

Results of Proficiency Test Metals in Plastics September 2011

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

World-wide, many consumer products with plastic parts are produced and transported. These plastic parts are produced under strict regulations. For instant in the European Directive 2002/95/EC maximum concentrations are specified for metals in plastic: the sum of Lead (Pb), Mercury (Hg), Cadmium (Cd) and hexavalent Chromium (CrVI) may not exceed 0.1%M/M, while the maximum concentration for Cadmium may not exceed 100 mg/kg.

Products are tested for metals contents in the countries of origin as well in EU- and/or American countries. Sometimes, significantly different results are found, thus causing problems with the import of the products.

The determination of metals in plastics is known to give problems with regard to the comparability of laboratory results. However, still only few plastic reference materials are available (ref 16.). As an alternative, participation in a proficiency test may enable the laboratories to check their performance and thus to increase this comparability. Therefore, a proficiency testing scheme (laboratory-evaluating interlaboratory study) for the determination of metals in plastics is organised by the Institute for Interlaboratory Studies since 1998 (see reference 16). Starting with only total Cadmium, over the years the scope was extended with total Lead, total Chromium and Chromium (VI) and in the previous year with total Mercury.

In the interlaboratory study of September 2011, 143 laboratories from 33 different countries participated (See appendix 3). In this report, the results of the proficiency test are presented and discussed.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, The Netherlands, was the organiser of this proficiency test. It was decided to send 2 different samples (approximately 5 gram each), labelled #11050 and #11051), both positive (artificially fortified) on several metals. The analyses for fit-for-use and for homogeneity testing were subcontracted.

Participants were requested to report also some details of the test methods used.

2.1 QUALITY SYSTEM

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, has implemented a quality system based on ISO guide 43, ILAC-G13:2007 and ISO/IEC 17043:2010. This ensures 100% confidentiality of participant's data. Also, customer's satisfaction is measured on a 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 Organization, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2), which can be downloaded from www.iisnl.com.

2.3 CONFIDENTIALITY STATEMENT

All data present 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 samples positive on one or more metals were selected. The first material (#11050) was a white coloured plastic material. The second material (#11051) was a yellow coloured plastic material. Both batches were divided over plastic bags, about 5 grams per sample.

The homogeneity of the subsamples #11050 was checked by determination of Cadmium content on 8 stratified randomly selected subsamples. The homogeneity of the subsamples #11051 was checked by determination of Lead content on 4 stratified randomly selected subsamples.

	Cadmium in #11050 in mg/kg	Lead in #11051 in mg/kg
Sample 1	156	139
Sample 2	162	136
Sample 3	157	137
Sample 4	163	138
Sample 5	155	
Sample 6	158	
Sample 7	160	
Sample 8	161	

Table 1: homogeneity test results of subsamples #11050 and #11051

From the above results of the homogeneity test, the relative between sample standard deviations RSD_r were calculated and compared with 0.3 times the relative proficiency target standard deviations RSD_R in agreement with the procedure of ISO 13528, Annex B2 in the next table:

	Cadmium in #11050 in mg/kg	Lead in #11051 in mg/kg
RSD_r (observed)	1.8%	0.9%
reference method	EN1122:01	Horwitz
$0.3 \times RSD_R$ (reference method)	2.2%	2.3%

Table 2: relative standard deviations for the subsamples #11050 and #11051

The calculated variation coefficients RSD_r are both in agreement with the respective targets, calculated using EN1122:01 and the Horwitz equation. Therefore, homogeneity of all subsamples was assumed. To each of the participating laboratories one set of samples, (1* sample #11050 and 1* sample #11051) was sent on August 18, 2011.

2.5 ANALYSIS

The participants were requested to determine on both samples: total Cadmium, total Chromium, hexavalent Chromium (VI), total Lead and total Mercury. It was explicitly requested to treat the samples as if it were routine samples and to report the analytical 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' results, which are above the detection limit, because such results can not be used for meaningful statistical calculations.

To get comparable results a detailed report form, on which the units were prescribed, was sent together with each set of samples. In addition, a letter of instructions was added to the package. The laboratories were also requested to report some details of the test methods used.

3 RESULTS

During four weeks after sample despatch, the results of the individual laboratories were received. The original data are tabulated per sample in the appendix 1 of this report. The laboratories are represented by their code numbers.

Directly after deadline, a reminder fax was sent to those laboratories that did not report results at that moment.

Shortly after the deadline, the available results were screened for suspect data. A 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 results. Additional or corrected results are used for the data analysis and the original results are placed under 'Remarks' in the result tables in appendix 1.

3.1 STATISTICS

Statistical calculations were performed as described in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2). First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test. After removal of outliers this check was repeated.

In accordance to ISO 5725 (1986 and 1994) the original results per determination were submitted subsequently to Dixon and Grubbs outlier tests. Outliers are marked by D(0.01) for the Dixon test, by G(0.01) or DG(0.01) for the Grubbs test. Stragglers are marked by D(0.05) for the Dixon test, by G(0.05) or DG(0.05) for the Grubbs test. Both outliers and stragglers were not included in the calculations of averages and 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. When the uncertainty passed the evaluation no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results. Finally, the reproducibilities were calculated from the standard deviations by multiplying them with a factor of 2.8.

3.2 GRAPHICS

In order to visualise 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 analysis results are plotted. The corresponding laboratory numbers are under 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 standard. 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. This method is producing a smooth density approximation to a set of data that avoids some problems associated with histograms (see appendix 4; nr.14 and 15).

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 proficiency test (PT) against the literature requirements, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the spread of this interlaboratory study.

The literature requirements were taken from EN 1122:2001, "Determination of Cadmium in plastics with the method of the wet decomposition" for Cadmium. For Lead, Chromium, Chromium (VI) and total Mercury no literature requirements were available and requirements were estimated from the Horwitz function. See reference 16 for a justification of this choice.

The target standard deviation was calculated from the target reproducibility by division with 2.8. The z-scores were calculated in accordance with:

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

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

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 the fit-for-useness of the reported test result. See also appendix 4; no. 16.

Absolute values for $z < 2$ are very common and absolute values for $z > 3$ are very rare. Therefore, 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

In this interlaboratory study no problems were encountered with the dispatch of the samples. Eleven participants reported the results after the final reporting date and three participants did not report any results at all. Not all laboratories were able to report all analytes requested. Finally, 140 of the 143 participants reported analysis results. The 140 reporting laboratories submitted 797 numerical results. Observed were 32 outlying results, which is 4.0% of all reported numerical test results. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

4.1 PERFORMANCE EVALUATION OF THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant standard and the reproducibility as found for the group of participating laboratories. The average results per sample, the calculated reproducibilities and the reproducibilities derived from EN1122 or from the Horwitz equation are compared in the next tables.

Parameter	unit	n	Average	2.8 * sd	R (target)
Total Cadmium as Cd	mg/kg	88	139.8	33.4	35.0
Total Chromium as Cr	mg/kg	108	44.5	29.1	11.3
Hexavalent Chromium (VI) as Cr	mg/kg	47	9.1	16.5	2.9
Total Lead as Pb	mg/kg	77	163.0	52.1	33.9
Total Mercury as Hg	mg/kg	95	59.3	32.5	14.4

Table 3: performance overview for sample #11050

Parameter	unit	n	Average	2.8 * sd	R (target)*
Total Cadmium as Cd	mg/kg	19	8.3	36.0	(2.1)
Total Chromium as Cr	mg/kg	113	34.5	18.8	9.1
Hexavalent Chromium (VI) as Cr	mg/kg	13	1.4	3.4	(0.6)
Total Lead as Pb	mg/kg	120	142.3	30.2	30.2
Total Mercury as Hg	mg/kg	11	0.4	1.3	(0.2)

Table 4: performance overview for sample #11051

* a figure between brackets means that the average may be below the respective LOD

Without further statistical calculations, it can be concluded that there is only a good compliance of the group of participating laboratories with the relevant target for Cd in #11050 and total Lead in #11051.

