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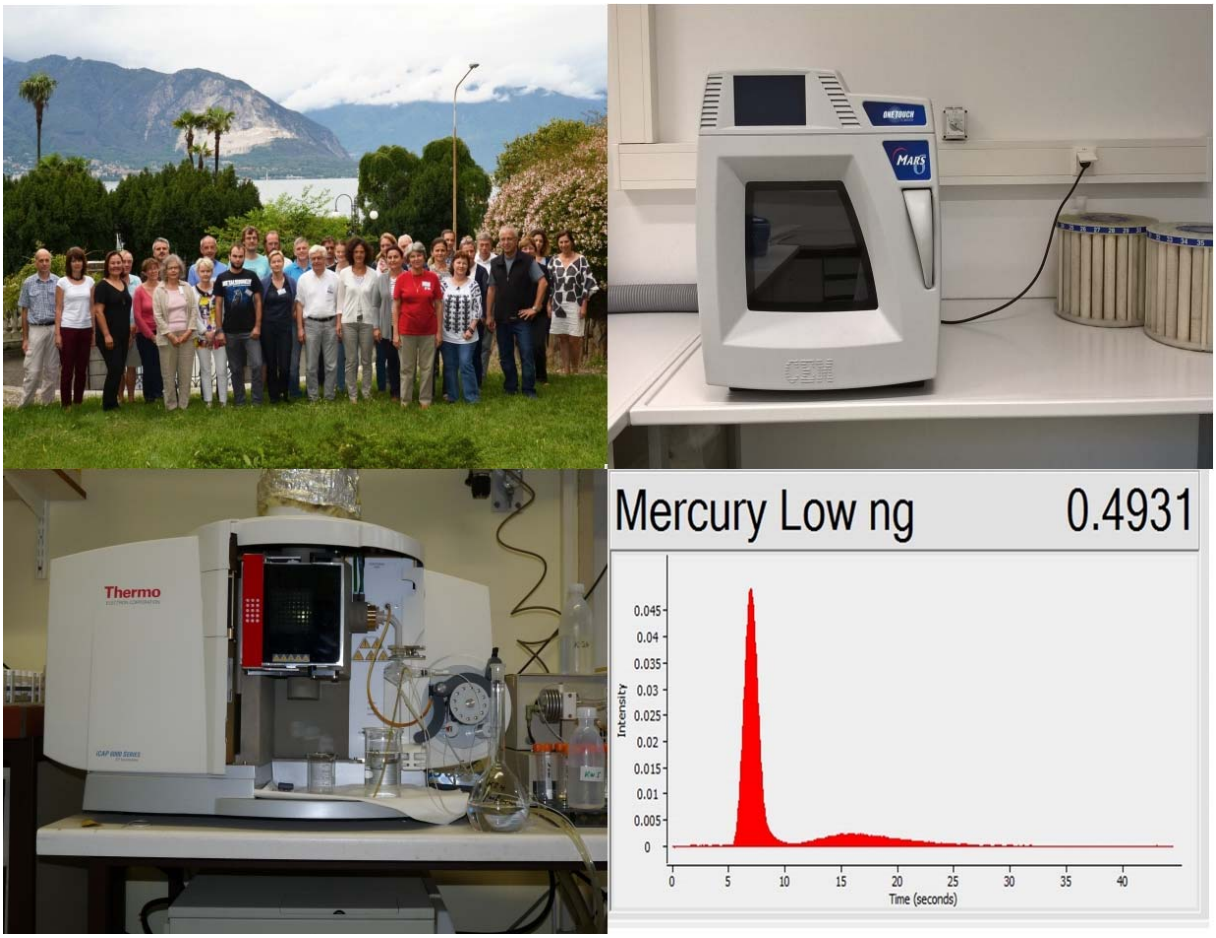
ICP Forests

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

Technical Report QA-RFoliar18

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

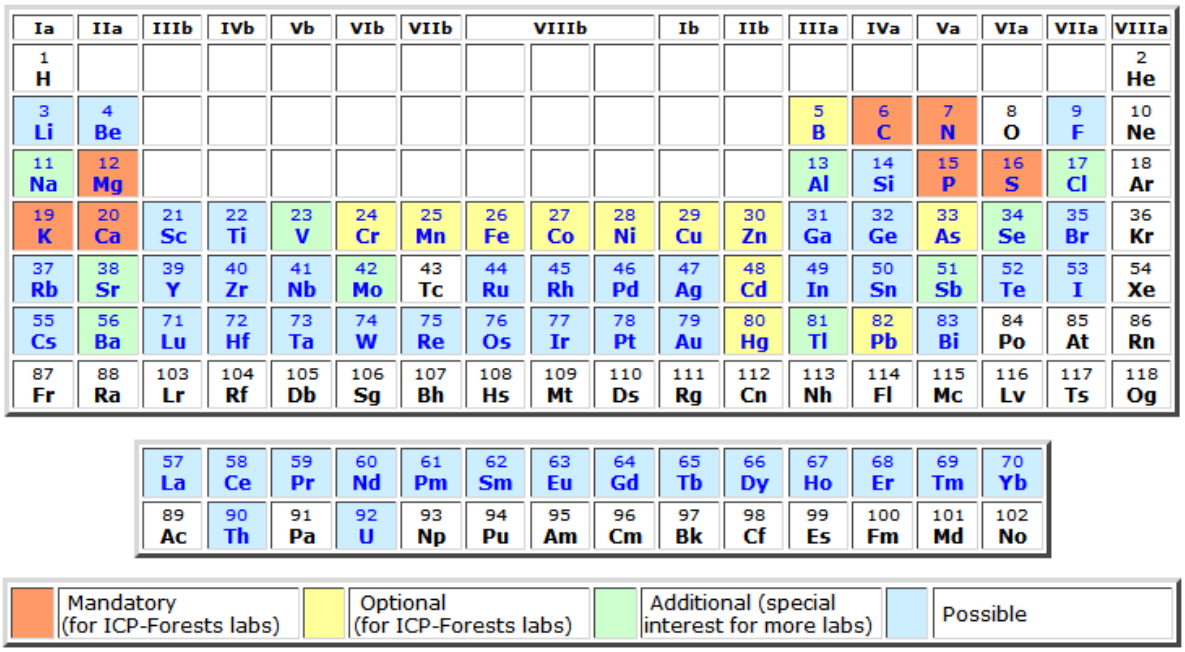
The Forest Foliar Co-ordinating Centre established the following timetable:

- Informing the participating labs (March 2017)
- Registration of the participants via internet (10th July 2017)
- Submission of the ring test samples (July 2017)
- Submission of the results from the labs (October-December 2017)
- Deadline of data input (1st January 2018)
- Evaluation according to DIN 38402/42 (January 2018)
- Submission of the final report and the online qualification reports (February 2018)
- Re-qualification process finished (1st September 2018)

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. The parameter list was enlarged with As, Cr, Co, Hg and Ni in 2017 based on the good results of the last two ringtests.

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 2017.

2.2 Material

In July 2017 the Austrian Federal Research Centre for Forests, Natural Hazards and Landscape (BFW) sent out four dried and powdered plant samples to 48 laboratories in 23 countries.

The samples consisted of:

1. Birch leaves (Austria)
2. Spruce needles (Germany)
3. Spruce needles (Austria) - same sample like in the 19th Test (Sample 2)
4. Pine cones (Austria)

Sample 1 and **Sample 4** were collected in the park area of Schönbrunn/Vienna. **Sample 2** was collected and prepared from Mrs. Gabriele Trefz-Malcher (FVA-Baden-Württemberg).
Sample 3 was collected from Mr. Walter Wuggenig and his employees in Austria/Carinthia.

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

One of the participating laboratories doesn't send any results till end of the deadline (A86). With a few exceptions, all other laboratories analysed in the 20th 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 2017 and these results will be sent to PCC in 2018 ("*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	x			x	x	x	x												
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																			
A53																			
A56																			
A57																			
A58	x	x	x	x	x	x	x	x	x	x	x		x						
A59																			
A60	x	x	x	x	x	x	x	x	x										
A61	x		x	x	x	x	x	x	x	x	x			x					
A62	x	x	x	x	x	x	x												
A65																			
A79																			
A80																			
A81																			
A82																			
A83																			
A85	x	x	x	x	x	x	x												
A88																			
A91																			
F01	x		x	x	x	x													
F02	x	x	x	x	x	x	x	x	x	x	x			x		x			x
F03																			
F04																			
F05	x	x	x	x	x	x	x	x	x	x	x	x	x						x
F06		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					
F08	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x
F09	x	x	x	x	x	x	x	x	x	x	x			x					
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											
F21	x		x	x	x	x	x												
F24	x	x	x	x	x	x	x												
F26																			
F27	x		x	x	x	x	x												
F28	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			x
F33	x	x	x	x	x	x	x	x	x	x	x	x	x						

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. 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). Finally, the recalculated standard deviation from the laboratories must be compared with the total standard deviation (F-test) to eliminate laboratories with an excessive standard deviation (outlier type 3). 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. 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	-

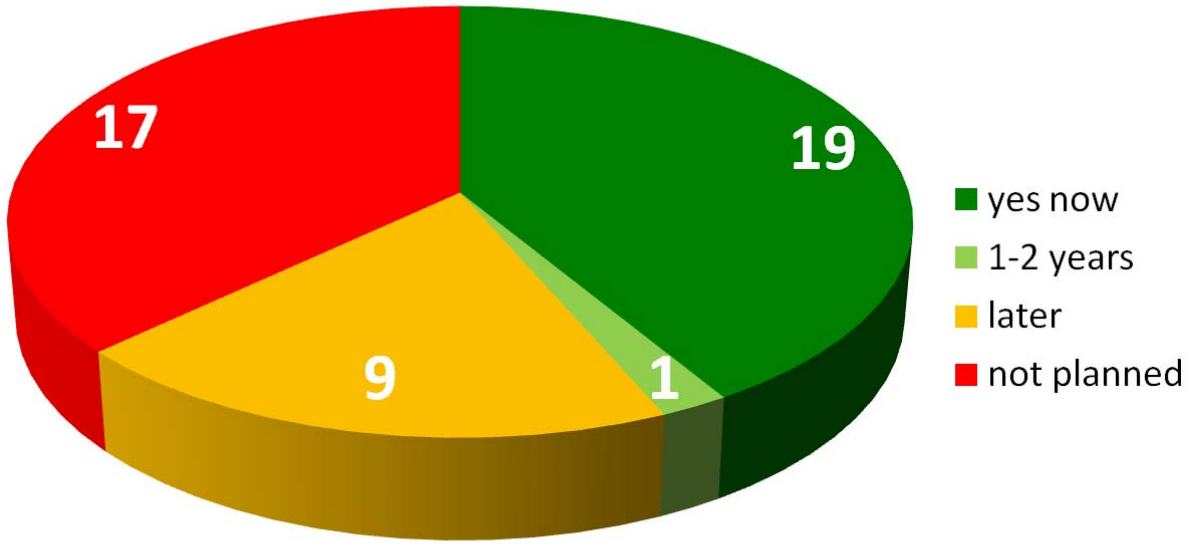
3 RESULTS

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. 46 of the 48 laboratories submit this questionnaire.

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

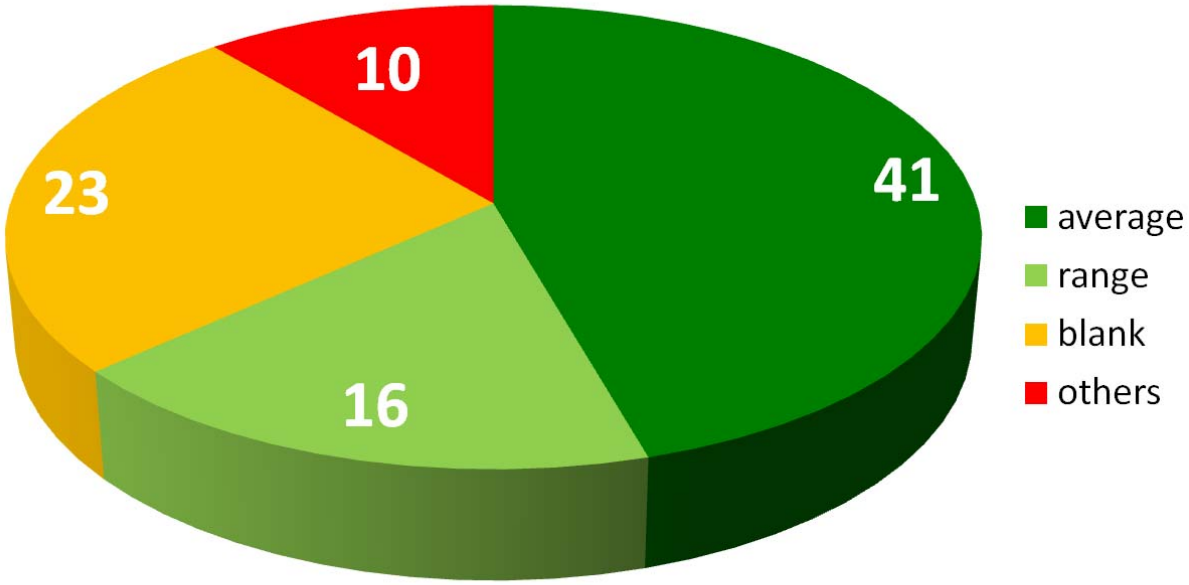
Figure 2: Accreditation status according EN 17025 (n=46)



43.5% of the laboratories are accredited now (19 labs) or plan an accreditation within 1-2 years (1 lab) - 17 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). 95.7% of these 46 laboratories (say that they) are using control charts, and most of them are using average control chart – 2 of this 46 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 19th 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 2018. 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:

F21 (79.2%), **A45** (78.5%), **A43** (75.0%), **A56** (75.0%), **F09** (75.0%), **A88** (71.0%), **F24** (64.3%), **A83** (63.9%) and **A62** (53.6%)

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 **mandatory parameters** – 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
A36							
A39					>	>	
A42							
A43			<>	>		<<	
A45		<<<<			>>		
A47						>>>	
A49			<<				<<<
A53			>	>>	>		
A56	>>	<					>>>>
A57			>		>		
A58			>				
A59		>	>>			<<<	
A60		>>>	>>			>>>>	
A61							
A62	<		<>	<<<<	<<<	<<<	
A65							
A79							
A80							
A81		<<<					>>>>
A82	<					<<<<	
A83			<<<<	<	<<	<<<	
A85		<<	<>		<		
A88		<<<<			>	<	
A91	<						
F01							
F02							
F03							
F04		>	>>>				>
F05		>					
F06							
F07							
F08						>	
F09		>>	>>>	>>	>		
F12							
F13	<			>		>	
F14							
F15			>>				
F16							
F18							
F19							
F21				<<<>	>		
F24		<<	<<	>>>>	>>		
F26			>>				
F27			<	<<	<<<		
F28		>	>	<	<		
F32						>	
F33		>					

Table 6b: Results of the **optional parameters** – 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	Zn	Mn	Fe	Cu	Pb	Cd	B	As	Cr	Co	Hg	Ni
A36												
A39		>>				L		LLL	<			
A42												
A43		>										
A45		<<<						<<<	<			<
A47		<		<								
A49				<								>
A53		>										
A56												
A57			>									
A58	<	<										
A59												
A60												
A61							>>>					
A62												
A65					>				>>	LL		L
A79												
A80								>>>				
A81												<
A82								>>>				
A83		<<<										
A85												
A88	<<		>	>>>			<		>>>	>		>
A91												
F01												
F02									>>			
F03												
F04												
F05				>			<	LLL				<
F06										LL		
F07		L						LLL	<<<<			<<<<
F08			>	>>>				<				>
F09	>			<<<								
F12			>		>				>	L		>
F13												
F14												<
F15		<	<			L	<					
F16												
F18												
F19												
F21												
F24												
F26	<>											
F27	<<											<<
F28	<	<	<									
F32		>										
F33												

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 *Birch leaves*	Sample 2 *Spruce needles*	Sample 3 *Spruce needles*	Sample 4 *Pine cones*
N	mg/g	25.61	15.58	14.31	3.23
	%	2.44	0.00	2.44	9.76
S	mg/g	1.78	1.21	0.94	0.32
	%	20.51	15.38	12.82	17.95
P	mg/g	1.46	1.43	1.99	0.22
	%	13.33	20.00	15.55	24.44
Ca	mg/g	7.58	7.56	5.92	0.80
	%	6.52	13.04	15.22	13.04
Mg	mg/g	2.59	1.59	1.06	0.62
	%	10.87	4.35	8.70	19.57
K	mg/g	6.43	5.13	7.33	2.16
	%	8.70	10.87	13.04	26.09
C	g/100g	53.28	52.90	52.12	52.48
	%	10.53	7.89	5.26	7.90
Zn	µg/g	84.10	44.42	32.24	12.25
	%	2.78	2.78	5.56	13.89
Mn	µg/g	2468.7	1054.4	376.5	9.15
	%	10.53	10.53	2.63	18.42
Fe	µg/g	150.70	69.71	71.78	39.40
	%	2.78	0.00	0.00	18.89
Cu	µg/g	5.80	4.24	3.06	2.06
	%	2.94	5.88	8.82	17.65
Pb	µg/g	0.91	*0.17*	*0.07*	*0.17*
	%	8.33	-	-	-
Cd	ng/g	331.48	244.36	29.20	*13.83*
	%	0.00	0.00	8.00	-
B	µg/g	17.88	20.84	11.55	6.24
	%	4.55	4.55	4.55	13.64
As	ng/g	49.20	*18.32*	29.87	30.98
	%	46.15	-	53.85	46.15
Co	µg/g	1.82	0.13	0.28	*0.04*
	%	0.00	23.53	11.76	-
Cr	µg/g	2.08	1.35	4.12	1.24
	%	17.39	17.39	4.35	21.74
Hg	ng/g	22.30	19.80	27.77	*5.60*
	%	0.00	0.00	0.00	-
Ni	µg/g	5.53	12.86	2.29	0.76
	%	4.35	13.04	13.04	34.78

The arsenic concentration of sample 2, the cadmium concentration of sample 4, the cobalt concentration of sample 4, the lead concentrations of samples 2, 3 and 4 and the mercury concentration of sample 4 were too low for the evaluation.

3.3 Comparison between the 20th Interlaboratory Comparison Test and former tests

Sample 3 of the 20th and sample 2 of the 19th Interlaboratory Comparison Tests are identical (*Spruce needles* - Austria). For most of the elements the mean values are identical (see Table 8). The results are good comparable and the sample is stable. Only the result for As is approximate 30% higher than in the 19th test. The measured concentration is quite low near to the lowest evaluated result (20 ng/g), this explains the higher differences.

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 in Pallanza 2017 (6th Meeting of the Heads of the Laboratories) are used from the 14th to 20th ringtest. The changes of the tolerable results from the 7th to the 20th test are shown in tables 9a and 9b.

Table 8: Comparison between the 19th and 20th Interlaboratory Comparison Test

Element (Unit)	19th Interlaboratory Comparison Test 2016/17 (Sample 2)	20th Interlaboratory Comparison Test 2017/18 (Sample 3)
N mg/g	14.20 *38*	14.31 *41*
S mg/g	0.94 *37*	0.94 *39*
P mg/g	2.01 *41*	1.99 *45*
Ca mg/g	5.83 *42*	5.92 *46*
Mg mg/g	1.07 *42*	1.06 *46*
K mg/g	7.28 *42*	7.33 *46*
C g/100g	51.98 *34*	52.12 38
Zn µg/g	32.70 *33*	32.24 *36*
Mn µg/g	359.3 *34*	376.5 *38*
Fe µg/g	73.73 *32*	71.78 *36*
Cu µg/g	3.16 *33*	3.06 *34*
Pb µg/g	*0.08* *26*	*0.07* *24*
Cd ng/g	28.14 *24*	29.20 *25*
B µg/g	12.06 *18*	11.55 *22*
As ng/g	20.58 *13*	29.87 *13*
Co µg/g	0.29 *17*	0.28 *17*
Cr µg/g	4.24 *23*	4.12 *23*
Hg ng/g	28.27 *14*	27.77 *12*
Ni µg/g	2.26 *23*	2.29 *23*

Table 9a: Percentage of non tolerable results from 7th to 13th test

Element	Tolerable limits [1]	7th Labtest 2004/2005		8th Labtest 2005/2006		9th Labtest 2006/2007		10th Labtest 2007/2008		11th Labtest 2008/2009		12th Labtest 2009/2010		13th Labtest 2010/2011	
	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)	**3,2**	*156*	**7,3**	*192*	**6,1**	*196*	**2,6**	*196*	**10,9**	*192*	**7,6**	*212*	**4,9**	*224*
S	15 (20)	**10,3**	*156*	**10,6**	*188*	**8,3**	*196*	**15,4**	*188*	**14,4**	*188*	**16,5**	*200*	**13,9**	*208*
P	10 (15)	**7,9**	*164*	**9,7**	*196*	**4,3**	*208*	**13,2**	*204*	**14,2**	*204*	**13,7**	*212*	**7,4**	*216*
Ca	10 (15)	**11,0**	*164*	**10,2**	*196*	**4,3**	*208*	**17,2**	*204*	**19,1**	*204*	**9,7**	*216*	**8,0**	*212*
Mg	10 (15)	**10,4**	*164*	**5,9**	*188*	**4,3**	*208*	**10,8**	*204*	**18,6**	*204*	**14,4**	*216*	**5,7**	*212*
K	10 (15)	**4,8**	*168*	**5,6**	*196*	**3,3**	*212*	**16,8**	*208*	**17,5**	*200*	**6,0**	*216*	**8,5**	*212*
C	5	**7,8**	*116*	**4,3**	*140*	**11,1**	*144*	**3,2**	*156*	**16,9**	*148*	**8,5**	*188*	**6,3**	*192*
Zn	15 (20)	**14,0**	*143*	**4,5**	*156*	**8,9**	*168*	**10,2**	*176*	**6,7**	*164*	**6,4**	*172*	**9,7**	*176*
Mn	15 (20)	**8,4**	*143*	**7,0**	*172*	**0,0**	*176*	**2,8**	*180*	**6,5**	*168*	**2,7**	*176*	**4,8**	*188*
Fe	20 (30)	**10,3**	*136*	**7,1**	*168*	**9,9**	*172*	**5,7**	*176*	**13,1**	*160*	**4,8**	*168*	**0,0**	*180*
Cu	20	**14,3**	*126*	**8,9**	*146*	**10,8**	*148*	**4,9**	*164*	**17,1**	*164*	**21,3**	*160*	**9,1**	*176*
Pb	30 (40)	**38,0**	*79*	**34,7**	*72*	**24,0**	*104*	**13,0**	*100*	**9,8**	*92*	**13,3**	*120*	**12,5**	*112*
Cd	30	**11,1**	*81*	**10,3**	*97*	**7,1**	*112*	**17,0**	*100*	**7,7**	*104*	**10,7**	*112*	**9,5**	*116*
B	20 (30)	**21,1**	*90*	**12,8**	*86*	**8,3**	*84*	**13,5**	*96*	**12,5**	*88*	**5,4**	*92*	**3,3**	*92*

[1] special tolerable limits for low concentrations in the 11th, 12th and 13th test

Table 9b: Percentage of non tolerable results from the 14th to the 20th test

Element	Tolerable limits [1] normal (low) (± %)	14th Labtest 2011/2012		15th Labtest 2012/2013		16th Labtest 2013/2014		17th Labtest 2014/2015		18th Labtest 2015/2016		19th Labtest 2016/2017		20th Labtest 2017/2018	
		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)	**8,9**	*224*	**6,0**	*216*	**3,1**	*196*	**2,1**	*192*	**7,9**	*164*	**4,6**	*152*	**3,7**	*164*
S	15 (20)	**12,7**	*220*	**13,9**	*208*	**14,8**	*196*	**9,9**	*192*	**6,4**	*156*	**7,4**	*148*	**16,7**	*156*
P	10 (15)	**15,9**	*220*	**9,4**	*224*	**18,8**	*208*	**14,7**	*204*	**15,5**	*168*	**15,4**	*164*	**18,3**	*180*
Ca	10 (15)	**14,7**	*224*	**12,1**	*224*	**16,3**	*208*	**17,7**	*212*	**9,1**	*176*	**11,3**	*168*	**12,0**	*184*
Mg	10 (15)	**19,3**	*228*	**5,9**	*220*	**8,8**	*204*	**12,3**	*212*	**14,2**	*176*	**13,1**	*168*	**10,9**	*184*
K	10 (15)	**21,0**	*228*	**18,0**	*228*	**9,1**	*208*	**11,5**	*208*	**15,6**	*180*	**16,7**	*168*	**14,7**	*184*
C	5	**15,4**	*208*	**7,7**	*196*	**10,0**	*180*	**7,8**	*180*	**9,5**	*148*	**8,1**	*136*	**7,9**	*152*
Zn	15 (20)	**4,4**	*184*	**5,4**	*184*	**5,6**	*180*	**8,1**	*172*	**13,5**	*148*	**12,1**	*132*	**6,3**	*144*
Mn	15 (20)	**6,8**	*192*	**0,5**	*188*	**8,7**	*184*	**3,9**	*180*	**6,1**	*148*	**8,8**	*136*	**10,5**	*152*
Fe	20 (30)	**14,1**	*184*	**3,7**	*188*	**9,4**	*180*	**6,5**	*168*	**12,2**	*148*	**13,3**	*128*	**4,2**	*144*
Cu	20	**10,3**	*184*	**9,1**	*176*	**14,5**	*172*	**15,7**	*172*	**4,2**	*144*	**15,2**	*132*	**8,8**	*136*
Pb	30 (40)	**15,6**	*128*	**8,6**	*105 [2]*	**10,7**	*56 [2]*	**7,8**	*87 [2]*	**16,0**	*75 [2]*	**7,7**	*24 [2]*	**8,3**	*24 [2]*
Cd	30	**10,0**	*140*	**7,1**	*140*	**4,8**	*62 [2]*	**14,3**	*112*	**8,0**	*112*	**2,1**	*96*	**2,7**	*75 [2]*
B	20 (30)	**12,0**	*100*	**5,0**	*100*	**6,3**	*96*	**5,0**	*100*	**11,9**	*84*	**13,9**	*72*	**6,8**	*88*
As	20 (30)									**19,2**	*52*	**25,6**	*39 [2]*	**48,7**	*39 [2]*
Co	25 (35)									**13,2**	*68*	**4,4**	*68*	**11,8**	*51 [2]*
Cr	25 (35)									**10,9**	*46 [2]*	**16,3**	*92*	**15,2**	*92*
Hg	20 (30)									**4,5**	*44*	**19,6**	*56*	**0,0**	*36 [2]*
Ni	20 (30)									**8,3**	*96*	**7,6**	*92*	**16,3**	*92*

[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

Only 3.7% of non-tolerable results - this is a really good result. No laboratory failed with three or four samples.

3.4.2 Sulphur

The laboratories A45, A60, A81 and A88 failed in analyzing three or four samples. In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results increased (6.4 → 7.4 → 16.7 %). 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. Laboratory A88 submitted the results in wrong units and has a technical problem with the element analyzer too. A requalification is needed from the *ICP-Forests laboratories* A45 and A60.

3.4.3 Phosphorus

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results is still high (15.5 → 15.4 → 18.3%). The laboratories A83, F04 and F09 fail in analyzing three or all four samples. A re-qualification is needed for the *ICP-Forests laboratory* F09.
Laboratory A83 uses a non-recommended open digestion method (HNO3/H2O2) with an ICP-AES determination method. The results are approximately 25-30% too low this could be linked with the lower digestion temperature of the open digestion method.
Laboratory F04 is using a microwave pressured digestion (HNO3/H2O2) and an UV/VIS photometric detection. All results are too high (103-161%).
Laboratory F09 failed in the last test too and uses an X-ray method. The results are too high (108-148%); this could be a calibration problem.

3.4.4 Calcium

In comparison with the last Interlaboratory Comparison Test the percentage of non-tolerable results is similar (9.1 → 11.3 → 12.0%). The laboratories A62, F21 and F24 fail in analyzing all four samples.
All three labs are *ICP-Forests laboratories* and had to re-qualify. All three labs 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. In case of laboratory F21 it seems to be more a calibration problem. The % recovery is connected with the measured concentration in the sample (higher recovery/lower measured concentration).
Laboratory A62 failed in the last tests too – the methodical problem is still not solved!

3.4.5 Magnesium

In comparison with the last tests the percentage of non-tolerable results is slightly decreasing (14.2 → 13.1 → 10.9%). The laboratories A62 and F27 fail with three of the four samples.

Laboratory A62 uses a microwave digestion method and a flame-AAS determination. The % recovery is between 50-100% - it seems to be a methodical problem. This lab failed in the last tests too – the methodical problem is still not solved!
Laboratory F27 uses a microwave digestion method and a flame-AAS determination too. A re-qualification is needed for both *ICP-Forests laboratories.*

3.4.6 Potassium

In comparison with the last tests the percentage of non-tolerable results is still high (15.6 → 16.7 → 14.7%). The laboratories A47, A59, A60, A62, A82 and A83 fail in analyzing three or all four samples.
A re-qualification is needed for the *ICP-Forests laboratories* A47, A60 and A62. The laboratories A59, A62 and A82 failed in the last test for potassium too – their methodical problem is still not solved!

3.4.7 Carbon

The percentage of non tolerable results is similar to the last Interlaboratory Comparison Tests (9.5 → 8.1 →7.9%). The laboratories A49, A56 and A81 fail in analyzing three or four samples. It seems that these laboratories have calibration problems with their element-analyzers.

3.4.8 Zinc

Only 6.3% of non-tolerable results - this is a really good result. No laboratory failed with three or four samples.

3.4.9 Manganese

10.5% of the results are non-tolerable. This is not bad, it has to be taken into account the high concentrations range in the samples (9,2 - 2469 µg Mn/g). The laboratories A45 and A83 failed with three or all four samples. A re-qualification is needed for the *ICP-Forests laboratory* A45.

3.4.10 Iron

Only 4.2% of non-tolerable results - this is a really good result. No laboratory failed with three or four samples.

3.4.11 Copper

8.8% of the results are non-tolerable – this is lower than in the last test. The laboratories A88, F08 and F09 failed with three of the four samples. The result of laboratory F08 has a high variation in the copper content. Contamination effects or a methodical problem could be a reason for this.
A re-qualification is needed for the *ICP-Forests laboratories* F08 and F09.

3.4.12 Lead

For passing this Interlaboratory Test only the result of sample 1 must be within the tolerable limits. The background samples 2, 3 and 4 (< 0.2 µg/g) are excluded from the evaluation.
In comparison with the last test the percentage of non-tolerable results is similar (7.7 → 8.3%). The laboratories A65 and F12 failed with this sample.

3.4.13 Cadmium

Only 2.7 of non-tolerable results - this is a really good result. No laboratory failed with two or three samples (sample concentration of sample 4 was too low).

3.4.14 Boron

In comparison with the last test the percentage of non-tolerable results is lower (11.9 → 13.9 → 6.8 %). Only laboratory A61 failed with three of the four samples. A re-qualification is needed for this *ICP-Forests laboratory.*

3.4.15 Arsenic

Only three samples can be evaluated and only in the lower concentration range (<50 ng/g). ICP-MS is the determination method which should be used – the maximum acceptable LOQ is 50 ng/g.
48.7% of all results are non-tolerable. But the labs A39 (100 ng/g), F05 (413 ng/g) and F07 (200 ng/g) failed (only) because of their high LOQ! The laboratories A45, A80 and A82 failed with all three samples. The results of the laboratories A80 and A82 are too high, a calibration or a contamination problem could be the reason for this.
A re-qualification is needed for the *ICP-Forests laboratory* A45.

3.4.16 Cobalt

Only 11.8 of non-tolerable results - this is a really good result, because the laboratories A65 and F06 failed (only) because of their too high LOQ. A re-qualification is needed for the *ICP-Forests laboratory* F06. The sample concentration of sample 4 was too low for evaluation.

3.4.17 Chromium

15.2% of the results are non-tolerable. The laboratories A88 and F07 failed with three or four samples.

3.4.18 Mercury

No non-tolerable results - this is a really good. The sample concentration of sample 4 was too low for evaluation.

3.4.19 Nickel

16.3% of the results are non-tolerable; this result is influenced by the low concentration of sample 4. Laboratory F07 failed with all four samples.

4 CONCLUSIONS

48 laboratories in 23 countries participated in the 20th Needle/Leaf Interlaboratory Test, but only 47 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 receives a qualification report which can be downloading 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 2017 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). This problem is more or less fixed now for the “old” parameters – only three laboratories submit LOQs higher than the maximum acceptable LOQs (**A39**: Cd; **F07**: Mn and **F15**: Cd). For the “new” parameters (heavy metals) it is not fixed at the moment. The laboratories **A39**: As, **A65**: Co, Ni, **F05**: As, **F06**: Co, **F07**: As and **F12**: Co submit LOQs higher than the maximum acceptable LOQs. Especially for As and Co ICP-MS should be used as determination method to reach these low LOQs.

In case of very low concentrations in the test samples, results of these samples will be excluded from the evaluation (this happened for **Pb**: samples 2, 3 and 4; **Cd**: sample 4; **As**: sample 2; **Co**: sample 4 and **Hg**: sample 4). 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:

F21 (79.2%), **A45** (78.5%), **A43** (75.0%), **A56** (75.0%), **F09** (75.0%), **A88** (71.0%), **F24** (64.3%), **A83** (63.9%) and **A62** (53.6%)

Some of the *ICP-Forests laboratories* fail and have to do a re-qualification for certain parameters (**A45**: S, Mn and As; **A47**: K; **A60**: S and K; **A61**: B; **A62**: Ca, Mg and K; **F06**: Co; **F08**: Cu; **F09**: P and Cu; **F21**: Ca; **F24**: Ca; **F27**: Mg). 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 **A59** (K), **A62** (Ca, Mg, K), **A82** (K) and **F09** (P) 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 2018 (see: 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.

For the next ringtest data submission it will be possible to submit results in your common units. The web interface will convert automatically the data in the “correct” units of the ringtest during data submission. So unit errors will be avoided with this tool in future.

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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 ≤ 100mg) with an extra milling step
DA05	Hg-Analyzer
DA99	Other Element analyzers 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-techniques
DE03	Continous flow UV-VIS-spectrophotometry-techniques
DE05	Flow injection UV-VIS-spectrophotometry-techniques
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 this laboratories without outliers type 1, 2, 3
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
Si	Standard deviation from each laboratory without outliers type 1
SI	Mean Standard deviation for all laboratories without outliers type 1, 2, 3
Vi	Si*100/Lab. mean
VI	SI*100/Mean
SR	Standard deviation from all results without outliers
VR	SR*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

