Results of Proficiency Test
Metals in dried Paint
April 2019

Organised by: Institute for Interlaboratory Studies
                    Spijkenisse, the Netherlands

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1   INTRODUCTION

Since the USA Consumer Product Safety Improvement Act (CPSIA) did pass in 2008, Institute for Interlaboratory Studies (iis) received a number of requests to start a Proficiency Test (PT) scheme for the determination of Lead in paint. Among other things, the CPSIA (sec. 101) bans Lead and Phthalates in toys. This USA legislation reduces the amount of total Lead content in the substrates of children's products to 600 ppm by 2009, to 100 ppm by 2011 and the total Lead content in surface coatings or paint to 90 mg/kg by 2009.

Since 2008, the Institute for Interlaboratory Studies (iis) organizes every year a proficiency test on total Lead in dried Paint. In 2015 it was decided to extend the scope with other metals on request of a number of participants. During the annual proficiency testing program 2018/2019, it was decided to continue the proficiency test for the analysis of Metals in dried Paint.

In this interlaboratory study 116 laboratories in 34 different countries registered for participation. See appendix 4 for the number of participants per country.

In this report, the results of the 2019 proficiency test are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2   SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test. Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory. It was decided to send two different dried paint samples of 0.5 g each, one sample with white colored dried paint labelled #19530 and one sample with beige colored dried paint labelled #19531.

The participants were asked to report the rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1   ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC 17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accreditation scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2   PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

2.3 CONFIDENTIALITY STATEMENT

All data presented in this report must be regarded as confidential and for use by the participating companies only. Disclosure of the information in this report is only allowed by means of the entire report. Use of the contents of this report for third parties is only allowed by written permission of the Institute for Interlaboratory Studies. Disclosure of the identity of one or more of the participating companies will be done only after receipt of a written agreement of the companies involved.

2.4 SAMPLES

Two different dried paint samples were used in this proficiency test. For the batch of sample #19530 white paint was artificially fortified with Arsenic, Chromium and Manganese. For the batch of sample #19531 beige paint was artificially fortified with Cobalt and Lead. After thorough mixing, the paint batches were applied to plastic sheets and after drying, the paints were scraped off and milled. Finally, the milled paint batches were divided over 200 plastic bags of 0.5 gram each and labelled #19530 or labelled #19531 respectively.

The batch for sample #19530 was used in a previous proficiency test on Metals in dried Paint: sample #17550 in iis17V01. In iis17V01 the homogeneity of this batch was demonstrated by the determination of total Arsenic and total Chromium on 8 randomly selected samples by an ISO/IEC 17025 accredited laboratory. Therefore, homogeneity of the subsamples #19530 was assumed.

The batch for sample #19531 was also used in a previous proficiency test on Metals in dried Paint: sample #15051 in iis15V01. In iis15V01 the homogeneity of this batch was demonstrated by the determination of total Lead on 8 randomly selected samples by an ISO/IEC 17025 accredited laboratory. Therefore, homogeneity of the subsamples #19531 was assumed.

Approx. 0.5 grams of each of the subsamples #19530 and #19531 were sent to the participating laboratories on March 27, 2019.

2.5 ANALYSES

The participants were requested to determine on both samples #19530 and #19531 the concentration of total Antimony, Arsenic, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel and Selenium. It was also requested to report if the laboratory was accredited for the determined components and to report some analytical details.

It was explicitly requested to treat the samples as if they were routine samples and to report the test results using the indicated units on the report form and not to round the results, but report as much significant figures as possible. It was also requested not to report 'less than' test results, which are above the detection limit, because such test results cannot be used for meaningful statistical evaluations.

To get comparable test results, a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the appropriate reference test methods (when applicable) that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis-cts/. The participating laboratories are also requested to confirm the sample receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

3   RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis-cts/. The reported test results are tabulated in appendix 1 and 2 of this report. The laboratories are presented by their code numbers.

Directly after the deadline, a reminder was sent to those laboratories that had not reported test results at that moment. Shortly after the deadline, the available test results were screened for suspect data. A test result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the reported test results (no re-analyzes). Additional or corrected test results are used for data analysis and original test results are placed under 'Remarks' in the result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1   STATISTICS

The protocol followed in the organization of this proficiency test was the one as described in the report 'iis Interlaboratory Studies: Protocol for the Organization, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5).

For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as '<…' or '>…" were in general not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either 'unknown', 'OK', 'suspect' or 'not OK'. After removal of outliers, this check was repeated. If a data set does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.

According to ISO 5725, the original test results per determination were submitted to Dixon's and/or Grubbs' and/or Rosner's outlier tests. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of the averages and the standard deviations.

For each assigned value, the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. In this PT, the criterion of ISO13528, paragraph 9.2.1. was met for all evaluated tests, therefore, the uncertainty of all assigned values may be negligible and need not be included in the PT report.

Finally, the reproducibities were calculated from the standard deviations by multiplying them with a factor of 2.8.

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported test results are plotted. The corresponding laboratory numbers are on the X-axis.

The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. The Kernel Density Graph is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve was projected over the Kernel Density Graph for reference.

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficienct test (PT) against the literature requirements, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.

The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used. In general, when no literature reproducibility is available, another target may be used, like Horwitz or an estimated reproducibility based on former iis proficiency tests.

When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test results is fit-for-use.

The z-scores were calculated according to:

$z_{(target)}$ = (test result - average of PT) / target standard deviation

The $z_{(target)}$ scores are listed in the result tables in appendix 1.

Absolute values for z<2 are very common and absolute values for z>3 are very rare. The usual interpretation of z-scores is as follows:

$|z| < 1$ good
$1 < |z| < 2$ satisfactory
$2 < |z| < 3$ questionable
$3 < |z|$ unsatisfactory

4   EVALUATION

During the execution of this proficiency test no major problems were encountered. Only three participants did not report any test results at all. In total 113 laboratories reported 417 numerical test results. Observed were 22 statistically outlying test results, which is 5.3% of the numerical test results. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

Not all original data sets proved to have a normal Gaussian distribution. These are referred to as "not OK" or "suspect". The statistical evaluation of these data sets should be used with due care, see also paragraph 3.1.

4.1   EVALUATION PER SAMPLE AND PER COMPONENT

In this section, the results are discussed per sample and per component. The test methods, which were used by the various laboratories were taken into account for explaining the observed differences when possible and applicable. These test methods are also in the tables in appendix 1 together with the original data. The abbreviations, used in these tables, are listed in appendix 5.

Unfortunately, a suitable reference method, providing the precision data, is not available for the determination of metals in paint. Therefore, the calculated reproducibility was compared against the reproducibility estimated from the Horwitz equation.

Sample #19530

Total Arsenic: This determination may be problematic at a consensus value of 175 mg/kg. Five statistical outliers were observed and two test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the estimated reproducibility using the Horwitz equation.

Total Chromium: This determination may be problematic at a consensus value of 170 mg/kg. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility using the Horwitz equation.

Total Manganese: This determination may not be problematic at a consensus value of 33 mg/kg. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility using the Horwitz equation.

The majority of the participants agreed on a concentration near or below the limit of detection for Antimony, Cadmium, Cobalt, Copper, Lead, Mercury, Nickel and Selenium.

Sample #19531

Total Cobalt: This determination may not be problematic at a consensus value of 483 mg/kg. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility using the Horwitz equation.

Total Lead: This determination may not be problematic at a consensus value of 88 mg/kg. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility using the Horwitz equation.

The majority of the participants agreed on a concentration near or below the limit of detection for Antimony, Arsenic, Cadmium, Chromium, Copper, Manganese, Mercury, Nickel and Selenium.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the estimated target reproducibility using the Horwitz equation and the reproducibility as found for the group of participating laboratories. The number of significant test results, the average results, the calculated reproducibility (2.8 * standard deviation) and the estimated target reproducibility are presented in the next tables.

Component	unit	n	average	2.8 * sd	R (target)
Total Arsenic	mg/kg	75	175.4	43.0	36.1
Total Chromium	mg/kg	86	170.4	47.7	35.2
Total Manganese	mg/kg	55	33.2	7.7	8.8

Table 1: reproducibilities of tests on sample #19530

Component	unit	n	average	2.8 * sd	R (target)
Total Cobalt	mg/kg	69	482.6	93.9	85.3
Total Lead	mg/kg	108	88.3	20.1	20.2

Table 2: reproducibilities of tests on sample #19531

Without further calculations, it could be concluded that for Manganese, Cobalt and Lead there is a good compliance of the group of participating laboratories with the strict target results calculated with the Horwitz equation. For Arsenic and Chromium the group of participating laboratories show to have more difficulty in this determination. The problematic tests have been discussed in paragraph 4.1.

4.3 EVALUATION OF THE PROFICIENCY TEST OF APRIL 2019 WITH PREVIOUS PTS

	April 2019	April 2018	April 2017	April 2016	April 2015
Number of reporting labs	113	133	132	152	156
Number of results reported	417	638	975	1133	558
Number of statistical outliers	22	25	24	33	16
Percentage outliers	5.3%	3.9%	2.5%	2.9%	2.9%

Table 3: comparison with previous proficiency tests

In proficiency tests, outlier percentages of 3% - 7.5% are quite normal.

The performance of the determinations of the proficiency tests was compared, expressed as relative standard deviation (RSD) of the PTs, see next table.

Component	April 2019	April 2018	April 2017	April 2016	April 2015	April 2014	Horwitz RSD 2500 - 25 mg/kg
Total Antimony	n.e.	n.e.	n.e.	15%	n.e.	n.e.	5 - 10%
Total Arsenic	9%	n.e.	9%	n.e.	n.e.	n.e.	5 - 10%
Total Cadmium	n.e.	7%	n.e.	7-8%	n.e.	n.e.	5 - 10%
Total Chromium	10%	9%	9-12%	9%	n.e.	n.e.	5 - 10%
Total Cobalt	7%	29%	8%	30%	7%	n.e.	5 - 10%
Total Copper	n.e.	n.e.	n.e.	n.e.	n.e.	n.e.	5 - 10%
Total Lead	8%	9%	9%	10%	9%	6 - 8%	5 - 10%
Total Manganese	8%	n.e..	n.e.	n.e.	n.e.	n.e.	5 - 10%
Total Mercury	n.e.	11%	14%	18%	n.e.	n.e.	5 - 10%
Total Nickel	n.e.	5%	13%	5%	13%	n.e.	5 - 10%
Total Selenium	n.e.	n.e.	n.e.	n.e.	n.e.	n.e.	5 - 10%

Table 4: development of the relative standard deviations (RSD) over the years.