The analytes that were problematic are discussed in paragraph 4.2.

4.2 EVALUATION PER ELEMENT

In this section, the results are discussed per analyte.

Identification: The identification of the plastic types used for the samples was reported by a limited number of laboratories, 32 in total. The majority of the laboratories used IR or FTIR.

The identification of sample #11050 was rather problematic. Only 19 laboratories (59%) did identify the material to be polypropylene (PP).

The identification of sample #11051 was not problematic. All 32 laboratories (100%) did identify the material correctly to be polyvinylchloride (PVC).

Total Cadmium: This determination was problematic for a number of laboratories.

For sample #11050, the calculated reproducibility is, after exclusion of 23 test results (see 4.3) and rejection of 7 statistical outliers, in good agreement with the requirements of EN1122:01. Nine participants may have reported a false negative test result. When the EN1122 data is evaluated separately, the calculated reproducibility of the EN1122 results is again in good agreement with the precision requirements of the standard. The mean of these 19 test results of 141.3 mg/kg does not differ significantly from the assigned value of 139.8 mg/kg for all test methods used.

For sample #11051, the Cadmium content is near of below the application range of the method. Almost all participants reported a "less than" test result. Five participants may have reported a false positive test result.

Total Chromium: This determination was very problematic.

For sample #11050 the calculated reproducibility, after exclusion of 6 test results (see 4.3) and rejection of two statistical outliers, is not at all in agreement with the estimated reproducibility limits calculated using the Horwitz equation.

For sample #11051 the calculated reproducibility, after rejection of five statistical outliers, is not at all in agreement with the estimated reproducibility limits calculated using the Horwitz equation. One test result was probably false negative.

Chromium VI: This determination was very problematic.

For sample #11050 the calculated reproducibility, after exclusion of one 'zero' test result and rejection of three statistical outliers, is not at all in agreement with the estimated reproducibility limits calculated using the Horwitz equation

The chemical, that was used to add approx. 50 mg/kg Chromium VI to the polypropylene material, was pure - readily soluble - Potassium chromate (K_2CrO_4). Therefore, the hexavalent Chromium content should in principle be equal to the total Chromium content. The majority (65%) of the reporting laboratories did detect Chromium VI in sample #11050 and they agreed on a result of approx 9.1 mg/kg.

However, one participant reported a result of 38 mg/kg, being in good agreement with the assigned value of the total Chromium for sample #11050 (44 mg/kg) and with the theoretical amount of 50 mg/kg. Although 38 mg/kg (n=1) may be a more traceable (more true) value than 9 mg/kg (n=47), it was decided to use 9 mg/kg as assigned value for calculation of the z-scores, because this lower value was supported by 96% of the reporting laboratories, when also the laboratories that reported 'less than' or 'n.d.' are taken into account.

For sample #11051 the calculated reproducibility, after exclusion of one 'zero' test result and rejection of two statistical outliers, is not at all in agreement with the estimated reproducibility limits calculated using the Horwitz equation. The chemical, that was used to add 40 mg/kg Chromium VI to the PVC material, was pure - readily soluble - Potassium chromate (K_2CrO_4). Therefore, the hexavalent Chromium content should in principle be equal to the total Chromium content. The majority (96%) of the reporting laboratories did **not** (!) detect Chromium VI in sample #11051. Only 13 laboratories reported a numerical test results and they agreed on a result of approx 1.4 mg/kg. However, two participants (both dissolving the PVC to release the Chromium VI) reported a result of approx 38 mg/kg, being in good agreement with the assigned value of the total Chromium for sample #11051 (35 mg/kg) and with the theoretical amount of 40 mg/kg. Although 38 mg/kg (n=2) may be a more traceable (more true) value than 1.4 mg/kg (n=13), it was decided to use 1.4 mg/kg as assigned value for calculation of the z-scores, because this lower value (near or below the limit of detection) was supported by 96% of the reporting laboratories, when also the laboratories that reported 'less than' or 'n.d.' are counted.

Total Lead:

This determination was problematic.

For sample #11050 the calculated reproducibility, after exclusion of 20 test results (see 4.3) and rejection of two statistical outliers, is not at all in agreement with the estimated reproducibility limits calculated using the Horwitz equation. Seventeen participants may have reported a false negative test result.

For sample #11051 the calculated reproducibility, after rejection of eight statistical outliers, is in full agreement with the estimated reproducibility limits calculated using the Horwitz equation. Two participants may have reported a false negative test result.

Total Mercury:

This determination was very problematic.

For sample #11050 the calculated reproducibility, after exclusion of 18 test results (see 4.3) and rejection of 1 statistical outlier, is not at all in agreement with the estimated reproducibility calculated using the Horwitz equation. Two participants may have reported a false negative test result.

For sample #11051 the Mercury content was near or below the application range of the method. Almost all participants, except 14, reported a "less then" result.

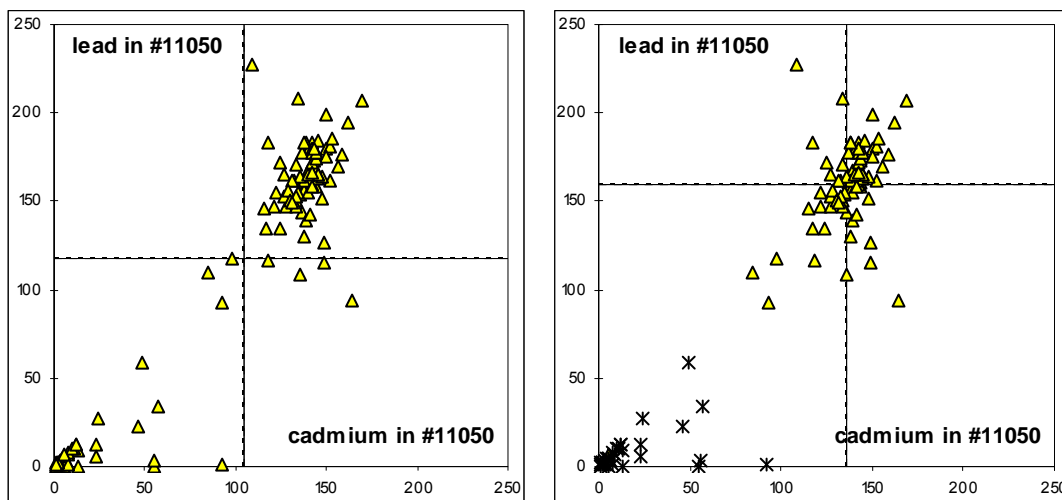
4.3 EVALUATION OF THE METHODS USED

The reported details of the methods that were used by the participants are listed in appendix 2.

Several laboratories remarked to have had problems with the complete digestion of sample #11050. This was not unexpected as also the laboratory that performed the homogeneity testing did initially report very low concentrations for cadmium and lead, much lower than expected from the amounts of lead and cadmium that were added to the PP material (approx. 150 mg/kg each).