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A91	PB02	DB99	23,20	20,60	22,20	23,30	0	22,33	*b*	*	1,25	5,61	87,16
2	A88	PB07	DZ02	23,20	23,30	23,50	23,00	4	23,25			0,21	0,90	90,77
3	F33x	PZ98	DA02	23,70	23,40	23,50	23,60	4	23,55			0,13	0,55	91,94
4	F18x	PB08	DZ02	24,70	24,60	24,70	24,50	4	24,63			0,10	0,39	96,14
5	F28x	PZ98	DA02	25,20	24,90	24,60	24,40	4	24,78			0,35	1,41	96,72
6	F24x	PB08	DZ02	24,65	24,84	24,90	24,78	4	24,80			0,11	0,44	96,80
7	A61x	PZ98	DA02	24,52	24,94	24,83	24,99	4	24,82			0,21	0,85	96,90
8	A65	PZ98	DA02	26,06	23,80	23,85	26,27	4	25,00			1,35	5,42	97,58
9	F07x	PZ98	DA01	24,74	24,97	25,45	25,14	4	25,08			0,30	1,19	97,90
10	F04	PB07	DZ02	25,11	25,04	25,18	25,01	4	25,09			0,08	0,30	97,94
11	F05x	PZ98	DA01	25,10	25,10	25,10	25,10	4	25,10			0,00	0,00	97,99
12	F19x	PZ98	DA01	25,10	25,10	25,10	25,20	4	25,13			0,05	0,20	98,09
13	A49	PZ98	DA02	25,10	25,10	24,80	25,60	4	25,15			0,33	1,32	98,19
14	F01x	PB07	DZ02	24,97	25,21	25,15	25,33	4	25,17			0,15	0,60	98,25
15	A42x	PZ98	DA02	25,15	25,14	25,27	25,21	4	25,19			0,06	0,24	98,35
16	A58x	PZ98	DA99	25,34	25,22	25,34	25,33	4	25,31			0,06	0,23	98,80
17	F32x	PZ98	DA01	25,40	25,50	25,30	25,60	4	25,45			0,13	0,51	99,36
18	F02x	PZ98	DA01	25,19	25,22	25,42	26,03	4	25,47			0,39	1,53	99,42
19	F13x	PZ98	DA01	25,21	25,39	25,78	25,52	4	25,48			0,24	0,94	99,46
20	A43	PB08	DZ02	25,41	25,41	25,87	25,26	4	25,49			0,26	1,04	99,51
21	A45x	PZ98	DA02	25,60	25,60	25,50	25,50	4	25,55			0,06	0,23	99,75
22	A60x	PZ98	DA02	25,34	25,03	26,34	25,49	4	25,55			0,56	2,19	99,75
23	A82	PZ98	DA02	25,65	25,75	25,40	25,50	4	25,58			0,16	0,61	99,85
24	A39	PZ98	DA02	25,40	25,76	25,72	25,75	4	25,66			0,17	0,67	100,17
25	A62x	PZ98	DA01	25,80	25,50	25,80	25,70	4	25,70			0,14	0,55	100,34
26	F27x	PZ98	DA01	25,81	25,81	25,83	25,54	4	25,75			0,14	0,54	100,52
27	F16x	PZ98	DA02	26,22	25,81	25,94	25,55	4	25,88			0,28	1,08	101,04
28	F26	PB07	DZ02	25,89	25,87	25,91	25,89	4	25,89			0,02	0,06	101,08
29	F12x	PZ98	DA02	25,49	26,27	26,07	26,39	4	26,06			0,40	1,53	101,72
30	F03	PZ98	DA01	25,95	26,17	26,06	26,17	4	26,09			0,11	0,40	101,85
31	A83	PZ98	DA01	26,26	26,58	25,99	26,13	4	26,24			0,25	0,96	102,44
32	A36	PZ98	DA01	26,23	26,08	26,04	26,65	4	26,25			0,28	1,06	102,48
33	F14x	PZ98	DA01	26,39	26,55	25,99	26,25	4	26,30			0,24	0,90	102,66
34	F09x	PZ98	DA01	26,30	26,40	26,10	26,40	4	26,30			0,14	0,54	102,68
35	F08x	PZ98	DA01	26,30	26,40	26,10	26,40	4	26,30			0,14	0,54	102,68
36	A57	PB07	DZ02	26,43	26,54	26,43	25,87	4	26,32			0,30	1,15	102,75
37	F15x	PC01	DB08	26,93	25,96	26,39	26,75	4	26,51			0,43	1,62	103,49
38	A47x	PZ98	DA01	26,66	26,37	26,77	26,92	4	26,68			0,23	0,87	104,16
39	A85x	PZ98	DA01	26,90	26,67	26,82	26,86	4	26,81			0,10	0,38	104,67
40	F21x	PZ98	DA02	27,11	27,06	27,13	27,20	4	27,13			0,06	0,21	105,90
41	A56	PZ98	DA01	28,00	28,60	27,90	28,10	4	28,15			0,31	1,10	109,90
42														
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	N	Mean	SI	VI
all labs	160	**25,61**	**0,225**	**0,880**
10	% from the mean			
	L		SR	VR
	40		**0,883**	**3,449**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: N **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. Si	Vi	Recovery %
1	A88	PB07	DZ02	14,10	14,30	14,40	14,40	4	14,30	0,14	0,99	91,78
2	A42x	PZ98	DA02	14,60	14,94	14,81	14,78	4	14,78	0,14	0,95	94,88
3	A65	PZ98	DA02	14,71	14,24	15,70	14,69	4	14,84	0,62	4,15	95,22
4	F01x	PB07	DZ02	14,81	14,87	14,92	14,98	4	14,90	0,07	0,49	95,60
5	A61x	PZ98	DA02	14,95	14,98	15,21	14,94	4	15,02	0,13	0,85	96,41
6	F18x	PB08	DZ02	15,00	14,90	15,20	15,00	4	15,03	0,13	0,84	96,44
7	F12x	PZ98	DA02	15,23	14,92	15,29	14,96	4	15,10	0,19	1,24	96,92
8	F19x	PZ98	DA01	15,10	15,10	15,20	15,00	4	15,10	0,08	0,54	96,92
9	A62x	PZ98	DA01	15,20	15,20	15,20	15,00	4	15,15	0,10	0,66	97,24
10	A49	PZ98	DA02	15,50	14,70	15,30	15,20	4	15,18	0,34	2,24	97,40
11	F07x	PZ98	DA01	14,99	14,95	15,43	15,43	4	15,20	0,27	1,75	97,56
12	A91	PB02	DB99	16,20	15,70	15,30	13,70	4	15,23	1,08	7,10	97,72
13	A82	PZ98	DA02	15,50	15,10	15,65	15,15	4	15,35	0,27	1,74	98,52
14	F05x	PZ98	DA01	15,40	15,30	15,40	15,40	4	15,38	0,05	0,33	98,68
15	F02x	PZ98	DA01	15,10	15,41	15,18	15,88	4	15,39	0,35	2,28	98,80
16	F28x	PZ98	DA02	15,70	15,50	15,10	15,30	4	15,40	0,26	1,68	98,85
17	A43	PB08	DZ02	15,95	15,05	15,05	15,65	4	15,43	0,45	2,92	99,01
18	F24x	PB08	DZ02	15,36	15,36	15,50	15,50	4	15,43	0,08	0,54	99,05
19	F13x	PZ98	DA01	15,49	15,22	15,52	15,59	4	15,46	0,16	1,05	99,20
20	A58x	PZ98	DA99	15,32	15,41	15,58	15,53	4	15,46	0,12	0,76	99,23
21	F04	PB07	DZ02	15,41	15,62	15,48	15,48	4	15,50	0,09	0,57	99,47
22	F27x	PZ98	DA01	15,59	15,47	15,82	15,51	4	15,60	0,16	1,00	100,11
23	A45x	PZ98	DA02	15,50	15,70	15,60	15,60	4	15,60	0,08	0,52	100,13
24	F32x	PZ98	DA01	15,70	15,60	15,60	15,70	4	15,65	0,06	0,37	100,45
25	F15x	PC01	DB08	15,38	15,54	15,83	15,91	4	15,67	0,25	1,58	100,55
26	F03	PZ98	DA01	15,59	15,81	15,70	15,59	4	15,67	0,11	0,67	100,59
27	F16x	PZ98	DA02	15,71	15,72	15,65	15,65	4	15,68	0,04	0,24	100,66
28	A57	PB07	DZ02	15,85	15,85	15,74	15,74	4	15,80	0,06	0,40	101,38
29	A60x	PZ98	DA02	16,16	15,48	15,62	16,02	4	15,82	0,32	2,04	101,54
30	A83	PZ98	DA01	15,74	15,89	16,10	15,78	4	15,88	0,16	1,02	101,91
31	A47x	PZ98	DA01	15,83	16,48	15,84	15,85	4	16,00	0,32	2,00	102,70
32	F09x	PZ98	DA01	16,10	15,60	15,90	16,40	4	16,00	0,34	2,10	102,70
33	F08x	PZ98	DA01	16,10	15,60	15,90	16,40	4	16,00	0,34	2,10	102,70
34	F26	PB07	DZ02	16,09	16,10	16,11	16,10	4	16,10	0,01	0,05	103,34
35	A36	PZ98	DA01	16,03	16,06	16,13	16,19	4	16,10	0,07	0,45	103,35
36	F14x	PZ98	DA01	16,87	16,20	16,11	15,80	4	16,25	0,45	2,77	104,27
37	A39	PZ98	DA02	16,09	16,15	16,61	16,37	4	16,31	0,24	1,45	104,65
38	A85x	PZ98	DA01	16,25	16,63	16,46	16,45	4	16,45	0,16	0,95	105,57
39	F21x	PZ98	DA02	*16,89a*	16,51	16,47	16,43	3	16,47	0,04	0,24	105,71
40	F33x	PZ98	DA02	16,30	16,70	16,30	16,70	4	16,50	0,23	1,40	105,91
41	A56	PZ98	DA01	17,00	16,60	16,80	17,10	4	16,88	0,22	1,31	108,31
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	N	Mean	SI	VI
all labs	163	**15,58**	**0,213**	**1,370**
10	% from the mean			
	L		SR	VR
	41		**0,538**	**3,452**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A88	PB07	DZ02	13,30	13,30	13,80	13,20	4	13,40			0,27	2,02	93,67
2	A65	PZ98	DA02	13,24	13,70	13,21	13,55	4	13,43			0,24	1,78	93,84
3	F01x	PB07	DZ02	13,68	13,74	13,80	13,74	4	13,74			0,05	0,36	96,04
4	F12x	PZ98	DA02	13,58	13,54	13,98	13,89	4	13,75			0,22	1,60	96,10
5	A42x	PZ98	DA02	13,71	13,83	13,75	13,81	4	13,78			0,06	0,40	96,29
6	A91	PB02	DB99	14,80	14,00	14,00	12,60	4	13,85			0,91	6,60	96,81
7	A43	PB08	DZ02	13,86	14,00	13,71	13,86	4	13,86			0,12	0,85	96,87
8	A62x	PZ98	DA01	14,00	13,90	14,00	13,70	4	13,90			0,14	1,02	97,16
9	F19x	PZ98	DA01	13,90	13,80	14,00	14,00	4	13,93			0,10	0,69	97,34
10	A82	PZ98	DA02	14,30	13,85	13,75	13,90	4	13,95			0,24	1,73	97,51
11	F13x	PZ98	DA01	14,08	13,95	13,99	13,94	4	13,99			0,06	0,46	97,79
12	F33x	PZ98	DA02	14,10	14,00	14,20	14,10	4	14,10			0,08	0,58	98,56
13	F18x	PB08	DZ02	14,10	14,00	14,10	14,20	4	14,10			0,08	0,58	98,56
14	F04	PB07	DZ02	14,12	14,12	14,26	13,95	4	14,11			0,13	0,90	98,65
15	F07x	PZ98	DA01	13,82	13,94	14,47	14,37	4	14,15			0,32	2,25	98,91
16	F02x	PZ98	DA01	14,20	13,92	14,44	14,25	4	14,20			0,21	1,51	99,28
17	A61x	PZ98	DA02	14,04	14,11	14,28	14,50	4	14,23			0,20	1,44	99,49
18	A39	PZ98	DA02	14,18	14,43	14,20	14,21	4	14,26			0,12	0,82	99,64
19	F27x	PZ98	DA01	14,39	14,44	14,16	14,19	4	14,30			0,14	0,98	99,92
20	A45x	PZ98	DA02	14,40	14,20	14,30	14,30	4	14,30			0,08	0,57	99,96
21	F05x	PZ98	DA01	14,30	14,30	14,30	14,30	4	14,30			0,00	0,00	99,96
22	A36	PZ98	DA01	14,11	14,08	14,43	14,69	4	14,33			0,29	2,02	100,15
23	A60x	PZ98	DA02	14,48	14,29	14,17	14,70	4	14,41			0,23	1,61	100,73
24	F24x	PB08	DZ02	14,28	14,37	14,63	14,36	4	14,41			0,15	1,06	100,73
25	F28x	PZ98	DA02	14,50	14,20	14,70	14,30	4	14,43			0,22	1,54	100,83
26	F16x	PZ98	DA02	14,52	14,41	14,54	14,45	4	14,48			0,06	0,42	101,22
27	A57	PB07	DZ02	14,61	14,61	14,29	14,50	4	14,50			0,15	1,04	101,37
28	F03	PZ98	DA01	14,54	14,54	14,54	14,43	4	14,51			0,05	0,38	101,44
29	A58x	PZ98	DA99	14,52	14,75	14,47	14,35	4	14,52			0,17	1,15	101,51
30	A49	PZ98	DA02	14,50	14,90	14,50	14,30	4	14,55			0,25	1,73	101,71
31	F32x	PZ98	DA01	14,60	14,60	14,60	14,60	4	14,60			0,00	0,00	102,06
32	A47x	PZ98	DA01	14,68	15,13	14,16	14,75	4	14,68			0,40	2,72	102,62
33	F26	PB07	DZ02	14,71	14,71	14,69	14,71	4	14,71			0,01	0,07	102,79
34	F15x	PC01	DB08	14,68	14,67	14,69	14,85	4	14,72			0,09	0,58	102,91
35	F21x	PZ98	DA02	14,59	14,86	14,72	14,89	4	14,77			0,14	0,94	103,21
36	A83	PZ98	DA01	14,56	14,89	15,09	14,72	4	14,82			0,23	1,54	103,56
37	F09x	PZ98	DA01	14,70	15,00	15,20	15,20	4	15,03			0,24	1,57	105,03
38	F08x	PZ98	DA01	14,70	15,00	15,20	15,20	4	15,03			0,24	1,57	105,03
39	A85x	PZ98	DA01	15,17	15,03	14,96	15,06	4	15,06			0,09	0,59	105,25
40	F14x	PZ98	DA01	15,10	15,01	14,98	15,28	4	15,09			0,13	0,89	105,50
41	A56	PZ98	DA01	16,30	15,50	16,00	15,90	0	15,93	*b*	*	0,33	2,07	111,32
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	N	Mean	SI	VI
all labs	160	**14,31**	**0,173**	**1,208**
10	% from the mean			
	L		SR	VR
	40		**0,427**	**2,987**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	A62x	PZ98	DA01	1,95	1,88	1,89	1,93	0	1,91	*b*	*	0,03	1,73	59,14
2	A82	PZ98	DA02	2,85	2,30	2,50	2,70	4	2,59		*	0,24	9,25	80,01
3	F13x	PZ98	DA01	2,70	2,70	2,64	2,66	4	2,68		*	0,03	1,12	82,71
4	F12x	PZ98	DA02	2,78	2,76	2,91	2,81	4	2,82			0,07	2,37	87,04
5	A91	PB02	DB99	2,95	3,25	2,16	2,95	4	2,83			0,47	**16,51**	87,43
6	F19x	PZ98	DA01	2,90	2,90	2,90	2,90	4	2,90			0,00	0,00	89,67
7	A88	PB07	DZ02	3,02	2,95	2,88	2,97	4	2,96			0,06	1,96	91,37
8	F33x	PZ98	DA02	3,05	2,94	2,94	2,94	4	2,97			0,06	1,85	91,76
9	A36	PZ98	DA01	2,94	3,10	2,98	3,13	4	3,04			0,09	2,98	93,88
10	F32x	PZ98	DA01	3,02	3,02	3,02	3,24	4	3,08			0,11	3,58	95,08
11	F16x	PZ98	DA02	3,10	3,18	3,08	3,13	4	3,12			0,04	1,42	96,51
12	F27x	PZ98	DA01	3,10	3,11	3,19	3,18	4	3,15			0,05	1,48	97,25
13	F15x	PC01	DB08	3,14	3,10	3,16	3,23	4	3,16			0,05	1,72	97,63
14	A65	PZ98	DA02	2,99	3,45	3,02	3,20	4	3,17			0,21	6,68	97,87
15	F28x	PZ98	DA02	3,25	3,16	3,22	3,18	4	3,20			0,04	1,26	99,03
16	A45x	PZ98	DA02	3,27	3,21	3,21	3,13	4	3,21			0,06	1,79	99,10
17	A57	PB07	DZ02	3,37	3,16	3,16	3,16	4	3,21			0,11	3,40	99,24
18	F03	PZ98	DA01	3,35	3,24	3,24	3,24	4	3,27			0,05	1,68	101,04
19	A58x	PZ98	DA99	3,30	3,31	3,24	3,28	4	3,28			0,03	0,94	101,50
20	F21x	PZ98	DA02	3,38	3,19	3,38	3,24	4	3,30			0,10	2,95	101,96
21	F02x	PZ98	DA01	3,36	3,14	3,32	3,37	4	3,30			0,11	3,25	101,96
22	F18x	PB08	DZ02	3,27	3,28	3,34	3,31	4	3,30			0,03	0,96	102,04
23	F24x	PB08	DZ02	3,28	3,30	3,31	3,33	4	3,31			0,02	0,68	102,21
24	A85x	PZ98	DA01	3,25	3,32	3,31	3,37	4	3,31			0,05	1,43	102,36
25	F05x	PZ98	DA01	3,27	3,40	3,29	3,30	4	3,32			0,06	1,75	102,50
26	A83	PZ98	DA01	3,32	3,26	3,40	*6,25a*	3	3,32			0,07	2,04	102,79
27	A39	PZ98	DA02	3,28	3,32	3,31	3,43	4	3,34			0,07	1,97	103,12
28	A60x	PZ98	DA02	3,24	3,19	3,40	3,55	4	3,35			0,16	4,88	103,43
29	A47x	PZ98	DA01	3,53	3,34	3,37	3,20	4	3,36			0,14	4,03	103,90
30	F07x	PZ98	DA01	3,11	3,28	3,52	3,57	4	3,37			0,21	6,37	104,20
31	F01x	PB07	DZ02	3,36	3,42	3,36	3,48	4	3,41			0,06	1,69	105,29
32	A43	PB08	DZ02	3,30	3,43	3,40	3,50	4	3,41			0,08	2,44	105,36
33	A42x	PZ98	DA02	3,45	3,42	3,37	3,47	4	3,43			0,04	1,27	105,98
34	A61x	PZ98	DA02	3,60	3,51	3,31	3,51	4	3,48			0,12	3,52	107,68
35	F26	PB07	DZ02	3,50	3,50	3,50	3,50	4	3,50			0,00	0,00	108,22
36	F04	PB07	DZ02	3,21	3,49	3,75	3,56	4	3,50			0,22	6,39	108,30
37	F08x	PZ98	DA01	3,67	3,28	3,45	3,67	4	3,52			0,19	5,38	108,77
38	F09x	PZ98	DA01	3,70	3,30	3,40	3,70	4	3,53			0,21	5,85	109,00
39	A49	PZ98	DA02	3,70	3,49	3,54	3,62	4	3,59			0,09	2,57	110,93
40	F14x	PZ98	DA01	3,42	3,69	3,72	3,73	4	3,64			0,15	4,06	112,55
41	A56	PZ98	DA01	4,10	4,10	*4,3a*	4,10	0	4,10	*b*	*	0,00	0,00	126,78
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	N	Mean	SI	VI
all labs	155	**3,23**	**0,101**	**3,126**
15	% from the mean			
	L		SR	VR
	39		**0,245**	**7,580**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A88	PZ98	DA01	0,16	0,16	0,16	0,16	0	0,16	*b*	*	0,00	2,57	8,93
2	A85x	PZ98	DA01	1,29	1,24	1,23	1,22	4	1,25		*	0,03	2,50	69,97
3	A81	PZ98	DA01	1,36	1,45	1,26	1,34	4	1,35		*	0,08	5,77	75,92
4	A45x	PZ99	DB08	1,34	1,49	1,41	1,39	4	1,41		*	0,06	4,43	79,01
5	F24x	PZ98	DA01	1,37	1,54	1,51	1,40	4	1,46		*	0,08	5,70	81,72
6	A83	PB05	DB08	1,65	1,54	1,55	1,62	4	1,59			0,05	3,33	89,29
7	A56	PC01	DB08	1,63	1,65	1,63	1,55	4	1,61			0,04	2,66	90,53
8	F08x	PZ99	DB08	1,69	1,72	1,64	1,66	4	1,68			0,03	2,02	94,10
9	F19x	PD02	DB08	1,68	1,69	1,68	1,70	4	1,69			0,01	0,57	94,73
10	A82	PC01	DB08	1,69	1,72	1,73	1,70	4	1,71			0,02	1,07	95,99
11	A62x	PZ98	DA01	1,65	1,75	1,73	1,72	4	1,71			0,04	2,54	96,13
12	F28x	PZ98	DA02	1,75	1,74	1,71	1,76	4	1,74			0,02	1,24	97,68
13	F16x	PC01	DB08	1,75	1,76	1,74	1,73	4	1,75			0,01	0,79	98,00
14	F14x	PC01	DB08	1,76	1,74	1,75	1,76	4	1,75			0,01	0,44	98,45
15	F06x	PD02	DB08	1,77	1,74	1,75	1,76	4	1,75			0,02	0,92	98,49
16	A58x	PZ98	DA99	1,72	1,73	1,78	1,79	4	1,76			0,04	2,00	98,52
17	F07x	PD02	DB08	1,68	1,83	1,83	1,75	4	1,77			0,07	3,96	99,47
18	F32x	PD02	DB08	1,80	1,78	1,77	1,77	4	1,78			0,01	0,79	99,92
19	A79	PD03	DB99	1,79	1,78	1,81	1,80	4	1,79			0,01	0,74	100,72
20	F12x	PC01	DB08	1,81	1,81	1,80	1,80	4	1,81			0,01	0,32	101,33
21	F13x	PD01	DB08	1,80	1,82	1,83	1,85	4	1,83			0,02	1,14	102,45
22	F05x	PZ98	DA01	1,83	1,84	1,83	1,83	4	1,83			0,01	0,27	102,87
23	A53	PZ02	DD02	1,84	1,84	1,83	1,84	4	1,84			0,01	0,27	103,15
24	A47x	PD01	DB08	1,84	1,84	1,85	1,87	4	1,85			0,01	0,76	103,85
25	A65	PD01	DB08	1,86	1,86	1,87	1,84	4	1,86			0,01	0,68	104,27
26	A57	PZ02	DD02	1,89	1,87	1,83	1,85	4	1,86			0,03	1,39	104,41
27	F02x	PZ98	DA01	1,86	1,88	1,91	1,82	4	1,87			0,04	2,02	104,83
28	A36	PD02	DB08	1,83	1,85	1,88	1,97	4	1,88			0,06	3,29	105,68
29	A49	PD05	DB08	1,88	1,88	1,88	1,90	4	1,88			0,01	0,48	105,80
30	F18x	PD99	DB08	1,88	1,89	1,88	1,89	4	1,89			0,01	0,31	105,82
31	F15x	PC01	DB08	1,87	1,90	1,89	1,89	4	1,89			0,01	0,67	105,96
32	A39	PD02	DB08	1,87	1,92	1,88	1,89	4	1,89			0,02	1,15	105,99
33	F33x	PD01	DB10	1,87	1,90	1,88	1,92	4	1,89			0,02	1,17	106,24
34	F27	PZ98	DA01	2,09	1,68	1,93	1,92	4	1,91			0,17	8,87	106,94
35	F03	PD02	DB08	1,92	1,90	1,92	1,91	4	1,91			0,01	0,54	107,46
36	F04	PD02	DB08	1,95	1,94	1,99	1,98	4	1,97			0,02	1,21	110,31
37	A59	PB03	DB08	1,98	2,21	1,90	2,15	4	2,06		*	0,15	7,16	115,56
38	F09x	PZ02	DD02	2,10	2,12	2,13	2,14	4	2,12		*	0,02	0,80	119,15
39	A60x	PD01	DB10	2,21	2,24	*2,471a*	2,26	3	2,24		*	0,03	1,17	125,71
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	N	Mean	SI	VI
all labs	151	**1,78**	**0,034**	**1,922**
15	% from the mean			
	L		SR	VR
	38		**0,193**	**10,839**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A88	PZ98	DA01	0,07	0,08	0,07	0,06	0	0,07	*b*	*	0,00	6,90	5,68
2	A81	PZ98	DA01	0,92	0,92	0,91	0,93	4	0,92		*	0,01	0,89	75,87
3	A85x	PZ98	DA01	0,93	0,92	0,92	0,93	4	0,93		*	0,01	0,62	76,41
4	A45x	PZ99	DB08	0,94	1,00	1,01	1,06	4	1,00		*	0,05	5,10	82,51
5	A83	PB05	DB08	1,09	1,16	1,00	1,05	4	1,07			0,07	6,09	88,45
6	A56	PC01	DB08	1,09	1,09	1,10	1,07	4	1,09			0,01	1,18	89,51
7	F24x	PZ98	DA01	1,04	1,13	1,07	1,10	4	1,09			0,04	3,83	89,52
8	F28x	PZ98	DA02	1,11	1,06	1,18	1,12	4	1,12			0,05	4,41	92,16
9	F27	PZ98	DA01	1,26	1,16	1,11	1,09	4	1,16			0,08	6,57	95,25
10	F19x	PD02	DB08	1,16	1,16	1,17	1,17	4	1,17			0,01	0,50	96,07
11	A82	PC01	DB08	1,17	1,18	1,18	1,17	4	1,18			0,01	0,49	96,90
12	F08x	PZ99	DB08	1,16	1,16	1,20	1,18	4	1,18			0,02	1,36	97,00
13	F06x	PD02	DB08	1,21	1,17	1,18	1,18	4	1,19			0,01	1,23	97,74
14	F14x	PC01	DB08	1,20	1,20	1,19	1,20	4	1,20			0,01	0,48	98,57
15	F12x	PC01	DB08	1,20	1,20	1,21	1,18	4	1,20			0,01	1,05	98,76
16	F16x	PC01	DB08	1,22	1,20	1,20	1,19	4	1,20			0,01	1,07	99,13
17	A62x	PZ98	DA01	1,15	1,23	1,18	1,26	4	1,21			0,05	4,09	99,37
18	F07x	PD02	DB08	1,25	1,17	1,21	1,20	4	1,21			0,04	2,94	99,54
19	A58x	PZ98	DA99	1,22	1,17	1,23	1,21	4	1,21			0,03	2,18	99,58
20	F05x	PZ98	DA01	1,20	1,21	1,23	1,22	4	1,22			0,01	1,06	100,20
21	A36	PD02	DB08	1,18	1,24	1,23	1,21	4	1,22			0,03	2,18	100,20
22	F02x	PZ98	DA01	1,23	1,19	1,23	1,23	4	1,22			0,02	1,64	100,61
23	F32x	PD02	DB08	1,25	1,22	1,22	1,22	4	1,23			0,02	1,22	101,23
24	F33x	PD01	DB10	1,26	1,20	1,25	1,20	4	1,23			0,03	2,61	101,23
25	A79	PD03	DB99	1,26	1,25	1,22	1,23	4	1,24			0,02	1,29	102,22
26	F03	PD02	DB08	1,25	1,25	1,22	1,26	4	1,24			0,02	1,56	102,53
27	A65	PD01	DB08	1,25	1,25	1,27	1,25	4	1,26			0,01	0,80	103,50
28	A59	PB03	DB08	1,42	1,24	1,21	1,15	4	1,26			0,11	9,12	103,52
29	F13x	PD01	DB08	1,27	1,26	1,26	1,26	4	1,26			0,01	0,40	104,12
30	F04	PD02	DB08	1,23	1,33	1,37	1,18	4	1,28			0,09	6,87	105,35
31	F15x	PC01	DB08	1,28	1,28	1,29	1,27	4	1,28			0,01	0,64	105,56
32	F18x	PD99	DB08	1,29	1,28	1,30	1,30	4	1,29			0,01	0,74	106,59
33	A39	PD02	DB08	1,32	1,33	1,27	1,26	4	1,29			0,04	2,85	106,71
34	A49	PD05	DB08	1,30	1,27	1,31	1,31	4	1,30			0,02	1,52	107,08
35	A47x	PD01	DB08	1,30	1,31	1,31	1,32	4	1,31			0,01	0,62	108,03
36	A53	PZ02	DD02	1,30	1,35	1,30	1,33	4	1,32			0,02	1,86	108,86
37	A57	PZ02	DD02	1,29	1,35	1,45	1,40	4	1,37			0,07	4,99	113,19
38	F09x	PZ02	DD02	1,46	1,47	1,47	1,48	4	1,47		*	0,01	0,56	121,23
39	A60x	PD01	DB10	1,53	1,48	1,55	1,54	4	1,52		*	0,03	2,23	125,72
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	N	Mean	SI	VI
all labs	152	**1,21**	**0,028**	**2,324**
15	% from the mean			
	L		SR	VR
	38		**0,120**	**9,878**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A88	PZ98	DA01	0,07	0,07	0,07	0,07	0	0,07	*b*	*	0,00	3,60	7,41
2	A81	PZ98	DA01	0,73	0,79	0,68	0,66	4	0,72		*	0,06	8,12	76,20
3	A45x	PZ99	DB08	0,75	0,76	0,74	0,74	4	0,75		*	0,01	1,40	79,69
4	F24x	PZ98	DA01	0,73	0,73	0,76	0,89	4	0,78		*	0,08	9,83	82,75
5	A83	PB05	DB08	0,82	0,83	0,80	0,78	4	0,81			0,02	2,60	86,30
6	A56	PC01	DB08	0,86	0,80	0,80	0,80	4	0,82			0,03	3,94	86,96
7	A85x	PZ98	DA01	0,91	0,89	0,83	0,82	4	0,86			0,05	5,50	91,93
8	F19x	PD02	DB08	0,88	0,89	0,89	0,89	4	0,89			0,00	0,48	94,64
9	F08x	PZ99	DB08	0,89	0,89	0,89	0,89	4	0,89			0,00	0,00	95,06
10	F27	PZ98	DA01	1,01	0,92	0,83	0,82	4	0,90			0,09	9,93	95,38
11	A82	PC01	DB08	0,89	0,91	0,90	0,92	4	0,91			0,01	1,24	96,53
12	F14x	PC01	DB08	0,91	0,91	0,91	0,91	4	0,91			0,00	0,20	97,23
13	F12x	PC01	DB08	0,91	0,94	0,94	0,94	4	0,93			0,01	1,43	99,11
14	F16x	PC01	DB08	0,95	0,93	0,92	0,93	4	0,93			0,01	1,51	99,34
15	A58x	PZ98	DA99	0,95	0,82	0,99	0,99	4	0,94			0,08	8,59	99,91
16	A36	PD02	DB08	0,93	0,89	0,96	0,97	4	0,94			0,04	3,83	99,91
17	F02x	PZ98	DA01	0,93	0,96	0,95	0,93	4	0,94			0,01	1,43	100,15
18	F06x	PD02	DB08	0,94	0,92	0,94	0,96	4	0,94			0,01	1,54	100,30
19	F03	PD02	DB08	0,94	0,94	0,94	0,95	4	0,94			0,00	0,27	100,34
20	A39	PD02	DB08	0,94	0,95	0,94	0,96	4	0,95			0,01	0,98	101,09
21	F32x	PD02	DB08	0,94	0,98	0,93	0,95	4	0,95			0,02	1,91	101,30
22	F07x	PD02	DB08	0,96	1,00	0,93	0,92	4	0,95			0,04	3,79	101,70
23	A47x	PD01	DB08	0,96	0,96	0,97	0,95	4	0,96			0,01	0,85	102,31
24	F13x	PD01	DB08	0,96	0,96	0,96	0,96	4	0,96			0,00	0,00	102,31
25	A79	PD03	DB99	0,95	0,97	0,96	0,96	4	0,96			0,01	0,60	102,42
26	F05x	PZ98	DA01	0,96	0,96	0,97	0,96	4	0,96			0,01	0,55	102,50
27	A65	PD01	DB08	0,97	0,97	0,96	0,96	4	0,97			0,01	0,60	102,84
28	F15x	PC01	DB08	0,98	0,99	0,95	0,97	4	0,97			0,02	1,76	103,64
29	A62x	PZ98	DA01	1,06	0,93	0,97	0,94	4	0,98			0,06	6,07	103,91
30	A53	PZ02	DD02	0,99	0,99	0,98	0,98	4	0,99			0,01	0,59	104,98
31	A49	PD05	DB08	0,97	0,99	1,00	0,98	4	0,99			0,01	1,31	105,03
32	F18x	PD99	DB08	1,00	1,00	0,99	1,00	4	1,00			0,01	0,53	106,12
33	F28x	PZ98	DA02	1,00	1,01	1,02	1,00	4	1,01			0,01	0,95	107,37
34	A59	PB03	DB08	1,04	1,02	1,06	0,94	4	1,02			0,05	5,16	108,23
35	A57	PZ02	DD02	1,00	1,00	1,09	1,04	4	1,03			0,04	4,14	110,04
36	F33x	PD01	DB10	1,04	1,08	1,01	1,02	4	1,04			0,03	2,98	110,57
37	F04	PD02	DB08	0,95	0,98	1,08	1,14	4	1,04			0,09	8,49	110,57
38	F09x	PZ02	DD02	1,07	1,08	1,07	1,08	4	1,08			0,01	0,54	114,57
39	A60x	PD01	DB10	1,09	1,10	1,10	1,10	4	1,10		*	0,01	0,63	116,75
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	N	Mean	SI	VI
all labs	152	**0,94**	**0,025**	**2,668**
15	% from the mean			
	L		SR	VR
	38		**0,083**	**8,833**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A88	PZ98	DA01	0,02	0,02	0,02	0,02	0	0,02	*b*	*	0,00	7,63	6,79
2	A45x	PZ99	DB08	0,14	0,16	0,15	0,18	0	0,16	*b*	*	0,01	8,83	50,24
3	A56	PC01	DB08	0,20	0,19	0,20	0,20	0	0,20	*b*	*	0,01	3,90	62,03
4	F16x	PC01	DB08	0,28	0,27	0,27	0,27	4	0,28			0,01	2,01	86,65
5	A83	PB05	DB08	0,27	0,28	0,29	0,27	4	0,28			0,01	3,36	87,51
6	F08x	PZ99	DB08	0,29	0,29	0,28	0,27	4	0,29			0,01	3,69	89,87
7	A58x	PZ98	DA99	0,27	0,29	0,30	0,31	4	0,29			0,02	5,84	92,00
8	F09x	PZ02	DD02	0,29	0,29	0,29	0,30	4	0,29			0,01	1,71	92,00
9	F18x	PD99	DB08	0,30	0,30	0,30	0,30	4	0,30			0,00	0,92	93,80
10	A82	PC01	DB08	0,30	0,29	0,30	0,31	4	0,30			0,01	2,24	94,12
11	F12x	PC01	DB08	0,30	0,30	0,30	0,30	4	0,30			0,00	0,33	94,51
12	F06x	PD02	DB08	0,31	0,31	0,30	0,29	4	0,30			0,01	3,23	94,82
13	F14x	PC01	DB08	0,30	0,30	0,30	0,30	4	0,30			0,00	0,80	94,85
14	F19x	PD02	DB08	0,31	0,30	0,31	0,30	4	0,30			0,00	1,18	95,69
15	A36	PD02	DB08	0,30	0,31	0,30	0,31	4	0,31			0,01	1,89	95,93
16	A47x	PD01	DB08	0,30	0,31	0,30	0,31	4	0,31			0,01	1,89	95,93
17	F15x	PC01	DB08	0,30	0,31	0,30	0,31	4	0,31			0,01	1,89	95,93
18	A49	PD05	DB08	0,31	0,31	0,31	0,30	4	0,31			0,00	1,08	96,32
19	F02x	PZ98	DA01	0,32	0,30	0,31	0,30	4	0,31			0,01	3,16	96,40
20	A81	PZ98	DA01	0,33	0,29	0,32	0,29	4	0,31			0,02	6,70	96,71
21	F24x	PZ98	DA01	0,31	0,34	0,30	0,28	4	0,31			0,03	8,84	97,03
22	A53	PZ02	DD02	0,31	0,31	0,31	0,31	4	0,31			0,00	0,00	97,50
23	F03	PD02	DB08	0,31	0,31	0,31	0,31	4	0,31			0,00	0,55	98,05
24	F27	PZ98	DA01	0,44	0,33	0,24	0,26	0	0,32	*c*		0,09	**28,45**	99,86
25	A79	PD03	DB99	0,32	0,32	0,32	0,31	4	0,32			0,00	1,05	100,24
26	F13x	PD01	DB08	0,32	0,32	0,32	0,32	4	0,32			0,00	0,00	100,65
27	F07x	PD02	DB08	0,33	0,33	0,32	0,31	4	0,32			0,01	2,14	100,80
28	A65	PD01	DB08	0,33	0,32	0,32	0,32	4	0,32			0,01	1,55	101,43
29	A59	PB03	DB08	0,33	0,32	0,32	0,33	4	0,33			0,01	2,04	102,22
30	F32x	PD02	DB08	0,34	0,32	0,33	0,32	4	0,33			0,01	2,15	103,00
31	A60x	PD01	DB10	0,32	0,33	0,34	0,34	4	0,33			0,01	2,21	104,26
32	A39	PD02	DB08	0,35	0,35	0,34	0,34	4	0,34			0,00	1,44	107,80
33	A57	PZ02	DD02	0,35	0,35	0,38	0,36	4	0,36			0,01	3,93	113,23
34	A85x	PZ98	DA01	0,40	0,37	0,35	0,35	4	0,37			0,03	6,83	115,28
35	A62x	PZ98	DA01	0,37	0,35	0,40	0,36	4	0,37			0,02	5,84	116,37
36	F05x	PZ98	DA01	0,40	0,39	0,40	0,39	4	0,39		*	0,01	1,57	123,84
37	F28x	PZ98	DA02	0,40	0,40	0,40	0,40	4	0,40		*	0,00	0,56	125,26
38	F33x	PD01	DB10	0,57	0,57	0,57	*0,59a*	0	0,57	*b*	*	0,00	0,00	179,27
39	F04	PD02	DB08	0,72	0,73	0,70	0,74	0	0,72	*b*	*	0,02	2,34	226,69
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	N	Mean	SI	VI
all labs	132	**0,32**	**0,008**	**2,515**
20	% from the mean			
	L		SR	VR
	33		**0,030**	**9,395**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A83	PB05	DB08	1,14	1,06	1,05	1,11	0	1,09	*b*	*	0,04	4,05	74,60
2	A62x	PD02	DE01	1,31	1,31	*1,28a*	1,31	3	1,31		*	0,00	0,00	89,66
3	A49	PD05	DB08	1,33	1,33	1,32	1,34	4	1,33			0,01	0,59	91,12
4	F27x	PD01	DE01	1,33	1,35	1,34	1,33	4	1,34			0,01	0,87	91,44
5	A82	PC01	DB08	1,34	1,35	1,35	1,33	4	1,34			0,01	0,71	91,89
6	A56	PC01	DB08	1,39	1,40	1,39	1,33	4	1,38			0,03	2,30	94,49
7	A91	PB02	DB99	1,38	1,37	1,33	1,46	4	1,39			0,05	3,93	94,80
8	F28x	PD02	DB08	1,39	1,44	1,38	1,34	4	1,39			0,04	2,96	95,00
9	F06x	PD02	DB08	1,41	1,38	1,38	1,40	4	1,39			0,01	0,84	95,26
10	F02x	PD02	DB08	1,39	1,40	1,39	1,41	4	1,40			0,01	0,69	95,65
11	A45x	PZ99	DB08	1,41	1,40	1,41	1,38	4	1,40			0,01	1,01	95,82
12	A53	PZ02	DD02	1,41	1,42	1,41	1,42	4	1,42			0,01	0,41	96,85
13	A81	PD02	DB10	1,42	1,43	1,43	1,41	4	1,42			0,01	0,67	97,36
14	F07x	PD02	DB08	1,42	1,43	1,44	1,41	4	1,42			0,01	0,91	97,38
15	A39	PD02	DB08	1,44	1,45	1,40	1,41	4	1,42			0,02	1,66	97,43
16	F05x	PD02	DB08	1,43	1,43	1,43	1,43	4	1,43			0,00	0,00	97,88
17	F01x	PB04	DE01	1,43	1,43	1,44	1,42	4	1,43			0,01	0,67	97,94
18	A57	PZ02	DD02	1,43	1,44	1,43	1,43	4	1,43			0,01	0,35	98,05
19	F14x	PC01	DB08	1,43	1,43	1,44	1,44	4	1,43			0,00	0,27	98,06
20	F19x	PD02	DB08	1,43	1,44	1,43	1,44	4	1,44			0,01	0,40	98,22
21	F24x	PB03	DE01	1,43	1,44	1,45	1,44	4	1,44			0,01	0,41	98,70
22	A85x	PD02	DE01	1,38	1,51	1,54	1,35	4	1,44			0,09	6,52	98,80
23	A47x	PD01	DB08	1,42	1,44	1,45	1,47	4	1,45			0,02	1,44	98,90
24	F18x	PD99	DB08	1,44	1,44	1,45	1,45	4	1,45			0,01	0,40	98,90
25	F16x	PC01	DB08	1,45	1,46	1,46	1,44	4	1,45			0,01	0,72	99,38
26	F12x	PC01	DB08	1,45	1,47	1,46	1,45	4	1,46			0,01	0,66	99,76
27	A58x	PD02	DE01	1,46	1,46	1,45	1,46	4	1,46			0,01	0,34	99,76
28	A61x	PB02	DB08	1,45	1,45	1,45	1,49	4	1,46			0,02	1,37	99,93
29	F33x	PD01	DB10	1,47	1,47	1,46	1,47	4	1,47			0,01	0,34	100,44
30	F13x	PD01	DB08	1,46	1,47	1,47	1,48	4	1,47			0,01	0,56	100,61
31	A43	PB06	DE01	1,50	1,56	1,34	1,50	4	1,47			0,09	6,41	100,92
32	F32x	PD02	DB08	1,49	1,47	1,48	1,47	4	1,48			0,01	0,65	101,13
33	A79	PD03	DB99	1,47	1,50	1,49	1,48	4	1,48			0,01	0,86	101,62
34	F21x	PD02	DE01	1,47	1,49	1,52	1,49	4	1,49			0,02	1,38	102,15
35	F04	PD02	DE01	1,48	1,50	1,50	1,51	4	1,50			0,01	0,84	102,50
36	F08x	PZ99	DB08	1,46	1,49	1,47	1,61	4	1,51			0,07	4,61	103,18
37	A65	PD01	DB08	1,53	1,52	1,53	1,52	4	1,53			0,01	0,38	104,38
38	A36	PD02	DB08	1,50	1,52	1,55	1,61	4	1,55			0,05	3,10	105,75
39	F03	PD02	DB08	1,54	1,54	1,56	1,54	4	1,55			0,01	0,49	105,87
40	F09x	PZ02	DD02	1,54	1,56	1,57	1,59	4	1,57			0,02	1,33	107,12
41	A88	PD99	DB08	1,60	1,61	1,52	1,63	4	1,59			0,05	3,04	108,83
42	F26	PD02	DB08	1,65	1,63	1,63	1,65	4	1,64		*	0,01	0,70	112,25
43	A60x	PD01	DB10	1,62	1,66	1,80	1,67	4	1,69		*	0,08	4,57	115,64
44	A59	PB03	DB08	1,62	1,84	1,58	1,78	4	1,70		*	0,12	7,29	116,60
45	F15x	PC01	DB08	1,71	1,76	1,78	1,82	0	1,77	*b*	*	0,05	2,59	120,98
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	N	Mean	SI	VI
all labs	171	**1,46**	**0,024**	**1,616**
10	% from the mean			
	L		SR	VR
	43		**0,085**	**5,845**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A85x	PD02	DE01	0,93	0,94	0,83	0,87	0	0,89	*b*	*	0,05	6,16	62,59
2	A83	PB05	DB08	1,09	1,13	0,98	0,99	0	1,05	*b*	*	0,07	7,09	73,34
3	F24x	PB03	DE01	1,12	1,24	1,25	1,31	4	1,23		*	0,08	6,50	86,28
4	A49	PD05	DB08	1,29	1,29	1,27	1,26	4	1,28		*	0,01	1,14	89,63
5	F27x	PD01	DE01	1,28	1,31	1,29	1,28	4	1,29			0,01	1,00	90,46
6	A43	PB06	DE01	1,29	1,28	1,36	1,28	4	1,30			0,04	3,00	91,32
7	A82	PC01	DB08	1,32	1,30	1,31	1,31	4	1,31			0,01	0,62	91,91
8	A62x	PD02	DE01	1,31	1,25	1,41	1,31	4	1,32			0,07	5,03	92,62
9	A91	PB02	DB99	1,34	1,37	1,31	1,27	4	1,32			0,04	3,23	92,79
10	F28x	PD02	DB08	1,40	1,31	1,32	1,31	4	1,34			0,04	3,31	93,69
11	F06x	PD02	DB08	1,37	1,33	1,34	1,35	4	1,35			0,02	1,26	94,42
12	A56	PC01	DB08	1,36	1,36	1,35	1,33	4	1,35			0,01	1,06	94,87
13	F16x	PC01	DB08	1,40	1,37	1,37	1,36	4	1,37			0,02	1,20	96,34
14	A39	PD02	DB08	1,38	1,39	1,37	1,35	4	1,37			0,02	1,30	96,37
15	F12x	PC01	DB08	1,38	1,38	1,39	1,37	4	1,38			0,01	0,59	96,83
16	F07x	PD02	DB08	1,40	1,37	1,38	1,38	4	1,38			0,01	0,99	96,83
17	F02x	PD02	DB08	1,37	1,38	1,36	1,41	4	1,38			0,02	1,57	96,83
18	A45x	PZ99	DB08	1,40	1,39	1,38	1,39	4	1,39			0,01	0,59	97,53
19	F05x	PD02	DB08	1,40	1,40	1,40	1,40	4	1,40			0,00	0,00	98,23
20	F01x	PB04	DE01	1,39	1,40	1,42	1,41	4	1,40			0,01	0,97	98,40
21	F19x	PD02	DB08	1,40	1,39	1,41	1,41	4	1,40			0,01	0,68	98,40
22	F14x	PC01	DB08	1,41	1,40	1,42	1,41	4	1,41			0,01	0,39	98,81
23	A81	PD02	DB10	1,42	1,42	1,41	1,39	4	1,41			0,01	1,00	98,93
24	F18x	PD99	DB08	1,40	1,42	1,44	1,41	4	1,42			0,02	1,20	99,46
25	F32x	PD02	DB08	1,43	1,42	1,43	1,42	4	1,43			0,01	0,41	99,98
26	A47x	PD01	DB08	1,41	1,42	1,43	1,44	4	1,43			0,01	0,91	99,98
27	F33x	PD01	DB10	1,45	1,39	1,46	1,41	4	1,43			0,03	2,31	100,16
28	A58x	PD02	DE01	1,45	1,41	1,44	1,42	4	1,43			0,02	1,28	100,33
29	A61x	PB02	DB08	1,45	1,45	1,42	1,43	4	1,44			0,02	1,04	100,86
30	A79	PD03	DB99	1,47	1,41	1,43	1,44	4	1,44			0,02	1,69	100,90
31	F03	PD02	DB08	1,45	1,45	1,46	1,42	4	1,44			0,02	1,16	101,30
32	F13x	PD01	DB08	1,45	1,45	1,44	1,45	4	1,45			0,01	0,35	101,56
33	A36	PD02	DB08	1,45	1,45	1,43	1,54	4	1,47			0,05	3,36	102,97
34	F08x	PZ99	DB08	1,44	1,49	1,48	1,49	4	1,48			0,02	1,61	103,49
35	A65	PD01	DB08	1,46	1,47	1,49	1,48	4	1,48			0,01	0,88	103,49
36	F21x	PD02	DE01	1,51	1,46	1,51	1,54	4	1,51			0,03	2,20	105,60
37	A88	PD99	DB08	1,51	1,48	1,53	1,51	4	1,51			0,02	1,37	105,77
38	A59	PB03	DB08	1,70	1,51	1,46	1,41	4	1,52			0,13	8,35	106,46
39	A53	PZ02	DD02	1,53	1,56	1,52	1,55	4	1,54			0,02	1,19	108,05
40	A57	PZ02	DD02	1,52	1,55	1,61	1,58	4	1,57			0,04	2,47	109,81
41	F26	PD02	DB08	1,54	1,60	1,59	1,59	4	1,58		*	0,03	1,71	110,86
42	A60x	PD01	DB10	1,61	1,57	1,63	1,62	4	1,61		*	0,03	1,84	112,79
43	F04	PD02	DE01	1,73	1,56	1,62	1,75	4	1,67		*	0,09	5,43	116,82
44	F09x	PZ02	DD02	1,66	1,68	1,69	1,69	4	1,68		*	0,01	0,84	117,88
45	F15x	PC01	DB08	1,78	1,81	1,84	1,86	0	1,82	*b*	*	0,04	1,92	127,87
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	N	Mean	SI	VI
all labs	168	**1,43**	**0,026**	**1,839**
10	% from the mean			
	L		SR	VR
	42		**0,099**	**6,976**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A83	PB05	DB08	1,50	1,52	1,42	1,41	0	1,46	*b*	*	0,05	3,77	73,24
2	A43	PB06	DE01	1,84	1,76	1,67	1,78	4	1,76		*	0,07	3,88	88,47
3	F27x	PD01	DE01	1,77	1,79	1,77	1,77	4	1,77		*	0,01	0,72	88,96
4	A49	PD05	DB08	1,78	1,77	1,79	1,76	4	1,77		*	0,01	0,64	89,02
5	A85x	PD02	DE01	1,77	1,87	1,74	1,82	4	1,80			0,06	3,29	90,40
6	F28x	PD02	DB08	1,81	1,83	1,82	1,83	4	1,82			0,01	0,56	91,45
7	A82	PC01	DB08	1,82	1,87	1,86	1,86	4	1,85			0,02	1,20	92,96
8	A91	PB02	DB99	1,89	1,91	1,87	1,80	4	1,87			0,05	2,56	93,71
9	A58x	PD02	DE01	1,91	1,90	1,93	1,92	4	1,92			0,01	0,67	96,09
10	A56	PC01	DB08	1,91	1,90	1,89	1,97	4	1,92			0,04	1,87	96,29
11	F02x	PD02	DB08	1,92	1,93	1,94	1,93	4	1,93			0,01	0,42	96,85
12	A47x	PD01	DB08	1,94	1,95	1,94	1,93	4	1,94			0,01	0,42	97,35
13	A45x	PZ99	DB08	1,93	1,95	1,96	1,92	4	1,94			0,02	0,94	97,35
14	F19x	PD02	DB08	1,97	1,98	1,96	1,97	4	1,97			0,01	0,41	98,85
15	A81	PD02	DB10	1,98	1,99	1,95	1,96	4	1,97			0,02	0,93	98,85
16	F24x	PB03	DE01	1,93	1,98	2,00	1,98	4	1,98			0,03	1,54	99,10
17	F16x	PC01	DB08	2,02	1,96	1,97	1,96	4	1,98			0,03	1,37	99,14
18	F06x	PD02	DB08	1,98	1,94	1,99	2,00	4	1,98			0,03	1,29	99,24
19	F07x	PD02	DB08	2,00	1,97	1,99	1,96	4	1,98			0,02	0,96	99,32
20	A61x	PB02	DB08	2,02	1,97	1,96	1,98	4	1,98			0,03	1,33	99,48
21	F05x	PD02	DB08	1,99	1,98	1,98	1,99	4	1,99			0,01	0,29	99,61
22	A39	PD02	DB08	2,03	2,03	1,98	1,96	4	2,00			0,03	1,67	100,46
23	F03	PD02	DB08	2,01	2,00	2,00	2,00	4	2,00			0,01	0,28	100,50
24	F12x	PC01	DB08	1,97	2,00	2,02	2,03	4	2,01			0,03	1,32	100,61
25	F01x	PB04	DE01	1,98	2,01	2,02	2,04	4	2,01			0,02	1,22	100,95
26	F18x	PD99	DB08	2,04	2,02	2,01	2,01	4	2,02			0,01	0,70	101,36
27	F08x	PZ99	DB08	1,91	2,08	2,03	2,07	4	2,02			0,08	3,86	101,49
28	F21x	PD02	DE01	2,01	1,97	2,02	2,10	4	2,03			0,05	2,69	101,61
29	F14x	PC01	DB08	2,02	2,03	2,03	2,04	4	2,03			0,01	0,31	101,71
30	A57	PZ02	DD02	2,02	2,03	2,05	2,04	4	2,04			0,01	0,63	102,11
31	F32x	PD02	DB08	2,04	2,03	2,04	2,04	4	2,04			0,01	0,25	102,24
32	F13x	PD01	DB08	2,04	2,04	2,06	2,01	4	2,04			0,02	1,01	102,24
33	A36	PD02	DB08	2,04	1,94	2,10	2,08	4	2,04			0,07	3,49	102,37
34	F33x	PD01	DB10	2,03	2,02	2,04	2,08	4	2,04			0,03	1,29	102,49
35	A53	PZ02	DD02	2,05	2,05	2,04	2,03	4	2,04			0,01	0,47	102,49
36	A79	PD03	DB99	2,07	2,07	2,02	2,03	4	2,05			0,03	1,30	102,92
37	F15x	PC01	DB08	*2,71a*	2,09	2,04	2,05	3	2,06			0,03	1,28	103,37
38	A65	PD01	DB08	2,08	2,09	2,08	2,04	4	2,07			0,02	1,07	104,00
39	A88	PD99	DB08	2,07	2,13	2,14	2,18	4	2,13			0,05	2,13	106,88
40	F26	PD02	DB08	2,13	2,17	2,16	2,08	4	2,14			0,04	1,89	107,13
41	A62x	PD02	DE01	2,08	2,18	2,34	1,95	4	2,14			0,16	7,70	107,26
42	A60x	PD01	DB10	2,17	2,20	2,18	2,20	4	2,19			0,01	0,67	109,69
43	F09x	PZ02	DD02	2,18	2,20	2,22	2,22	4	2,21		*	0,02	0,87	110,65
44	A59	PB03	DB08	2,33	2,36	2,27	2,11	4	2,27		*	0,11	4,86	113,83
45	F04	PD02	DE01	2,40	2,28	2,51	2,52	0	2,43	*b*	*	0,11	4,63	121,81
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	N	Mean	SI	VI
all labs	171	**1,99**	**0,031**	**1,558**
10	% from the mean			
	L		SR	VR
	43		**0,112**	**5,601**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A83	PB05	DB08	0,14	0,16	0,15	0,13	0	0,15	*b*	*	0,01	7,03	67,63
2	F24x	PB03	DE01	0,16	0,19	0,18	0,16	4	0,17		*	0,01	7,26	80,39
3	F21x	PD02	DE01	0,21	0,18	0,19	0,20	4	0,20			0,01	6,62	90,49
4	A82	PC01	DB08	0,19	0,19	0,20	0,20	4	0,20			0,00	1,61	90,95
5	A81	PD02	DB10	0,19	0,19	0,20	0,21	4	0,20			0,01	4,85	91,65
6	A88	PD99	DB08	0,20	0,20	0,20	0,20	4	0,20			0,00	0,00	92,81
7	F18x	PD99	DB08	0,20	0,20	0,20	0,20	4	0,20			0,00	0,41	92,81
8	A91	PB02	DB99	0,18	0,24	0,17	0,21	4	0,20			0,03	**15,81**	92,81
9	F27x	PD01	DE01	0,21	0,20	0,21	0,20	4	0,20			0,01	3,02	94,08
10	F02x	PD02	DB08	0,20	0,20	0,21	0,21	4	0,21			0,01	2,82	95,13
11	F15x	PC01	DB08	0,20	0,21	0,20	0,21	4	0,21			0,01	2,82	95,13
12	F16x	PC01	DB08	0,21	0,20	0,21	0,20	4	0,21			0,00	1,70	95,27
13	A45x	PZ99	DB08	0,21	0,21	0,20	0,21	4	0,21			0,00	2,18	95,82
14	F06x	PD02	DB08	0,22	0,21	0,20	0,20	4	0,21			0,01	3,78	95,88
15	A47x	PD01	DB08	0,21	0,21	0,20	0,21	4	0,21			0,00	2,41	96,29
16	F12x	PC01	DB08	0,21	0,21	0,21	0,21	4	0,21			0,00	0,62	96,75
17	A61x	PB02	DB08	0,21	0,21	0,21	0,21	4	0,21			0,00	0,00	97,45
18	A49	PD05	DB08	0,21	0,21	0,21	0,21	4	0,21			0,00	0,24	97,79
19	A39	PD02	DB08	0,21	0,21	0,21	0,21	4	0,21			0,00	0,71	97,79
20	A79	PD03	DB99	0,21	0,21	0,21	0,21	4	0,21			0,00	0,82	98,53
21	F14x	PC01	DB08	0,21	0,21	0,21	0,21	4	0,21			0,00	0,22	99,13
22	A36	PD02	DB08	0,21	0,22	0,21	0,22	4	0,22			0,01	2,69	99,77
23	F07x	PD02	DB08	0,22	0,22	0,22	0,21	4	0,22			0,00	1,23	100,00
24	F19x	PD02	DB08	0,22	0,21	0,22	0,22	4	0,22			0,00	1,38	100,93
25	F33x	PD01	DB10	0,23	0,22	0,22	0,22	4	0,22			0,01	2,25	103,25
26	F13x	PD01	DB08	0,22	0,23	0,22	0,22	4	0,22			0,01	2,25	103,25
27	F32x	PD02	DB08	0,22	0,23	0,23	0,22	4	0,22			0,00	1,33	103,83
28	A56	PC01	DB08	0,22	0,22	0,22	0,23	4	0,22			0,00	1,26	104,15
29	F05x	PD02	DB08	0,23	0,22	0,24	0,22	4	0,23			0,01	4,37	105,22
30	F01x	PB04	DE01	0,22	0,24	0,23	0,22	4	0,23			0,01	5,00	105,34
31	A65	PD01	DB08	0,23	0,22	0,23	0,23	4	0,23			0,01	2,20	105,57
32	A60x	PD01	DB10	0,23	0,23	0,23	0,23	4	0,23			0,00	0,66	105,68
33	A59	PB03	DB08	0,24	0,23	0,23	0,24	4	0,23			0,01	3,10	108,58
34	F03	PD02	DB08	0,23	0,22	0,25	0,23	4	0,23			0,01	3,86	108,70
35	F08x	PZ99	DB08	0,25	0,24	0,23	0,23	4	0,24			0,01	4,46	109,63
36	F26	PD02	DB08	0,24	0,24	0,24	0,23	4	0,24			0,00	2,11	110,21
37	A53	PZ02	DD02	0,25	0,25	0,25	0,25	4	0,25		*	0,00	0,00	116,01
38	A58x	PD02	DE01	0,26	0,26	0,27	0,27	4	0,27		*	0,01	2,18	122,97
39	A57	PZ02	DD02	0,27	0,27	0,28	0,28	0	0,28	*b*	*	0,01	2,10	127,61
40	A43	PB06	DE01	0,30	0,32	0,32	0,30	0	0,31	*b*	*	0,01	3,93	143,62
41	F09x	PZ02	DD02	0,32	0,32	0,32	0,32	0	0,32	*b*	*	0,00	0,00	148,49
42	F28x	PD02	DB08	0,35	0,34	0,31	0,31	0	0,33	*b*	*	0,02	5,36	152,55
43	F04	PD02	DE01	0,35	0,33	0,33	0,39	0	0,35	*b*	*	0,03	7,66	161,14
44	A62x	PD02	DE01	0,52	0,60	0,49	0,55	0	0,54	*b*	*	0,05	8,69	250,58
45	A85x	PD02	DE01	0,59	0,49	0,59	0,52	0	0,55	*b*	*	0,05	9,05	252,90
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	N	Mean	SI	VI
all labs	148	**0,22**	**0,006**	**2,599**
15	% from the mean			
	L		SR	VR
	37		**0,017**	**7,937**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	A62x	PC02	DB01	5,83	5,88	6,06	6,33	0	6,03	*b*	*	0,23	3,75	79,48
2	F21x	PD02	DB01	6,07	6,15	6,08	6,05	0	6,09	*b*	*	0,04	0,71	80,30
3	F27x	PD01	DB01	6,92	6,78	7,28	6,84	4	6,96			0,23	3,25	91,75
4	A82	PC01	DB08	6,99	6,98	6,99	*6,94a*	3	6,99			0,01	0,08	92,17
5	A49	PD05	DB08	6,97	7,02	6,93	7,01	4	6,98			0,04	0,56	92,11
6	A85x	PD02	DB08	7,14	7,16	7,31	6,81	4	7,11			0,21	2,95	93,74
7	A83	PB05	DB08	7,54	7,08	6,89	7,15	4	7,17			0,27	3,80	94,55
8	F13x	PZ02	DD01	7,05	7,20	7,22	7,20	4	7,17			0,08	1,10	94,55
9	A79	PD03	DB10	7,21	7,27	7,22	7,18	4	7,22			0,03	0,47	95,25
10	F19x	PD02	DB08	7,30	7,30	7,21	7,29	4	7,28			0,04	0,60	95,97
11	F01x	PB04	DB01	7,26	7,34	7,43	7,17	4	7,30			0,11	1,52	96,30
12	F28x	PD02	DB08	7,43	7,24	6,89	7,69	4	7,31			0,34	4,60	96,45
13	F14x	PC01	DB08	7,38	7,31	7,34	7,36	4	7,35			0,03	0,39	96,92
14	A47x	PD01	DB08	7,45	7,31	7,32	7,41	4	7,37			0,07	0,93	97,25
15	A39	PD02	DB08	7,26	7,13	7,46	7,71	4	7,39			0,25	3,45	97,49
16	A56	PC01	DB08	7,54	7,45	7,53	7,07	4	7,40			0,22	3,02	97,58
17	F16x	PC01	DB08	7,38	7,48	7,42	7,45	4	7,43			0,04	0,58	98,04
18	A42x	PB04	DB01	7,33	7,53	7,55	7,37	4	7,44			0,11	1,49	98,18
19	A91	PB02	DB99	7,43	7,83	7,29	7,29	4	7,46			0,26	3,42	98,41
20	A81	PD02	DB10	7,48	7,53	7,40	7,44	4	7,46			0,06	0,75	98,44
21	F26	PD02	DB08	7,49	7,38	7,48	7,51	4	7,47			0,06	0,78	98,48
22	F07x	PC02	DB08	7,46	7,53	7,50	7,48	4	7,49			0,03	0,40	98,79
23	F32x	PD02	DB08	7,52	7,58	7,42	7,44	4	7,49			0,07	0,99	98,80
24	F18x	PD99	DB08	7,48	7,52	7,59	7,60	4	7,55			0,06	0,76	99,56
25	A60x	PD01	DB10	7,56	7,59	7,69	7,41	4	7,56			0,12	1,53	99,74
26	F02x	PD02	DB08	7,58	7,59	7,55	7,56	4	7,57			0,02	0,24	99,86
27	F12x	PC01	DB08	7,58	7,61	7,58	7,55	4	7,58			0,02	0,32	99,99
28	A45x	PZ99	DB08	7,58	7,57	7,62	7,58	4	7,59			0,02	0,29	100,09
29	F15x	PC01	DB08	7,59	7,63	7,57	7,57	4	7,59			0,03	0,37	100,12
30	F05x	PD02	DB08	7,65	7,61	7,63	7,62	4	7,63			0,02	0,22	100,62
31	A58x	PD02	DB02	7,69	7,69	7,61	7,59	4	7,65			0,05	0,69	100,85
32	A57	PZ02	DD02	7,70	7,71	7,71	7,71	4	7,71			0,00	0,06	101,67
33	F06x	PD02	DB08	7,83	7,66	7,71	7,81	4	7,75			0,08	1,03	102,24
34	F33x	PD01	DB10	8,01	7,86	7,74	7,79	4	7,85			0,12	1,50	103,55
35	A65	PC01	DB08	7,89	7,82	7,95	7,88	4	7,89			0,05	0,68	104,02
36	A53	PZ02	DD02	7,91	7,94	7,92	7,95	4	7,93			0,02	0,23	104,61
37	F08x	PZ99	DB08	7,72	7,87	7,98	8,20	4	7,94			0,20	2,54	104,77
38	A43	PB06	DB01	7,70	8,20	7,94	8,00	4	7,96			0,21	2,59	105,00
39	A61x	PB02	DB08	7,92	7,85	7,97	8,11	4	7,96			0,11	1,38	105,04
40	F03	PD02	DB08	7,95	7,97	7,96	8,05	4	7,98			0,04	0,55	105,27
41	F04	PD02	DB01	8,09	8,11	7,89	8,02	4	8,03			0,10	1,24	105,90
42	A59	PB03	DB08	7,71	8,50	7,60	8,61	4	8,10			0,53	6,48	106,91
43	F09x	PZ02	DD02	8,04	8,15	8,22	8,28	4	8,17			0,10	1,26	107,81
44	A36	PD02	DB08	8,04	8,17	8,30	8,60	4	8,28			0,24	2,90	109,19
45	A88	PD99	DB08	8,50	8,55	7,94	8,36	4	8,34			0,28	3,32	109,98
46	F24x	PB03	DB01	10,11	10,26	10,31	10,24	0	10,23	*b*	*	0,09	0,84	134,95
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	N	Mean	SI	VI
	all labs	171	**7,58**	**0,116**	**1,526**
* = non tolerable mean because more than +/-	10	% from the mean		
	L		SR	VR
	43		**0,349**	**4,605**

