9,00	4	8,93		0,08	0,89	98,06
14	F08x	PZ99	DB08	9,60	8,17	9,27	8,71	4	8,94		0,63	7,05	98,14
15	F29x	PD02	DB10	8,82	9,00	9,24	9,00	4	9,02		0,17	1,91	98,99
16	F09	PZ02	DD02	8,68	8,98	9,12	9,39	4	9,04		0,30	3,27	99,29
17	A82	PC01	DB10	8,93	9,06	9,24	9,20	4	9,11		0,14	1,55	100,01
18	A45x	PB99	DB08	8,64	8,81	9,21	9,79	4	9,11		0,51	5,61	100,06
19	F13x	PC01	DB08	9,02	9,03	9,32	9,22	4	9,15		0,15	1,61	100,45
20	F28x	PD02	DB08	9,06	9,34	8,99	9,23	4	9,16		0,16	1,74	100,54
21	A90	PD01	DB10	9,31	9,26	9,23	8,97	4	9,19		0,15	1,65	100,94
22	F02x	PD02	DB08	9,10	9,40	9,40	9,20	4	9,28		0,15	1,62	101,85
23	A80	PD03	DB10	9,17	9,32	9,13	9,53	4	9,29		0,18	1,95	101,98
24	A53	PZ02	DD02	9,40	9,29	9,30	9,28	4	9,32		0,06	0,60	102,31
25	F18x	PD99	DB10	9,44	9,44	9,21	9,29	4	9,35		0,11	1,22	102,61
26	A39	PD02	DB08	9,26	9,53	9,37	9,35	4	9,38		0,11	1,20	102,97
27	A36	PD02	DB08	9,20	9,27	9,16	9,90	4	9,38		0,35	3,71	103,03
28	F32x	PD02	DB08	9,36	9,47	9,49	9,43	4	9,44		0,06	0,61	103,63
29	F15x	PC01	DB08	9,18	9,80	9,42	9,51	4	9,48		0,26	2,70	104,07
30	F03	PD02	DB08	9,47	9,58	9,49	9,42	4	9,49		0,07	0,70	104,21
31	F26x	PC02	DB08	9,36	9,67	9,57	9,39	4	9,50		0,15	1,56	104,29
32	A88	PD01	DB08	9,76	9,51	9,63	9,70	4	9,65		0,11	1,11	105,96
33	A65	PD01	DB08	9,70	9,60	9,70	9,80	4	9,70		0,08	0,84	106,51
34	F16x	PC01	DB08	9,89	10,05	10,10	9,73	4	9,94		0,17	1,69	109,18
35	A57	PZ02	DD02	9,70	10,30	9,90	10,00	4	9,98		0,25	2,51	109,53
36	F14x	PC01	DB10	10,54	9,88	10,00	10,06	4	10,12		0,29	2,87	111,14
37	A71	PB03	DB01	10,94	10,99	10,55	*11,0526a*	3	10,83		0,24	2,20	118,90
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	n	Mean	s_r	CV_r
all labs	**142**	**9,11**	**0,223**	**2,451**
20	% from the mean			
	l		s_R	CV_R
	36		**0,655**	**7,183**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cu **Sample: 2** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	S22	PB06	DB08	2,51	2,49	2,53	2,63	0	2,54	*b*	*	0,06	2,45	63,44
2	F09	PZ02	DD02	3,35	3,60	3,37	3,67	4	3,50			0,16	4,62	87,35
3	F07x	PD02	DB08	3,33	3,63	3,28	3,83	4	3,52			0,26	7,30	87,88
4	A60x	PD01	DB10	3,56	3,64	3,57	3,53	4	3,58			0,05	1,30	89,29
5	F19x	PD02	DB08	3,60	3,54	3,63	3,59	4	3,59			0,04	1,04	89,66
6	A57	PZ02	DD02	3,60	3,60	3,60	3,60	4	3,60			0,00	0,00	89,91
7	F27	PD01	DB05	3,67	3,67	3,71	3,67	4	3,68			0,02	0,46	91,95
8	A79	PD03	DB10	3,76	3,66	3,68	3,71	4	3,70			0,04	1,15	92,42
9	F06x	PD02	DB08	3,74	3,77	3,73	3,68	4	3,73			0,04	1,00	93,16
10	A47x	PD01	DB08	3,63	3,78	3,70	3,87	4	3,75			0,10	2,76	93,53
11	F12x	PC01	DB09	3,80	3,79	3,72	3,70	4	3,75			0,05	1,33	93,72
12	F05	PD02	DB08	3,79	3,72	3,75	3,75	4	3,75			0,03	0,77	93,72
13	A82	PC01	DB10	3,87	3,85	3,87	3,89	4	3,87			0,02	0,42	96,65
14	F33x	PD01	DB10	4,00	3,78	3,92	3,98	4	3,92			0,10	2,53	97,90
15	F03	PD02	DB08	4,04	3,96	3,91	4,00	4	3,98			0,06	1,40	99,34
16	F26x	PC02	DB08	3,90	3,99	4,01	4,05	4	3,99			0,06	1,59	99,59
17	A90	PD01	DB10	4,05	4,00	3,97	4,06	4	4,02			0,04	1,06	100,40
18	A36	PD02	DB08	4,08	4,01	4,03	4,03	4	4,04			0,03	0,74	100,84
19	F32x	PD02	DB08	4,08	4,01	4,03	4,10	4	4,06			0,04	1,04	101,27
20	F18x	PD99	DB10	4,01	4,04	4,13	4,12	4	4,08			0,06	1,45	101,77
21	A80	PD03	DB10	3,99	4,02	3,98	4,33	4	4,08			0,17	4,11	101,90
22	A39	PD02	DB08	4,09	4,11	4,16	3,97	4	4,08			0,08	1,97	101,96
23	F13x	PC01	DB08	4,07	4,06	4,11	4,11	4	4,09			0,03	0,64	102,09
24	F14x	PC01	DB10	3,98	4,16	4,20	4,09	4	4,11			0,10	2,37	102,53
25	A45x	PB99	DB08	4,10	4,22	4,12	4,19	4	4,16			0,06	1,37	103,83
26	A53	PZ02	DD02	4,11	4,17	4,21	4,16	4	4,16			0,04	0,99	103,96
27	A65	PD01	DB08	4,20	4,20	4,30	4,20	4	4,23			0,05	1,18	105,52
28	F02x	PD02	DB08	4,20	4,20	4,10	4,40	4	4,23			0,13	2,98	105,52
29	F16x	PC01	DB08	4,20	4,36	4,24	4,19	4	4,25			0,08	1,84	106,08
30	A88	PD01	DB08	4,41	4,23	4,32	4,37	4	4,33			0,08	1,79	108,21
31	F08x	PZ99	DB08	3,88	4,91	4,36	4,30	4	4,36			0,42	9,69	108,95
32	F15x	PC01	DB08	4,27	5,60	3,76	3,85	0	4,37	*c*		0,85	19,44	109,14
33	F29x	PD02	DB10	4,47	4,44	4,44	4,37	4	4,43			0,04	0,96	110,64
34	A49	PC03	DB08	4,60	4,47	4,60	4,54	4	4,55			0,06	1,36	113,70
35	F28x	PD02	DB08	4,51	4,78	4,57	4,72	4	4,65			0,13	2,73	116,02
36	A59	PC01	DB08	4,64	4,78	3,99	*7,73a*	3	4,47			0,42	9,43	111,64
37	A71	PB03	DB01	6,10	6,19	6,80	7,24	0	6,58	*b*	*	0,54	8,18	164,39
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	n	Mean	s_r	CV_r
all labs	**135**	**4,00**	**0,090**	**2,252**
20	% from the mean			
	l		s_R	CV_R
	34		**0,306**	**7,638**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cu **Sample: 3** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	S22	PB06	DB08	4,21	4,60	4,31	4,22	0	4,34	*b*	*	0,18	4,21	72,11
2	F07x	PD02	DB08	5,05	5,16	4,74	4,74	4	4,92			0,21	4,36	81,90
3	F27	PD01	DB05	5,13	4,91	5,26	4,92	4	5,06			0,17	3,34	84,10
4	A60x	PD01	DB10	5,37	5,37	5,37	5,28	4	5,35			0,04	0,84	88,95
5	F19x	PD02	DB08	5,27	5,50	5,64	5,51	4	5,48			0,15	2,81	91,16
6	A47x	PD01	DB08	5,47	5,43	5,51	5,67	4	5,52			0,11	1,91	91,82
7	F06x	PD02	DB08	5,59	5,56	5,62	5,62	4	5,60			0,03	0,51	93,11
8	A80	PD03	DB10	5,48	5,86	5,66	5,57	4	5,64			0,16	2,88	93,86
9	F05	PD02	DB08	5,73	5,71	5,74	5,71	4	5,72			0,02	0,26	95,19
10	F12x	PC01	DB09	5,65	5,76	5,64	5,86	4	5,73			0,10	1,81	95,28
11	A45x	PB99	DB08	6,07	5,79	6,01	5,80	4	5,92			0,14	2,43	98,44
12	A36	PD02	DB08	5,87	5,90	5,94	6,02	4	5,93			0,06	1,10	98,69
13	F18x	PD99	DB10	6,05	5,96	5,99	5,85	4	5,96			0,08	1,41	99,18
14	A90	PD01	DB10	6,32	6,23	6,09	5,37	4	6,00			0,43	7,20	99,85
15	A82	PC01	DB10	6,19	5,98	6,17	5,73	4	6,02			0,21	3,55	100,10
16	A49	PC03	DB08	6,15	6,33	5,79	5,96	4	6,06			0,23	3,86	100,77
17	A39	PD02	DB08	5,99	6,10	6,07	6,07	4	6,06			0,05	0,78	100,77
18	A79	PD03	DB10	6,14	6,09	6,05	6,16	4	6,11			0,05	0,78	101,62
19	F28x	PD02	DB08	6,07	6,10	6,24	6,03	4	6,11			0,09	1,50	101,70
20	F09	PZ02	DD02	5,90	5,95	6,37	6,27	4	6,12			0,23	3,80	101,85
21	A57	PZ02	DD02	6,30	6,20	6,10	5,90	4	6,13			0,17	2,79	101,89
22	F13x	PC01	DB08	6,13	6,09	6,07	6,23	4	6,13			0,07	1,16	101,97
23	F33x	PD01	DB10	6,95	5,84	6,19	5,54	4	6,13			0,61	9,91	101,97
24	F08x	PZ99	DB08	5,67	6,40	5,56	6,92	4	6,14			0,64	**10,45**	102,10
25	F26x	PC02	DB08	6,28	6,01	6,18	6,33	4	6,20			0,14	2,28	103,14
26	F32x	PD02	DB08	6,24	6,15	6,30	6,28	4	6,24			0,07	1,07	103,84
27	A59	PC01	DB08	6,63	6,77	5,97	5,70	4	6,27			0,51	8,21	104,26
28	F03	PD02	DB08	6,29	6,23	6,28	6,31	4	6,28			0,03	0,54	104,42
29	F29x	PD02	DB10	6,41	6,29	6,28	6,50	4	6,37			0,10	1,65	105,96
30	F16x	PC01	DB08	6,32	6,20	6,46	6,55	4	6,38			0,15	2,42	106,17
31	F14x	PC01	DB10	6,91	6,21	5,98	6,48	4	6,40			0,40	6,27	106,38
32	A65	PD01	DB08	6,10	6,80	6,40	6,60	4	6,48			0,30	4,61	107,71
33	F02x	PD02	DB08	6,60	6,40	6,60	6,60	4	6,55			0,10	1,53	108,96
34	A88	PD01	DB08	6,77	6,34	6,56	6,67	4	6,59			0,18	2,80	109,54
35	A53	PZ02	DD02	6,90	6,88	6,80	6,68	4	6,82			0,10	1,46	113,37
36	F15x	PC01	DB08	*6,31a*	8,09	8,10	7,74	0	7,98	*b*	*	0,21	2,57	132,69
37	A71	PB03	DB01	9,40	9,33	8,48	7,78	0	8,75	*b*	*	0,77	8,82	145,55
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	n	Mean	s_r	CV_r
all labs	**136**	**6,01**	**0,182**	**3,023**
20	% from the mean			
	l		s_R	CV_R
	34		**0,418**	**6,951**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cu **Sample: 4** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	S22	PB06	DB08	4,18	4,32	4,16	4,17	0	4,21	*b*	*	0,08	1,79	68,97
2	F09	PZ02	DD02	4,82	4,62	4,66	4,90	4	4,75		*	0,13	2,78	77,86
3	F07x	PD02	DB08	4,82	5,46	4,83	4,96	4	5,02			0,30	6,03	82,26
4	A57	PZ02	DD02	5,00	5,10	5,30	5,20	4	5,15			0,13	2,51	84,41
5	F27	PD01	DB05	5,08	5,45	5,57	5,34	4	5,36			0,21	3,88	87,89
6	A60x	PD01	DB10	5,70	5,46	5,47	5,54	4	5,54			0,11	2,00	90,85
7	F12x	PC01	DB09	5,58	5,69	5,53	5,73	4	5,63			0,09	1,66	92,32
8	F19x	PD02	DB08	5,59	5,59	5,69	5,68	4	5,64			0,06	0,98	92,41
9	A80	PD03	DB10	5,82	5,85	5,67	5,84	4	5,80			0,08	1,45	94,99
10	A45x	PB99	DB08	6,02	5,67	5,94	5,77	4	5,85			0,16	2,72	95,89
11	A47x	PD01	DB08	6,05	5,73	5,84	5,83	4	5,86			0,13	2,29	96,09
12	F06x	PD02	DB08	5,90	5,87	5,94	5,80	4	5,88			0,06	1,01	96,34
13	A88	PD01	DB08	5,99	5,84	5,91	5,95	4	5,92			0,06	1,08	97,08
14	A39	PD02	DB08	6,16	5,94	5,93	5,92	4	5,99			0,12	1,93	98,14
15	F33x	PD01	DB10	6,17	5,97	5,89	6,08	4	6,03			0,12	2,04	98,80
16	A82	PC01	DB10	6,24	6,02	5,99	6,05	4	6,08			0,11	1,86	99,58
17	F13x	PC01	DB08	6,08	6,01	6,14	6,07	4	6,08			0,05	0,88	99,58
18	A53	PZ02	DD02	6,07	6,10	6,23	6,10	4	6,13			0,07	1,17	100,40
19	A49	PC03	DB08	6,14	6,09	6,13	6,25	4	6,15			0,07	1,11	100,85
20	A79	PD03	DB10	6,22	6,18	6,03	6,21	4	6,16			0,09	1,44	100,96
21	F32x	PD02	DB08	6,25	6,24	6,23	6,29	4	6,25			0,03	0,42	102,49
22	A36	PD02	DB08	6,16	6,24	6,21	6,47	4	6,27			0,14	2,19	102,77
23	F05	PD02	DB08	6,29	6,30	6,30	6,28	4	6,29			0,01	0,15	103,14
24	F14x	PC01	DB10	6,32	6,04	6,89	6,20	4	6,36			0,37	5,87	104,26
25	F16x	PC01	DB08	6,52	6,34	6,36	6,34	4	6,39			0,09	1,36	104,74
26	F02x	PD02	DB08	6,30	6,40	6,50	6,40	4	6,40			0,08	1,28	104,90
27	F18x	PD99	DB10	6,42	6,46	6,45	6,29	4	6,41			0,08	1,23	104,99
28	F28x	PD02	DB08	6,25	6,46	6,40	6,63	4	6,43			0,16	2,43	105,47
29	A59	PC01	DB08	8,28	5,78	6,66	5,18	0	6,48	*c*		1,35	**20,82**	106,13
30	F15x	PC01	DB08	6,39	6,69	6,41	*8,08a*	3	6,50			0,17	2,58	106,49
31	A90	PD01	DB10	6,81	6,14	6,55	6,53	4	6,51			0,28	4,24	106,67
32	A65	PD01	DB08	6,50	6,50	6,50	6,60	4	6,53			0,05	0,77	106,95
33	F29x	PD02	DB10	6,54	6,47	6,45	6,65	4	6,53			0,09	1,38	106,99
34	F03	PD02	DB08	6,74	6,75	6,80	6,71	4	6,75			0,04	0,55	110,64
35	F08x	PZ99	DB08	8,02	6,77	7,26	6,85	4	7,23			0,57	7,91	118,43
36	F26x	PC02	DB08	7,65	7,40	7,80	7,90	4	7,69		*	0,22	2,83	126,01
37	A71	PB03	DB01	8,00	8,12	8,90	8,73	0	8,44	*b*	*	0,44	5,24	138,33
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	n	Mean	s_r	CV_r
all labs	**135**	**6,10**	**0,133**	**2,182**
20	% from the mean			
	l		s_R	CV_R
	34		**0,576**	**9,430**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Pb **Sample: 1** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F18x	PD99	DB10	0,20	0,20	0,19	0,20	4	0,20		0,00	2,46	78,83
2	F16x	PC01	DB10	0,21	0,23	0,20	0,25	4	0,22		0,02	**10,18**	89,24
3	F33x	PD01	DB10	0,22	0,22	0,25	0,22	4	0,23		0,02	6,59	91,50
4	A45x	PB99	DB10	0,22	0,23	0,22	0,24	4	0,23		0,01	3,00	91,80
5	F08x	PC01	DB08	0,23	0,28	0,22	0,20	4	0,23		0,03	**14,48**	93,21
6	A82	PC01	DB10	0,23	0,23	0,24	0,27	4	0,24		0,02	7,91	96,33
7	A90	PD01	DB10	0,24	0,24	0,25	0,23	4	0,24		0,01	5,01	96,43
8	A36	PD02	DB10	0,24	0,24	0,24	0,24	4	0,24		0,00	1,14	96,83
9	F32x	PD02	DB10	0,25	0,27	0,26	0,24	4	0,25		0,01	5,28	102,36
10	A79	PD03	DB10	0,26	0,29	0,27	0,24	4	0,26		0,02	8,02	106,41
11	F13x	PD01	DB05	0,27	0,27	0,29	0,29	4	0,28		0,01	4,12	112,62
12	F05	PD02	DB05	0,28	0,28	0,29	0,30	4	0,29		0,01	2,54	115,33
13	F29x	PD02	DB10	0,30	0,30	0,29	0,29	4	0,30		0,01	1,96	118,65
14	F14x	PC01	DB10	0,28	0,28	0,29	*0,337a*	3	0,28		0,01	2,21	113,82
15	A60x	PD01	DB10	0,22	0,24	0,28	*0,621a*	3	0,25		0,03	**12,23**	100,15
16	F27	PD01	DB05	0,47	0,50	0,41	0,41	0	0,44	*b* *	0,05	**10,47**	178,88
17	A65	PD01	DB08	1,30	0,90	1,20	1,20	0	1,15	*b* *	0,17	**15,06**	462,53
18													
19													
20	A88	PD01	DB08	<1	<1	<1	<1			**			
21	F25x	PB06	DB08	<,5	<,5	<,5	<,5						
22	F03	PD02	DB08	<,5	<,5	<,5	<,5						
23	F06x	PD02	DB08	<,5	<,5	<,5	<,5						
24	A39	PD02	DB08	<,5	<,5	<,5	<,5						
25	F15x	PC01	DB08	<,5	<,5	<,5	<,5						
26	F12x	PC01	DB09	<,5	<,5	<,5	<,5						
27	F02	PD02	DB05	<,5	<,5	<,5	<,5						
28	A49	PC03	DB09	<,3	<,3	<,3	<,3						
29	A80	PD03	DB10	<,25	<,25	<,25	<,25						
30	F07x	PD02	DB08	<,2	0,26	<,2	<,2						
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	n	Mean	s_r	CV_r
all labs	**58**	**0,25**	**0,014**	**5,696**
40	% from the mean			

l	s_R	CV_R
15	**0,028**	**11,201**

* = non tolerable mean because more than +/-
limit for the lower concentration range