Only after change of the acid mixture used ($\text{HNO}_3/\text{H}_2\text{O}_2$ in stead of HNO_3 only) and also after a drastic change in the microwave program to: from room temp. to 165°C within 12 min, then hold for 5 min., then from 165°C to 210°C within 12 min, then hold for 35 min., the laboratory was able to find the expected amounts of cadmium and lead in the sample #11050.

Regretfully no clear correlation between the reported test details and the height of the reported results could be found. A correlation was clearly observed when the test results for cadmium and lead on sample #11050 were plotted against each other, see below plot.



Correlation of cadmium and lead results for #11050

After exclusion of all extremely low test results

Clearly a large number of significantly low test results is present. Probably those laboratories encountered the same problems with the digestion of the polypropylene sample #11050. Regretfully the numbers of low results were too large to enable the outlier test to detect any results as statistically suspect. Therefore it was decided to exclude these test results manually.

For PVC sample #11051 digestion problems were not observed.

For the determination of total Cadmium in plastics, the EN1122 test method is considered to be the official EC test method. In this proficiency test only 23 participants (15% of all) used a version of EN1122. It is remarkable to find that 3 laboratories that performed EN1122 did use hydrochloric acid (!) and that 7 laboratories that performed EN1122 did not use any sulfuric acid (!), see the reported details in appendix 2. Two laboratories did initially report very low cadmium results when using nitric acid and later reported much better revised results when using sulfuric acid *cfr* EN1122. No clear correlation between the method used and the quality of the results could be found.

Only two laboratories did use XRF for the determination of cadmium and only one INAA. Thus no significant conclusions could be drawn about the quality of the results of these techniques.

For the determination of total Chromium in plastics, test method IEC62321 is available, regretfully without precision data. In this interlaboratory study, the majority of the group used the IEC62321 or EPA 3050, 3051 or EPA 3052 methods. Two participants reported to have used EN1122, which is only applicable for Cadmium. Six participants used CPSD-CH-E1002-08 and two participants used XRF. No clear correlation between method used and quality of the results could be found.

For determination of hexavalent Chromium in plastics, test method IEC62321 is available, regretfully without precision data. The method is based on EPA 3060A and EPA 7196. In this interlaboratory study, 55 laboratories used this method and almost all other participants reported to have used EPA 3060A or an in house method. The test method for Chromium VI does contain several parts that may influence the test results strongly, for example the grain size of the plastic particles that is used to extract the CrVI ions. Therefore, some important details (particle size, extraction technique and extraction conditions) were requested to be reported (see appendix 2). It is remarkable to see that several laboratories (> 14) that reported to have used IEC62321 also reported not to reduce the samples to a particle size of 500 µm or less prior to use. Although not all participating laboratories did provide the grain size, it was tried to determine whether a significant correlation could be detected between the grain size and the Cr VI concentration as was done in the previous PT iis10P02. Regretfully this time no correlation was observed. The reason for this is not clear.

For the determination of total Lead in plastics, test method IEC62321 is available, regretfully without precision data. In this interlaboratory study, the majority of the group used the IEC62321 or EPA 3052/3051A. No clear correlation between method used and quality of the results could be found.

For the determination of total Mercury in plastics, test method IEC62321 is available, regretfully without precision data.

In this interlaboratory study, the majority of the group used the IEC62321 or EPA 3052 methods. No clear correlation between method used and quality of the results could be found.

4.4 COMPARISON WITH PREVIOUS PROFICIENCY TESTS

The number of participants increased from 66 in 2005 to 143 in this round. The percentage of outliers decreased over the years from 10.3% in 2005 to 4.0% of the numerical results in 2011.

The evolution of the reproducibilities for cadmium, lead, chromium, chromium VI and mercury as observed in this proficiency scheme and the comparison with the findings in previous rounds are visualized in table 6.

	25-250 mg Cd/kg	50-100 mg Pb/kg	50-250 mg Cr/kg	50-250 mg Cr VI/kg	5-25 mg Hg/kg
2002	51%	81%	--	--	--
2003	31%	100%	--	--	--
2004	33%	--	--	--	--
2005	21%	--	34%	--	--
2006	20%	26%	30%	--	--
2007	23%	22-30%	43%	--	--
2008	25%	24%	25%	159-212%	--
2009	28%	20-28%	27-32%	155-174%	104-129%
2010	21-27%	26%	28%	64%	90%
2011	24%	21-32%	54-65%	180%	55%
EN1122:01	25%	--	--	--	--
Horwitz	----	22-25%	21-25%	20-25%	28-35%

Table 6: comparison of the relative Cd, Pb, Cr, CrVI and Hg reproducibilities (in %) in the previous rounds and in the present round

Sample #11051 was used in a previous PT iis07P03 as sample #0751. When the assigned value of both PTs are compared the resemblance is striking, see below table

	unit	Average		2.8 * sd		R (target)*
		#0751	#11051	#0751	#11051	
Total Cadmium as Cd	mg/kg	n.e.	8.3	n.e.	36.0	(2.1)
Total Chromium as Cr	mg/kg	33.8	34.5	14.6	18.8	9.1
Chromium VI as Cr	mg/kg	1.3	1.4	2.9	3.4	(0.6)
Total Lead as Pb	mg/kg	141.2	142.3	41.8	30.2	30.2
Total Mercury as Hg	mg/kg	n.e.	0.4	n.e.	1.3	(0.2)

Table 5: comparison of samples #0751 and #11051

Not only the difference between the assigned values of both PTs are very small and statistically not significant, it can also be concluded from the decrease of the lead reproducibility that the quality of the testing of lead in plastic has improved to a satisfactory level.

APPENDIX 1

Determination of type of plastic on sample #11050

lab	method	type	mark	lab	method	type	mark
110				2312			
310	FTIR	PP+PEP		2316			
324				2350			
330				2352			
357				2353			
452				2355			
551				2357			
607				2363			
632				2365			
657				2366			
815				2369			
840				2370		PP	
1051				2372			
1126	IR	PP+PEP		2379			
1195		PE		2380			
1213				2385	IR	PP/PE	
1800				2406			
2115				2410		PP	
2120				2413			
2127				2415			
2129				2418	FTIR	PP	
2131				2421			
2132				2424			
2135	Beilstein	PVC		2432			
2146	IR	PP		2433			
2152		PP		2438		PP	
2155	FTIR	PP		2441			
2156		PP		2442			
2160				2444			
2165				2445			
2167				2449			
2172	Beilstein	PVC		2451		PP	
2173				2453			
2175				3100		PP	
2176				3104			
2179		PVC		3107			
2180				3110			
2184	IR	PP		3113			
2190				3116			
2196				3122			
2197				3124			
2201				3126			
2202				3134			
2212				3146			
2214	IEC62321	non-PVC		3153			
2215		PP		3154		PP	
2216				3160		PP	
2217				3163			
2218				3167			
2227				3169			
2228				3172			
2229				3176		PP	
2236	EPA3050	PP/PE		3182	FTIR	PP	
2241				3185		PP	
2246				3190			
2247				3191			
2251				3192			
2253				3199		PVC	
2255				3210			
2256		PP		3215			
2258				3218			
2259		PA		3220			
2272				3225			
2284				3228			
2290				3237			
2293	FTIR	PP		3239			
2298				3242			
2301				3243		PP/PE	
2303				3246		PVC	
2309				3248			
2310				8005			
2311							