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Ca **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. Si	Lab.standard dev. Vi	Recovery %
1	A62x	PC02	DB01	5,58	*5,39a*	5,58	5,58	0	5,58	*b*	*	0,00	0,00	73,79
2	F21x	PD02	DB01	6,15	6,07	6,09	6,14	0	6,11	*b*	*	0,04	0,63	80,83
3	F27x	PD01	DB01	6,80	6,73	6,78	6,66	4	6,74		*	0,06	0,91	89,12
4	A83	PB05	DB08	7,14	7,39	6,75	6,63	4	6,98			0,35	5,04	92,28
5	A49	PD05	DB08	6,98	7,03	7,04	7,03	4	7,02			0,03	0,37	92,83
6	F28x	PD02	DB08	6,96	6,67	7,13	7,37	4	7,03			0,30	4,21	92,97
7	A82	PC01	DB08	7,00	7,07	7,18	7,04	4	7,07			0,08	1,09	93,53
8	A79	PD03	DB10	7,16	7,21	7,26	7,20	4	7,20			0,04	0,59	95,27
9	A85x	PD02	DB08	7,34	7,40	7,16	7,15	4	7,26			0,13	1,74	96,06
10	F16x	PC01	DB08	7,34	7,28	7,24	7,34	4	7,30			0,05	0,65	96,52
11	F12x	PC01	DB08	7,38	7,32	7,37	7,28	4	7,34			0,05	0,63	97,03
12	F19x	PD02	DB08	7,34	7,33	7,45	7,39	4	7,38			0,06	0,75	97,56
13	F14x	PC01	DB08	7,42	7,38	7,38	7,36	4	7,38			0,03	0,38	97,63
14	A47x	PD01	DB08	7,31	7,40	7,48	7,42	4	7,40			0,07	0,95	97,89
15	F32x	PD02	DB08	7,43	7,38	7,38	7,45	4	7,41			0,04	0,48	97,99
16	A42x	PB04	DB01	7,38	7,42	7,52	7,52	4	7,46			0,07	0,99	98,67
17	A56	PC01	DB08	7,40	7,62	7,50	7,32	4	7,46			0,13	1,75	98,69
18	F18x	PD99	DB08	7,47	7,45	7,55	7,48	4	7,49			0,04	0,58	99,01
19	F01x	PB04	DB01	7,39	7,46	7,52	7,60	4	7,49			0,09	1,19	99,08
20	A59	PB03	DB08	8,28	7,82	7,18	6,73	4	7,50			0,68	9,13	99,19
21	A81	PD02	DB10	7,53	7,51	7,50	7,51	4	7,51			0,01	0,17	99,34
22	F07x	PC02	DB08	7,59	7,53	7,57	7,56	4	7,56			0,03	0,34	99,98
23	F15x	PC01	DB08	7,59	7,64	7,65	7,52	4	7,60			0,06	0,78	100,50
24	A60x	PD01	DB10	7,68	7,56	7,66	7,53	4	7,61			0,07	0,97	100,61
25	A45x	PZ99	DB08	7,63	7,60	7,60	7,61	4	7,61			0,01	0,19	100,63
26	F26	PD02	DB08	7,64	7,52	7,65	7,71	4	7,63			0,08	1,04	100,90
27	F02x	PD02	DB08	7,57	7,65	7,78	7,66	4	7,67			0,09	1,13	101,36
28	F05x	PD02	DB08	7,65	7,71	7,66	7,67	4	7,67			0,03	0,34	101,46
29	F33x	PD01	DB10	7,74	7,47	7,85	7,64	4	7,68			0,16	2,10	101,49
30	A39	PD02	DB08	8,18	7,65	7,47	7,39	4	7,68			0,35	4,61	101,50
31	A91	PB02	DB99	7,57	7,73	8,07	7,47	4	7,71			0,26	3,41	101,96
32	F03	PD02	DB08	7,71	7,76	7,71	7,68	4	7,71			0,04	0,45	102,01
33	A43	PB06	DB01	7,88	7,65	7,72	7,66	4	7,73			0,11	1,38	102,19
34	F06x	PD02	DB08	7,83	7,65	7,72	7,75	4	7,74			0,08	0,99	102,31
35	F04	PD02	DB01	7,77	7,95	7,65	7,60	4	7,74			0,16	2,01	102,39
36	A58x	PD02	DB02	7,76	7,76	7,76	7,75	4	7,76			0,00	0,06	102,58
37	F08x	PZ99	DB08	7,78	7,88	7,79	7,94	4	7,85			0,08	0,97	103,77
38	F13x	PZ02	DD01	7,93	7,80	8,11	7,80	4	7,91			0,15	1,86	104,60
39	A65	PC01	DB08	7,90	7,91	8,02	7,83	4	7,92			0,08	0,99	104,67
40	A36	PD02	DB08	7,61	8,07	8,05	7,94	4	7,92			0,21	2,69	104,70
41	A88	PD99	DB08	8,02	7,96	8,06	7,85	4	7,97			0,09	1,15	105,43
42	A61x	PB02	DB08	8,03	8,11	8,03	7,82	4	8,00			0,12	1,55	105,76
43	A57	PZ02	DD02	7,94	8,01	8,25	8,13	4	8,08			0,14	1,69	106,88
44	A53	PZ02	DD02	8,38	8,56	8,36	8,48	4	8,45		*	0,09	1,10	111,68
45	F09x	PZ02	DD02	8,55	8,64	8,71	8,72	0	8,66	*b*	*	0,08	0,91	114,45
46	F24x	PB03	DB01	10,00	10,05	*10,216a*	10,03	0	10,03	*b*	*	0,02	0,22	132,57
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	N	Mean	SI	VI
all labs	168	**7,56**	**0,114**	**1,505**
10	% from the mean			
	L		SR	VR
	42		**0,328**	**4,340**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	A62x	PC02	DB01	3,72	3,94	3,99	3,88	0	3,88	*b*	*	0,12	3,02	65,57
2	F21x	PD02	DB01	5,04	5,07	5,09	5,13	4	5,08		*	0,04	0,74	85,84
3	F27x	PD01	DB01	5,81	5,32	5,06	4,99	4	5,29		*	0,37	7,00	89,39
4	F28x	PD02	DB08	4,92	5,20	5,41	5,65	4	5,29		*	0,31	5,91	89,40
5	A85x	PD02	DB08	5,37	5,31	5,36	5,38	4	5,35			0,03	0,62	90,41
6	A83	PB05	DB08	5,50	5,48	5,33	5,22	4	5,38			0,13	2,42	90,88
7	A49	PD05	DB08	5,49	5,47	5,52	5,44	4	5,48			0,03	0,61	92,57
8	A82	PC01	DB08	5,52	5,56	5,59	5,56	4	5,56			0,03	0,52	93,86
9	A79	PD03	DB10	5,62	5,70	5,56	5,60	4	5,62			0,06	1,04	94,90
10	A47x	PD01	DB08	5,73	5,68	5,73	5,67	4	5,70			0,03	0,56	96,31
11	F14x	PC01	DB08	5,70	5,73	5,71	5,72	4	5,71			0,01	0,21	96,51
12	F19x	PD02	DB08	5,75	5,71	5,73	5,73	4	5,73			0,02	0,28	96,77
13	F32x	PD02	DB08	5,79	5,77	5,74	5,75	4	5,76			0,02	0,38	97,32
14	A58x	PD02	DB02	5,87	5,80	5,73	5,78	4	5,80			0,06	1,00	97,87
15	A39	PD02	DB08	5,64	5,92	5,75	5,91	4	5,80			0,14	2,35	97,98
16	F16x	PC01	DB08	5,78	5,86	5,83	5,80	4	5,82			0,03	0,54	98,25
17	F05x	PD02	DB08	5,83	5,80	5,84	5,86	4	5,83			0,03	0,43	98,50
18	A45x	PZ99	DB08	5,81	5,87	5,84	5,87	4	5,85			0,03	0,49	98,76
19	A56	PC01	DB08	5,87	5,87	5,87	5,79	4	5,85			0,04	0,69	98,81
20	F26	PD02	DB08	5,83	5,87	5,88	5,85	4	5,86			0,02	0,38	98,93
21	A81	PD02	DB10	5,91	5,84	5,82	5,86	4	5,86			0,04	0,66	98,93
22	F18x	PD99	DB08	5,90	5,80	5,88	5,85	4	5,86			0,04	0,74	98,93
23	A42x	PB04	DB01	5,98	5,98	5,98	5,63	4	5,89			0,18	2,98	99,52
24	F12x	PC01	DB08	5,86	5,93	5,91	5,88	4	5,90			0,03	0,53	99,56
25	F15x	PC01	DB08	5,95	6,00	5,84	5,91	4	5,93			0,07	1,14	100,07
26	F01x	PB04	DB01	5,85	5,93	5,95	6,01	4	5,94			0,07	1,11	100,24
27	A60x	PD01	DB10	6,01	6,03	5,89	5,86	4	5,95			0,08	1,40	100,45
28	F03	PD02	DB08	5,97	5,90	5,96	5,98	4	5,95			0,04	0,62	100,51
29	F07x	PC02	DB08	6,01	5,99	5,98	5,89	4	5,97			0,05	0,91	100,79
30	F02x	PD02	DB08	5,98	5,99	6,00	6,00	4	5,99			0,01	0,16	101,21
31	A91	PB02	DB99	5,93	6,21	6,24	5,79	4	6,04			0,22	3,62	102,05
32	A65	PC01	DB08	6,11	6,11	6,05	6,06	4	6,08			0,03	0,53	102,73
33	A59	PB03	DB08	6,03	6,25	6,02	6,04	4	6,09			0,11	1,83	102,79
34	A43	PB06	DB01	6,21	5,55	6,28	6,31	4	6,09			0,36	5,93	102,81
35	A61x	PB02	DB08	6,22	6,13	6,01	6,01	4	6,09			0,10	1,68	102,90
36	F13x	PZ02	DD01	6,17	6,21	6,19	6,26	4	6,21			0,04	0,62	104,84
37	A57	PZ02	DD02	6,22	6,24	6,19	6,21	4	6,22			0,02	0,33	104,96
38	F33x	PD01	DB10	6,29	6,26	6,12	6,21	4	6,22			0,07	1,20	105,05
39	A36	PD02	DB08	6,26	5,93	6,40	6,40	4	6,25			0,22	3,55	105,51
40	A88	PD99	DB08	6,19	6,38	6,18	6,31	4	6,27			0,10	1,54	105,81
41	F08x	PZ99	DB08	6,21	6,53	6,30	6,26	4	6,33			0,14	2,24	106,82
42	F06x	PD02	DB08	6,43	6,25	6,41	6,48	4	6,39			0,10	1,58	107,96
43	F04	PD02	DB01	6,56	6,48	6,33	6,62	4	6,50			0,13	1,93	109,74
44	A53	PZ02	DD02	6,54	6,54	6,52	6,54	4	6,54		*	0,01	0,15	110,37
45	F09x	PZ02	DD02	6,48	6,53	6,57	6,61	4	6,55		*	0,06	0,85	110,58
46	F24x	PB03	DB01	6,34	6,39	6,81	6,90	4	6,61		*	0,28	4,30	111,61
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	N	Mean	SI	VI
all labs	180	**5,92**	**0,090**	**1,513**
10	% from the mean			

L	SR	VR
45	**0,348**	**5,875**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	A62x	PC02	DB01	0,37	0,40	0,42	0,34	0	0,38	*b*	*	0,04	9,15	47,73
2	A83	PB05	DB08	0,53	0,57	0,59	0,52	0	0,55	*b*	*	0,03	5,79	68,87
3	F15x	PC01	DB08	0,72	0,71	0,68	0,71	4	0,71			0,02	2,46	87,98
4	A49	PD05	DB08	0,73	0,72	0,72	0,69	4	0,72			0,02	2,70	89,32
5	A85x	PD02	DB08	0,67	0,73	0,71	0,77	4	0,72			0,04	5,98	89,76
6	A79	PD03	DB10	0,72	0,72	0,73	0,72	4	0,72			0,00	0,43	89,93
7	A58x	PD02	DB02	0,76	0,72	0,73	0,70	4	0,73			0,03	3,44	90,79
8	F14x	PC01	DB08	0,73	0,74	0,73	0,74	4	0,74			0,00	0,67	91,97
9	A42x	PB04	DB01	0,79	0,72	0,78	0,72	4	0,75			0,04	5,13	94,06
10	F16x	PC01	DB08	0,76	0,77	0,75	0,75	4	0,76			0,01	1,30	94,68
11	F27x	PD01	DB01	0,84	0,92	0,65	0,65	0	0,76	*c*		0,14	**18,10**	95,40
12	A88	PD99	DB08	0,77	0,75	0,77	0,77	4	0,77			0,01	1,31	95,46
13	A47x	PD01	DB08	0,77	0,79	0,77	0,73	4	0,77			0,03	3,29	95,46
14	A82	PC01	DB08	0,75	0,76	0,77	0,80	4	0,77			0,02	2,91	96,00
15	A45x	PZ99	DB08	0,78	0,77	0,76	0,78	4	0,77			0,01	1,25	96,28
16	F12x	PC01	DB08	0,78	0,78	0,78	0,78	4	0,78			0,00	0,28	97,59
17	A81	PD02	DB10	0,76	0,77	0,77	0,83	4	0,78			0,03	4,09	97,65
18	F26	PD02	DB08	0,79	0,78	0,79	0,78	4	0,79			0,01	0,74	97,96
19	F28x	PD02	DB08	0,76	0,77	0,81	0,82	4	0,79			0,03	3,56	98,24
20	F18x	PD99	DB08	0,79	0,79	0,78	0,79	4	0,79			0,01	0,75	98,24
21	F01x	PB04	DB01	0,79	0,81	0,75	0,80	4	0,79			0,03	3,34	98,27
22	F32x	PD02	DB08	0,80	0,78	0,79	0,78	4	0,79			0,01	1,00	98,46
23	A39	PD02	DB08	0,78	0,79	0,80	0,81	4	0,79			0,01	1,36	99,11
24	A91	PB02	DB99	0,74	0,83	0,77	0,84	4	0,80			0,05	6,03	99,21
25	F07x	PC02	DB08	0,83	0,76	0,77	0,82	4	0,80			0,03	4,08	99,30
26	A60x	PD01	DB10	0,80	0,81	0,79	0,79	4	0,80			0,01	1,27	99,58
27	F19x	PD02	DB08	0,81	0,79	0,81	0,80	4	0,80			0,01	1,44	99,83
28	F02x	PD02	DB08	0,80	0,79	0,80	0,82	4	0,80			0,01	1,57	100,14
29	A61x	PB02	DB08	0,81	0,80	0,80	0,80	4	0,80			0,01	0,62	100,14
30	F33x	PD01	DB10	0,84	0,79	0,80	0,80	4	0,81			0,02	2,75	100,77
31	F06x	PD02	DB08	0,84	0,84	0,80	0,78	4	0,82			0,03	3,64	102,02
32	A59	PB03	DB08	0,80	0,81	0,78	0,88	4	0,82			0,04	5,44	102,08
33	F08x	PZ99	DB08	0,79	0,87	0,80	0,84	4	0,83			0,04	4,48	102,95
34	F05x	PD02	DB08	0,84	0,83	0,82	0,88	4	0,84			0,02	2,93	105,17
35	A56	PC01	DB08	0,83	0,83	0,86	0,86	4	0,85			0,02	2,26	105,63
36	A36	PD02	DB08	0,84	0,88	0,84	0,87	4	0,86			0,02	2,40	107,01
37	A65	PC01	DB08	0,89	0,83	0,88	0,84	4	0,86			0,03	3,42	107,32
38	F03	PD02	DB08	0,84	0,86	0,90	0,86	4	0,87			0,02	2,76	108,29
39	A53	PZ02	DD02	0,89	0,88	0,88	0,89	4	0,89			0,01	0,65	110,44
40	A57	PZ02	DD02	0,90	0,89	0,91	0,90	4	0,90			0,01	0,91	112,31
41	F04	PD02	DB01	0,88	0,90	*0,965a*	0,90	3	0,89			0,01	1,01	111,60
42	F09x	PZ02	DD02	0,90	0,91	0,92	0,92	4	0,91			0,01	1,05	113,87
43	A43	PB06	DB01	0,99	0,91	0,91	0,97	4	0,95		*	0,04	4,05	118,02
44	F13x	PZ02	DD01	1,00	*1,06a*	0,99	1,00	0	1,00	*b*	*	0,01	0,58	124,37
45	F21x	PD02	DB01	1,01	1,02	1,02	*1,06a*	0	1,02	*b*	*	0,01	0,57	126,87
46	F24x	PB03	DB01	1,28	1,29	1,30	*1,43a*	0	1,29	*b*	*	0,01	0,45	161,06
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	N	Mean	SI	VI
all labs	159	**0,80**	**0,020**	**2,461**
15	% from the mean			
	L		SR	VR
	40		**0,056**	**7,044**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Mg **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. Si	Vi	Recovery %
1	F27x	PD01	DB01	2,25	2,36	2,28	2,24	4	2,28	*	0,05	2,30	87,99
2	A62x	PD02	DB01	2,22	2,41	2,35	2,26	4	2,31	*	0,09	3,72	89,12
3	F28x	PD02	DB08	2,22	2,34	2,42	2,39	4	2,34		0,09	3,80	90,24
4	F07x	PD02	DB08	2,32	2,34	2,35	2,36	4	2,34		0,02	0,67	90,32
5	A57	PZ02	DD02	2,38	2,38	2,36	2,37	4	2,37		0,01	0,40	91,53
6	F33x	PD01	DB10	2,43	2,45	2,43	2,44	4	2,44		0,01	0,39	94,03
7	A83	PB05	DB08	2,48	2,41	2,39	2,47	4	2,44		0,04	1,82	94,12
8	A53	PZ02	DD02	2,44	2,44	2,44	2,45	4	2,44		0,01	0,20	94,23
9	A58x	PD02	DB01	2,44	2,44	2,46	2,47	4	2,45		0,02	0,61	94,61
10	A49	PD05	DB08	2,46	2,48	2,45	2,46	4	2,46		0,01	0,46	95,05
11	F09x	PZ02	DD02	2,42	2,45	2,49	2,50	4	2,47		0,04	1,50	95,09
12	A56	PC01	DB08	2,50	2,49	2,50	2,39	4	2,47		0,05	2,18	95,27
13	F26	PD02	DB08	2,48	2,49	2,49	2,43	4	2,47		0,03	1,16	95,38
14	A79	PD03	DB10	2,52	2,53	2,50	2,49	4	2,51		0,02	0,63	96,87
15	A85x	PD02	DB08	2,50	2,53	2,51	2,52	4	2,51		0,01	0,59	96,97
16	A43	PB06	DB02	2,51	2,63	2,57	2,51	4	2,55		0,05	2,14	98,52
17	F08x	PZ99	DB08	2,43	2,57	2,56	2,68	4	2,56		0,10	4,00	98,76
18	F13x	PD01	DB08	2,55	2,54	2,56	2,60	4	2,56		0,03	1,03	98,86
19	F18x	PD99	DB08	2,57	2,57	2,57	2,56	4	2,57		0,00	0,19	99,05
20	F19x	PD02	DB08	2,58	2,58	2,54	2,58	4	2,57		0,02	0,78	99,15
21	A91	PB02	DB99	2,50	2,71	2,66	2,44	4	2,58		0,13	4,97	99,43
22	A81	PD02	DB10	2,60	2,58	2,56	2,57	4	2,58		0,02	0,66	99,43
23	F06x	PD02	DB08	2,61	2,55	2,58	2,60	4	2,58		0,02	0,94	99,70
24	A82	PC01	DB08	2,61	2,61	2,59	2,57	4	2,60		0,02	0,74	100,11
25	A45x	PZ99	DB08	2,60	2,58	2,60	2,61	4	2,60		0,01	0,48	100,21
26	F02x	PD02	DB08	2,58	2,60	2,62	2,63	4	2,61		0,02	0,85	100,59
27	F12x	PC01	DB08	2,62	2,62	2,61	2,61	4	2,62		0,01	0,21	100,89
28	A42x	PB04	DB01	2,62	2,60	2,65	2,60	4	2,62		0,02	0,88	100,98
29	F05x	PD02	DB08	2,63	2,61	2,61	2,62	4	2,62		0,01	0,37	100,98
30	F01x	PB04	DB01	2,59	2,62	2,63	2,64	4	2,62		0,02	0,82	101,07
31	F14x	PC01	DB08	2,64	2,61	2,62	2,63	4	2,62		0,01	0,47	101,24
32	F16x	PC01	DB08	2,61	2,65	2,65	2,60	4	2,63		0,03	0,96	101,32
33	A36	PD02	DB08	2,48	2,67	2,70	2,77	4	2,66		0,12	4,67	102,42
34	F15x	PC01	DB08	2,67	2,69	2,69	2,65	4	2,68		0,02	0,72	103,20
35	A65	PD01	DB08	2,69	2,67	2,70	2,68	4	2,69		0,01	0,48	103,58
36	F32x	PD02	DB08	2,75	2,72	2,67	2,69	4	2,71		0,04	1,29	104,45
37	F03	PD02	DB08	2,71	2,71	2,73	2,73	4	2,72		0,01	0,39	104,93
38	A60x	PD01	DB10	2,83	2,78	2,76	2,70	4	2,77		0,05	1,93	106,76
39	F04	PD02	DB01	2,75	2,74	2,76	2,82	4	2,77		0,04	1,30	106,76
40	A61x	PB02	DB08	2,75	2,74	2,77	2,82	4	2,77		0,04	1,28	106,86
41	A39	PD02	DB08	2,79	2,81	2,69	2,81	4	2,77		0,06	2,11	106,99
42	A47x	PD01	DB08	2,80	2,77	2,81	2,78	4	2,79		0,02	0,65	107,63
43	A59	PB03	DB08	2,68	2,95	2,63	2,97	4	2,81		0,18	6,27	108,29
44	A88	PD99	DB08	2,84	2,85	2,86	2,86	4	2,85	*	0,01	0,34	110,04
45	F21x	PD02	DB01	2,90	2,88	2,91	2,85	4	2,89	*	0,03	0,92	111,30
46	F24x	PB03	DB01	2,92	2,92	3,00	3,16	4	3,00	*	0,11	3,76	115,69
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	N	Mean	SI	VI
all labs	184	**2,59**	**0,038**	**1,463**
10	% from the mean			