4.4 EVALUATION OF THE ANALYTICAL DETAILS

Many different test methods were mentioned. The American CPSC-CH-E1003-09 method ("For determining Lead (Pb) in Paint and Other Similar Surface Coatings) was used by about 50% of the participants. Also other methods were reported and sometimes the method used was depending on the metal to be determined. Surprisingly, some of these test methods are not designed to determine metals in dried paint. For example, EN16711 is for metals in textile and IEC62321 for metals in electro technical products.

For this PT also some analytical details were requested and these are submitted by most of the participants, see appendix 3. Based on the answers given by the participants the following can be summarized:

- About 85% of the reporting participants mentioned that they are accredited for the determination of Metals in dried Paint.
- About 20% of the reporting participants used less than 100mg as sample intake, about 45% used 100mg, about 20% used between 100mg and 200mg and about 5% used more than 200mg as sample intake.
- Nearly all laboratories used a strong acid like Nitric Acid (or Nitric Acid in combination with Hydrochloric Acid and/or Hydrofluoric Acid) to digest the dried paint. About 65% of the participants used a Nitric Acid with a concentration ≥ 65%
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When the analytical details where investigated separately, it appeared that the effect on the determination of Metals in dried Paint is negligible.

5   DISCUSSION

Sample #19530 was used in a previous proficiency test on Metals in dried Paint: sample #17550 in PT iis17V01. A comparison is made between the two proficiency tests. It is observed that the PT findings of the subsamples #19530 and #17550 are comparable.

Component	unit	#19530			#17550		
		n	average	R(calc)	n	average	R(calc)
Total Arsenic	mg/kg	75	175.4	43.0	96	175.9	46.7
Total Chromium	mg/kg	86	170.4	47.7	103	168.7	54.6
Total Manganese	mg/kg	55	33.2	7.7	n.e.	n.e.	n.e.

Table 5: comparison of sample #19530 with #17550

Sample #19531 was used in a previous proficiency test on Metals in dried Paint: sample #15051 in PT iis15V01. A comparison is made between the two proficiency tests. It is observed that the PT findings of the subsamples #19531 and #15051 are comparable.

Component	unit	#19531			#15051		
		n	average	R(calc)	n	average	R(calc)
Total Cobalt	mg/kg	69	482.6	93.9	n.e.	n.e.	n.e.
Total Lead	mg/kg	108	88.3	20.1	152	88.2	21.8

Table 6: comparison of sample #19531 with #15051

6   CONCLUSION

When the concentration limit recommended in UN Environment's "Model Law and Guidance for Regulating Lead Paint" 90 mg/kg total Lead is taken into account 65% of the respondents would accept sample #19531 based on the total Lead content.

Each participating laboratory will have to evaluate its performance in this study and decide about any corrective actions if necessary. Therefore, participation on a regular basis in this scheme could be helpful to improve the performance and thus increase of the quality of the analytical results.

APPENDIX 1

Determination of Total Arsenic as As on sample #19530; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
330		-----		-----	
348		-----		-----	
523		-----		-----	
551	EPA3052	103.0295	C,R(0.01)	-5.61	first reported 222.17
623	In house	172.00		-0.26	
632		-----		-----	
658	EPA3052	137.145	ex,C	-2.97	first reported 126.649, ex: see below table
1051		-----		-----	
1213	CPSC-CH-E1003-09	184.8		0.73	
2115	ASTM F963	27.85	R(0.01)	-11.44	
2118	CPSC-CH-E1002-08	181.33		0.46	
2120	CPSC-CH-E1003-09	163.3		-0.94	
2129		179		0.28	
2137	CPSC-CH-E1003-09	151.0		-1.89	
2139	CPSC-CH-E1003-09/D3335	184.3		0.69	
2165		-----		-----	
2170		-----		-----	
2184		-----		-----	
2255	CPSC-CH-E1003-09	175.4		0.00	
2256	ASTM F963	172.87		-0.19	
2258	CPSC-CH-E1003-09	136.46	C	-3.02	first reported 106.87
2286		-----		-----	
2287	EPA3052	167.22		-0.63	
2289	CPSC-CH-E1003-09	186.6		0.87	
2290	CPSC-CH-E1003-09	183.62		0.64	
2293		-----		-----	
2294		-----		-----	
2301		172.1		-0.25	
2310	CPSC-CH-E1003-09	164.3		-0.86	
2311	CPSC-CH-E1003-09	167.54		-0.61	
2314		-----		-----	
2330	EPA3052	148.53		-2.08	
2347	In house	175.6		0.02	
2352	In house	182.50		0.55	
2355	EPA3052	180.55		0.40	
2357	ISO8124-5	177.5		0.16	
2358	CPSC-CH-E1003-09	173.1		-0.18	
2363	EPA3052	171.32		-0.31	
2365	EPA3052	182.3		0.54	
2366	CPSC-CH-E1003-09	179.4		0.31	
2369	EPA3052	178.62		0.25	
2370	CPSC-CH-E1003-09	174		-0.11	
2374	CPSC-CH-E1002-08	179.80		0.34	
2375	ASTM F963	178		0.20	
2378	EN16711-1	179.1		0.29	
2379		-----		-----	
2380	CPSC-CH-E1003-09	162.54		-1.00	
2381		-----		-----	
2382	EPA3052	175.0		-0.03	
2384		-----		-----	
2385	EPA3051	189.9		1.13	
2390	CPSC-CH-E1003-09	131.0	C	-3.44	first reported 124.75
2391	CPSC-CH-E1003-09	163.50		-0.92	
2410	ISO8124-5	184		0.67	
2426	CPSC-CH-E1003-09	181.4		0.47	
2429	CPSC-CH-E1003-09	186.6		0.87	
2431	CPSC-CH-E1003-09	183.921		0.66	
2433	CPSC-CH-E1003-09	153.22		-1.72	
2453		-----		-----	
2459	CPSC-CH-E1003-09	174.44		-0.07	
2460		-----		-----	
2480	In house	209.17		2.62	
2492	In house	181.0		0.44	
2497	CPSC-CH-E1003-09	214.92	ex	3.07	ex: see below table
2503		57.55	R(0.01)	-9.14	
2511		174.0		-0.11	
2514		-----		-----	
2529		-----		-----	
2532	EPA3052	186.5		0.86	
2563		-----		-----	
2564		-----		-----	
2567	CPSC-CH-E1003-09	179.7		0.34	
2582		-----		-----	
2590	CPSC-CH-E1003-09	173.523		-0.14	
2595	ABNT NM300.3	40.8	C,R(0.01)	-10.44	first reported 102

lab	method	value	mark	z(targ)	remarks
2634		-----		-----	
2637	EPA3052	182		0.51	
2642		-----		-----	
2674		-----		-----	
2678	CPSC-CH-E1003-09	129.53		-3.56	
2705	In house	223.2		3.71	
2720	CPSC-CH-E1003-09	187.6		0.95	
2736	In house	204.75		2.28	
2737	CPSC-CH-E1003-09	176.258		0.07	
2788	ASTM F963	173.26		-0.16	
2799	In house	7.89	C,R(0.01)	-12.99	first reported 515.45
2812		-----		-----	
2826		-----		-----	
2829		149.25		-2.03	
2853		-----		-----	
2858	In house	177.326		0.15	
2875	In house	179.743		0.34	
3100	EPA3051	178.23696		0.22	
3116	ASTM F963	167.975		-0.57	
3118	EN16711-1	185.407		0.78	
3124		-----		-----	
3146	In house	195		1.52	
3150	CPSC-CH-E1003-09	159.2		-1.25	
3154	CPSC-CH-E1003-09	157.5		-1.39	
3160	CPSC-CH-E1003-09	179.26		0.30	
3172	CPSC-CH-E1003-09	184.6		0.72	
3182	CPSC-CH-E1003-09	183.5		0.63	
3185	ISO8124-5	179.48		0.32	
3190	ASTM F963	167.3		-0.63	
3197	CPSC-CH-E1003-09	180.7		0.41	
3199		-----		-----	
3210		-----		-----	
3214	EPA3052	189.67		1.11	
3225		-----		-----	
3228		-----		-----	
3237		155.51		-1.54	
3243	CPSC-CH-E1003-09	200	C	1.91	first reported 130.0
3246	CPSC-CH-E1003-09.01	166.72		-0.67	
3248	CPSC-CH-E1003-09	181	C	0.44	first reported 96
8005	In house	167.55		-0.61	
	normality	not OK			
	n	75			
	outliers	5 (+2 ex)			
	mean (n)	175.375			
	st.dev. (n)	15.3474	RSD = 8.8%		
	R(calc.)	42.973			
	st.dev.(Horwitz)	12.8925			
	R(Horwitz)	36.099			