Determination of type of plastic on sample #11051

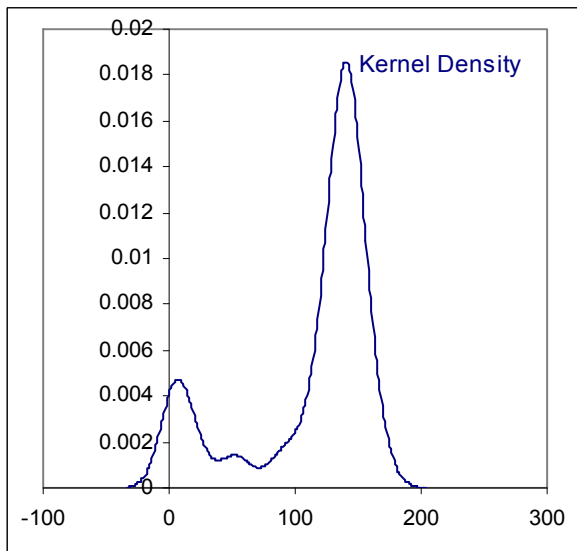
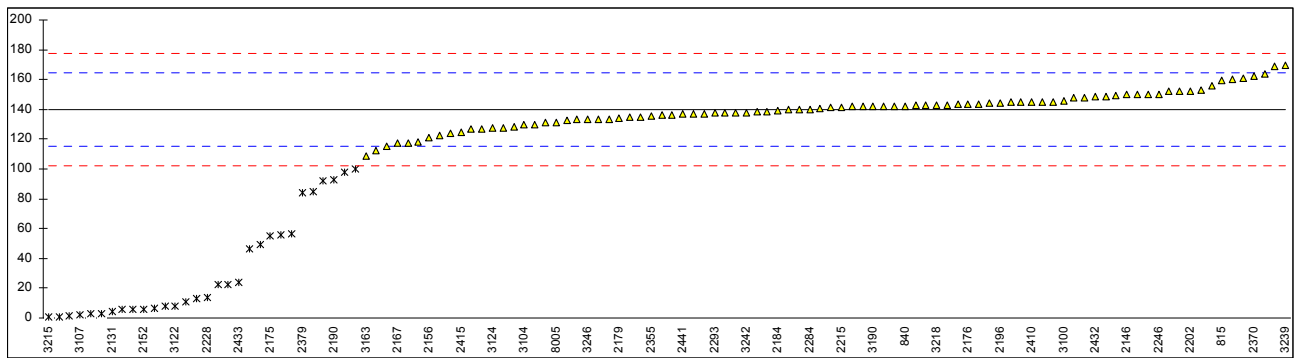
lab	method	type	mark	lab	method	type	mark
110				2312			
310	FTIR	PVC		2316			
324				2350			
330				2352			
357				2353			
452				2355			
551				2357			
607				2363			
632				2365			
657				2366			
815				2369			
840				2370		PVC	
1051				2372			
1126	IR	PVC		2379			
1195		PVC		2380			
1213				2385	IR	PVC	
1800				2406			
2115				2410		PVC	
2120				2413			
2127				2415			
2129				2418	FTIR	PVC	
2131				2421			
2132				2424			
2135	Beilstein	PVC		2432			
2146	IR	PVC		2433			
2152		PVC		2438		PVC	
2155	FTIR	PVC		2441			
2156		PVC		2442			
2160				2444			
2165				2445			
2167				2449			
2172	Beilstein	PVC		2451		PVC	
2173				2453			
2175				3100		PVC	
2176				3104			
2179		PVC		3107			
2180				3110			
2184	IR	PVC		3113			
2190				3116			
2196				3122			
2197				3124			
2201				3126			
2202				3134			
2212				3146			
2214	IEC62321	PVC		3153			
2215		PVC		3154		PVC	
2216				3160		PVC	
2217				3163			
2218				3167			
2227				3169			
2228				3172			
2229				3176		PVC	
2236	EPA3050	PVC		3182	FTIR	PVC	
2241				3185		PVC	
2246				3190			
2247				3191			
2251				3192			
2253				3199		PVC	
2255				3210			
2256		PVC		3215			
2258				3218			
2259		PVC		3220			
2272				3225			
2284				3228			
2290				3237			
2293	FTIR	PVC		3239			
2298				3242			
2301				3243		PVC	
2303				3246		PVC	
2309				3248			
2310				8005			
2311							