L	SR	VR
46	**0,157**	**6,045**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A62x	PD02	DB01	1,13	1,15	1,12	1,14	0	1,14	*b*	*	0,01	1,14	71,33
2	F28x	PD02	DB08	1,37	1,39	1,50	1,48	4	1,43			0,06	4,50	90,14
3	F27x	PD01	DB01	1,43	1,47	1,43	1,46	4	1,45			0,02	1,29	90,85
4	A83	PB05	DB08	1,51	1,52	1,45	1,43	4	1,48			0,04	2,90	92,80
5	F33x	PD01	DB10	1,50	1,45	1,51	1,47	4	1,48			0,03	1,86	93,17
6	A53	PZ02	DD02	1,48	1,49	1,47	1,50	4	1,49			0,01	0,87	93,33
7	F09x	PZ02	DD02	1,46	1,49	1,50	1,51	4	1,49			0,02	1,45	93,65
8	A57	PZ02	DD02	1,47	1,49	1,53	1,51	4	1,50			0,03	1,72	94,27
9	F07x	PD02	DB08	1,50	1,53	1,50	1,51	4	1,51			0,02	1,01	94,71
10	A56	PC01	DB08	1,53	1,55	1,53	1,52	4	1,53			0,01	0,91	96,40
11	A85x	PD02	DB08	1,59	1,51	1,50	1,55	4	1,54			0,04	2,65	96,68
12	F26	PD02	DB08	1,55	1,56	1,53	1,54	4	1,55			0,01	0,84	97,10
13	A49	PD05	DB08	1,54	1,54	1,54	1,57	4	1,55			0,01	0,94	97,18
14	A58x	PD02	DB01	1,54	1,54	1,56	1,55	4	1,55			0,01	0,62	97,26
15	A79	PD03	DB10	1,55	1,56	1,56	1,57	4	1,56			0,01	0,61	97,84
16	F08x	PZ99	DB08	1,52	1,54	1,56	1,61	4	1,56			0,04	2,48	97,89
17	F21x	PD02	DB01	1,56	1,57	1,60	1,59	4	1,58			0,02	1,16	99,30
18	F13x	PD01	DB08	1,58	1,57	1,59	1,59	4	1,58			0,01	0,61	99,46
19	F16x	PC01	DB08	1,60	1,58	1,59	1,56	4	1,58			0,02	1,26	99,49
20	A81	PD02	DB10	1,59	1,61	1,59	1,58	4	1,59			0,01	0,79	100,09
21	F18x	PD99	DB08	1,60	1,60	1,59	1,59	4	1,60			0,01	0,36	100,24
22	F12x	PC01	DB08	1,59	1,59	1,60	1,60	4	1,60			0,01	0,34	100,32
23	A42x	PB04	DB01	1,61	1,58	1,59	1,63	4	1,60			0,02	1,28	100,70
24	F19x	PD02	DB08	1,59	1,60	1,62	1,61	4	1,61			0,01	0,80	100,87
25	F06x	PD02	DB08	1,62	1,59	1,61	1,62	4	1,61			0,01	0,84	101,09
26	F04	PD02	DB01	1,66	1,68	1,60	1,50	4	1,61			0,08	5,02	101,19
27	A91	PB02	DB99	1,56	1,64	1,70	1,54	4	1,61			0,07	4,59	101,19
28	F03	PD02	DB08	1,61	1,61	1,60	1,63	4	1,61			0,01	0,70	101,33
29	F01x	PB04	DB01	1,60	1,61	1,63	1,62	4	1,62			0,01	0,80	101,50
30	F14x	PC01	DB08	1,63	1,62	1,62	1,61	4	1,62			0,01	0,35	101,74
31	F05x	PD02	DB08	1,62	1,62	1,62	1,62	4	1,62			0,00	0,00	101,82
32	A82	PC01	DB08	1,61	1,63	1,62	1,63	4	1,62			0,01	0,59	101,97
33	A43	PB06	DB02	1,64	1,58	1,64	1,64	4	1,62			0,03	1,76	101,99
34	F02x	PD02	DB08	1,60	1,63	1,66	1,63	4	1,63			0,02	1,50	102,44
35	A36	PD02	DB08	1,57	1,66	1,66	1,66	4	1,64			0,04	2,75	102,92
36	F15x	PC01	DB08	1,65	1,64	1,64	1,63	4	1,64			0,01	0,50	103,07
37	A59	PB03	DB08	1,78	1,74	1,55	1,51	4	1,64			0,13	8,10	103,31
38	A65	PD01	DB08	1,67	1,67	1,67	1,66	4	1,67			0,01	0,30	104,80
39	A47x	PD01	DB08	1,69	1,68	1,68	1,68	4	1,68			0,01	0,30	105,74
40	A88	PD99	DB08	1,70	1,68	1,69	1,67	4	1,69			0,01	0,77	105,90
41	F24x	PB03	DB01	1,68	1,68	1,69	1,69	4	1,69			0,01	0,43	105,93
42	F32x	PD02	DB08	1,70	1,68	1,70	1,67	4	1,69			0,02	0,89	106,06
43	A61x	PB02	DB08	1,71	1,71	1,69	1,65	4	1,69			0,03	1,67	106,21
44	A39	PD02	DB08	1,74	1,75	1,66	1,70	4	1,71			0,04	2,41	107,52
45	A60x	PD01	DB10	1,75	1,72	1,75	1,69	4	1,73			0,03	1,68	108,54
46	A45x	PZ99	DB08	6,39	6,17	6,29	6,48	0	6,33	*b*	*	0,13	2,10	397,99
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	N	Mean	SI	VI
all labs	176	**1,59**	**0,024**	**1,521**
10	% from the mean			
	L		SR	VR
	44		**0,072**	**4,504**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Mg **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. Si	Vi	Recovery %
1	A62x	PD02	DB01	0,56	0,55	0,54	0,50	0	0,54	*b*	*	0,03	4,89	50,50
2	F27x	PD01	DB01	0,92	0,91	0,94	0,90	0	0,91	*b*	*	0,02	1,77	85,91
3	A83	PB05	DB08	0,96	0,97	0,95	0,94	4	0,95		*	0,01	1,50	89,64
4	F21x	PD02	DB01	0,98	0,97	0,99	0,97	4	0,98			0,01	0,98	91,83
5	A85x	PD02	DB08	1,00	0,97	0,97	0,98	4	0,98			0,01	1,27	92,02
6	F28x	PD02	DB08	0,93	0,93	1,04	1,05	4	0,99			0,07	6,74	92,77
7	A56	PC01	DB08	1,01	1,00	1,00	1,03	4	1,01			0,02	1,51	94,82
8	F07x	PD02	DB08	1,02	1,01	1,02	1,00	4	1,02			0,01	0,85	95,38
9	F16x	PC01	DB08	1,04	1,05	1,05	1,01	4	1,04			0,02	1,63	97,42
10	A79	PD03	DB10	1,04	1,05	1,02	1,04	4	1,04			0,01	1,05	97,44
11	F26	PD02	DB08	1,05	1,04	1,04	1,03	4	1,04			0,01	0,79	97,70
12	F19x	PD02	DB08	1,03	1,05	1,04	1,05	4	1,04			0,01	0,92	97,94
13	F03	PD02	DB08	1,05	1,04	1,04	1,05	4	1,04			0,01	0,54	98,08
14	A81	PD02	DB10	1,04	1,05	1,05	1,04	4	1,05			0,01	0,55	98,17
15	A47x	PD01	DB08	1,04	1,05	1,05	1,04	4	1,05			0,01	0,55	98,17
16	A49	PD05	DB08	1,05	1,04	1,05	1,05	4	1,05			0,00	0,23	98,22
17	F13x	PD01	DB08	1,05	1,05	1,06	1,05	4	1,05			0,01	0,48	98,88
18	A58x	PD02	DB01	1,06	1,04	1,05	1,06	4	1,05			0,01	0,91	98,88
19	F18x	PD99	DB08	1,06	1,05	1,05	1,06	4	1,06			0,01	0,55	99,11
20	F08x	PZ99	DB08	1,05	1,02	1,08	1,07	4	1,06			0,03	2,51	99,11
21	F14x	PC01	DB08	1,05	1,06	1,06	1,06	4	1,06			0,00	0,40	99,37
22	F12x	PC01	DB08	1,04	1,06	1,07	1,07	4	1,06			0,01	1,37	99,72
23	A43	PB06	DB02	1,11	1,05	1,00	1,11	4	1,06			0,05	5,00	99,98
24	F09x	PZ02	DD02	1,05	1,06	1,07	1,08	4	1,07			0,01	1,21	100,05
25	A57	PZ02	DD02	1,06	1,07	1,08	1,07	4	1,07			0,01	0,76	100,52
26	A42x	PB04	DB01	1,09	1,09	1,06	1,06	4	1,07			0,02	1,81	100,92
27	F05x	PD02	DB08	1,08	1,07	1,07	1,08	4	1,08			0,01	0,54	100,99
28	A53	PZ02	DD02	1,08	1,08	1,07	1,07	4	1,08			0,01	0,54	100,99
29	A82	PC01	DB08	1,07	1,07	1,09	1,08	4	1,08			0,01	0,89	101,23
30	F04	PD02	DB01	1,11	1,10	1,06	1,04	4	1,08			0,03	3,07	101,23
31	A91	PB02	DB99	1,05	1,12	1,13	1,02	4	1,08			0,05	4,96	101,46
32	A61x	PB02	DB08	1,11	1,09	1,07	1,08	4	1,09			0,02	1,57	102,17
33	F32x	PD02	DB08	1,09	1,08	1,09	1,09	4	1,09			0,01	0,46	102,17
34	F33x	PD01	DB10	1,07	1,09	1,09	1,11	4	1,09			0,02	1,50	102,40
35	F15x	PC01	DB08	1,09	1,09	1,08	1,10	4	1,09			0,01	0,75	102,40
36	F02x	PD02	DB08	1,09	1,08	1,10	1,10	4	1,09			0,01	0,88	102,64
37	F01x	PB04	DB01	1,08	1,10	1,09	1,11	4	1,10			0,01	1,18	102,87
38	A65	PD01	DB08	1,10	1,10	1,10	1,10	4	1,10			0,00	0,00	103,34
39	A36	PD02	DB08	1,10	1,04	1,13	1,14	4	1,10			0,05	4,08	103,57
40	F06x	PD02	DB08	1,11	1,09	1,13	1,12	4	1,11			0,02	1,51	104,37
41	A39	PD02	DB08	1,09	1,11	1,11	1,15	4	1,11			0,02	2,04	104,63
42	F24x	PB03	DB01	1,12	1,13	1,13	1,13	4	1,12			0,01	0,46	105,55
43	A59	PB03	DB08	1,13	1,16	1,12	1,12	4	1,13			0,02	1,57	106,42
44	A60x	PD01	DB10	1,16	1,15	1,13	1,15	4	1,15			0,01	1,14	107,61
45	A88	PD99	DB08	1,14	1,18	1,12	1,15	4	1,15			0,02	2,18	107,80
46	A45x	PZ99	DB08	5,27	5,38	5,30	5,29	0	5,31	*b*	*	0,05	0,91	498,85
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	N	Mean	SI	VI
all labs	172	**1,06**	**0,016**	**1,471**
10	% from the mean			
	L		SR	VR
	43		**0,043**	**4,020**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F28x	PD02	DB08	0,52	0,56	0,52	0,51	4	0,53		*	0,02	4,14	85,44
2	F27x	PD01	DB01	0,55	0,53	0,54	0,54	4	0,54		*	0,01	1,15	87,27
3	A83	PB05	DB08	0,54	0,55	0,56	0,53	4	0,55		*	0,02	2,86	88,70
4	A85x	PD02	DB08	0,56	0,57	0,56	0,53	4	0,55		*	0,01	2,68	89,99
5	A56	PC01	DB08	0,58	0,58	0,58	0,60	4	0,59			0,01	1,33	95,22
6	F16x	PC01	DB08	0,59	0,59	0,59	0,57	4	0,59			0,01	1,50	95,25
7	F26	PD02	DB08	0,59	0,59	0,59	0,58	4	0,59			0,01	0,85	95,48
8	A91	PB02	DB99	0,57	0,63	0,59	0,56	4	0,59			0,03	5,27	95,48
9	F21x	PD02	DB01	0,58	0,58	0,59	0,60	4	0,59			0,01	1,63	95,48
10	A49	PD05	DB08	0,59	0,59	0,59	0,59	4	0,59			0,00	0,14	96,21
11	A45x	PZ99	DB08	0,60	0,60	0,59	0,60	4	0,60			0,01	0,99	96,86
12	A88	PD99	DB08	0,60	0,59	0,60	0,61	4	0,60			0,01	1,36	97,51
13	F19x	PD02	DB08	0,60	0,59	0,60	0,60	4	0,60			0,01	0,87	97,59
14	F33x	PD01	DB10	0,61	0,60	0,60	0,60	4	0,60			0,01	0,83	97,92
15	F18x	PD99	DB08	0,60	0,61	0,61	0,61	4	0,61			0,00	0,25	98,44
16	F14x	PC01	DB08	0,61	0,61	0,61	0,61	4	0,61			0,00	0,51	98,73
17	A58x	PD02	DB01	0,60	0,61	0,61	0,61	4	0,61			0,01	0,82	98,73
18	A61x	PB02	DB08	0,61	0,61	0,60	0,61	4	0,61			0,01	0,82	98,73
19	F03	PD02	DB08	0,61	0,61	0,61	0,61	4	0,61			0,00	0,47	98,85
20	F07x	PD02	DB08	0,61	0,61	0,62	0,61	4	0,61			0,01	0,86	99,05
21	F06x	PD02	DB08	0,63	0,63	0,60	0,59	4	0,61			0,02	3,52	99,35
22	A81	PD02	DB10	0,60	0,60	0,61	0,64	4	0,61			0,02	3,09	99,54
23	A62x	PD02	DB01	0,59	0,61	0,60	0,65	4	0,61			0,03	4,29	99,54
24	A79	PD03	DB10	0,61	0,62	0,61	0,62	4	0,61			0,00	0,63	99,86
25	A47x	PD01	DB08	0,61	0,61	0,62	0,62	4	0,62			0,01	0,94	99,95
26	A82	PC01	DB08	0,61	0,61	0,62	0,63	4	0,62			0,01	1,53	100,27
27	F12x	PC01	DB08	0,59	0,63	0,63	0,63	4	0,62			0,02	2,65	100,52
28	A42x	PB04	DB01	0,62	0,61	0,63	0,62	4	0,62			0,01	1,66	100,96
29	F02x	PD02	DB08	0,61	0,62	0,63	0,63	4	0,62			0,01	1,54	101,17
30	F15x	PC01	DB08	0,62	0,62	0,62	0,63	4	0,62			0,01	0,80	101,17
31	A43	PB06	DB02	0,61	0,61	0,61	0,67	4	0,63			0,03	4,46	102,06
32	A36	PD02	DB08	0,63	0,64	0,62	0,66	4	0,64			0,02	2,68	103,60
33	A65	PD01	DB08	0,65	0,63	0,63	0,64	4	0,64			0,01	1,50	103,60
34	F01x	PB04	DB01	0,61	0,63	0,65	0,66	4	0,64			0,02	3,48	103,60
35	F32x	PD02	DB08	0,65	0,66	0,65	0,64	4	0,65			0,01	1,39	105,31
36	A59	PB03	DB08	0,66	0,64	0,62	0,68	4	0,65			0,02	3,55	105,55
37	F05x	PD02	DB08	0,65	0,66	0,66	0,66	4	0,66			0,00	0,34	106,49
38	F08x	PZ99	DB08	0,66	0,72	0,64	0,63	4	0,66			0,04	5,86	107,79
39	F13x	PD01	DB08	0,66	0,66	0,67	0,67	4	0,67			0,01	0,87	108,07
40	F04	PD02	DB01	0,64	0,67	0,67	0,69	4	0,67			0,02	3,42	108,56
41	A60x	PD01	DB10	0,68	0,69	0,67	0,66	4	0,67			0,01	1,77	109,50
42	F24x	PB03	DB01	0,67	0,68	0,69	0,70	4	0,68		*	0,01	2,09	111,00
43	A39	PD02	DB08	0,72	0,71	0,71	0,71	4	0,71		*	0,01	0,76	115,59
44	A57	PZ02	DD02	0,75	0,75	0,77	0,76	0	0,76	*b*	*	0,01	1,26	123,11
45	A53	PZ02	DD02	0,77	0,76	0,76	0,77	0	0,77	*b*	*	0,01	0,75	124,33
46	F09x	PZ02	DD02	0,78	0,79	0,80	0,80	0	0,79	*b*	*	0,01	1,21	128,79
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	N	Mean	SI	VI
all labs	172	**0,62**	**0,012**	**1,911**
10	% from the mean			
	L		SR	VR
	43		**0,038**	**6,096**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A82	PC01	DB08	5,01	5,07	5,07	4,98	0	5,03	*b*	*	0,05	0,89	78,26
2	A62x	PD02	DB01	4,85	5,25	5,64	5,56	0	5,33	*b*	*	0,36	6,73	82,81
3	A83	PB05	DB08	5,31	5,45	5,60	6,02	4	5,60		*	0,30	5,44	87,01
4	F04	PD02	DB06	5,79	5,82	5,88	5,76	4	5,81			0,05	0,88	90,39
5	A43	PB06	DB01	5,76	6,09	6,14	5,87	4	5,97			0,18	3,02	92,76
6	F13x	PZ02	DD01	5,88	6,02	6,04	6,02	4	5,99			0,07	1,23	93,15
7	A49	PD05	DB08	6,01	6,04	6,05	6,05	4	6,04			0,02	0,35	93,86
8	F28x	PD02	DB08	5,86	5,93	6,23	6,26	4	6,07			0,20	3,37	94,40
9	A59	PB03	DB08	5,85	6,19	5,78	6,47	4	6,07			0,32	5,28	94,42
10	A85x	PD02	DB08	6,05	6,02	6,10	6,13	4	6,07			0,05	0,83	94,45
11	F27x	PD01	DB06	6,16	6,04	6,11	6,15	4	6,11			0,05	0,89	95,07
12	A91	PB02	DB99	6,12	5,32	6,76	6,50	4	6,18			0,63	**10,16**	96,02
13	F07x	PD02	DB08	6,30	6,22	6,20	6,27	4	6,25			0,05	0,75	97,14
14	F18x	PD99	DB08	6,28	6,24	6,21	6,28	4	6,25			0,03	0,54	97,23
15	A58x	PD02	DB01	6,25	6,28	6,25	6,27	4	6,26			0,02	0,24	97,38
16	A88	PD99	DB08	6,29	6,36	6,03	6,40	4	6,27			0,17	2,65	97,50
17	F26	PD02	DB08	6,29	6,40	6,22	6,32	4	6,31			0,07	1,18	98,08
18	F06x	PD02	DB08	6,40	6,30	6,21	6,37	4	6,32			0,08	1,34	98,25
19	F32x	PD02	DB08	6,59	6,27	6,35	6,18	4	6,35			0,18	2,77	98,71
20	F19x	PD02	DB08	6,40	6,37	6,28	6,38	4	6,36			0,05	0,84	98,86
21	A45x	PZ99	DB08	6,39	6,39	6,37	6,33	4	6,37			0,03	0,44	99,06
22	F33x	PD01	DB10	6,40	6,41	6,39	6,41	4	6,40			0,01	0,15	99,56
23	F14x	PC01	DB08	6,52	6,37	6,37	6,36	4	6,40			0,07	1,17	99,60
24	A42x	PB04	DB01	6,41	6,33	6,52	6,37	4	6,41			0,08	1,24	99,61
25	F01x	PB04	DB01	6,37	6,42	6,48	6,54	4	6,45			0,07	1,14	100,34
26	F03	PD02	DB08	6,47	6,45	6,48	6,46	4	6,47			0,01	0,23	100,55
27	F16x	PC01	DB08	6,45	6,52	6,45	6,47	4	6,47			0,04	0,55	100,63
28	A81	PD02	DB10	6,52	6,58	6,46	6,37	4	6,48			0,09	1,38	100,81
29	F05x	PD02	DB08	6,49	6,49	6,48	6,49	4	6,49			0,00	0,08	100,88
30	F15x	PC01	DB08	6,54	6,54	6,59	6,49	4	6,54			0,04	0,62	101,70
31	A56	PC01	DB08	6,69	6,67	6,73	6,11	4	6,55			0,30	4,53	101,86
32	F12x	PC01	DB08	6,56	6,58	6,56	6,57	4	6,57			0,01	0,15	102,13
33	A65	PD01	DB08	6,56	6,53	6,64	6,54	4	6,57			0,05	0,76	102,13
34	A79	PD03	DB10	6,52	6,58	6,74	6,68	4	6,63			0,10	1,45	103,10
35	F21x	PD02	DB01	6,58	6,54	6,73	6,72	4	6,64			0,10	1,46	103,29
36	F02x	PD02	DB08	6,61	6,62	6,64	6,70	4	6,64			0,04	0,61	103,29
37	A57	PZ02	DD02	6,64	6,63	6,70	6,66	4	6,66			0,03	0,46	103,53
38	A53	PZ02	DD02	6,64	6,67	6,68	6,68	4	6,67			0,02	0,28	103,68
39	F09x	PZ02	DD01	6,60	6,67	6,74	6,78	4	6,70			0,08	1,18	104,15
40	A39	PD02	DB08	6,55	6,62	6,55	7,13	4	6,72			0,28	4,15	104,43
41	F24x	PB03	DB01	6,78	6,79	6,86	6,87	4	6,82			0,05	0,68	106,13
42	A36	PD02	DB08	7,10	6,75	6,73	7,04	4	6,91			0,19	2,78	107,38
43	A61x	PB02	DB08	6,89	6,84	6,91	7,01	4	6,91			0,07	1,03	107,49
44	F08x	PZ99	DB08	6,81	6,82	6,94	7,09	4	6,92			0,13	1,89	107,53
45	A47x	PD01	DB08	6,98	6,86	6,95	6,99	4	6,95			0,06	0,85	108,00
46	A60x	PD01	DB10	7,53	7,46	7,34	7,12	4	7,36		*	0,18	2,42	114,47
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	N	Mean	SI	VI
all labs	176	**6,43**	**0,106**	**1,649**
10	% from the mean			
	L		SR	VR
	44		**0,334**	**5,198**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A82	PC01	DB08	4,01	4,01	4,06	4,06	0	4,04	*b*	*	0,03	0,72	78,63
2	A62x	PD02	DB01	4,50	4,43	4,54	4,57	4	4,51		*	0,06	1,34	87,88
3	A59	PB03	DB08	5,11	4,53	4,45	4,17	4	4,56		*	0,39	8,65	88,93
4	A43	PB06	DB01	4,89	4,57	4,46	4,57	4	4,62			0,19	4,02	90,08
5	F04	PD02	DB06	4,62	4,70	4,63	4,66	4	4,65			0,04	0,77	90,66
6	A83	PB05	DB08	4,78	4,67	4,40	4,76	4	4,65			0,18	3,78	90,68
7	A88	PD99	DB08	4,73	4,72	4,75	4,70	4	4,73			0,02	0,44	92,07
8	F28x	PD02	DB08	4,72	4,51	4,98	4,78	4	4,75			0,20	4,11	92,50
9	A49	PD05	DB08	4,79	4,79	4,81	4,72	4	4,78			0,04	0,79	93,06
10	A85x	PD02	DB08	4,95	4,92	4,79	4,86	4	4,88			0,07	1,38	95,09
11	F27x	PD01	DB06	4,94	5,02	4,85	5,08	4	4,97			0,10	2,07	96,88
12	F13x	PZ02	DD01	5,00	4,94	5,11	4,95	4	5,00			0,08	1,56	97,43
13	A91	PB02	DB99	4,91	4,34	5,41	5,35	4	5,00			0,49	9,89	97,48
14	F07x	PD02	DB08	5,07	5,03	4,97	5,00	4	5,01			0,04	0,85	97,72
15	F18x	PD99	DB08	5,06	5,03	5,04	5,00	4	5,03			0,02	0,50	98,07
16	A45x	PZ99	DB08	5,07	5,04	5,04	5,05	4	5,05			0,01	0,28	98,41
17	F16x	PC01	DB08	5,12	5,03	5,05	5,02	4	5,05			0,05	0,95	98,48
18	F26	PD02	DB08	5,16	5,04	5,02	5,04	4	5,07			0,06	1,26	98,70
19	F33x	PD01	DB10	5,10	4,94	5,18	5,05	4	5,07			0,10	1,98	98,75
20	F03	PD02	DB08	5,12	5,14	5,06	5,04	4	5,09			0,05	0,96	99,18
21	F06x	PD02	DB08	5,15	5,08	5,10	5,14	4	5,12			0,03	0,67	99,69
22	A58x	PD02	DB01	5,17	5,13	5,07	5,17	4	5,14			0,05	0,92	100,06
23	F21x	PD02	DB01	5,14	5,17	5,12	5,11	4	5,14			0,03	0,52	100,06
24	A56	PC01	DB08	5,23	5,18	5,08	5,05	4	5,14			0,09	1,69	100,09
25	F01x	PB04	DB01	5,06	5,09	5,19	5,22	4	5,14			0,08	1,50	100,16
26	F05x	PD02	DB08	5,15	5,14	5,14	5,14	4	5,14			0,01	0,10	100,21
27	F14x	PC01	DB08	5,17	5,17	5,13	5,14	4	5,15			0,02	0,38	100,34
28	F19x	PD02	DB08	5,08	5,13	5,22	5,22	4	5,16			0,07	1,35	100,60
29	A81	PD02	DB10	5,22	5,26	5,17	5,17	4	5,21			0,04	0,84	101,43
30	F15x	PC01	DB08	5,20	5,24	5,23	5,18	4	5,21			0,03	0,53	101,57
31	A42x	PB04	DB01	5,22	5,20	5,24	5,24	4	5,22			0,02	0,41	101,78
32	A39	PD02	DB08	5,32	5,15	5,28	5,24	4	5,25			0,07	1,36	102,21
33	A65	PD01	DB08	5,24	5,25	5,26	5,27	4	5,26			0,01	0,25	102,40
34	F12x	PC01	DB08	5,26	5,24	5,27	5,26	4	5,26			0,01	0,24	102,45
35	F32x	PD02	DB08	5,04	5,32	5,36	5,45	4	5,29			0,18	3,34	103,13
36	F02x	PD02	DB08	5,28	5,29	5,26	5,37	4	5,30			0,05	0,91	103,28
37	A57	PZ02	DD02	5,29	5,28	5,34	5,31	4	5,31			0,03	0,50	103,38
38	F08x	PZ99	DB08	5,28	5,29	5,24	5,48	4	5,32			0,11	2,01	103,72
39	A53	PZ02	DD02	5,35	5,36	5,33	5,34	4	5,35			0,01	0,24	104,16
40	F09x	PZ02	DD01	5,32	5,38	5,41	5,44	4	5,39			0,05	0,95	104,98
41	A79	PD03	DB10	5,37	5,35	5,30	5,75	4	5,44			0,20	3,74	106,08
42	A36	PD02	DB08	5,39	5,36	5,46	5,76	4	5,49			0,18	3,34	107,03
43	F24x	PB03	DB01	5,51	5,52	5,53	5,54	4	5,52			0,02	0,29	107,66
44	A61x	PB02	DB08	5,66	5,60	5,53	5,55	4	5,59			0,06	1,04	108,83
45	A60x	PD01	DB10	6,07	6,02	5,89	5,75	4	5,93		*	0,14	2,40	115,61
46	A47x	PD01	DB08	6,05	5,98	5,99	6,00	4	6,01		*	0,03	0,52	117,02
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	N	Mean	SI	VI
all labs	180	**5,13**	**0,085**	**1,648**
10	% from the mean			
	L		SR	VR
	45		**0,314**	**6,110**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A82	PC01	DB08	5,88	5,88	5,96	5,89	4	5,90	*	0,04	0,65	80,57
2	A59	PB03	DB08	6,66	6,72	6,43	6,32	4	6,53	*	0,19	2,84	89,16
3	A83	PB05	DB08	6,79	6,45	6,38	6,56	4	6,54	*	0,18	2,71	89,31
4	A43	PB06	DB01	6,42	6,42	7,00	6,48	4	6,58	*	0,28	4,28	89,82
5	F28x	PD02	DB08	6,61	6,68	6,82	6,44	4	6,64		0,16	2,43	90,62
6	F04	PD02	DB06	6,72	6,60	6,71	6,64	4	6,67		0,06	0,86	91,01
7	A62x	PD02	DB01	6,56	7,11	6,96	6,72	4	6,84		0,25	3,58	93,33
8	F27x	PD01	DB06	6,83	6,76	6,82	6,96	4	6,84		0,08	1,20	93,39
9	A88	PD99	DB08	6,63	6,87	6,88	7,04	4	6,86		0,17	2,47	93,57
10	A49	PD05	DB08	6,80	6,93	6,89	6,84	4	6,87		0,06	0,83	93,72
11	F21x	PD02	DB01	6,93	7,05	6,86	6,84	4	6,92		0,09	1,37	94,46
12	A85x	PD02	DB08	6,88	6,70	6,77	7,33	4	6,92		0,28	4,08	94,47
13	A91	PB02	DB99	7,13	6,13	7,77	7,58	4	7,15		0,73	**10,24**	97,63
14	F07x	PD02	DB08	7,19	7,28	7,10	7,11	4	7,17		0,08	1,17	97,89
15	F18x	PD99	DB08	7,26	7,11	7,18	7,16	4	7,18		0,06	0,87	97,97
16	A42x	PB04	DB01	7,43	7,41	7,15	7,14	4	7,28		0,16	2,20	99,40
17	F03	PD02	DB08	7,33	7,31	7,30	7,26	4	7,30		0,03	0,43	99,66
18	A58x	PD02	DB01	7,32	7,34	7,30	7,30	4	7,32		0,02	0,26	99,85
19	F26	PD02	DB08	7,24	7,26	7,34	7,43	4	7,32		0,09	1,18	99,88
20	A56	PC01	DB08	7,30	7,37	7,31	7,38	4	7,34		0,04	0,55	100,17
21	F13x	PZ02	DD01	7,30	7,37	7,36	7,42	4	7,36		0,05	0,67	100,50
22	F14x	PC01	DB08	7,36	7,33	7,40	7,39	4	7,37		0,03	0,44	100,55
23	A45x	PZ99	DB08	7,37	7,38	7,37	7,37	4	7,37		0,00	0,07	100,64
24	F16x	PC01	DB08	7,41	7,40	7,41	7,27	4	7,37		0,07	0,97	100,64
25	A57	PZ02	DD02	7,33	7,39	7,42	7,41	4	7,39		0,04	0,55	100,84
26	F01x	PB04	DB01	7,38	7,45	7,50	7,42	4	7,44		0,05	0,68	101,52
27	A81	PD02	DB10	7,56	7,44	7,42	7,45	4	7,47		0,06	0,84	101,93
28	F19x	PD02	DB08	7,41	7,51	7,44	7,55	4	7,48		0,06	0,86	102,07
29	A65	PD01	DB08	7,43	7,59	7,45	7,46	4	7,48		0,07	0,97	102,14
30	F06x	PD02	DB08	7,48	7,32	7,55	7,58	4	7,48		0,12	1,54	102,15
31	F05x	PD02	DB08	7,54	7,43	7,51	7,48	4	7,49		0,05	0,63	102,24
32	F09x	PZ02	DD01	7,43	7,51	7,54	7,59	4	7,52		0,07	0,89	102,61
33	F15x	PC01	DB08	7,59	7,57	7,48	7,49	4	7,53		0,06	0,74	102,82
34	A53	PZ02	DD02	7,60	7,57	7,58	7,55	4	7,58		0,02	0,27	103,40
35	F33x	PD01	DB10	7,69	7,62	7,47	7,57	4	7,59		0,09	1,22	103,57
36	A39	PD02	DB08	7,93	7,48	7,43	7,64	4	7,62		0,23	2,99	104,02
37	A79	PD03	DB10	7,69	7,73	7,61	7,52	4	7,64		0,09	1,21	104,26
38	F32x	PD02	DB08	7,61	7,66	7,70	7,66	4	7,66		0,04	0,48	104,53
39	F12x	PC01	DB08	7,58	7,72	7,74	7,67	4	7,68		0,07	0,93	104,80
40	A61x	PB02	DB08	7,83	7,63	7,73	7,62	4	7,70		0,10	1,28	105,14
41	F02x	PD02	DB08	7,86	7,80	7,81	7,89	4	7,84		0,04	0,54	107,02
42	F08x	PZ99	DB08	7,90	7,94	7,76	7,78	4	7,85		0,09	1,13	107,09
43	F24x	PB03	DB01	7,87	7,91	7,92	7,94	4	7,91		0,03	0,37	107,99
44	A36	PD02	DB08	7,93	7,76	8,01	7,96	4	7,92		0,11	1,37	108,04
45	A60x	PD01	DB10	8,67	8,66	8,27	8,28	4	8,47	*	0,23	2,68	115,60
46	A47x	PD01	DB08	8,46	8,37	8,83	8,92	4	8,65	*	0,27	3,13	118,01
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	N	Mean	SI	VI
all labs	184	**7,33**	**0,113**	**1,539**
10	% from the mean			
	L		SR	VR
	46		**0,500**	**6,818**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Lab.standard dev. Vi	Recovery %
1	A62x	PD02	DB01	1,33	1,47	1,36	1,30	0	1,37	*b*	*	0,07	5,43	63,32
2	A88	PD99	DB08	1,70	1,66	1,69	1,70	4	1,69		*	0,02	1,12	78,28
3	A43	PB06	DB01	1,76	1,70	1,76	1,76	4	1,75		*	0,03	1,72	80,95
4	A82	PC01	DB08	1,74	1,73	1,75	1,77	4	1,75		*	0,02	0,98	81,07
5	A59	PB03	DB08	1,93	1,89	1,88	1,99	4	1,92		*	0,05	2,48	89,25
6	A83	PB05	DB08	1,93	1,98	1,94	1,86	4	1,93		*	0,05	2,54	89,43
7	F04	PD02	DB06	1,96	1,90	1,96	1,97	4	1,95			0,03	1,64	90,34
8	A49	PD05	DB08	2,00	1,95	1,93	1,93	4	1,95			0,03	1,71	90,58
9	A85x	PD02	DB08	2,03	2,01	2,02	1,88	4	1,99			0,07	3,51	92,10
10	F28x	PD02	DB08	1,99	2,03	2,04	2,03	4	2,02			0,02	1,18	93,80
11	A45x	PZ99	DB08	2,04	2,05	2,00	2,04	4	2,03			0,02	1,09	94,29
12	F27x	PD01	DB06	2,05	1,99	2,10	2,08	4	2,05			0,05	2,22	95,22
13	A91	PB02	DB99	2,00	1,82	2,28	2,19	4	2,07			0,20	9,88	96,14
14	F18x	PD99	DB08	2,07	2,08	2,08	2,08	4	2,08			0,01	0,24	96,38
15	F14x	PC01	DB08	2,10	2,06	2,08	2,11	4	2,09			0,02	1,05	96,87
16	A58x	PD02	DB01	2,13	2,11	2,10	2,10	4	2,11			0,01	0,67	97,88
17	F16x	PC01	DB08	2,11	2,13	2,14	2,08	4	2,11			0,03	1,19	98,01
18	F15x	PC01	DB08	2,11	2,15	2,13	2,14	4	2,13			0,02	0,80	98,93
19	A56	PC01	DB08	2,13	2,12	2,12	2,18	4	2,14			0,03	1,23	99,08
20	A42x	PB04	DB01	2,22	2,23	2,03	2,07	4	2,14			0,10	4,85	99,16
21	F12x	PC01	DB08	2,17	2,14	2,15	2,15	4	2,15			0,01	0,58	99,85
22	A81	PD02	DB10	2,13	2,13	2,14	2,22	4	2,16			0,04	2,02	99,97
23	F07x	PD02	DB08	2,18	2,17	2,15	2,14	4	2,16			0,02	0,84	100,16
24	F19x	PD02	DB08	2,17	2,13	2,18	2,16	4	2,16			0,02	1,00	100,20
25	A79	PD03	DB10	2,16	2,16	2,17	2,15	4	2,16			0,01	0,48	100,23
26	F03	PD02	DB08	2,19	2,16	2,16	2,16	4	2,17			0,02	0,72	100,46
27	F05x	PD02	DB08	2,16	2,18	2,16	2,18	4	2,17			0,01	0,53	100,67
28	A61x	PB02	DB08	2,20	2,19	2,15	2,17	4	2,18			0,02	1,02	101,01
29	F26	PD02	DB08	2,25	2,22	2,14	2,13	4	2,19			0,06	2,71	101,36
30	F02x	PD02	DB08	2,21	2,18	2,20	2,17	4	2,19			0,02	0,83	101,59
31	A36	PD02	DB08	2,21	2,26	2,19	2,26	4	2,23			0,04	1,60	103,45
32	F21x	PD02	DB01	2,29	2,22	2,23	2,19	4	2,23			0,04	1,88	103,57
33	A53	PZ02	DD02	2,24	2,24	2,22	2,25	4	2,24			0,01	0,56	103,80
34	A65	PD01	DB08	2,28	2,21	2,25	2,22	4	2,24			0,03	1,41	103,91
35	A57	PZ02	DD02	2,29	2,29	2,32	2,30	4	2,30			0,01	0,61	106,70
36	F33x	PD01	DB10	2,34	2,30	2,29	2,27	4	2,30			0,03	1,28	106,70
37	F24x	PB03	DB01	2,28	2,29	2,33	2,36	4	2,31			0,04	1,60	107,36
38	F01x	PB04	DB01	2,35	2,23	2,28	2,43	4	2,32			0,09	3,74	107,74
39	F06x	PD02	DB08	2,35	2,32	2,39	2,23	4	2,32			0,07	2,93	107,75
40	F09x	PZ02	DD01	2,33	2,35	2,37	2,37	4	2,36			0,02	0,81	109,25
41	F32x	PD02	DB08	2,43	2,42	2,35	2,38	4	2,40		*	0,04	1,54	111,10
42	A47x	PD01	DB08	2,34	2,38	2,40	2,47	4	2,40		*	0,05	2,27	111,22
43	F13x	PZ02	DD01	2,38	2,46	2,38	2,38	4	2,40		*	0,04	1,67	111,34
44	A60x	PD01	DB10	2,48	2,53	2,37	2,36	4	2,43		*	0,08	3,38	112,94
45	F08x	PZ99	DB08	2,54	2,54	2,11	2,65	4	2,46		*	0,24	9,72	114,12
46	A39	PD02	DB08	2,47	2,53	2,56	2,43	4	2,50		*	0,06	2,29	115,81
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	N	Mean	SI	VI
all labs	180	**2,16**	**0,043**	**1,986**
10	% from the mean			
	L		SR	VR
	45		**0,184**	**8,544**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	A49	PZ98	DA02	50,06	50,03	50,03	50,14	4	50,07	*	0,05	0,10	93,96
2	A88	PZ98	DA01	51,60	52,20	51,30	52,20	4	51,83		0,45	0,87	97,26
3	F28x	PZ98	DA02	51,90	52,20	52,80	51,50	4	52,10		0,55	1,05	97,78
4	F07x	PZ98	DA01	51,92	52,20	52,29	52,43	4	52,21		0,22	0,41	97,98
5	F02x	PZ98	DA01	52,10	52,53	52,49	52,40	4	52,38		0,19	0,37	98,30
6	F26	PZ98	DA01	52,60	52,50	52,50	52,60	4	52,55		0,06	0,11	98,62
7	A60x	PZ98	DA02	52,55	52,52	52,70	52,66	4	52,61		0,09	0,17	98,73
8	A42x	PZ98	DA02	52,40	52,60	52,79	52,69	4	52,62		0,17	0,32	98,75
9	A39	PZ98	DA02	52,44	52,60	52,74	52,74	4	52,63		0,14	0,27	98,77
10	A61x	PZ98	DA02	52,67	52,71	52,48	52,67	4	52,63		0,10	0,20	98,78
11	F09x	PZ98	DA01	52,60	52,80	52,70	52,60	4	52,68		0,10	0,18	98,86
12	F08x	PZ98	DA01	52,60	52,80	52,70	52,60	4	52,68		0,10	0,18	98,86
13	F12x	PZ98	DA02	52,22	52,57	52,55	53,38	4	52,68		0,49	0,94	98,87
14	A82	PZ98	DA02	52,76	52,79	52,63	52,72	4	52,72		0,07	0,13	98,94
15	F32x	PZ98	DA01	52,90	52,90	52,80	52,90	4	52,88		0,05	0,09	99,23
16	A47x	PZ98	DA01	53,03	51,92	53,10	53,51	4	52,89		0,68	1,29	99,26
17	F05x	PZ98	DA01	52,90	52,90	52,90	52,90	4	52,90		0,00	0,00	99,28
18	F19x	PZ98	DA01	52,90	52,90	53,00	53,20	4	53,00		0,14	0,27	99,47
19	F18x	PZ98	DA99	53,00	52,80	53,10	53,20	4	53,03		0,17	0,32	99,51
20	F13x	PZ98	DA01	53,12	53,15	53,12	52,97	4	53,09		0,08	0,15	99,64
21	A45x	PZ98	DA02	53,10	53,20	53,00	53,10	4	53,10		0,08	0,15	99,65
22	F14x	PZ98	DA01	53,15	53,18	53,15	53,14	4	53,16		0,02	0,03	99,76
23	F16x	PZ98	DA02	53,23	53,16	53,34	53,27	4	53,25		0,08	0,14	99,94
24	F24x	PZ98	DA01	51,53	53,62	53,97	54,10	4	53,30		1,20	2,25	100,04
25	A65	PD01	DB08	53,39	53,47	53,33	53,29	4	53,37		0,08	0,15	100,16
26	F33x	PZ98	DA02	53,40	53,30	53,50	53,30	4	53,38		0,10	0,18	100,17
27	A62x	PZ98	DA01	53,65	53,18	53,49	53,46	4	53,45		0,20	0,37	100,30
28	A58x	PZ98	DA99	53,84	53,59	53,78	53,26	4	53,62		0,26	0,49	100,63
29	F03	PZ98	DA01	53,54	53,88	53,69	53,71	4	53,71		0,14	0,26	100,79
30	A85x	PZ98	DA01	53,66	53,42	54,09	53,70	4	53,72		0,28	0,52	100,81
31	F21x	PZ98	DA02	54,25	54,15	53,13	53,38	4	53,73		0,56	1,04	100,83
32	F27x	PZ98	DA01	53,84	53,66	53,98	53,50	4	53,75		0,21	0,39	100,86
33	F15x	PZ98	DA01	54,80	54,20	54,30	54,10	4	54,35		0,31	0,57	102,00
34	A83	PZ98	DA01	54,47	54,61	54,65	54,59	4	54,58		0,08	0,14	102,43
35	A36	PZ98	DA01	55,51	55,31	54,89	55,28	4	55,25		0,26	0,47	103,68
36	A81	PZ98	DA01	56,00	55,90	56,20	55,90	4	56,00	*	0,14	0,25	105,10
37	F04	PB99	DZ99	56,22	56,19	55,90	56,94	4	56,31	*	0,44	0,79	105,68
38	A56	PZ98	DA01	56,62	56,70	56,62	56,65	4	56,65	*	0,04	0,07	106,31
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	N	Mean	SI	VI
all labs	152	**53,28**	**0,220**	**0,413**
5	% from the mean			

L	SR	VR
38	**1,227**	**2,304**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	A49	PZ98	DA02	49,94	49,99	50,04	49,97	0	49,99	*b*	*	0,04	0,08	94,50
2	F18x	PZ98	DA99	51,80	52,20	51,00	51,30	4	51,58			0,53	1,03	97,50
3	F07x	PZ98	DA01	51,82	51,86	52,00	52,34	4	52,01			0,24	0,45	98,32
4	F28x	PZ98	DA02	52,50	52,30	51,90	51,80	4	52,13			0,33	0,63	98,54
5	A39	PZ98	DA02	52,17	52,17	52,24	52,05	4	52,16			0,08	0,15	98,60
6	F02x	PZ98	DA01	52,19	52,36	52,13	52,26	4	52,24			0,10	0,19	98,75
7	A60x	PZ98	DA02	52,39	52,35	52,09	52,37	4	52,30			0,14	0,27	98,87
8	F26	PZ98	DA01	52,40	52,30	52,30	52,20	4	52,30			0,08	0,16	98,87
9	F08x	PZ98	DA01	52,60	52,60	52,60	51,60	4	52,35			0,50	0,96	98,97
10	F09x	PZ98	DA01	52,60	52,60	52,60	51,60	4	52,35			0,50	0,96	98,97
11	A61x	PZ98	DA02	52,49	52,46	52,39	52,39	4	52,43			0,05	0,10	99,12
12	A42x	PZ98	DA02	52,20	52,50	52,69	52,35	4	52,44			0,21	0,40	99,13
13	A88	PZ98	DA01	51,30	52,70	52,80	53,10	4	52,48			0,80	1,53	99,20
14	F32x	PZ98	DA01	52,60	52,60	52,70	52,50	4	52,60			0,08	0,16	99,44
15	A47x	PZ98	DA01	53,01	52,76	52,36	52,45	4	52,65			0,30	0,57	99,53
16	F19x	PZ98	DA01	52,70	52,60	52,80	52,70	4	52,70			0,08	0,15	99,63
17	F05x	PZ98	DA01	52,70	52,70	52,70	52,70	4	52,70			0,00	0,00	99,63
18	F14x	PZ98	DA01	52,71	52,68	52,67	52,76	4	52,71			0,04	0,08	99,64
19	F13x	PZ98	DA01	52,82	52,86	52,63	52,62	4	52,73			0,13	0,24	99,69
20	A82	PZ98	DA02	52,84	52,82	52,70	52,75	4	52,77			0,06	0,12	99,77
21	F24x	PZ98	DA01	52,09	52,34	53,38	53,46	4	52,82			0,70	1,33	99,85
22	F16x	PZ98	DA02	52,71	52,83	52,96	52,99	4	52,87			0,13	0,24	99,96
23	F33x	PZ98	DA02	52,67	53,00	52,83	53,09	4	52,90			0,19	0,35	100,00
24	A45x	PZ98	DA02	52,70	52,80	53,00	53,10	4	52,90			0,18	0,35	100,01
25	F12x	PZ98	DA02	53,16	52,93	53,09	52,94	4	53,03			0,11	0,21	100,25
26	A65	PD01	DB08	53,04	53,11	52,79	53,19	4	53,03			0,17	0,33	100,26
27	F03	PZ98	DA01	53,18	53,11	53,15	53,15	4	53,15			0,03	0,05	100,48
28	A62x	PZ98	DA01	53,31	53,57	53,48	52,99	4	53,34			0,26	0,48	100,84
29	F21x	PZ98	DA02	53,82	53,79	53,10	52,76	4	53,37			0,52	0,98	100,89
30	A85x	PZ98	DA01	53,18	53,55	53,62	53,31	4	53,41			0,21	0,39	100,98
31	F27x	PZ98	DA01	53,57	53,39	53,63	53,24	4	53,46			0,18	0,33	101,06
32	A58x	PZ98	DA99	53,65	53,35	53,66	53,60	4	53,57			0,15	0,27	101,27
33	F15x	PZ98	DA01	53,90	54,00	54,00	53,80	4	53,93			0,10	0,18	101,95
34	A83	PZ98	DA01	54,44	54,62	54,37	54,54	4	54,49			0,11	0,20	103,02
35	A36	PZ98	DA01	54,66	54,62	54,33	54,61	4	54,56			0,15	0,28	103,14
36	F04	PB99	DZ99	54,79	54,54	55,38	55,07	4	54,95			0,36	0,66	103,87
37	A81	PZ98	DA01	57,30	56,40	56,70	55,70	0	56,53	*b*	*	0,67	1,18	106,86
38	A56	PZ98	DA01	56,56	56,59	56,65	56,67	0	56,62	*b*	*	0,05	0,09	107,04
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	N	Mean	SI	VI
all labs	140	**52,90**	**0,223**	**0,421**
5	% from the mean			
	L		SR	VR
	35		**0,737**	**1,393**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A49	PZ98	DA02	49,64	49,64	49,58	*49,35a*	0	49,62	*b*		0,03	0,07	95,20
2	F07x	PZ98	DA01	51,06	51,17	51,10	51,43	4	51,19			0,17	0,32	98,22
3	F26	PZ98	DA01	51,60	51,50	51,40	51,50	4	51,50			0,08	0,16	98,81
4	F02x	PZ98	DA01	51,53	51,37	51,52	51,73	4	51,54			0,15	0,29	98,88
5	A42x	PZ98	DA02	51,71	51,72	51,32	51,47	4	51,56			0,19	0,38	98,92
6	F08x	PZ98	DA01	51,70	51,70	51,70	51,70	4	51,70			0,00	0,00	99,19
7	F09x	PZ98	DA01	51,70	51,70	51,70	51,70	4	51,70			0,00	0,00	99,19
8	F19x	PZ98	DA01	51,70	51,60	51,90	51,80	4	51,75			0,13	0,25	99,29
9	A39	PZ98	DA02	51,83	51,86	51,78	51,62	4	51,77			0,11	0,21	99,33
10	A61x	PZ98	DA02	51,79	51,89	51,73	51,76	4	51,79			0,07	0,13	99,37
11	A45x	PZ98	DA02	51,70	51,80	51,80	51,90	4	51,80			0,08	0,16	99,39
12	F28x	PZ98	DA02	51,90	52,10	51,50	51,70	4	51,80			0,26	0,50	99,39
13	F32x	PZ98	DA01	51,80	51,90	51,80	51,80	4	51,83			0,05	0,10	99,43
14	A60x	PZ98	DA02	51,85	52,10	51,52	51,99	4	51,86			0,25	0,48	99,51
15	F05x	PZ98	DA01	51,90	51,90	51,90	51,90	4	51,90			0,00	0,00	99,58
16	F14x	PZ98	DA01	51,97	52,05	51,86	51,82	4	51,93			0,10	0,20	99,63
17	A47x	PZ98	DA01	52,06	51,72	51,99	52,06	4	51,96			0,16	0,31	99,69
18	F16x	PZ98	DA02	51,89	52,08	52,02	52,07	4	52,02			0,09	0,17	99,80
19	F33x	PZ98	DA02	52,11	51,85	52,14	52,03	4	52,03			0,13	0,25	99,83
20	F18x	PZ98	DA99	52,10	52,20	51,50	52,40	4	52,05			0,39	0,74	99,87
21	F24x	PZ98	DA01	50,18	52,21	52,91	53,12	0	52,11	*c*		1,34	2,58	99,97
22	F27x	PZ98	DA01	52,35	52,33	51,96	51,94	4	52,15			0,23	0,43	100,05
23	A82	PZ98	DA02	52,31	52,14	52,16	52,13	4	52,18			0,08	0,16	100,12
24	F13x	PZ98	DA01	52,35	52,32	52,21	52,15	4	52,26			0,09	0,18	100,26
25	F03	PZ98	DA01	52,22	52,39	52,24	52,23	4	52,27			0,08	0,15	100,29
26	A88	PZ98	DA01	52,00	52,00	51,90	53,20	4	52,28			0,62	1,18	100,30
27	A85x	PZ98	DA01	52,39	52,22	52,20	52,38	4	52,30			0,10	0,20	100,34
28	F21x	PZ98	DA02	52,64	52,67	51,78	52,13	4	52,31			0,43	0,82	100,36
29	A65	PD01	DB08	52,43	52,34	52,39	52,30	4	52,37			0,06	0,11	100,47
30	F12x	PZ98	DA02	52,30	52,30	52,60	52,30	4	52,38			0,15	0,29	100,49
31	A62x	PZ98	DA01	52,84	52,82	52,91	52,52	4	52,77			0,17	0,33	101,25
32	A58x	PZ98	DA99	53,00	53,20	53,06	53,01	4	53,07			0,09	0,17	101,82
33	F15x	PZ98	DA01	53,20	53,20	53,10	53,00	4	53,13			0,10	0,18	101,93
34	A36	PZ98	DA01	53,48	53,13	52,88	53,53	4	53,26			0,31	0,58	102,18
35	A83	PZ98	DA01	53,61	53,47	53,61	53,68	4	53,59			0,09	0,16	102,83
36	F04	PB99	DZ99	54,32	53,62	54,10	53,40	0	53,86	*b*		0,42	0,79	103,34
37	A81	PZ98	DA01	55,40	55,90	55,60	54,10	0	55,25	*b*	*	0,79	1,44	106,01
38	A56	PZ98	DA01	*56,48a*	56,33	56,29	56,30	0	56,31	*b*	*	0,02	0,04	108,03
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	N	Mean	SI	VI
all labs	132	**52,12**	**0,152**	**0,291**
5	% from the mean			
	L		SR	VR
	33		**0,535**	**1,027**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	A49	PZ98	DA02	49,26	48,81	48,87	49,11	4	49,01	*	0,21	0,43	93,39
2	F24x	PZ98	DA01	49,84	50,21	50,56	50,72	4	50,33		0,39	0,78	95,90
3	F26	PZ98	DA01	50,60	50,70	50,70	50,50	4	50,63		0,10	0,19	96,46
4	A88	PZ98	DA01	50,90	50,80	51,90	50,60	4	51,05		0,58	1,14	97,27
5	F33x	PZ98	DA02	51,10	50,95	51,26	51,11	4	51,11		0,13	0,25	97,37
6	F28x	PZ98	DA02	51,70	51,50	51,10	51,40	4	51,43		0,25	0,49	97,98
7	A42x	PZ98	DA02	51,40	51,65	51,80	51,40	4	51,56		0,20	0,38	98,24
8	A60x	PZ98	DA02	51,51	51,66	51,81	51,67	4	51,66		0,12	0,23	98,44
9	F02x	PZ98	DA01	51,72	51,86	51,72	51,63	4	51,73		0,09	0,18	98,57
10	F07x	PZ98	DA01	51,45	51,97	51,96	51,69	4	51,77		0,25	0,48	98,64
11	A61x	PZ98	DA02	52,51	52,17	51,83	52,27	4	52,20		0,28	0,54	99,45
12	A39	PZ98	DA02	52,25	52,27	52,18	52,10	4	52,20		0,08	0,15	99,46
13	A45x	PZ98	DA02	52,00	52,60	52,20	52,20	4	52,25		0,25	0,48	99,55
14	F32x	PZ98	DA01	52,30	52,20	52,30	52,30	4	52,28		0,05	0,10	99,60
15	A62x	PZ98	DA01	52,24	52,52	52,36	52,35	4	52,37		0,12	0,22	99,78
16	F14x	PZ98	DA01	52,39	52,29	52,50	52,38	4	52,39		0,09	0,16	99,82
17	F08x	PZ98	DA01	52,50	52,50	52,50	52,40	4	52,48		0,05	0,10	99,98
18	F09x	PZ98	DA01	52,50	52,50	52,50	52,40	4	52,48		0,05	0,10	99,98
19	A82	PZ98	DA02	52,36	52,35	52,50	52,73	4	52,48		0,18	0,34	100,00
20	F03	PZ98	DA01	52,42	52,43	52,58	52,58	4	52,50		0,09	0,17	100,04
21	F13x	PZ98	DA01	52,66	52,67	52,45	52,49	4	52,57		0,11	0,22	100,16
22	A47x	PZ98	DA01	52,23	53,04	52,78	52,33	4	52,60		0,38	0,72	100,21
23	F16x	PZ98	DA02	52,50	52,58	52,71	52,75	4	52,64		0,12	0,22	100,29
24	F19x	PZ98	DA01	52,60	52,60	52,80	52,70	4	52,68		0,10	0,18	100,36
25	A36	PZ98	DA01	52,71	52,82	52,55	52,65	4	52,68		0,11	0,21	100,38
26	F18x	PZ98	DA99	52,80	52,90	52,60	52,60	4	52,73		0,15	0,28	100,46
27	F15x	PZ98	DA01	52,90	52,90	52,90	52,80	4	52,88		0,05	0,09	100,75
28	A65	PD01	DB08	52,98	53,02	52,71	52,81	4	52,88		0,15	0,27	100,75
29	F04	PB99	DZ99	53,17	52,71	52,69	52,96	4	52,88		0,23	0,43	100,76
30	A85x	PZ98	DA01	52,86	52,92	53,27	52,74	4	52,95		0,23	0,43	100,89
31	F12x	PZ98	DA02	52,90	52,70	53,06	53,46	4	53,03		0,32	0,61	101,04
32	F27x	PZ98	DA01	53,52	53,33	53,09	53,04	4	53,25		0,22	0,42	101,45
33	F05x	PZ98	DA01	53,40	53,40	53,30	53,30	4	53,35		0,06	0,11	101,65
34	F21x	PZ98	DA02	53,57	53,73	53,18	52,99	4	53,37		0,34	0,64	101,68
35	A58x	PZ98	DA99	53,99	54,02	53,97	53,58	4	53,89		0,21	0,39	102,68
36	A83	PZ98	DA01	54,12	54,17	54,09	53,91	4	54,07		0,11	0,21	103,03
37	A81	PZ98	DA01	57,00	56,40	55,20	55,50	4	56,03	*	0,83	1,47	106,75
38	A56	PZ98	DA01	56,00	55,82	56,02	56,36	4	56,05	*	0,23	0,40	106,79
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	N	Mean	SI	VI
all labs	152	**52,48**	**0,197**	**0,375**
5	% from the mean			