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Pb **Sample: 2** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F07x	PD02	DB08	21,16	22,81	20,39	21,24	4	21,40		1,02	4,74	76,24
2	F02	PD02	DB05	22,22	21,69	23,43	21,57	4	22,23		0,85	3,82	79,18
3	F27	PD01	DB05	23,54	24,40	26,29	25,18	4	24,85		1,17	4,70	88,54
4	A49	PC03	DB09	26,70	25,40	25,80	25,90	4	25,95		0,54	2,10	92,45
5	F29x	PD02	DB10	26,22	26,13	26,50	25,74	4	26,15		0,31	1,20	93,15
6	F08x	PC01	DB08	26,90	25,96	25,46	26,42	4	26,18		0,62	2,36	93,28
7	A60x	PD01	DB10	26,40	27,60	27,20	26,80	4	27,00		0,52	1,91	96,19
8	F12x	PC01	DB09	27,60	27,10	27,00	26,90	4	27,15		0,31	1,15	96,72
9	A82	PC01	DB10	27,70	26,80	27,40	27,10	4	27,25		0,39	1,42	97,08
10	F06x	PD02	DB08	27,80	27,34	27,23	26,75	4	27,28		0,43	1,58	97,18
11	F05	PD02	DB05	27,50	27,20	27,20	27,30	4	27,30		0,14	0,52	97,25
12	A45x	PB99	DB10	27,40	27,30	27,40	27,10	4	27,30		0,14	0,52	97,25
13	A90	PD01	DB10	27,20	27,60	27,60	29,10	4	27,88		0,84	3,01	99,30
14	F14x	PC01	DB10	27,85	28,49	28,59	27,95	4	28,22		0,37	1,32	100,53
15	A39	PD02	DB08	28,27	27,94	29,01	27,73	4	28,24		0,56	1,99	100,59
16	F16x	PC01	DB10	27,34	29,38	26,94	29,34	4	28,25		1,29	4,57	100,64
17	F18x	PD99	DB10	28,30	28,30	28,30	28,50	4	28,35		0,10	0,35	101,00
18	A36	PD02	DB10	28,72	29,27	28,51	27,82	4	28,58		0,60	2,10	101,81
19	A80	PD03	DB10	27,50	28,20	28,30	30,70	4	28,68		1,40	4,87	102,15
20	A88	PD01	DB08	28,70	28,77	28,72	28,74	4	28,73		0,03	0,10	102,36
21	F13x	PD01	DB05	30,26	29,81	28,30	28,03	4	29,10		1,10	3,78	103,67
22	A65	PD01	DB08	29,90	28,80	30,10	30,40	4	29,80		0,70	2,34	106,16
23	F15x	PC01	DB08	31,40	30,00	30,70	30,60	4	30,68		0,57	1,87	109,28
24	A79	PD03	DB10	30,94	30,54	30,67	30,64	4	30,70		0,17	0,56	109,36
25	F03	PD02	DB08	31,20	30,30	31,40	31,50	4	31,10		0,55	1,76	110,79
26	F25x	PB06	DB08	31,24	31,14	31,52	31,14	4	31,26		0,18	0,57	111,36
27	F33x	PD01	DB10	32,95	32,19	32,80	32,00	4	32,49		0,46	1,42	115,73
28	F32x	PD02	DB10	34,30	33,40	33,90	34,00	4	33,90		0,37	1,10	120,77
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	n	Mean	s_r	CV_r
all labs	**112**	**28,07**	**0,562**	**2,002**
* = non tolerable mean because more than +/- **30** % from the mean				
	l		s_R	CV_R
	28		**2,701**	**9,624**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Pb **Sample: 3** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F18x	PD99	DB10	0,11	0,11	0,12	0,10	4	0,11		0,01	7,09	60,60
2	A90	PD01	DB10	0,13	0,13	0,16	0,13	4	0,14		0,02	**12,23**	74,12
3	F16x	PC01	DB10	0,13	0,14	0,16	0,16	4	0,15		0,01	7,86	81,02
4	A82	PC01	DB10	0,16	0,16	0,14	0,14	4	0,15		0,01	5,62	81,08
5	A36	PD02	DB10	0,15	0,15	0,15	0,15	4	0,15		0,00	1,57	82,71
6	A60x	PD01	DB10	0,16	0,16	0,15	0,15	4	0,15		0,01	4,59	82,99
7	F08x	PC01	DB08	0,17	0,15	0,17	0,13	4	0,16		0,02	**10,66**	85,31
8	A79	PD03	DB10	0,16	0,16	0,18	0,17	4	0,17		0,01	4,82	90,90
9	A45x	PB99	DB10	0,16	0,17	0,17	0,18	4	0,17		0,01	5,80	91,45
10	F32x	PD02	DB10	0,16	0,19	0,20	0,20	4	0,19		0,02	8,29	101,96
11	F33x	PD01	DB10	0,18	0,22	0,20	0,21	4	0,20		0,02	8,43	110,56
12	F05	PD02	DB05	0,24	0,22	0,21	0,22	4	0,22		0,01	5,24	122,16
13	F14x	PC01	DB10	0,23	0,20	0,23	0,25	4	0,23		0,02	8,82	122,98
14	F27	PD01	DB05	0,30	0,25	0,25	0,32	4	0,28	*	0,03	**12,35**	152,46
15	F29x	PD02	DB10	0,31	0,29	0,29	0,28	4	0,29	*	0,01	4,30	159,70
16	A65	PD01	DB08	0,80	0,70	1,20	0,90	0	0,90	*b* *	0,22	**24,00**	491,37
17													
18													
19	A88	PD01	DB08	<1	<1	<1	<1			**			
20	F12x	PC01	DB09	<,5	<,5	<,5	<,5						
21	A39	PD02	DB08	<,5	<,5	<,5	<,5						
22	F02	PD02	DB05	<,5	<,5	<,5	<,5						
23	F06x	PD02	DB08	<,5	<,5	<,5	<,5						
24	F03	PD02	DB08	<,5	<,5	<,5	<,5						
25	F25x	PB06	DB08	<,5	<,5	<,5	<,5						
26	F15x	PC01	DB08	<,5	<,5	<,5	<,5						
27	A49	PC03	DB09	<,3	<,3	<,3	<,3						
28	A80	PD03	DB10	<,25	<,25	<,25	<,25						
29	F07x	PD02	DB08	<,2	<,2	<,2	<,2						
30	F13x	PD01	DB05	<,155	<,155	0,16	<,155						
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	n	Mean	s_r	CV_r
all labs	**60**	**0,18**	**0,013**	**7,260**
40	% from the mean			

l	s_R	CV_R
15	**0,052**	**28,474**

* = non tolerable mean because more than +/-

Lower than the lowest evaluated result

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Pb **Sample: 4** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A88	PD01	DB08	1,17	1,27	1,22	1,25	0	1,23	*b*	*	0,04	3,54	53,32
2	F03	PD02	DB08	1,59	1,57	1,51	1,65	4	1,58		*	0,06	3,65	68,63
3	F07x	PD02	DB08	1,58	1,79	1,60	1,58	4	1,64			0,10	6,29	71,10
4	A49	PC03	DB09	1,85	1,92	1,80	1,75	4	1,83			0,07	3,97	79,49
5	F27	PD01	DB05	2,12	1,98	1,96	2,03	4	2,02			0,07	3,64	87,73
6	F06x	PD02	DB08	2,51	1,93	1,88	1,94	4	2,06			0,30	**14,48**	89,67
7	F05	PD02	DB05	2,09	2,11	2,18	2,13	4	2,13			0,04	1,82	92,41
8	F29x	PD02	DB10	2,11	2,04	2,22	2,30	4	2,17			0,12	5,32	94,15
9	A60x	PD01	DB10	2,20	2,09	2,14	2,28	4	2,18			0,08	3,76	94,58
10	F16x	PC01	DB10	2,11	2,32	2,02	2,28	4	2,18			0,14	6,44	94,82
11	A36	PD02	DB10	2,22	2,22	2,20	2,15	4	2,20			0,03	1,49	95,43
12	A82	PC01	DB10	2,31	2,24	2,26	2,27	4	2,27			0,03	1,30	98,60
13	F12x	PC01	DB09	2,25	2,31	2,31	2,25	4	2,28			0,03	1,52	99,03
14	A90	PD01	DB10	2,35	2,24	2,47	2,24	4	2,33			0,11	4,72	100,99
15	F18x	PD99	DB10	2,38	2,38	2,33	2,38	4	2,37			0,02	1,06	102,83
16	F33x	PD01	DB10	2,43	2,33	2,46	2,31	4	2,38			0,07	3,09	103,48
17	F08x	PC01	DB08	2,41	2,30	2,35	2,50	4	2,39			0,08	3,51	103,86
18	A39	PD02	DB08	2,39	2,34	2,43	2,41	4	2,39			0,04	1,61	103,92
19	F14x	PC01	DB10	2,41	2,32	2,47	2,38	4	2,39			0,06	2,62	103,96
20	A80	PD03	DB10	3,26	2,18	2,11	2,24	0	2,45	*c*		0,54	**22,24**	106,31
21	F15x	PC01	DB08	2,40	2,40	2,60	2,80	4	2,55			0,19	7,51	110,76
22	A45x	PB99	DB10	2,62	2,64	2,61	2,56	4	2,61			0,03	1,31	113,26
23	F25x	PB06	DB08	2,66	2,68	2,70	2,54	4	2,65			0,07	2,72	114,89
24	A79	PD03	DB10	2,71	2,85	2,60	2,60	4	2,69			0,12	4,43	116,79
25	F32x	PD02	DB10	2,70	2,79	2,77	2,74	4	2,75			0,04	1,42	119,45
26	F13x	PD01	DB05	2,80	2,73	2,76	2,73	4	2,76			0,03	1,20	119,66
27	F02	PD02	DB05	3,05	2,61	2,62	2,82	4	2,78			0,21	7,47	120,53
28	A65	PD01	DB08	4,30	5,00	4,20	4,00	0	4,38	*b*	*	0,43	9,94	190,03
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	n	Mean	s_r	CV_r
all labs	**100**	**2,30**	**0,087**	**3,768**
30	% from the mean			
	l		s_R	CV_R
	25		**0,323**	**14,021**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cd **Sample: 1** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F18x	PD99	DB10	53,90	53,90	53,80	*53,2a*	3	53,87		0,06	0,11	81,48
2	F02	PD02	DB05	60,00	50,00	50,00	60,00	4	55,00		5,77	**10,50**	83,20
3	F29x	PD02	DB10	62,25	52,34	53,12	52,95	4	55,17		4,74	8,58	83,44
4	F16x	PC01	DB10	59,90	53,26	55,40	60,95	4	57,38		3,65	6,36	86,79
5	F07x	PD02	DB08	57,90	53,40	59,50	59,20	4	57,50		2,82	4,90	86,98
6	F25x	PB06	DB08	61,00	58,00	56,00	61,00	4	59,00		2,45	4,15	89,25
7	F03	PD02	DB08	62,40	58,50	60,00	56,00	4	59,23		2,68	4,53	89,59
8	A79	PD03	DB10	64,50	62,50	61,90	57,40	4	61,58		3,00	4,87	93,14
9	F05	PD02	DB05	62,50	67,20	63,00	59,40	4	63,03		3,21	5,09	95,33
10	A36	PD02	DB10	64,21	62,89	63,00	65,09	4	63,80		1,05	1,64	96,50
11	F13x	PD01	DB05	63,24	65,20	63,29	63,58	4	63,83		0,93	1,45	96,55
12	F33x	PD01	DB10	58,00	70,00	62,00	67,00	4	64,25		5,32	8,27	97,19
13	F32x	PD02	DB10	65,00	64,00	65,00	64,00	4	64,50		0,58	0,90	97,57
14	F28x	PD02	DB05	63,48	67,97	61,84	65,70	4	64,75		2,67	4,12	97,94
15	F08x	PD01	DB10	73,90	60,00	58,30	73,90	0	66,53	*c*	8,54	**12,84**	100,63
16	A82	PC01	DB10	70,00	69,00	65,00	65,00	4	67,25		2,63	3,91	101,73
17	A90	PD01	DB10	70,70	67,20	65,70	68,60	4	68,05		2,13	3,13	102,94
18	A45x	PB99	DB10	68,80	68,00	67,90	67,90	4	68,15		0,44	0,64	103,09
19	A80	PD03	DB10	69,90	68,80	66,50	69,30	4	68,63		1,49	2,17	103,80
20	A39	PD02	DB08	70,80	72,00	68,70	69,00	4	70,13		1,56	2,22	106,07
21	F14x	PC01	DB10	73,59	70,29	70,66	68,10	4	70,66		2,26	3,19	106,88
22	A60x	PD01	DB10	75,30	67,80	71,60	68,50	4	70,80		3,42	4,84	107,09
23	A88	PD01	DB05	67,50	73,50	76,50	75,00	4	73,13		3,94	5,39	110,61
24	F06x	PD02	DB08	87,00	84,00	77,00	84,00	4	83,00		4,24	5,11	125,55
25	F27	PD01	DB05	84,23	82,92	81,06	85,34	4	83,39		1,84	2,21	126,14
26	F12x	PC01	DB09	83,40	83,40	87,40	80,40	4	83,65		2,87	3,43	126,53
27													
28													
29	A65	PD01	DB08	<200	<200	<200	<200			**			
30	A49	PC03	DB09	<120	<120	<120	<120			**			
31	F15x	PC01	DB08	<50	<50	<50	<50						
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	n	Mean	s_r	CV_r
all labs	**99**	**66,11**	**2,629**	**3,977**
30	% from the mean			

l	s_R	CV_R
25	**8,428**	**12,772**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cd **Sample: 2** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F07x	PD02	DB08	254,20	263,60	251,10	255,10	4	256,00		5,35	2,09	83,24
2	F29x	PD02	DB10	294,41	252,36	247,74	260,27	4	263,70		21,12	8,01	85,74
3	F02	PD02	DB05	230,00	310,00	230,00	300,00	0	267,50	c	43,49	**16,26**	86,98
4	A49	PC03	DB09	275,00	278,00	280,00	277,00	4	277,50		2,08	0,75	90,23
5	F15x	PC01	DB08	310,00	282,00	267,00	260,00	4	279,75		22,16	7,92	90,96
6	F16x	PC01	DB10	293,30	292,80	275,20	285,60	4	286,73		8,45	2,95	93,23
7	F28x	PD02	DB05	272,60	304,80	297,40	285,80	4	290,15		14,07	4,85	94,34
8	A60x	PD01	DB10	288,00	292,00	295,00	290,00	4	291,25		2,99	1,03	94,70
9	A39	PD02	DB08	296,00	298,00	289,00	290,00	4	293,25		4,43	1,51	95,35
10	A82	PC01	DB10	297,00	291,00	295,00	296,00	4	294,75		2,63	0,89	95,84
11	A79	PD03	DB10	307,10	288,90	301,40	296,70	4	298,53		7,70	2,58	97,07
12	A65	PD01	DB08	300,00	300,00	300,00	300,00	4	300,00		0,00	0,00	97,55
13	A36	PD02	DB10	305,60	301,40	302,90	299,80	4	302,43		2,47	0,82	98,34
14	A90	PD01	DB10	302,40	302,00	283,00	324,00	4	302,85		16,76	5,53	98,47
15	F32x	PD02	DB10	307,00	307,00	307,00	307,00	4	307,00		0,00	0,00	99,82
16	F08x	PD01	DB10	337,00	307,80	303,90	291,80	4	310,13		19,17	6,18	100,84
17	F03	PD02	DB08	314,00	325,00	313,00	309,00	4	315,25		6,85	2,17	102,51
18	F12x	PC01	DB09	318,10	314,00	316,00	313,00	4	315,28		2,26	0,72	102,51
19	F25x	PB06	DB08	319,00	311,00	317,00	319,00	4	316,50		3,79	1,20	102,91
20	A80	PD03	DB10	307,00	310,00	315,00	336,00	4	317,00		13,09	4,13	103,08
21	F05	PD02	DB05	315,00	321,00	314,00	320,00	4	317,50		3,51	1,11	103,24
22	F06x	PD02	DB08	306,00	332,00	307,00	329,00	4	318,50		13,92	4,37	103,56
23	F18x	PD99	DB10	317,00	325,00	307,00	328,00	4	319,25		9,39	2,94	103,81
24	F14x	PC01	DB10	324,18	327,37	309,30	316,74	4	319,40		8,07	2,53	103,85
25	A45x	PB99	DB10	322,00	323,00	325,00	321,00	4	322,75		1,71	0,53	104,94
26	F33x	PD01	DB10	340,00	303,00	358,00	334,00	4	333,75		22,90	6,86	108,52
27	F13x	PD01	DB05	344,57	350,53	336,63	351,84	4	345,89		6,94	2,01	112,47
28	F27	PD01	DB05	343,20	360,00	347,10	354,20	4	351,13		7,47	2,13	114,17
29	A88	PD01	DB05	365,00	360,00	355,00	380,00	4	365,00		10,80	2,96	118,68
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	n	Mean	s_r	CV_r
all labs	**112**	**307,54**	**8,573**	**2,788**
30	% from the mean			
	l		s_R	CV_R
	28		**24,489**	**7,963**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cd **Sample: 3** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	F18x	PD99	DB10	43,10	43,60	43,00	43,60	4	43,33			0,32	0,74	77,97
2	F08x	PD01	DB10	46,30	53,40	42,10	47,90	4	47,43			4,67	9,86	85,35
3	F07x	PD02	DB08	50,10	49,80	53,80	43,40	4	49,28			4,32	8,76	88,68
4	F05	PD02	DB05	49,00	45,70	53,70	49,20	4	49,40			3,29	6,65	88,90
5	F16x	PC01	DB10	46,75	51,57	49,17	51,03	4	49,63			2,18	4,39	89,32
6	F02	PD02	DB05	60,00	50,00	50,00	40,00	4	50,00			8,16	**16,33**	89,98
7	A80	PD03	DB10	49,90	53,30	51,10	52,50	4	51,70			1,51	2,91	93,04
8	A60x	PD01	DB10	50,30	53,30	51,30	53,50	4	52,10			1,56	2,99	93,76
9	F13x	PD01	DB05	53,82	52,53	51,47	50,76	4	52,15			1,33	2,56	93,84
10	A36	PD02	DB10	51,38	52,65	51,49	53,60	4	52,28			1,05	2,01	94,09
11	A90	PD01	DB10	52,00	49,00	57,00	54,00	4	53,00			3,37	6,35	95,38
12	F25x	PB06	DB08	52,00	51,00	59,00	51,00	4	53,25			3,86	7,25	95,83
13	A79	PD03	DB10	53,90	53,10	53,90	52,90	4	53,45			0,53	0,98	96,19
14	A39	PD02	DB08	55,80	54,00	53,10	53,40	4	54,08			1,21	2,24	97,32
15	A82	PC01	DB10	59,00	57,00	57,00	54,00	4	56,75			2,06	3,63	102,13
16	A45x	PB99	DB10	57,60	57,70	56,40	56,70	4	57,10			0,65	1,13	102,76
17	F32x	PD02	DB10	59,80	60,80	59,80	59,80	4	60,05			0,50	0,83	108,07
18	A88	PD01	DB05	58,00	60,00	61,00	62,00	4	60,25			1,71	2,83	108,43
19	F14x	PC01	DB10	58,40	69,02	58,40	63,71	4	62,38			5,08	8,15	112,27
20	F12x	PC01	DB09	64,60	62,70	60,70	69,10	4	64,28			3,59	5,58	115,67
21	F33x	PD01	DB10	62,00	72,00	61,00	72,00	4	66,75			6,08	9,10	120,13
22	F27	PD01	DB05	66,64	66,72	65,76	68,73	4	66,96			1,26	1,88	120,51
23	F28x	PD02	DB05	70,87	73,81	69,58	75,55	4	72,45		*	2,72	3,75	130,39
24	F06x	PD02	DB08	90,00	65,00	82,00	61,00	0	74,50	*c*	*	13,77	**18,49**	134,07
25	F29x	PD02	DB10	105,14	*101,42a*	104,79	104,73	0	104,89	*b*	*	0,22	0,21	188,76
26														
27														
28	A65	PD01	DB08	<200	<200	<200	<200				**			
29	A49	PC03	DB09	<120	<120	<120	<120				**			
30	F15x	PC01	DB08	<50	<50	<50	<50							
31	F03	PD02	DB08	<50	<50	<50	<50							
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	n	Mean	s_r	CV_r
all labs	**92**	**55,57**	**2,652**	**4,772**
30	% from the mean			
	l		s_R	CV_R
	23		**7,187**	**12,934**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cd **Sample: 4** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F18x	PD99	DB10	73,60	72,40	75,40	71,20	4	73,15		1,79	2,45	72,41
2	F05	PD02	DB05	80,20	80,50	*71a*	79,50	3	80,07		0,51	0,64	79,26
3	F03	PD02	DB08	81,38	80,25	80,08	86,67	4	82,10		3,10	3,78	81,27
4	A60x	PD01	DB10	87,80	87,80	85,80	87,10	4	87,13		0,94	1,08	86,25
5	F02	PD02	DB05	100,00	80,00	80,00	100,00	4	90,00		11,55	**12,83**	89,09
6	F16x	PC01	DB10	84,77	93,12	92,17	93,23	4	90,82		4,06	4,47	89,91
7	A36	PD02	DB10	93,67	91,51	95,20	90,18	4	92,64		2,23	2,41	91,71
8	F33x	PD01	DB10	90,00	88,00	95,00	109,00	4	95,50		9,47	9,92	94,54
9	A79	PD03	DB10	98,00	96,20	93,20	96,60	4	96,00		2,02	2,10	95,03
10	A80	PD03	DB10	96,30	98,70	94,90	96,40	4	96,58		1,57	1,63	95,60
11	A90	PD01	DB10	100,00	92,00	104,00	100,00	4	99,00		5,03	5,08	98,00
12	A88	PD01	DB05	90,00	108,00	102,00	102,00	4	100,50		7,55	7,51	99,49
13	F14x	PC01	DB10	104,00	98,64	98,64	100,79	4	100,52		2,53	2,52	99,51
14	A39	PD02	DB08	99,00	96,90	99,30	109,50	4	101,18		5,65	5,59	100,16
15	A45x	PB99	DB10	102,00	104,00	103,00	102,00	4	102,75		0,96	0,93	101,71
16	F29x	PD02	DB10	105,47	104,30	95,12	107,32	4	103,05		5,43	5,27	102,01
17	A82	PC01	DB10	106,00	105,00	108,00	106,00	4	106,25		1,26	1,18	105,18
18	F08x	PD01	DB10	99,70	113,80	96,70	117,90	4	107,03		10,40	9,72	105,95
19	F32x	PD02	DB10	104,00	111,00	111,00	109,00	4	108,75		3,30	3,04	107,65
20	F28x	PD02	DB05	119,70	109,20	118,10	122,20	4	117,30		5,66	4,82	116,12
21	F06x	PD02	DB08	131,00	126,00	122,00	107,00	4	121,50		10,34	8,51	120,28
22	F27	PD01	DB05	121,60	124,80	122,10	118,40	4	121,73		2,62	2,16	120,50
23	F13x	PD01	DB05	120,77	123,41	119,93	123,57	4	121,92		1,85	1,51	120,69
24	F25x	PB06	DB08	120,00	122,00	127,00	126,00	4	123,75		3,30	2,67	122,50
25	F12x	PC01	DB09	156,00	166,00	152,00	158,00	0	158,00	*b* *	5,89	3,73	156,41
26	F07x	PD02	DB08	189,20	188,60	188,00	*166,2a*	0	188,60	*b* *	0,60	0,32	186,70
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29	A65	PD01	DB08	<200	<200	<200	<200			**			
30	A49	PC03	DB09	<120	<120	<120	<120			**			
31	F15x	PC01	DB08	<50	66,00	69,00	98,00			*			
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	n	Mean	s_r	CV_r
all labs	**95**	**101,02**	**4,298**	**4,255**
30	% from the mean			
	l		s_R	CV_R
	24		**13,734**	**13,625**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: B **Sample: 1** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A60x	PD01	DB10	10,30	10,40	10,70	10,00	0	10,35	*b* *	0,29	2,79	61,18
2	A59	PC01	DB08	*14a*	15,70	15,50	15,40	3	15,53		0,15	0,98	91,82
3	F18x	PD99	DB08	15,60	15,60	15,60	15,50	4	15,58		0,05	0,32	92,07
4	A88	PD01	DB08	15,74	15,45	15,60	15,67	4	15,62		0,12	0,79	92,31
5	A79	PD03	DB10	16,03	15,85	15,70	15,16	4	15,69		0,38	2,39	92,72
6	F16x	PC01	DB10	16,20	15,93	15,80	16,28	4	16,05		0,23	1,40	94,89
7	F19	PD02	DB08	16,30	16,40	16,30	16,20	4	16,30		0,08	0,50	96,36
8	A39	PD02	DB08	17,15	17,04	15,78	15,89	4	16,47		0,73	4,44	97,33
9	A49	PC03	DB07	16,60	16,50	16,70	16,30	4	16,53		0,17	1,03	97,69
10	F07x	PD02	DB08	16,72	15,72	17,10	17,25	4	16,70		0,69	4,12	98,69
11	F02x	PD02	DB08	16,30	16,70	17,30	16,60	4	16,73		0,42	2,51	98,87
12	F33x	PD01	DB10	15,85	17,99	17,06	16,38	4	16,82		0,92	5,49	99,43
13	F28x	PD02	DB08	16,82	16,56	17,08	17,14	4	16,90		0,27	1,57	99,90
14	F05	PD02	DB08	16,90	16,90	16,90	17,20	4	16,98		0,15	0,88	100,35
15	F32x	PD02	DB08	17,10	17,00	17,00	17,10	4	17,05		0,06	0,34	100,79
16	F08	PZ99	DB08	16,50	17,60	17,70	16,50	4	17,08		0,67	3,90	100,94
17	A65	PD01	DB08	17,40	17,40	17,00	16,90	4	17,18		0,26	1,53	101,53
18	A90	PC01	DB09	17,70	17,70	17,00	17,00	4	17,35		0,40	2,33	102,56
19	A47x	PD01	DB08	17,42	17,53	17,43	17,62	4	17,50		0,09	0,54	103,45
20	F09	PD01	DB10	18,00	17,80	16,20	18,50	4	17,63		0,99	5,64	104,19
21	F14x	PC01	DB08	18,34	17,90	17,68	17,79	4	17,93		0,29	1,61	105,98
22	A36	PD02	DB08	18,70	19,50	18,40	19,40	4	19,00		0,54	2,82	112,32
23	F15x	PC01	DB08	18,40	19,10	19,90	19,60	4	19,25		0,66	3,41	113,79
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	n	Mean	s_r	CV_r
all labs	**87**	**16,92**	**0,378**	**2,234**
20	% from the mean			