Determination of total Cadmium as Cd on sample #11050; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	127		-1.03	2312	EPA3052	132.54		-0.58
310	ICP-MS	135		-0.39	2316	EPA3052	156.03		1.30
324	IEC62321	142.9		0.25	2350	IEC62321	139.5		-0.03
330	in house	<10	false -?	<-10.40	2352	IEC62321	147.653		0.63
357	EN1122	98	C,DG(0.05)	-3.35	2353	EPA3051	133.5		-0.51
452	INH-004	49.0	ex	-7.28	2355	IEC62321	135.812		-0.32
551	IEC62321	22.7	ex	-9.38	2357	IEC62321	127.39		-1.00
607	EPA3051A	n.d.		----	2363	IEC62321	143.8		0.32
632	IEC62321	136		-0.31	2365	IEC62321	145.2		0.43
657	IEC62321	122.191		-1.41	2366	EPA3052	144.8		0.40
815	EPA3052	159.1		1.54	2369		----		----
840	IEC62321	142.38		0.20	2370	IEC62321	162		1.78
1051	EN1122	160.80		1.68	2372	Microwave	153		1.05
1126	XRF	56.8	G(0.01)	-6.65	2379	IEC62321	84.26	DG(0.05)	-4.45
1195	EN1122	84.70	DG(0.05)	-4.42	2380	EPA3052	136.32		-0.28
1213	IEC62321	99.67	DG(0.05)	-3.22	2385	ICP-OES	1.053	ex	-11.12
1800	in house	1.3	ex	-11.10	2406	IEC62321	<5	C, false-?	<-10.80
2115		----		----	2410	EN1122	145		0.41
2120	DIN 54233	<25	false -?	<-9.20	2413	in house	n.d.		----
2127	ICP-MS	13.3	ex	-10.13	2415	CPSC-CH-E1002	124.7		-1.21
2129	EPA3050B	46.1	C, ex	-7.51	2418	EPA3050B/3052	<7	C, false-?	<-10.64
2131	in house	4.71	ex	-10.82	2421		112.0		-2.23
2132	in house	117.60		-1.78	2424	CPSC-CH-E1002-08	131.4		-0.68
2135	EN1122	150		0.81	2432	in house	148.8		0.72
2146	EN1122	149.7		0.79	2433	EPA3050B	23.97	ex	-9.28
2152	Microwave	5.99	ex	-10.72	2438	ICP-OES	148.12		0.66
2155	Microwave	144		0.33	2441	EPA3052/6020A	136.6		-0.26
2156	IEC62321	121.3		-1.48	2442	EN1122	168.67		2.31
2160		----		----	2444	IEC62321	2.7880	ex	-10.98
2165	EPA3052	137.28		-0.20	2445	in house	123.9		-1.28
2167	IEC62321	117.26		-1.81	2449		----		----
2172	IEC62321	143.4		0.29	2451	IEC62321	140.06		0.02
2173	IEC62321	150.0		0.81	2453	IEC62321	118.03		-1.75
2175	EPA3052	55.13	C, ex	-6.78	3100	IEC62321	145.8		0.48
2176	in house	143.7		0.31	3104	EN1122	129.8		-0.80
2179	IEC62321	133.95		-0.47	3107	EPA3051AMod.	2.27	ex	-11.02
2180		----	W	----	3110	EN1122	141.9		0.17
2184	EPA3052	139.4		-0.03	3113		----		----
2190	EN1122	93	DG(0.05)	-3.75	3116	EN1122	133.60		-0.50
2196	IEC62321	144		0.33	3122	in house	8.23	ex	-10.54
2197	ICP-OES	152.0		0.97	3124	EPA3052	127.2		-1.01
2201	IEC62321	141.8		0.16	3126	INAA	n.d.		----
2202	in house	152.5		1.01	3134	in house	148.83		0.72
2212		----		----	3146	EN11885	<5	false-?	<-10.80
2214	XRF	164		1.94	3153	IEC62321	142.4		0.21
2215	EPA3052	141.5		0.13	3154	EN1122	10.56	ex	-10.35
2216		----	W	----	3160	CPSC-CH-E1002-08	<16	false-?	<-9.92
2217	IEC62321	22.72	ex	-9.38	3163	in house	109		-2.47
2218		142	C	0.17	3167	IEC62321	128.6		-0.90
2227	EPA3051A	6.5	ex	-10.68	3169	EN1122	138.7467	C	-0.09
2228	CPSD-AN-00067	13.444	C, ex	-10.12	3172	EN1122	<20	false-?	<-9.60
2229	IEC62321	126.8	C	-1.04	3176	EN1122	141		0.09
2236	CPSC-CH-E1002-08	137.2		-0.21	3182	IEC62321	7.75	ex	-10.58
2241	IEC62321	142.6		0.22	3185	IEC62321	142.2		0.19
2246	EN1122	150.00		0.81	3190	IEC62321	142		0.17
2247	EN1122	138.22		-0.13	3191	IEC62321	144.7		0.39
2251		----		----	3192	EN1122	<5	false-?	<-10.80
2253		----		----	3199	EPA3051	5.855	ex	-10.73
2255	EPA3052	152.0		0.97	3210	EN17072	<25	false-?	<-9.20
2256	EN1122	140.9		0.09	3215	IEC62321	0.59	ex	-11.15
2258	CPSD-AN-164	3.0670	ex	-10.95	3218	IEC62321	142.7		0.23
2259	IEC62321	145		0.41	3220	EN1122	55.6	ex	-6.75
2272	EN17072	115.4		-1.96	3225	IEC62321	134.91		-0.39
2284	EPA3052	140.2		0.03	3228	IEC62321	133		-0.55
2290	IEC62321	n.d.		----	3237	in house	160		1.62
2293	EN1122	137.80	C	-0.16	3239	IEC62321	169.22		2.35
2298		----		----	3242	Microwave	138.04		-0.14
2301	CPSC-CH-E1002-08	n.d.		----	3243	EN1122	92.21	DG(0.05)	-3.81
2303	ICP-MS	5.92	ex	-10.73	3246	in house	133.5		-0.51
2309	EPA3052	149.14		0.75	3248	EN1122	130		-0.79
2310	EPA3052	138		-0.15	8005	EPA3051AMod.	131.5		-0.67
2311	EPA3052	138		-0.15					

normality	not OK	<u>Only EN1122 data:</u>	normality	OK
n	88	n	19	
outliers	7	outliers	2	(excluded: 4)
mean (n)	139.835	mean (n)	141.343	
st.dev. (n)	11.946	st.dev. (n)	8.6035	
R(calc.)	33.449	R(calc.)	24.090	
R(EN1122:01)	34.959	R(EN1122:01)	34.725	

lab 357 first reported: <5, using an in house method and HNO₃ for digestion
 lab 2129 first reported: 22.27
 lab 2175 first reported: 48.76
 lab 2180 withdrawn first reported: 2.70
 lab 2216 withdrawn first reported: 6.4
 lab 2218 first reported: <10
 lab 2228 first reported: 20.831
 lab 2229 first reported: 4.2
 lab 2293 first reported: 2.564, using HNO₃ for digestion
 lab 2406 first reported: 2.437
 lab 2418 first reported: 6.155
 lab 3169 first reported: <5