* = non tolerable mean because more than +/-

L	SR	VR
38	**1,285**	**2,449**

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Zn **Sample: 1** Unit: µg/g

No.	Lab. Code	Method code P	Method code D	Replications 1	Replications 2	Replications 3	Replications 4	n	Lab.mean		Lab.standard dev. Si	Lab.standard dev. Vi	Recovery %
1	F27	PD01	DB01	73,70	72,24	73,64	71,19	4	72,69		1,21	1,66	86,44
2	F28x	PC02	DB08	72,73	74,76	75,72	73,69	4	74,23		1,30	1,75	88,26
3	A82	PC01	DB08	76,10	74,80	76,10	73,50	4	75,13		1,24	1,66	89,33
4	F18x	PD99	DB10	77,90	74,00	75,00	75,50	4	75,60		1,66	2,19	89,90
5	F07x	PD02	DB08	76,91	76,99	75,97	76,69	4	76,64		0,46	0,61	91,13
6	A81	PD02	DB10	76,80	77,00	78,70	75,70	4	77,05		1,24	1,61	91,62
7	A80	PD03	DB10	76,80	74,60	85,80	72,80	4	77,50		5,77	7,45	92,15
8	F19x	PD02	DB08	78,90	79,50	78,70	79,30	4	79,10		0,37	0,46	94,06
9	F13x	PD01	DB08	79,87	79,65	79,56	78,61	4	79,42		0,56	0,70	94,44
10	F08x	PZ99	DB08	78,30	79,10	85,00	82,80	4	81,30		3,15	3,88	96,67
11	A45x	PZ99	DB08	81,50	82,00	81,60	82,20	4	81,83		0,33	0,40	97,30
12	A60x	PD01	DB10	82,05	82,32	82,50	80,45	4	81,83		0,94	1,15	97,30
13	A88	PD99	DB08	83,90	85,20	79,40	79,90	4	82,10		2,89	3,51	97,62
14	A47x	PD01	DB08	80,90	82,10	82,40	83,20	4	82,15		0,95	1,16	97,68
15	F14x	PC01	DB08	82,09	81,92	82,75	82,49	4	82,31		0,38	0,46	97,88
16	F06x	PD02	DB08	83,80	82,20	82,30	83,20	4	82,88		0,76	0,92	98,55
17	F02x	PD02	DB08	82,90	82,90	82,50	83,30	4	82,90		0,33	0,39	98,58
18	A49	PD05	DB08	83,60	83,80	83,00	83,80	4	83,55		0,38	0,45	99,35
19	F12x	PC01	DB09	83,70	84,50	83,90	83,60	4	83,93		0,40	0,48	99,79
20	F32x	PD02	DB08	84,80	84,50	83,60	83,40	4	84,08		0,68	0,81	99,97
21	F05x	PD02	DB08	84,80	85,30	86,10	85,20	4	85,35		0,54	0,64	101,49
22	F33x	PD01	DB10	87,80	85,90	85,70	84,50	4	85,98		1,36	1,59	102,23
23	A39	PD02	DB08	86,10	87,01	85,02	86,43	4	86,14		0,84	0,97	102,43
24	F16x	PC01	DB08	85,65	88,02	87,03	86,98	4	86,92		0,97	1,12	103,36
25	A61x	PB02	DB08	87,10	85,70	87,50	87,50	4	86,95		0,85	0,98	103,39
26	A79	PD03	DB10	90,82	88,79	84,87	84,41	4	87,22		3,10	3,55	103,72
27	F09x	PZ98	DD02	85,50	87,70	88,70	89,10	4	87,75		1,61	1,84	104,34
28	A65	PD01	DB08	88,00	88,00	88,30	87,50	4	87,95		0,33	0,38	104,58
29	F03	PD02	DB08	87,87	87,22	88,84	88,73	4	88,17		0,76	0,87	104,84
30	A58x	PD02	DB01	88,57	89,56	89,38	89,22	4	89,18		0,43	0,48	106,05
31	F15x	PC01	DB08	89,00	90,00	91,00	89,00	4	89,75		0,96	1,07	106,72
32	A53	PZ02	DD02	89,70	89,80	90,00	89,80	4	89,83		0,13	0,14	106,81
33	A36	PD02	DB08	87,70	89,50	90,50	93,80	4	90,38		2,56	2,83	107,46
34	A57	PZ02	DD02	95,10	94,10	95,20	94,70	4	94,78		0,50	0,53	112,70
35	A59	PB03	DB08	91,00	100,80	89,20	99,10	4	95,03		5,78	6,08	112,99
36	F26	PD02	DB08	100,65	99,19	100,10	99,96	4	99,98	*	0,60	0,60	118,88
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	N	Mean	SI	VI
all labs	144	**84,10**	**1,287**	**1,530**
15	% from the mean			
	L		SR	VR
	36		**6,103**	**7,257**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Zn **Sample: 2** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	F28x	PC02	DB08	39,10	35,93	39,02	36,35	4	37,60	*	1,70	4,51	84,64
2	A88	PD99	DB08	38,80	38,60	39,20	39,10	4	38,93		0,28	0,71	87,62
3	F27	PD01	DB01	39,81	39,93	39,58	39,21	4	39,63		0,32	0,80	89,21
4	A82	PC01	DB08	42,10	40,00	39,90	39,70	4	40,43		1,12	2,78	91,00
5	F07x	PD02	DB08	40,82	41,06	40,75	40,86	4	40,87		0,13	0,33	92,01
6	F18x	PD99	DB10	40,00	41,60	41,60	41,80	4	41,25		0,84	2,03	92,86
7	A81	PD02	DB10	40,70	43,20	42,00	40,30	4	41,55		1,32	3,17	93,53
8	F13x	PD01	DB08	42,09	42,10	42,42	42,11	4	42,18		0,16	0,38	94,95
9	F19x	PD02	DB08	42,60	42,50	43,10	43,10	4	42,83		0,32	0,75	96,40
10	F14x	PC01	DB08	43,59	43,31	43,02	42,97	4	43,22		0,29	0,66	97,30
11	A45x	PZ99	DB08	43,90	43,50	43,80	43,40	4	43,65		0,24	0,55	98,26
12	F06x	PD02	DB08	44,20	43,00	43,80	44,30	4	43,83		0,59	1,35	98,65
13	F08x	PZ99	DB08	41,20	42,20	47,60	44,40	4	43,85		2,83	6,46	98,71
14	F03	PD02	DB08	44,19	44,20	44,22	43,51	4	44,03		0,35	0,79	99,11
15	F02x	PD02	DB08	44,30	44,10	43,50	44,50	4	44,10		0,43	0,98	99,27
16	F32x	PD02	DB08	45,00	44,50	44,00	44,20	4	44,43		0,43	0,98	100,00
17	F12x	PC01	DB09	44,50	44,40	44,60	44,20	4	44,43		0,17	0,38	100,00
18	A47x	PD01	DB08	44,20	44,60	44,40	44,70	4	44,48		0,22	0,50	100,11
19	A49	PD05	DB08	44,00	44,50	44,90	45,30	4	44,68		0,56	1,24	100,56
20	A80	PD03	DB10	43,70	45,90	44,40	44,70	4	44,68		0,92	2,05	100,56
21	A39	PD02	DB08	45,65	45,78	43,36	44,03	4	44,71		1,20	2,68	100,63
22	F16x	PC01	DB08	45,55	44,47	45,06	43,76	4	44,71		0,77	1,73	100,64
23	F05x	PD02	DB08	44,50	44,90	44,80	44,80	4	44,75		0,17	0,39	100,73
24	F33x	PD01	DB10	46,20	44,40	46,30	44,20	4	45,28		1,13	2,49	101,92
25	A79	PD03	DB10	45,58	44,61	44,79	47,98	4	45,74		1,55	3,39	102,96
26	A60x	PD01	DB10	46,14	45,85	46,71	45,44	4	46,04		0,53	1,16	103,63
27	F15x	PC01	DB08	46,00	47,00	46,00	46,00	4	46,25		0,50	1,08	104,11
28	A61x	PB02	DB08	46,60	47,10	45,60	46,30	4	46,40		0,63	1,35	104,45
29	A65	PD01	DB08	46,50	46,80	47,20	46,60	4	46,78		0,31	0,66	105,29
30	A36	PD02	DB08	46,40	46,60	45,60	49,60	4	47,05		1,75	3,73	105,91
31	A58x	PD02	DB01	46,05	46,96	48,90	47,07	4	47,25		1,19	2,53	106,35
32	A59	PB03	DB08	53,80	46,70	45,40	43,40	4	47,33		4,53	9,56	106,53
33	F09x	PZ98	DD02	47,20	48,70	48,40	49,00	4	48,33		0,79	1,63	108,78
34	A53	PZ02	DD02	48,40	48,70	48,50	48,80	4	48,60		0,18	0,38	109,40
35	A57	PZ02	DD02	49,40	49,10	49,85	49,48	4	49,46		0,31	0,62	111,33
36	F26	PD02	DB08	51,03	49,25	49,43	50,33	4	50,01		0,83	1,66	112,57
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	N	Mean	SI	VI
all labs	144	**44,42**	**0,822**	**1,850**
15	% from the mean			
	L		SR	VR
	36		**2,868**	**6,457**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F27	PD01	DB01	23,78	24,19	26,53	28,19	4	25,67	*	2,07	8,06	79,63
2	A88	PD99	DB08	26,10	26,40	26,50	26,90	4	26,48	*	0,33	1,25	82,12
3	F28x	PC02	DB08	28,64	26,31	29,48	27,58	4	28,00		1,37	4,89	86,85
4	A82	PC01	DB08	28,90	30,00	29,60	30,20	4	29,68		0,57	1,93	92,04
5	A81	PD02	DB10	30,00	29,50	30,50	29,40	4	29,85		0,51	1,70	92,59
6	F07x	PD02	DB08	30,34	30,46	30,51	30,35	4	30,42		0,08	0,27	94,34
7	A47x	PD01	DB08	30,70	30,60	30,60	30,40	4	30,58		0,13	0,41	94,83
8	F08x	PZ99	DB08	29,60	29,40	32,00	31,90	4	30,73		1,42	4,61	95,30
9	F14x	PC01	DB08	31,22	31,09	31,27	31,13	4	31,18		0,08	0,26	96,70
10	A58x	PD02	DB01	31,52	31,11	31,34	30,92	4	31,22		0,26	0,84	96,84
11	F19x	PD02	DB08	31,20	31,40	31,00	31,30	4	31,23		0,17	0,55	96,85
12	F13x	PD01	DB08	31,24	31,33	31,41	31,11	4	31,27		0,13	0,41	97,00
13	A45x	PZ99	DB08	31,50	31,90	31,60	31,60	4	31,65		0,17	0,55	98,17
14	F18x	PD99	DB10	29,50	34,30	29,00	33,90	4	31,68		2,81	8,88	98,25
15	A39	PD02	DB08	31,83	32,26	32,31	31,38	4	31,95		0,43	1,36	99,08
16	F03	PD02	DB08	32,13	32,33	31,69	31,66	4	31,95		0,33	1,04	99,11
17	F02x	PD02	DB08	31,90	32,10	32,20	32,20	4	32,10		0,14	0,44	99,56
18	F12x	PC01	DB09	31,80	32,60	32,70	32,20	4	32,33		0,41	1,27	100,26
19	F32x	PD02	DB08	32,50	32,70	32,50	32,30	4	32,50		0,16	0,50	100,81
20	A49	PD05	DB08	32,20	32,60	33,00	32,50	4	32,58		0,33	1,01	101,04
21	F05x	PD02	DB08	32,70	32,60	32,50	32,70	4	32,63		0,10	0,29	101,19
22	F16x	PC01	DB08	33,45	32,87	32,38	32,34	4	32,76		0,52	1,59	101,61
23	F06x	PD02	DB08	32,80	32,40	33,30	33,80	4	33,08		0,61	1,84	102,59
24	F15x	PC01	DB08	33,00	33,00	33,00	35,00	4	33,50		1,00	2,99	103,91
25	A61x	PB02	DB08	34,00	33,70	33,10	33,40	4	33,55		0,39	1,15	104,06
26	F33x	PD01	DB10	32,10	35,30	33,30	33,70	4	33,60		1,32	3,93	104,22
27	A36	PD02	DB08	33,60	32,00	34,80	34,20	4	33,65		1,20	3,58	104,37
28	A80	PD03	DB10	36,10	33,20	33,70	33,60	4	34,15		1,32	3,86	105,92
29	A65	PD01	DB08	34,60	34,40	34,60	33,20	4	34,20		0,67	1,97	106,08
30	A57	PZ02	DD02	34,60	34,55	34,45	34,50	4	34,53		0,06	0,19	107,09
31	A53	PZ02	DD02	34,90	34,70	34,80	34,40	4	34,70		0,22	0,62	107,63
32	F09x	PZ98	DD02	34,10	35,20	35,00	35,20	4	34,88		0,53	1,51	108,17
33	F26	PD02	DB08	34,71	35,03	35,25	34,75	4	34,94		0,25	0,73	108,36
34	A60x	PD01	DB10	35,45	35,72	35,11	34,95	4	35,31		0,35	0,98	109,51
35	A79	PD03	DB10	35,70	36,18	35,70	36,18	4	35,94		0,28	0,77	111,48
36	A59	PB03	DB08	37,20	37,60	36,40	33,80	4	36,25		1,71	4,71	112,44
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	N	Mean	SI	VI
all labs	144	**32,24**	**0,623**	**1,933**
15	% from the mean			
	L		SR	VR
	36		**2,394**	**7,426**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A88	PD99	DB08	5,11	5,02	4,98	5,35	0	5,12	*b*	*	0,17	3,24	41,74
2	F27	PD01	DB01	7,15	5,95	7,04	10,14	0	7,57	*b*	*	1,80	**23,74**	61,78
3	F26	PD02	DB08	8,60	8,78	8,72	8,35	4	8,61		*	0,19	2,21	70,29
4	A58x	PD02	DB01	9,15	8,40	8,16	9,59	4	8,83		*	0,66	7,50	72,02
5	F28x	PC02	DB08	10,03	10,89	11,43	11,21	4	10,89			0,62	5,66	88,86
6	F18x	PD99	DB10	10,80	11,60	10,50	11,50	4	11,10			0,54	4,82	90,59
7	A80	PD03	DB10	11,60	11,80	11,10	11,40	4	11,48			0,30	2,60	93,65
8	A82	PC01	DB08	11,50	11,20	11,60	11,90	4	11,55			0,29	2,50	94,26
9	F14x	PC01	DB08	11,64	11,54	11,58	11,84	4	11,65			0,13	1,14	95,08
10	A47x	PD01	DB08	11,70	11,80	11,50	11,60	4	11,65			0,13	1,11	95,08
11	A81	PD02	DB10	11,10	11,30	11,50	13,00	4	11,73			0,87	7,38	95,69
12	A45x	PZ99	DB08	11,80	11,70	11,80	11,80	4	11,78			0,05	0,42	96,10
13	F08x	PZ99	DB08	11,40	10,80	12,90	12,10	4	11,80			0,91	7,67	96,30
14	F07x	PD02	DB08	11,95	11,72	11,73	11,84	4	11,81			0,11	0,91	96,38
15	F16x	PC01	DB08	12,03	11,96	11,84	11,54	4	11,84			0,22	1,83	96,65
16	A60x	PD01	DB10	11,93	12,26	11,91	11,89	4	12,00			0,18	1,46	97,91
17	F13x	PD01	DB08	12,29	12,18	12,20	12,14	4	12,20			0,06	0,52	99,59
18	F12x	PC01	DB09	12,27	12,16	12,25	12,24	4	12,23			0,05	0,39	99,81
19	F06x	PD02	DB08	12,90	12,50	12,30	11,80	4	12,38			0,46	3,70	100,99
20	F19x	PD02	DB08	12,90	12,10	12,40	12,20	4	12,40			0,36	2,87	101,20
21	F02x	PD02	DB08	12,50	12,40	12,50	12,40	4	12,45			0,06	0,46	101,61
22	F15x	PC01	DB08	13,00	13,00	11,00	13,00	4	12,50			1,00	8,00	102,01
23	A49	PD05	DB08	12,60	12,50	12,60	12,40	4	12,53			0,10	0,76	102,22
24	F33x	PD01	DB10	12,00	12,30	12,90	13,20	4	12,60			0,55	4,35	102,83
25	F32x	PD02	DB08	12,70	12,70	12,70	12,70	4	12,70			0,00	0,00	103,65
26	F03	PD02	DB08	12,64	12,97	12,73	12,48	4	12,71			0,20	1,61	103,69
27	A61x	PB02	DB08	13,30	13,00	12,80	13,10	4	13,05			0,21	1,60	106,50
28	A36	PD02	DB08	12,90	13,00	13,10	13,60	4	13,15			0,31	2,36	107,32
29	A53	PZ02	DD02	13,20	13,30	13,20	13,20	4	13,23			0,05	0,38	107,93
30	F05x	PD02	DB08	13,20	13,30	13,20	13,40	4	13,28			0,10	0,72	108,34
31	A65	PD01	DB08	13,20	13,00	14,10	13,00	4	13,33			0,53	3,94	108,75
32	A57	PZ02	DD02	13,45	13,05	13,55	13,30	4	13,34			0,22	1,63	108,85
33	A79	PD03	DB10	13,36	13,36	13,36	13,36	4	13,36			0,00	0,00	109,03
34	A59	PB03	DB08	13,00	13,30	13,30	14,10	4	13,43			0,47	3,51	109,56
35	A39	PD02	DB08	14,01	13,66	13,78	14,54	4	14,00			0,39	2,78	114,24
36	F09x	PZ98	DD02	14,60	15,30	15,20	15,20	4	15,08		*	0,32	2,12	123,03
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	N	Mean	SI	VI
all labs	136	**12,25**	**0,312**	**2,543**
20	% from the mean			
	L		SR	VR
	34		**1,246**	**10,172**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A45x	PZ99	DB08	1760,0	1550,0	1640,0	1810,0	0	1690,0	*b*	*	117,47	6,95	68,46
2	A83	PB05	DB08	2133,0	2074,0	2048,0	2119,0	4	2093,5		*	39,42	1,88	84,80
3	F28x	PC02	DB08	2197,9	2293,0	2381,6	2387,0	4	2314,9			89,10	3,85	93,77
4	F27	PD01	DB01	2320,7	2317,0	2315,6	2316,6	4	2317,5			2,23	0,10	93,88
5	A80	PD03	DB10	2343,0	2323,0	2385,0	2256,0	4	2326,8			53,78	2,31	94,25
6	F19	PD02	DB08	2340,0	2360,0	2320,0	2340,0	4	2340,0			16,33	0,70	94,79
7	A82	PC01	DB08	2346,0	2356,0	2364,0	2348,0	4	2353,5			8,23	0,35	95,33
8	F06x	PD02	DB08	2386,0	2337,0	2340,0	2372,0	4	2358,8			24,10	1,02	95,55
9	F14x	PC01	DB08	2377,0	2351,0	2361,0	2369,0	4	2364,5			11,12	0,47	95,78
10	A49	PD05	DB08	2362,0	2376,0	2375,0	2363,0	4	2369,0			7,53	0,32	95,96
11	F07x	PD02	DB08	2376,0	2401,0	2343,0	2370,0	4	2372,5			23,81	1,00	96,10
12	F05x	PD02	DB08	2404,0	2385,0	2385,0	2399,0	4	2393,3			9,74	0,41	96,94
13	A60x	PD01	DB10	2430,0	2417,0	2417,0	2368,0	4	2408,0			27,36	1,14	97,54
14	F12x	PC01	DB09	2425,0	2431,0	2416,0	2399,0	4	2417,8			13,94	0,58	97,94
15	F18x	PD99	DB08	2430,0	2420,0	2420,0	2430,0	4	2425,0			5,77	0,24	98,23
16	F26	PD02	DB09	2409,0	2435,0	2418,0	2468,0	4	2432,5			26,01	1,07	98,53
17	F08x	PZ99	DB08	2537,0	2468,0	2370,0	2358,0	4	2433,3			84,92	3,49	98,57
18	F02x	PD02	DB08	2430,0	2434,0	2447,0	2431,0	4	2435,5			7,85	0,32	98,66
19	F16x	PC01	DB08	2449,0	2419,0	2453,0	2426,0	4	2436,8			16,78	0,69	98,71
20	A79	PD03	DB10	2460,0	2468,0	2450,0	2418,0	4	2449,0			21,94	0,90	99,20
21	F13x	PD01	DB08	2430,0	2437,0	2452,0	2498,0	4	2454,3			30,58	1,25	99,42
22	F33x	PD01	DB10	2474,0	2477,0	2471,0	2481,0	4	2475,8			4,27	0,17	100,29
23	A47x	PD01	DB08	2557,0	2419,0	2464,0	2473,0	4	2478,3			57,57	2,32	100,39
24	A81	PD02	DB10	2491,0	2497,0	2489,0	2457,0	4	2483,5			17,99	0,72	100,60
25	F15x	PC01	DB08	2503,0	2505,0	2515,0	2493,0	4	2504,0			9,02	0,36	101,43
26	A53	PZ02	DD02	2500,0	2510,0	2500,0	2510,0	4	2505,0			5,77	0,23	101,47
27	F09x	PZ02	DD02	2492,0	2526,0	2549,0	2562,0	4	2532,3			30,69	1,21	102,58
28	A65	PD01	DB08	2547,0	2525,0	2559,0	2549,0	4	2545,0			14,33	0,56	103,09
29	A58x	PD02	DB01	2583,6	2517,7	2559,2	2525,2	4	2546,4			30,63	1,20	103,15
30	A61x	PB02	DB08	2591,0	2575,0	2585,0	2636,0	4	2596,8			26,99	1,04	105,19
31	F03	PD02	DB08	2601,0	2604,0	2597,0	2618,0	4	2605,0			9,13	0,35	105,52
32	A57	PZ02	DD02	2607,3	2608,8	2606,8	2605,4	4	2607,1			1,40	0,05	105,61
33	A43	PB06	DB01	2488,0	2784,0	2607,0	2666,0	4	2636,3			123,22	4,67	106,79
34	A36	PD02	DB08	2584,0	2615,0	2635,0	2782,0	4	2654,0			87,87	3,31	107,51
35	A88	PD99	DB09	2704,8	2726,0	2536,9	2685,1	4	2663,2			85,84	3,22	107,88
36	A59	PB03	DB08	2582,0	2829,0	2528,0	2868,0	4	2701,8			171,62	6,35	109,44
37	F32x	PD02	DB08	2863,0	2863,0	2799,0	2842,0	4	2841,8		*	30,17	1,06	115,11
38	A39	PD02	DB08	2911,0	2947,0	2943,0	2961,0	0	2940,5	*b*	*	21,13	0,72	119,11
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	N	Mean	SI	VI
all labs	144	**2468,7**	**34,085**	**1,381**
15	% from the mean			
	L		SR	VR
	36		**137,868**	**5,585**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Mn **Sample: 2** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	A45x	PZ99	DB08	907,0	833,0	842,0	903,0	0	871,3	*b*	*	39,18	4,50	82,63
2	A83	PB05	DB08	911,1	918,0	870,8	873,9	0	893,5	*b*	*	24,56	2,75	84,74
3	F14x	PC01	DB08	997,0	990,2	988,3	985,4	4	990,2			4,93	0,50	93,92
4	F28x	PC02	DB08	940,8	1010,0	983,7	1026,6	4	990,3			37,41	3,78	93,92
5	F27	PD01	DB01	975,4	975,9	1023,8	1001,1	4	994,1			23,18	2,33	94,28
6	A82	PC01	DB08	984,0	999,0	1015,0	995,0	4	998,3			12,84	1,29	94,68
7	A80	PD03	DB10	1005,0	1039,0	987,0	1013,0	4	1011,0			21,60	2,14	95,89
8	F06x	PD02	DB08	1029,0	1001,0	1013,0	1014,0	4	1014,3			11,47	1,13	96,19
9	F19	PD02	DB08	1010,0	1020,0	1020,0	1020,0	4	1017,5			5,00	0,49	96,50
10	F07x	PD02	DB08	1041,0	1044,0	1020,0	1008,0	4	1028,3			17,21	1,67	97,52
11	F16x	PC01	DB08	1014,0	1032,0	1051,0	1022,0	4	1029,8			15,97	1,55	97,66
12	F18x	PD99	DB08	1040,0	1030,0	1030,0	1030,0	4	1032,5			5,00	0,48	97,93
13	F26	PD02	DB09	1041,0	1042,0	1044,0	1038,0	4	1041,3			2,50	0,24	98,76
14	F03	PD02	DB08	1048,0	1054,0	1036,0	1039,0	4	1044,3			8,26	0,79	99,04
15	F33x	PD01	DB10	1059,0	1022,0	1065,0	1032,0	4	1044,5			20,76	1,99	99,06
16	F08x	PZ99	DB08	995,0	1105,0	1052,0	1034,0	4	1046,5			45,68	4,37	99,25
17	A49	PD05	DB08	1060,0	1068,0	1063,0	1018,0	4	1052,3			23,07	2,19	99,80
18	F13x	PD01	DB08	1048,0	1055,0	1054,0	1054,0	4	1052,8			3,20	0,30	99,85
19	A60x	PD01	DB10	1053,0	1053,0	1072,0	1039,0	4	1054,3			13,55	1,29	99,99
20	A79	PD03	DB10	1064,0	1057,0	1055,0	1052,0	4	1057,0			5,10	0,48	100,25
21	A81	PD02	DB10	1071,0	1060,0	1049,0	1051,0	4	1057,8			10,05	0,95	100,32
22	F02x	PD02	DB08	1050,0	1065,0	1063,0	1053,0	4	1057,8			7,37	0,70	100,32
23	F15x	PC01	DB08	1076,0	1061,0	1062,0	1053,0	4	1063,0			9,56	0,90	100,82
24	F12x	PC01	DB09	1065,0	1067,0	1067,0	1061,0	4	1065,0			2,83	0,27	101,01
25	F05x	PD02	DB08	1065,0	1075,0	1075,0	1075,0	4	1072,5			5,00	0,47	101,72
26	A59	PB03	DB08	1182,0	1135,0	1018,0	991,0	0	1081,5	*c*		91,62	8,47	102,57
27	A47x	PD01	DB08	1082,0	1078,0	1086,0	1102,0	4	1087,0			10,52	0,97	103,09
28	A36	PD02	DB08	1036,0	1120,0	1114,0	1090,0	4	1090,0			38,26	3,51	103,38
29	F09x	PZ02	DD02	1077,0	1092,0	1098,0	1100,0	4	1091,8			10,40	0,95	103,55
30	A65	PD01	DB08	1103,0	1095,0	1099,0	1086,0	4	1095,8			7,27	0,66	103,92
31	A88	PD99	DB09	1113,3	1097,7	1109,1	1091,6	4	1102,9			10,02	0,91	104,60
32	A53	PZ02	DD02	1110,0	1110,0	1100,0	1110,0	4	1107,5			5,00	0,45	105,04
33	A58x	PD02	DB01	1116,1	1102,2	1111,1	1121,4	4	1112,7			8,16	0,73	105,53
34	A61x	PB02	DB08	1132,0	1126,0	1109,0	1102,0	4	1117,3			14,08	1,26	105,96
35	A57	PZ02	DD02	1119,2	1123,9	1122,3	1115,5	4	1120,2			3,71	0,33	106,25
36	F32x	PD02	DB08	*1196a*	1207,0	1207,0	1207,0	0	1207,0	*b*		0,00	0,00	114,48
37	A39	PD02	DB08	1278,0	1302,0	1231,0	1248,0	0	1264,8	*b*	*	31,53	2,49	119,95
38	A43	PB06	DB01	1348,0	1300,0	1255,0	1406,0	0	1327,3	*b*	*	64,79	4,88	125,88
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	N	Mean	SI	VI
all labs	128	**1054,4**	**13,093**	**1,242**
15	% from the mean			
	L		SR	VR
	32		**38,071**	**3,611**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Mn **Sample: 3** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	A83	PB05	DB08	320,20	319,30	314,90	312,20	4	316,65	*	3,76	1,19	84,10
2	F19	PD02	DB08	338,00	343,00	340,00	339,00	4	340,00		2,16	0,64	90,30
3	F27	PD01	DB01	341,70	339,90	332,50	346,20	4	340,08		5,70	1,68	90,32
4	A82	PC01	DB08	344,00	346,00	351,00	349,00	4	347,50		3,11	0,89	92,29
5	F26	PD02	DB09	344,40	341,10	352,70	356,00	4	348,55		6,96	2,00	92,57
6	A45x	PZ99	DB08	353,00	357,00	359,00	345,00	4	353,50		6,19	1,75	93,89
7	F14x	PC01	DB08	355,30	358,20	358,70	357,00	4	357,30		1,51	0,42	94,90
8	F07x	PD02	DB08	365,50	362,00	361,20	359,20	4	361,98		2,63	0,73	96,14
9	F03	PD02	DB08	362,50	361,90	362,60	362,50	4	362,38		0,32	0,09	96,24
10	A47x	PD01	DB08	365,00	367,00	365,00	368,00	4	366,25		1,50	0,41	97,27
11	F16x	PC01	DB08	365,70	373,50	367,10	367,70	4	368,50		3,44	0,93	97,87
12	A80	PD03	DB10	380,00	366,00	368,00	364,00	4	369,50		7,19	1,95	98,14
13	F18x	PD99	DB08	373,00	370,00	368,00	370,00	4	370,25		2,06	0,56	98,34
14	F15x	PC01	DB08	377,00	378,00	367,00	371,00	4	373,25		5,19	1,39	99,13
15	F28x	PC02	DB08	387,80	381,40	352,00	377,20	4	374,60		15,68	4,19	99,49
16	A79	PD03	DB10	378,10	377,00	375,50	372,00	4	375,65		2,66	0,71	99,77
17	F08x	PZ99	DB08	380,00	359,00	397,00	368,00	4	376,00		16,43	4,37	99,86
18	A49	PD05	DB08	375,00	374,00	377,00	381,00	4	376,75		3,10	0,82	100,06
19	F05x	PD02	DB08	376,00	379,00	379,00	377,00	4	377,75		1,50	0,40	100,33
20	A81	PD02	DB10	384,00	382,00	379,00	378,00	4	380,75		2,75	0,72	101,13
21	F06x	PD02	DB08	383,40	372,20	381,10	386,80	4	380,88		6,24	1,64	101,16
22	A60x	PD01	DB10	382,10	384,00	379,70	379,10	4	381,23		2,26	0,59	101,25
23	F12x	PC01	DB09	376,00	384,00	383,00	382,00	4	381,25		3,59	0,94	101,26
24	F09x	PZ02	DD02	377,00	382,00	385,00	384,00	4	382,00		3,56	0,93	101,46
25	F13x	PD01	DB08	380,00	385,80	384,50	378,50	4	382,20		3,50	0,92	101,51
26	F02x	PD02	DB08	384,00	385,00	385,00	391,00	4	386,25		3,20	0,83	102,59
27	A57	PZ02	DD02	386,00	387,80	385,10	386,40	4	386,33		1,12	0,29	102,61
28	A53	PZ02	DD02	390,00	389,00	391,00	388,00	4	389,50		1,29	0,33	103,45
29	F33x	PD01	DB10	400,00	392,00	382,00	390,00	4	391,00		7,39	1,89	103,85
30	A58x	PD02	DB01	392,06	391,72	392,50	391,06	4	391,84		0,61	0,16	104,07
31	A43	PB06	DB01	396,00	396,00	390,00	390,00	4	393,00		3,46	0,88	104,38
32	A36	PD02	DB08	382,10	401,70	381,10	407,20	4	393,03		13,39	3,41	104,39
33	A61x	PB02	DB08	402,00	389,00	396,00	393,00	4	395,00		5,48	1,39	104,91
34	F32x	PD02	DB08	394,00	399,00	392,00	397,00	4	395,50		3,11	0,79	105,04
35	A65	PD01	DB08	394,00	403,00	401,00	401,00	4	399,75		3,95	0,99	106,17
36	A88	PD99	DB09	399,90	403,10	399,80	406,20	4	402,25		3,05	0,76	106,84
37	A59	PB03	DB08	412,00	416,00	399,00	403,00	4	407,50		7,85	1,93	108,23
38	A39	PD02	DB08	427,00	440,30	432,10	428,00	4	431,85		6,05	1,40	114,70
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	N	Mean	SI	VI
all labs	152	**376,51**	**4,551**	**1,209**
15	% from the mean			
	L		SR	VR
	38		**21,355**	**5,672**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Lab.standard dev. Vi	Recovery %
1	A58x	PD02	DB01	1,68	1,75	1,97	1,63	0	1,76	*b*	*	0,15	8,53	19,20
2	F15x	PC01	DB08	*6a*	5,00	5,00	5,00	0	5,00	*b*	*	0,00	0,00	54,62
3	F28x	PC02	DB08	6,79	5,82	7,01	6,25	4	6,47		*	0,54	8,28	70,67
4	A45x	PZ99	DB08	6,37	8,08	7,33	7,17	4	7,24		*	0,70	9,69	79,07
5	F26	PD02	DB09	7,40	7,35	7,31	7,54	4	7,40			0,10	1,36	80,84
6	A83	PB05	DB08	7,70	7,76	7,74	7,44	4	7,66			0,15	1,94	83,68
7	A39	PD02	DB08	8,18	7,96	7,82	7,75	4	7,92			0,19	2,41	86,57
8	F18x	PD99	DB08	8,26	8,26	8,18	8,21	4	8,23			0,04	0,48	89,88
9	A82	PC01	DB08	8,16	8,34	8,37	8,61	4	8,37			0,18	2,21	91,44
10	A60x	PD01	DB10	8,62	8,55	8,22	8,21	4	8,40			0,22	2,57	91,77
11	A49	PD05	DB08	8,74	8,42	8,25	8,23	4	8,41			0,24	2,81	91,88
12	F16x	PC01	DB08	8,57	8,18	7,60	9,56	4	8,47			0,82	9,72	92,58
13	F19	PD02	DB08	8,89	8,36	8,66	8,53	4	8,61			0,22	2,60	94,06
14	F33x	PD01	DB10	9,14	8,43	8,54	8,37	4	8,62			0,35	4,10	94,17
15	F27	PD01	DB01	8,75	8,34	9,30	8,32	4	8,68			0,46	5,30	94,80
16	A80	PD03	DB10	9,00	8,82	8,56	9,08	4	8,87			0,23	2,60	96,85
17	F06x	PD02	DB08	9,27	9,06	9,01	8,29	4	8,91			0,43	4,79	97,29
18	F14x	PC01	DB08	9,20	8,89	8,77	8,87	4	8,93			0,19	2,07	97,58
19	F08x	PZ99	DB08	8,47	8,67	9,35	9,26	4	8,94			0,43	4,85	97,64
20	F03	PD02	DB08	9,12	9,12	9,05	9,16	4	9,11			0,05	0,50	99,55
21	A81	PD02	DB10	9,01	9,12	9,27	9,67	4	9,27			0,29	3,12	101,24
22	A43	PB06	DB01	9,45	9,50	9,42	9,45	4	9,46			0,03	0,35	103,29
23	A57	PZ02	DD02	9,60	9,80	9,30	9,55	4	9,56			0,21	2,15	104,47
24	F09x	PZ02	DD02	9,78	9,40	9,60	9,60	4	9,60			0,16	1,62	104,82
25	A61x	PB02	DB08	10,09	9,85	9,47	9,54	4	9,74			0,29	2,95	106,38
26	F02x	PD02	DB08	9,83	9,69	9,63	9,82	4	9,74			0,10	1,01	106,43
27	A88	PD99	DB09	10,80	9,70	9,10	9,60	4	9,80			0,72	7,31	107,06
28	A36	PD02	DB08	9,81	10,11	9,65	10,32	4	9,97			0,30	3,01	108,95
29	A65	PD01	DB08	11,00	10,00	10,00	10,00	4	10,25			0,50	4,88	111,98
30	F13x	PD01	DB08	10,19	10,41	10,49	10,26	4	10,34			0,14	1,32	112,93
31	F32x	PD02	DB08	10,70	10,40	10,20	10,10	4	10,35			0,26	2,56	113,07
32	F05x	PD02	DB08	10,30	10,30	10,50	10,40	4	10,38			0,10	0,92	113,34
33	A59	PB03	DB08	10,20	9,50	12,70	9,40	4	10,45			1,54	**14,75**	114,16
34	A79	PD03	DB10	10,50	10,44	10,50	10,44	4	10,47			0,03	0,33	114,38
35	F12x	PC01	DB09	10,60	10,90	11,30	11,10	4	10,98			0,30	2,72	119,90
36	A53	PZ02	DD02	11,80	11,90	11,20	11,70	4	11,65		*	0,31	2,67	127,27
37														
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39	F07x	PD02	DB08	<10	<10	<10	<10				**			
40	A47x	PD01	DB08	<5	<5	<5	<5				*			
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	N	Mean	SI	VI
all labs	136	**9,15**	**0,318**	**3,471**
20	% from the mean			
	L		SR	VR
	34		**1,135**	**12,402**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Fe **Sample: 1** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4			Si	Vi	%
1	F28x	PD02	DB08	111,20	114,80	126,00	122,90	4	118,73 *	6,89	5,80	78,78
2	A83	PB05	DB08	127,80	122,20	118,10	126,80	4	123,73	4,47	3,62	82,10
3	F27	PD01	DB02	125,60	125,60	130,00	130,50	4	127,93	2,69	2,10	84,89
4	A45x	PZ99	DB08	137,00	130,00	136,00	123,00	4	131,50	6,45	4,91	87,26
5	F19	PD02	DB08	140,00	133,00	133,00	134,00	4	135,00	3,37	2,49	89,58
6	A82	PC01	DB08	136,00	135,00	136,00	133,00	4	135,00	1,41	1,05	89,58
7	A39	PD02	DB08	135,90	137,70	132,30	138,40	4	136,08	2,73	2,00	90,30
8	F07x	PD02	DB08	134,10	141,70	138,10	137,80	4	137,93	3,11	2,25	91,52
9	A49	PD05	DB08	135,70	138,20	137,20	150,30	4	140,35	6,71	4,78	93,13
10	F13x	PD01	DB08	146,93	146,60	147,41	146,86	4	146,95	0,34	0,23	97,51
11	F05x	PD02	DB08	149,00	145,00	147,00	148,00	4	147,25	1,71	1,16	97,71
12	A60	PD01	DB10	147,40	146,20	149,90	147,10	4	147,65	1,58	1,07	97,98
13	A80	PD03	DB10	151,00	148,00	151,00	141,00	4	147,75	4,72	3,19	98,04
14	F14x	PC01	DB08	148,15	147,51	146,97	148,37	4	147,75	0,64	0,43	98,04
15	F02x	PD02	DB08	146,60	148,50	150,10	149,70	4	148,73	1,57	1,06	98,69
16	A57	PZ02	DD02	150,20	150,10	147,00	148,60	4	148,98	1,51	1,01	98,86
17	F12x	PC01	DB09	149,70	151,80	149,40	149,10	4	150,00	1,22	0,82	99,54
18	F06x	PD02	DB08	152,30	149,80	149,60	150,40	4	150,53	1,23	0,82	99,88
19	F15x	PC01	DB08	150,00	152,00	151,00	150,00	4	150,75	0,96	0,64	100,03
20	F16x	PC01	DB08	151,60	155,20	152,10	151,30	4	152,55	1,80	1,18	101,23
21	F33x	PD01	DB10	157,40	153,00	152,40	149,30	4	153,03	3,34	2,18	101,54
22	F03	PD02	DB08	154,18	156,98	155,16	155,26	4	155,40	1,16	0,75	103,12
23	A79	PD03	DB10	156,10	155,50	156,40	153,60	4	155,40	1,26	0,81	103,12
24	A81	PD02	DB10	158,00	157,00	157,00	152,00	4	156,00	2,71	1,74	103,52
25	A47x	PD01	DB08	156,00	155,00	157,00	157,00	4	156,25	0,96	0,61	103,68
26	A58x	PD02	DB01	157,24	157,73	154,81	155,73	4	156,38	1,35	0,86	103,77
27	F18x	PD99	DB08	158,00	153,00	156,00	162,00	4	157,25	3,77	2,40	104,35
28	F32x	PD02	DB08	161,00	163,00	164,00	162,00	4	162,50	1,29	0,79	107,83
29	A53	PZ02	DD02	164,00	165,00	163,00	165,00	4	164,25	0,96	0,58	108,99
30	F08x	PD02	DB10	171,00	158,00	158,00	174,00	4	165,25	8,46	5,12	109,66
31	A36	PD02	DB08	159,30	162,70	167,10	173,80	4	165,73	6,26	3,78	109,97
32	A59	PC01	DB08	157,60	177,20	151,80	179,40	4	166,50	13,86	8,32	110,49
33	F09x	PZ02	DD02	164,00	167,00	169,00	168,00	4	167,00	2,16	1,29	110,82
34	A65	PD01	DB08	169,70	164,90	167,10	167,10	4	167,20	1,96	1,17	110,95
35	A61x	PB02	DB08	171,30	171,80	174,90	176,00	4	173,50	2,31	1,33	115,13
36	A88	PD99	DB08	184,40	181,20	169,80	178,30	4	178,43	6,27	3,51	118,40
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	N	Mean	SI	VI
all labs	144	**150,70**	**3,144**	**2,086**
20	% from the mean			

L	SR	VR
36	**13,834**	**9,180**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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			Si	Vi	%
1	F27	PD01	DB02	55,40	57,70	55,00	60,40	4	57,13	2,49	4,35	81,95
2	A82	PC01	DB08	66,50	57,40	57,80	58,30	4	60,00	4,35	7,25	86,07
3	A83	PB05	DB08	71,55	62,89	57,52	59,13	4	62,77	6,27	9,99	90,05
4	F19	PD02	DB08	62,90	63,10	62,70	62,70	4	62,85	0,19	0,30	90,16
5	F28x	PD02	DB08	60,41	64,82	65,03	65,14	4	63,85	2,30	3,60	91,60
6	A49	PD05	DB08	64,90	64,40	63,00	63,70	4	64,00	0,83	1,29	91,81
7	A45x	PZ99	DB08	65,80	66,70	64,00	65,50	4	65,50	1,12	1,71	93,96
8	F07x	PD02	DB08	67,34	65,83	64,89	64,81	4	65,72	1,18	1,79	94,27
9	F15x	PC01	DB08	65,00	65,00	65,00	70,00	4	66,25	2,50	3,77	95,04
10	F14x	PC01	DB08	66,88	66,23	67,03	65,64	4	66,45	0,64	0,96	95,32
11	F13x	PD01	DB08	68,31	67,88	65,34	66,07	4	66,90	1,42	2,13	95,97
12	A80	PD03	DB10	66,40	70,20	64,50	67,00	4	67,03	2,37	3,54	96,15
13	F12x	PC01	DB09	67,50	67,90	66,60	66,40	4	67,10	0,72	1,07	96,26
14	A39	PD02	DB08	67,89	69,14	65,62	67,37	4	67,51	1,46	2,16	96,84
15	F06x	PD02	DB08	68,15	66,40	67,28	68,60	4	67,61	0,97	1,44	96,99
16	F16x	PC01	DB08	67,50	67,00	70,13	66,84	4	67,87	1,53	2,26	97,36
17	A60	PD01	DB10	68,74	70,01	69,63	67,65	4	69,01	1,05	1,52	98,99
18	F05x	PD02	DB08	70,30	70,90	69,60	69,40	4	70,05	0,69	0,98	100,49
19	A81	PD02	DB10	72,80	69,80	70,20	69,50	4	70,58	1,51	2,14	101,24
20	A59	PC01	DB08	77,50	70,80	70,10	65,00	4	70,85	5,13	7,24	101,64
21	F02x	PD02	DB08	69,50	72,20	69,20	72,80	4	70,93	1,84	2,59	101,74
22	A79	PD03	DB10	70,96	70,70	69,44	73,06	4	71,04	1,50	2,11	101,91
23	A53	PZ02	DD02	71,10	71,70	70,30	72,30	4	71,35	0,85	1,20	102,35
24	F18x	PD99	DB08	72,40	70,60	72,90	70,50	4	71,60	1,23	1,72	102,71
25	A36	PD02	DB08	69,90	72,60	72,30	71,80	4	71,65	1,21	1,69	102,78
26	F03	PD02	DB08	71,87	71,86	71,24	72,39	4	71,84	0,47	0,65	103,06
27	A58x	PD02	DB01	69,48	71,75	72,93	73,43	4	71,90	1,76	2,45	103,14
28	F32x	PD02	DB08	72,30	75,60	73,20	71,50	4	73,15	1,77	2,43	104,94
29	A47x	PD01	DB08	74,90	73,20	72,90	73,40	4	73,60	0,89	1,21	105,58
30	F09x	PZ02	DD02	72,80	73,60	75,20	75,80	4	74,35	1,39	1,87	106,66
31	A65	PD01	DB08	73,70	72,90	78,80	75,10	4	75,13	2,61	3,48	107,77
32	A61x	PB02	DB08	75,80	79,00	76,80	74,60	4	76,55	1,86	2,44	109,81
33	F08x	PD02	DB10	83,80	84,80	70,90	76,30	4	78,95	6,57	8,32	113,26
34	A57	PZ02	DD02	77,90	78,90	79,80	79,35	4	78,99	0,81	1,03	113,31
35	F33x	PD01	DB10	80,00	76,70	81,30	78,80	4	79,20	1,95	2,47	113,62
36	A88	PD99	DB08	81,30	80,40	80,90	78,60	4	80,30	1,19	1,48	115,19
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	N	Mean	SI	VI
all labs	144	**69,71**	**1,851**	**2,656**
20	% from the mean			
	L		SR	VR
	36		**5,423**	**7,779**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Fe **Sample: 3** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4			Si	Vi	%
1	A83	PB05	DB08	67,21	63,25	56,03	60,56	4	61,76	4,70	7,61	86,04
2	F28x	PD02	DB08	61,18	64,56	57,48	64,88	4	62,03	3,46	5,58	86,41
3	F27	PD01	DB02	61,10	59,50	64,60	63,20	4	62,10	2,25	3,63	86,51
4	F19	PD02	DB08	59,50	64,30	60,80	66,50	4	62,78	3,21	5,11	87,45
5	A82	PC01	DB08	61,80	64,40	65,00	64,10	4	63,83	1,40	2,19	88,91
6	A45x	PZ99	DB08	65,00	65,70	64,80	64,80	4	65,08	0,43	0,66	90,65
7	A49	PD05	DB08	67,20	65,80	65,40	66,60	4	66,25	0,81	1,22	92,29
8	A53	PZ02	DD02	65,50	68,00	67,80	68,10	4	67,35	1,24	1,84	93,82
9	F07x	PD02	DB08	66,87	68,04	66,06	69,98	4	67,74	1,70	2,51	94,36
10	F15x	PC01	DB08	67,00	72,00	63,00	70,00	4	68,00	3,92	5,76	94,73
11	F05x	PD02	DB08	68,40	69,20	70,20	68,60	4	69,10	0,81	1,17	96,26
12	A80	PD03	DB10	70,10	71,40	67,00	70,20	4	69,68	1,88	2,70	97,06
13	F14x	PC01	DB08	70,68	69,68	69,40	69,76	4	69,88	0,56	0,79	97,35
14	F13x	PD01	DB08	70,72	70,40	70,04	70,17	4	70,33	0,30	0,42	97,98
15	A81	PD02	DB10	72,00	68,70	69,60	71,30	4	70,40	1,52	2,15	98,07
16	A39	PD02	DB08	69,51	68,75	73,30	70,48	4	70,51	1,99	2,82	98,23
17	A58x	PD02	DB01	71,67	70,39	70,72	70,16	4	70,74	0,66	0,94	98,54
18	A60	PD01	DB10	73,43	72,21	69,67	69,29	4	71,15	2,00	2,81	99,12
19	F03	PD02	DB08	71,12	71,79	71,97	70,89	4	71,44	0,52	0,73	99,52
20	F16x	PC01	DB08	72,68	71,47	71,57	71,61	4	71,83	0,57	0,79	100,07
21	F09x	PZ02	DD02	72,80	72,40	72,30	71,00	4	72,13	0,78	1,08	100,48
22	F12x	PC01	DB09	71,30	73,30	72,90	71,80	4	72,33	0,93	1,29	100,75
23	F02x	PD02	DB08	70,60	74,40	72,60	74,10	4	72,93	1,74	2,38	101,59
24	F06x	PD02	DB08	73,91	73,55	75,09	73,64	4	74,05	0,71	0,96	103,15
25	A47x	PD01	DB08	73,20	75,10	81,40	70,20	4	74,98	4,73	6,31	104,45
26	A65	PD01	DB08	73,90	75,20	75,80	77,40	4	75,58	1,45	1,92	105,28
27	A79	PD03	DB10	78,79	72,74	73,00	78,79	4	75,83	3,42	4,51	105,64
28	A36	PD02	DB08	78,50	71,30	77,20	77,20	4	76,05	3,23	4,24	105,94
29	A59	PC01	DB08	79,30	77,10	77,90	72,20	4	76,63	3,09	4,03	106,74
30	F32x	PD02	DB08	79,60	77,10	76,60	77,10	4	77,60	1,35	1,74	108,10
31	A61x	PB02	DB08	78,00	80,10	74,80	77,60	4	77,63	2,18	2,81	108,14
32	F33x	PD01	DB10	85,60	75,30	74,80	77,40	4	78,28	5,01	6,40	109,04
33	F18x	PD99	DB08	80,60	76,60	81,90	79,90	4	79,75	2,26	2,83	111,10
34	A57	PZ02	DD02	80,50	80,95	81,65	81,30	4	81,10	0,49	0,61	112,98
35	A88	PD99	DB08	82,80	82,10	80,80	84,70	4	82,60	1,63	1,97	115,07
36	F08x	PD02	DB10	85,50	91,40	75,10	87,30	4	84,83	6,94	8,18	118,17
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	N	Mean	SI	VI
all labs	144	**71,78**	**2,051**	**2,858**
20	% from the mean			

* = non tolerable mean because more than +/-

L	SR	VR
36	**5,902**	**8,222**

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F15x	PC01	DB08	31,00	34,00	30,00	28,00	4	30,75		*	2,50	8,13	78,05
2	A83	PB05	DB08	31,68	35,22	31,84	32,02	4	32,69			1,69	5,18	82,97
3	F33x	PD01	DB10	35,10	32,30	32,10	33,30	4	33,20			1,37	4,13	84,27
4	F27	PD01	DB02	30,80	35,30	32,30	34,90	4	33,33			2,15	6,44	84,59
5	A45x	PZ99	DB08	34,50	34,20	34,50	31,00	4	33,55			1,71	5,08	85,16
6	F07x	PD02	DB08	33,88	33,05	34,79	32,93	4	33,66			0,86	2,56	85,44
7	A53	PZ02	DD02	33,70	34,20	34,40	34,80	4	34,28			0,46	1,33	87,00
8	F19	PD02	DB08	35,00	35,50	35,40	34,70	4	35,15			0,37	1,05	89,22
9	A82	PC01	DB08	40,30	33,80	35,00	35,90	4	36,25			2,83	7,82	92,01
10	F28x	PD02	DB08	35,90	37,70	37,10	37,10	4	36,95			0,75	2,04	93,79
11	F06x	PD02	DB08	38,74	38,62	38,11	34,47	4	37,49			2,03	5,41	95,15
12	A49	PD05	DB08	37,50	37,40	36,70	38,50	4	37,53			0,74	1,97	95,25
13	A80	PD03	DB10	39,80	37,80	35,70	39,00	4	38,08			1,78	4,69	96,64
14	A58x	PD02	DB01	38,83	38,00	37,22	38,48	4	38,13			0,70	1,83	96,79
15	A60	PD01	DB10	39,05	37,96	37,80	38,48	4	38,32			0,57	1,47	97,27
16	F03	PD02	DB08	38,96	37,39	39,40	38,97	4	38,68			0,88	2,29	98,18
17	A81	PD02	DB10	37,40	37,20	40,30	42,00	4	39,23			2,33	5,94	99,56
18	A39	PD02	DB08	39,47	39,68	39,64	38,13	4	39,23			0,74	1,88	99,57
19	F14x	PC01	DB08	40,93	39,52	38,67	38,03	4	39,29			1,25	3,19	99,72
20	F16x	PC01	DB08	42,10	39,70	37,13	39,60	4	39,63			2,03	5,12	100,60
21	A36	PD02	DB08	38,00	41,10	39,20	41,20	4	39,88			1,55	3,89	101,21
22	F13x	PD01	DB08	41,47	39,56	41,52	40,13	4	40,67			0,98	2,41	103,23
23	F02x	PD02	DB08	40,90	42,90	41,80	39,20	4	41,20			1,56	3,80	104,57
24	A61x	PB02	DB08	40,40	43,30	38,40	45,50	4	41,90			3,13	7,47	106,35
25	A59	PC01	DB08	45,60	40,10	40,10	41,90	4	41,93			2,59	6,18	106,42
26	F09x	PZ02	DD02	41,80	42,50	42,20	41,90	4	42,10			0,32	0,75	106,86
27	F18x	PD99	DB08	42,20	45,70	41,80	42,90	4	43,15			1,76	4,08	109,52
28	A47x	PD01	DB08	42,10	49,20	40,50	41,20	4	43,25			4,02	9,30	109,78
29	A79	PD03	DB10	42,65	45,25	42,65	45,25	4	43,95			1,50	3,42	111,56
30	F05x	PD02	DB08	45,70	44,10	45,70	43,80	4	44,83			1,02	2,27	113,78
31	A65	PD01	DB08	46,30	44,20	44,90	47,90	4	45,83			1,64	3,57	116,31
32	F32x	PD02	DB08	45,40	46,10	47,40	45,40	4	46,08			0,94	2,05	116,95
33	A88	PD99	DB08	48,30	47,20	49,60	49,40	4	48,63		*	1,11	2,28	123,42
34	F08x	PD02	DB10	48,20	53,50	46,40	54,90	4	50,75		*	4,09	8,06	128,82
35	A57	PZ02	DD02	56,55	56,55	57,40	56,98	0	56,87	*b*	*	0,41	0,72	144,35
36	F12x	PC01	DB09	70,20	70,50	70,70	72,20	0	70,90	*b*	*	0,89	1,26	179,96
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	N	Mean	SI	VI
all labs	136	**39,40**	**1,587**	**4,028**
20	% from the mean			
	L		SR	VR
	34		**4,731**	**12,009**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Cu **Sample: 1** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	A58x	PD02	DB05	4,93	4,80	4,60	4,64	4	4,74		0,15	3,20	81,77
2	A60	PD01	DB10	5,09	5,01	5,01	4,87	4	4,99		0,09	1,87	86,12
3	F05x	PD02	DB08	4,99	4,97	5,20	5,21	4	5,09		0,13	2,56	87,81
4	A82	PC01	DB10	5,32	5,30	5,32	5,34	4	5,32		0,02	0,31	91,73
5	F28x	PC02	DB08	5,28	5,28	5,51	5,42	4	5,37		0,11	2,14	92,58
6	F09x	PZ02	DD02	5,25	5,50	5,40	5,43	4	5,40		0,11	1,95	93,02
7	F12x	PC01	DB09	5,40	5,51	5,36	5,33	4	5,40		0,08	1,46	93,11
8	F07x	PD02	DB08	5,68	5,17	5,40	5,36	4	5,40		0,21	3,88	93,12
9	F19	PD02	DB08	5,45	5,49	5,35	5,43	4	5,43		0,06	1,08	93,63
10	F27	PD01	DB01	5,87	5,72	5,15	5,60	4	5,58		0,31	5,57	96,27
11	A81	PD02	DB10	5,62	5,57	5,53	5,63	4	5,59		0,05	0,83	96,34
12	A49	PD05	DB09	5,60	5,64	5,74	5,65	4	5,66		0,06	1,04	97,55
13	F14x	PC01	DB08	5,61	5,86	5,60	5,58	4	5,66		0,13	2,34	97,64
14	A80	PD03	DB10	5,69	5,61	5,93	5,46	4	5,67		0,20	3,46	97,81
15	F18x	PD99	DB10	5,70	5,70	5,70	5,66	4	5,69		0,02	0,35	98,11
16	A45x	PZ99	DB08	5,80	5,77	5,63	5,64	4	5,71		0,09	1,53	98,46
17	F15x	PC01	DB08	5,20	5,80	5,70	6,40	4	5,78		0,49	8,53	99,58
18	A39	PD02	DB08	5,99	5,94	5,79	5,95	4	5,92		0,09	1,44	102,02
19	F03	PD02	DB08	5,86	6,07	5,93	5,88	4	5,94		0,09	1,60	102,33
20	A47x	PD01	DB08	5,73	6,15	5,80	6,07	4	5,94		0,20	3,43	102,38
21	A79	PD03	DB10	6,00	5,94	6,00	5,94	4	5,97		0,03	0,55	102,91
22	A53	PZ02	DD02	6,01	6,02	6,02	6,01	4	6,02		0,01	0,10	103,71
23	F33x	PD01	DB10	6,17	6,01	5,87	6,18	4	6,06		0,15	2,43	104,45
24	F06x	PD02	DB08	6,19	6,33	5,61	6,15	4	6,07		0,32	5,21	104,66
25	A61x	PB02	DB08	6,01	6,12	6,07	6,12	4	6,08		0,05	0,86	104,83
26	A36	PD02	DB08	5,78	6,11	6,11	6,39	4	6,10		0,25	4,09	105,14
27	F13x	PD01	DB08	5,96	6,17	6,13	6,13	4	6,10		0,09	1,53	105,14
28	F32x	PD02	DB08	6,11	6,11	6,17	6,04	4	6,11		0,05	0,87	105,31
29	F16x	PC01	DB08	6,06	6,21	6,15	6,10	4	6,13		0,06	1,03	105,71
30	A57	PZ02	DD02	6,20	6,00	6,30	6,30	4	6,20		0,14	2,28	106,90
31	A65	PD01	DB08	6,40	6,30	6,20	6,30	4	6,30		0,08	1,30	108,63
32	F02x	PD02	DB08	6,36	6,34	6,41	6,38	4	6,37		0,03	0,47	109,88
33	A88	PD99	DB08	6,58	*7,53a*	6,59	6,79	3	6,65		0,12	1,78	114,72
34	F08x	PZ99	DB08	6,61	6,01	7,80	7,49	4	6,98	*	0,82	**11,73**	120,31
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	N	Mean	SI	VI
all labs	135	**5,80**	**0,144**	**2,481**
20	% from the mean			