Lab 658: test result excluded as in this sample the test results of Cr and Mn are statistical outliers
Lab 2497: test result excluded as in this sample the test results of Cr and Mn are statistical outliers
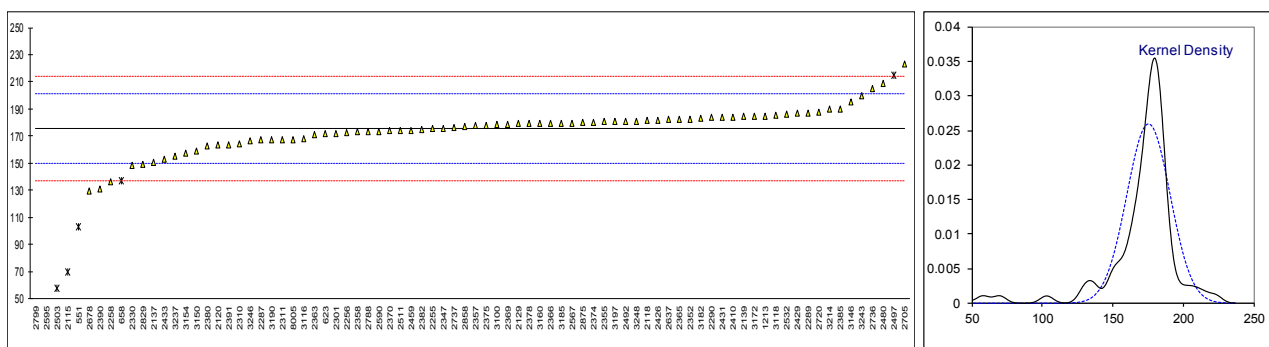
Determination of Total Chromium as Cr on sample #19530; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210	CPSC-CH-E1003-09	183.63		1.05	
330		-----		-----	
348	CPSC-CH-E1003-09	197.32		2.14	
523		-----		-----	
551	EPA3052	143.226	C	-2.16	first reported 106.836
623	In house	180.52		0.81	
632		-----		-----	
658	EPA3052	69.372	C,R(0.01)	-8.03	first reported 57.377
1051		-----		-----	
1213	CPSC-CH-E1003-09	176.9		0.52	
2115	ASTM F963	18.7	R(0.01)	-12.06	
2118	CPSC-CH-E1002-08	189.48		1.52	
2120	CPSC-CH-E1003-09	176.6		0.49	
2129		190		1.56	
2137	CPSC-CH-E1003-09	164.3		-0.48	
2139	CPSC-CH-E1003-09/D3335	162.1	C	-0.66	first reported 37.3
2165	ASTM F963	169.0		-0.11	
2170		-----		-----	
2184		-----		-----	
2255	CPSC-CH-E1003-09	171.3		0.07	
2256	ASTM F963	170.63		0.02	
2258	CPSC-CH-E1003-09	141.59		-2.29	
2286		-----		-----	
2287	EPA3052	172.41		0.16	
2289	CPSC-CH-E1003-09	164.6		-0.46	
2290	CPSC-CH-E1003-09	179.30		0.71	
2293		-----		-----	
2294		-----		-----	
2301		161.6		-0.70	
2310	CPSC-CH-E1003-09	178.7		0.66	
2311	CPSC-CH-E1003-09	185.41		1.20	
2314		-----		-----	
2330	EPA3052	122.4	C	-3.81	first reported 116.38
2347	In house	154.6		-1.25	
2352	IEC62321-5	159.71		-0.85	
2355	EPA3052	169.7		-0.05	
2357	ISO8124-5	164.2		-0.49	
2358	CPSC-CH-E1003-09	167.2		-0.25	
2363	EPA3052	164.43		-0.47	
2365	EPA3052	160.0		-0.82	
2366	CPSC-CH-E1003-09	162.3		-0.64	
2369	EPA3052	162.32		-0.64	
2370	CPSC-CH-E1003-09	163		-0.59	
2374	CPSC-CH-E1002-08	160.06		-0.82	
2375	ASTM F963	180		0.77	
2378	EN16711-1	164.9		-0.44	
2379	IEC62321	128.10	C	-3.36	first reported 106.55
2380	CPSC-CH-E1003-09	161.63		-0.70	
2381		-----		-----	
2382	EPA3052	160.0		-0.82	
2384	CPSC-CH-E1003-09	152.62		-1.41	
2385	EPA3051	143.5		-2.14	
2390	CPSC-CH-E1003-09	146.4	C	-1.91	first reported 120.76
2391	CPSC-CH-E1003-09	175.40		0.40	
2410	ISO8124-5	173		0.21	
2426	CPSC-CH-E1003-09	193.9		1.87	
2429	CPSC-CH-E1003-09	161.5		-0.71	
2431	CPSC-CH-E1003-09	190.3305		1.59	
2433	CPSC-CH-E1003-09	150.63		-1.57	
2453		-----		-----	
2459	CPSC-CH-E1003-09	173.74		0.27	
2460		-----		-----	
2480	In house	198.15		2.21	
2492	In house	157.5		-1.02	
2497	CPSC-CH-E1003-09	23.28	R(0.01)	-11.69	
2503		23.30	R(0.01)	-11.69	
2511		183.7		1.06	
2514		-----		-----	
2529	CPSC-CH-E1003-09	183.062		1.01	
2532	EPA3052	139		-2.49	
2563	EN62321	182.4		0.96	
2564		-----		-----	
2567	CPSC-CH-E1003-09	175.58		0.41	
2582		-----		-----	
2590	CPSC-CH-E1003-09	192.944		1.79	
2595	ABNT NM300.3	22.97	C,R(0.01)	-11.72	first reported 32.81

lab	method	value	mark	z(targ)	remarks
2634		-----		-----	
2637	EPA3052	188		1.40	
2642		-----		-----	
2674	EPA3051	161.16		-0.73	
2678		-----		-----	
2705	In house	222.0		4.10	
2720	CPSC-CH-E1003-09	163.4		-0.55	
2736	In house	191.10		1.65	
2737	CPSC-CH-E1003-09	197.765		2.18	
2788	ASTM F963	178.53		0.65	
2799	In house	178.2	C	0.62	first reported 195.41
2812		-----		-----	
2826	CPSC-CH-E1002-08	180.626		0.81	
2829		162.80		-0.60	
2853		-----		-----	
2858	In house	180.42	C	0.80	first reported 218.557
2875	In house	174.069		0.29	
3100	EPA3051	173.02975		0.21	
3116	ASTM F963	157.7		-1.01	
3118	EN16711-1	173.970		0.29	
3124		-----		-----	
3146	In house	193		1.80	
3150	CPSC-CH-E1003-09	154.5		-1.26	
3154	CPSC-CH-E1003-09	187.0		1.32	
3160	CPSC-CH-E1003-09	202.67		2.57	
3172	CPSC-CH-E1003-09	180.7		0.82	
3182	CPSC-CH-E1003-09	169.9		-0.04	
3185	ISO8124-5	166.97		-0.27	
3190	ASTM F963	158.3		-0.96	
3197	CPSC-CH-E1003-09	172.2		0.15	
3199		-----		-----	
3210		-----		-----	
3214	EPA3052	178.43		0.64	
3225		-----		-----	
3228	CPSC-CH-E1003-09	164.5		-0.47	
3237		174.26		0.31	
3243	CPSC-CH-E1003-09	133.4		-2.94	
3246	CPSC-CH-E1003-09.01	152.24		-1.44	
3248	CPSC-CH-E1003-09	186	C	1.24	first reported 85
8005	In house	158.9		-0.91	
	normality	OK			
	n	86			
	outliers	5			
	mean (n)	170.375			
	st.dev. (n)	17.0359	RSD = 10.0%		
	R(calc.)	47.701			
	st.dev.(Horwitz)	12.5796			
	R(Horwitz)	35.223			
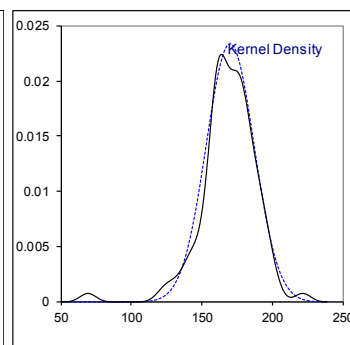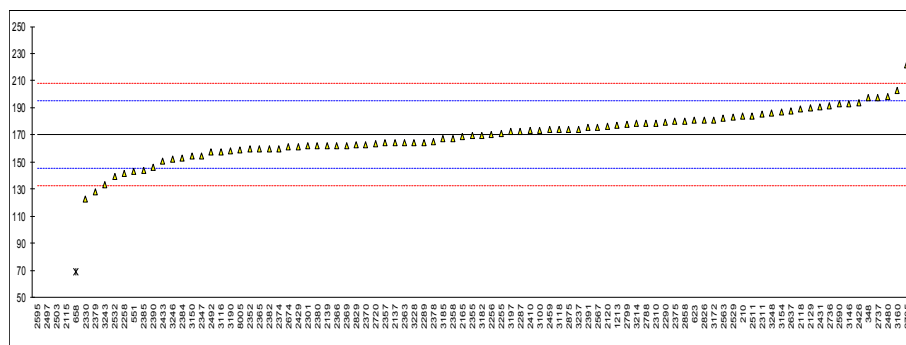
Determination of Total Manganese as Mn on sample #19530; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
330		-----		-----	
348		-----		-----	
523		-----		-----	
551	EPA3052	26.724	C	-2.06	first reported 20.261
623	In house	31.59		-0.51	
632		-----		-----	
658	EPA3052	17.293	C,R(0.01)	-5.07	first reported 16.094
1051		-----		-----	
1213	CPSC-CH-E1003-09	34.9		0.55	
2115		-----		-----	
2118	CPSC-CH-E1002-08	36.77		1.15	
2120	CPSC-CH-E1003-09	<100	C	-----	first reported <10
2129		-----		-----	
2137	CPSC-CH-E1003-09	33.06		-0.04	
2139	CPSC-CH-E1003-09/D3335	34.3	C	0.36	first reported 21.0
2165		-----		-----	
2170		-----		-----	
2184		-----		-----	
2255	CPSC-CH-E1003-09	34.2		0.33	
2256		-----		-----	
2258		-----		-----	
2286		-----		-----	
2287	EPA3052	33.02		-0.05	
2289	CPSC-CH-E1003-09	31.4		-0.57	
2290	CPSC-CH-E1003-09	36.38		1.02	
2293		-----		-----	
2294		-----		-----	
2301		-----		-----	
2310	CPSC-CH-E1003-09	35.81		0.84	
2311	CPSC-CH-E1003-09	33.63		0.14	
2314		-----		-----	
2330		-----	W	-----	first reported ND
2347	In house	33.8		0.20	
2352	In house	31.14		-0.65	
2355	EPA3052	33.2		0.01	
2357	ISO8124-5	32.46		-0.23	
2358	CPSC-CH-E1003-09	N/A		-----	
2363	EPA3052	30.87		-0.74	
2365	EPA3052	31.9		-0.41	
2366	CPSC-CH-E1003-09	32.2		-0.31	
2369	EPA3052	32.10		-0.34	
2370	CPSC-CH-E1003-09	31.6		-0.50	
2374		-----		-----	
2375	ASTM F963	32		-0.38	
2378		-----		-----	
2379		-----		-----	
2380		-----		-----	
2381		-----		-----	
2382	EPA3052	32.0		-0.38	
2384		-----		-----	
2385	EPA3051	27.4		-1.84	
2390	CPSC-CH-E1003-09	33.5	C	0.10	first reported 5.99
2391	CPSC-CH-E1003-09	33.90		0.23	
2410	ISO8124-5	35		0.58	
2426		-----		-----	
2429	CPSC-CH-E1003-09	31.36		-0.58	
2431	CPSC-CH-E1003-09	37.0034		1.22	
2433	CPSC-CH-E1003-09	27.82		-1.71	
2453		-----		-----	
2459	CPSC-CH-E1003-09	31.7		-0.47	
2460		-----		-----	
2480		-----		-----	
2492		-----		-----	
2497	CPSC-CH-E1003-09	11.29	R(0.01)	-6.99	
2503		4.025	R(0.01)	-9.30	
2511		-----		-----	
2514		-----		-----	
2529		-----		-----	
2532	EPA3052	30.7		-0.79	
2563	EN62321	35.7	C	0.80	first reported n.d.
2564		-----		-----	
2567	CPSC-CH-E1003-09	36.2		0.96	
2582		-----		-----	
2590	CPSC-CH-E1003-09	33.454		0.09	
2595	ABNT NM300.3	7.758	R(0.01)	-8.11	