l	s_R	CV_R
22	**0,987**	**5,839**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: B **Sample: 2** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A60x	PD01	DB10	11,10	11,60	9,77	10,90	0	10,84	*b*	*	0,77	7,13	66,43
2	F18x	PD99	DB08	14,80	14,80	14,90	14,80	4	14,83			0,05	0,34	90,83
3	A90	PC01	DB09	14,40	14,90	15,00	15,10	4	14,85			0,31	2,09	90,99
4	F28x	PD02	DB08	15,06	14,70	15,30	15,03	4	15,02			0,25	1,64	92,04
5	A88	PD01	DB08	15,72	15,55	15,64	15,68	4	15,65			0,07	0,46	95,87
6	A59	PC01	DB08	15,50	16,00	16,20	15,00	4	15,68			0,54	3,43	96,04
7	A79	PD03	DB10	15,94	15,74	15,79	15,29	4	15,69			0,28	1,78	96,13
8	F16x	PC01	DB10	15,56	15,36	16,33	15,78	4	15,76			0,42	2,66	96,55
9	F19	PD02	DB08	16,00	15,80	16,00	16,00	4	15,95			0,10	0,63	97,73
10	A47x	PD01	DB08	16,22	16,22	16,26	15,50	4	16,05			0,37	2,29	98,34
11	A65	PD01	DB08	15,60	15,80	16,30	16,70	4	16,10			0,50	3,08	98,64
12	F07x	PD02	DB08	16,09	15,65	15,87	16,84	4	16,11			0,52	3,22	98,72
13	A39	PD02	DB08	16,69	16,91	16,42	16,62	4	16,66			0,20	1,21	102,08
14	A49	PC03	DB07	16,70	16,90	16,80	17,10	4	16,88			0,17	1,01	103,39
15	F05	PD02	DB08	16,90	16,90	16,80	17,00	4	16,90			0,08	0,48	103,55
16	F02x	PD02	DB08	17,00	16,20	16,60	18,00	4	16,95			0,77	4,56	103,85
17	F32x	PD02	DB08	17,10	17,20	17,30	17,30	4	17,23			0,10	0,56	105,54
18	F33x	PD01	DB10	17,27	17,82	17,08	17,02	4	17,30			0,36	2,11	105,98
19	F08	PZ99	DB08	16,80	17,10	17,50	18,20	4	17,40			0,61	3,48	106,61
20	F09	PD01	DB10	18,10	19,10	17,10	15,50	0	17,45	*c*		1,54	8,80	106,92
21	F14x	PC01	DB08	17,54	17,54	17,43	17,64	4	17,54			0,09	0,49	107,45
22	A36	PD02	DB08	18,10	17,40	18,20	17,90	4	17,90			0,36	1,99	109,67
23	F15x	PC01	DB08	19,80	20,20	19,70	19,40	0	19,78	*b*	*	0,33	1,67	121,16
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	n	Mean	s_r	CV_r
all labs	**80**	**16,32**	**0,307**	**1,879**
20	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
20	**0,919**	**5,629**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: B **Sample: 3** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F18x	PD99	DB08	8,99	9,11	9,17	9,04	4	9,08		0,08	0,87	87,97
2	A90	PC01	DB09	9,60	9,20	10,00	9,40	4	9,55		0,34	3,58	92,54
3	A79	PD03	DB10	10,08	9,66	9,18	9,70	4	9,65		0,37	3,81	93,55
4	F28x	PD02	DB08	9,85	9,47	9,61	9,92	4	9,71		0,21	2,17	94,10
5	A47x	PD01	DB08	9,62	9,43	9,85	10,00	4	9,73		0,25	2,58	94,24
6	A59	PC01	DB08	9,80	10,40	10,00	9,00	4	9,80		0,59	6,01	94,97
7	A49	PC03	DB07	9,70	10,30	9,60	9,70	4	9,83		0,32	3,26	95,21
8	F16x	PC01	DB10	9,73	9,75	9,91	10,05	4	9,86		0,15	1,52	95,54
9	A88	PD01	DB08	10,22	9,65	9,93	10,07	4	9,97		0,24	2,43	96,59
10	F07x	PD02	DB08	10,41	9,28	9,91	10,28	4	9,97		0,51	5,08	96,61
11	F19	PD02	DB08	9,58	9,98	10,30	10,10	4	9,99		0,30	3,04	96,81
12	A60x	PD01	DB10	10,40	10,60	9,60	9,68	4	10,07		0,50	5,01	97,58
13	A39	PD02	DB08	10,68	10,26	10,31	10,83	4	10,52		0,28	2,65	101,94
14	F05	PD02	DB08	10,60	10,50	10,70	10,40	4	10,55		0,13	1,22	102,24
15	A65	PD01	DB08	10,50	10,80	11,10	10,50	4	10,73		0,29	2,68	103,93
16	F32x	PD02	DB08	10,70	10,90	10,80	10,90	4	10,83		0,10	0,88	104,90
17	A36	PD02	DB08	11,20	10,80	10,90	11,00	4	10,98		0,17	1,56	106,35
18	F08	PZ99	DB08	11,80	10,20	10,90	11,10	4	11,00		0,66	5,98	106,60
19	F33x	PD01	DB10	11,18	11,81	10,94	10,35	4	11,07		0,60	5,46	107,27
20	F02x	PD02	DB08	11,30	10,70	11,60	11,20	4	11,20		0,37	3,34	108,53
21	F14x	PC01	DB08	11,79	11,47	10,62	11,47	4	11,34		0,50	4,42	109,87
22	F09	PD01	DB10	10,80	10,80	12,30	12,60	4	11,63		0,96	8,26	112,65
23	F15x	PC01	DB08	13,40	12,30	13,20	13,00	0	12,98	*b* *	0,48	3,69	125,73
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	n	Mean	s_r	CV_r
all labs	**88**	**10,32**	**0,360**	**3,491**
* = non tolerable mean because more than +/- **20** % from the mean				

l	s_R	CV_R
22	**0,688**	**6,664**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: B **Sample: 4** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				s_i	V_i	%
1	A60x	PD01	DB10	10,60	10,30	10,40	10,50	4	10,45		0,13	1,24	82,61
2	A59	PC01	DB08	10,00	11,00	11,80	10,10	4	10,73		0,85	7,89	84,78
3	F18x	PD99	DB08	11,10	11,00	11,00	11,10	4	11,05		0,06	0,52	87,35
4	F33x	PD01	DB10	11,60	11,50	11,48	11,11	4	11,42		0,21	1,88	90,29
5	F05	PD02	DB08	12,00	12,00	12,10	12,00	4	12,03		0,05	0,42	95,06
6	F16x	PC01	DB10	12,52	11,69	11,71	12,45	4	12,09		0,45	3,76	95,59
7	A65	PD01	DB08	12,30	12,10	12,20	12,30	4	12,23		0,10	0,78	96,64
8	A79	PD03	DB10	12,32	12,25	12,69	11,85	4	12,28		0,34	2,80	97,05
9	F19	PD02	DB08	12,30	12,10	12,50	12,30	4	12,30		0,16	1,33	97,23
10	A90	PC01	DB09	12,40	12,30	12,20	12,30	4	12,30		0,08	0,66	97,23
11	F09	PD01	DB10	11,70	13,20	12,60	12,90	4	12,60		0,65	5,14	99,60
12	A88	PD01	DB08	12,53	12,81	12,67	12,60	4	12,65		0,12	0,94	100,02
13	A39	PD02	DB08	13,27	12,60	12,62	12,57	4	12,77		0,34	2,64	100,91
14	F28x	PD02	DB08	12,77	12,25	13,09	12,97	4	12,77		0,37	2,90	100,95
15	F32x	PD02	DB08	13,00	13,00	13,10	13,00	4	13,03		0,05	0,38	102,96
16	A36	PD02	DB08	12,90	12,50	13,30	13,40	4	13,03		0,41	3,16	102,96
17	F08	PZ99	DB08	14,17	12,17	13,28	13,14	4	13,19		0,82	6,21	104,27
18	F07x	PD02	DB08	13,87	13,20	13,69	13,48	4	13,56		0,29	2,12	107,18
19	F02x	PD02	DB08	13,60	14,30	13,50	13,90	4	13,83		0,36	2,60	109,29
20	F14x	PC01	DB08	14,15	14,05	14,15	14,58	4	14,23		0,24	1,66	112,51
21	F15x	PC01	DB08	14,60	13,60	14,10	16,00	0	14,58	*c*	1,03	7,09	115,21
22	A49	PC03	DB07	14,60	14,20	15,00	15,60	4	14,85		0,60	4,02	117,39
23	A47x	PD01	DB08	14,89	14,90	14,94	15,06	4	14,95		0,08	0,52	118,16
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	n	Mean	s_r	CV_r
all labs	**88**	**12,65**	**0,307**	**2,426**
20	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
22	**1,181**	**9,339**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: As **Sample: 1** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A60x	PD01	DB10	28,60	21,90	27,40	33,50	4	27,85		4,76	**17,11**	75,65
2	F08x	PC01	DB10	28,80	25,00	27,70	30,30	4	27,95		2,24	8,00	75,92
3	A90	PD01	DB10	29,00	40,00	27,00	35,00	4	32,75		5,91	**18,04**	88,96
4	A45x	PB99	DB10	32,40	34,30	34,30	32,60	4	33,40		1,04	3,12	90,73
5	A82	PC01	DB99	37,70	30,50	31,60	38,40	4	34,55		4,08	**11,80**	93,85
6	A79	PD03	DB10	36,80	36,80	33,60	31,70	4	34,73		2,52	7,25	94,32
7	F32	PD02	DB10	35,20	33,00	37,40	38,50	4	36,03		2,44	6,77	97,86
8	A36	PD02	DB10	36,50	36,06	36,83	37,27	4	36,67		0,51	1,40	99,59
9	F14x	PC01	DB10	36,00	38,00	38,00	43,00	4	38,75		2,99	7,71	105,26
10	F16x	PC01	DB10	39,71	44,33	35,81	41,68	4	40,38		3,59	8,89	109,69
11	A80	PD03	DB10	44,10	50,90	46,80	52,40	4	48,55	*	3,80	7,82	131,88
12	A39	PD02	DB08	51,20	55,80	45,50	48,20	4	50,18	*	4,41	8,80	136,29
13	F07x	PD02	DB08	100,00	*221,8a*	105,00	116,00	0	107,00	*b* *	8,19	7,65	290,65
14													
15													
16	A88	PD01	DB08	<1	<1	<1	<1			*			
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	n	Mean	s_r	CV_r
all labs	**48**	**36,81**	**3,190**	**8,665**
30	% from the mean			
	l		s_R	CV_R
	12		**6,941**	**18,854**

* = non tolerable mean because more than +/-

limit for the lower concentration range

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: As **Sample: 2** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A90	PD01	DB10	93,00	109,00	88,00	104,00	4	98,50		9,68	9,83	89,74
2	A79	PD03	DB10	105,00	98,80	101,90	99,50	4	101,30		2,80	2,77	92,29
3	A60x	PD01	DB10	103,00	104,00	103,00	*98,4a*	3	103,33		0,58	0,56	94,14
4	A82	PC01	DB99	109,00	98,80	104,00	104,00	4	103,95		4,16	4,01	94,70
5	F08x	PC01	DB10	120,50	102,40	96,40	100,60	4	104,98		10,65	**10,15**	95,64
6	A45x	PB99	DB10	108,00	107,00	105,00	105,00	4	106,25		1,50	1,41	96,80
7	A80	PD03	DB10	112,00	113,00	106,00	124,00	4	113,75		7,50	6,59	103,63
8	F14x	PC01	DB10	106,00	116,00	122,00	113,00	4	114,25		6,65	5,82	104,09
9	F16x	PC01	DB10	106,10	123,60	111,80	120,20	4	115,43		7,95	6,89	105,16
10	A36	PD02	DB10	114,70	114,38	116,84	116,09	4	115,50		1,16	1,00	105,23
11	A39	PD02	DB08	119,00	119,50	117,80	118,00	4	118,58		0,81	0,68	108,03
12	F32	PD02	DB10	115,00	118,00	122,00	124,00	4	119,75		4,03	3,37	109,10
13	F07x	PD02	DB08	175,00	*303,9a*	182,00	168,00	0	175,00	*b* *	7,00	4,00	159,43
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16	A88	PD01	DB08	<1	<1	<1	<1			*			
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	n	Mean	s_r	CV_r
all labs	**47**	**109,76**	**4,790**	**4,364**
20 % from the mean				
	l		s_R	CV_R
	12		**7,306**	**6,664**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: As **Sample: 3** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A60x	PD01	DB10	*103a*	20,00	18,20	19,30	3	19,17		0,91	4,73	71,46
2	F08x	PC01	DB10	22,70	18,90	24,70	18,00	4	21,08		3,16	**15,00**	78,57
3	A79	PD03	DB10	22,30	23,10	23,80	22,60	4	22,95		0,66	2,86	85,56
4	A82	PC01	DB99	23,80	26,40	22,10	22,50	4	23,70		1,94	8,19	88,36
5	A90	PD01	DB10	25,00	28,00	23,00	21,00	4	24,25		2,99	**12,31**	90,41
6	F32	PD02	DB10	25,60	26,70	24,50	28,80	4	26,40		1,83	6,95	98,43
7	A36	PD02	DB10	28,80	29,86	29,33	28,91	4	29,23		0,48	1,65	108,96
8	F16x	PC01	DB10	26,20	31,99	28,43	31,72	4	29,59		2,78	9,39	110,30
9	A45x	PB99	DB10	30,40	30,90	30,10	29,80	4	30,30		0,47	1,55	112,97
10	F14x	PC01	DB10	35,00	33,00	29,00	33,00	4	32,50		2,52	7,74	121,17
11	A80	PD03	DB10	31,50	32,50	33,50	38,40	4	33,98		3,06	9,01	126,67
12	A39	PD02	DB08	48,60	51,60	42,40	43,00	0	46,40	*b* *	4,45	9,59	172,99
13													
14	A88	PD01	DB08	<1	<1	<1	<1			*			
15	F07x	PD02	DB08	187,00	<100	145,00	143,00			*			

	n	Mean	s_r	CV_r
all labs	**43**	**26,82**	**1,890**	**7,046**
30	% from the mean			

l	s_R	CV_R
11	**4,814**	**18,065**

* = non tolerable mean because more than +/-
limit for the lower concentration range