L	SR	VR
34	**0,462**	**7,959**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Lab.standard dev. Vi	Recovery %
1	F09x	PZ02	DD02	3,14	3,34	3,21	3,29	0	3,25	*b*	*	0,09	2,72	76,59
2	F15x	PC01	DB08	4,50	3,20	4,50	2,40	0	3,65	*c*		1,03	**28,34**	86,15
3	A60	PD01	DB10	3,72	3,65	3,72	3,60	4	3,67			0,06	1,59	86,61
4	F12x	PC01	DB09	3,84	3,87	3,90	3,85	4	3,87			0,03	0,68	91,23
5	F05x	PD02	DB08	3,89	3,94	3,95	3,85	4	3,91			0,05	1,19	92,23
6	A82	PC01	DB10	3,91	3,91	4,03	3,83	4	3,92			0,08	2,10	92,53
7	F07x	PD02	DB08	4,02	3,81	3,98	3,88	4	3,92			0,10	2,44	92,57
8	F06x	PD02	DB08	4,00	3,89	3,90	3,96	4	3,94			0,05	1,32	92,94
9	A81	PD02	DB10	4,09	4,06	4,02	4,02	4	4,05			0,03	0,84	95,54
10	F19	PD02	DB08	4,09	4,02	4,09	4,07	4	4,07			0,03	0,81	96,01
11	A49	PD05	DB09	3,86	4,46	3,95	4,17	4	4,11			0,27	6,50	97,01
12	F14x	PC01	DB08	4,19	4,14	4,06	4,06	4	4,11			0,06	1,56	97,07
13	A80	PD03	DB10	4,12	4,19	4,03	4,14	4	4,12			0,07	1,62	97,25
14	F03	PD02	DB08	4,14	4,22	4,20	4,12	4	4,17			0,05	1,14	98,43
15	F18x	PD99	DB10	4,33	4,22	4,13	4,17	4	4,21			0,09	2,05	99,43
16	F28x	PC02	DB08	4,31	4,14	4,19	4,30	4	4,23			0,08	1,97	99,90
17	A79	PD03	DB10	4,24	4,25	4,24	4,25	4	4,24			0,01	0,22	100,15
18	A45x	PZ99	DB08	4,23	4,17	4,23	4,46	4	4,27			0,13	3,00	100,85
19	F33x	PD01	DB10	4,35	4,20	4,33	4,24	4	4,28			0,07	1,67	101,02
20	F16x	PC01	DB08	4,37	4,32	4,31	4,17	4	4,29			0,09	2,01	101,26
21	A39	PD02	DB08	4,37	4,44	4,32	4,25	4	4,34			0,08	1,91	102,55
22	F32x	PD02	DB08	4,33	4,38	4,35	4,33	4	4,35			0,02	0,54	102,62
23	F13x	PD01	DB08	4,30	4,30	4,43	4,37	4	4,35			0,06	1,44	102,68
24	F08x	PZ99	DB08	5,02	4,08	3,04	5,56	0	4,43	*c*		1,11	**25,03**	104,45
25	A36	PD02	DB08	4,30	4,56	4,42	4,53	4	4,45			0,12	2,65	105,10
26	A61x	PB02	DB08	4,46	4,60	4,39	4,43	4	4,47			0,09	2,04	105,51
27	A47x	PD01	DB08	4,56	4,45	4,59	4,40	4	4,50			0,09	2,00	106,22
28	A57	PZ02	DD02	4,50	4,50	4,50	4,50	4	4,50			0,00	0,00	106,22
29	A58x	PD02	DB05	4,78	4,13	4,94	4,25	4	4,53			0,40	8,74	106,81
30	A53	PZ02	DD02	4,51	4,58	4,48	4,64	4	4,55			0,07	1,58	107,46
31	A65	PD01	DB08	4,50	4,50	4,70	4,60	4	4,58			0,10	2,09	107,99
32	F02x	PD02	DB08	4,57	*4,7a*	4,58	4,59	3	4,58			0,01	0,22	108,10
33	F27	PD01	DB01	4,78	4,65	4,82	4,18	4	4,61			0,30	6,41	108,77
34	A88	PD99	DB08	5,16	5,26	5,50	4,64	0	5,14	*b*	*	0,36	7,05	121,32
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	N	Mean	SI	VI
all labs	119	**4,24**	**0,089**	**2,105**
20	% from the mean			
	L		SR	VR
	30		**0,250**	**5,888**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Cu **Sample: 3** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	F09x	PZ02	DD02	2,37	2,31	2,38	2,40	4	2,37	*	0,04	1,64	77,26
2	A47x	PD01	DB08	2,51	2,50	2,59	2,48	4	2,52		0,05	1,92	82,32
3	A60	PD01	DB10	2,76	2,80	2,72	2,73	4	2,75		0,04	1,36	89,88
4	A45x	PZ99	DB08	2,83	2,71	2,86	2,61	4	2,75		0,12	4,18	89,92
5	F05x	PD02	DB08	2,83	2,74	2,80	2,78	4	2,79		0,04	1,35	91,06
6	F12x	PC01	DB09	2,72	2,85	2,82	2,77	4	2,79		0,06	2,05	91,14
7	A49	PD05	DB09	2,70	2,90	2,87	3,06	4	2,88		0,15	5,12	94,16
8	A82	PC01	DB10	2,82	2,93	2,86	2,98	4	2,90		0,07	2,46	94,65
9	F07x	PD02	DB08	3,07	2,85	2,89	2,82	4	2,91		0,11	3,86	94,99
10	F03	PD02	DB08	2,93	2,92	2,98	2,93	4	2,94		0,03	0,92	96,04
11	F19	PD02	DB08	2,89	2,96	2,95	3,01	4	2,95		0,05	1,67	96,45
12	F14x	PC01	DB08	2,96	2,91	3,01	3,01	4	2,97		0,05	1,61	97,10
13	F28x	PC02	DB08	2,99	2,97	2,96	3,05	4	2,99		0,04	1,43	97,77
14	A81	PD02	DB10	3,33	2,91	2,88	2,94	4	3,02		0,21	7,01	98,49
15	F06x	PD02	DB08	3,06	2,96	3,07	3,01	4	3,03		0,05	1,67	98,82
16	A79	PD03	DB10	3,08	3,02	3,08	3,02	4	3,05		0,03	0,98	99,60
17	A80	PD03	DB10	3,15	3,05	3,05	3,10	4	3,09		0,05	1,55	100,86
18	A57	PZ02	DD02	3,10	3,00	3,10	3,20	4	3,10		0,08	2,63	101,27
19	A58x	PD02	DB05	3,10	3,06	3,07	3,18	4	3,10		0,05	1,75	101,35
20	A36	PD02	DB08	2,93	2,98	3,36	3,32	4	3,15		0,22	7,11	102,82
21	A61x	PB02	DB08	3,22	3,17	3,17	3,08	4	3,16		0,06	1,85	103,23
22	A39	PD02	DB08	3,21	3,19	3,22	3,15	4	3,19		0,03	1,03	104,28
23	F18x	PD99	DB10	3,25	3,19	3,22	3,12	4	3,20		0,06	1,74	104,37
24	F33x	PD01	DB10	3,37	3,20	3,12	3,21	4	3,23		0,10	3,25	105,35
25	F32x	PD02	DB08	3,27	3,25	3,20	3,26	4	3,25		0,03	0,96	106,01
26	F13x	PD01	DB08	3,25	3,28	3,23	3,26	4	3,26		0,02	0,64	106,33
27	F16x	PC01	DB08	3,35	3,36	3,19	3,14	4	3,26		0,11	3,42	106,51
28	A53	PZ02	DD02	3,31	3,36	3,38	3,34	4	3,35		0,03	0,89	109,35
29	A65	PD01	DB08	3,20	3,40	3,30	3,60	4	3,38		0,17	5,06	110,25
30	F02x	PD02	DB08	3,38	3,37	3,41	3,40	4	3,39		0,02	0,54	110,74
31	F27	PD01	DB01	3,59	3,30	3,67	3,43	4	3,50		0,16	4,69	114,34
32	F08x	PZ99	DB08	2,96	3,17	4,17	4,56	0	3,72	c *	0,77	20,78	121,36
33	A88	PD99	DB08	3,92	3,76	4,07	3,34	4	3,77	*	0,31	8,35	123,24
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36	F15x	PC01	DB08	3,40	<1	2,30	2,80						
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	N	Mean	SI	VI
all labs	128	**3,06**	**0,083**	**2,700**
20	% from the mean			
	L		SR	VR
	32		**0,280**	**9,134**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F09x	PZ02	DD02	1,46	1,26	1,46	1,31	4	1,37	*	0,10	7,51	66,76
2	A49	PD05	DB09	1,38	1,59	1,60	1,43	4	1,50	*	0,11	7,44	72,97
3	A47x	PD01	DB08	1,45	1,75	1,51	1,32	4	1,51	*	0,18	**11,94**	73,33
4	F15x	PC01	DB08	2,10	1,90	1,20	1,90	4	1,78		0,39	**22,24**	86,34
5	A57	PZ02	DD02	1,70	1,70	1,80	1,90	4	1,78		0,10	5,39	86,34
6	A60	PD01	DB10	1,89	1,89	1,84	1,84	4	1,86		0,02	1,33	90,67
7	F06x	PD02	DB08	1,93	1,86	1,90	1,77	4	1,87		0,07	3,73	90,72
8	A45x	PZ99	DB08	1,81	2,09	1,74	1,98	4	1,91		0,16	8,36	92,67
9	A82	PC01	DB10	1,96	1,88	1,90	1,98	4	1,93		0,05	2,47	93,88
10	A81	PD02	DB10	1,93	1,90	1,97	2,01	4	1,95		0,05	2,45	94,98
11	F07x	PD02	DB08	1,96	1,93	1,98	2,00	4	1,97		0,03	1,54	95,68
12	A58x	PD02	DB05	2,04	1,94	1,96	1,94	4	1,97		0,05	2,42	95,83
13	F16x	PC01	DB08	2,03	2,02	2,05	1,89	4	2,00		0,07	3,54	97,12
14	A61x	PB02	DB08	2,19	2,03	1,94	2,02	4	2,05		0,10	5,12	99,48
15	F03	PD02	DB08	2,13	1,96	2,12	2,05	4	2,07		0,08	3,80	100,45
16	A80	PD03	DB10	2,16	2,12	2,00	2,08	4	2,09		0,07	3,27	101,66
17	A39	PD02	DB08	2,06	2,17	2,09	2,08	4	2,10		0,04	2,12	102,24
18	F12x	PC01	DB09	2,09	2,09	2,15	2,13	4	2,12		0,03	1,42	102,88
19	A79	PD03	DB10	2,13	2,11	2,13	2,11	4	2,12		0,01	0,60	103,12
20	F19	PD02	DB08	2,14	2,13	2,12	2,11	4	2,13		0,01	0,61	103,37
21	F13x	PD01	DB08	2,05	2,18	2,04	2,26	4	2,13		0,11	4,98	103,73
22	F33x	PD01	DB10	2,17	2,20	2,12	2,10	4	2,15		0,05	2,13	104,46
23	A53	PZ02	DD02	2,15	2,11	2,15	2,18	4	2,15		0,03	1,34	104,46
24	F14x	PC01	DB08	2,24	2,00	2,33	2,17	4	2,19		0,14	6,39	106,29
25	F18x	PD99	DB10	2,22	2,12	2,37	2,15	4	2,22		0,11	5,03	107,75
26	F32x	PD02	DB08	2,22	2,21	2,21	2,28	4	2,23		0,03	1,51	108,48
27	A36	PD02	DB08	2,23	2,30	2,16	2,37	4	2,27		0,09	3,99	110,18
28	F28x	PC02	DB08	2,12	2,23	2,37	2,40	4	2,28		0,13	5,68	111,05
29	F27	PD01	DB01	2,58	2,36	2,14	2,12	4	2,30		0,21	9,29	111,92
30	A65	PD01	DB08	2,40	2,40	2,30	2,40	4	2,38		0,05	2,11	115,53
31	F02x	PD02	DB08	2,32	2,47	2,39	2,36	4	2,39		0,06	2,66	116,01
32	F05x	PD02	DB08	2,54	2,59	2,46	2,61	4	2,55	*	0,07	2,62	124,04
33	A88	PD99	DB08	2,62	2,69	2,67	2,35	4	2,58	*	0,16	6,11	125,62
34	F08x	PZ99	DB08	2,92	2,45	3,27	3,55	0	3,05	*b* *	0,47	**15,57**	148,24
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	N	Mean	SI	VI
all labs	132	**2,06**	**0,090**	**4,381**
20	% from the mean			
	L		SR	VR
	33		**0,272**	**13,248**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F05x	PD02	DB05	0,68	0,63	0,64	0,63	4	0,64			0,02	3,60	70,61
2	A45x	PZ99	DB10	0,80	0,73	0,79	0,67	4	0,75			0,06	8,07	82,07
3	A60	PD01	DB10	0,76	0,76	0,74	0,73	4	0,75			0,01	1,98	82,26
4	F13x	PD01	DB05	0,76	0,78	0,78	0,80	4	0,78			0,02	2,15	85,78
5	A79	PD03	DB10	0,81	0,82	0,81	0,82	4	0,82			0,00	0,50	89,94
6	F16x	PC01	DB10	0,84	0,80	0,81	0,89	4	0,84			0,04	4,59	91,88
7	A82	PC01	DB10	0,86	0,84	0,83	0,84	4	0,84			0,01	1,56	92,68
8	F18x	PD99	DB10	0,90	0,89	0,89	0,88	4	0,89			0,01	0,69	97,71
9	A80	PD03	DB10	0,89	0,90	0,87	0,89	4	0,89			0,01	1,36	97,76
10	F27	PD01	DB05	0,94	0,83	0,89	0,91	4	0,89			0,05	5,48	98,26
11	F07x	PD02	DB08	0,93	0,91	0,89	0,91	4	0,91			0,02	1,85	100,06
12	A81	PD02	DB10	0,92	0,92	0,93	0,92	4	0,92			0,01	0,54	101,42
13	F15x	PC01	DB08	0,77	1,08	1,11	0,78	4	0,94			0,19	**19,81**	102,79
14	A49	PD05	DB09	0,96	0,96	0,96	0,96	4	0,96			0,00	0,13	105,29
15	F14x	PC01	DB10	0,97	0,97	0,95	0,99	4	0,97			0,02	1,76	106,56
16	A36	PD02	DB10	0,96	0,97	0,99	1,01	4	0,98			0,02	2,25	108,07
17	F03	PD02	DB08	0,94	1,03	1,02	0,99	4	1,00			0,04	4,06	109,39
18	F08x	PD02	DB10	1,01	1,02	1,01	1,02	4	1,02			0,01	0,57	111,59
19	F02	PD02	DB05	1,05	0,86	0,98	1,22	4	1,03			0,15	**14,64**	112,96
20	F33x	PD01	DB10	1,09	1,02	1,02	1,01	4	1,03			0,03	3,30	113,70
21	F32x	PD02	DB10	1,12	1,12	1,07	1,06	4	1,09			0,03	2,93	120,11
22	A39	PD02	DB08	*1,17a*	1,14	1,14	1,14	3	1,14			0,00	0,22	125,48
23	A65	PD01	DB08	1,20	1,50	1,50	1,30	0	1,38	*b*	*	0,15	**10,91**	151,17
24	F12x	PC01	DB09	1,43	1,57	1,58	1,51	0	1,52	*b*	*	0,07	4,53	167,38
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	N	Mean	SI	VI
all labs	87	**0,91**	**0,034**	**3,750**
30	% from the mean			
	L		SR	VR
	22		**0,121**	**13,257**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Pb **Sample: 2** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	F13x	PD01	DB05	0,11	0,09	0,09	0,09	4	0,10	*	0,01	**10,69**	55,04
2	A60	PD01	DB10	0,10	0,10	0,10	0,10	4	0,10	*	0,00	1,27	58,65
3	F16x	PC01	DB10	0,11	0,10	0,11	0,11	4	0,11		0,00	4,14	62,23
4	A79	PD03	DB10	0,11	0,11	0,11	0,11	4	0,11		0,00	0,62	64,66
5	A82	PC01	DB10	0,13	0,11	0,11	0,11	4	0,11		0,01	**10,61**	66,30
6	F33x	PD01	DB10	0,12	0,13	0,12	0,12	4	0,12		0,00	4,12	68,04
7	A81	PD02	DB10	0,13	0,12	0,12	0,14	4	0,13		0,01	7,51	73,67
8	F32x	PD02	DB10	0,13	0,13	0,13	0,13	4	0,13		0,00	0,00	73,96
9	A36	PD02	DB10	0,14	0,13	0,14	0,13	4	0,13		0,00	2,36	77,42
10	F18x	PD99	DB10	0,15	0,14	0,14	0,16	4	0,15		0,01	6,04	83,92
11	A45x	PZ99	DB10	0,17	0,17	0,17	0,17	4	0,17		0,00	1,82	98,08
12	F14x	PC01	DB10	0,18	0,18	0,18	0,17	4	0,18		0,01	3,20	102,41
13	F08x	PD02	DB10	0,34	0,31	0,33	0,31	4	0,32	*	0,02	5,30	185,17
14	F27	PD01	DB05	0,28	0,36	0,30	0,41	4	0,34	*	0,06	**17,48**	193,85
15	A49	PD05	DB09	0,44	0,42	0,38	0,40	4	0,41	*	0,03	7,08	236,61
16													
17													
18	F03	PD02	DB08	<,5	<,5	<,5	<,5						
19	F15x	PC01	DB08	<,5	<,5	<,5	<,5						
20	A39	PD02	DB08	<,5	<,5	<,5	<,5						
21	A65	PD01	DB08	<,4	<,4	<,4	<,4						
22	F02	PD02	DB05	<,3	<,3	<,3	<,3						
23	A80	PD03	DB10	<,25	<,25	<,25	<,25						
24	F07x	PD02	DB08	<,2	<,2	<,2	<,2						
25	F05x	PD02	DB05	<,125	<,125	<,125	<,125						
26	F12x	PC01	DB09	<,5	0,58	0,56	<,5						
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	N	Mean	SI	VI
all labs	60	**0,17**	**0,011**	**6,493**
40	% from the mean			
	L		SR	VR
	15		**0,099**	**56,970**

* = non tolerable mean because more than +/-

lower than the lowest evaluated result

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Pb **Sample: 3** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	F13x	PD01	DB05	0,05	0,04	0,06	0,04	4	0,05			0,01	**22,99**	66,28
2	A82	PC01	DB10	0,05	0,05	0,05	0,06	4	0,05			0,00	4,78	76,53
3	F33x	PD01	DB10	0,05	0,05	0,05	0,05	4	0,05			0,00	3,30	76,89
4	F16x	PC01	DB10	0,05	0,06	0,05	0,06	4	0,05			0,00	4,60	80,30
5	A60	PD01	DB10	0,06	0,05	0,06	0,06	4	0,06			0,00	4,01	80,92
6	A79	PD03	DB10	0,06	0,06	0,06	0,06	4	0,06			0,00	0,31	81,07
7	F32x	PD02	DB10	0,06	0,06	0,07	0,06	4	0,06			0,00	1,96	94,10
8	A36	PD02	DB10	0,08	0,07	0,08	0,07	4	0,07			0,01	8,76	104,36
9	A81	PD02	DB10	0,07	0,07	0,07	0,08	4	0,07			0,01	6,90	106,19
10	F18x	PD99	DB10	0,09	0,09	0,09	0,09	4	0,09			0,00	2,15	131,78
11	A45x	PZ99	DB10	0,10	0,10	0,09	0,10	4	0,10		*	0,01	7,27	143,39
12	F14x	PC01	DB10	0,10	0,10	0,12	0,12	4	0,11		*	0,01	**10,50**	158,18
13	F08x	PD02	DB10	0,18	0,19	0,16	0,16	4	0,17	*b*	*	0,02	8,92	253,75
14	F27	PD01	DB05	0,19	0,25	0,33	0,35	4	0,28	*b*	*	0,07	**26,93**	406,81
15														
16														
17	F12x	PC01	DB09	<,5	<,5	<,5	<,5							
18	F03	PD02	DB08	<,5	<,5	<,5	<,5							
19	F15x	PC01	DB08	<,5	<,5	<,5	<,5							
20	A39	PD02	DB08	<,5	<,5	<,5	<,5							
21	F02	PD02	DB05	<,3	<,3	<,3	<,3							
22	A49	PD05	DB09	<,3	<,3	<,3	<,3							
23	A80	PD03	DB10	<,25	<,25	<,25	<,25							
24	F07x	PD02	DB08	<,2	<,2	<,2	<,2							
25	F05x	PD02	DB05	<,125	<,125	<,125	<,125							
26	A65	PD01	DB08	<,4	<,4	<,4	0,90							
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	N	Mean	SI	VI
all labs	48	**0,07**	**0,004**	**6,401**
40	% from the mean			
	L		SR	VR
	12		**0,020**	**29,700**

* = non tolerable mean because more than +/-

lower than the lowest evaluated result

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Pb **Sample: 4** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	A82	PC01	DB10	0,10	0,10	0,11	0,11	4	0,11		0,00	3,65	62,79
2	A60	PD01	DB10	0,13	0,11	0,11	0,11	4	0,11		0,01	7,56	66,80
3	F16x	PC01	DB10	0,12	0,11	0,12	0,12	4	0,12		0,00	3,16	69,98
4	A79	PD03	DB10	0,12	0,12	0,12	0,12	4	0,12		0,00	1,91	71,91
5	F13x	PD01	DB05	0,13	0,13	0,12	0,11	4	0,12		0,01	6,00	72,00
6	F32x	PD02	DB10	0,13	0,13	0,13	0,13	4	0,13		0,00	0,00	77,19
7	F33x	PD01	DB10	0,14	0,13	0,14	0,13	4	0,13		0,01	5,90	78,38
8	A36	PD02	DB10	0,14	0,14	0,13	0,13	4	0,14		0,00	3,65	81,20
9	A81	PD02	DB10	0,12	0,13	0,14	0,16	4	0,14		0,02	**12,42**	81,64
10	F18x	PD99	DB10	0,15	0,16	0,14	0,15	4	0,15		0,01	3,90	89,22
11	A45x	PZ99	DB10	0,18	0,18	0,16	0,17	4	0,17		0,01	4,63	100,94
12	F14x	PC01	DB10	0,23	0,19	0,21	0,25	4	0,22		0,02	**11,14**	130,33
13	F05x	PD02	DB05	0,24	0,23	0,24	0,21	4	0,23		0,01	5,16	135,68
14	F27	PD01	DB05	0,28	0,32	0,35	0,27	4	0,30	*	0,04	**12,64**	180,06
15	F08x	PD02	DB10	0,34	0,32	0,37	0,34	4	0,34	*	0,02	5,85	201,88
16													
17													
18	A39	PD02	DB08	<,5	<,5	<,5	<,5						
19	F15x	PC01	DB08	<,5	<,5	<,5	<,5						
20	F03	PD02	DB08	<,5	<,5	<,5	<,5						
21	F12x	PC01	DB09	<,5	<,5	<,5	<,5						
22	A65	PD01	DB08	<,4	<,4	<,4	<,4						
23	A49	PD05	DB09	<,3	<,3	<,3	<,3						
24	F02	PD02	DB05	<,3	<,3	<,3	<,3						
25	A80	PD03	DB10	<,25	<,25	<,25	<,25						
26	F07x	PD02	DB08	<,2	<,2	<,2	<,2						
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	N	Mean	SI	VI
all labs	60	**0,17**	**0,011**	**6,481**
40	% from the mean			
	L		SR	VR
	15		**0,072**	**42,879**

* = non tolerable mean because more than +/-

lower than the lowest evaluated result

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4			Si	Vi	%
1	F02	PD02	DB05	285,00	224,00	335,00	233,00	0	269,25 *b*	51,42	**19,10**	81,23
2	F07x	PD02	DB08	278,70	288,00	283,50	279,40	4	282,40	4,29	1,52	85,19
3	F16x	PC01	DB10	301,00	335,20	295,00	315,30	4	311,63	17,88	5,74	94,01
4	A80	PD03	DB10	318,00	311,00	318,00	303,00	4	312,50	7,14	2,29	94,27
5	A81	PD02	DB10	310,00	317,00	317,00	309,00	4	313,25	4,35	1,39	94,50
6	A58x	PD02	DB05	314,72	317,03	318,89	311,58	4	315,56	3,15	1,00	95,20
7	F03	PD02	DB08	335,90	312,80	305,00	333,20	4	321,73	15,19	4,72	97,06
8	F18x	PD99	DB10	322,00	316,00	320,00	329,00	4	321,75	5,44	1,69	97,07
9	A39	PD02	DB08	323,70	325,80	314,70	323,70	4	321,98	4,95	1,54	97,13
10	A45x	PZ99	DB10	330,00	322,00	321,00	322,00	4	323,75	4,19	1,30	97,67
11	F15x	PC01	DB08	328,00	348,00	307,00	317,00	4	325,00	17,57	5,41	98,05
12	F08x	PD02	DB10	325,90	329,40	326,20	323,70	4	326,30	2,35	0,72	98,44
13	F05x	PD02	DB05	339,00	331,00	333,00	330,00	4	333,25	4,03	1,21	100,53
14	A82	PC01	DB10	331,00	337,00	332,00	340,00	4	335,00	4,24	1,27	101,06
15	F13x	PD01	DB05	327,24	333,31	344,37	341,74	4	336,67	7,86	2,33	101,56
16	A88	PD99	DB99	360,00	325,00	320,00	345,00	4	337,50	18,48	5,48	101,82
17	A79	PD03	DB10	341,30	336,40	341,30	336,40	4	338,85	2,83	0,83	102,22
18	F33x	PD01	DB10	338,00	336,00	342,00	341,00	4	339,25	2,75	0,81	102,34
19	A36	PD02	DB10	348,70	338,70	335,30	342,00	4	341,18	5,71	1,67	102,93
20	F12x	PC01	DB09	341,00	344,00	344,00	343,00	4	343,00	1,41	0,41	103,48
21	A60	PD01	DB10	347,50	349,50	349,70	330,00	4	344,18	9,50	2,76	103,83
22	A47	PD01	DB08	330,00	329,00	351,00	374,00	4	346,00	21,24	6,14	104,38
23	F14x	PC01	DB08	355,10	346,40	356,10	344,30	4	350,48	5,99	1,71	105,73
24	F27	PD01	DB05	388,30	334,00	335,30	368,60	4	356,55	26,54	7,44	107,56
25	F32x	PD02	DB10	375,00	386,00	375,00	375,00	4	377,75	5,50	1,46	113,96
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	N	Mean	SI	VI
all labs	96	**331,48**	**8,442**	**2,547**
30	% from the mean			

* = non tolerable mean because more than +/-

L	SR	VR
24	**18,743**	**5,655**

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Lab.standard dev. Vi	Recovery %
1	F02	PD02	DB05	238,00	183,00	169,00	235,00	0	206,25	*c*	35,42	**17,17**	84,40
2	F07x	PD02	DB08	214,30	201,80	207,60	203,70	4	206,85		5,52	2,67	84,65
3	F03	PD02	DB08	222,90	235,30	213,80	216,60	4	222,15		9,56	4,30	90,91
4	F15x	PC01	DB08	276,00	184,00	204,00	225,00	0	222,25	*c*	39,55	**17,80**	90,95
5	F16x	PC01	DB10	223,80	226,00	226,30	220,80	4	224,23		2,54	1,13	91,76
6	A80	PD03	DB10	229,00	239,00	224,00	232,00	4	231,00		6,27	2,71	94,53
7	F18x	PD99	DB10	233,00	234,00	232,00	237,00	4	234,00		2,16	0,92	95,76
8	A81	PD02	DB10	239,00	236,00	240,00	230,00	4	236,25		4,50	1,90	96,68
9	F08x	PD02	DB10	236,50	236,40	242,00	236,40	4	237,83		2,78	1,17	97,32
10	A39	PD02	DB08	243,00	239,00	235,80	233,70	4	237,88		4,05	1,70	97,35
11	F05x	PD02	DB05	244,00	232,00	240,00	244,00	4	240,00		5,66	2,36	98,21
12	A45x	PZ99	DB10	241,00	262,00	241,00	243,00	4	246,75		10,21	4,14	100,98
13	F33x	PD01	DB10	249,00	237,00	253,00	249,00	4	247,00		6,93	2,80	101,08
14	A58x	PD02	DB05	248,93	247,68	247,80	245,81	4	247,56		1,29	0,52	101,31
15	F12x	PC01	DB09	246,00	246,00	252,00	251,00	4	248,75		3,20	1,29	101,80
16	F13x	PD01	DB05	249,61	245,25	247,16	256,31	4	249,58		4,83	1,93	102,14
17	A60	PD01	DB10	254,70	252,80	248,70	243,90	4	250,03		4,79	1,92	102,32
18	A36	PD02	DB10	257,30	249,60	248,50	249,60	4	251,25		4,07	1,62	102,82
19	A82	PC01	DB10	253,00	254,00	260,00	244,00	4	252,75		6,60	2,61	103,43
20	A79	PD03	DB10	252,40	254,50	252,40	254,50	4	253,45		1,21	0,48	103,72
21	F27	PD01	DB05	275,10	245,20	247,10	259,40	4	256,70		13,79	5,37	105,05
22	F32x	PD02	DB10	256,00	267,00	256,00	256,00	4	258,75		5,50	2,13	105,89
23	A88	PD99	DB99	265,00	260,00	260,00	255,00	4	260,00		4,08	1,57	106,40
24	F14x	PC01	DB08	250,40	267,60	261,10	263,30	4	260,60		7,32	2,81	106,64
25	A47	PD01	DB08	267,00	270,00	253,00	278,00	4	267,00		10,42	3,90	109,26
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	N	Mean	SI	VI
all labs	92	**244,36**	**5,534**	**2,265**
30	% from the mean			

L	SR	VR
23	**14,212**	**5,816**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F13x	PD01	DB05	27,09	25,18	24,92	27,09	4	26,07		1,18	4,54	89,27
2	F07x	PD02	DB08	26,50	28,00	26,50	25,90	4	26,73		0,90	3,35	91,51
3	F16x	PC01	DB10	27,25	26,53	27,41	27,02	4	27,05		0,38	1,42	92,63
4	A58x	PD02	DB05	26,63	27,77	26,75	27,20	4	27,09		0,52	1,91	92,75
5	A80	PD03	DB10	27,20	28,00	28,20	27,80	4	27,80		0,43	1,55	95,19
6	F08x	PD02	DB10	28,40	26,60	29,70	26,80	4	27,88		1,46	5,23	95,45
7	A45x	PZ99	DB10	31,90	27,90	28,60	25,70	4	28,53		2,57	9,00	97,67
8	A81	PD02	DB10	28,20	28,30	30,20	29,30	4	29,00		0,94	3,25	99,30
9	A79	PD03	DB10	29,40	28,80	29,40	28,80	4	29,10		0,35	1,19	99,64
10	A36	PD02	DB10	29,50	29,61	29,50	29,29	4	29,48		0,13	0,45	100,93
11	A88	PD99	DB99	30,00	30,50	29,50	28,00	4	29,50		1,08	3,66	101,01
12	A82	PC01	DB10	29,70	30,70	29,30	30,50	4	30,05		0,66	2,20	102,90
13	A60	PD01	DB10	31,35	29,49	30,22	29,69	4	30,19		0,83	2,76	103,37
14	F32x	PD02	DB10	29,70	30,80	30,80	29,70	4	30,25		0,64	2,10	103,58
15	F33x	PD01	DB10	31,70	28,50	33,00	29,70	4	30,73		2,01	6,54	105,21
16	F14x	PC01	DB08	31,90	28,80	30,90	33,00	4	31,15		1,79	5,73	106,66
17	F18x	PD99	DB10	32,20	31,70	31,40	30,50	4	31,45		0,71	2,27	107,69
18	F27	PD01	DB05	32,10	34,10	32,00	36,40	4	33,65		2,07	6,16	115,22
19	F12x	PC01	DB09	35,40	37,60	38,40	36,10	4	36,88	*b*	1,37	3,71	126,27
20													
21													
22	A39	PD02	DB08	<100	<100	<100	<100			**			
23	F15x	PC01	DB08	<75	<75	<75	<75			**			
24	F03	PD02	DB08	<50	<50	<50	<50						
25	A47	PD01	DB08	<50	<50	<50	<50						
26	F05x	PD02	DB05	<25	<25	<25	<25						
27	F02	PD02	DB05	30,00	<30	30,00	30,00						
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	N	Mean	SI	VI
all labs	72	**29,20**	**1,036**	**3,548**
30	% from the mean			

L	SR	VR
18	**1,928**	**6,601**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	A58x	PD02	DB05	13,52	14,52	12,44	10,88	4	12,84	c		1,56	**12,14**	92,83
2	A81	PD02	DB10	12,20	13,30	13,30	13,30	4	13,03			0,55	4,22	94,17
3	A80	PD03	DB10	13,70	12,50	13,50	13,40	4	13,28			0,53	4,00	95,98
4	F16x	PC01	DB10	13,13	13,53	13,35	13,30	4	13,33			0,16	1,24	96,36
5	F13x	PD01	DB05	14,40	12,65	12,38	13,97	4	13,35			0,99	7,39	96,52
6	F32x	PD02	DB10	13,50	13,30	13,00	13,80	4	13,40			0,34	2,51	96,88
7	A88	PD99	DB99	14,00	15,00	13,50	12,50	4	13,75			1,04	7,57	99,41
8	F33x	PD01	DB10	12,70	13,10	14,90	15,00	4	13,93	c		1,20	8,59	100,68
9	A36	PD02	DB10	14,61	13,95	14,28	13,19	4	14,01			0,61	4,34	101,28
10	A79	PD03	DB10	14,20	14,00	14,20	14,00	4	14,10			0,12	0,82	101,94
11	F14x	PC01	DB08	14,10	14,10	14,10	15,20	4	14,38			0,55	3,83	103,93
12	A60	PD01	DB10	14,68	15,25	15,13	13,57	4	14,66			0,77	5,22	105,97
13	A82	PC01	DB10	14,80	14,60	14,70	15,40	4	14,88			0,36	2,42	107,55
14	F08x	PD02	DB10	16,60	16,40	14,20	13,20	4	15,10	c		1,67	**11,06**	109,17
15	A45x	PZ99	DB10	15,40	19,20	18,20	16,40	4	17,30	b		1,72	9,92	125,08
16	F18x	PD99	DB10	19,30	18,30	19,50	18,70	4	18,95	b	*	0,55	2,91	137,01
17	F27	PD01	DB05	16,80	24,00	23,00	21,40	4	21,30	b	*	3,19	**14,95**	154,00
18	F05x	PD02	DB05	27,60	30,20	27,10	28,30	4	28,30	b	*	1,36	4,80	204,61
19														
20														
21	A39	PD02	DB08	<100	<100	<100	<100				**			
22	F15x	PC01	DB08	<75	<75	<75	<75				**			
23	F03	PD02	DB08	<50	<50	<50	<50							
24	A47	PD01	DB08	<50	<50	<50	<50							
25	F02	PD02	DB05	<30	<30	<30	<30							
26	F12x	PC01	DB09	<25	<25	<25	<25							
27	F07x	PD02	DB08	<20	<20	<20	<20							
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	N	Mean	SI	VI
all labs	44	**13,83**	**0,546**	**3,949**
30	% from the mean			

L	SR	VR
11	**0,617**	**4,462**

* = non tolerable mean because more than +/-

lower than the lowest evaluated result

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F28x	PC02	DB08	15,82	14,57	14,27	15,23	4	14,97		0,69	4,63	83,72
2	F05	PD02	DB08	15,50	15,40	15,50	15,50	4	15,48		0,05	0,32	86,54
3	F08x	PZ99	DB08	16,20	16,20	15,50	18,00	4	16,48		1,07	6,49	92,14
4	F18x	PD99	DB08	16,70	16,40	16,60	16,50	4	16,55		0,13	0,78	92,56
5	F07x	PD02	DB08	16,36	16,75	17,15	16,14	4	16,60		0,45	2,68	92,84
6	A88	PD99	DB08	18,80	17,90	15,10	16,20	4	17,00		1,66	9,78	95,07
7	F19	PD02	DB08	17,10	17,20	16,90	17,10	4	17,08		0,13	0,74	95,49
8	F02x	PD02	DB08	17,05	17,06	17,30	17,29	4	17,18		0,14	0,81	96,05
9	A81	PD02	DB10	17,80	17,70	17,60	17,10	4	17,55		0,31	1,77	98,15
10	A60	PD01	DB10	18,48	17,91	17,78	17,17	4	17,84		0,54	3,01	99,74
11	A49	PD05	DB08	17,80	17,80	17,90	17,90	4	17,85		0,06	0,32	99,83
12	F15x	PC01	DB08	18,30	17,90	17,80	17,60	4	17,90		0,29	1,64	100,11
13	F16x	PC01	DB10	19,33	18,75	16,22	17,79	4	18,02		1,36	7,54	100,79
14	A39	PD02	DB08	18,02	18,62	18,42	18,67	4	18,43		0,30	1,60	103,08
15	A65	PD01	DB08	18,50	18,40	18,50	18,40	4	18,45		0,06	0,31	103,18
16	F09x	PD02	DB10	18,80	18,60	17,90	19,20	4	18,63		0,54	2,92	104,16
17	F32x	PD02	DB08	18,80	18,70	18,70	18,60	4	18,70		0,08	0,44	104,58
18	F14x	PC01	DB08	18,77	18,70	18,63	18,71	4	18,70		0,06	0,31	104,59
19	A47x	PD01	DB08	20,00	19,49	18,53	18,25	4	19,07		0,82	4,29	106,64
20	A79	PD03	DB10	19,73	19,49	20,18	19,33	4	19,68		0,37	1,88	110,07
21	A36	PD02	DB08	19,70	20,40	20,70	20,90	4	20,43		0,53	2,57	114,23
22	A61x	PB02	DB08	*22,1a*	21,80	21,80	21,80	3	21,80	*	0,00	0,00	121,92
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	N	Mean	SI	VI
all labs	87	**17,88**	**0,437**	**2,446**
20	% from the mean			
	L		SR	VR
	22		**1,553**	**8,666**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: B **Sample: 2** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	A88	PD99	DB08	*19,6a*	16,80	16,50	16,20	0	16,50	*b*	*	0,30	1,82	79,18
2	F18x	PD99	DB08	18,40	18,50	18,40	18,10	4	18,35			0,17	0,94	88,05
3	F28x	PC02	DB08	17,09	20,20	18,20	19,95	4	18,86			1,48	7,84	90,49
4	F07x	PD02	DB08	19,78	19,16	19,12	18,70	4	19,19			0,44	2,32	92,08
5	F05	PD02	DB08	19,60	19,90	20,00	19,60	4	19,78			0,21	1,04	94,89
6	F19	PD02	DB08	19,90	19,70	20,10	19,90	4	19,90			0,16	0,82	95,49
7	F08x	PZ99	DB08	19,10	18,70	21,60	20,40	4	19,95			1,32	6,61	95,73
8	F16x	PC01	DB10	20,01	20,84	20,61	20,23	4	20,42			0,37	1,82	98,00
9	F02x	PD02	DB08	20,25	20,50	20,53	20,44	4	20,43			0,13	0,62	98,03
10	A81	PD02	DB10	21,00	20,80	20,20	20,20	4	20,55			0,41	2,01	98,61
11	A39	PD02	DB08	21,75	21,51	19,68	19,80	4	20,69			1,10	5,30	99,26
12	A47x	PD01	DB08	20,88	21,01	20,89	20,94	4	20,93			0,06	0,28	100,43
13	A60	PD01	DB10	21,27	20,86	21,15	20,48	4	20,94			0,35	1,68	100,48
14	A49	PD05	DB08	20,90	20,70	21,30	21,50	4	21,10			0,37	1,73	101,25
15	A65	PD01	DB08	21,30	21,10	21,40	21,30	4	21,28			0,13	0,59	102,09
16	F09x	PD02	DB10	21,20	23,20	19,90	20,80	4	21,28			1,39	6,55	102,09
17	F14x	PC01	DB08	21,62	21,50	21,47	21,50	4	21,52			0,07	0,31	103,28
18	F32x	PD02	DB08	21,50	21,50	21,60	21,60	4	21,55			0,06	0,27	103,41
19	F15x	PC01	DB08	21,60	21,00	22,20	21,50	4	21,58			0,49	2,28	103,53
20	A79	PD03	DB10	23,23	23,29	21,87	22,12	4	22,63			0,74	3,26	108,58
21	A36	PD02	DB08	23,00	23,00	23,30	23,90	4	23,30			0,42	1,82	111,81
22	A61x	PB02	DB08	23,90	23,30	23,00	23,50	4	23,43			0,38	1,61	112,41
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	N	Mean	SI	VI
all labs	84	**20,84**	**0,488**	**2,341**
20	% from the mean			
	L		SR	VR
	21		**1,304**	**6,258**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: B **Sample: 3** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	F28x	PC02	DB08	10,10	9,34	9,36	10,38	4	9,80			0,52	5,36	84,80
2	F05	PD02	DB08	10,50	10,20	10,40	10,20	4	10,33			0,15	1,45	89,39
3	F18x	PD99	DB08	10,50	10,40	10,50	10,40	4	10,45			0,06	0,55	90,47
4	F08x	PZ99	DB08	10,50	10,10	10,30	11,70	4	10,65			0,72	6,75	92,20
5	F15x	PC01	DB08	11,10	11,20	11,20	9,90	4	10,85			0,64	5,85	93,93
6	F07x	PD02	DB08	11,12	10,84	11,01	10,63	4	10,90			0,21	1,96	94,37
7	F02x	PD02	DB08	10,92	11,07	10,97	10,93	4	10,97			0,07	0,62	94,99
8	A39	PD02	DB08	10,82	11,35	11,67	11,79	4	11,41			0,43	3,80	98,76
9	F19	PD02	DB08	11,50	11,40	11,40	11,40	4	11,43			0,05	0,44	98,91
10	A88	PD99	DB08	11,76	11,76	11,48	10,80	4	11,45			0,45	3,96	99,13
11	A49	PD05	DB08	11,50	11,50	11,70	11,40	4	11,53			0,13	1,09	99,78
12	A81	PD02	DB10	11,80	11,60	11,50	11,40	4	11,58			0,17	1,48	100,21
13	F16x	PC01	DB10	11,52	11,79	11,60	11,47	4	11,60			0,14	1,21	100,38
14	A60	PD01	DB10	12,23	12,18	11,79	11,82	4	12,01			0,23	1,93	103,93
15	F14x	PC01	DB08	12,19	12,17	12,29	12,21	4	12,22			0,05	0,43	105,75
16	F32x	PD02	DB08	12,30	12,30	12,30	12,30	4	12,30			0,00	0,00	106,49
17	F09x	PD02	DB10	12,70	11,80	12,00	12,80	4	12,33			0,50	4,05	106,70
18	A65	PD01	DB08	12,30	12,30	12,20	12,60	4	12,35			0,17	1,40	106,92
19	A36	PD02	DB08	12,60	12,80	12,40	13,00	4	12,70			0,26	2,03	109,95
20	A79	PD03	DB10	13,63	13,23	12,45	12,01	4	12,83			0,73	5,72	111,07
21	A47x	PD01	DB08	13,98	13,17	12,43	12,11	4	12,92			0,83	6,45	111,87
22	A61x	PB02	DB08	17,60	17,40	17,70	17,50	0	17,55	*b*	*	0,13	0,74	151,94
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	N	Mean	SI	VI
all labs	84	**11,55**	**0,311**	**2,690**
20	% from the mean			
	L		SR	VR
	21		**0,872**	**7,545**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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					Si	Vi	%
1	F05	PD02	DB08	4,42	4,43	4,42	*4,35a*	3	4,42		*	0,01	0,13	70,85
2	F15x	PC01	DB08	4,20	4,20	5,00	4,90	4	4,58		*	0,43	9,51	73,28
3	A88	PD99	DB08	5,88	5,88	5,04	5,04	4	5,46			0,48	8,88	87,46
4	F28x	PC02	DB08	5,64	5,82	5,32	5,13	4	5,48			0,31	5,68	87,72
5	F02x	PD02	DB08	5,38	5,38	5,76	5,53	4	5,51			0,18	3,26	88,30
6	A49	PD05	DB08	5,93	5,95	5,86	5,76	4	5,88			0,09	1,46	94,10
7	F18x	PD99	DB08	5,97	5,98	5,94	6,05	4	5,99			0,05	0,78	95,86
8	F07x	PD02	DB08	6,21	6,23	6,51	6,18	4	6,29			0,15	2,42	100,67
9	F08x	PZ99	DB08	5,61	5,69	7,13	6,81	4	6,31			0,77	**12,26**	101,07
10	F16x	PC01	DB10	6,24	6,35	6,39	6,51	4	6,37			0,11	1,78	102,07
11	F19	PD02	DB08	6,53	6,35	6,42	6,38	4	6,42			0,08	1,23	102,83
12	A81	PD02	DB10	6,47	6,41	6,41	6,58	4	6,47			0,08	1,24	103,59
13	A47x	PD01	DB08	7,04	6,56	6,23	6,32	4	6,54			0,36	5,55	104,71
14	F14x	PC01	DB08	6,70	6,67	6,63	6,78	4	6,70			0,06	0,95	107,24
15	A60	PD01	DB10	6,74	6,90	6,59	6,61	4	6,71			0,14	2,13	107,48
16	A39	PD02	DB08	6,84	6,86	6,71	6,75	4	6,79			0,07	1,06	108,76
17	A36	PD02	DB08	6,64	6,75	6,97	6,96	4	6,83			0,16	2,38	109,40
18	A65	PD01	DB08	7,00	6,90	6,90	6,90	4	6,93			0,05	0,72	110,92
19	A79	PD03	DB10	7,07	7,21	6,70	6,86	4	6,96			0,23	3,24	111,46
20	F09x	PD02	DB10	5,87	7,25	6,65	8,07	4	6,96			0,93	**13,38**	111,48
21	F32x	PD02	DB08	7,11	7,12	7,08	7,02	4	7,08			0,05	0,64	113,44
22	A61x	PB02	DB08	14,60	14,90	14,60	14,20	0	14,58	*b*	*	0,29	1,97	233,46
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	N	Mean	SI	VI
all labs	83	**6,24**	**0,229**	**3,662**
20	% from the mean			
	L		SR	VR
	21		**0,757**	**12,174**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab. Code	Method code P	Method code D	Replications 1	Replications 2	Replications 3	Replications 4	n	Lab.mean		Lab.standard dev. Si	Lab.standard dev. Vi	Recovery %
1	A45x	PZ99	DB10	25,70	25,80	27,70	28,80	4	27,00	*	1,51	5,60	54,88
2	F08x	PD02	DB10	36,50	37,70	38,00	38,80	4	37,75		0,95	2,53	76,73
3	A79	PD03	DB10	40,00	39,40	40,00	39,40	4	39,70		0,35	0,87	80,70
4	F14x	PC01	DB10	44,00	49,00	47,00	45,00	4	46,25		2,22	4,79	94,01
5	A36	PD02	DB10	46,79	47,13	45,23	48,69	4	46,96		1,42	3,02	95,46
6	F16x	PC01	DB10	47,05	43,55	50,28	47,30	4	47,05		2,75	5,85	95,63
7	A81	PD02	DB10	53,70	44,80	46,70	43,70	4	47,23		4,49	9,51	95,99
8	F32	PD02	DB10	67,60	51,50	51,50	55,80	4	56,60		7,61	**13,44**	115,05
9	A80	PD03	DB10	65,10	65,90	70,50	73,10	4	68,65	*	3,80	5,54	139,55
10	A82	PC01	DB10	73,60	73,80	75,30	76,40	4	74,78	*	1,32	1,77	152,00
11													
12													
13	F05	PD02	DB05	<413	<413	<413	<413			**			
14	F07	PD02	DB08	<200	<200	<200	<200			**			
15	A39	PD02	DB08	<100	<100	<100	<100			**			
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	N	Mean	SI	VI
all labs	40	**49,20**	**2,643**	**5,372**
30	% from the mean			