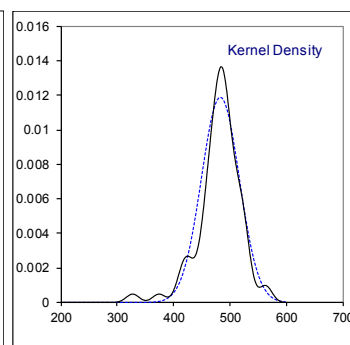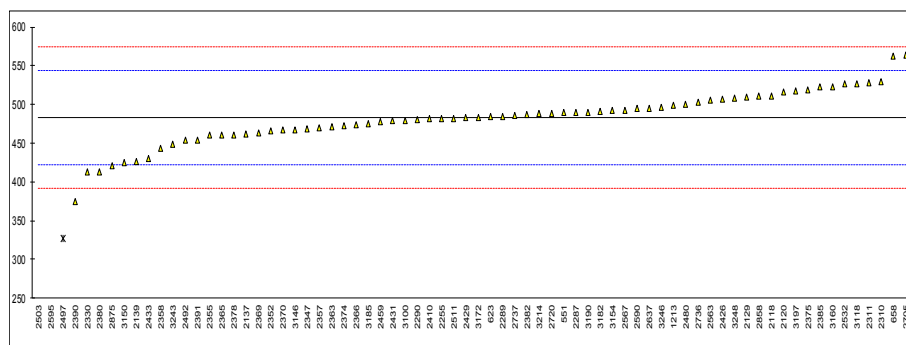| lab	method	value	mark	z(targ)	remarks
2634		-----		-----	
2637	EPA3052	36		0.90	
2642		-----		-----	
2674		-----		-----	
2678		-----		-----	
2705	In house	47.27	R(0.01)	4.50	
2720	CPSC-CH-E1003-09	32.70		-0.15	
2736	In house	36.91		1.19	
2737	CPSC-CH-E1003-09	41.298		2.59	
2788		-----		-----	
2799		-----		-----	
2812		-----		-----	
2826		-----		-----	
2829		31.39		-0.57	
2853		-----		-----	
2858	In house	34.73	C	0.49	first reported 51.169
2875	In house	33.805		0.20	
3100	EPA3051	33.64		0.15	
3116		-----		-----	
3118	EN16711-1	31.357		-0.58	
3124		-----		-----	
3146	In house	37.6		1.41	
3150	CPSC-CH-E1003-09	27.25		-1.89	
3154		-----		-----	
3160	CPSC-CH-E1003-09	33.93		0.24	
3172	CPSC-CH-E1003-09	n.p.		-----	
3182	CPSC-CH-E1003-09	32.5		-0.22	
3185	ISO8124-5	32.44		-0.24	
3190	ASTM F963	31.2		-0.63	
3197	CPSC-CH-E1003-09	33.5		0.10	
3199		-----		-----	
3210		-----		-----	
3214	EPA3052	35.79		0.83	
3225		-----		-----	
3228		-----		-----	
3237		-----		-----	
3243	CPSC-CH-E1003-09	29.2		-1.27	
3246	CPSC-CH-E1003-09.01	36.89		1.18	
3248	CPSC-CH-E1003-09	34	C	0.26	first reported 17
8005		-----		-----	
	normality	OK			
	n	55			
	outliers	5			
	mean (n)	33.180			
	st.dev. (n)	2.7392	RSD = 8.3%		
	R(calc.)	7.670			
	st.dev.(Horwitz)	3.1339			
	R(Horwitz)	8.775			
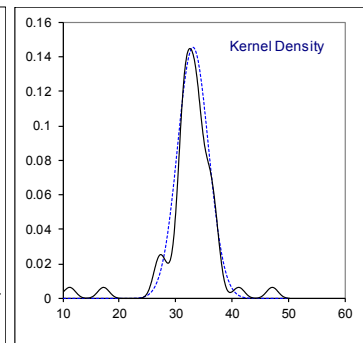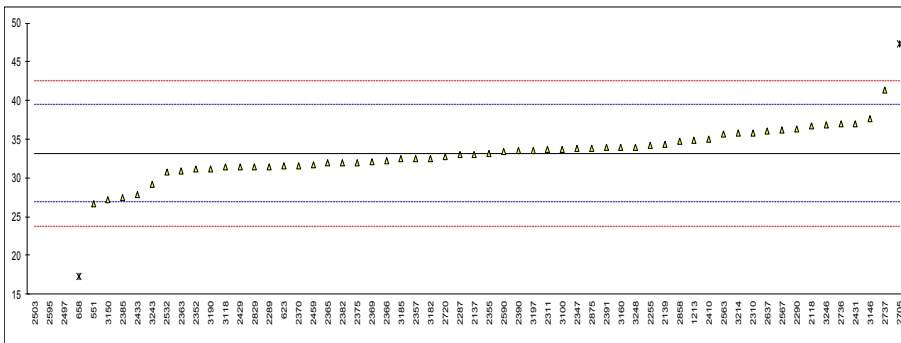
Determination of Total Cobalt as Co on sample #19531; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210		-----		-----	
330		-----		-----	
348		-----		-----	
523		-----		-----	
551	EPA3052	489.337		0.22	
623	In house	483.67		0.04	
632		-----		-----	
658	EPA3052	561.703		2.60	
1051		-----		-----	
1213	CPSC-CH-E1003-09	499.4		0.55	
2115		-----		-----	
2118	CPSC-CH-E1002-08	510.85		0.93	
2120	CPSC-CH-E1003-09	515.7		1.09	
2129		509		0.87	
2137	CPSC-CH-E1003-09	461.3		-0.70	
2139	CPSC-CH-E1003-09/D3335	426.0		-1.86	
2165		-----		-----	
2170		-----		-----	
2184		-----		-----	
2255	CPSC-CH-E1003-09	481.3		-0.04	
2256		-----		-----	
2258		-----		-----	
2286		-----		-----	
2287	EPA3052	489.73		0.23	
2289	CPSC-CH-E1003-09	484.6		0.07	
2290	CPSC-CH-E1003-09	480.18		-0.08	
2293		-----		-----	
2294		-----		-----	
2301		-----		-----	
2310	CPSC-CH-E1003-09	529.4		1.54	
2311	CPSC-CH-E1003-09	528.28		1.50	
2314		-----		-----	
2330	EPA3052	413.04		-2.28	
2347	In house	468.9		-0.45	
2352	In house	466.34		-0.53	
2355	EPA3052	460.0		-0.74	
2357	ISO8124-5	469.1		-0.44	
2358	CPSC-CH-E1003-09	443.6		-1.28	
2363	EPA3052	470.94		-0.38	
2365	EPA3052	460.0		-0.74	
2366	CPSC-CH-E1003-09	473.6		-0.30	
2369	EPA3052	463.64		-0.62	
2370	CPSC-CH-E1003-09	467		-0.51	
2374	CPSC-CH-E1002-08	473.00		-0.31	
2375	ASTM F963	519		1.20	
2378	EN16711-1	460.2		-0.74	
2379		-----		-----	
2380	CPSC-CH-E1003-09	413.51		-2.27	
2381		-----		-----	
2382	EPA3052	487.0		0.14	
2384		-----		-----	
2385		522		1.29	
2390	CPSC-CH-E1003-09	373.9	C	-3.57	first reported 371.97
2391	CPSC-CH-E1003-09	454.10		-0.94	
2410	CPSC-CH-E1003-09	481		-0.05	
2426	CPSC-CH-E1003-09	506.3		0.78	
2429	CPSC-CH-E1003-09	483.3		0.02	
2431	CPSC-CH-E1003-09	479.1766		-0.11	
2433	CPSC-CH-E1003-09	430.04		-1.73	
2453		-----		-----	
2459	CPSC-CH-E1003-09	478.25		-0.14	
2460		-----		-----	
2480	In house	499.72		0.56	
2492	In house	453.5		-0.95	
2497		327.23	R(0.01)	-5.10	
2503		80.56	R(0.01)	-13.20	
2511		481.98		-0.02	
2514		-----		-----	
2529		-----		-----	
2532	EPA3052	526		1.42	
2563	EN62321	504.9		0.73	
2564		-----		-----	
2567	CPSC-CH-E1003-09	492.11		0.31	
2582		-----		-----	
2590	CPSC-CH-E1003-09	494.736		0.40	
2595	ABNT NM300.3	130.2	R(0.01)	-11.57	

lab	method	value	mark	z(targ)	remarks
2634		-----		-----	
2637	EPA3052	495		0.41	
2642		-----		-----	
2674		-----		-----	
2678		-----		-----	
2705		563.54		2.66	
2720	CPSC-CH-E1003-09	488.9		0.21	
2736	In house	502.59		0.66	
2737	CPSC-CH-E1003-09	485.077		0.08	
2788		-----		-----	
2799		-----		-----	
2812		-----		-----	
2826		-----		-----	
2829		-----		-----	
2853		-----		-----	
2858	In house	510.539		0.92	
2875	In house	421.28		-2.01	
3100	EPA3051	479.49		-0.10	
3116		-----		-----	
3118	EN16711-1	526.630		1.45	
3124		-----		-----	
3146	In house	467		-0.51	
3150	CPSC-CH-E1003-09	424.3		-1.91	
3154	CPSC-CH-E1003-09	491.6		0.30	
3160		523.21		1.33	
3172	CPSC-CH-E1003-09	483.4		0.03	
3182	CPSC-CH-E1003-09	491.4		0.29	
3185	CPSC-CH-E1003-09	475.40		-0.24	
3190	ASTM F963	489.9		0.24	
3197	CPSC-CH-E1003-09	518.0		1.16	
3199		-----		-----	
3210		-----		-----	
3214	EPA3052	488.56		0.20	
3225		-----		-----	
3228		-----		-----	
3237		-----		-----	
3243	CPSC-CH-E1003-09	448.9		-1.11	
3246	CPSC-CH-E1003-09.01	495.78		0.43	
3248	CPSC-CH-E1003-09	508	C	0.83	first reported 249
8005		-----		-----	

normality	suspect
n	69
outliers	3
mean (n)	482.592
st.dev. (n)	33.5313 RSD = 6.9%
R(calc.)	93.888
st.dev.(Horwitz)	30.4636
R(Horwitz)	85.298