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: As **Sample: 4** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	A45x	PB99	DB10	817,00	786,00	808,00	826,00	0	809,25	*b*		17,15	2,12	89,28
2	A80	PD03	DB10	883,00	865,00	865,00	895,00	4	877,00			14,70	1,68	96,75
3	A82	PC01	DB99	912,00	881,00	854,00	902,00	4	887,25			25,66	2,89	97,88
4	A90	PD01	DB10	856,00	871,00	897,00	950,00	4	893,50			41,30	4,62	98,57
5	A79	PD03	DB10	925,00	899,50	873,10	878,10	4	893,93			23,67	2,65	98,62
6	A60x	PD01	DB10	905,00	890,00	890,00	925,00	4	902,50			16,58	1,84	99,57
7	F08x	PC01	DB10	920,20	904,30	935,30	851,10	4	902,73			36,67	4,06	99,59
8	A36	PD02	DB10	916,30	902,70	918,00	898,60	4	908,90			9,70	1,07	100,27
9	F32	PD02	DB10	921,00	945,00	911,00	922,00	4	924,75			14,38	1,56	102,02
10	F14x	PC01	DB10	952,00	923,00	933,00	902,00	4	927,50			20,82	2,25	102,32
11	F16x	PC01	DB10	935,90	982,60	909,40	957,40	4	946,33			31,15	3,29	104,40
12	F07x	PD02	DB08	1014,00	1018,00	910,00	1041,00	0	995,75	*b*		58,39	5,86	109,85
13	A39	PD02	DB08	1008,80	1008,20	1228,10	1134,40	0	1094,88	*b*	*	106,82	9,76	120,79
14														
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16	A88	PD01	DB08	<1	<1	<1	<1				*			
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	n	Mean	s_r	CV_r
all labs	**40**	**906,44**	**23,463**	**2,589**
20	% from the mean			
	l		s_R	CV_R
	10		**20,987**	**2,315**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cr **Sample: 1** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	Lab.standard dev. V_i	Recovery %
1	F27	PD01	DB05	0,26	0,44	0,48	0,41	0	0,40	*b*	*	0,10	**24,41**	37,91
2	F07x	PD02	DB08	0,70	0,74	0,68	0,76	4	0,72		*	0,04	5,58	68,53
3	A60x	PD01	DB10	0,78	0,84	0,93	0,87	4	0,86			0,06	7,56	81,41
4	A49	PC03	DB09	0,88	0,97	0,82	0,93	4	0,90			0,06	7,20	85,67
5	F08x	PC01	DB10	0,84	0,94	0,88	0,96	4	0,90			0,05	5,83	86,00
6	A88	PD01	DB08	0,97	0,87	0,92	0,89	4	0,91			0,04	4,77	86,86
7	A39	PD02	DB08	1,03	0,95	0,89	0,96	4	0,96			0,06	5,97	91,45
8	F16x	PC01	DB10	0,97	0,93	1,03	0,97	4	0,97			0,04	4,25	92,77
9	F12x	PC01	DB09	0,97	1,01	0,96	0,96	4	0,97			0,02	2,49	92,78
10	A36	PD02	DB10	1,05	1,08	1,04	1,05	4	1,06			0,02	1,75	100,47
11	A80	PD03	DB10	1,01	1,11	1,07	1,08	4	1,07			0,04	3,93	101,61
12	A79	PD03	DB10	1,07	1,06	1,05	1,20	4	1,09			0,07	6,49	103,97
13	F02x	PD02	DB08	1,00	1,30	1,10	1,00	4	1,10			0,14	**12,86**	104,71
14	F33x	PD01	DB10	1,11	1,19	0,99	1,13	4	1,11			0,08	7,59	105,18
15	F06x	PD02	DB08	1,02	1,31	0,99	1,15	4	1,12			0,14	**12,82**	106,18
16	F14x	PC01	DB10	1,07	1,26	1,13	1,05	4	1,13			0,10	8,42	107,47
17	F32	PD02	DB10	1,06	1,10	1,18	1,28	4	1,16			0,10	8,41	109,94
18	A45x	PB99	DB10	1,11	1,16	1,28	1,12	4	1,17			0,08	6,69	111,13
19	F18x	PD99	DB10	1,22	1,18	1,22	1,23	4	1,21			0,02	1,83	115,42
20	F05	PD02	DB05	1,24	1,39	1,39	1,11	4	1,28			0,13	**10,53**	122,08
21	F03	PD02	DB08	1,38	1,25	1,42	1,26	4	1,33		*	0,09	6,43	126,36
22	A82	PC01	DB10	1,94	1,39	1,12	1,16	0	1,40	*c*	*	0,38	**26,92**	133,50
23														
24														
25	A65	PD01	DB08	1,50	<1,1	<1,1	<1,1				**			
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	n	Mean	s_r	CV_r
all labs	**80**	**1,05**	**0,070**	**6,669**
25	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
20	**0,150**	**14,311**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cr **Sample: 2** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	F27	PD01	DB05	0,82	0,88	0,88	0,96	0	0,88	*b*	*	0,06	6,33	33,29
2	F07x	PD02	DB08	1,27	1,57	1,35	1,33	0	1,38	*b*	*	0,13	9,24	52,03
3	F08x	PC01	DB10	1,85	1,84	1,98	1,81	4	1,87		*	0,08	4,07	70,44
4	A60x	PD01	DB10	1,90	1,89	1,91	1,93	4	1,91		*	0,02	0,90	71,84
5	F05	PD02	DB05	2,19	2,32	2,21	2,23	4	2,24			0,06	2,56	84,26
6	F33x	PD01	DB10	2,51	2,49	2,58	2,54	4	2,53			0,04	1,55	95,28
7	F03	PD02	DB08	2,37	2,55	2,68	2,68	4	2,57			0,15	5,71	96,79
8	F02x	PD02	DB08	2,60	2,80	2,40	2,50	4	2,58			0,17	6,63	96,98
9	A49	PC03	DB09	2,73	2,54	2,62	2,53	4	2,61			0,09	3,55	98,10
10	A36	PD02	DB10	2,70	2,70	2,56	2,54	4	2,63			0,09	3,33	98,91
11	A88	PD01	DB08	2,70	2,63	2,67	2,65	4	2,66			0,03	1,12	100,27
12	F16x	PC01	DB10	2,51	2,89	2,49	2,78	4	2,67			0,20	7,55	100,44
13	A79	PD03	DB10	2,77	2,66	2,61	2,72	4	2,69			0,07	2,62	101,32
14	A80	PD03	DB10	2,76	2,68	2,69	2,82	4	2,74			0,07	2,39	103,09
15	F14x	PC01	DB10	2,67	2,74	2,97	2,63	4	2,75			0,15	5,52	103,69
16	F06x	PD02	DB08	2,68	2,90	2,66	2,83	4	2,77			0,12	4,22	104,19
17	F12x	PC01	DB09	2,89	2,81	2,72	2,69	4	2,78			0,09	3,27	104,60
18	A39	PD02	DB08	2,81	2,82	2,81	2,86	4	2,83			0,03	0,91	106,39
19	A45x	PB99	DB10	2,88	2,89	2,79	2,80	4	2,84			0,05	1,84	106,96
20	F18x	PD99	DB10	2,94	2,84	2,92	2,94	4	2,91			0,05	1,64	109,59
21	F32	PD02	DB10	2,94	3,03	3,05	3,11	4	3,03			0,07	2,32	114,20
22	A65	PD01	DB08	3,30	2,90	3,00	3,10	4	3,08			0,17	5,55	115,81
23	A82	PC01	DB10	2,99	3,46	2,90	3,06	4	3,10			0,25	7,97	116,84
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	n	Mean	s_r	CV_r
all labs	**84**	**2,66**	**0,097**	**3,636**
25	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
21	**0,322**	**12,127**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cr **Sample: 3** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F27	PD01	DB05	0,14	0,27	0,28	0,31	4	0,25	*	0,07	**29,75**	37,97
2	F07x	PD02	DB08	0,45	0,44	0,43	0,42	4	0,44		0,01	2,98	66,57
3	F08x	PC01	DB10	0,48	0,47	0,50	0,49	4	0,48		0,01	2,91	73,47
4	F32	PD02	DB10	0,55	0,58	0,59	0,55	4	0,57		0,02	3,63	86,46
5	A36	PD02	DB10	0,59	0,57	0,59	0,57	4	0,58		0,01	1,65	88,40
6	A80	PD03	DB10	0,61	0,61	0,55	0,62	4	0,60		0,03	5,72	91,06
7	A79	PD03	DB10	0,60	0,65	0,59	0,62	4	0,62		0,02	4,01	94,02
8	F05	PD02	DB05	0,61	0,58	0,68	0,65	4	0,63		0,04	6,88	96,05
9	F12x	PC01	DB09	0,61	0,63	0,63	0,68	4	0,64		0,03	5,20	96,93
10	F06x	PD02	DB08	0,60	0,57	0,56	0,86	4	0,65		0,14	**21,78**	98,60
11	A60x	PD01	DB10	0,69	0,70	0,63	0,66	4	0,67		0,03	4,61	101,80
12	F14x	PC01	DB10	0,81	0,66	0,64	0,72	4	0,70		0,07	**10,62**	107,36
13	A45x	PB99	DB10	0,68	0,77	0,73	0,65	4	0,71		0,05	7,59	107,44
14	F18x	PD99	DB10	0,73	0,74	0,72	0,77	4	0,74		0,02	2,43	112,89
15	F02x	PD02	DB08	0,80	0,90	0,90	0,80	4	0,85		0,06	6,79	129,49
16	A39	PD02	DB08	0,91	0,84	0,89	0,93	4	0,89	*	0,04	4,13	135,74
17	F33x	PD01	DB10	0,91	0,87	0,91	0,90	4	0,90	*	0,02	2,11	136,73
18	F03	PD02	DB08	0,91	0,89	0,87	0,98	4	0,91	*	0,05	5,25	139,01
19	A82	PC01	DB10	1,79	2,12	0,96	0,83	0	1,42	*c* *	0,63	**44,20**	217,01
20	F16x	PC01	DB10	1,41	1,51	1,46	1,42	0	1,45	*b* *	0,04	3,00	220,67
21													
22													
23	A65	PD01	DB08	<1,1	<1,1	<1,1	<1,1			**			
24	A88	PD01	DB08	<1	<1	<1	<1						
25	A49	PC03	DB09	<,6	<,6	<,6	<,6						
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	n	Mean	s_r	CV_r
all labs	**72**	**0,66**	**0,041**	**6,316**
35	% from the mean			

l	s_R	CV_R
18	**0,170**	**25,926**

* = non tolerable mean because more than +/-

limit for the lower concentration range

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Cr **Sample: 4** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	F07x	PD02	DB08	15,00	16,60	14,45	16,71	0	15,69	*b*	*	1,14	7,25	51,19
2	A45x	PB99	DB10	20,00	20,80	21,00	19,90	4	20,43		*	0,56	2,72	66,64
3	F03	PD02	DB08	22,27	22,29	22,11	22,19	4	22,22		*	0,08	0,37	72,49
4	F08x	PC01	DB10	23,75	23,82	23,22	25,23	4	24,00			0,86	3,59	78,33
5	F33x	PD01	DB10	25,14	26,17	24,82	26,94	4	25,77			0,97	3,77	84,08
6	A60x	PD01	DB10	26,00	26,30	26,70	27,20	4	26,55			0,52	1,96	86,63
7	F02x	PD02	DB08	27,50	28,90	24,80	27,40	4	27,15			1,71	6,30	88,59
8	A39	PD02	DB08	31,13	29,89	30,14	29,32	4	30,12			0,76	2,51	98,28
9	F32	PD02	DB10	31,90	30,70	29,70	31,10	4	30,85			0,91	2,96	100,66
10	A80	PD03	DB10	31,80	31,20	30,00	31,90	4	31,23			0,87	2,80	101,88
11	A88	PD01	DB08	29,70	33,20	30,90	33,00	4	31,70			1,69	5,33	103,43
12	A36	PD02	DB10	31,82	30,47	32,30	32,25	4	31,71			0,85	2,69	103,47
13	F12x	PC01	DB09	31,99	31,72	31,23	32,28	4	31,81			0,45	1,40	103,78
14	F06x	PD02	DB08	31,42	33,26	31,58	31,36	4	31,91			0,91	2,85	104,10
15	F05	PD02	DB05	33,60	31,90	31,30	31,60	4	32,10			1,03	3,21	104,74
16	A49	PC03	DB09	31,30	33,50	32,40	33,00	4	32,55			0,95	2,91	106,21
17	F14x	PC01	DB10	33,45	33,56	33,88	32,17	4	33,26			0,75	2,27	108,54
18	F16x	PC01	DB10	32,20	36,24	32,19	34,12	4	33,69			1,93	5,72	109,92
19	F18x	PD99	DB10	33,90	34,60	33,90	34,20	4	34,15			0,33	0,97	111,43
20	F27	PD01	DB05	34,86	34,06	32,37	35,91	4	34,30			1,49	4,35	111,92
21	A65	PD01	DB08	32,50	34,90	34,70	36,00	4	34,53			1,47	4,25	112,65
22	A79	PD03	DB10	35,61	35,24	37,43	32,48	4	35,19			2,04	5,81	114,82
23	A82	PC01	DB10	38,20	40,10	39,20	38,70	4	39,05		*	0,81	2,08	127,42
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	n	Mean	s_r	CV_r
all labs	**88**	**30,65**	**0,998**	**3,255**
25	% from the mean			
	l		s_R	CV_R
	22		**4,536**	**14,801**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Co **Sample: 1** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				s_i	V_i	%
1	A60x	PD01	DB10	0,024	0,024	0,028	0,035	4	0,028	*	0,005	**18,903**	60,64
2	F08x	PC01	DB10	0,041	0,038	0,036	0,040	4	0,039		0,002	5,722	85,14
3	F16x	PC01	DB10	0,039	0,037	0,043	0,040	4	0,040		0,003	6,425	86,79
4	A36	PD02	DB10	0,043	0,042	0,043	0,040	4	0,042		0,001	3,367	92,28
5	A80	PD03	DB10	0,042	0,041	0,041	0,046	4	0,042		0,002	5,297	92,94
6	F33x	PD01	DB10	0,042	0,045	0,049	0,051	4	0,047		0,004	8,623	102,71
7	A79	PD03	DB10	0,048	0,042	0,049	0,049	4	0,047		0,004	7,542	103,26
8	F32	PD02	DB10	0,049	0,048	0,046	0,047	4	0,048		0,001	2,718	104,36
9	A82	PC01	DB10	0,052	0,047	0,048	0,050	4	0,049		0,002	4,502	108,21
10	F14x	PC01	DB10	0,048	0,051	0,050	0,052	4	0,050		0,002	3,399	110,40
11	A90	PD01	DB10	0,047	0,043	0,074	0,046	0	0,053	*c*	0,014	**27,493**	115,35
12	A39	PD02	DB08	0,059	0,056	0,060	0,052	4	0,057		0,004	6,216	124,58
13	A45x	PB99	DB10	0,059	0,060	0,056	0,059	4	0,059		0,002	2,661	128,70
14													
15													
16	A88	PD01	DB08	<1	<1	<1	<1			**			
17	F27	PD01	DB05	<,5	<,5	<,5	<,5			**			
18	A65	PD01	DB08	<,2	<,2	<,2	<,2			**			
19	F12x	PC01	DB09	<,15	<,15	<,15	<,15			**			
20	A49	PC03	DB09	<,12	<,12	<,12	<,12			**			
21	F03	PD02	DB08	<,1	<,1	<,1	<,1						
22	F06x	PD02	DB08	<,08	<,08	<,08	<,08						
23	F07x	PD02	DB08	<,05	<,05	<,05	<,05						
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	n	Mean	s_r	CV_r
all labs	**48**	**0,046**	**0,003**	**5,768**
35	% from the mean			

l	s_R	CV_R
12	**0,008**	**18,326**

* = non tolerable mean because more than +/-

lower than the lowest evaluated result

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Co **Sample: 2** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F07x	PD02	DB08	0,074	0,075	0,077	0,075	0	0,075	*b* *	0,001	1,473	56,74
2	A60x	PD01	DB10	0,088	0,085	0,076	0,085	0	0,083	*b* *	0,005	6,511	62,77
3	F06x	PD02	DB08	0,086	0,082	0,115	0,088	0	0,093	*c* *	0,015	**16,217**	69,92
4	F08x	PC01	DB10	0,114	0,127	0,122	0,116	4	0,120		0,006	4,934	90,27
5	A79	PD03	DB10	0,128	0,123	0,129	0,126	4	0,126		0,002	1,964	95,19
6	F16x	PC01	DB10	0,133	0,123	0,123	0,130	4	0,127		0,005	3,943	95,73
7	F33x	PD01	DB10	0,125	0,133	0,129	0,124	4	0,128		0,004	3,220	96,30
8	F03	PD02	DB08	0,139	0,138	0,126	0,120	4	0,131		0,009	7,103	98,56
9	A80	PD03	DB10	0,131	0,129	0,126	0,139	4	0,131		0,006	4,236	98,94
10	A90	PD01	DB10	0,132	0,135	0,132	*0,244a*	3	0,133		0,002	1,302	100,26
11	A36	PD02	DB10	0,134	0,131	0,135	0,133	4	0,133		0,002	1,282	100,44
12	A39	PD02	DB08	0,137	0,133	0,139	0,132	4	0,135		0,003	2,303	101,88
13	A82	PC01	DB10	0,138	0,139	0,139	0,139	4	0,139		0,001	0,360	104,59
14	F14x	PC01	DB10	0,139	0,137	0,141	0,139	4	0,139		0,002	1,175	104,78
15	A45x	PB99	DB10	0,148	0,136	0,135	0,146	4	0,141		0,007	4,745	106,47
16	F32	PD02	DB10	0,142	0,142	0,141	0,141	4	0,142		0,001	0,408	106,66
17													
18													
19	A88	PD01	DB08	<1	<1	<1	<1			**			
20	F27	PD01	DB05	<,5	<,5	<,5	<,5			**			
21	A65	PD01	DB08	<,2	<,2	<,2	<,2			**			
22	F12x	PC01	DB09	<,15	<,15	<,15	<,15			**			
23	A49	PC03	DB09	<,12	<,12	<,12	<,12			**			
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	n	Mean	s_r	CV_r
all labs	**51**	**0,133**	**0,004**	**2,802**
25	% from the mean			
	l		s_R	CV_R
	13		**0,006**	**4,890**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Co **Sample: 3** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F07x	PD02	DB08	0,32	0,36	0,30	0,34	4	0,33		0,02	7,39	79,07
2	F06x	PD02	DB08	0,36	0,33	0,40	0,35	4	0,36		0,03	7,42	85,52
3	A49	PC03	DB09	0,35	0,39	0,35	0,37	4	0,37		0,02	5,25	87,26
4	A60x	PD01	DB10	0,38	0,40	0,40	0,37	4	0,39		0,01	3,22	92,70
5	F08x	PC01	DB10	0,39	0,39	0,39	0,39	4	0,39		0,00	1,10	92,70
6	A39	PD02	DB08	0,40	0,39	0,39	0,40	4	0,40		0,01	1,48	95,17
7	A80	PD03	DB10	0,40	0,42	0,39	0,41	4	0,40		0,01	2,96	96,70
8	F12x	PC01	DB09	0,42	0,41	0,42	0,41	4	0,42		0,01	1,39	99,21
9	F16x	PC01	DB10	0,41	0,44	0,42	0,43	4	0,42		0,01	2,69	101,57
10	A79	PD03	DB10	0,43	0,43	0,42	0,44	4	0,43		0,01	1,88	102,72
11	F32	PD02	DB10	0,44	0,44	0,43	0,42	4	0,43		0,01	2,47	102,74
12	F03	PD02	DB08	0,44	0,44	0,43	0,44	4	0,44		0,00	1,01	104,59
13	A36	PD02	DB10	0,44	0,44	0,45	0,44	4	0,44		0,01	1,41	105,54
14	A65	PD01	DB08	0,40	0,40	0,50	0,50	0	0,45	*c*	0,06	**12,83**	107,58
15	F33x	PD01	DB10	0,45	0,49	0,49	0,42	4	0,46		0,03	7,46	110,27
16	A82	PC01	DB10	0,50	0,48	0,47	0,45	4	0,47		0,02	4,33	113,19
17	F14x	PC01	DB10	0,51	0,47	0,44	0,48	4	0,47		0,03	5,77	113,43
18	A45x	PB99	DB10	0,50	0,48	0,48	0,50	4	0,49		0,01	1,82	117,44
19	A90	PD01	DB10	*2,19a*	0,44	0,44	0,38	3	0,42		0,03	8,13	100,25
20													
21													
22	A88	PD01	DB08	<1	<1	<1	<1			**			
23	F27	PD01	DB05	<,5	<,5	<,5	<,5			**			
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	n	Mean	s_r	CV_r
all labs	**71**	**0,42**	**0,015**	**3,675**
25	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
18	**0,043**	**10,246**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Co **Sample: 4** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F07x	PD02	DB08	0,79	0,79	0,73	0,83	4	0,79	*	0,04	4,91	74,75
2	A60x	PD01	DB10	0,84	0,83	0,87	0,85	4	0,85		0,02	1,99	80,89
3	F33x	PD01	DB10	0,87	0,93	0,92	0,89	4	0,90		0,03	2,84	85,89
4	F08x	PC01	DB10	0,88	0,92	0,91	0,93	4	0,91		0,02	2,42	86,60
5	F27	PD01	DB05	0,98	0,90	0,97	0,87	4	0,93		0,05	5,86	88,44
6	A88	PD01	DB08	0,89	0,98	0,93	0,96	4	0,94		0,04	4,17	89,46
7	A45x	PB99	DB10	0,96	1,02	1,03	0,98	4	1,00		0,03	3,26	94,93
8	A80	PD03	DB10	1,01	0,99	0,97	1,04	4	1,00		0,03	3,04	95,43
9	F03	PD02	DB08	1,02	1,03	1,01	0,98	4	1,01		0,02	2,01	96,38
10	F16x	PC01	DB10	1,01	1,06	1,02	1,02	4	1,03		0,02	2,34	97,67
11	A36	PD02	DB10	1,05	1,05	1,07	1,07	4	1,06		0,01	1,00	100,71
12	F32	PD02	DB10	1,09	1,07	1,05	1,07	4	1,07		0,02	1,53	101,83
13	A79	PD03	DB10	1,16	1,11	1,07	1,08	4	1,11		0,04	3,73	105,33
14	F14x	PC01	DB10	1,14	1,14	1,13	1,10	4	1,13		0,02	1,48	107,23
15	A39	PD02	DB08	1,12	1,13	1,16	1,12	4	1,13		0,02	2,02	107,59
16	F06x	PD02	DB08	1,12	1,16	1,12	1,14	4	1,13		0,02	1,62	107,90
17	A82	PC01	DB10	1,17	1,18	1,15	1,17	4	1,17		0,01	1,08	111,11
18	A65	PD01	DB08	1,10	1,20	1,10	1,30	0	1,18	*c*	0,10	8,15	111,82
19	A90	PD01	DB10	1,15	1,17	1,22	*2,192a*	3	1,18		0,03	2,69	112,30
20	A49	PC03	DB09	1,29	1,36	1,39	1,35	4	1,35	*	0,04	3,11	128,24
21	F12x	PC01	DB09	1,40	1,36	1,32	1,40	4	1,37	*	0,04	2,80	130,38
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	n	Mean	s_r	CV_r
all labs	**79**	**1,05**	**0,028**	**2,640**
25	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
20	**0,150**	**14,288**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Hg **Sample: 1** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F28x	PZ98	DA05	4,93	5,14	5,51	5,56	4	5,28	*	0,30	5,67	69,29
2	A39	PZ98	DA05	5,45	5,40	5,60	5,40	4	5,46		0,09	1,73	71,65
3	A36	PD02	DB03	7,70	5,94	6,16	5,61	4	6,35		0,93	**14,58**	83,33
4	F02x	PZ98	DA05	7,30	7,40	6,80	6,90	4	7,10		0,29	4,15	93,13
5	F16x	PC01	DB10	7,40	7,38	7,13	6,90	4	7,20		0,24	3,27	94,45
6	A45x	PB99	DB08	7,27	7,17	7,38	7,22	4	7,26		0,09	1,24	95,23
7	A82	PZ98	DA05	7,77	7,25	7,41	7,51	4	7,49		0,22	2,91	98,18
8	F32x	PZ98	DA05	8,24	8,57	8,46	8,79	4	8,52		0,23	2,69	111,69
9	A79	PD03	DB10	8,80	8,50	9,20	8,70	4	8,80		0,29	3,35	115,43
10	A90	PD01	DB10	11,90	9,30	5,90	9,00	4	9,03		2,46	**27,22**	118,38
11	A80	PZ98	DA05	10,00	9,50	9,40	9,10	4	9,50		0,37	3,94	124,61
12	A93	PZ98	DA05	10,60	10,50	8,40	8,50	4	9,50		1,21	**12,78**	124,61
13	A88	PD01	DB04	13,10	12,90	12,70	13,20	0	12,98	*b* *	0,22	1,71	170,20
14	F08	PC01	DB03	39,00	23,00	32,00	36,00	0	32,50	*b* *	6,95	**21,39**	426,31
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17	F03	PZ98	DA05	<20	<20	<20	<20						
18	F18x	PD99	DA05	<20	<20	<20	<20						
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	n	Mean	s_r	CV_r
all labs	**48**	**7,62**	**0,561**	**7,353**
30	% from the mean			

l	s_R	CV_R
12	**1,463**	**19,195**

* = non tolerable mean because more than +/-

lower than the lowest evaluated result

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Hg **Sample: 2** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A39	PZ98	DA05	36,00	36,00	35,00	35,00	4	35,50		0,58	1,63	82,66
2	F28x	PZ98	DA05	38,19	37,26	36,41	36,83	4	37,17		0,76	2,05	86,55
3	A88	PD01	DB04	37,80	38,30	37,50	38,40	4	38,00		0,42	1,12	88,48
4	F32x	PZ98	DA05	40,40	39,60	39,40	39,30	4	39,68		0,50	1,26	92,38
5	F18x	PD99	DA05	40,70	40,00	42,40	42,00	4	41,28		1,12	2,71	96,10
6	F16x	PC01	DB10	40,54	43,02	39,30	42,28	4	41,29		1,68	4,08	96,13
7	A45x	PB99	DB08	41,30	41,40	41,70	41,40	4	41,45		0,17	0,42	96,51
8	F08	PC01	DB03	44,00	39,00	45,00	44,00	4	43,00		2,71	6,30	100,12
9	F02x	PZ98	DA05	42,50	43,40	43,30	43,10	4	43,08		0,40	0,94	100,29
10	F03	PZ98	DA05	43,85	43,75	43,64	43,85	4	43,77		0,10	0,23	101,92
11	A36	PD02	DB03	45,79	42,37	42,69	48,15	4	44,75		2,74	6,13	104,19
12	A93	PZ98	DA05	47,70	45,60	44,60	43,50	4	45,35		1,79	3,94	105,59
13	A90	PD01	DB10	44,70	44,80	50,70	47,00	4	46,80		2,81	6,00	108,97
14	A79	PD03	DB10	47,60	46,80	47,70	47,00	4	47,28		0,44	0,94	110,07
15	A82	PZ98	DA05	47,00	47,80	47,10	48,80	4	47,68		0,83	1,74	111,00
16	A80	PZ98	DA05	50,60	49,70	51,00	53,20	4	51,13		1,49	2,91	119,04
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	n	Mean	s_r	CV_r
all labs	**64**	**42,95**	**1,159**	**2,698**
30	% from the mean			

l	s_R	CV_R
16	**4,198**	**9,774**

* = non tolerable mean because more than +/-

limit for the lower concentration range

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Hg **Sample: 3** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	A39	PZ98	DA05	16,00	16,00	14,00	13,00	4	14,75		1,50	**10,17**	74,50
2	A88	PD01	DB04	16,26	16,37	16,15	16,21	4	16,25		0,09	0,57	82,06
3	F28x	PZ98	DA05	16,60	16,29	16,94	16,16	4	16,50		0,35	2,11	83,33
4	F32x	PZ98	DA05	17,30	17,60	18,00	17,30	4	17,55		0,33	1,89	88,64
5	A90	PD01	DB10	19,00	15,80	17,70	18,90	4	17,85		1,49	8,34	90,16
6	F16x	PC01	DB10	17,26	18,82	17,03	18,40	4	17,88		0,87	4,86	90,30
7	A36	PD02	DB03	19,62	18,25	20,68	15,83	4	18,60		2,09	**11,26**	93,92
8	F03	PZ98	DA05	19,45	19,56	19,86	19,88	4	19,69		0,22	1,10	99,44
9	A45x	PB99	DB08	21,70	21,60	21,00	20,70	4	21,25		0,48	2,26	107,33
10	F02x	PZ98	DA05	22,50	22,00	*24,3a*	22,40	3	22,30		0,26	1,19	112,63
11	A79	PD03	DB10	22,50	22,40	21,90	23,70	4	22,63		0,76	3,37	114,28
12	A93	PZ98	DA05	23,90	23,00	22,50	21,20	4	22,65		1,13	4,98	114,40
13	A82	PZ98	DA05	22,20	22,90	23,30	22,50	4	22,73		0,48	2,11	114,78
14	A80	PZ98	DA05	22,50	23,60	22,80	22,70	4	22,90		0,48	2,11	115,66
15	F18x	PD99	DA05	24,40	24,20	24,60	23,20	4	24,10		0,62	2,58	121,73
16	F08	PC01	DB03	32,00	30,00	43,00	35,00	0	35,00	*b* *	5,72	**16,33**	176,78
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	n	Mean	s_r	CV_r
all labs	**59**	**19,80**	**0,744**	**3,757**
30	% from the mean			
	l		s_R	CV_R
	15		**2,978**	**15,009**