Determination of total Chromium as Cr on sample #11050; results in mg/kg

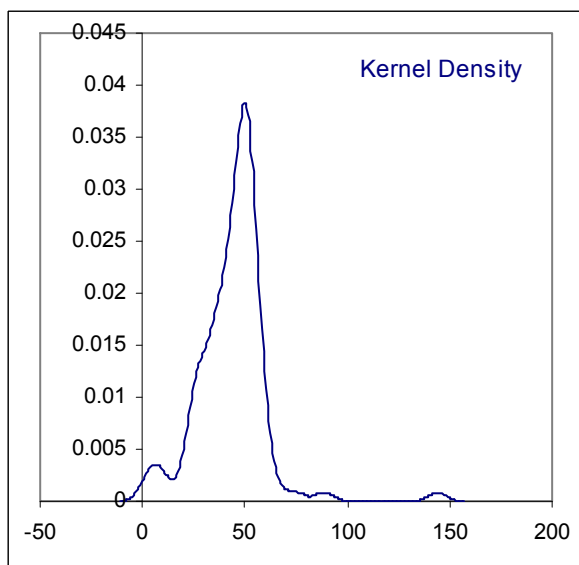
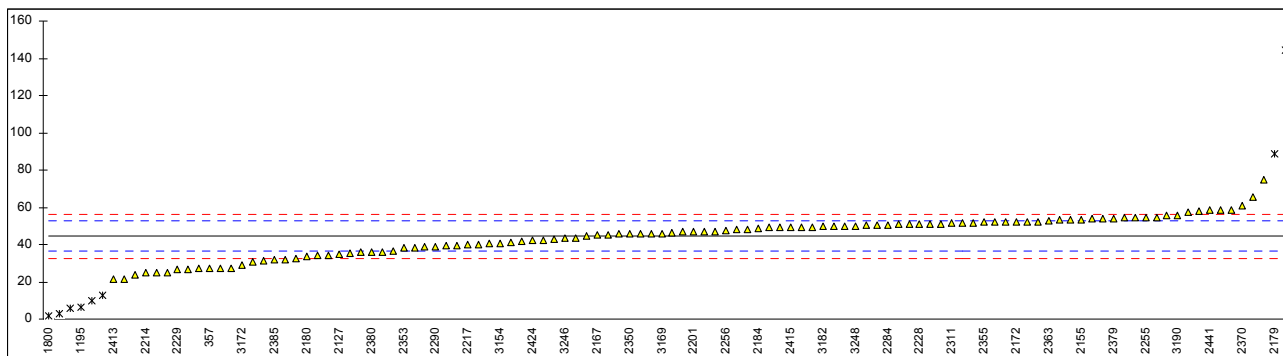
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	39.14		-1.33	2312	EPA3052	58.61		3.51
310	ICP-MS	47		0.63	2316	EPA3052	58.62		3.52
324	IEC62321	51.2		1.67	2350	IEC62321	45.59		0.28
330	in house	34		-2.61	2352	IEC62321	54.026		2.37
357	in house	27.2		-4.30	2353	EPA3051	38.0		-1.61
452		----		----	2355	IEC62321	51.8998		1.85
551	IEC62321	26.9		-4.37	2357	IEC62321	49.50		1.25
607	EPA3051A	27.40		-4.25	2363	IEC62321	52.9		2.09
632	IEC62321	42.2		-0.57	2365	IEC62321	53.2		2.17
657	IEC62321	49.5169		1.25	2366	EPA3052	52.0		1.87
815	EPA3052	45.81		0.33	2369		----		----
840	IEC62321	45.56		0.27	2370	IEC62321	61.1		4.13
1051		----		----	2372	Microwave	50.4		1.47
1126	XRF	58		3.36	2379	IEC62321	54.04		2.38
1195	EN1122	6.6	ex	-9.42	2380	EPA3052	35.98		-2.11
1213	IEC62321	38.861		-1.40	2385	ICP-OES	31.6		-3.20
1800	in house	2.0	ex	-10.57	2406	IEC62321	43.44		-0.26
2115		----		----	2410	EPA3052	49		1.12
2120	DIN 54233	27.0		-4.35	2413	in house	21.65		-5.68
2127	ICP-MS	34.8		-2.41	2415	CPSC-CH-E1002	49.24		1.18
2129	ISO17294	144.1	C,G(0.01)	24.78	2418	EPA3050B/3052	31.228		-3.30
2131	in house	25.10		-4.82	2421		----		----
2132	in house	36.14		-2.07	2424	CPSC-CH-E1002-08	42.16		-0.58
2135	AAS	75.0		7.59	2432		----		----
2146		----		----	2433	EPA3050B	44.48		0.00
2152	Microwave	32.42		-3.00	2438	ICP-OES	50.64		1.53
2155	Acid Digest	53.4		2.22	2441	EPA3052/6020A	58.3		3.44
2156	IEC62321	36.5		-1.99	2442		----		----
2160		----		----	2444	IEC62321	9.6201	ex	-8.67
2165	EPA3052	40.25		-1.05	2445	in house	32.005		-3.10
2167	IEC62321	45.035		0.14	2449		----		----
2172	IEC62321	52.13		1.90	2451	IEC62321	54.28		2.44
2173	IEC62321	55.8		2.82	2453		----		----
2175	EPA3052	41.69		-0.69	3100	IEC62321	51.17		1.66
2176	in house	45.6		0.28	3104		----		----
2179	IEC62321	88.43	G(0.01)	10.93	3107	EPA3051A mod.	46.23		0.44
2180	ICP-OES	33.5		-2.73	3110	EN1122	45.3		0.20
2184	EPA3052	48.6		1.02	3113		----		----
2190	in house	13	ex	-7.83	3116		----		----
2196	IEC62321	51		1.62	3122	in house	25.2		-4.80
2197		----		----	3124	EPA3052	41.0		-0.87
2201	IEC62321	46.85		0.59	3126	INAA	n.d.		----
2202	in house	53.1		2.14	3134	in house	48.05		0.89
2212		----		----	3146	EN11885	39.6		-1.21
2214	XRF	25		-4.85	3153	IEC62321	49.7		1.30
2215	EPA3052	52.36		1.96	3154	EN1122	40.69		-0.94
2216		----	W	----	3160	CPSC-CH-E1002-08	30.62		-3.45
2217	IEC62321	40.04		-1.10	3163	in house	3.1	ex	-10.29
2218		----		----	3167	IEC62321	46.94		0.61
2227	EPA3051A	27.5		-4.22	3169	EPA3052	45.8593		0.34
2228	CPSD-AN-00067	51.166	C	1.66	3172	CPSC-CH-E1002-08	29.0		-3.85
2229	IEC62321	26.6		-4.45	3176	in house	38.4		-1.51
2236	CPSC-CH-E1002-08	35.71		-2.18	3182	IEC62321	49.57		1.27
2241	IEC62321	49.2		1.17	3185	IEC62321	51.91		1.85
2246		----		----	3190	IEC62321	55.8		2.82
2247	IEC62321	52.41		1.97	3191	IEC62321	54.3		2.44
2251		----		----	3192	in house	40.59		-0.97
2253		----		----	3199	EPA3051	50.92		1.60
2255	EPA3052	54.6		2.52	3210	EN17072	<25		----
2256	EPA 3052	47.4		0.73	3215	IEC62321	34.2		-2.56
2258		----		----	3218	IEC62321	51.46		1.74
2259	IEC62321	46.7		0.55	3220	EPA5030B	42.7		-0.44
2272	EN17072	51.5		1.75	3225	IEC62321	49.66		1.29
2284	EPA3052	50.7		1.55	3228	IEC62321	48		0.88
2290	IEC62321	39.1		-1.34	3237		----		----
2293	CPSC-CH-E1002-08	35.107		-2.33	3239	IEC62321	54.67		2.53
2298		----		----	3242	Microwave	57.25		3.18
2301	CPSC-CH-E1002-08	23.53		-5.21	3243	EN11885	5.81	ex	-9.62
2303	ICP-MS	21.70		-5.67	3246	in house	43.4		-0.27
2309	EPA3052	65.73		5.29	3248	CPSC	50		1.37
2310	EPA3052	53.7		2.29	8005		----		----
2311	EPA3052	51.4		1.72					

normality not OK
 n 108
 outliers 2
 mean (n) 44.481
 st.dev. (n) 10.3873
 R(calc.) 29.084
 R(Horwitz) 11.256

lab 2129 first reported: 21.48

lab 2216 withdrawn, first reported: 25.6

lab 2228 first reported: 18.725

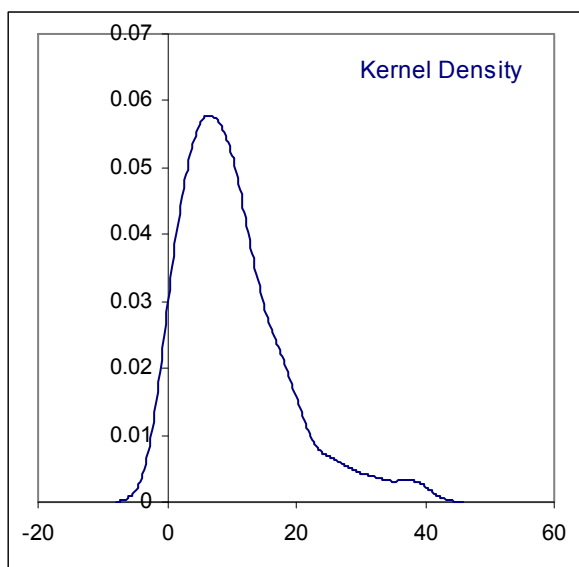
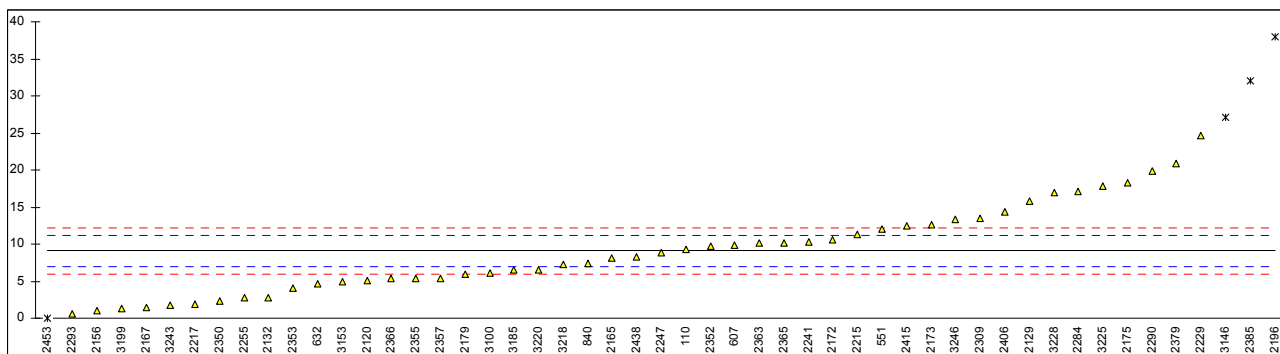