Determination of Total Lead as Pb on sample #19531; results in mg/kg

lab	method	value	mark	z(targ)	remarks
210	CPSC-CH-E1003-09	107.33		2.65	
330	CPSC-CH-E1003-09	80.2		-1.12	
348	CPSC-CH-E1003-09	93.09		0.67	
523		-----		-----	
551	EPA3052	87.394		-0.12	
623	In house	87.73		-0.08	
632		-----		-----	
658	EPA3052	86.922	C	-0.19	first reported <2
1051	CPSC-CH-E1003-09	84.70		-0.50	
1213	CPSC-CH-E1003-09	88.7		0.06	
2115	ASTM F963	4.2	R(0.01)	-11.68	
2118	CPSC-CH-E1002-08	93.03		0.66	
2120	CPSC-CH-E1003-09	97.4		1.27	
2129		90		0.24	
2137	CPSC-CH-E1003-09	70.37		-2.49	
2139	CPSC-CH-E1003-09/D3335	78.3	C	-1.39	first reported 61.3
2165	ASTM F963	86.4		-0.26	
2170	CPSC-CH-E1003-09	97.96		1.34	
2184	CPSC-CH-E1003-09	90.7		0.34	
2255	CPSC-CH-E1003-09	90.2		0.27	
2256	CPSC-CH-E1003-09.1	90.40		0.29	
2258	CPSC-CH-E1003-09	98.116		1.37	
2286	CPSC-CH-E1003-09	92.73		0.62	
2287	EPA3052	99.07		1.50	
2289	CPSC-CH-E1003-09	84.2		-0.57	
2290	CPSC-CH-E1003-09	91.61		0.46	
2293	CPSC-CH-E1003-09	101.00		1.77	
2294		87.9		-0.05	
2301		82.7		-0.78	
2310	CPSC-CH-E1003-09	91.71		0.48	
2311	CPSC-CH-E1003-09	90.84		0.36	
2314		93.12		0.67	
2330	CPSC-CH-E1003-09	73.97		-1.99	
2347	In house	83.6		-0.65	
2352	IEC62321-1	85.11		-0.44	
2355	CPSC-CH-E1003-09.1	84.0		-0.60	
2357	ISO8124-5	85.41		-0.40	
2358	CPSC-CH-E1003-09	95.1		0.95	
2363	EPA3052	83.38		-0.68	
2365	CPSC-CH-E1003-09	85.5		-0.39	
2366	CPSC-CH-E1003-09	84.8		-0.48	
2369	EPA3052	87.44		-0.12	
2370	CPSC-CH-E1003-09	84.8		-0.48	
2374	CPSC-CH-E1002-08	84.50		-0.53	
2375	ASTM F963	91		0.38	
2378	EN16711-1	86.1		-0.30	
2379	CPSC-CH-E1003-09	68.23	C	-2.79	first reported 61.55
2380	CPSC-CH-E1003-09	91.64		0.47	
2381	CPSC-CH-E1003-09	96.9		1.20	
2382	EPA3052	86.0		-0.32	
2384	CPSC-CH-E1003-09	82.13		-0.86	
2385		87.6		-0.10	
2390	CPSC-CH-E1003-09	66.2	C	-3.07	first reported 61.83
2391	CPSC-CH-E1003-09	75.90		-1.72	
2410	CPSC-CH-E1003-09	95		0.93	
2426	CPSC-CH-E1003-09	95.4		0.99	
2429	CPSC-CH-E1003-09	85.29		-0.42	
2431	CPSC-CH-E1003-09	86.0679		-0.31	
2433	CPSC-CH-E1003-09	90.51		0.31	
2453	CPSC-CH-E1003-09	75.4		-1.79	
2459	CPSC-CH-E1003-09	91.58		0.46	
2460	CPSC-CH-E1003-09	96.25		1.11	
2480	In house	94.52		0.87	
2492	In house	105.2		2.35	
2497		60.41	R(0.05)	-3.87	
2503		3.891	R(0.01)	-11.73	
2511		87.3		-0.14	
2514	In house	94.79		0.90	
2529	CPSC-CH-E1003-09	87.612		-0.09	
2532	EPA3052	94		0.79	
2563	EN62321	96		1.07	
2564	CPSC-CH-E1003-09	94.37		0.85	
2567	CPSC-CH-E1003-09	96.2		1.10	
2582		-----		-----	
2590	CPSC-CH-E1003-09	89.764		0.21	
2595	ABNT NM300.3	4.855	C,R(0.01)	-11.59	first reported 6.935

lab	method	value	mark	z(targ)	remarks
2634	CPSC-CH-E1003-09	108.7		2.84	
2637	EPA3052	89		0.10	
2642	CPSC-CH-E1003-09	85.6		-0.37	
2674	CPSC-CH-E1003-09	85.65		-0.37	
2678	CPSC-CH-E1003-09	78.30		-1.39	
2705		92.07		0.53	
2720	CPSC-CH-E1003-09	84.18		-0.57	
2736	In house	91.29		0.42	
2737	CPSC-CH-E1003-09	85.432		-0.40	
2788	ASTM F963	87.76		-0.07	
2799	In house	88.04	C	-0.03	first reported 131.34
2812	CPSC-CH-E1003-09	92.361		0.57	
2826	CPSC-CH-E1002-08	93.8867		0.78	
2829		89.71	C	0.20	first reported 110.91
2853	CPSC-CH-E1003-09	84.19		-0.57	
2858	In house	92.0168		0.52	
2875	In house	76.673		-1.61	
3100	EPA3051	86.01661		-0.32	
3116	CPSC-CH-E1003-09	86.945		-0.19	
3118	EN16711-1	97.778		1.32	
3124	EPA3052	98.935		1.48	
3146	In house	81.8		-0.90	
3150	CPSC-CH-E1003-09	78.57		-1.35	
3154	CPSC-CH-E1003-09	76.43		-1.65	
3160		87.57		-0.10	
3172	CPSC-CH-E1003-09	89.5		0.17	
3182	CPSC-CH-E1003-09	82.65		-0.78	
3185	CPSC-CH-E1003-09	86.00		-0.32	
3190	ASTM F963	85.3		-0.41	
3197	CPSC-CH-E1003-09	90.2		0.27	
3199	In house	91.01		0.38	
3210	CPSC-CH-E1003-09	<90		-----	
3214	EPA3052	89.55		0.18	
3225	CPSC-CH-E1003-09	86.98		-0.18	
3228	CPSC-CH-E1003-09	87		-0.18	
3237		87.11		-0.16	
3243	CPSC-CH-E1003-09	88.7505		0.06	
3246	CPSC-CH-E1003-09.01	82.53		-0.80	
3248	CPSC-CH-E1003-09	84	C	-0.60	first reported 48
8005	In house	86.88		-0.20	

	normality	suspect		
	n	108		
	outliers	4		
	mean (n)	88.285		
	st.dev. (n)	7.1615	RSD = 8.1%	
	R(calc.)	20.052		
	st.dev.(Horwitz)	7.1965		
	R(Horwitz)	20.150		
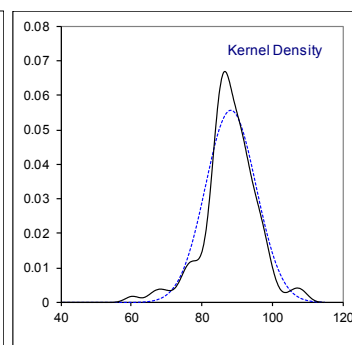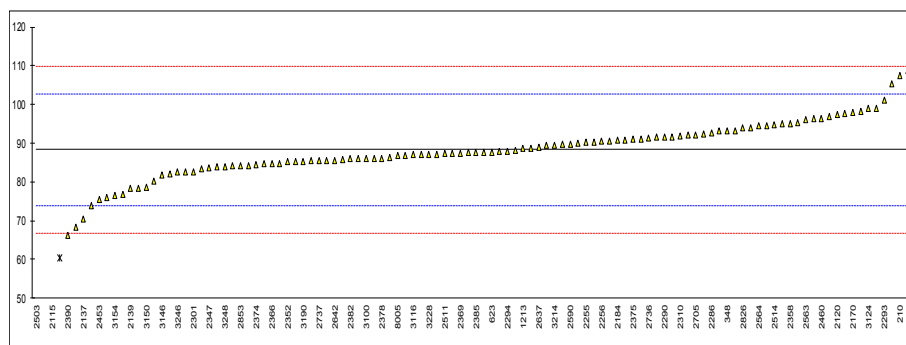
APPENDIX 2
Other reported test results

Abbreviations of Metals:
Sb = total Antimony
As = total Arsenic
Cd = total Cadmium
Cr = total Chromium
Co = total Cobalt
Cu = total Copper
Pb = total Lead
Mn = total Manganese
Hg = total Mercury
Ni = total Nickel
Se = total Selenium