* = non tolerable mean because more than +/-

limit for the lower concentration range

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Hg **Sample: 4** Unit: ng/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F08	PC01	DB03	12,00	14,00	18,00	13,00	0	14,25	*b* *	2,63	**18,46**	27,53
2	A88	PD01	DB04	34,60	33,10	33,60	34,10	0	33,85	*b* *	0,65	1,91	65,38
3	A39	PZ98	DA05	48,00	50,00	42,00	44,00	4	46,00		3,65	7,94	88,85
4	F28x	PZ98	DA05	47,07	46,79	45,97	45,46	4	46,32		0,74	1,60	89,48
5	F16x	PC01	DB10	45,11	50,14	45,76	47,34	4	47,09		2,24	4,76	90,95
6	A36	PD02	DB03	48,88	46,01	46,83	49,60	4	47,83		1,69	3,53	92,39
7	F32x	PZ98	DA05	47,00	48,60	48,60	48,20	4	48,10		0,76	1,57	92,91
8	F02x	PZ98	DA05	49,20	49,90	48,60	48,00	4	48,93		0,81	1,66	94,50
9	A45x	PB99	DB08	50,00	50,20	49,90	50,00	4	50,03		0,13	0,25	96,63
10	A90	PD01	DB10	51,30	51,30	52,10	57,10	4	52,95		2,79	5,27	102,28
11	F03	PZ98	DA05	54,52	53,87	52,14	54,59	4	53,78		1,14	2,12	103,88
12	A82	PZ98	DA05	56,10	57,30	55,40	54,90	4	55,93		1,04	1,86	108,02
13	A93	PZ98	DA05	58,30	60,20	54,80	54,20	4	56,88		2,86	5,03	109,86
14	F18x	PD99	DA05	57,30	56,10	55,70	59,00	4	57,03		1,48	2,60	110,15
15	A80	PZ98	DA05	56,80	58,00	57,90	57,60	4	57,58		0,54	0,94	111,21
16	A79	PD03	DB10	58,60	*63,4a*	57,60	57,50	3	57,90		0,61	1,05	111,84
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	n	Mean	s_r	CV_r
all labs	**55**	**51,77**	**1,463**	**2,826**
20	% from the mean			
	l		s_R	CV_R
	14		**4,578**	**8,825**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Ni **Sample: 1** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F27	PD01	DB05	3,29	3,38	3,31	3,36	4	3,33	*	0,04	1,26	79,31
2	F07x	PD02	DB08	3,46	3,23	3,42	3,52	4	3,41		0,13	3,72	81,11
3	F33x	PD01	DB10	3,54	3,75	3,57	3,72	4	3,65		0,11	2,89	86,77
4	A49	PC03	DB08	3,92	3,86	3,91	3,95	4	3,91		0,04	0,96	93,08
5	F16x	PC01	DB10	3,85	3,88	4,10	4,01	4	3,96		0,12	2,91	94,27
6	F02x	PD02	DB08	3,90	3,80	4,20	4,20	4	4,03		0,21	5,12	95,82
7	A79	PD03	DB10	4,12	4,04	4,02	4,08	4	4,06		0,04	1,05	96,75
8	A71	PB03	DB01	4,18	4,19	4,13	4,06	4	4,14		0,06	1,49	98,54
9	A88	PD01	DB08	4,17	4,14	4,16	4,15	4	4,16		0,01	0,31	98,91
10	A90	PD01	DB10	4,31	4,09	4,13	4,10	4	4,16		0,10	2,48	98,97
11	F08x	PC01	DB10	4,30	3,97	4,42	4,09	4	4,20		0,20	4,85	99,93
12	F32	PD02	DB10	4,09	4,16	4,34	4,45	4	4,26		0,16	3,87	101,41
13	F06x	PD02	DB08	4,28	4,37	4,19	4,23	4	4,27		0,08	1,82	101,59
14	A36	PD02	DB10	4,32	4,31	4,29	4,26	4	4,29		0,03	0,61	102,22
15	F12x	PC01	DB09	4,37	4,39	4,34	4,12	4	4,31		0,13	2,90	102,48
16	F05	PD02	DB08	4,28	4,27	4,39	4,39	4	4,33		0,07	1,54	103,14
17	A80	PD03	DB10	4,30	4,40	4,25	4,43	4	4,35		0,08	1,94	103,43
18	A45x	PZ98	DB08	4,32	4,41	4,40	4,37	4	4,38		0,04	0,92	104,15
19	A39	PD02	DB08	4,28	4,47	4,38	4,51	4	4,41		0,10	2,34	104,93
20	F18x	PD99	DB10	4,41	4,49	4,39	4,53	4	4,46		0,07	1,48	106,05
21	F14x	PC01	DB10	4,30	4,45	4,48	4,76	4	4,50		0,19	4,24	107,00
22	A65	PD01	DB08	4,60	4,50	4,50	4,40	4	4,50		0,08	1,81	107,12
23	F03	PD02	DB08	4,59	4,59	4,60	4,66	4	4,61		0,03	0,73	109,74
24	A60x	PD01	DB10	4,52	4,69	4,74	4,66	4	4,65		0,09	2,03	110,75
25	A82	PC01	DB10	4,92	4,61	4,49	4,89	4	4,73		0,21	4,47	112,54
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	n	Mean	s_r	CV_r
all labs	**100**	**4,20**	**0,097**	**2,306**
20	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
25	**0,349**	**8,307**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Ni **Sample: 2** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean			Lab.standard dev. s_i	V_i	Recovery %
1	F07x	PD02	DB08	2,58	2,55	2,54	*2,3934a*	0	2,56	*b*	*	0,02	0,66	71,21
2	F27	PD01	DB05	3,00	2,89	3,01	2,90	0	2,95	*b*		0,06	2,18	82,17
3	F08x	PC01	DB10	2,98	3,30	3,45	3,22	4	3,24			0,20	6,10	90,14
4	A49	PC03	DB08	3,33	3,23	3,31	3,34	4	3,30			0,05	1,51	91,95
5	F05	PD02	DB08	3,36	3,32	3,38	3,33	4	3,35			0,03	0,82	93,20
6	A79	PD03	DB10	3,44	3,31	3,53	3,35	4	3,41			0,10	2,87	94,83
7	F12x	PC01	DB09	3,65	3,42	3,36	3,30	4	3,43			0,15	4,46	95,57
8	A36	PD02	DB10	3,48	3,38	3,46	3,46	4	3,45			0,04	1,29	95,91
9	F16x	PC01	DB10	3,40	3,60	3,38	3,54	4	3,48			0,11	3,04	96,90
10	F03	PD02	DB08	3,48	3,48	3,47	3,55	4	3,50			0,04	1,06	97,31
11	A45x	PZ98	DB08	3,51	3,53	3,49	3,58	4	3,53			0,04	1,09	98,21
12	A88	PD01	DB08	3,52	3,56	3,54	3,55	4	3,54			0,02	0,48	98,63
13	A90	PD01	DB10	3,50	3,62	3,58	3,70	4	3,60			0,08	2,31	100,23
14	F33x	PD01	DB10	3,50	3,46	4,00	3,60	0	3,64	*c*		0,25	6,79	101,34
15	A80	PD03	DB10	3,56	3,63	3,58	3,83	4	3,65			0,12	3,39	101,62
16	A39	PD02	DB08	3,63	3,79	3,60	3,60	4	3,66			0,09	2,49	101,82
17	A60x	PD01	DB10	3,64	3,73	3,67	3,71	4	3,69			0,04	1,09	102,67
18	F14x	PC01	DB10	3,67	3,64	3,81	3,66	4	3,69			0,08	2,09	102,76
19	A82	PC01	DB10	3,71	3,77	3,71	3,75	4	3,74			0,03	0,80	103,99
20	F06x	PD02	DB08	3,72	3,77	3,74	3,77	4	3,75			0,02	0,65	104,41
21	F02x	PD02	DB08	3,60	3,90	3,70	3,80	4	3,75			0,13	3,44	104,41
22	F18x	PD99	DB10	3,72	3,78	3,83	3,83	4	3,79			0,05	1,38	105,52
23	F32	PD02	DB10	3,76	3,77	3,79	3,85	4	3,79			0,04	1,06	105,59
24	A65	PD01	DB08	3,70	3,80	3,90	3,90	4	3,83			0,10	2,50	106,49
25	A71	PB03	DB01	3,99	3,73	3,73	4,05	4	3,87			0,17	4,35	107,88
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	n	Mean	s_r	CV_r
all labs	**88**	**3,59**	**0,078**	**2,182**
20	% from the mean			
	l		s_R	CV_R
	22		**0,181**	**5,046**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Ni **Sample: 3** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F27	PD01	DB05	1,99	1,88	1,87	1,78	4	1,88	*	0,08	4,47	79,48
2	F07x	PD02	DB08	2,02	1,85	1,92	1,81	4	1,90		0,09	4,76	80,25
3	A49	PC03	DB08	2,06	2,26	2,10	2,32	4	2,19		0,12	5,71	92,39
4	A90	PD01	DB10	2,00	2,38	2,37	1,99	4	2,19		0,22	**10,04**	92,39
5	F08x	PC01	DB10	2,18	2,11	2,31	2,27	4	2,22		0,09	4,14	93,69
6	F32	PD02	DB10	2,16	2,26	2,34	2,17	4	2,23		0,08	3,79	94,40
7	A80	PD03	DB10	2,20	2,36	2,13	2,26	4	2,24		0,10	4,35	94,61
8	F12x	PC01	DB09	2,25	2,23	2,26	2,26	4	2,25		0,01	0,63	95,14
9	A79	PD03	DB10	2,28	2,29	2,19	2,36	4	2,28		0,07	2,93	96,37
10	A39	PD02	DB08	2,24	2,27	2,23	2,39	4	2,28		0,07	3,19	96,47
11	A36	PD02	DB10	2,37	2,28	2,35	2,29	4	2,32		0,04	1,91	98,21
12	F33x	PD01	DB10	2,51	2,23	2,48	2,12	4	2,34		0,19	8,16	98,74
13	A88	PD01	DB08	2,39	2,31	2,35	2,33	4	2,35		0,03	1,46	99,16
14	F18x	PD99	DB10	2,39	2,41	2,26	2,35	4	2,35		0,07	2,83	99,48
15	F06x	PD02	DB08	2,30	2,35	2,41	2,44	4	2,38		0,06	2,63	100,43
16	A65	PD01	DB08	2,30	2,70	2,40	2,60	4	2,50		0,18	7,30	105,71
17	A60x	PD01	DB10	2,48	2,56	2,56	2,48	4	2,52		0,05	1,83	106,56
18	F14x	PC01	DB10	2,67	2,66	2,29	2,55	4	2,54		0,18	7,04	107,44
19	A45x	PZ98	DB08	2,58	2,59	2,53	2,58	4	2,57		0,03	1,05	108,67
20	F02x	PD02	DB08	2,80	2,30	2,80	2,50	4	2,60		0,24	9,42	109,94
21	F03	PD02	DB08	2,60	2,61	2,63	2,64	4	2,62		0,02	0,70	110,79
22	F05	PD02	DB08	2,68	2,69	2,67	2,58	4	2,66		0,05	1,91	112,27
23	F16x	PC01	DB10	2,64	2,73	2,62	2,68	4	2,67		0,05	1,76	112,74
24	A71	PB03	DB01	2,87	2,81	2,80	*3,0914a*	3	2,83		0,04	1,25	119,54
25	A82	PC01	DB10	3,16	3,45	2,72	2,48	0	2,95	*c* *	0,44	**14,74**	124,85
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	n	Mean	s_r	CV_r
all labs	**95**	**2,36**	**0,091**	**3,832**
20	% from the mean			
	l		s_R	CV_R
	24		**0,231**	**9,755**

* = non tolerable mean because more than +/-

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Element: Ni **Sample: 4** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	2	3	4	n	Lab.mean		Lab.standard dev. s_i	V_i	Recovery %
1	F07x	PD02	DB08	11,29	12,44	9,96	10,27	4	10,99	*	1,12	**10,20**	57,88
2	A45x	PZ98	DB08	12,30	12,90	12,80	12,00	4	12,50	*	0,42	3,39	65,83
3	F03	PD02	DB08	14,85	15,03	15,10	14,85	4	14,96	*	0,13	0,85	78,77
4	F08x	PC01	DB10	15,54	15,82	16,32	16,58	4	16,06		0,47	2,95	84,59
5	F02x	PD02	DB08	17,10	17,10	16,70	15,10	4	16,50		0,95	5,77	86,89
6	F33x	PD01	DB10	16,93	18,07	16,48	17,89	4	17,34		0,76	4,40	91,33
7	A88	PD01	DB08	15,69	19,14	17,41	18,28	4	17,63		1,47	8,36	92,84
8	F12x	PC01	DB09	19,34	18,53	18,14	18,81	4	18,71		0,50	2,70	98,50
9	F16x	PC01	DB10	18,16	18,92	18,61	19,29	4	18,75		0,48	2,55	98,71
10	A80	PD03	DB10	18,60	19,00	18,30	19,40	4	18,83		0,48	2,54	99,13
11	A49	PC03	DB08	18,20	19,60	18,90	19,60	4	19,08		0,67	3,51	100,45
12	A36	PD02	DB10	18,67	19,03	19,55	19,19	4	19,11		0,37	1,91	100,64
13	F05	PD02	DB08	19,70	19,10	20,20	18,40	4	19,35		0,78	4,01	101,90
14	F32	PD02	DB10	20,00	19,20	18,70	19,50	4	19,35		0,54	2,81	101,90
15	F06x	PD02	DB08	19,30	20,50	19,50	19,30	4	19,65		0,57	2,92	103,48
16	A71	PB03	DB01	19,50	19,68	19,72	20,03	4	19,73		0,22	1,12	103,91
17	F27	PD01	DB05	19,48	17,97	21,47	20,52	4	19,86		1,50	7,55	104,59
18	F14x	PC01	DB10	20,16	20,26	20,37	19,51	4	20,08		0,39	1,92	105,73
19	A39	PD02	DB08	21,06	19,44	20,24	19,87	4	20,15		0,69	3,41	106,13
20	A79	PD03	DB10	23,40	21,15	21,36	22,36	4	22,07		1,03	4,68	116,21
21	A82	PC01	DB10	21,50	22,70	22,10	22,00	4	22,08		0,49	2,23	116,25
22	A65	PD01	DB08	20,90	23,00	22,40	23,30	4	22,40		1,07	4,77	117,96
23	F18x	PD99	DB10	22,50	22,70	22,20	22,30	4	22,43		0,22	0,99	118,09
24	A90	PD01	DB10	21,54	22,04	23,52	24,90	4	23,00	*	1,52	6,61	121,12
25	A60x	PD01	DB10	24,20	23,50	24,20	24,70	4	24,15	*	0,49	2,04	127,18
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	n	Mean	s_r	CV_r
all labs	**100**	**18,99**	**0,694**	**3,655**
20	% from the mean			

* = non tolerable mean because more than +/-

l	s_R	CV_R
25	**3,106**	**16,357**

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	1	F08x	PD01	DB10	57,3	55,8	57,4	58,4	57,23	1,072	1,873
Al	(µg/g)	1	F33x	PD01	DB10	73,3	62,84	65,6	64,65	66,60	4,613	6,926
Al	(µg/g)	1	F07x	PD02	DB08	67,64	69,63	68,06	66,766	68,02	1,199	1,762
Al	(µg/g)	1	F18x	PD99	DB08	71	68,1	70	70	69,78	1,212	1,737
Al	(µg/g)	1	A80	PD03	DB10	77,7	62,5	75,3	68,4	70,98	6,889	9,707
Al	(µg/g)	1	F03	PD02	DB08	72,76	73,21	71,71	67,54	71,31	2,587	3,629
Al	(µg/g)	1	F05	PD02	DB08	76,2	75,4	77,4	76,7	76,43	0,842	1,102
Al	(µg/g)	1	A60x	PD01	DB10	75,4	74,1	75,9	81,7	76,78	3,370	4,389
Al	(µg/g)	1	A36	PD02	DB08	79,9	75,4	81,4	77,1	78,45	2,704	3,446
Al	(µg/g)	1	F27	PD01	DB02	77,5	77,6	93	76,3	81,10	7,955	9,809
Al	(µg/g)	1	F12x	PC01	DB08	89,4	86,9	87,2	88	87,88	1,118	1,272
Al	(µg/g)	1	A39	PD02	DB08	88,72	92,58	89,89	89,55	90,19	1,671	1,852
Al	(µg/g)	1	A65	PD01	DB08	89	100	90	87	91,50	5,802	6,341
Al	(µg/g)	1	F06x	PD02	DB08	93,59	89,22	91,24	92,63	91,67	1,897	2,069
Al	(µg/g)	1	A53	PZ02	DD02	94,8	90,1	93,8	91,5	92,55	2,139	2,312
Al	(µg/g)	1	A57	PZ02	DD02	88,8	103,4	93,6	92,6	94,60	6,220	6,575
Al	(µg/g)	1	F16x	PC01	DB08	100,4	93,79	97,05	96,97	97,05	2,699	2,781
Al	(µg/g)	1	A49	PC03	DB09	100	96	98	99	98,25	1,708	1,738
Al	(µg/g)	1	F28x	PD02	DB08	97,1	95,17	98,74	102,7	98,43	3,200	3,251
Al	(µg/g)	1	F14x	PC01	DB08	103,79	104,56	103,35	103,79	103,87	0,503	0,484
Al	(µg/g)	1	F15x	PC01	DB08	98	103	109	106	104,00	4,690	4,510
Al	(µg/g)	1	A90	PD01	DB10	103	111	103	100	104,25	4,717	4,525
Al	(µg/g)	1	A45x	PB99	DB08	107	106	105	104	105,50	1,291	1,224
Al	(µg/g)	1	A79	PD03	DB10	109,4	109,6	103,2	111	108,30	3,474	3,207
Al	(µg/g)	2	F08x	PD01	DB10	103,6	101,4	99,5	101,8	101,58	1,682	1,656
Al	(µg/g)	2	A36	PD02	DB08	106,7	104,4	109,5	104,2	106,20	2,475	2,331
Al	(µg/g)	2	A60x	PD01	DB10	106	108	108	107	107,25	0,957	0,893
Al	(µg/g)	2	F03	PD02	DB08	107,15	107,86	108,33	108,49	107,96	0,601	0,557
Al	(µg/g)	2	F07x	PD02	DB08	105,4	108,5	113,973	106,092	108,49	3,889	3,584