Determination of Hexavalent Chromium as Cr⁶⁺ on sample #11050; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	9.235		0.15	2312	IEC62321	n.d.		----
310		----		----	2316	IEC62321	<2	false-?	<-6.79
324	IEC62321	<2	false-?	<-6.79	2350	IEC62321	2.3407		6.46
330		----		----	2352	IEC62321	9.780		0.68
357		----		----	2353	EPA3060	4.0		4.87
452		----		----	2355	IEC62321	5.3633		3.56
551	IEC62321	12.0		2.81	2357	IEC62321	5.40		3.53
607	IEC62321	9.87		0.76	2363	IEC62321	10.2		1.08
632	IEC62321	4.60		-4.29	2365	IEC62321	10.2		1.08
657	IEC62321	<2	false-?	<-6.79	2366	IEC62321	5.3		3.62
815	IEC62321	<2	false-?	<-6.79	2369		----		----
840	IEC62321	7.32		-1.68	2370	IEC62321	n.d.		----
1051		----		----	2372	Alkaline extraction	n.d.		----
1126		----		----	2379	IEC62321	20.94		11.39
1195		----		----	2380	EPA3052	n.d.		----
1213	IEC62321	<5	false-?	<-3.91	2385	EPA3060A	32.0	DG(0.05)	22.01
1800		----		----	2406	IEC62321	14.33		5.05
2115		----		----	2410		----		----
2120	IEC62321	5.11		-3.81	2413		----		----
2127		----		----	2415	IEC62321	12.42		3.21
2129	ISO17294	15.84		6.49	2418	EPA3060A/7196A	<7		----
2131		----		----	2421		----		----
2132	EPA3060A/7196	2.78		-6.04	2424	CPSC-CH-E1002-08	n.d.		----
2135	DIN17075	<3	false-?	<-5.83	2432		----		----
2146		----		----	2433	USEPA3060A/7196A	<1	false-?	<-7.75
2152		----		----	2438	ICP-OES	8.22		0.82
2155		----		----	2441		----		----
2156	IEC62321	1.0		-7.75	2442		----		----
2160		----		----	2444		----		----
2165	IEC62321	8.1		-0.94	2445	IEC62321	<12.2		----
2167	IEC62321	1.483		-7.29	2449		----		----
2172	IEC62321	10.51		1.38	2451		----		----
2173	IEC62321	12.6		3.38	2453	IEC62321	0	ex	8.71
2175	EPA3060A/7196A	18.30		8.86	3100	IEC62321	6.075		2.88
2176	in house	n.d.		----	3104		----		----
2179	IEC62321	5.89	C	-3.06	3107		----		----
2180		----		----	3110		----		----
2184	IEC62321	<2.5	false-?	<-6.31	3113		----		----
2190		----		----	3116		----		----
2196	IEC62321	38	G(0.05)	27.77	3122		----		----
2197		----		----	3124		----		----
2201	IEC62321	<1	false-?	<-7.75	3126		----		----
2202		----		----	3134		----		----
2212		----		----	3146	IEC62321	27.1	DG(0.05)	17.30
2214		----		----	3153	IEC62321	5		-3.91
2215	EPA3060A	11.24		2.08	3154		----		----
2216		----	W	----	3160		----		----
2217	IEC62321	1.88		-6.91	3163		----		----
2218		----		----	3167		----		----
2227		----		----	3169	IEC62321	<5	false-?	<-3.91
2228		----		----	3172		----		----
2229	IEC62321	24.7		15.00	3176	ISO11083	n.d.		----
2236		----		----	3182	IEC62321	<1	false-?	<-7.75
2241	IEC62321	10.3		1.18	3185	IEC62321	6.465		-2.50
2246		----		----	3190	IEC62321	<1	false-?	<-7.75
2247	IEC62321	8.90		-0.17	3191	IEC62321	<5	false-?	<-3.91
2251		----		----	3192		----		----
2253		----		----	3199	EPA3060A/7196A	1.295		-7.47
2255	EPA3060	2.76		-6.06	3210	EN17075	<3	false-?	<-5.83
2256	EPA3060A	<2	false-?	<-6.79	3215		----		----
2258		----		----	3218	IEC62321	7.21		-1.79
2259		----		----	3220	EPA3060AMod.	6.5		-2.47
2272		----		----	3225	IEC62321	17.80		8.38
2284	EPA3060A	17.1		7.70	3228	IEC62321	17		7.61
2290	IEC62321	19.9		10.39	3237		----		----
2293	DIN53314/17075	0.542		-8.19	3239	IEC62321	<2.0	false-?	<-6.79
2298		----		----	3242		----		----
2301		----		----	3243	IEC62321	1.79		-6.99
2303		----		----	3246	IEC62321	13.4		4.15
2309	IEC62321	13.50		4.25	3248	EPA3060B	<2	false-?	<-6.79
2310		----		----	8005		----		----
2311		----		----					

normality OK
 n 47
 outliers 3
 mean (n) 9.074
 st.dev. (n) 5.8842
 R(calc.) 16.476
 R(Horwitz) 2.917

lab 2179 first reported: 589
 lab 2216 withdrawn first reported: <5
 lab 2453 ex: zero is not a real value

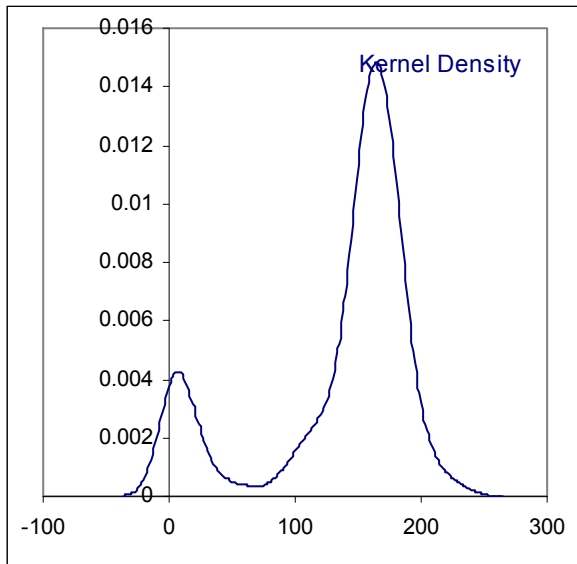
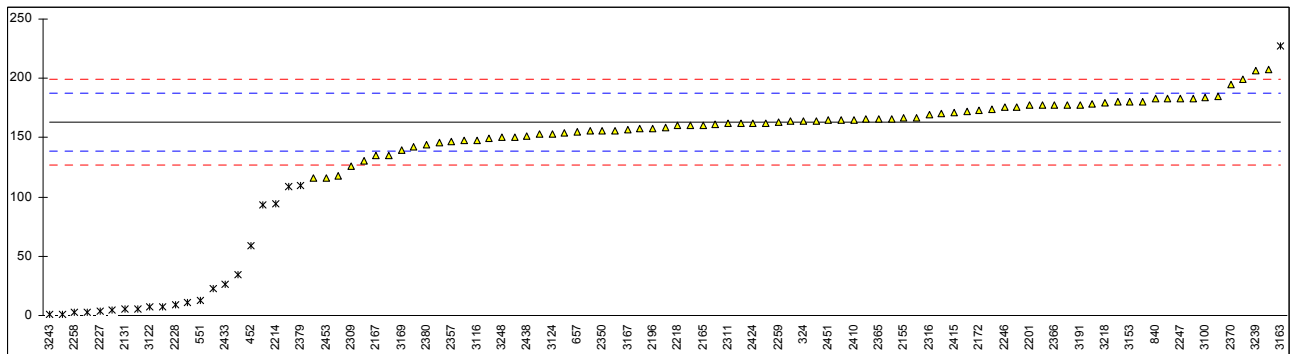