* = non tolerable mean because more than +/-

limit for the lower concentration range

L	SR	VR
10	**14,235**	**28,935**

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	F08x	PD02	DB10	16,90	12,60	11,90	18,30	4	14,93			3,15	**21,13**	81,48
2	F16x	PC01	DB10	15,32	13,40	15,21	18,14	4	15,52			1,96	**12,61**	84,72
3	A36	PD02	DB10	15,13	15,24	16,24	16,79	4	15,85			0,80	5,06	86,53
4	F14x	PC01	DB10	17,00	19,00	16,00	17,00	4	17,25			1,26	7,29	94,18
5	F32	PD02	DB10	18,20	18,20	17,10	21,40	4	18,73			1,86	9,92	102,23
6	A81	PD02	DB10	22,70	21,70	22,70	19,70	4	21,70			1,41	6,52	118,47
7	A82	PC01	DB10	23,20	25,60	25,00	23,20	4	24,25		*	1,24	5,10	132,39
8	A80	PD03	DB10	50,20	54,30	49,60	51,40	0	51,38	*b*	*	2,09	4,07	280,48
9														
10														
11	F05	PD02	DB05	<413	<413	<413	<413				**			
12	F07	PD02	DB08	<200	<200	<200	<200				**			
13	A39	PD02	DB08	<100	<100	<100	<100				**			
14	A79	PD03	DB10	<25	<25	<25	<25							
15	A45x	PZ99	DB10	<20	<20	<20	<20							
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	N	Mean	SI	VI
all labs	28	**18,32**	**1,669**	**9,109**
30	% from the mean			

L	SR	VR
7	**3,497**	**19,092**

* = non tolerable mean because more than +/-

lower than the lowest evaluated result

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F08x	PD02	DB10	17,90	19,00	14,90	17,30	4	17,28	*	1,73	10,03	57,83
2	F16x	PC01	DB10	18,39	24,56	19,10	23,95	4	21,50		3,20	14,90	71,97
3	A36	PD02	DB10	23,63	22,32	21,45	23,30	4	22,68		0,99	4,36	75,91
4	F14x	PC01	DB10	24,00	23,00	23,00	28,00	4	24,50		2,38	9,72	82,02
5	A81	PD02	DB10	23,70	22,70	28,70	28,80	4	25,98		3,23	12,44	86,95
6	F32	PD02	DB10	26,50	25,50	24,40	27,60	4	26,00		1,37	5,26	87,04
7	A82	PC01	DB10	43,10	45,10	43,40	46,80	4	44,60	*	1,71	3,84	149,30
8	A80	PD03	DB10	61,10	51,90	54,10	58,70	4	56,45	*	4,20	7,44	188,97
9													
10													
11	F05	PD02	DB05	<413	<413	<413	<413			**			
12	F07	PD02	DB08	<200	<200	<200	<200			**			
13	A39	PD02	DB08	<100	<100	<100	<100			**			
14	A79	PD03	DB10	<25	<25	<25	<25						
15	A45x	PZ99	DB10	<20	<20	<20	<20			*			
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	N	Mean	SI	VI
all labs	32	**29,87**	**2,352**	**7,873**
30	% from the mean			
	L		SR	VR
	8		**13,432**	**44,965**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	A81	PD02	DB10	22,70	25,70	20,80	18,70	4	21,98		2,97	**13,53**	70,93
2	A36	PD02	DB10	24,86	25,51	23,33	23,77	4	24,37		1,00	4,09	78,65
3	F16x	PC01	DB10	22,25	25,97	26,49	26,23	4	25,24		2,00	7,93	81,45
4	F08x	PD02	DB10	23,80	27,30	26,20	25,70	4	25,75		1,46	5,68	83,11
5	F14x	PC01	DB10	25,00	27,00	29,00	24,00	4	26,25		2,22	8,45	84,73
6	F32	PD02	DB10	29,20	32,40	23,80	25,90	4	27,83		3,77	**13,56**	89,81
7	A82	PC01	DB10	46,40	43,70	45,40	43,50	4	44,75	*	1,39	3,11	144,44
8	A80	PD03	DB10	60,40	52,80	45,70	47,90	4	51,70	*	6,52	**12,60**	166,87
9													
10													
11	F05	PD02	DB05	<413	<413	<413	<413			**			
12	F07	PD02	DB08	<200	<200	<200	<200			**			
13	A39	PD02	DB08	<100	<100	<100	<100			**			
14	A79	PD03	DB10	<25	<25	<25	<25						
15	A45x	PZ99	DB10	<20	<20	<20	<20			*			
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	N	Mean	SI	VI
all labs	32	**30,98**	**2,666**	**8,606**
30	% from the mean			

L	SR	VR
8	**10,931**	**35,283**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F07	PD02	DB08	1,04	1,02	*0,8795a*	1,04	0	1,04	*b*	*	0,01	1,04	49,85
2	A81	PD02	DB10	1,86	1,91	1,75	1,61	4	1,78			0,13	7,46	85,83
3	A60	PD01	DB10	1,92	1,88	1,87	1,86	4	1,88			0,03	1,36	90,62
4	A80	PD03	DB10	1,95	1,91	1,99	1,84	4	1,92			0,06	3,33	92,58
5	F16x	PC01	DB10	1,91	2,03	1,77	2,01	4	1,93			0,12	6,06	93,03
6	F12x	PC01	DB09	1,94	1,96	1,92	1,94	4	1,94			0,02	0,84	93,42
7	F32x	PD02	DB10	1,98	1,98	2,01	1,84	4	1,95			0,08	3,91	94,02
8	A49	PD05	DB08	1,93	1,99	2,01	2,00	4	1,98			0,04	1,81	95,46
9	A39	PD02	DB08	2,01	2,05	2,03	2,01	4	2,03			0,02	0,91	97,61
10	F03	PD02	DB08	2,04	2,01	2,05	2,13	4	2,06			0,05	2,49	99,08
11	F06x	PD02	DB08	2,07	2,08	2,07	2,14	4	2,09			0,04	1,70	100,72
12	F27	PD01	DB05	1,75	2,01	2,68	1,98	0	2,10	*c*		0,40	**19,02**	101,34
13	A82	PC01	DB10	2,16	2,00	2,23	2,09	4	2,12			0,10	4,71	102,05
14	A45x	PZ99	DB10	2,22	2,16	2,12	2,25	4	2,19			0,06	2,68	105,34
15	F18x	PD99	DB10	2,19	2,21	2,14	2,23	4	2,19			0,04	1,76	105,58
16	A36	PD02	DB10	2,21	2,21	2,18	2,20	4	2,20			0,01	0,68	105,90
17	F08x	PD02	DB10	2,33	2,19	2,17	2,20	4	2,22			0,07	3,12	107,08
18	F14x	PC01	DB10	2,36	2,23	2,21	2,27	4	2,27			0,07	3,02	109,14
19	A79	PD03	DB10	2,32	2,22	2,32	2,22	4	2,27			0,06	2,54	109,26
20	F05	PD02	DB05	2,39	2,49	2,18	2,35	4	2,35			0,13	5,49	113,28
21	A65	PD01	DB08	2,60	2,70	2,60	2,80	0	2,68	*b*	*	0,10	3,58	128,81
22	A88	PD99	DB08	3,34	3,20	3,15	3,15	0	3,21	*b*	*	0,09	2,80	154,57
23	F02x	PD02	DB08	3,65	3,64	3,38	3,72	0	3,60	*b*	*	0,15	4,15	173,23
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	N	Mean	SI	VI
all labs	72	**2,08**	**0,062**	**2,970**
25	% from the mean			
	L		SR	VR
	18		**0,159**	**7,644**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Cr **Sample: 2** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	F07	PD02	DB08	0,86	0,88	0,95	0,88	4	0,89	*	0,04	4,27	65,91
2	F16x	PC01	DB10	1,22	1,14	1,04	1,06	4	1,11		0,08	7,55	82,52
3	A80	PD03	DB10	1,07	1,44	1,04	1,08	4	1,16		0,19	16,34	85,74
4	F27	PD01	DB05	1,16	1,12	1,17	1,25	4	1,17		0,06	4,84	86,89
5	F06x	PD02	DB08	1,20	1,13	1,17	1,22	4	1,18		0,04	3,24	87,40
6	F32x	PD02	DB10	1,27	1,03	1,25	1,28	4	1,21		0,12	9,85	89,44
7	A39	PD02	DB08	1,21	1,23	1,27	1,16	4	1,22		0,05	3,83	90,16
8	F12x	PC01	DB09	1,22	1,23	1,21	1,22	4	1,22		0,01	0,67	90,37
9	A49	PD05	DB08	1,41	1,17	1,13	1,20	4	1,23		0,12	**10,18**	90,92
10	A82	PC01	DB10	1,21	1,16	1,22	1,33	4	1,23		0,07	5,96	91,14
11	F08x	PD02	DB10	1,19	1,29	1,09	1,36	4	1,23		0,12	9,56	91,33
12	F03	PD02	DB08	1,14	1,29	1,22	1,30	4	1,24		0,07	5,99	91,66
13	A81	PD02	DB10	1,40	1,23	1,22	1,16	4	1,25		0,10	8,23	92,77
14	A60	PD01	DB10	1,21	1,52	1,18	1,10	4	1,25		0,18	**14,72**	92,85
15	F18x	PD99	DB10	1,34	1,38	1,29	1,29	4	1,33		0,04	3,29	98,14
16	F14x	PC01	DB10	1,39	1,38	1,46	1,28	4	1,38		0,08	5,55	101,92
17	A79	PD03	DB10	1,39	1,37	1,39	1,37	4	1,38		0,01	0,83	102,44
18	A36	PD02	DB10	1,36	1,43	1,39	1,44	4	1,40		0,03	2,45	103,98
19	A45x	PZ99	DB10	1,64	1,39	1,52	1,60	4	1,54		0,11	7,17	113,88
20	F05	PD02	DB05	1,72	1,49	1,78	1,51	4	1,63		0,15	9,02	120,37
21	A65	PD01	DB08	1,50	1,50	2,20	1,80	4	1,75	*	0,33	**18,95**	129,62
22	A88	PD99	DB08	2,21	2,14	1,92	1,78	4	2,01	*	0,20	9,85	149,07
23	F02x	PD02	DB08	2,15	2,04	1,93	2,06	4	2,05	*	0,09	4,42	151,48
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	N	Mean	SI	VI
all labs	92	**1,35**	**0,100**	**7,410**
25	% from the mean			
	L		SR	VR
	23		**0,277**	**20,542**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Cr **Sample: 3** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	F07	PD02	DB08	2,61	2,65	2,85	2,98	4	2,78	*	0,17	6,26	67,40
2	F05	PD02	DB05	3,04	3,23	3,22	3,42	4	3,23		0,16	4,81	78,39
3	F03	PD02	DB08	3,37	3,45	3,37	3,36	4	3,39		0,04	1,24	82,28
4	F27	PD01	DB05	3,92	3,67	3,28	3,99	4	3,72		0,32	8,59	90,26
5	A81	PD02	DB10	3,94	3,62	3,89	3,88	4	3,83		0,14	3,76	93,08
6	F16x	PC01	DB10	3,53	3,89	3,82	4,15	4	3,85		0,25	6,60	93,47
7	A60	PD01	DB10	4,21	4,06	3,70	3,59	4	3,89		0,29	7,49	94,51
8	F02x	PD02	DB08	3,79	4,00	3,88	3,92	4	3,90		0,09	2,24	94,66
9	A80	PD03	DB10	3,77	4,39	3,58	3,97	4	3,93		0,35	8,84	95,39
10	F06x	PD02	DB08	4,07	4,07	4,21	3,89	4	4,06		0,13	3,20	98,59
11	F32x	PD02	DB10	4,20	4,14	3,93	4,23	4	4,13		0,14	3,28	100,19
12	A39	PD02	DB08	3,94	4,11	4,34	4,19	4	4,14		0,16	3,94	100,64
13	A49	PD05	DB08	4,23	4,18	3,99	4,31	4	4,18		0,14	3,26	101,46
14	F18x	PD99	DB10	4,17	4,40	4,18	4,37	4	4,28		0,12	2,85	103,95
15	A45x	PZ99	DB10	4,58	4,18	4,46	4,08	4	4,33		0,23	5,41	105,05
16	F14x	PC01	DB10	4,45	4,29	4,18	4,61	4	4,38		0,19	4,31	106,49
17	A82	PC01	DB10	4,27	4,56	4,34	4,47	4	4,41		0,13	2,94	107,11
18	A79	PD03	DB10	4,73	4,11	4,11	4,73	4	4,42		0,36	8,10	107,37
19	F12x	PC01	DB09	4,29	4,16	4,61	4,65	4	4,43		0,24	5,43	107,54
20	A36	PD02	DB10	4,54	4,46	4,48	4,43	4	4,48		0,04	0,99	108,70
21	F08x	PD02	DB10	4,95	4,63	5,03	4,90	4	4,88		0,17	3,57	118,46
22	A65	PD01	DB08	4,90	5,00	5,20	4,90	4	5,00		0,14	2,83	121,44
23	A88	PD99	DB08	5,14	5,19	4,89	5,13	4	5,09		0,13	2,64	123,57
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	N	Mean	SI	VI
all labs	92	**4,12**	**0,180**	**4,378**
25	% from the mean			
	L		SR	VR
	23		**0,540**	**13,126**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Vi	Recovery %
1	F07	PD02	DB08	0,63	0,62	0,63	0,61	4	0,62		*	0,01	1,67	50,57
2	A39	PD02	DB08	0,79	0,85	0,83	0,85	4	0,83		*	0,03	3,68	67,19
3	A45x	PZ99	DB10	0,88	0,89	0,81	0,79	4	0,84		*	0,05	6,03	68,33
4	F02x	PD02	DB08	1,00	0,92	0,87	0,94	4	0,93			0,05	5,77	75,47
5	F05	PD02	DB05	0,98	0,93	1,00	1,10	4	1,00			0,07	7,35	80,87
6	A81	PD02	DB10	1,00	1,13	0,89	1,09	4	1,03			0,11	**10,37**	83,16
7	F03	PD02	DB08	1,22	1,21	1,15	1,09	4	1,17			0,06	5,16	94,49
8	F32x	PD02	DB10	1,30	1,08	1,26	1,12	4	1,19			0,11	8,95	96,31
9	A60	PD01	DB10	1,14	1,27	1,13	1,25	4	1,20			0,07	6,07	96,92
10	F06x	PD02	DB08	1,31	1,24	1,28	1,05	4	1,22			0,12	9,66	98,56
11	A80	PD03	DB10	1,23	1,25	1,25	1,25	4	1,25			0,01	0,80	100,76
12	A49	PD05	DB08	1,27	1,42	1,21	1,11	4	1,25			0,13	**10,36**	101,37
13	F27	PD01	DB05	1,27	1,24	1,34	1,16	4	1,25			0,07	5,89	101,43
14	F16x	PC01	DB10	1,34	1,24	1,43	1,29	4	1,32			0,08	6,02	107,11
15	A36	PD02	DB10	1,46	1,31	1,46	1,29	4	1,38			0,09	6,73	111,71
16	F08x	PD02	DB10	1,45	1,45	1,44	1,44	4	1,44			0,01	0,46	116,87
17	F18x	PD99	DB10	1,47	1,52	1,52	1,32	4	1,46			0,09	6,49	117,96
18	A79	PD03	DB10	1,42	1,51	1,42	1,51	4	1,46			0,05	3,48	118,32
19	A65	PD01	DB08	1,50	1,50	1,40	1,70	4	1,53			0,13	8,25	123,42
20	F14x	PC01	DB10	1,55	1,49	1,55	1,51	4	1,53			0,03	1,85	123,54
21	A82	PC01	DB10	*2,789a*	1,24	1,34	1,55	3	1,38			0,16	**11,57**	111,52
22	A88	PD99	DB08	1,99	2,03	1,86	1,88	4	1,94		*	0,08	4,27	157,01
23	F12x	PC01	DB09	7,84	8,11	7,98	7,98	0	7,98	*b*	*	0,11	1,38	645,64
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	N	Mean	SI	VI
all labs	87	**1,24**	**0,074**	**5,950**
25	% from the mean			
	L		SR	VR
	22		**0,289**	**23,320**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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			Si	Vi	%
1	F07	PD02	DB08	1,58	1,58	1,57	1,59	4	1,58	0,01	0,53	86,60
2	A60	PD01	DB10	1,68	1,66	1,62	1,61	4	1,64	0,03	2,13	89,95
3	A39	PD02	DB08	1,70	1,70	1,65	1,69	4	1,68	0,02	1,35	92,19
4	F32	PD02	DB10	1,78	1,71	1,72	1,76	4	1,74	0,03	1,90	95,48
5	A88	PD99	DB08	1,75	1,75	1,75	1,75	4	1,75	0,00	0,00	95,89
6	F06x	PD02	DB08	1,81	1,83	1,77	1,80	4	1,80	0,02	1,22	98,85
7	F16x	PC01	DB10	1,83	1,85	1,74	1,80	4	1,81	0,05	2,69	98,96
8	A82	PC01	DB10	1,81	1,82	1,80	1,80	4	1,81	0,01	0,49	99,13
9	A80	PD03	DB10	1,84	1,84	1,88	1,78	4	1,84	0,04	2,25	100,55
10	A45x	PZ99	DB10	1,86	1,87	1,83	1,92	4	1,87	0,04	2,00	102,47
11	F08x	PD02	DB10	1,90	1,88	1,92	1,90	4	1,90	0,02	0,99	104,03
12	A65	PD01	DB08	1,90	*2a*	1,90	1,90	3	1,90	0,00	0,00	104,11
13	A81	PD02	DB10	1,93	1,91	1,89	1,88	4	1,90	0,02	1,17	104,25
14	F12x	PC01	DB09	1,90	1,93	1,92	1,91	4	1,92	0,01	0,67	104,93
15	F14x	PC01	DB10	1,95	1,94	1,98	1,95	4	1,96	0,01	0,70	107,17
16	A36	PD02	DB10	1,97	1,97	1,94	2,00	4	1,97	0,02	1,23	107,88
17	A79	PD03	DB10	1,99	1,97	1,99	1,97	4	1,98	0,01	0,44	108,58
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	N	Mean	SI	VI
all labs	67	**1,82**	**0,021**	**1,152**
25	% from the mean			
	L		SR	VR
	17		**0,116**	**6,374**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Co **Sample: 2** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	F07	PD02	DB08	0,10	0,11	0,10	0,10	4	0,10			0,01	6,63	78,89
2	A60	PD01	DB10	0,12	0,12	0,12	0,11	4	0,12			0,00	3,56	91,05
3	A39	PD02	DB08	0,13	0,12	0,12	0,12	4	0,12			0,01	4,32	92,61
4	F16x	PC01	DB10	0,13	0,12	0,13	0,12	4	0,12			0,00	1,96	96,32
5	A80	PD03	DB10	0,13	0,13	0,12	0,13	4	0,13			0,00	2,32	98,20
6	A82	PC01	DB10	0,13	0,14	0,12	0,13	4	0,13			0,01	4,97	100,33
7	A45x	PZ99	DB10	0,13	0,13	0,14	0,13	4	0,13			0,00	2,74	100,52
8	F08x	PD02	DB10	0,13	0,13	0,13	0,13	4	0,13			0,00	1,69	101,49
9	A36	PD02	DB10	0,14	0,14	0,14	0,13	4	0,14			0,00	2,98	107,09
10	F32	PD02	DB10	0,14	0,14	0,14	0,14	4	0,14			0,00	0,00	107,48
11	A81	PD02	DB10	0,14	0,14	0,14	0,14	4	0,14			0,00	0,00	108,25
12	A79	PD03	DB10	0,14	0,14	0,14	0,14	4	0,14			0,00	0,33	108,56
13	F14x	PC01	DB10	0,14	0,14	0,14	0,14	4	0,14			0,00	0,68	109,22
14	A88	PD99	DB08	0,25	0,25	0,25	0,25	0	0,25	*b*	*	0,00	0,00	193,31
15														
16														
17	F06x	PD02	DB08	<,25	<,25	<,25	<,25				**			
18	A65	PD01	DB08	<,2	<,2	<,2	<,2				**			
19	F12x	PC01	DB09	<,15	<,15	<,15	<,15				**			
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	N	Mean	SI	VI
all labs	52	**0,13**	**0,003**	**2,336**
25	% from the mean			

L	SR	VR
13	**0,011**	**8,814**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Co **Sample: 3** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	F07	PD02	DB08	0,25	0,24	0,24	0,24	4	0,24		0,01	2,82	84,84
2	A88	PD99	DB08	0,25	0,25	0,25	0,25	4	0,25		0,00	0,00	88,40
3	A60	PD01	DB10	0,26	0,26	0,25	0,25	4	0,26		0,01	2,13	91,32
4	A39	PD02	DB08	0,27	0,27	0,26	0,27	4	0,27		0,01	2,72	95,19
5	F08x	PD02	DB10	0,28	0,28	0,27	0,27	4	0,28		0,00	1,66	97,33
6	F16x	PC01	DB10	0,28	0,28	0,27	0,28	4	0,28		0,01	2,22	97,74
7	A80	PD03	DB10	0,29	0,27	0,28	0,28	4	0,28		0,01	2,09	98,13
8	A81	PD02	DB10	0,29	0,29	0,28	0,28	4	0,29		0,01	2,03	100,78
9	A82	PC01	DB10	0,28	0,29	0,28	0,30	4	0,29		0,01	2,49	101,84
10	A36	PD02	DB10	0,28	0,30	0,29	0,30	4	0,29		0,01	2,77	102,99
11	A45x	PZ99	DB10	0,31	0,28	0,28	0,31	4	0,29		0,02	5,21	103,79
12	F14x	PC01	DB10	0,30	0,30	0,30	0,30	4	0,30		0,00	0,42	106,35
13	F32	PD02	DB10	0,31	0,30	0,31	0,31	4	0,31		0,01	1,80	107,94
14	A79	PD03	DB10	0,31	0,30	0,31	0,30	4	0,31		0,00	1,39	108,42
15	F12x	PC01	DB09	0,33	0,33	0,32	0,32	4	0,33		0,01	1,78	114,93
16													
17													
18	F06x	PD02	DB08	<,25	<,25	<,25	<,25			**			
19	A65	PD01	DB08	0,30	<,2	0,30	0,40			**			
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	N	Mean	SI	VI
all labs	60	**0,28**	**0,006**	**2,103**
25	% from the mean			

L	SR	VR
15	**0,023**	**8,030**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Co **Sample: 4** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	A60	PD01	DB10	0,043	0,039	0,033	0,034	4	0,037		0,00	**12,47**	93,08
2	F08x	PD02	DB10	0,035	0,038	0,037	0,040	4	0,038		0,00	5,55	93,71
3	A45x	PZ99	DB10	0,035	0,041	0,040	0,035	4	0,038		0,00	8,91	94,21
4	F16x	PC01	DB10	0,037	0,038	0,039	0,039	4	0,038		0,00	1,90	95,89
5	A80	PD03	DB10	0,038	0,038	0,042	0,036	4	0,039		0,00	6,36	96,39
6	A81	PD02	DB10	0,040	0,040	0,040	0,040	4	0,040		0,00	0,00	99,95
7	A36	PD02	DB10	0,040	0,042	0,041	0,040	4	0,041		0,00	2,35	101,83
8	F32	PD02	DB10	0,041	0,044	0,044	0,041	4	0,043		0,00	4,08	106,20
9	F14x	PC01	DB10	0,044	0,042	0,047	0,042	4	0,044		0,00	5,40	109,32
10	A79	PD03	DB10	0,044	0,045	0,044	0,045	4	0,044		0,00	1,44	110,07
11	A82	PC01	DB10	*0,06a*	0,038	0,040	0,041	3	0,040		0,00	3,85	99,12
12	A88	PD99	DB08	0,250	0,250	0,250	0,250	0	0,250	*b* *	0,00	0,00	624,71
13													
14													
15	F06x	PD02	DB08	<,25	<,25	<,25	<,25			**			
16	A65	PD01	DB08	<,2	<,2	<,2	<,2			**			
17	F12x	PC01	DB09	<,15	<,15	<,15	<,15			**			
18	A39	PD02	DB08	<,1	<,1	<,1	<,1						
19	F07	PD02	DB08	<,05	<,05	<,05	<,05						
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	N	Mean	SI	VI
all labs	43	**0,040**	**0,002**	**4,652**
25	% from the mean			

L	SR	VR
11	**0,002**	**6,181**

* = non tolerable mean because more than +/-

lower than the lowest evaluated result

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4			Si	Vi	%
1	A39	PZ98	DB03	19,50	20,00	19,50	19,50	4	19,63	0,25	1,27	88,01
2	F32	PZ98	DB03	19,70	19,70	19,80	19,70	4	19,73	0,05	0,25	88,45
3	F28x	PZ98	DA05	20,22	20,08	*19,44a*	20,12	3	20,14	0,07	0,36	90,31
4	F18x	PD03	DA05	20,60	22,10	22,40	22,40	4	21,88	0,86	3,94	98,10
5	A79	PD03	DB10	21,90	22,30	21,90	22,30	4	22,10	0,23	1,04	99,10
6	F02	PZ98	DA05	22,00	22,50	21,80	22,20	4	22,13	0,30	1,35	99,22
7	A36	PD02	DB03	22,84	21,39	21,84	22,62	4	22,17	0,68	3,05	99,43
8	A45x	PZ98	DA05	22,50	22,50	22,40	22,40	4	22,45	0,06	0,26	100,67
9	F16x	PC01	DB10	23,06	22,14	23,48	22,25	4	22,73	0,65	2,84	101,94
10	A82	PZ98	DA05	23,00	22,80	23,70	23,00	4	23,13	0,39	1,71	103,70
11	F03	PZ98	DA05	25,40	25,40	25,50	25,25	4	25,39	0,10	0,41	113,85
12	A80	PZ98	DA05	27,00	26,90	*30,3a*	26,20	3	26,70	0,44	1,63	119,73
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	N	Mean	SI	VI
all labs	46	**22,30**	**0,340**	**1,523**
30	% from the mean			
	L		SR	VR
	12		**2,099**	**9,394**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4			Si	Vi	%
1	A39	PZ98	DB03	16,00	17,00	16,00	15,50	4	16,13	0,63	3,90	81,45
2	F28x	PZ98	DA05	17,40	17,70	16,37	16,80	4	17,07	0,60	3,50	86,21
3	F32	PZ98	DB03	17,50	17,70	17,70	17,80	4	17,68	0,13	0,71	89,28
4	A45x	PZ98	DA05	19,90	19,70	19,40	19,70	4	19,68	0,21	1,05	99,38
5	F02	PZ98	DA05	19,80	19,80	19,90	19,60	4	19,78	0,13	0,64	99,88
6	A79	PD03	DB10	19,90	20,10	19,90	20,10	4	20,00	0,12	0,58	101,02
7	A36	PD02	DB03	20,21	19,44	19,55	20,87	4	20,02	0,66	3,31	101,11
8	F16x	PC01	DB10	20,26	20,41	19,83	20,40	4	20,23	0,27	1,35	102,16
9	A82	PZ98	DA05	21,20	21,80	21,40	22,00	4	21,60	0,37	1,69	109,10
10	F03	PZ98	DA05	22,41	22,51	22,03	22,22	4	22,29	0,21	0,95	112,60
11	A80	PZ98	DA05	23,50	23,10	23,50	23,20	4	23,33	0,21	0,88	117,82
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13												
14	F18x	PD03	DA05	<20	<20	<20	<20					
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	N	Mean	SI	VI
all labs	44	**19,80**	**0,320**	**1,615**
30	% from the mean			
	L		SR	VR
	11		**2,183**	**11,026**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4			Si	Vi	%
1	A39	PZ98	DB03	24,50	25,00	22,00	23,50	4	23,75	1,32	5,57	85,53
2	F28x	PZ98	DA05	24,00	23,20	24,40	24,60	4	24,05	0,62	2,57	86,61
3	F18x	PD03	DA05	24,80	24,80	23,70	24,60	4	24,48	0,53	2,15	88,15
4	F32	PZ98	DB03	26,00	26,20	25,80	25,50	4	25,88	0,30	1,15	93,19
5	A79	PD03	DB10	28,20	26,70	28,20	26,70	4	27,45	0,87	3,15	98,86
6	A45x	PZ98	DA05	28,40	28,20	28,10	28,20	4	28,23	0,13	0,45	101,65
7	A36	PD02	DB03	29,50	28,63	29,07	27,98	4	28,80	0,65	2,25	103,70
8	F02	PZ98	DA05	29,30	29,10	29,10	29,20	4	29,18	0,10	0,33	105,07
9	F16x	PC01	DB10	28,78	30,05	29,62	30,02	4	29,62	0,59	2,00	106,67
10	A82	PZ98	DA05	30,30	29,20	29,10	30,60	4	29,80	0,76	2,56	107,32
11	F03	PZ98	DA05	30,90	31,09	30,51	30,88	4	30,85	0,24	0,79	111,09
12	A80	PZ98	DA05	*33,8a*	32,10	32,40	32,30	3	32,27	0,15	0,47	116,21
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	N	Mean	SI	VI
all labs	47	**27,77**	**0,521**	**1,876**
30	% from the mean			

* = non tolerable mean because more than +/-

limit for the lower concentration range

L	SR	VR
12	**2,778**	**9,971**

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	F32	PZ98	DB03	4,54	4,54	*4,43a*	4,54	3	4,54			0,00	0,00	81,03
2	A39	PZ98	DB03	4,75	4,70	*4,3a*	4,65	3	4,70			0,05	1,06	83,89
3	A36	PD02	DB03	3,93	4,69	5,02	5,78	4	4,85			0,77	**15,83**	86,59
4	F02	PZ98	DA05	5,60	5,60	5,80	5,50	4	5,63			0,13	2,24	100,40
5	A45x	PZ98	DA05	5,80	5,70	5,53	5,73	4	5,69			0,11	2,01	101,56
6	A82	PZ98	DA05	5,80	5,84	5,78	5,64	4	5,77			0,09	1,51	102,89
7	F16x	PC01	DB10	6,01	5,93	6,23	5,98	4	6,04			0,13	2,21	107,71
8	A80	PZ98	DA05	7,00	7,30	7,20	7,00	4	7,13		*	0,15	2,11	127,17
9	F28x	PZ98	DA05	45,60	43,60	48,60	50,90	4	47,18	*b*	*	3,22	6,83	841,98
10														
11														
12	F18x	PD03	DA05	<20	<20	<20	<20							
13	F03	PZ98	DA05	<20	<20	<20	<20							
14	A79	PD03	DB10	<10	<10	<10	<10							
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	N	Mean	SI	VI
all labs	30	**5,60**	**0,179**	**3,188**
20	% from the mean			
	L		SR	VR
	8		**0,847**	**15,278**

* = non tolerable mean because more than +/-

lower than the lowest evaluated result

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Ni **Sample: 1** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	F07	PD02	DB08	3,85	3,86	3,73	3,78	0	3,81	*b*	*	0,06	1,57	68,78
2	F27	PD01	DB05	4,52	4,48	4,52	4,46	4	4,49			0,03	0,67	81,22
3	F05x	PD02	DB08	5,23	5,15	5,18	5,15	4	5,18			0,04	0,73	93,58
4	F08x	PD02	DB10	5,18	5,27	5,20	5,20	4	5,21			0,04	0,80	94,18
5	F16x	PC01	DB10	5,29	5,21	5,43	5,23	4	5,29			0,10	1,88	95,62
6	A81	PD02	DB10	5,50	5,42	5,19	5,12	4	5,31			0,18	3,42	95,93
7	F06x	PD02	DB08	5,33	5,27	5,34	5,40	4	5,34			0,05	1,00	96,43
8	A80	PD03	DB10	5,38	5,33	5,50	5,16	4	5,34			0,14	2,64	96,57
9	A39	PD02	DB08	5,52	5,39	5,21	5,46	4	5,40			0,13	2,47	97,53
10	F02x	PD02	DB08	5,24	5,55	5,45	5,38	4	5,41			0,13	2,41	97,70
11	A45x	PZ99	DB10	5,44	5,51	5,34	5,41	4	5,43			0,07	1,30	98,06
12	F18x	PD99	DB10	5,45	5,44	5,39	5,47	4	5,44			0,03	0,63	98,28
13	F32x	PD02	DB10	5,51	5,31	5,36	5,59	4	5,44			0,13	2,39	98,37
14	A60	PD01	DB10	5,60	5,49	5,40	5,34	4	5,46			0,11	2,02	98,62
15	A82	PC01	DB10	5,57	5,47	5,56	5,47	4	5,52			0,06	1,00	99,73
16	F12x	PC01	DB09	5,55	5,62	5,59	5,56	4	5,58			0,03	0,57	100,86
17	A79	PD03	DB10	5,74	5,60	5,74	5,60	4	5,67			0,08	1,47	102,45
18	A36	PD02	DB10	5,81	5,65	5,58	5,68	4	5,68			0,10	1,70	102,65
19	F03	PD02	DB08	5,74	5,89	5,91	5,77	4	5,83			0,09	1,46	105,33
20	F14x	PC01	DB10	5,93	5,83	5,92	5,92	4	5,90			0,05	0,81	106,62
21	A49	PD05	DB09	6,00	6,08	6,13	6,07	4	6,07			0,05	0,88	109,72
22	A65	PD01	DB08	6,30	6,40	6,40	6,20	4	6,33			0,10	1,51	114,32
23	A88	PD99	DB08	6,47	6,41	6,47	6,37	4	6,43			0,05	0,76	116,22
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	N	Mean	SI	VI
all labs	88	**5,53**	**0,081**	**1,470**
20	% from the mean			
	L		SR	VR
	22		**0,411**	**7,431**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Ni **Sample: 2** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	F14x	PC01	DB10	0,14	0,14	0,14	0,14	0	0,14	*b*	*	0,00	0,68	1,10
2	F27	PD01	DB05	9,34	9,39	9,43	*9,742a*	0	9,39	*b*	*	0,04	0,44	72,99
3	F07	PD02	DB08	9,89	9,93	9,86	9,80	0	9,87	*b*	*	0,05	0,56	76,78
4	F16x	PC01	DB10	11,58	12,08	11,79	12,06	4	11,88			0,24	2,01	92,38
5	A60	PD01	DB10	12,01	11,93	12,13	11,78	4	11,96			0,15	1,23	93,04
6	F06x	PD02	DB08	12,20	11,80	12,10	11,80	4	11,98			0,21	1,72	93,13
7	A80	PD03	DB10	12,20	12,70	11,90	12,30	4	12,28			0,33	2,69	95,47
8	A45x	PZ99	DB10	12,30	12,40	12,30	12,20	4	12,30			0,08	0,66	95,66
9	F18x	PD99	DB10	12,40	12,40	12,50	12,40	4	12,43			0,05	0,40	96,63
10	A81	PD02	DB10	12,60	12,60	12,20	12,40	4	12,45			0,19	1,54	96,83
11	F03	PD02	DB08	12,37	12,42	12,53	12,56	4	12,47			0,09	0,72	96,98
12	A82	PC01	DB10	12,60	12,71	12,40	12,60	4	12,58			0,13	1,03	97,82
13	A39	PD02	DB08	12,68	12,87	12,45	12,35	4	12,59			0,23	1,86	97,90
14	F12x	PC01	DB09	12,65	12,71	12,76	12,69	4	12,70			0,05	0,36	98,79
15	F05x	PD02	DB08	12,70	12,70	12,80	12,70	4	12,73			0,05	0,39	98,97
16	F02x	PD02	DB08	12,57	12,84	12,67	13,01	4	12,77			0,19	1,52	99,34
17	F08x	PD02	DB10	14,36	14,05	11,91	12,13	4	13,11			1,27	9,69	101,98
18	A36	PD02	DB10	13,95	13,53	13,32	13,07	4	13,47			0,37	2,77	104,74
19	A79	PD03	DB10	13,78	13,63	13,78	13,63	4	13,71			0,09	0,63	106,59
20	A49	PD05	DB09	13,53	13,81	13,75	13,90	4	13,75			0,16	1,15	106,92
21	A88	PD99	DB08	13,90	13,70	13,90	13,70	4	13,80			0,12	0,84	107,33
22	F32x	PD02	DB10	13,70	13,80	13,90	14,10	4	13,88			0,17	1,23	107,91
23	A65	PD01	DB08	14,20	14,30	14,60	14,30	4	14,35			0,17	1,21	111,60
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	N	Mean	SI	VI
all labs	80	**12,86**	**0,217**	**1,685**
20	% from the mean			

* = non tolerable mean because more than +/-

L	SR	VR
20	**0,725**	**5,640**

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Element: Ni **Sample: 3** Unit: µg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	F07	PD02	DB08	1,44	1,42	1,43	1,35	0	1,41	*b*	*	0,04	3,13	61,65
2	F27	PD01	DB05	1,66	1,69	1,55	1,64	4	1,64		*	0,06	3,67	71,52
3	F05x	PD02	DB08	1,81	1,85	1,87	1,73	4	1,82		*	0,06	3,41	79,33
4	A81	PD02	DB10	2,00	1,80	1,92	1,80	4	1,88			0,10	5,21	82,17
5	A39	PD02	DB08	2,17	2,10	2,06	2,13	4	2,11			0,04	2,05	92,37
6	A80	PD03	DB10	2,21	2,15	2,12	2,19	4	2,17			0,04	1,86	94,73
7	A45x	PZ99	DB10	2,22	2,09	2,17	2,25	4	2,18			0,07	3,20	95,39
8	F16x	PC01	DB10	2,22	2,17	2,17	2,21	4	2,20			0,03	1,15	95,96
9	F03	PD02	DB08	2,17	2,17	2,38	2,22	4	2,24			0,10	4,45	97,68
10	A36	PD02	DB10	2,24	2,30	2,21	2,31	4	2,26			0,05	2,00	98,92
11	F06x	PD02	DB08	2,30	2,31	2,27	2,18	4	2,27			0,06	2,61	98,99
12	F18x	PD99	DB10	2,31	2,21	2,28	2,27	4	2,27			0,04	1,85	99,10
13	F02x	PD02	DB08	2,27	2,35	2,27	2,45	4	2,34			0,09	3,66	102,05
14	A60	PD01	DB10	2,36	2,41	2,29	2,33	4	2,35			0,05	2,14	102,62
15	F12x	PC01	DB09	2,43	2,29	2,49	2,25	4	2,37			0,11	4,80	103,36
16	A82	PC01	DB10	2,40	2,40	2,31	2,55	4	2,42			0,10	4,12	105,55
17	A79	PD03	DB10	2,51	2,33	2,51	2,33	4	2,42			0,10	4,30	105,68
18	F08x	PD02	DB10	2,60	2,40	2,40	2,34	4	2,44			0,11	4,72	106,45
19	F14x	PC01	DB10	2,40	2,47	2,42	2,46	4	2,44			0,03	1,43	106,48
20	F32x	PD02	DB10	2,48	2,51	2,49	2,51	4	2,50			0,01	0,60	109,16
21	A65	PD01	DB08	2,50	2,60	2,60	2,70	4	2,60			0,08	3,14	113,64
22	A88	PD99	DB08	2,68	2,77	2,75	2,69	4	2,72			0,04	1,63	118,99
23	A49	PD05	DB09	2,77	2,81	2,68	2,71	4	2,74			0,06	2,13	119,86
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	N	Mean	SI	VI
all labs	88	**2,29**	**0,066**	**2,873**
20	% from the mean			
	L		SR	VR
	22		**0,268**	**11,715**

* = non tolerable mean because more than +/-

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

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. Si	Lab.standard dev. Vi	Recovery %
1	F07	PD02	DB08	0,35	0,32	0,34	0,35	4	0,34	*	0,01	3,57	44,81
2	A81	PD02	DB10	0,49	0,49	0,43	0,57	4	0,50	*	0,06	**11,61**	64,75
3	A45x	PZ99	DB10	0,51	0,52	0,50	0,46	4	0,50	*	0,03	5,54	64,95
4	F27	PD01	DB05	0,70	0,60	0,71	0,57	4	0,65		0,07	**10,82**	84,54
5	F05x	PD02	DB08	0,62	0,71	0,59	0,67	4	0,65		0,05	8,04	84,57
6	A39	PD02	DB08	0,69	0,68	0,68	0,68	4	0,68		0,01	0,77	89,03
7	A80	PD03	DB10	0,72	0,70	0,76	0,70	4	0,72		0,03	4,17	94,15
8	A36	PD02	DB10	0,75	0,74	0,78	0,71	4	0,74		0,03	3,61	97,26
9	F02x	PD02	DB08	0,77	0,81	0,76	0,70	4	0,76		0,05	5,98	99,42
10	A79	PD03	DB10	0,78	0,81	0,78	0,81	4	0,79		0,01	1,74	103,95
11	A60	PD01	DB10	0,81	0,87	0,79	0,81	4	0,82		0,04	4,52	107,30
12	F18x	PD99	DB10	0,81	0,83	0,84	0,84	4	0,83		0,01	1,44	108,38
13	F16x	PC01	DB10	0,82	0,86	0,80	0,84	4	0,83		0,03	3,31	108,45
14	A82	PC01	DB10	*1,743a*	0,80	0,80	0,92	3	0,84		0,07	7,98	109,62
15	F32x	PD02	DB10	0,86	0,81	0,85	0,85	4	0,84		0,02	2,63	110,21
16	F06x	PD02	DB08	0,90	0,82	0,78	0,88	4	0,84		0,05	6,27	110,34
17	F14x	PC01	DB10	0,88	0,84	0,89	0,85	4	0,87		0,02	2,81	113,35
18	A49	PD05	DB09	1,05	0,84	0,87	1,23	4	1,00	*	0,18	**18,11**	130,48
19	F08x	PD02	DB10	1,06	1,17	1,11	0,85	4	1,05	*	0,14	**13,17**	137,22
20	A88	PD99	DB08	1,01	1,11	1,13	1,02	4	1,07	*	0,06	5,74	139,64
21	F12x	PC01	DB09	3,51	3,68	3,66	3,63	4	3,62	*b* *	0,08	2,10	473,54
22													
23													
24	A65	PD01	DB08	<1,1	<1,1	<1,1	<1,1			**			
25	F03	PD02	DB08	<1	<1	<1	<1						
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	N	Mean	SI	VI
all labs	79	**0,76**	**0,048**	**6,300**
30	% from the mean			
	L		SR	VR
	20		**0,182**	**23,741**