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	2	A80	PD03	DB10	109	106	107	115	109,25	4,031	3,690
Al	(µg/g)	2	A65	PD01	DB08	107	112	109	112	110,00	2,449	2,227
Al	(µg/g)	2	F27	PD01	DB02	104,9	107,9	129,3	99,7	110,45	13,015	11,784
Al	(µg/g)	2	F12x	PC01	DB08	113	112	109	110	111,00	1,826	1,645
Al	(µg/g)	2	F16x	PC01	DB08	112,1	113,1	110,5	115	112,68	1,884	1,672
Al	(µg/g)	2	F18x	PD99	DB08	115	114	114	114	114,25	0,500	0,438
Al	(µg/g)	2	F06x	PD02	DB08	115,6	116,2	114,4	114,9	115,28	0,789	0,684
Al	(µg/g)	2	A79	PD03	DB10	115,2	118,6	112,2	115,3	115,33	2,615	2,267
Al	(µg/g)	2	F33x	PD01	DB10	115,91	116,31	118,04	112,9	115,79	2,137	1,846
Al	(µg/g)	2	A39	PD02	DB08	118,3	116,8	116,6	114,5	116,55	1,563	1,341
Al	(µg/g)	2	A49	PC03	DB09	117	116	119	117	117,25	1,258	1,073
Al	(µg/g)	2	F05	PD02	DB08	119	118	118	118	118,25	0,500	0,423
Al	(µg/g)	2	F15x	PC01	DB08	122	117	118	117	118,50	2,380	2,009
Al	(µg/g)	2	F28x	PD02	DB08	117,6	115,8	125,4	122,8	120,40	4,463	3,707
Al	(µg/g)	2	A90	PD01	DB10	118	122	125	124	122,25	3,096	2,532
Al	(µg/g)	2	A45x	PB99	DB08	126	124	124	123	124,25	1,258	1,013
Al	(µg/g)	2	F14x	PC01	DB08	120,21	124,78	130,95	127,01	125,74	4,482	3,564
Al	(µg/g)	2	A57	PZ02	DD02	130,5	127,6	126,4	128,1	128,15	1,721	1,343
Al	(µg/g)	2	A53	PZ02	DD02	140	136	141	140	139,25	2,217	1,592
Al	(µg/g)	3	F18x	PD99	DB08	62,4	61,1	61,1	63,7	62,08	1,245	2,005
Al	(µg/g)	3	A80	PD03	DB10	63,7	66,8	61,2	69,8	65,38	3,735	5,713
Al	(µg/g)	3	F08x	PD01	DB10	68,1	68,9	66,5	63	66,63	2,615	3,924
Al	(µg/g)	3	F07x	PD02	DB08	68,32	68,21	69,3	68,398	68,56	0,501	0,731
Al	(µg/g)	3	A36	PD02	DB08	70,5	71,2	70	68,2	69,98	1,282	1,832
Al	(µg/g)	3	F03	PD02	DB08	71,35	70	69,34	73,34	71,01	1,766	2,487
Al	(µg/g)	3	F27	PD01	DB02	66,7	73,1	65,7	86,3	72,95	9,485	13,001
Al	(µg/g)	3	A60x	PD01	DB10	72,9	73,3	73,2	74,3	73,43	0,608	0,827
Al	(µg/g)	3	F05	PD02	DB08	74,8	75,2	73,3	73,7	74,25	0,896	1,207
Al	(µg/g)	3	F28x	PD02	DB08	79,91	77,04	81,08	78,31	79,09	1,774	2,243

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	3	F33x	PD01	DB10	80,96	81,27	84,71	77,17	81,03	3,082	3,804
Al	(µg/g)	3	A39	PD02	DB08	80,94	83,51	80,08	82,77	81,83	1,588	1,940
Al	(µg/g)	3	A90	PD01	DB10	82,3	81,4	104,6	76,6	86,23	12,503	14,500
Al	(µg/g)	3	F12x	PC01	DB08	87,2	86,1	88,3	87,5	87,28	0,911	1,043
Al	(µg/g)	3	F06x	PD02	DB08	89,5	86,94	89,61	86,82	88,22	1,546	1,752
Al	(µg/g)	3	A49	PC03	DB09	89	95	81	88	88,25	5,737	6,501
Al	(µg/g)	3	A65	PD01	DB08	82	102	87	92	90,75	8,539	9,410
Al	(µg/g)	3	F16x	PC01	DB08	88,87	88,95	93,6	91,58	90,75	2,279	2,512
Al	(µg/g)	3	A45x	PB99	DB08	102	102	107	98,6	102,40	3,460	3,379
Al	(µg/g)	3	A79	PD03	DB10	102	103,1	98	109,3	103,10	4,678	4,538
Al	(µg/g)	3	F15x	PC01	DB08	124	102	100	103	107,25	11,236	10,477
Al	(µg/g)	3	F14x	PC01	DB08	125,3	105,66	107,57	119,46	114,50	9,441	8,246
Al	(µg/g)	3	A57	PZ02	DD02	132,5	127,4	115,6	130	126,38	7,479	5,918
Al	(µg/g)	3	A53	PZ02	DD02	153	144	148	148	148,25	3,686	2,486
Al	(µg/g)	4	F33x	PD01	DB10	1109,78	1018,57	1011,17	1025,32	1041,21	46,077	4,425
Al	(µg/g)	4	F08x	PD01	DB10	1077	1026	1141	1015	1064,75	57,564	5,406
Al	(µg/g)	4	F03	PD02	DB08	1137,95	1193,74	1208,76	1097,57	1159,51	51,312	4,425
Al	(µg/g)	4	F05	PD02	DB08	1167	1208	1147	1190	1178,00	26,621	2,260
Al	(µg/g)	4	F18x	PD99	DB08	1220	1220	1220	1220	1220,00	0,000	0,000
Al	(µg/g)	4	A80	PD03	DB10	1162	1368	1136	1339	1251,25	119,134	9,521
Al	(µg/g)	4	A36	PD02	DB08	1308	1349	1278	1184	1279,75	70,154	5,482
Al	(µg/g)	4	F27	PD01	DB02	1164,7	1239,9	1360,9	1398,5	1291,00	108,020	8,367
Al	(µg/g)	4	F07x	PD02	DB08	1397,18	1248,095	1397,958	1210,693	1313,48	98,290	7,483
Al	(µg/g)	4	A60x	PD01	DB10	1310	1240	1340	1380	1317,50	59,090	4,485
Al	(µg/g)	4	F28x	PD02	DB08	1360	1405	1360	1378	1375,75	21,266	1,546
Al	(µg/g)	4	A65	PD01	DB08	1592	1562	1749	1846	1687,25	133,884	7,935
Al	(µg/g)	4	A39	PD02	DB08	1718	1707	1724	1700	1712,25	10,782	0,630
Al	(µg/g)	4	F06x	PD02	DB08	1724	1872	1783	1660	1759,75	90,127	5,122
Al	(µg/g)	4	F14x	PC01	DB08	1925,98	1856,82	1933,27	1879,55	1898,91	36,787	1,937

21th Needle/Leaf Interlaboratory Comparison Test 2018/2019

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	4	F16x	PC01	DB08	1955	2054	1943	1974	1981,50	49,990	2,523
Al	(µg/g)	4	F15x	PC01	DB08	2049	1971	2032	2105	2039,25	55,163	2,705
Al	(µg/g)	4	A90	PD01	DB10	2146	2016	2135	2077	2093,50	59,880	2,860
Al	(µg/g)	4	A57	PZ02	DD02	2101,6	2165,5	2151,3	2157,5	2143,98	28,842	1,345
Al	(µg/g)	4	F12x	PC01	DB08	2161	2169	2145	2213	2172,00	29,098	1,340
Al	(µg/g)	4	A45x	PB99	DB08	2540	2580	2710	2360	2547,50	144,539	5,674
Al	(µg/g)	4	A79	PD03	DB10	2633	2587	2549	2529	2574,50	45,822	1,780
Al	(µg/g)	4	A53	PZ02	DD02	2640	2670	2690	2570	2642,50	52,520	1,988
Al	(µg/g)	4	A49	PC03	DB09	2763	2750	2949	2855	2829,25	92,507	3,270
Ba	(µg/g)	1	F08x	PC01	DB10	1,634	1,586	1,402	1,429	1,51	0,115	7,571
Ba	(µg/g)	1	A39	PD02	DB08	1,623	1,624	1,608	1,663	1,63	0,024	1,442
Ba	(µg/g)	1	A80	PD03	DB10	1,7	1,63	1,69	1,69	1,68	0,032	1,909
Ba	(µg/g)	1	A49	PC03	DB09	1,7	1,67	1,66	1,7	1,68	0,021	1,225
Ba	(µg/g)	1	F16x	PC01	DB10	1,852	1,822	1,861	1,834	1,84	0,018	0,953
Ba	(µg/g)	1	A90	PD01	DB10	1,97	1,96	1,93	1,95	1,95	0,017	0,875
Ba	(µg/g)	1	A65	PD01	DB08	2,4	1,9	2	1,8	2,03	0,263	12,987
Ba	(µg/g)	1	A82	PC01	DB08	1,93	1,86	1,81	3,03	2,16	0,584	27,057
Ba	(µg/g)	2	A82	PC01	DB08	48,8	49	48,6	49,1	48,88	0,222	0,454
Ba	(µg/g)	2	A49	PC03	DB09	51,04	49,03	48,71	49,22	49,50	1,048	2,117
Ba	(µg/g)	2	F08x	PC01	DB10	50,46	50,68	51,62	49,93	50,67	0,706	1,393
Ba	(µg/g)	2	F16x	PC01	DB10	50,2	51,89	50,05	50,98	50,78	0,845	1,664
Ba	(µg/g)	2	A65	PD01	DB08	50	51,7	51,8	52,9	51,60	1,197	2,320
Ba	(µg/g)	2	A39	PD02	DB08	52,24	53,08	53,11	51,48	52,48	0,778	1,482
Ba	(µg/g)	2	A80	PD03	DB10	51	51,6	51,2	56,2	52,50	2,479	4,722
Ba	(µg/g)	2	A90	PD01	DB10	52,4	53,8	53,2	55,7	53,78	1,406	2,614
Ba	(µg/g)	3	A82	PC01	DB08	36,2	35,8	34,7	37,9	36,15	1,328	3,673
Ba	(µg/g)	3	A49	PC03	DB09	36,4	37	35,7	36,68	36,45	0,554	1,520
Ba	(µg/g)	3	F08x	PC01	DB10	35,93	36,5	36,95	36,93	36,58	0,479	1,310
Ba	(µg/g)	3	A80	PD03	DB10	35,8	37,1	36,2	37,4	36,63	0,750	2,048

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Ba	(µg/g)	3	A90	PD01	DB10	38,3	39,2	42,3	37,7	39,38	2,045	5,194
Ba	(µg/g)	3	F16x	PC01	DB10	40,25	38,5	40	38,78	39,38	0,871	2,212
Ba	(µg/g)	3	A39	PD02	DB08	40,99	42,79	40,74	40,04	41,14	1,171	2,847
Ba	(µg/g)	3	A65	PD01	DB08	41,4	40,5	41,9	42	41,45	0,686	1,654
Ba	(µg/g)	4	F08x	PC01	DB10	54,13	53,69	51,64	55,1	53,64	1,458	2,717
Ba	(µg/g)	4	A80	PD03	DB10	53,3	54,5	53	54,5	53,83	0,789	1,466
Ba	(µg/g)	4	A39	PD02	DB08	57,52	56,74	57,13	57,72	57,28	0,434	0,758
Ba	(µg/g)	4	A82	PC01	DB08	57,3	57,6	57,2	57,7	57,45	0,238	0,414
Ba	(µg/g)	4	F16x	PC01	DB10	58,68	58,45	61,28	58,51	59,23	1,370	2,313
Ba	(µg/g)	4	A65	PD01	DB08	60,8	60,6	62,9	64,3	62,15	1,771	2,850
Ba	(µg/g)	4	A90	PD01	DB10	66,3	63,6	67,4	67,2	66,13	1,750	2,647
Ba	(µg/g)	4	A49	PC03	DB09	66,74	66,07	66,55	65,78	66,29	0,439	0,662
Be	(ng/g)	1	A80	PD03	DB10	<25	<25	<25	<25			
Be	(ng/g)	1	F16x	PC01	DB10	7,504	8,02	6,42	7,719	7,42	0,697	9,396
Be	(ng/g)	1	F32	PD02	DB10	7,8	7,9	8	7,7	7,85	0,129	1,645
Be	(ng/g)	1	A90	PD01	DB10	8,8	9,8	8,8	8,5	8,98	0,568	6,327
Be	(ng/g)	2	A80	PD03	DB10	<25	<25	<25	<25			
Be	(ng/g)	2	A90	PD01	DB10	7,7	6,7	7,4	7,8	7,40	0,497	6,712
Be	(ng/g)	2	F16x	PC01	DB10	8,068	7,114	7,895	7,228	7,58	0,476	6,277
Be	(ng/g)	2	F32	PD02	DB10	8,5	8,2	8,6	8,3	8,40	0,183	2,174
Be	(ng/g)	3	A80	PD03	DB10	<25	<25	<25	<25			
Be	(ng/g)	3	F16x	PC01	DB10	3,372	4,153	3,124	3,957	3,65	0,483	13,240
Be	(ng/g)	3	A90	PD01	DB10	3,5	3,4	5	3,5	3,85	0,768	19,951
Be	(ng/g)	3	F32	PD02	DB10	4,8	4,91	5,34	4,59	4,91	0,316	6,434
Be	(ng/g)	4	A80	PD03	DB10	40,5	46,2	40,8	44,8	43,08	2,861	6,641
Be	(ng/g)	4	F16x	PC01	DB10	55,27	58,69	59,09	66,76	59,95	4,851	8,092
Be	(ng/g)	4	F32	PD02	DB10	68,8	67,9	69,7	70,5	69,23	1,124	1,623
Be	(ng/g)	4	A90	PD01	DB10	76	68	74	70	72,00	3,651	5,072

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Bi	(ng/g)	1	F16x	PC01	DB10	6,896	5,396	6,057	5,88	6,06	0,625	10,320
Bi	(ng/g)	1	A80	PD03	DB10	9,27	8,93	10,9	18,1	11,80	4,287	36,331
Bi	(ng/g)	2	F16x	PC01	DB10	46,55	40,95	48,9	45,72	45,53	3,337	7,330
Bi	(ng/g)	2	A80	PD03	DB10	49,8	50,7	49,9	55,6	51,50	2,763	5,365
Bi	(ng/g)	3	A80	PD03	DB10	<7	<7	<7	<7			
Bi	(ng/g)	3	F16x	PC01	DB10	2,702	2,742	3,371	2,879	2,92	0,308	10,529
Bi	(ng/g)	4	F16x	PC01	DB10	19,34	17,8	19,69	17,6	18,61	1,061	5,701
Bi	(ng/g)	4	A80	PD03	DB10	18,5	18,8	18,8	24	20,03	2,654	13,252
Br	(µg/g)	1	A53	PZ02	DD02	5,2	5,2	5,4	5,3	5,28	0,096	1,815
Br	(µg/g)	2	A53	PZ02	DD02	<1	<1	<1	<1			
Br	(µg/g)	3	A53	PZ02	DD02	<1	<1	<1	<1			
Br	(µg/g)	4	A53	PZ02	DD02	<1	<1	<1	<1			
Ce	(ng/g)	1	A80	PD03	DB10	136	130	115	115	124,00	10,677	8,611
Ce	(ng/g)	1	A90	PD01	DB10	181	143	161	148	158,25	16,958	10,716
Ce	(ng/g)	2	A80	PD03	DB10	98,3	86,4	94,7	95,6	93,75	5,133	5,475
Ce	(ng/g)	2	A90	PD01	DB10	119	126	123	126	123,50	3,317	2,686
Ce	(ng/g)	3	A80	PD03	DB10	74,1	70	87,8	71,6	75,88	8,127	10,711
Ce	(ng/g)	3	A90	PD01	DB10	88	68	83	73	78,00	9,129	11,703
Ce	(ng/g)	4	A80	PD03	DB10	2610	2960	2960	2880	2852,50	166,007	5,820
Ce	(ng/g)	4	A90	PD01	DB10	3220	3190	3400	3410	3305,00	116,190	3,516
Cl	(µg/g)	1	F05	PZ99	DF08	4010	3942	4052	4000	4001,00	45,328	1,133
Cl	(µg/g)	1	A57	PZ02	DD02	4300	4310	4380	4380	4342,50	43,493	1,002
Cl	(µg/g)	1	F02	PA06	DF08	4350	4310	4380	4460	4375,00	63,509	1,452
Cl	(µg/g)	1	A53	PZ02	DD02	4460	4470	4480	4470	4470,00	8,165	0,183
Cl	(µg/g)	2	F05	PZ99	DF08	608	573	568	535	571,00	29,878	5,232
Cl	(µg/g)	2	F02	PA06	DF08	580	570	570	580	575,00	5,774	1,004
Cl	(µg/g)	2	A53	PZ02	DD02	660	670	670	670	667,50	5,000	0,749
Cl	(µg/g)	2	A57	PZ02	DD02	700	710	690	700	700,00	8,165	1,166

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Cl	(µg/g)	3	F05	PZ99	DF08	354	385	375	367	370,25	13,099	3,538
Cl	(µg/g)	3	F02	PA06	DF08	400	410	410	410	407,50	5,000	1,227
Cl	(µg/g)	3	A53	PZ02	DD02	500	490	500	490	495,00	5,774	1,166
Cl	(µg/g)	3	A57	PZ02	DD02	520	500	490	480	497,50	17,078	3,433
Cl	(µg/g)	4	F05	PZ99	DF08	<47,4	<47,4	<47,4	<47,4			
Cl	(µg/g)	4	F02	PA06	DF08	70	50	50	60	57,50	9,574	16,651
Cl	(µg/g)	4	A53	PZ02	DD02	60	70	60	70	65,00	5,774	8,882
Cl	(µg/g)	4	A57	PZ02	DD02	140	140	140	150	142,50	5,000	3,509
Cs	(ng/g)	1	A80	PD03	DB10	19,1	17,7	18,8	19,2	18,70	0,688	3,679
Cs	(ng/g)	1	A90	PD01	DB10	20,5	20,5	19,6	19,8	20,10	0,469	2,334
Cs	(ng/g)	2	A90	PD01	DB10	55,2	53,7	56,3	57,9	55,78	1,773	3,178
Cs	(ng/g)	2	A80	PD03	DB10	57,3	57,8	57,4	62,6	58,78	2,559	4,354
Cs	(ng/g)	3	A80	PD03	DB10	14,9	14	13,4	15,1	14,35	0,794	5,531
Cs	(ng/g)	3	A90	PD01	DB10	15,4	13,6	15,3	14,2	14,63	0,873	5,971
Cs	(ng/g)	4	A80	PD03	DB10	254	257	247	263	255,25	6,652	2,606
Cs	(ng/g)	4	A90	PD01	DB10	284,7	277	285,6	290,9	284,55	5,729	2,013
F	(µg/g)	1	F02	PE01	DF03	2,6	2,2	2,6	2,2	2,40	0,231	9,623
F	(µg/g)	1	F32x	PE99	DF03	<5	6,1	5,86	5,21	5,72	0,460	8,045
F	(µg/g)	2	F02	PE01	DF03	2,8	2,7	2,7	3,1	2,83	0,189	6,701
F	(µg/g)	2	F32x	PE99	DF03	5,66	5,48	5,07	5,07	5,32	0,298	5,599
F	(µg/g)	3	F32x	PE99	DF03	<5	<5	<5	<5			
F	(µg/g)	3	F02	PE01	DF03	2,2	2,1	1,7	2,3	2,08	0,263	12,674
F	(µg/g)	4	F02	PE01	DF03	13,7	17,8	13,2	15,5	15,05	2,082	13,837
F	(µg/g)	4	F32x	PE99	DF03	24,1	25	25,7	25,1	24,98	0,660	2,643
Hf	(ng/g)	1	A90	PC01	DB10	0,54	0,8	0,66	0,5	0,63	0,135	21,605
Hf	(ng/g)	2	A90	PC01	DB10	1,47	1,31	1,33	1,65	1,44	0,157	10,907
Hf	(ng/g)	3	A90	PC01	DB10	0,68	0,7	0,91	0,55	0,71	0,149	20,985
Hf	(ng/g)	4	A90	PC01	DB10	5,36	3,14	4,55	3,99	4,26	0,935	21,943

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
La	(ng/g)	1	A80	PD03	DB10	96,6	95,4	89,2	89,6	92,70	3,845	4,148
La	(ng/g)	2	A80	PD03	DB10	43,1	40,1	40,4	43,9	41,88	1,909	4,558
La	(ng/g)	3	A80	PD03	DB10	34,9	33,2	39,9	32,9	35,23	3,239	9,194
La	(ng/g)	4	A80	PD03	DB10	1340	1500	1490	1470	1450,00	74,386	5,130
Li	(µg/g)	1	A65	PD01	DB08	0,6	0,9	1,1	0,9	0,88	0,206	23,561
Li	(µg/g)	2	A65	PD01	DB08	0,9	0,8	1	0,8	0,88	0,096	10,942
Li	(µg/g)	3	A65	PD01	DB08	1,1	0,7	1	0,8	0,90	0,183	20,286
Li	(µg/g)	4	A65	PD01	DB08	2,4	2,4	2,5	2,8	2,53	0,189	7,497
Lu	(ng/g)	1	A90	PD01	DB10	0,56	0,51	0,67	0,47	0,55	0,087	15,666
Lu	(ng/g)	2	A90	PD01	DB10	0,2	0,23	0,17	0,18	0,20	0,026	13,568
Lu	(ng/g)	3	A90	PD01	DB10	0,29	0,23	0,24	0,23	0,25	0,029	11,605
Lu	(ng/g)	4	A90	PD01	DB10	0,135	0,112	0,137	0,129	0,13	0,011	8,853
Mo	(ng/g)	1	A88	PD01	DB05	260	295	280	285	280,00	14,720	5,257
Mo	(ng/g)	1	F08x	PC01	DB10	538	532	562	559	547,75	14,975	2,734
Mo	(ng/g)	1	F07x	PD02	DB08	532	542,5	527,9	615,7	554,53	41,244	7,438
Mo	(ng/g)	1	F32	PD02	DB10	637	637	626	626	631,50	6,351	1,006
Mo	(ng/g)	1	A80	PD03	DB10	632	661	644	655	648,00	12,780	1,972
Mo	(ng/g)	1	A36	PD02	DB10	668,2	657,6	666,5	657,9	662,55	5,587	0,843
Mo	(ng/g)	1	F16x	PC01	DB10	669,5	678,4	654,5	656,9	664,83	11,188	1,683
Mo	(ng/g)	1	F14x	PC01	DB10	666	668	667	666	666,75	0,957	0,144
Mo	(ng/g)	1	A39	PD02	DB08	701,1	721,4	702	741,3	716,45	19,030	2,656
Mo	(ng/g)	1	A65	PD01	DB08	1800	1700	1600	1800	1725,00	95,743	5,550
Mo	(ng/g)	2	F07x	PD02	DB08	212,7	235,4	222,9	208,4	219,85	12,018	5,467
Mo	(ng/g)	2	F08x	PC01	DB10	270,1	304,6	270,6	244,6	272,48	24,618	9,035
Mo	(ng/g)	2	A39	PD02	DB08	326,1	323,4	341,1	354,9	336,38	14,599	4,340
Mo	(ng/g)	2	F32	PD02	DB10	340	340	350	340	342,50	5,000	1,460
Mo	(ng/g)	2	A36	PD02	DB10	350,3	360,4	360,2	354,4	356,33	4,886	1,371
Mo	(ng/g)	2	F16x	PC01	DB10	373,9	372,3	341,9	346,3	358,60	16,852	4,699