Determination of Other Metals on sample #19530; results in mg/kg

lab	Sb	Cd	Co	Cu	Pb	Hg	Ni	Se
210	-----	-----	-----	1.41	0.986	-----	-----	-----
330	-----	-----	-----	-----	-----	-----	-----	-----
348	-----	<5	-----	-----	<10	-----	-----	-----
523	-----	-----	-----	-----	-----	-----	-----	-----
551	nd	nd	nd	12.290 C	nd	nd	33.990 C	nd
623	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
632	-----	-----	-----	-----	-----	-----	-----	-----
658	<2	<2	<2	<2	<2	<2	<2	<2
1051	-----	-----	-----	-----	<10	-----	-----	-----
1213	Not detected	Not detected	Not detected	Not detected	nd (LOD=20)	Not detected	Not detected	Not detected
2115	-----	-----	-----	-----	-----	-----	-----	-----
2118	0.07	0.08	0.113	1.71	1.205	0	1.21	0.90
2120	< 10	< 10	< 10	< 10	< 5	< 10	< 10	< 10
2129	<5	<5	<5	<25	<5	<5	<5	-----
2137	-----	-----	-----	-----	-----	-----	-----	-----
2139	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2165	-----	n.d.	-----	-----	n.d.	n.d.	-----	-----
2170	-----	-----	-----	-----	<10	-----	-----	-----
2184	-----	<10	-----	-----	<10	-----	-----	-----
2255	nd	nd	nd	nd	nd	nd	nd	nd
2256	ND	ND	-----	-----	ND	ND	-----	ND
2258	< det. limit	< det. limit	-----	-----	< det. limit	< det. limit	-----	< det. limit
2286	-----	-----	-----	-----	<10	-----	-----	-----
2287	<5	<5	<5	<5	<5	<5	<5	<5
2289	<10	<5	<10	<10	<10	<10	<10	<10
2290	<20	<20	<20	<20	<20	<20	<20	<20
2293	-----	-----	-----	-----	< 10	-----	-----	-----
2294	-----	-----	-----	-----	0	-----	-----	-----
2301	ND	ND	-----	ND	ND	ND	-----	ND
2310	Not Detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2311	Not Detected	Not detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2314	-----	Not detected	-----	-----	Not detected	-----	-----	-----
2330	ND	ND	ND	ND	ND	ND	ND	ND
2347	<10	<2	<5	<5	<2	<2	<5	<10
2352	-----	-----	-----	-----	-----	-----	-----	-----
2355	<10	<2	<5	<5	<2	<2	<5	<10
2357	-----	-----	-----	-----	-----	-----	-----	-----
2358	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	N/A
2363	ND	ND	ND	ND	ND	ND	ND	ND
2365	<10	<5	<5	<5	<20	<2	<5	<10
2366	<10	<5	<10	<10	<10	<10	<10	<10
2369	<10	<2	<5	<5	<2	<2	<5	<10
2370	<10	<5	<5	<5	<5	<2	<5	<10
2374	-----	-----	-----	-----	-----	-----	-----	-----
2375	<10	<10	<10	<10	<10	<10	<10	<10
2378	-----	-----	-----	-----	-----	-----	-----	-----
2379	-----	Not detected	-----	-----	Not detected	Not detected	-----	-----
2380	-----	-----	-----	-----	-----	-----	-----	-----
2381	-----	N.D	-----	-----	N.D	-----	-----	-----
2382	-----	-----	-----	-----	-----	-----	-----	-----
2384	-----	N.D [<10]	-----	-----	N.D[<10]	N.D[<1]	-----	-----
2385	<5	<0,5	<1	<5	<5	<0,5	<1	<5
2390	-----	-----	-----	-----	-----	-----	-----	-----
2391	2.60	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	13.70
2410	<20	<20	<20	<20	<20	<20	<20	<20

lab	Sb	Cd	Co	Cu	Pb	Hg	Ni	Se
2426	<20	<20	<20	<20	<20	<20	<20	<20
2429	<10	<5	<10	<10	<10	<10	<10	<10
2431	-----	-----	-----	-----	-----	-----	-----	-----
2433	-----	-----	-----	<5	-----	-----	-----	-----
2453	-----	-----	-----	-----	LQ[12 mg/kg]	-----	-----	-----
2459	<10	ND	ND	ND	ND	< 10	< 10	ND
2460	-----	-----	-----	-----	0	-----	-----	-----
2480	-----	-----	0.86	0.88	1.34	-----	1.71	-----
2492	-----	-----	-----	-----	-----	-----	-----	-----
2497	-----	-----	-----	-----	-----	-----	-----	-----
2503	-----	-----	-----	9.853	-----	2.061	1.940	2.266
2511	-----	-----	-----	-----	-----	-----	-----	-----
2514	-----	nd	-----	-----	nd	-----	-----	-----
2529	-----	-----	-----	-----	-----	-----	-----	-----
2532	<10	<10	<10	<10	<10	<10	<10	<10
2563	-----	n.d.	n.d.	n.d.	n.d.	-----	n.d.	-----
2564	-----	ND [<20]	-----	-----	125.28 C	-----	-----	-----
2567	<20	<20	<20	<20	<20	<20	<20	<20
2582	-----	-----	-----	-----	-----	-----	-----	-----
2590	1.288	< L.O.Q.	< L.O.Q.	< L.O.Q.	1.055	< L.O.Q.	< L.O.Q.	< L.O.Q.
2595	1.014 C	0	0	0	0	0.4662 C	0	0
2634	-----	-----	-----	-----	6.02	-----	-----	-----
2637	<0.1	0.06	1.2	<1	0.94	<0.01	0.9	<0.5
2642	-----	-----	-----	-----	<25	-----	-----	-----
2674	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	-----
2678	-----	ND	-----	-----	ND	ND	-----	-----
2705	0.0148	0.0709	0.11	0.837	0.917	0.00	0.6598	0.25
2720	<10	<10	<10	<10	<10	<10	<10	<10
2736	<50.56	<5.06	<5.06	<5.06	<5.06	<0.25	<5.06	<5.06
2737	-----	-----	-----	12.968	-----	-----	-----	-----
2788	ND	ND	-----	-----	ND	ND	-----	ND
2799	----- W	2.51 C	-----	-----	2.48 C	-----	-----	-----
2812	-----	-----	-----	-----	0.623	-----	-----	-----
2826	-----	<20	-----	-----	<20	<20	-----	-----
2829	-----	-----	-----	-----	-----	-----	-----	-----
2853	-----	-----	-----	-----	ND	ND	-----	-----
2858	ND	ND	ND	--	ND	ND	ND	ND
2875	<0.100	0.0728	0.277	0.7773	1.019	0.01422	0.455	0.163
3100	<10	<5	<10	<10	<10	<10	<10	<10
3116	-----	-----	-----	-----	-----	-----	-----	-----
3118	<5	<5	<5	-----	<5	<5	<5	<5
3124	-----	0.0719	0.1522	1.0918	1.1604	-----	0.5735	-----
3146	nd (LOQ=5)	nd (LOQ=1)	nd (LOQ=5)	nd (LOQ=5)	nd (LOQ=5)	nd (LOQ=0.1)	nd (LOQ=5)	nd (LOQ=5)
3150	<0,1	0.153	0.383	16.25	1.42	1.005	<0,1	<0,1
3154	-----	-----	-----	3.15	-----	-----	10.40	-----
3160	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
3172	< 10	< 10	< 10	n.p.	< 10	< 10	n.p.	n.p.
3182	<13	<5	<13	<13	<13	<13	<13	<13
3185	<10	<10	<10	<10	<10	<10	<10	<10
3190	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
3197	ND	ND	ND	ND	ND	ND	ND	ND
3199	-----	-----	-----	-----	< 2.00	-----	-----	-----
3210	-----	-----	-----	-----	<90	-----	-----	-----
3214	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]
3225	-----	-----	-----	-----	ND	-----	-----	-----
3228	-----	<10	-----	-----	<10	<10	-----	-----
3237	-----	-----	-----	-----	-----	-----	-----	-----
3243	<10	2.638	<2	<2	<25	<0.05	<2	<10
3246	ND	ND	ND	ND	ND	ND	ND	ND
3248	<10 C	<10 C	<10 C	84 C	<10 C	<0.078 C	<10 C	<10 C
8005	-----	-----	-----	-----	-----	-----	-----	-----

Lab 551: first reported 43.326 and 25.567 respectively
Lab 2564: first reported 48.16
Lab 2595: first reported 2.535 and 0.9325 respectively
Lab 2799: first reported 431.70, 22.63 and 161.51 respectively
Lab 3248: first reported ND for all elements listed in the above table