* = non tolerable mean because more than +/-

limit for the lower concentration range

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Ag	(ng/g)	1	A82	PC01	DB10	3,78	4,85	3,99	3,57	4,05	0,562	13,880
Ag	(ng/g)	2	A82	PC01	DB10	1,43	1,53	1,34	1,35	1,41	0,088	6,236
Ag	(ng/g)	3	A82	PC01	DB10	2,36	2,07	2,68	2,65	2,44	0,286	11,712
Ag	(ng/g)	4	A82	PC01	DB10	1,55	2,23	1,55	1,56	1,72	0,338	19,644
Al	(µg/g)	1	F05x	PD02	DB08	97,9	99,4	97,5	96,7	97,88	1,132	1,157
			F07	PD02	DB08	102,2	102,8	98,29	104,1	101,85	2,501	2,455
			A80	PD03	DB10	116	108	107	105	109,00	4,830	4,432
			A60	PD01	DB10	115,83	118,66	129,36	115,56	119,85	6,492	5,416
			F27	PD01	DB02	118	124,1	116,6	127	121,43	4,941	4,069
			F28x	PC02	DB08	113,528	122,392	132,325	124,422	123,17	7,723	6,271
			F12x	PC01	DB08	122,5	124,4	123,4	131,9	125,55	4,304	3,428
			F08x	PD02	DB10	129	127	129	126	127,75	1,500	1,174
			F03	PD02	DB08	132,34	127,75	129,36	127,52	129,24	2,221	1,719
			F06x	PD02	DB08	134	136	136	133	134,75	1,500	1,113
			A36	PD02	DB08	132,6	128,1	131,5	147,1	134,83	8,405	6,234
			A81	PD02	DB10	147	142	136	131	139,00	6,976	5,019
			A39	PD02	DB08	138,6	146,5	136	141,4	140,63	4,495	3,196
			F16x	PC01	DB08	143,8	147,4	143,2	141,4	143,95	2,516	1,748
			F15x	PC01	DB08	146	146	147	147	146,50	0,577	0,394
			A65	PD01	DB08	148	152	152	149	150,25	2,062	1,372
			F14x	PC01	DB08	152,78	149,88	150,63	158,48	152,94	3,891	2,544
			A49	PD05	DB08	150,9	155,6	156,1	155,6	154,55	2,445	1,582
			A59	PB03	DB08	160,9	169,6	145,1	161,5	159,28	10,249	6,435
			A45x	PZ99	DB08	161	166	161	163	162,75	2,363	1,452
			A57	PZ02	DD02	163	163,7	162,9	163,3	163,23	0,359	0,220
			A79	PD03	DB10	166,2	166,1	168,2	160,8	165,33	3,168	1,916
			A53	PZ02	DD02	185	180	180	192	184,25	5,679	3,082

20th Needle/Leaf Interlaboratory Comparison Test 2017/2018

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	2	A49	PD05	DB08	362,6	362,1	365,8	372,2	365,68	4,649	1,271
			F05x	PD02	DB08	366	367	365	366	366,00	0,816	0,223
			F07	PD02	DB08	364,7	374,7	367,5	365,7	368,15	4,518	1,227
			F16x	PC01	DB08	373,8	382,4	382,4	382,1	380,18	4,252	1,119
			F27	PD01	DB02	365,1	402	396	361	381,03	20,967	5,503
			A80	PD03	DB10	380	395	371	382	382,00	9,899	2,591
			F14x	PC01	DB08	385,29	381,97	382,61	380,9	382,69	1,870	0,489
			F08x	PD02	DB10	394	398	361	384	384,25	16,581	4,315
			F12x	PC01	DB08	384	384	386	384	384,50	1,000	0,260
			F06x	PD02	DB08	389	381	386	387	385,75	3,403	0,882
			A59	PB03	DB08	442,2	391,4	382,3	359,9	393,95	34,784	8,829
			A45x	PZ99	DB08	396	398	401	400	398,75	2,217	0,556
			A81	PD02	DB10	410	406	398	392	401,50	8,062	2,008
			F15x	PC01	DB08	399	408	402	399	402,00	4,243	1,055
			A36	PD02	DB08	388,8	413,1	408,7	407,6	404,55	10,766	2,661
			A79	PD03	DB10	401,9	401,9	400	414,4	404,55	6,627	1,638
			A65	PD01	DB08	406	406	415	407	408,50	4,359	1,067
			A57	PZ02	DD02	424,8	414,5	410,9	410	415,05	6,785	1,635
			A60	PD01	DB10	423,66	414,59	424,32	415,7	419,57	5,134	1,224
			F28x	PC02	DB08	394,902	408,301	441,029	439,537	420,94	23,001	5,464
			F03	PD02	DB08	423,21	436,92	425,21	430,13	428,87	6,105	1,424
			A39	PD02	DB08	446,3	443,3	419,2	436,2	436,25	12,130	2,781
			A53	PZ02	DD02	504	496	499	496	498,75	3,775	0,757
Al	(µg/g)	3	F27	PD01	DB02	20,6	22,9	25,2	32,3	25,25	5,061	20,045
			F03	PD02	DB08	51,36	49,52	48,85	50,53	50,07	1,106	2,208
			A80	PD03	DB10	52,6	50,9	48,3	49,7	50,38	1,825	3,622
			F07	PD02	DB08	53,29	50,47	53,85	52,8	52,60	1,485	2,823
			F05x	PD02	DB08	52,6	54,4	52,6	51,8	52,85	1,100	2,081
			A60	PD01	DB10	54,24	55,31	53,79	54,63	54,49	0,644	1,182

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	3	F12x	PC01	DB08	53,8	57,1	55,2	54,9	55,25	1,372	2,484
			A81	PD02	DB10	60	53,5	54,6	53,3	55,35	3,152	5,695
			F08x	PD02	DB10	57,1	58,7	55,4	57,3	57,13	1,352	2,368
			F15x	PC01	DB08	57	64	54	56	57,75	4,349	7,531
			F16x	PC01	DB08	55,13	60,27	57,35	58,52	57,82	2,156	3,730
			A39	PD02	DB08	56,17	57,39	58,63	59,97	58,04	1,632	2,812
			A49	PD05	DB08	59,3	58	58,4	57,7	58,35	0,695	1,191
			A36	PD02	DB08	60,1	53,02	60,75	60,75	58,66	3,769	6,426
			F06x	PD02	DB08	57,3	56,6	65,3	60,7	59,98	3,976	6,630
			A65	PD01	DB08	61	59	60	60	60,00	0,816	1,361
			F14x	PC01	DB08	59,49	58,86	62,26	59,56	60,04	1,511	2,517
			A59	PB03	DB08	58,8	65,6	64,6	55,7	61,18	4,723	7,721
			A45x	PZ99	DB08	62,3	61,1	59,7	62,7	61,45	1,350	2,197
			A57	PZ02	DD02	62,6	63,5	64,5	65	63,90	1,068	1,671
			A53	PZ02	DD02	62,6	65,2	65,1	64,4	64,33	1,204	1,871
			F28x	PC02	DB08	66,676	67,733	71,114	71,325	69,21	2,359	3,409
			A79	PD03	DB10	72,33	70,49	72,33	70,49	71,41	1,062	1,488
Al	(µg/g)	4	F27	PD01	DB02	19,1	17,5	19,7	18,5	18,70	0,938	5,016
			A45x	PZ99	DB08	33,8	31,8	32	29	31,65	1,982	6,264
			A60	PD01	DB10	30,94	34,01	29,87	33,53	32,09	2,001	6,236
			A80	PD03	DB10	34,8	32,6	29,4	32,4	32,30	2,218	6,867
			F05x	PD02	DB08	33,2	35,5	33,9	33,2	33,95	1,085	3,195
			F03	PD02	DB08	36,6	35,24	33,17	33,81	34,71	1,531	4,412
			F07	PD02	DB08	34,38	35,69	35,36	34,34	34,94	0,686	1,964
			F15x	PC01	DB08	36	38	34	37	36,25	1,708	4,711
			A36	PD02	DB08	38,7	35,76	35,54	36,3	36,58	1,452	3,970
			F06x	PD02	DB08	39,1	38,6	35,8	32,9	36,60	2,862	7,821
			A81	PD02	DB10	36,1	34,1	38,2	39,3	36,93	2,304	6,240
			F16x	PC01	DB08	41,07	38,43	36,34	38,9	38,69	1,941	5,017

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	4	F08x	PD02	DB10	40,3	42,1	40,5	40,1	40,75	0,915	2,245
			A65	PD01	DB08	42	42	39	41	41,00	1,414	3,449
			A49	PD05	DB08	45,2	40,3	39,5	41,1	41,53	2,536	6,106
			A59	PB03	DB08	41,8	40,5	42,4	44,7	42,35	1,756	4,146
			F28x	PC02	DB08	40,536	42,908	42,045	43,986	42,37	1,457	3,439
			F12x	PC01	DB08	40	44	42	44	42,50	1,915	4,506
			A39	PD02	DB08	42,7	41,37	45,63	41,2	42,73	2,049	4,797
			F14x	PC01	DB08	49,66	42,52	49,2	44,56	46,49	3,506	7,542
			A79	PD03	DB10	52,38	53,76	52,38	53,76	53,07	0,797	1,501
			A57	PZ02	DD02	54	53,6	54,3	57,2	54,78	1,642	2,998
			A53	PZ02	DD02	55,4	54,3	56,9	65,1	57,93	4,901	8,460
Ba	(µg/g)	1	A82	PC01	DB08	31,7	31,8	31,1	31,7	31,58	0,320	1,014
			F16x	PC01	DB10	34,67	32,45	31,92	36,16	33,80	1,973	5,839
			A49	PD05	DB08	35,8	36	35,7	36	35,88	0,150	0,418
			A80	PD03	DB10	37,7	37,4	38,4	36,6	37,53	0,746	1,987
			A81	PD02	DB10	37,8	38,5	37,9	38	38,05	0,311	0,817
			A39	PD02	DB08	38,9	41,24	38,68	38,82	39,41	1,223	3,104
			A65	PD01	DB08	40,9	40,7	41,9	41	41,13	0,532	1,292
Ba	(µg/g)	2	A82	PC01	DB08	37,1	37,4	38	37,5	37,50	0,374	0,998
			F16x	PC01	DB10	39,18	39,57	40,6	40,53	39,97	0,706	1,766
			A49	PD05	DB08	41,5	41,9	42,2	42,7	42,08	0,506	1,202
			A80	PD03	DB10	43,2	45	42,4	43,5	43,53	1,087	2,498
			A81	PD02	DB10	43,8	43,6	44,5	43,4	43,83	0,479	1,092
			A39	PD02	DB08	45,73	45,84	43,28	44,2	44,76	1,240	2,770
			A65	PD01	DB08	47,1	47,1	47,4	46,7	47,08	0,287	0,610
Ba	(µg/g)	3	A82	PC01	DB08	41	41,3	41,9	41,8	41,50	0,424	1,022
			F16x	PC01	DB10	44,8	45,42	44,38	44,69	44,82	0,436	0,973
			A49	PD05	DB08	46,5	46,2	46,1	46	46,20	0,216	0,468
			A39	PD02	DB08	45,67	47,01	47,21	46,29	46,55	0,705	1,514

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Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Ba	(µg/g)	3	A80	PD03	DB10	48,8	46,9	46,7	46,4	47,20	1,086	2,301
			A81	PD02	DB10	46,6	47,4	48	47,4	47,35	0,574	1,213
			A65	PD01	DB08	50	50,5	50,4	48,4	49,83	0,974	1,955
Ba	(µg/g)	4	A39	PD02	DB08	<5	<5	<5	<5			
			A49	PD05	DB08	<1,8	<1,8	<1,8	<1,8			
			A82	PC01	DB08	0,655	0,664	0,612	0,78	0,68	0,072	10,600
			A80	PD03	DB10	0,756	0,714	0,674	0,714	0,71	0,033	4,686
			F16x	PC01	DB10	0,7147	0,7963	0,7172	0,7216	0,74	0,039	5,334
			A81	PD02	DB10	0,8	0,77	0,84	0,82	0,81	0,030	3,698
			A65	PD01	DB08	1	0,8	0,9	0,9	0,90	0,082	9,072
Be	(ng/g)	1	F32	PD02	DB10	24,7	25,7	25,7	26,8	25,73	0,858	3,335
			F16x	PC01	DB10	25,79	26,99	25,94	25,48	26,05	0,655	2,515
Be	(ng/g)	2	F16x	PC01	DB10	25,15	25,2	25,26	25,88	25,37	0,341	1,345
			F32	PD02	DB10	27,8	26,7	27,8	26,7	27,25	0,635	2,331
Be	(ng/g)	3	F16x	PC01	DB10	6,825	6,569	6,933	6,599	6,73	0,176	2,620
			F32	PD02	DB10	7	6,9	7,11	7,22	7,06	0,138	1,958
Be	(ng/g)	4	F16x	PC01	DB10	1,279	1,417	1,182	1,187	1,27	0,110	8,683
			F32	PD02	DB10	1,4	1,4	1,51	1,19	1,38	0,134	9,730
Bi	(ng/g)	1	A80	PD03	DB10	8,24	<5	8,44	7,59	8,09	0,444	5,493
			F16x	PC01	DB10	11,07	9,591	13,83	10,11	11,15	1,889	16,938
Bi	(ng/g)	2	A80	PD03	DB10	<5	<5	<5	<5			
			F16x	PC01	DB10	5,509	5,37	5,082	5,11	5,27	0,207	3,922
Bi	(ng/g)	3	A80	PD03	DB10	<5	<5	<5	<5			
			F16x	PC01	DB10	1,486	1,793	1,666	1,745	1,67	0,135	8,066
Bi	(ng/g)	4	A80	PD03	DB10	<5	<5	<5	<5			
			F16x	PC01	DB10	1,588	1,171	1,691	1,47	1,48	0,225	15,197
Br	(µg/g)	1	A53	PZ02	DD02	1,1	1,2	1,1	1	1,10	0,082	7,423
Br	(µg/g)	2	A53	PZ02	DD02	<1	<1	<1	<1			
Br	(µg/g)	3	A53	PZ02	DD02	<1	<1	<1	<1			

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Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Br	(µg/g)	4	A53	PZ02	DD02	<1	<1	<1	<1			
Ce	(ng/g)	1	A80	PD03	DB10	248	218	234	221	230,25	13,720	5,959
Ce	(ng/g)	2	A80	PD03	DB10	48,6	62,3	45,6	46,8	50,83	7,749	15,246
Ce	(ng/g)	3	A80	PD03	DB10	30,4	33,7	31,1	30,9	31,53	1,480	4,693
Ce	(ng/g)	4	A80	PD03	DB10	101	40,4	49,8	75,1	66,58	27,229	40,900
Cl	(µg/g)	1	F02	PA06	DF08	100	<100	<100	100	100,00	0,000	0,000
			A53	PZ02	DD02	90	90	90	90	90,00	0,000	0,000
			F05	PZ99	DF08	181	182	178	193	183,50	6,557	3,574
			A57	PZ02	DD02	195	200	195	197,5	196,88	2,394	1,216
Cl	(µg/g)	2	F02	PA06	DF08	200	170	200	220	197,50	20,616	10,438
			A53	PZ02	DD02	220	210	220	220	217,50	5,000	2,299
			F05	PZ99	DF08	262	283	262	269	269,00	9,899	3,680
			A57	PZ02	DD02	305	310	315	312,5	310,63	4,270	1,375
Cl	(µg/g)	3	A53	PZ02	DD02	41	41	41	40	40,75	0,500	1,227
			F02	PA06	DF08	400	400	410	370	395,00	17,321	4,385
			F05	PZ99	DF08	446	401	390	408	411,25	24,322	5,914
			A57	PZ02	DD02	480	490	490	490	487,50	5,000	1,026
Cl	(µg/g)	4	F02	PA06	DF08	<100	<100	<100	<100			
			F05	PZ99	DF08	<40,6	<40,6	<40,6	<40,6			
			A53	PZ02	DD02	<10	<10	<10	<10			
			A57	PZ02	DD02	105	105	110	107,5	106,88	2,394	2,240
Cs	(ng/g)	1	A80	PD03	DB10	21,3	20,4	20,7	20	20,60	0,548	2,659
			A81	PD02	DB10	24,2	24,3	23,3	22,2	23,50	0,976	4,155
Cs	(ng/g)	2	A80	PD03	DB10	113	117	109	113	113,00	3,266	2,890
			A81	PD02	DB10	117	118	120	119	118,50	1,291	1,089
Cs	(ng/g)	3	A80	PD03	DB10	10,3	10,1	9,88	9,65	9,98	0,280	2,808
			A81	PD02	DB10	11,3	10,3	11,3	11,3	11,05	0,500	4,525
Cs	(ng/g)	4	A80	PD03	DB10	9,33	8,88	8,69	9,31	9,05	0,319	3,519
			A81	PD02	DB10	10,3	10,3	10,3	11,3	10,55	0,500	4,739

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Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
F	(µg/g)	1	F02	PE01	DF03	2	2,3	2,2	2,4	2,23	0,171	7,676
			F05	PZ99	DF03	2,1	2,5	2,1	2,38	2,27	0,202	8,913
F	(µg/g)	2	F05	PZ99	DF03	1,28	1,06	1,11	1,11	1,14	0,096	8,444
			F02	PE01	DF03	1,6	1,5	2	1,5	1,65	0,238	14,427
F	(µg/g)	3	F02	PE01	DF03	2	2,5	2,1	1,9	2,13	0,263	12,376
			F05	PZ99	DF03	2,12	2,44	2,57	2,31	2,36	0,192	8,136
F	(µg/g)	4	F05	PZ99	DF03	1,38	1,3	1,27	1,04	1,25	0,146	11,697
			F02	PE01	DF03	2,3	1,9	1,5	1,8	1,88	0,330	17,622
La	(ng/g)	1	A80	PD03	DB10	102	88,9	90,5	89,1	92,63	6,290	6,791
La	(ng/g)	2	A80	PD03	DB10	28	34,2	25,9	26,4	28,63	3,823	13,356
La	(ng/g)	3	A80	PD03	DB10	15,9	17,2	16,5	15,5	16,28	0,741	4,553
La	(ng/g)	4	A80	PD03	DB10	49,7	18,2	22,2	35,5	31,40	14,266	45,434
Li	(µg/g)	1	A81	PD02	DB10	0,11	0,11	0,11	0,1	0,11	0,005	4,651
Li	(µg/g)	2	A81	PD02	DB10	0,03	0,03	0,03	0,03	0,03	0,000	0,000
Li	(µg/g)	3	A81	PD02	DB10	0,12	0,12	0,12	0,12	0,12	0,000	0,000
Li	(µg/g)	4	A81	PD02	DB10	0,03	0,03	0,03	0,03	0,03	0,000	0,000
Mo	(ng/g)	1	F07	PD02	DB08	96,1	105,1	108,7	142,9	113,20	20,497	18,107
			A81	PD02	DB10	213	230	223	212	219,50	8,583	3,910
			F08x	PD02	DB10	228	213	221	228	222,50	7,141	3,210
			A80	PD03	DB10	258	251	261	245	253,75	7,182	2,830
			A88	PD99	DB99	252,5	255	270	240	254,38	12,311	4,840
			F16x	PC01	DB10	255,1	270,5	261,9	244,9	258,10	10,823	4,194
			F32	PD02	DB10	268	268	257	257	262,50	6,351	2,419
			A36	PD02	DB10	274,3	273,5	267,7	266,8	270,58	3,871	1,431
			F14x	PC01	DB10	296	277	260	263	274,00	16,432	5,997
			A39	PD02	DB08	250	282	288	284	276,00	17,512	6,345
Mo	(ng/g)	2	A39	PD02	DB08	<100	<100	<100	<100			
			F07	PD02	DB08	<75	<75	<75	<75			
			A88	PD99	DB99	46,7	47,5	62,5	47,5	51,05	7,643	14,971

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Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Mo	(ng/g)	2	A81	PD02	DB10	54,4	55,4	55,2	53,4	54,60	0,909	1,665
			F08x	PD02	DB10	70,1	56,7	43,6	58,4	57,20	10,848	18,966
			F32	PD02	DB10	55,5	56,6	58,7	59,8	57,65	1,954	3,389
			F16x	PC01	DB10	60,15	60,17	60,32	61,06	60,43	0,430	0,712
			A36	PD02	DB10	62,29	64,83	66,27	62,96	64,09	1,809	2,823
			A80	PD03	DB10	63,5	69,1	60,9	65	64,63	3,431	5,309
			F14x	PC01	DB10	80	87	70	81	79,50	7,047	8,865
Mo	(ng/g)	3	F07	PD02	DB08	169,6	158,7	154,7	168,1	162,78	7,228	4,441
			A81	PD02	DB10	254	218	240	215	231,75	18,554	8,006
			A88	PD99	DB99	290	230	235	245	250,00	27,386	10,954
			F08x	PD02	DB10	285	286	296	269	284,00	11,165	3,931
			A80	PD03	DB10	301	292	290	307	297,50	7,937	2,668
			F16x	PC01	DB10	311	308,5	301	307,4	306,98	4,259	1,387
			F32	PD02	DB10	297	318	318	308	310,25	10,012	3,227
			A36	PD02	DB10	295	326,2	308,1	326,6	313,98	15,312	4,877
			F14x	PC01	DB10	309	329	300	333	317,75	15,819	4,979
			A39	PD02	DB08	447	461	494	447	462,25	22,172	4,796
Mo	(ng/g)	4	F07	PD02	DB08	135,6	148,6	137,6	155,1	144,23	9,232	6,401
			A81	PD02	DB10	182	194	178	208	190,50	13,503	7,088
			A88	PD99	DB99	241,67	210	200	220	217,92	17,816	8,176
			A80	PD03	DB10	226	215	216	217	218,50	5,066	2,319
			F16x	PC01	DB10	216,6	219,5	219,3	222,7	219,53	2,496	1,137
			F08x	PD02	DB10	224	232	224	213	223,25	7,805	3,496
			A36	PD02	DB10	228,9	223,5	233,3	232,2	229,48	4,400	1,918
			F32	PD02	DB10	227	238	227	238	232,50	6,351	2,732
			F14x	PC01	DB10	255	244	258	250	251,75	6,131	2,435
			A39	PD02	DB08	330	315	289	284	304,50	21,764	7,147

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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	A53	PZ02	DD02	<35	<35	<35	<35			
			F03	PD02	DB08	<25	<25	<25	<25			
			F18x	PD99	DB08	<10	<10	<10	<10			
			A60	PD01	DB10	5,8	6,1	6	5,51	5,85	0,260	4,446
			F16x	PC01	DB10	9,132	9,171	8,533	8,945	8,95	0,292	3,264
			F07	PD02	DB08	8,928	9,545	9,32	8,939	9,18	0,302	3,293
			A81	PD02	DB10	11,3	10,3	8,09	8,24	9,48	1,576	16,624
			F32x	PD02	DB08	15,9	13,8	13,1	12,8	13,90	1,398	10,055
			A65	PD01	DB08	13,6	14,6	16,8	15,9	15,23	1,410	9,264
			F14x	PC01	DB01	15,6	15,6	14,63	16,03	15,47	0,592	3,831
			A36	PD02	DB08	16,4	14,6	14,3	19,5	16,20	2,387	14,737
			A39	PD02	DB08	20,2	17,59	18,24	19,38	18,85	1,164	6,173
			F05	PD02	DB01	20,8	16,1	19,2	19,7	18,95	2,014	10,629
			A79	PD03	DB10	21,02	19,59	18,84	18,92	19,59	1,009	5,152
			F15x	PC01	DB08	31	31	31	31	31,00	0,000	0,000
			F27	PD01	DB06	38,6	44,4	34,5	36,4	38,48	4,291	11,152
			F28x	PC02	DB08	47,366	44,333	51,691	50,623	48,50	3,334	6,873
			A83	PB05	DB08	39,84	49,54	49,44	60,1	49,73	8,276	16,642
			F06x	PD02	DB08	52,82	52,25	48,21	53,13	51,60	2,291	4,439
Na	(µg/g)	2	A53	PZ02	DD02	<35	<35	<35	<35			
			F03	PD02	DB08	<25	<25	<25	<25			
			A65	PD01	DB08	<11,1	<11,1	<11,1	<11,1			
			F18x	PD99	DB08	<10	<10	<10	<10			
			A81	PD02	DB10	<7,9	<7,9	<7,9	<7,9			
			A60	PD01	DB10	4,75	4,73	4,58	4,54	4,65	0,106	2,269
			F16x	PC01	DB10	5,264	5,119	4,897	5,27	5,14	0,175	3,404
			F32x	PD02	DB08	6,41	6,52	6,52	6,62	6,52	0,086	1,316
			F14x	PC01	DB01	6,64	6,74	6,74	6,53	6,66	0,100	1,503
			F07	PD02	DB08	8,185	7,632	7,679	8,317	7,95	0,349	4,382

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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	A79	PD03	DB10	8,148	8,215	8,143	8,134	8,16	0,037	0,455
			A36	PD02	DB08	14,5	14,6	15,8	17	15,48	1,176	7,598
			A39	PD02	DB08	15,55	16,2	15,23	15,33	15,58	0,436	2,799
			F05	PD02	DB01	16,8	16,9	17,2	16,4	16,83	0,330	1,964
			F15x	PC01	DB08	31	31	31	31	31,00	0,000	0,000
			F28x	PC02	DB08	39,192	37,758	36,779	39,21	38,23	1,185	3,100
			F27	PD01	DB06	39,2	40,2	35	39,6	38,50	2,369	6,154
			A83	PB05	DB08	64,78	43,19	39,3	42,25	47,38	11,718	24,731
			F06x	PD02	DB08	50,99	52,43	52,67	53,65	52,44	1,098	2,095
Na	(µg/g)	3	A53	PZ02	DD02	<35	<35	<35	<35			
			F03	PD02	DB08	<25	<25	<25	<25			
			A81	PD02	DB10	<7,9	<7,9	<7,9	<7,9			
			A60	PD01	DB10	7,35	7,12	7,13	7,26	7,22	0,110	1,529
			F16x	PC01	DB10	6,974	7,751	7,218	7,386	7,33	0,326	4,452
			A65	PD01	DB08	13,4	<11,1	14,7	15,2	14,43	0,929	6,438
			F14x	PC01	DB01	7,56	8,84	7,77	8,73	8,23	0,654	7,949
			F32x	PD02	DB08	8,7	8,7	9,13	9,13	8,92	0,248	2,785
			A79	PD03	DB10	9,337	9,437	9,184	9,343	9,33	0,105	1,123
			F07	PD02	DB08	10,43	10,97	10,44	10,5	10,59	0,259	2,442
			F18x	PD99	DB08	10,8	10,7	10,2	10,9	10,65	0,311	2,919
			A39	PD02	DB08	15,69	18,99	16,05	18,48	17,30	1,674	9,673
			A36	PD02	DB08	16,8	18,8	16,4	20,3	18,08	1,817	10,054
			F05	PD02	DB01	18,2	19,1	19,1	18,4	18,70	0,469	2,508
			F15x	PC01	DB08	31	31	31	31	31,00	0,000	0,000
			F27	PD01	DB06	42,1	34,5	26,8	26,2	32,40	7,490	23,117
			F28x	PC02	DB08	41,728	42,056	40,682	41,337	41,45	0,591	1,425
			A83	PB05	DB08	79,14	45,01	40,39	71,73	59,07	19,233	32,561
			F06x	PD02	DB08	62,35	58,24	62,15	66,81	62,39	3,503	5,615

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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)	4	A53	PZ02	DD02	<35	<35	<35	<35			
			F03	PD02	DB08	<25	<25	<25	<25			
			F15x	PC01	DB08	<20	<20	<20	<20			
			A60	PD01	DB10	9,68	10,13	9,18	9,43	9,61	0,405	4,218
			A81	PD02	DB10	10,1	9,93	10,7	11	10,43	0,502	4,814
			F16x	PC01	DB10	11,71	12,86	9,429	9,955	10,99	1,584	14,411
			A79	PD03	DB10	13,39	13,88	13,66	13,4	13,58	0,234	1,726
			F06x	PD02	DB08	14,63	14,07	13,06	12,64	13,60	0,912	6,706
			F14x	PC01	DB01	13,55	13,87	13,87	13,66	13,74	0,159	1,161
			F07	PD02	DB08	14,37	13,38	14,63	14,32	14,18	0,547	3,860
			F18x	PD99	DB08	14,1	13,8	14,2	15,2	14,33	0,608	4,241
			F32x	PD02	DB08	14,8	15	15,2	15	15,00	0,163	1,089
			A36	PD02	DB08	17,4	15	14,7	17,1	16,05	1,396	8,700
			A65	PD01	DB08	18,2	17,8	17,2	17,6	17,70	0,416	2,352
			A39	PD02	DB08	20,79	20,11	19,97	19,08	19,99	0,703	3,517
			F05	PD02	DB01	19,6	22,9	24,3	21,4	22,05	2,017	9,149
			F27	PD01	DB06	39	37,3	33,8	35,9	36,50	2,202	6,032
			F28x	PC02	DB08	45,776	43,566	45,883	46,045	45,32	1,173	2,588
			A83	PB05	DB08	63,14	56,22	56,02	48,06	55,86	6,164	11,035
Nb	(ng/g)	1	A80	PD03	DB10	9,22	7,27	6,59	7,4	7,62	1,124	14,754
Nb	(ng/g)	2	A80	PD03	DB10	<5	5,84	<5	<5	5,84		
Nb	(ng/g)	3	A80	PD03	DB10	<5	<5	<5	<5			
Nb	(ng/g)	4	A80	PD03	DB10	<5	<5	<5	<5			
Rb	(µg/g)	1	A80	PD03	DB10	5,24	5,18	5,32	5,06	5,20	0,110	2,107
			A81	PD02	DB10	5,39	5,43	5,36	5,34	5,38	0,039	0,728
			F16x	PC01	DB10	6,37	5,882	5,9	6,679	6,21	0,387	6,234
Rb	(µg/g)	2	A80	PD03	DB10	7,49	7,79	7,33	7,55	7,54	0,191	2,530
			A81	PD02	DB10	7,7	7,73	7,73	7,71	7,72	0,015	0,194
			F16x	PC01	DB10	8,354	9,012	7,895	8,888	8,54	0,515	6,028

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Rb	(µg/g)	3	A80	PD03	DB10	5,37	5,16	5,14	5,14	5,20	0,112	2,154
			A81	PD02	DB10	5,32	5,32	5,33	5,23	5,30	0,047	0,885
			F16x	PC01	DB10	6,108	5,309	5,801	6,311	5,88	0,436	7,410
Rb	(µg/g)	4	A80	PD03	DB10	1,23	1,2	1,15	1,22	1,20	0,036	2,966
			A81	PD02	DB10	1,23	1,25	1,25	1,31	1,26	0,035	2,749
			F16x	PC01	DB10	1,355	1,221	1,346	1,281	1,30	0,063	4,809
Sb	(ng/g)	1	F16x	PC01	DB10	35,56	34,01	37,78	36,78	36,03	1,625	4,511
			A79	PD03	DB10	37,1	37,6	37,1	37,6	37,35	0,289	0,773
			F32	PD02	DB10	38,6	35,4	41,8	41,8	39,40	3,064	7,776
			A80	PD03	DB10	44,7	44,9	46,1	46,4	45,53	0,850	1,867
			A81	PD02	DB10	56,5	41,6	44,6	43,6	46,58	6,733	14,457
Sb	(ng/g)	2	F16x	PC01	DB10	23,3	22,29	22,7	24,04	23,08	0,761	3,298
			A79	PD03	DB10	24	24,4	24	24,4	24,20	0,231	0,954
			F32	PD02	DB10	25,6	25,6	26,7	25,6	25,88	0,550	2,126
			A80	PD03	DB10	26,9	35,4	28,6	30,9	30,45	3,685	12,101
			A81	PD02	DB10	35,6	34,6	32,5	28,6	32,83	3,099	9,440
Sb	(ng/g)	3	A79	PD03	DB10	<20	<20	<20	<20			
			A80	PD03	DB10	<20	<20	<20	<20			
			A81	PD02	DB10	<19,2	<19,2	<19,2	<19,2			
			F16x	PC01	DB10	9,253	9,013	8,376	8,468	8,78	0,424	4,827
			F32	PD02	DB10	10,6	11,7	10,6	11,7	11,15	0,635	5,696
Sb	(ng/g)	4	A80	PD03	DB10	<20	<20	<20	<20			
			A79	PD03	DB10	<20	<20	<20	<20			
			A81	PD02	DB10	<19,2	<19,2	<19,2	<19,2			
			F32	PD02	DB10	13	13	11,9	11,9	12,45	0,635	5,101
			F16x	PC01	DB10	12,24	13,28	12,42	12,35	12,57	0,477	3,798
Se	(ng/g)	1	A39	PD02	DB08	<100	<100	<100	<100			
			F32	PD02	DB04	<30	<30	<30	<30			
			A80	PD03	DB10	<0,2	<0,2	<0,2	<0,2			

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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	PD02	DB10	42	38,1	37,2	35,4	38,18	2,786	7,298
			A36	PD02	DB10	51,58	49,13	52,03	52,03	51,19	1,391	2,718
			F14x	PC01	DB10	62	49	61	34	51,50	13,077	25,392
			A82	PC01	DB10	54,7	52,4	60,7	53,4	55,30	3,721	6,729
			F16x	PC01	DB10	53,24	71,8	50,5	65,76	60,33	10,132	16,795
Se	(ng/g)	2	A39	PD02	DB08	<100	<100	<100	<100			
			F32	PD02	DB04	<30	<30	<30	<30			
			A80	PD03	DB10	<0,2	<0,2	<0,2	<0,2			
			F08x	PD02	DB10	6,88	7,95	7,21	8,36	7,60	0,676	8,894
			A36	PD02	DB10	13,36	16,9	16,13	16,35	15,69	1,583	10,095
			A82	PC01	DB10	14,3	21,9	17,8	20,7	18,68	3,387	18,134
			F14x	PC01	DB10	14	21	17	31	20,75	7,411	35,714
			F16x	PC01	DB10	19,49	30,71	27,61	28,72	26,63	4,931	18,516
Se	(ng/g)	3	A39	PD02	DB08	<100	<100	<100	<100			
			F32	PD02	DB04	<30	<30	<30	<30			
			F08x	PD02	DB10	<4,4	<4,4	<4,4	<4,4			
			A80	PD03	DB10	<0,2	<0,2	<0,2	<0,2			
			A36	PD02	DB10	9,036	9,799	9,472	9,145	9,36	0,345	3,681
			F14x	PC01	DB10	11	13	3	17	11,00	5,888	53,526
			A82	PC01	DB10	18,3	10,7	13,7	12,1	13,70	3,303	24,106
			F16x	PC01	DB10	23,79	29,11	16,41	25,05	23,59	5,298	22,457
Se	(ng/g)	4	A39	PD02	DB08	<100	<100	<100	<100			
			F32	PD02	DB04	<30	<30	<30	<30			
			F16x	PC01	DB10	<10	<10	<10	<10			
			F08x	PD02	DB10	<4,4	<4,4	<4,4	<4,4			
			A80	PD03	DB10	<0,2	<0,2	<0,2	<0,2			
			A36	PD02	DB10	5,451	4,797	5,778	5,887	5,48	0,490	8,954
			F14x	PC01	DB10	8	7	9	7	7,75	0,957	12,354
			A82	PC01	DB10	13,1	11,6	12,4	13,3	12,60	0,770	6,113

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Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Sn	(ng/g)	1	A80	PD03	DB10	<0,05	<0,05	<0,05	<0,05			
			F16x	PC01	DB10	56,89	56,85	41,35	42,45	49,39	8,655	17,525
Sn	(ng/g)	2	A80	PD03	DB10	0,0654	0,0645	0,0609	0,0662	0,06	0,002	3,640
			F16x	PC01	DB10	65,34	63,94	66,65	63,96	64,97	1,296	1,995
Sn	(ng/g)	3	A80	PD03	DB10	<0,05	<0,05	<0,05	<0,05			
			F16x	PC01	DB10	22,05	23,05	23,4	22,25	22,69	0,642	2,830
Sn	(ng/g)	4	A80	PD03	DB10	<0,05	<0,05	<0,05	<0,05			
			F16x	PC01	DB10	24,23	23,11	24,68	23,92	23,99	0,662	2,758
Sr	(µg/g)	1	A53	PZ02	DD02	13,7	13,4	13,5	13,6	13,55	0,129	0,953
			A80	PD03	DB10	13,8	13,7	14	13,3	13,70	0,294	2,149
			A81	PD02	DB10	14	14,1	13,9	13,9	13,98	0,096	0,685
			A65	PD01	DB08	14,8	14,8	14,9	14,8	14,83	0,050	0,337
			A39	PD02	DB08	15,58	15,64	15,45	14,83	15,38	0,372	2,419
			F16x	PC01	DB10	16,41	16,46	15,4	17,28	16,39	0,770	4,697
Sr	(µg/g)	2	A53	PZ02	DD02	16,4	17,1	16,3	17	16,70	0,408	2,445
			A80	PD03	DB10	16,7	17,4	16,4	16,9	16,85	0,420	2,494
			A81	PD02	DB10	17,2	17,1	17,1	17	17,10	0,082	0,477
			A65	PD01	DB08	18	18,1	18,4	18	18,13	0,189	1,044
			A39	PD02	DB08	19,27	19,23	18,23	18,61	18,84	0,504	2,676
			F16x	PC01	DB10	19,27	18,42	20,18	18,48	19,09	0,825	4,322
Sr	(µg/g)	3	A53	PZ02	DD02	20,5	20,8	20,5	19,9	20,43	0,377	1,848
			A80	PD03	DB10	21,9	21,1	21	20,9	21,23	0,457	2,155
			A81	PD02	DB10	21,4	21,3	21,3	21,2	21,30	0,082	0,383
			A65	PD01	DB08	22,6	22,5	22,4	22,4	22,48	0,096	0,426
			A39	PD02	DB08	22,3	23,21	23,09	22,77	22,84	0,407	1,780
			F16x	PC01	DB10	23,3	25,22	23,03	24,74	24,07	1,072	4,452

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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)	4	A80	PD03	DB10	1,01	0,986	0,947	0,993	0,98	0,027	2,708
			A81	PD02	DB10	0,98	0,99	0,99	1,05	1,00	0,032	3,194
			F16x	PC01	DB10	1,106	1,086	1,014	1,015	1,06	0,048	4,526
			A65	PD01	DB08	1,2	1,1	1,1	1,1	1,13	0,050	4,444
			A39	PD02	DB08	1,251	1,203	1,218	1,266	1,23	0,029	2,352
			A53	PZ02	DD02	1,47	1,63	1,62	1,55	1,57	0,074	4,728
Th	(ng/g)	1	A80	PD03	DB10	26,9	23,4	23	24,8	24,53	1,761	7,182
Th	(ng/g)	2	A80	PD03	DB10	<5	<5	<5	<5			
Th	(ng/g)	3	A80	PD03	DB10	<5	<5	<5	<5			
Th	(ng/g)	4	A80	PD03	DB10	8,31	5,43	6,84	6,48	6,77	1,191	17,607
Ti	(µg/g)	1	A39	PD02	DB08	<5	<5	<5	<5			
			A80	PD03	DB10	2,5	2,09	1,85	2,07	2,13	0,271	12,742
			A65	PD01	DB08	6,8	6,5	7,7	6,7	6,93	0,532	7,675
Ti	(µg/g)	2	A39	PD02	DB08	<5	<5	<5	<5			
			A80	PD03	DB10	0,717	1,03	0,751	0,819	0,83	0,140	16,930
			A65	PD01	DB08	2,1	1,8	2,2	2,1	2,05	0,173	8,449
Ti	(µg/g)	3	A39	PD02	DB08	<5	<5	<5	<5			
			A80	PD03	DB10	1,01	0,946	0,802	0,849	0,90	0,094	10,405
			A65	PD01	DB08	1,8	1,7	1,7	1,9	1,78	0,096	5,394
Ti	(µg/g)	4	A39	PD02	DB08	<5	<5	<5	<5			
			A80	PD03	DB10	1,01	0,855	0,637	0,866	0,84	0,154	18,270
			A65	PD01	DB08	1,9	1,8	1,6	2	1,83	0,171	9,358

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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)	1	A79	PD03	DB10	<10	<10	<10	<10			
			A80	PD03	DB10	<5	<5	<5	<5			
			F08x	PD02	DB10	2,85	2,45	3,57	3,2	3,02	0,479	15,878
			A82	PC01	DB10	3,5	3,44	3,37	3,1	3,35	0,177	5,265
			F16x	PC01	DB10	4,085	4,348	3,933	4,237	4,15	0,181	4,356
			A36	PD02	DB10	4,122	4,122	4,234	4,234	4,18	0,065	1,548
			A81	PD02	DB10	4,66	4,67	4,66	4,67	4,67	0,006	0,124
			F32	PD02	DB10	4,83	5,04	4,93	4,93	4,93	0,086	1,739
Tl	(ng/g)	2	A80	PD03	DB10	48,8	51,4	48,4	51,8	50,10	1,747	3,488
			A82	PC01	DB10	55,4	55,7	55	56	55,53	0,427	0,769
			A79	PD03	DB10	55,4	55,8	55,4	55,8	55,60	0,231	0,415
			F08x	PD02	DB10	59,1	53,7	56,8	57,7	56,83	2,288	4,027
			F16x	PC01	DB10	59,52	59,67	60,89	60,95	60,26	0,768	1,274
			A81	PD02	DB10	62,7	61,6	61,4	61,7	61,85	0,580	0,938
			A36	PD02	DB10	66,16	65,72	64,39	65,28	65,39	0,756	1,156
			F32	PD02	DB10	66,2	65,2	65,2	66,2	65,70	0,577	0,879
Tl	(ng/g)	3	A79	PD03	DB10	<10	<10	<10	<10			
			A80	PD03	DB10	<5	<5	<5	<5			
			F08x	PD02	DB10	3,92	3,21	4,13	4,01	3,82	0,414	10,846
			A82	PC01	DB10	4,29	3,99	4,12	4,06	4,12	0,128	3,115
			F16x	PC01	DB10	5,289	5,159	5,248	5,262	5,24	0,056	1,075
			A36	PD02	DB10	5,444	5,226	5,661	5,335	5,42	0,186	3,429
			A81	PD02	DB10	5,66	4,67	5,66	5,68	5,42	0,498	9,200
			F32	PD02	DB10	5,31	5,52	5,52	5,41	5,44	0,101	1,857

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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)	4	A79	PD03	DB10	<10	<10	<10	<10			
			A80	PD03	DB10	<5	<5	<5	<5			
			A82	PC01	DB10	<0,78	<0,78	<0,78	<0,78			
			F08x	PD02	DB10	1,3	1,49	<1	<1	1,40	0,134	9,631
			F16x	PC01	DB10	1,147	1,154	1,235	1,14	1,17	0,044	3,796
			A36	PD02	DB10	1,199	1,09	1,199	1,309	1,20	0,089	7,455
			F32	PD02	DB10	1,19	1,19	1,3	1,3	1,25	0,064	5,101
			A81	PD02	DB10	1,66	1,67	1,67	1,67	1,67	0,005	0,300
U	(ng/g)	1	A80	PD03	DB10	9,04	8,04	7,85	8,41	8,34	0,524	6,291
			F16x	PC01	DB10	9,123	8,644	10,43	8,814	9,25	0,809	8,749
			F14x	PC01	DB10	11	9	11	9	10,00	1,155	11,547
U	(ng/g)	2	A80	PD03	DB10	<2	<2	<2	<2			
			F16x	PC01	DB10	1,319	1,055	1,131	1,13	1,16	0,113	9,718
			F14x	PC01	DB10	2	2	2	1	1,75	0,500	28,571
U	(ng/g)	3	A80	PD03	DB10	<2	<2	<2	<2			
			F16x	PC01	DB10	0,985	0,9427	0,8981	0,8298	0,91	0,066	7,260
			F14x	PC01	DB10	1	1	1	1	1,00	0,000	0,000
U	(ng/g)	4	A80	PD03	DB10	<2	<2	<2	<2			
			F16x	PC01	DB10	1,987	2,128	2,133	1,947	2,05	0,096	4,677
			F14x	PC01	DB10	3	2	2	2	2,25	0,500	22,222
V	(µg/g)	1	A39	PD02	DB08	<0,25	<0,25	<0,25	<0,25			
			A80	PD03	DB10	0,242	0,231	0,236	0,23	0,23	0,005	2,343
			F08x	PD02	DB10	0,2463	0,2376	0,2543	0,248	0,25	0,007	2,794
			F16x	PC01	DB10	0,2539	0,23	0,2563	0,2492	0,25	0,012	4,826
			A82	PC01	DB10	0,261	0,253	0,249	0,248	0,25	0,006	2,338
			F32	PD02	DB10	0,257	0,268	0,257	0,279	0,27	0,011	3,970
			A81	PD02	DB10	0,27	0,27	0,27	0,26	0,27	0,005	1,869
			A79	PD03	DB10	0,2833	0,2771	0,2833	0,2771	0,28	0,004	1,278
			F14x	PC01	DB10	0,2776	0,2765	0,2862	0,284	0,28	0,005	1,692

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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)	2	A39	PD02	DB08	<0,25	<0,25	<0,25	<0,25			
			A80	PD03	DB10	<0,05	0,0577	<0,05	<0,05	0,06		
			F16x	PC01	DB10	0,0509	0,0519	0,0508	0,0515	0,05	0,001	1,012
			A79	PD03	DB10	0,0517	0,0514	0,0517	0,0514	0,05	0,000	0,336
			A82	PC01	DB10	0,055	0,054	0,055	0,051	0,05	0,002	3,522
			F32	PD02	DB10	0,053	0,055	0,053	0,056	0,05	0,002	2,765
			A81	PD02	DB10	0,057	0,057	0,064	0,059	0,06	0,003	5,576
			F08x	PD02	DB10	0,0601	0,0644	0,052	0,0623	0,06	0,005	9,088
			F14x	PC01	DB10	0,061	0,0621	0,0599	0,0599	0,06	0,001	1,734
V	(µg/g)	3	A39	PD02	DB08	<0,25	<0,25	<0,25	<0,25			
			A80	PD03	DB10	<0,05	0,0547	<0,05	<0,05	0,05		
			F16x	PC01	DB10	0,0594	0,0563	0,0578	0,0594	0,06	0,001	2,557
			A81	PD02	DB10	0,076	0,054	0,057	0,053	0,06	0,011	18,002
			A79	PD03	DB10	0,0638	0,0563	0,0638	0,0563	0,06	0,004	7,211
			A82	PC01	DB10	0,059	0,06	0,059	0,064	0,06	0,002	3,935
			F08x	PD02	DB10	0,0645	0,0624	0,0574	0,0594	0,06	0,003	5,165
			F14x	PC01	DB10	0,0681	0,0692	0,0692	0,0671	0,07	0,001	1,477
			F32	PD02	DB10	0,069	0,07	0,072	0,072	0,07	0,001	2,120
V	(µg/g)	4	A39	PD02	DB08	<0,25	<0,25	<0,25	<0,25			
			F08x	PD02	DB10	0,0649	0,0612	0,0641	0,0667	0,06	0,002	3,567
			A80	PD03	DB10	0,0691	0,0637	0,0626	0,0643	0,06	0,003	4,422
			A82	PC01	DB10	0,075	0,066	0,067	0,07	0,07	0,004	5,815
			F16x	PC01	DB10	0,0679	0,0759	0,0672	0,0688	0,07	0,004	5,747
			A81	PD02	DB10	0,063	0,072	0,076	0,077	0,07	0,006	8,857
			F32	PD02	DB10	0,069	0,075	0,071	0,073	0,07	0,003	3,586
			A79	PD03	DB10	0,075	0,0772	0,075	0,0772	0,08	0,001	1,669
			F14x	PC01	DB10	0,0791	0,078	0,077	0,0759	0,08	0,001	1,766