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Mo	(ng/g)	2	A80	PD03	DB10	359	365	356	395	368,75	17,896	4,853
Mo	(ng/g)	2	A88	PD01	DB05	370	375	375	385	376,25	6,292	1,672
Mo	(ng/g)	2	F14x	PC01	DB10	392	390	384	372	384,50	9,000	2,341
Mo	(ng/g)	2	A65	PD01	DB08	1100	1200	1200	1100	1150,00	57,735	5,020
Mo	(ng/g)	3	F08x	PC01	DB10	354	425	365	376	380,00	31,316	8,241
Mo	(ng/g)	3	F07x	PD02	DB08	430,4	400,9	380,4	411,6	405,83	20,880	5,145
Mo	(ng/g)	3	A80	PD03	DB10	420	420	418	435	423,25	7,890	1,864
Mo	(ng/g)	3	A39	PD02	DB08	453,3	438,6	450,5	435,1	444,38	8,880	1,998
Mo	(ng/g)	3	F32	PD02	DB10	438	438	470	438	446,00	16,000	3,587
Mo	(ng/g)	3	A36	PD02	DB10	453,4	460,5	466,1	460,4	460,10	5,201	1,130
Mo	(ng/g)	3	F14x	PC01	DB10	548	516	465	525	513,50	35,029	6,822
Mo	(ng/g)	3	F16x	PC01	DB10	536,2	547,4	556,5	522,9	540,75	14,510	2,683
Mo	(ng/g)	3	A88	PD01	DB05	640	520	480	535	543,75	68,237	12,549
Mo	(ng/g)	3	A65	PD01	DB08	1400	1600	1200	1400	1400,00	163,299	11,664
Mo	(ng/g)	4	F07x	PD02	DB08	1384	1395	1551,9	1349	1419,98	90,110	6,346
Mo	(ng/g)	4	F08x	PC01	DB10	2687	2637	2901	2709	2733,50	115,659	4,231
Mo	(ng/g)	4	A39	PD02	DB08	3383	3345	3217	3181	3281,50	97,630	2,975
Mo	(ng/g)	4	A36	PD02	DB10	3390,4	3401	3327	3446,4	3391,20	49,212	1,451
Mo	(ng/g)	4	A80	PD03	DB10	3400	3430	3360	3580	3442,50	96,047	2,790
Mo	(ng/g)	4	A88	PD01	DB05	3510	3310	3660	3493	3493,25	143,372	4,104
Mo	(ng/g)	4	F14x	PC01	DB10	3624	3678	3613	3538	3613,25	57,651	1,596
Mo	(ng/g)	4	F32	PD02	DB10	3844	3888	3844	4050	3906,50	97,889	2,506
Mo	(ng/g)	4	F16x	PC01	DB10	3798	4460	4064	4125	4111,75	272,135	6,618
Mo	(ng/g)	4	A65	PD01	DB08	4700	5300	5500	5200	5175,00	340,343	6,577
Na	(µg/g)	1	F07x	PD02	DB08	24,68	24,02	24,07	23,96	24,18	0,335	1,384
Na	(µg/g)	1	F33x	PD01	DB10	25,64	23,34	28,91	25,62	25,88	2,292	8,857
Na	(µg/g)	1	F16x	PC01	DB10	26,95	26,25	27,44	29,14	27,45	1,231	4,485
Na	(µg/g)	1	A60x	PD01	DB10	28,7	28,5	27,4	26,3	27,73	1,109	3,999
Na	(µg/g)	1	F03	PD02	DB08	28,1	28,7	29,5	27,2	28,38	0,971	3,421

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Na	(µg/g)	1	F05	PD02	DB01	29,3	28,2	29,2	28,7	28,85	0,507	1,756
Na	(µg/g)	1	A79	PD03	DB10	30,8	30,23	30,33	30,15	30,38	0,291	0,958
Na	(µg/g)	1	A36	PD02	DB08	27,8	34	31,4	29,5	30,68	2,660	8,672
Na	(µg/g)	1	F18x	PD99	DB08	31,6	32	32,4	32	32,00	0,327	1,021
Na	(µg/g)	1	F06x	PD02	DB08	33,54	31,11	33,58	32,52	32,69	1,160	3,550
Na	(µg/g)	1	F12x	PC01	DB08	36,8	34,6	30	30,8	33,05	3,206	9,700
Na	(µg/g)	1	A49	PC03	DB08	36,2	35,5	35,3	35,7	35,68	0,386	1,083
Na	(µg/g)	1	F32x	PD02	DB08	35,9	37,3	36,3	36	36,38	0,640	1,759
Na	(µg/g)	1	F14x	PC01	DB08	37,56	37,67	37,45	39,87	38,14	1,158	3,038
Na	(µg/g)	1	A90	PD01	DB10	39,5	39,9	38,6	38,5	39,13	0,685	1,751
Na	(µg/g)	1	A65	PD01	DB08	39,7	46,5	43,6	40,1	42,48	3,205	7,545
Na	(µg/g)	1	F28x	PD02	DB08	42,24	43,24	45,1	46,52	44,28	1,909	4,312
Na	(µg/g)	1	A57	PZ02	DD02	40	50	40	50	45,00	5,774	12,830
Na	(µg/g)	1	F15x	PC01	DB08	47	48	45	52	48,00	2,944	6,133
Na	(µg/g)	1	F27	PD01	DB06	50,9	48,1	49,3	69,5	54,45	10,099	18,547
Na	(µg/g)	1	A53	PZ02	DD02	59,2	56,5	55,7	59,3	57,68	1,848	3,205
Na	(µg/g)	1	A39	PD02	DB08	76,36	76,15	77,12	72,18	75,45	2,221	2,944
Na	(µg/g)	2	A53	PZ02	DD02	69,9	73,1	69,8	71,9	71,18	1,607	2,258
Na	(µg/g)	2	F05	PD02	DB01	75,2	71,8	69,1	70,4	71,63	2,626	3,666
Na	(µg/g)	2	F07x	PD02	DB08	73,9	72,35	72,33	72,07	72,66	0,835	1,149
Na	(µg/g)	2	F06x	PD02	DB08	74,69	74,38	74,44	73,49	74,25	0,524	0,706
Na	(µg/g)	2	A49	PC03	DB08	75,8	76,4	76,5	76,7	76,35	0,387	0,507
Na	(µg/g)	2	F16x	PC01	DB10	76,03	78,47	75,39	76,69	76,65	1,327	1,732
Na	(µg/g)	2	F03	PD02	DB08	77,7	75,2	74,3	80,8	77,00	2,913	3,783
Na	(µg/g)	2	F28x	PD02	DB08	78,32	77,26	79,38	75,15	77,53	1,806	2,329
Na	(µg/g)	2	A79	PD03	DB10	78,99	79,09	77,95	76,18	78,05	1,351	1,730
Na	(µg/g)	2	F15x	PC01	DB08	79	82	76	77	78,50	2,646	3,370
Na	(µg/g)	2	A39	PD02	DB08	80,49	76,82	83,56	79,52	80,10	2,782	3,473
Na	(µg/g)	2	F12x	PC01	DB08	83,7	83,1	80,6	78,4	81,45	2,437	2,991

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Na	(µg/g)	2	A60x	PD01	DB10	81,9	84,6	82,2	80,7	82,35	1,634	1,984
Na	(µg/g)	2	F33x	PD01	DB10	85,24	84,74	78,37	81,68	82,51	3,176	3,849
Na	(µg/g)	2	F18x	PD99	DB08	82,5	81,8	82,6	83,5	82,60	0,698	0,845
Na	(µg/g)	2	A36	PD02	DB08	84,3	85,6	85,2	84,7	84,95	0,569	0,669
Na	(µg/g)	2	A90	PD01	DB10	84,3	86,3	82,6	88,2	85,35	2,428	2,845
Na	(µg/g)	2	A65	PD01	DB08	84,9	89,8	87,5	90,1	88,08	2,414	2,741
Na	(µg/g)	2	F32x	PD02	DB08	91	93	91,5	91,2	91,68	0,907	0,989
Na	(µg/g)	2	F14x	PC01	DB08	95,66	94,92	96,72	95,87	95,79	0,741	0,773
Na	(µg/g)	2	F27	PD01	DB06	112,5	112,1	113,2	114	112,95	0,835	0,739
Na	(µg/g)	2	A57	PZ02	DD02	120	110	120	110	115,00	5,774	5,020
Na	(µg/g)	3	A53	PZ02	DD02	<35	<35	<35	<35			
Na	(µg/g)	3	F03	PD02	DB08	<25	<25	<25	<25			
Na	(µg/g)	3	A39	PD02	DB08	10,36	10,08	10,88	10,42	10,44	0,332	3,178
Na	(µg/g)	3	F07x	PD02	DB08	12,29	11,44	12,15	11,76	11,91	0,385	3,235
Na	(µg/g)	3	F16x	PC01	DB10	11,69	12,76	13,45	11,41	12,33	0,948	7,689
Na	(µg/g)	3	A60x	PD01	DB10	15,4	14,8	12,9	12,8	13,98	1,323	9,464
Na	(µg/g)	3	F33x	PD01	DB10	16,94	13,79	16,87	15,02	15,66	1,528	9,764
Na	(µg/g)	3	F06x	PD02	DB08	15,94	15,4	15,84	15,44	15,66	0,275	1,756
Na	(µg/g)	3	F05	PD02	DB01	15,2	17,3	14,7	16,3	15,88	1,162	7,317
Na	(µg/g)	3	A49	PC03	DB08	16,8	17,3	16	16,2	16,58	0,591	3,565
Na	(µg/g)	3	F18x	PD99	DB08	17,7	16,6	17,2	16,3	16,95	0,624	3,684
Na	(µg/g)	3	A90	PD01	DB10	16,3	16,6	19,2	16	17,03	1,471	8,638
Na	(µg/g)	3	A57	PZ02	DD02	20	20	10	20	17,50	5,000	28,571
Na	(µg/g)	3	A79	PD03	DB10	17,75	18,04	17,5	18,22	17,88	0,318	1,776
Na	(µg/g)	3	A36	PD02	DB08	19,8	19,4	16,6	19,8	18,90	1,545	8,174
Na	(µg/g)	3	F12x	PC01	DB08	21,4	19,6	19	20,5	20,13	1,050	5,217
Na	(µg/g)	3	F32x	PD02	DB08	22,2	21,2	21,3	21,1	21,45	0,507	2,362
Na	(µg/g)	3	F15x	PC01	DB08	26	22	24	22	23,50	1,915	8,148
Na	(µg/g)	3	A65	PD01	DB08	24	26,3	25,2	20,4	23,98	2,562	10,685

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Na	(µg/g)	3	F14x	PC01	DB08	33,45	29,2	27,5	29,31	29,87	2,530	8,470
Na	(µg/g)	3	F28x	PD02	DB08	33,16	32,81	34,52	33,88	33,59	0,762	2,269
Na	(µg/g)	3	F27	PD01	DB06	32,8	35,7	33,8	32,3	33,65	1,502	4,464
Na	(µg/g)	4	F07x	PD02	DB08	33,76	35,81	33,34	34,32	34,31	1,079	3,145
Na	(µg/g)	4	F33x	PD01	DB10	33,13	39,54	33,68	37,06	35,85	3,010	8,397
Na	(µg/g)	4	F03	PD02	DB08	38,5	39,8	38,8	38,4	38,88	0,640	1,645
Na	(µg/g)	4	A60x	PD01	DB10	44,4	39,1	41,4	43,3	42,05	2,325	5,528
Na	(µg/g)	4	F18x	PD99	DB08	48,3	49,7	47,4	49,5	48,73	1,078	2,213
Na	(µg/g)	4	A36	PD02	DB08	55,3	54,9	49,2	52	52,85	2,843	5,380
Na	(µg/g)	4	F05	PD02	DB01	58,1	52,2	56	54,4	55,18	2,496	4,523
Na	(µg/g)	4	F16x	PC01	DB10	62,19	57,48	54,71	51,56	56,49	4,507	7,979
Na	(µg/g)	4	F06x	PD02	DB08	57,36	63,81	61	58,59	60,19	2,848	4,731
Na	(µg/g)	4	F28x	PD02	DB08	59,6	61,38	66,08	64,91	62,99	3,018	4,790
Na	(µg/g)	4	F27	PD01	DB06	67,9	68,3	64,8	71,6	68,15	2,781	4,081
Na	(µg/g)	4	F32x	PD02	DB08	67,7	67	70,7	71,8	69,30	2,314	3,339
Na	(µg/g)	4	A65	PD01	DB08	66,7	67,4	74	78,3	71,60	5,547	7,747
Na	(µg/g)	4	A39	PD02	DB08	81,42	77,12	86,76	75,21	80,13	5,128	6,400
Na	(µg/g)	4	A90	PD01	DB10	81,1	77,8	83,5	80	80,60	2,371	2,941
Na	(µg/g)	4	A79	PD03	DB10	83,27	82,28	79,97	79,35	81,22	1,861	2,291
Na	(µg/g)	4	F12x	PC01	DB08	84,2	83,2	80,4	80,1	81,98	2,037	2,485
Na	(µg/g)	4	F15x	PC01	DB08	84	79	85	87	83,75	3,403	4,064
Na	(µg/g)	4	F14x	PC01	DB08	88,24	84,38	86,95	91,14	87,68	2,811	3,206
Na	(µg/g)	4	A57	PZ02	DD02	260	280	280	280	275,00	10,000	3,636
Na	(µg/g)	4	A53	PZ02	DD02	293	308	300	293	298,50	7,141	2,392
Na	(µg/g)	4	A49	PC03	DB08	482	493	491	503	492,25	8,617	1,751
Nb	(ng/g)	1	A90	PD01	DB10	13,1	13,2	13,7	13,8	13,45	0,351	2,611
Nb	(ng/g)	1	A80	PD03	DB10	8,76	7,8	10,6	78,8	26,49	34,893	131,720
Nb	(ng/g)	2	A80	PD03	DB10	16,5	12,4	15,5	13,9	14,58	1,803	12,367
Nb	(ng/g)	2	A90	PD01	DB10	19,1	16,7	13,8	15,9	16,38	2,190	13,374

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Nb	(ng/g)	3	A80	PD03	DB10	8,13	9,4	7,65	9,5	8,67	0,923	10,642
Nb	(ng/g)	3	A90	PD01	DB10	12,2	10,2	15,1	11,3	12,20	2,099	17,207
Nb	(ng/g)	4	A90	PD01	DB10	85,2	45,5	81,9	47,1	64,93	21,558	33,205
Nb	(ng/g)	4	A80	PD03	DB10	167	186	172	184	177,25	9,215	5,199
Pr	(ng/g)	1	A90	PD01	DB10	20,8	17,6	19,6	17,6	18,90	1,579	8,355
Pr	(ng/g)	2	A90	PD01	DB10	5,5	5,9	6	7,1	6,13	0,685	11,183
Pr	(ng/g)	3	A90	PD01	DB10	9,7	7,7	9,3	8,2	8,73	0,932	10,685
Pr	(ng/g)	4	A90	PD01	DB10	385	353	395	381	378,50	17,991	4,753
Rb	(µg/g)	1	A90	PD01	DB10	16,6	16,8	16,6	16,3	16,58	0,206	1,244
Rb	(µg/g)	1	A80	PD03	DB10	16,5	16,8	16,5	17	16,70	0,245	1,467
Rb	(µg/g)	1	F16x	PC01	DB10	19,11	22,2	19,66	22,1	20,77	1,613	7,765
Rb	(µg/g)	2	A80	PD03	DB10	11,6	11,8	11,7	12,7	11,95	0,507	4,240
Rb	(µg/g)	2	F16x	PC01	DB10	12,88	14,92	15,21	12,7	13,93	1,321	9,484
Rb	(µg/g)	2	A90	PD01	DB10	11,5	11,7	118	11,9	38,28	53,150	138,864
Rb	(µg/g)	3	A80	PD03	DB10	6,31	6,49	6,37	6,36	6,38	0,076	1,196
Rb	(µg/g)	3	A90	PD01	DB10	6,99	6,47	6,68	6,43	6,64	0,256	3,859
Rb	(µg/g)	3	F16x	PC01	DB10	7,432	9,452	7,568	8,767	8,30	0,972	11,704
Rb	(µg/g)	4	A80	PD03	DB10	7,2	7,54	7,13	7,67	7,39	0,261	3,535
Rb	(µg/g)	4	A90	PD01	DB10	8,57	8,4	8,5	8,45	8,48	0,073	0,856
Rb	(µg/g)	4	F16x	PC01	DB10	10,17	12,25	10,01	12,06	11,12	1,197	10,758
Sb	(ng/g)	1	A80	PD03	DB10	<100	<100	<100	<100			
Sb	(ng/g)	1	F16x	PC01	DB10	60,8	56,19	52,21	51,71	55,23	4,221	7,643
Sb	(ng/g)	1	F08x	PC01	DB10	63,64	57,49	66,95	52,15	60,06	6,569	10,938
Sb	(ng/g)	1	A82	PC01	DB10	61	66	59	64	62,50	3,109	4,975
Sb	(ng/g)	1	F32	PD02	DB10	65,2	64,2	64,7	62,7	64,20	1,080	1,682
Sb	(ng/g)	1	A79	PD03	DB10	65	65,2	64,1	69	65,83	2,170	3,297
Sb	(ng/g)	1	A90	PD01	DB10	61	65	83	69	69,50	9,574	13,776

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Sb	(ng/g)	2	F08x	PC01	DB10	370	318	330	370	347,00	27,006	7,783
Sb	(ng/g)	2	A82	PC01	DB10	413	359	375	376	380,75	22,867	6,006
Sb	(ng/g)	2	F16x	PC01	DB10	384,7	408,8	397,6	414,2	401,33	13,063	3,255
Sb	(ng/g)	2	F32	PD02	DB10	493	493	468	493	486,75	12,500	2,568
Sb	(ng/g)	2	A79	PD03	DB10	518	511,9	524,9	539,6	523,60	11,916	2,276
Sb	(ng/g)	2	A80	PD03	DB10	517	524	522	558	530,25	18,733	3,533
Sb	(ng/g)	2	A90	PD01	DB10	551	619	587	566	580,75	29,466	5,074
Sb	(ng/g)	3	A80	PD03	DB10	<100	<100	<100	<100			
Sb	(ng/g)	3	F08x	PC01	DB10	<,0365	<,0365	<,0365	<,0365			
Sb	(ng/g)	3	F16x	PC01	DB10	18,1	17,94	16,21	16,9	17,29	0,894	5,171
Sb	(ng/g)	3	A82	PC01	DB10	22	22	18	16	19,50	3,000	15,385
Sb	(ng/g)	3	A79	PD03	DB10	18,4	20,5	20,5	19,2	19,65	1,034	5,264
Sb	(ng/g)	3	F32	PD02	DB10	21,2	21,5	21,5	20,5	21,18	0,472	2,228
Sb	(ng/g)	3	A90	PD01	DB10	24	24	21	22	22,75	1,500	6,593
Sb	(ng/g)	4	A80	PD03	DB10	<100	<100	<100	<100			
Sb	(ng/g)	4	F08x	PC01	DB10	<,0365	<,0365	<,0365	<,0365			
Sb	(ng/g)	4	F16x	PC01	DB10	37,09	37,62	36,02	37,41	37,04	0,711	1,920
Sb	(ng/g)	4	A82	PC01	DB10	39	40	38	39	39,00	0,816	2,094
Sb	(ng/g)	4	F32	PD02	DB10	43,1	43,6	42,1	42,4	42,80	0,678	1,585
Sb	(ng/g)	4	A79	PD03	DB10	56,4	61,9	55,3	56,5	57,53	2,967	5,158
Sb	(ng/g)	4	A90	PD01	DB10	64	58	62	50	58,50	6,191	10,584
Sc	(ng/g)	1	A90	PD01	DB10	7,9	7,3	7,8	7,5	7,63	0,275	3,612
Sc	(ng/g)	2	A90	PD01	DB10	5,1	4,3	3,7	3,9	4,25	0,619	14,568
Sc	(ng/g)	3	A90	PD01	DB10	4,5	4,2	5,9	4	4,65	0,858	18,458
Sc	(ng/g)	4	A90	PD01	DB10	220	220	236	234	227,50	8,699	3,824
Se	(ng/g)	1	A80	PD03	DB10	<200	<200	<200	<200			
Se	(ng/g)	1	A39	PD02	DB08	<100	<100	<100	<100			
Se	(ng/g)	1	A82	PC01	DB99	18	18	21	23	20,00	2,449	12,247