Determination of Other Metals on sample #19531; results in mg/kg

lab	Sb	As	Cd	Cr	Cu	Mn	Hg	Ni	Se
210	-----	-----	-----	-----	-----	-----	-----	-----	-----
330	-----	-----	< 10	-----	-----	-----	-----	-----	-----
348	-----	-----	<5	<5	-----	-----	-----	-----	-----
523	-----	-----	-----	-----	-----	-----	-----	-----	-----
551	nd	nd	nd	nd	44.70 C	nd	nd	nd	nd
623	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
632	-----	-----	-----	-----	-----	-----	-----	-----	-----
658	<2	<2	<2	<2	<2	<2	<2	<2	<2
1051	-----	-----	-----	-----	-----	-----	-----	-----	-----
1213	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2115	-----	-----	-----	-----	-----	-----	-----	-----	-----
2118	0.01	0.46	0.31	2.46	1.75	0.90	0	4.10	0.14
2120	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2129	<5	<5	<5	<5	<25	-----	<5	<5	-----
2137	-----	-----	-----	-----	-----	-----	-----	-----	-----
2139	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2165	-----	-----	n.d.	n.d.	-----	-----	n.d.	-----	-----
2170	-----	-----	-----	-----	-----	-----	-----	-----	-----
2184	-----	-----	<10	-----	-----	-----	-----	-----	-----
2255	nd	nd	nd	nd	nd	nd	nd	nd	nd
2256	ND	ND	ND	ND	-----	-----	ND	-----	ND
2258	< det. limit	< det. limit	< det. limit	< det. limit	-----	-----	< det. limit	-----	< det. limit
2286	-----	-----	-----	-----	-----	-----	-----	-----	-----
2287	<5	<5	<5	<5	<5	<5	<5	<5	<5
2289	<10	<10	<5	<10	<10	<10	<10	<10	<10
2290	<20	<20	<20	<20	<20	<20	<20	<20	<20
2293	-----	-----	-----	-----	-----	-----	-----	-----	-----
2294	-----	-----	-----	-----	-----	-----	-----	-----	-----
2301	ND	ND	ND	ND	ND	-----	ND	-----	ND
2310	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2311	Not detected	Not detected	<5	<5	Not detected	<5	Not detected	<5	Not detected
2314	-----	-----	Not detected	-----	-----	-----	-----	-----	-----
2330	ND	ND	ND	ND	ND	ND	ND	ND	ND
2347	<10	<10	<2	<2	<5	<5	<2	<5	<10
2352	-----	-----	-----	-----	-----	-----	-----	-----	-----
2355	<10	<10	<2	<2	<5	<5	<2	<5	<10
2357	-----	-----	-----	-----	-----	-----	-----	-----	-----
2358	n.d.	n.d.	n.d.	n.d.	n.d.	N/A	n.d.	n.d.	N/A
2363	ND	ND	ND	ND	ND	ND	ND	ND	ND
2365	<10	<10	<5	<5	<5	<5	<2	<5	<10
2366	<10	<10	<5	<5	<5	<10	<10	<10	<10
2369	<10	<10	<2	<5	<5	<5	<2	<5	<10
2370	<10	<10	<5	<2	<5	<5	<2	<5	<10
2374	-----	-----	-----	-----	-----	-----	-----	-----	-----
2375	<10	<10	<10	<10	<10	<10	<10	<10	<10
2378	-----	-----	-----	-----	-----	-----	-----	-----	-----
2379	-----	-----	Not detected	Not detected	-----	-----	Not detected	-----	-----
2380	-----	-----	-----	-----	-----	-----	-----	-----	-----
2381	-----	-----	N.D	-----	-----	-----	-----	-----	-----
2382	-----	-----	-----	-----	-----	-----	-----	-----	-----
2384	-----	-----	N.D[<10]	N.D[<10]	-----	-----	N.D[<1]	-----	-----
2385	<5	<5	<0,5	1.3	<5	<5	<0,5	2.6	<5
2390	-----	-----	-----	-----	-----	-----	-----	-----	-----
2391	<0.5	10.50	<0.5	2.70	<0.5	<0.5	<1.0	<0.5	<0.5
2410	<20	<20	<20	<20	<20	<20	<20	<20	<20
2426	<20	<20	<20	<20	<20	-----	<20	<20	<20
2429	<10	<10	<10	<10	<10	<10	<10	<10	<10
2431	-----	-----	-----	-----	-----	-----	-----	-----	-----
2433	-----	-----	-----	<5	<5	-----	-----	-----	-----
2453	-----	-----	-----	-----	-----	-----	-----	-----	-----
2459	ND	ND	ND	< 10	ND	ND	< 10	< 10	ND
2460	-----	-----	-----	-----	-----	-----	-----	-----	-----
2480	-----	-----	-----	1.20	0.37	-----	-----	3.16	-----
2492	-----	-----	-----	-----	-----	-----	-----	-----	-----
2497	-----	-----	-----	-----	35.21	-----	-----	-----	-----
2503	1.052	-----	-----	-----	8.323	-----	1.915	1.647	2.189
2511	-----	-----	-----	-----	-----	-----	-----	-----	-----
2514	-----	-----	nd	-----	-----	-----	-----	-----	-----
2529	-----	-----	-----	-----	-----	-----	-----	-----	-----
2532	<10	<10	<10	<10	<10	<10	<10	<10	<10
2563	-----	-----	n. d.	n. d.	n. d.	n. d.	-----	n. d.	-----
2564	-----	-----	ND [<20]	-----	-----	-----	-----	-----	-----
2567	<20	<20	<20	<20	<20	<20	<20	<20	<20
2582	-----	-----	-----	-----	-----	-----	-----	-----	-----
2590	< L.O.Q.	< L.O.Q.	< L.O.Q.	< L.O.Q.	0.940	< L.O.Q.	< L.O.Q.	2.323	< L.O.Q.
2595	0.3948 C	0	0	0	0.2604	0	0	0	0

lab	Sb	As	Cd	Cr	Cu	Mn	Hg	Ni	Se
2634	-----	-----	-----	-----	-----	-----	-----	-----	-----
2637	<0.1	0.5	<0.01	1.7	<1	0.7	0.07	2.8	<0.5
2642	-----	-----	-----	-----	-----	-----	-----	-----	-----
2674	n.d.	-----	n.d.	<10	n.d.	-----	n.d.	n.d.	-----
2678	-----	ND	ND	-----	-----	-----	ND	-----	-----
2705	0.00	0.29	0.0768	3.22	0.373	0.928	0.00	3.077	0.00
2720	<10	<10	<10	<10	<10	<10	<10	<10	<10
2736	<51.87	<5.19	<5.19	<5.19	<5.19	<5.19	<0.26	<5..19	<5.19
2737	-----	ND C	-----	15.241	-----	-----	-----	-----	-----
2788	ND	ND	ND	ND	-----	-----	ND	-----	ND
2799	----- W	1.55 C	2.89 C	2.29 C	-----	-----	-----	-----	-----
2812	-----	-----	-----	-----	-----	-----	-----	-----	-----
2826	-----	-----	<20	<20	-----	-----	<20	-----	-----
2829	-----	-----	-----	-----	-----	-----	-----	-----	-----
2853	-----	-----	-----	-----	-----	-----	ND	-----	-----
2858	ND	--	ND	ND	--	ND	ND	ND	ND
2875	0.2697	0.8074	0.2162	1.63	0.2052	0.6553	0.06648	2.328	<0.100
3100	<10	<10	<5	<10	<10	<10	<10	<10	<10
3116	-----	-----	-----	-----	-----	-----	-----	-----	-----
3118	<5	<5	<5	<5	-----	<5	<5	<5	<5
3124	-----	-----	1.4435	-----	-----	-----	0.0752	3.5432	-----
3146	nd (LOQ=5)	nd (LOQ=5)	nd (LOQ=1)	nd (LOQ=5)	nd (LOQ=5)	nd (LOQ=5)	nd(LOQ=0.1)	nd (LOQ=5)	nd (LOQ=5)
3150	<0,5	<0,5	1.141	1.997	17.03	<2	1.775	<0,1	<0,1
3154	-----	-----	-----	18.79	-----	-----	-----	12.98	-----
3160	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
3172	< 10	< 10	< 10	< 10	n.p.	n.p.	< 10	n.p.	n.p.
3182	<13	<13	<5	<13	<13	<13	<13	<13	<13
3185	<10	<10	<10	<10	<10	<10	<10	<10	<10
3190	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
3197	ND	ND	ND	ND	ND	ND	ND	ND	ND
3199	-----	-----	-----	-----	-----	-----	-----	-----	-----
3210	-----	-----	-----	-----	-----	-----	-----	-----	-----
3214	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]	N.D[<10]
3225	-----	-----	-----	-----	-----	-----	-----	-----	-----
3228	-----	-----	<10	<10	-----	-----	<10	-----	-----
3237	-----	-----	-----	-----	-----	-----	-----	-----	-----
3243	<10	<10	<1	<2	<2	<2	0.060	<2	<10
3246	ND	ND	ND	ND	ND	ND	ND	ND	ND
3248	<10 C	<10 C	<10 C	<10 C	78 C	<10 C	<0.078 C	<10 C	<10 C
8005	-----	-----	-----	-----	-----	-----	-----	-----	-----

Lab 551: first reported 39.995
Lab 2595: first reported 0.987
Lab 2737: first reported 26.444
Lab 2799: first reported 513.43, 55.92, 1.89 and 3.58 respectively
Lab 3248: first reported ND for all elements listed in the above table

APPENDIX 3
Analytical Details

lab	ISO17025 accr.	Sample intake (in mg)	Acid used for the digestion	Concentration of the acid	Acid used (mL)
210	No				
330	No	100 mg	nitric acid	HNO3 69%	4 mL final recovery volume = 20mL
348	Yes	100	HNO3+H2O2+HCl	67% HNO3 + 30% H2O2 + 32% HCl	10 ml HNO3 + 2ml H2O2 + 3 ml HCl
523	---				
551	No	100mg.	HNO3.	HNO3 (c)	8mL.
623	Yes	200	HNO3 and HCl	65% (HNO3) and 37% (HCl)	8 ml
632	---				
658	Yes	250.1mg	Nitric Acid + HF	65% Nitric Acid + 48% HF	7mL nitric acid + 1mL HF
1051	Yes	100 mg	HNO3	13.8%	25 ml
1213	Yes	500 mg	HNO3	HNO3 65%	10 mL
2115	Yes	110 mg	HCl	0.07 M	5 ml
2118	Yes	50mg	HNO3	65%	8ml
2120	Yes: Lead only	0,1g	HNO3+HCl	according to ASTM for lead in paint 6 ml HNO3 + 18 ml HCl /100 ml water	10 ml
2129	Yes				
2137	Yes	70	Nitric acid	70%	10 mL
2139	Yes	about 0.1 gram	Nitric acid, Hydrofluoric acid	Nitric acid : about 70% Hydrofluoric acid : 48~51 %	Nitric acid : 3 mL Hydrofluoric acid : 0.5 mL
2165	Yes	100	#19530:HCL+HNO3 #19531:HF+HCL+HNO3	40%HNO3	10
2170	Yes	#19530: 55.1mg #19531: 44.2mg	Nitric Acid	65%	5ml
2184	Yes	40	HNO3	20%	5
2255	Yes	60	HNO3+H2O2		10ml
2256	Yes	100	Conc nitric acid, trace metal grade	Conc nitric acid 65-70%	10
2258	Yes	#19530: 141 mg #19531: 146 mg	Nitric Acid	65%	10 mL
2286	Yes	100mg	nitric acid	60%	5mL
2287	No	50mg	HNO3, HCl	HNO3 : 70% HCl : 35%	8ml
2289	Yes	0.1g	HNO3	65%	5ml
2290	Yes				
2293	Yes	#19530:125.00 mg #19531:125.80 mg	Nitric acid at 65%	65%	6 mL
2294	Yes	503	nitric acid	69%	6
2301	---				
2310	Yes	100 mg	Nitric acid	65% of Nitric acid	10 ml
2311	Yes	50	Nitric Acid	69% Nitric Acid	5
2314	Yes	0.1G	Nitric acid	69% of Nitric acid	5ml
2330	Yes: CPSC-CH-E1003:09 only	200 mg	Nitric acid	65%	5 ml
2347	---				
2352	Yes	0.1g	HNO3, HCl	HNO3 1mol/L HCl 12mol/L	10mL
2355	Yes	nearly 0.2g	HNO3+HCl	65%HNO3+37%HCl	8mlHNO3+3mlHCl
2357	---				
2358	Yes	100 mg	HF, HNO3	65%	25 ml
2363	Yes	0.1g	HNO3 and HCl used in sample #19530; HNO3,HF and HCl used in sample #19531;	70% NO3 37% HCl 49% HF	7ml HNO3 and 2ml HCl used in #19530; 7ml HNO3, 1ml HF and 2ml HCl used #19531;
2365	Yes	0.1g	HNO3,H2O2,HBF4	69.0%~70.0%HNO3; 30%H2O2; 40%HBF4	6.5mL HNO3+1mL H2O2+1mL HBF4