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Se	(ng/g)	1	F08x	PC01	DB10	23,6	25,1	24	26,7	24,85	1,387	5,581
Se	(ng/g)	1	F32	PD02	DB10	27	26	26	23	25,50	1,732	6,792
Se	(ng/g)	1	A36	PD02	DB10	32,77	32,33	32,44	32,11	32,41	0,275	0,848
Se	(ng/g)	1	F14x	PC01	DB10	27	35	31	44	34,25	7,274	21,239
Se	(ng/g)	1	F16x	PC01	DB10	62,83	67,63	52,3	53,87	59,16	7,309	12,355
Se	(ng/g)	2	A80	PD03	DB10	<200	<200	<200	<200			
Se	(ng/g)	2	A39	PD02	DB08	<100	<100	<100	<100			
Se	(ng/g)	2	F08x	PC01	DB10	15,03	16,27	15,59	15,81	15,68	0,515	3,285
Se	(ng/g)	2	A82	PC01	DB99	19	18	21	19	19,25	1,258	6,537
Se	(ng/g)	2	F14x	PC01	DB10	23	26	24	22	23,75	1,708	7,191
Se	(ng/g)	2	A36	PD02	DB10	22,9	24,5	25,04	23,65	24,02	0,942	3,921
Se	(ng/g)	2	F32	PD02	DB10	27	25	28	28	27,00	1,414	5,238
Se	(ng/g)	2	F16x	PC01	DB10	62,82	63,62	64,62	63,82	63,72	0,739	1,160
Se	(ng/g)	3	A80	PD03	DB10	<200	<200	<200	<200			
Se	(ng/g)	3	A39	PD02	DB08	<100	<100	<100	<100			
Se	(ng/g)	3	F08x	PC01	DB10	<,0087	<,0087	<,0087	<,0087			
Se	(ng/g)	3	A82	PC01	DB99	13	16	10	15	13,50	2,646	19,598
Se	(ng/g)	3	A36	PD02	DB10	14,14	14,98	13,72	12,98	13,96	0,835	5,982
Se	(ng/g)	3	F14x	PC01	DB10	11	18	13	14	14,00	2,944	21,028
Se	(ng/g)	3	F32	PD02	DB10	18	17	16	16	16,75	0,957	5,716
Se	(ng/g)	3	F16x	PC01	DB10	25,2	33,06	35,82	38,15	33,06	5,636	17,050
Se	(ng/g)	4	A80	PD03	DB10	<200	<200	<200	<200			
Se	(ng/g)	4	A39	PD02	DB08	<100	<100	<100	<100			
Se	(ng/g)	4	F08x	PC01	DB10	31,74	30,89	31,13	31,03	31,20	0,375	1,201
Se	(ng/g)	4	A82	PC01	DB99	36	32	35	34	34,25	1,708	4,986
Se	(ng/g)	4	F32	PD02	DB10	36	40	37	41	38,50	2,380	6,183
Se	(ng/g)	4	A36	PD02	DB10	40,58	41,4	41,81	41,5	41,32	0,525	1,270
Se	(ng/g)	4	F16x	PC01	DB10	84,95	78,7	63,34	87,82	78,70	10,927	13,883
Se	(ng/g)	4	F14x	PC01	DB10	168	137	157	154	154,00	12,832	8,333

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Si	(µg/g)	1	A53	PD05	DD02	330	320	320	320	322,50	5,000	1,550
Si	(µg/g)	2	A53	PD05	DD02	2470	2450	2400	2430	2437,50	29,861	1,225
Si	(µg/g)	3	A53	PD05	DD02	250	270	260	250	257,50	9,574	3,718
Si	(µg/g)	4	A53	PD05	DD02	16100	16100	16300	16000	16125,00	125,831	0,780
Sn	(ng/g)	1	F16x	PC01	DB10	96,67	89,24	76,82	83,25	86,50	8,470	9,792
Sn	(ng/g)	1	A90	PD01	DB10	99	99	108	99	101,25	4,500	4,444
Sn	(ng/g)	1	A80	PD03	DB10	104	103	114	136	114,25	15,327	13,415
Sn	(ng/g)	2	F16x	PC01	DB10	676	742,8	681,4	681,6	695,45	31,673	4,554
Sn	(ng/g)	2	A90	PD01	DB10	845	858	815	842	840,00	18,055	2,149
Sn	(ng/g)	2	A80	PD03	DB10	919	968	987	1020	973,50	42,210	4,336
Sn	(ng/g)	3	A80	PD03	DB10	<50	<50	<50	<50			
Sn	(ng/g)	3	F16x	PC01	DB10	40,12	34,25	48,13	38	40,13	5,863	14,611
Sn	(ng/g)	3	A90	PD01	DB10	30	32	77	33	43,00	22,701	52,793
Sn	(ng/g)	4	F16x	PC01	DB10	125,4	156,2	129,8	154,6	141,50	16,164	11,423
Sn	(ng/g)	4	A90	PD01	DB10	176	159	187	165	171,75	12,366	7,200
Sn	(ng/g)	4	A80	PD03	DB10	180	193	169	189	182,75	10,658	5,832
Sr	(µg/g)	1	F08x	PC01	DB10	5,587	5,402	4,992	5,01	5,25	0,295	5,619
Sr	(µg/g)	1	A65	PD01	DB08	5,4	5,3	5,3	5,3	5,33	0,050	0,939
Sr	(µg/g)	1	A80	PD03	DB10	5,41	5,5	5,43	5,55	5,47	0,064	1,178
Sr	(µg/g)	1	A53	PZ02	DD02	5,62	5,56	5,48	5,41	5,52	0,092	1,664
Sr	(µg/g)	1	A90	PD01	DB10	5,76	5,72	5,6	5,66	5,69	0,070	1,231
Sr	(µg/g)	1	A39	PD02	DB08	5,78	6,015	5,734	5,864	5,85	0,124	2,112
Sr	(µg/g)	1	F16x	PC01	DB10	7,692	6,415	7,438	6,496	7,01	0,650	9,269
Sr	(µg/g)	2	F08x	PC01	DB10	6,078	6,278	6,136	5,824	6,08	0,190	3,119
Sr	(µg/g)	2	A39	PD02	DB08	6,664	6,805	6,343	6,438	6,56	0,210	3,206
Sr	(µg/g)	2	A80	PD03	DB10	6,4	6,46	6,42	6,99	6,57	0,283	4,306
Sr	(µg/g)	2	A65	PD01	DB08	6,5	6,6	6,6	6,7	6,60	0,082	1,237
Sr	(µg/g)	2	A90	PD01	DB10	6,51	6,81	6,53	6,67	6,63	0,140	2,104

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Sr	(µg/g)	2	A53	PZ02	DD02	6,79	6,84	6,77	6,68	6,77	0,067	0,987
Sr	(µg/g)	2	F16x	PC01	DB10	7,172	8,649	7,129	8,358	7,83	0,790	10,098
Sr	(µg/g)	3	F08x	PC01	DB10	15,63	15,72	16,11	16,2	15,92	0,282	1,772
Sr	(µg/g)	3	A53	PZ02	DD02	16,1	15,9	15,9	16,1	16,00	0,115	0,722
Sr	(µg/g)	3	A80	PD03	DB10	15,9	16,7	16,3	16,6	16,38	0,359	2,195
Sr	(µg/g)	3	A90	PD01	DB10	17	17,2	17,8	16,6	17,15	0,500	2,915
Sr	(µg/g)	3	A65	PD01	DB08	17,7	18,3	18,3	18,2	18,13	0,287	1,585
Sr	(µg/g)	3	A39	PD02	DB08	18,97	18,17	18,12	18,71	18,49	0,416	2,247
Sr	(µg/g)	3	F16x	PC01	DB10	19,35	23,81	19,16	23,16	21,37	2,458	11,501
Sr	(µg/g)	4	F08x	PC01	DB10	24,95	25,36	24,89	24,76	24,99	0,259	1,037
Sr	(µg/g)	4	A80	PD03	DB10	25,8	26,7	25,5	26,8	26,20	0,648	2,474
Sr	(µg/g)	4	A39	PD02	DB08	27,5	27,29	27,21	28,13	27,53	0,417	1,513
Sr	(µg/g)	4	A53	PZ02	DD02	28	27,5	27,9	27,6	27,75	0,238	0,858
Sr	(µg/g)	4	A65	PD01	DB08	27,8	27,6	28	28,7	28,03	0,479	1,708
Sr	(µg/g)	4	A90	PD01	DB10	30,7	30,8	29,4	30	30,23	0,655	2,167
Sr	(µg/g)	4	F16x	PC01	DB10	30,7	31,04	37,03	37,97	34,19	3,850	11,261
Th	(ng/g)	1	A80	PD03	DB10	14,1	20,6	13	14,6	15,58	3,416	21,933
Th	(ng/g)	2	A80	PD03	DB10	<5	<5	<5	<5			
Th	(ng/g)	3	A80	PD03	DB10	8	7,92	8,87	8,25	8,26	0,430	5,209
Th	(ng/g)	4	A80	PD03	DB10	336	378	392	363	367,25	23,964	6,525
Ti	(µg/g)	1	A80	PD03	DB10	2,27	1,67	2,26	2,01	2,05	0,282	13,737
Ti	(µg/g)	1	A39	PD02	DB08	4,122	4,58	4,503	4,062	4,32	0,263	6,082
Ti	(µg/g)	1	A90	PD01	DB10	3,61	6,17	6,5	3,32	4,90	1,667	34,014
Ti	(µg/g)	1	A65	PD01	DB08	5,2	4,7	5,5	4,7	5,03	0,395	7,856
Ti	(µg/g)	2	A80	PD03	DB10	3,63	3,23	3,41	3,75	3,51	0,231	6,595
Ti	(µg/g)	2	A90	PD01	DB10	4,25	3,63	3,92	3,78	3,90	0,265	6,794
Ti	(µg/g)	2	A65	PD01	DB08	4,2	3,9	4,1	4,2	4,10	0,141	3,449
Ti	(µg/g)	2	A39	PD02	DB08	4,909	4,539	5,186	5,329	4,99	0,348	6,973

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Ti	(µg/g)	3	A80	PD03	DB10	2,38	2,25	2,21	2,5	2,34	0,132	5,644
Ti	(µg/g)	3	A90	PD01	DB10	3,02	2,82	4,08	2,76	3,17	0,617	19,456
Ti	(µg/g)	3	A39	PD02	DB08	3,278	2,896	3,375	3,25	3,20	0,209	6,546
Ti	(µg/g)	3	A65	PD01	DB08	4,2	5,5	4,9	4,2	4,70	0,627	13,344
Ti	(µg/g)	4	A39	PD02	DB08	71,52	69,18	70,08	72,08	70,72	1,325	1,874
Ti	(µg/g)	4	A80	PD03	DB10	68,8	84,2	70,9	79,2	75,78	7,191	9,490
Ti	(µg/g)	4	A65	PD01	DB08	79	77,1	84,7	77,8	79,65	3,457	4,340
Ti	(µg/g)	4	A90	PD01	DB10	91	66	92,5	74,7	81,05	12,870	15,879
Tl	(ng/g)	1	A80	PD03	DB10	25,7	<20	<20	23,2	24,45	1,768	7,230
Tl	(ng/g)	1	A82	PC01	DB10	19,5	17,8	18,6	18,1	18,50	0,744	4,021
Tl	(ng/g)	1	F14x	PC01	DB10	19,8	17,6	18,7	18,7	18,70	0,898	4,803
Tl	(ng/g)	1	A36	PD02	DB10	20,12	20,01	20,23	20,01	20,09	0,105	0,524
Tl	(ng/g)	1	F08x	PC01	DB10	21,48	20,08	20,62	19,07	20,31	1,009	4,968
Tl	(ng/g)	1	F16x	PC01	DB10	21,11	19,66	22,36	20,14	20,82	1,192	5,727
Tl	(ng/g)	1	A79	PD03	DB10	21,2	20,5	21,6	21,2	21,13	0,457	2,165
Tl	(ng/g)	1	F32	PD02	DB10	21,4	22,1	21,1	21,5	21,53	0,419	1,948
Tl	(ng/g)	1	A90	PD01	DB10	24,1	22	21,5	21,5	22,28	1,239	5,564
Tl	(ng/g)	2	A82	PC01	DB10	1043	1039	1037	1040	1039,75	2,500	0,240
Tl	(ng/g)	2	F14x	PC01	DB10	1046,9	1041,6	1042,7	1031	1040,55	6,764	0,650
Tl	(ng/g)	2	F08x	PC01	DB10	1064	1078	1004	1040	1046,50	32,388	3,095
Tl	(ng/g)	2	A36	PD02	DB10	1125,7	1102,4	1094,3	1107	1107,35	13,312	1,202
Tl	(ng/g)	2	A80	PD03	DB10	1050	1120	1100	1230	1125,00	75,939	6,750
Tl	(ng/g)	2	A79	PD03	DB10	1120	1107	1138	1146	1127,75	17,595	1,560
Tl	(ng/g)	2	F16x	PC01	DB10	1194	1185	1057	1078	1128,50	71,052	6,296
Tl	(ng/g)	2	F32	PD02	DB10	1142	1145	1134	1149	1142,50	6,351	0,556
Tl	(ng/g)	2	A90	PD01	DB10	1620	1201	1183	1273	1319,25	204,236	15,481
Tl	(ng/g)	3	A79	PD03	DB10	<20	<20	<20	<20			
Tl	(ng/g)	3	A80	PD03	DB10	<20	28,5	<20	<20	28,50		
Tl	(ng/g)	3	A82	PC01	DB10	3,96	3,5	3,94	3,16	3,64	0,384	10,550

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Tl	(ng/g)	3	F08x	PC01	DB10	5,82	4,4	5,94	5,47	5,41	0,701	12,957
Tl	(ng/g)	3	F14x	PC01	DB10	6,4	5,3	5,3	5,3	5,58	0,550	9,865
Tl	(ng/g)	3	A36	PD02	DB10	6,33	5,8	5,91	6,12	6,04	0,235	3,883
Tl	(ng/g)	3	A90	PD01	DB10	6,3	6,3	6,4	6,2	6,30	0,082	1,296
Tl	(ng/g)	3	F16x	PC01	DB10	6,028	6,806	5,956	6,63	6,36	0,426	6,708
Tl	(ng/g)	3	F32	PD02	DB10	6,94	6,83	6,83	6,72	6,83	0,090	1,315
Tl	(ng/g)	4	F08x	PC01	DB10	19,81	18,95	17,68	20,1	19,14	1,086	5,675
Tl	(ng/g)	4	A36	PD02	DB10	22,03	22,65	21,32	21,93	21,98	0,545	2,477
Tl	(ng/g)	4	A82	PC01	DB10	24,3	24,1	23	24,1	23,88	0,591	2,475
Tl	(ng/g)	4	F14x	PC01	DB10	25,73	24,66	23,59	23,59	24,39	1,024	4,200
Tl	(ng/g)	4	A80	PD03	DB10	26,6	27,1	24,9	26,3	26,23	0,943	3,596
Tl	(ng/g)	4	F16x	PC01	DB10	26,75	30,78	27,48	29,07	28,52	1,791	6,280
Tl	(ng/g)	4	A90	PD01	DB10	31,2	26,8	29,9	28,1	29,00	1,941	6,692
Tl	(ng/g)	4	F32	PD02	DB10	32,6	32,3	32,2	32	32,28	0,250	0,775
Tl	(ng/g)	4	A79	PD03	DB10	32,8	34,6	31,5	31,8	32,68	1,399	4,280
U	(ng/g)	1	A80	PD03	DB10	2,96	2,84	2,88	2,89	2,89	0,050	1,726
U	(ng/g)	1	F14x	PC01	DB10	4	3	3	3	3,25	0,500	15,385
U	(ng/g)	1	F16x	PC01	DB10	3,538	3,599	3,944	3,874	3,74	0,200	5,355
U	(ng/g)	1	A90	PD01	DB10	4,1	3,5	5,1	3,8	4,13	0,695	16,839
U	(ng/g)	2	A80	PD03	DB10	<2	<2	<2	<2			
U	(ng/g)	2	A90	PD01	DB10	2	1,8	1,7	1,9	1,85	0,129	6,978
U	(ng/g)	2	F14x	PC01	DB10	2	2	2	2	2,00	0,000	0,000
U	(ng/g)	2	F16x	PC01	DB10	2,039	1,962	1,968	2,206	2,04	0,114	5,562
U	(ng/g)	3	A80	PD03	DB10	<2	<2	<2	<2			
U	(ng/g)	3	A90	PD01	DB10	1,8	1,7	2,3	1,7	1,88	0,287	15,319
U	(ng/g)	3	F14x	PC01	DB10	2	2	2	2	2,00	0,000	0,000
U	(ng/g)	3	F16x	PC01	DB10	2,216	3,126	2,38	2,908	2,66	0,430	16,173

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
U	(ng/g)	4	A80	PD03	DB10	58	63,2	65,8	63,7	62,68	3,314	5,288
U	(ng/g)	4	F14x	PC01	DB10	71	70	74	66	70,25	3,304	4,703
U	(ng/g)	4	F16x	PC01	DB10	69,58	87,29	72,47	76,2	76,39	7,759	10,157
U	(ng/g)	4	A90	PD01	DB10	76,8	71,8	79,9	79,5	77,00	3,730	4,844
V	(µg/g)	1	F08x	PC01	DB10	0,1597	0,1159	0,1236	0,1113	0,13	0,022	17,220
V	(µg/g)	1	A79	PD03	DB10	0,1541	0,1345	0,125	0,1272	0,14	0,013	9,791
V	(µg/g)	1	A90	PD01	DB10	0,144	0,137	0,143	0,138	0,14	0,004	2,500
V	(µg/g)	1	F16x	PC01	DB10	0,1479	0,1549	0,1468	0,1484	0,15	0,004	2,449
V	(µg/g)	1	A80	PD03	DB10	0,159	0,138	0,155	0,15	0,15	0,009	6,053
V	(µg/g)	1	F14x	PC01	DB10	0,183	0,181	0,18	0,176	0,18	0,003	1,636
V	(µg/g)	1	A39	PD02	DB08	0,2592	0,255	0,255	0,2619	0,26	0,003	1,315
V	(µg/g)	2	A79	PD03	DB10	0,1338	0,1241	0,1323	0,1363	0,13	0,005	4,012
V	(µg/g)	2	F08x	PC01	DB10	0,1335	0,1467	0,1392	0,1475	0,14	0,007	4,683
V	(µg/g)	2	A90	PD01	DB10	0,148	0,157	0,1059	0,156	0,14	0,024	17,090
V	(µg/g)	2	F16x	PC01	DB10	0,1524	0,1843	0,1541	0,1618	0,16	0,015	8,999
V	(µg/g)	2	A80	PD03	DB10	0,159	0,165	0,161	0,168	0,16	0,004	2,469
V	(µg/g)	2	F14x	PC01	DB10	0,174	0,173	0,175	0,173	0,17	0,001	0,551
V	(µg/g)	2	A39	PD02	DB08	0,1623	0,1811	0,1638	0,1977	0,18	0,017	9,457
V	(µg/g)	3	F08x	PC01	DB10	0,1013	0,1044	0,0951	0,096	0,10	0,004	4,451
V	(µg/g)	3	A79	PD03	DB10	0,1054	0,1065	0,1068	0,1166	0,11	0,005	4,795
V	(µg/g)	3	A80	PD03	DB10	0,112	0,109	0,103	0,121	0,11	0,008	6,742
V	(µg/g)	3	A90	PD01	DB10	0,108	0,103	0,138	0,098	0,11	0,018	16,080
V	(µg/g)	3	F16x	PC01	DB10	0,1369	0,1413	0,1502	0,1469	0,14	0,006	4,102
V	(µg/g)	3	F14x	PC01	DB10	0,179	0,152	0,144	0,171	0,16	0,016	10,067
V	(µg/g)	3	A39	PD02	DB08	0,1968	0,2085	0,2018	0,2068	0,20	0,005	2,595

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
V	(µg/g)	4	F08x	PC01	DB10	2,22	2,1943	2,3558	2,1553	2,23	0,087	3,905
V	(µg/g)	4	A80	PD03	DB10	2,71	3,07	2,67	3,02	2,87	0,207	7,206
V	(µg/g)	4	F16x	PC01	DB10	3,744	3,968	3,725	3,942	3,84	0,128	3,329
V	(µg/g)	4	A39	PD02	DB08	4,095	4,09	4,105	4,107	4,10	0,008	0,198
V	(µg/g)	4	F14x	PC01	DB10	4,214	4,139	4,171	4,096	4,16	0,050	1,201
V	(µg/g)	4	A90	PD01	DB10	4,37	4,17	4,41	4,46	4,35	0,127	2,921
V	(µg/g)	4	A79	PD03	DB10	4,507	4,447	4,158	4,392	4,38	0,153	3,490
W	(ng/g)	1	A90	PD01	DB10	34,1	42,5	59	81,1	54,18	20,717	38,240
W	(ng/g)	2	A90	PD01	DB10	69,7	79,5	82,9	87,3	79,85	7,482	9,370
W	(ng/g)	3	A90	PD01	DB10	9,2	19,2	12,5	8,6	12,38	4,862	39,292
W	(ng/g)	4	A90	PD01	DB10	65,9	56,8	70,4	60,3	63,35	6,011	9,489
Y	(ng/g)	1	A90	PC01	DB10	71	67	75	69	70,50	3,416	4,845
Y	(ng/g)	2	A90	PC01	DB10	26	25	21	26	24,50	2,380	9,716
Y	(ng/g)	3	A90	PC01	DB10	20	18	24	18	20,00	2,828	14,142
Y	(ng/g)	4	A90	PC01	DB10	1207	1018	1171	1181	1144,25	85,523	7,474
Zr	(µg/g)	1	A90	PD01	DB10	0,026	0,019	0,019	0,018	0,02	0,004	18,033
Zr	(µg/g)	2	A90	PD01	DB10	0,04	0,04	0,045	0,046	0,04	0,003	7,489
Zr	(µg/g)	3	A90	PD01	DB10	0,01	0,011	0,015	0,01	0,01	0,002	20,700
Zr	(µg/g)	4	A90	PD01	DB10	0,114	0,086	0,105	0,098	0,10	0,012	11,727