lab	ISO17025 accr.	Sample intake (in mg)	Acid used for the digestion	Concentration of the acid	Acid used (mL)
2366	Yes	100mg	19530: HNO3+ HCL 19531: HNO3+ HF	HNO3: 69% HCL: 37% HF: 49%	19530: 8ml HNO3+ 2ml HCL 19531: 8ml HNO3+ 2ml HF
2369	Yes	#19530: 0.1mg #19531: 0.1mg	#19530: nitric acid,hydrochloric acid #19531: nitric acid,hydrochloric acid,hydrofluoric acid	#19530: nitric acid 65%-70%,hydrochloric acid 36%-38% #19531: nitric acid 65%-70%,hydrochloric acid 36%-38%,hydrofluoric acid	#19530: nitric acid 6ml,hydrochloric acid 2ml #19531: nitric acid 6ml,hydrochloric acid 3ml,hydrofluoric acid 1ml
2370	Yes	100 mg	HNO3 HF	HNO3 69% HF 49%	HNO3 10 ml HF 4 ml
2374	No	NA	HNO3:HCl:HF 8:0:1	HNO3 5%	8ml+1ml
2375	---	0,1 g	5 ml HNO3	65% HNO3	5 ml HNO3
2378	Yes	0.1g	nitric acid	1 mol/L	5mL
2379	Yes				
2380	Yes	0.05	Nitric acid, Hydrogen per oxide	65%Nitric acid,30%Hydrogen per oxide	7 ml
2381	Yes	50	NITRIC ACID	65%	6
2382	Yes	0.1g	HCL+HNO3	36.0 %~38.0 %HCL+ 69.0 %~71.0 %HNO3	3mlHCL+6mlHNO3
2384	Yes	100mg	Nitric Acid	Concentrated	5ml
2385	Yes	about 100 mg	HNO3	65%	3 ml
2390	Yes	100.2 grams	HNO3	65%	10ml
2391	Yes	100	Nitric Acid	65%	10
2410	Yes	0.1 g	Aqua regia, HF		Aqua regia 5 mL, HF 1 mL
2426	Yes	Yes	Nitric Acid	69%	10ml.
2429	Yes	100	7ml HNO3 + 1ml HCl	10%	7ml HNO3 + 1ml HCl
2431	Yes	0.1g	HNO3 , HCl	HNO3 67-69% , HCl 34%	10 mL HNO3 , 1 mL HCl
2433	Yes	250 mg	Nitric Acid	65%	25mL
2453	Yes	110	HNO3	Conc.	5mL
2459	Yes	0.100 mg	HNO3 & HCl	70% Nitric Acid 37% Hydrochloric Acid	6 ml HNO3 & 2 ml HCl
2460	Yes	194.8 mg	HNO3	16%	6 ml
2480	Yes	180	HCl/HNO3		
2492	Yes	0.1 Gram	Nitric Acid	37%	10 ml
2497	Yes	0.2	nitric acid	concentrate nitric acid	6mL
2503	Yes				
2511	---				
2514	Yes	31.7	Nitric Acid	65 %	5
2529	No	40mg	Nitric Acid	16M (67-70%)	4mL
2532	No	#19530: 0.0659 g #19531: 0.0511 g	HF:Hcl:HNO3	Purity: HF - 40% Hcl - 36.5 - 38 % HNO3- 69 - 70 %	2:2:6
2563	Yes	150	Nitril acid	65 %	5
2564	Yes	125mg / 0.125g	Nitric Acid.	65% Nitric Acid	5ML
2567	Yes	100mg	Nitric acid	65%	6ml
2582	---				
2590	Yes	86 mg	HNO3	2.5%	2mL
2595	No	0.25 milligrams	Hydrochloric Acid	0.07 mol/L	12.5 mL
2634	Yes	200	Nitric, Hydrofluoric Complete digestion without any insoluble residue	Nitric - 70 % (m/m) Hydrofluoric - 40 % (m/m)	Nitric - 12 ml Hydrofluoric - 1 ml
2637	Yes	200	HNO3	65 %	6 ml
2642	Yes				
2674	Yes	about 100 mg	#19530 Nitric acid #19531 Nitric acid and Hydrofluoric acid	Nitric acid:68%(w/w) and Hydrofluoric acid:40%(w/w)	#19530 10mL Nitric acid #19531 8mL Nitric acid and 2mL Hydrofluoric acid
2678	Yes	100	HNO3	Trace metal grade >69%	7
2705	No	100	HNO3/H2O2	30%	4
2720	Yes	100mg	HMO3+HCL	16%(v/v)	7ml HNO3,1mlHCL
2736	Yes	100mg for HG, 10mg for all other elements	Nitric and hydrochloric		5mL nitric, 0.5 mL HCl
2737	Yes	100mg	Nitric acid	65%-68%	4ml

lab	ISO17025 accr.	Sample intake (in mg)	Acid used for the digestion	Concentration of the acid	Acid used (mL)
2788	Yes	50 mg	Aqua Regia	(3:1 HCl:HNO3)	5 mL
2799 *)	Yes	100.3	Nitric acid	Concentrated nitric acid (69%)	9 ml of acid used for the digestion and 1 ml used for the final washing, so total 10 ml of acid used.
2812	Yes	0,15	Nitric Acid	% 65	25
2826	Yes	100	Nitric acid	69%	5ml
2829	No	from 10mg to 100 mg	Nitric acid (65%)	25%	5mL
2853	No	0.05	Nitric acid	3%	7.5
2858	Yes	100 mg	Nitric Acid	65%	10 ml
2875	Yes	0.2 mg	nitric acid	65%	2.5 ml
3100	Yes	#19530 0.0960g #19531 0.0989g	hydrogen nitrate	65% w/w	10mL
3116	Yes	50mg	nitric acid	3%	25ml
3118	Yes	100 mg	Hidrocloric acid:Nitric acid (3:1)	Hidrocloric acid 4.5 ml:Nitric acid 1.5 ml	Hidrocloric acid 4.5 ml:Nitric acid 1.5 ml (total 5 ml)
3124	Yes: only Pb / Cd	150-200	HNO3+HCl+HF	65% HNO3 40% HF 37 %HCl	1 ml HF + 8 ml HNO3 +2 ml HCl +1 ml HF
3146	Yes	200	Niric acid/Hydrogen peroxide	65% Nitric acid 30% Hydrogen peroxide	5 ml Nitric acid + 1 ml Hydrogen peroxide
3150	Yes	50	nitric acid	67%	8
3154	Yes				
3160	Yes	150 mg	4,5 ml nitric acid 1,0 ml hydrogen peroxide 0,5 ml hydrochloric acid	8 %	5 ml
3172	Yes	100	Nitric Acid	69%	5
3182	Yes	100mg	Nitric acid	65% Nitric acid	5 milliliter
3185	Yes	0.1g	Nitric acid	69%-70%	10mL
3190	Yes	100mg	Nitric acid	65%	5mL
3197	Yes	100	HNO3	65%	10
3199	Yes	#19530 was 120.0 mg. #19531 was 103.2 mg.	Nitric acid	Full concentration	25 ml
3210	Yes	95mg et 97mg	HNO3	67%	5ml
3214	Yes	100 mg	HNO3, HCl, HF	HNO3: 65.5%, HCl: 37%, HF: 40%	9 ml HNO3, 3ml HCl, 1 ml HF
3225	Yes	100mg	Nitric acid	65%	10mL
3228	Yes	100-200	HNO3	65%HNO3 was used	8ml HNO3 and 2ml H2O2
3237	Yes	0,2 g	Nitric acid and HCl	%65 Nitric %37 HCl	9 ml Nitric, 3 ml HCl
3243	Yes	Sample #19530 (1) --> 99.8 mg Sample #19530 (2) --> 103.3 mg Sample #19531 (1) --> 103.0 mg Sample #19531 (2) --> 103.4 mg	HNO3	67 - 69%	all samples --> 5.0 ml HNO3
3246	---				
3248	Yes	150	Nitric acid	69%	5
8005	Yes	50 mg	nitric acid	40 %	25 ml

Lab 2799 remarked: 3 mL of Hydrogen peroxide is used additionally

APPENDIX 4

Number of participants per country

```
 5 labs in BANGLADESH
 1 lab in BELGIUM
 2 labs in BRAZIL
 2 labs in CAMBODIA
 1 lab in DENMARK
 3 labs in FRANCE
 8 labs in GERMANY
 2 labs in GUATEMALA
13 labs in HONG KONG
 4 labs in INDIA
 3 labs in INDONESIA
 1 lab in ISRAEL
 5 labs in ITALY
 2 labs in JAPAN
 3 labs in KOREA
 1 lab in LUXEMBOURG
 2 labs in MALAYSIA
 3 labs in MEXICO
 1 lab in MOROCCO
22 labs in P.R. of CHINA
 3 labs in PAKISTAN
 2 labs in PHILIPPINES
 2 labs in PORTUGAL
 1 lab in SERBIA
 2 labs in SINGAPORE
 2 labs in SPAIN
 1 lab in SRI LANKA
 2 labs in TAIWAN R.O.C.
 2 labs in THAILAND
 2 labs in TUNISIA
 4 labs in TURKEY
 5 labs in U.S.A.
 1 lab in UNITED ARAB EMIRATES
 3 labs in VIETNAM
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APPENDIX 5

Abbreviations:

C = final test result after checking of first reported suspect test result
D(0.01) = outlier in Dixon's outlier test
D(0.05) = straggler in Dixon's outlier test
G(0.01) = outlier in Grubbs' outlier test
G(0.05) = straggler in Grubbs' outlier test
DG(0.01) = outlier in Double Grubbs' outlier test
DG(0.05) = straggler in Double Grubbs' outlier test
R(0.01) = outlier in Rosner's outlier test
R(0.05) = straggler in Rosner's outlier test
W = test result withdrawn on request of participant
ex = test result excluded from the statistical evaluation
n.a. = not applicable
n.e. = not evaluated
n.d. = not detected
fr. = first reported

Literature:

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