Determination of total Lead as Pb on sample #11050; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	165.5		0.20	2312	EPA3052	162.04		-0.08
310	ICP-MS	154		-0.75	2316	EPA3052	169.50		0.53
324	IEC62321	164.2		0.10	2350	IEC62321	155.5		-0.62
330	in house	<10	false-?	<-12.63	2352	IEC62321	164.220		0.10
357	EN1122	118	C	-3.72	2353	EPA3051	150.5		-1.04
452	INH-004	58.7	ex	-8.61	2355	IEC62321	163.728		0.06
551	IEC62321	12.6	ex	-12.41	2357	IEC62321	147.04		-1.32
607	EPA3051A	n.d.		----	2363	IEC62321	173.7		0.88
632	IEC62321	109	ex	-4.46	2365	IEC62321	165.6		0.21
657	IEC62321	154.69		-0.69	2366	EPA3052	177.6		1.20
815	IEC62321	176.0		1.07	2369	----	----		----
840	IEC62321	182.77		1.63	2370	IEC62321	195		2.64
1051	----	----		----	2372	Microwave	185		1.81
1126	ICP	34	ex	-10.65	2379	IEC62321	109.78	ex	-4.40
1195	EN1122	n.d.		----	2380	EPA3052	144.09		-1.56
1213	IEC62321	n.d.	C	----	2385	ICP-OES	<1	false-?	<-13.37
1800	in house	<5.0	false-?	<-13.04	2406	IEC62321	<5	C, false-?	<-13.04
2115	----	----		----	2410	IEC62321	165		0.16
2120	DIN54233	<25	false-?	<-11.39	2413	in house	n.d.		----
2127	ICP-MS	<1	false-?	<-13.37	2415	CPSC-CH-E1002	171.6		0.71
2129	ISO105	22.6	C, ex	-11.59	2418	EPA3060A/7196A	n.d.		----
2131	in house	5.05	ex	-13.04	2421	----	----		----
2132	in house	182.93		1.64	2424	CPSC-CH-E1002-08	162.1		-0.08
2135	AAS	199.6		3.02	2432	----	----		----
2146	----	----		----	2433	EPA3050B	26.60	ex	-11.26
2152	Microwave	4.29	ex	-13.10	2438	ICP-OES	151.45		-0.96
2155	Microwave	167		0.33	2441	EPA3052/6020A	177.3		1.18
2156	IEC62321	147.4		-1.29	2442	----	----		----
2160	----	----		----	2444	IEC62321	<2.5	false-?	<-13.25
2165	IEC62321	160.40		-0.22	2445	in house	134.7		-2.34
2167	IEC62321	134.66		-2.34	2449	CPSC-CH-E1002-08	<15	false-?	<-12.22
2172	IEC62321	173.1		0.83	2451	IEC62321	164.97		0.16
2173	IEC62321	180.2		1.42	2453	IEC62321	116.12		-3.87
2175	EPA3052	<1	false-?	<-13.37	3100	IEC62321	184.2		1.75
2176	in house	160.2		-0.23	3104	----	----		----
2179	IEC62321	207.84		3.70	3107	EPA3051A	1.06	ex	-13.37
2180	----	----	W	----	3110	CPSC-CH-E1002-08	158.4		-0.38
2184	EPA3052	167.0		0.33	3113	----	----		----
2190	in house	93	ex	-5.78	3116	CHPA C-02.3	147.47		-1.29
2196	IEC62321	158		-0.42	3122	in house	6.96	ex	-12.88
2197	----	----		----	3124	EPA3052	153.2		-0.81
2201	IEC62321	177.2		1.17	3126	----	----		----
2202	in house	180.5		1.44	3134	in house	115.58		-3.92
2212	----	----	W	----	3146	EN11885	<5	false-?	<-13.04
2214	XRF	94	G(0.05)	-5.70	3153	IEC62321	180.4		1.43
2215	EPA3052	165.00		0.16	3154	EN1122	10.66	ex	-12.57
2216	CPSC-CH-E1002-08	-----	W	-----	3160	CPSC-CH-E1002-08	<16	false-?	<-12.13
2217	IEC62321	5.70	ex	-12.98	3163	in house	227	G(0.05)	5.28
2218	----	160	C	-0.25	3167	IEC62321	156.5		-0.54
2227	EPA3051A	3.5	ex	-13.17	3169	CPSC-CH-E1002-08	139.3442	C	-1.96
2228	CPSD-AN-00067	9.222	C,ex	-12.69	3172	CPSC-CH-E1002-08	<20	false-?	<-11.80
2229	IEC62321	n.d.		----	3176	INH-1303	142.5		-1.70
2236	CPSC-CH-E1002-08	157.6		-0.45	3182	IEC62321	<2	false?	<-13.29
2241	IEC62321	172.3		0.76	3185	IEC62321	177.8		1.22
2246	CPSC-CH-E1002-08	175.81		1.05	3190	IEC62321	166		0.24
2247	IEC62321	183.20		1.66	3191	IEC62321	177.8		1.22
2251	----	----		----	3192	in house	<5	false-?	<-13.04
2253	----	----		----	3199	EPA3051	7.192	ex	-12.86
2255	EPA3052	161.3		-0.14	3210	EN17072	<25	false-?	<-11.39
2256	CPSC-CH-E1002-08	162.2		-0.07	3215	IEC62321	<2	false-?	<-13.29
2258	CPSD-AN-164	2.9291	ex	-13.21	3218	IEC62321	179.4		1.35
2259	IEC62321	163		0.00	3220	EPA 5030B	3.0	ex	-13.21
2272	EN17072	145.4		-1.46	3225	IEC62321	155.43		-0.63
2284	EPA3052	178.3		1.26	3228	IEC62321	153		-0.83
2290	IEC62321	n.d.		----	3237	----	----		----
2293	CPSC-CH-E1002-08	130.60	C	-2.68	3239	IEC62321	206.70		3.60
2298	----	----	W	----	3242	Microwave	183.25		1.67
2301	CPSC-CH-E1002-08	n.d.		----	3243	DIN38406	0.895	ex	-13.38
2303	ICP-MS	<0.01	false-?	<-13.45	3246	in house	170.6		0.62
2309	EPA3052	126.17		-3.04	3248	CPSC	150		-1.08
2310	EPA3052	156		-0.58	8005	CPSC-CH-E1002-08	149.88		-1.09
2311	EPA3052	162		-0.09					

normality OK
 n 77
 outliers 2
 mean (n) 163.043
 st.dev. (n) 18.6106
 R(calc.) 52.110
 R(Horwitz) 33.931

lab 357 first reported: <5
 lab 1213 first reported: 6.37
 lab 2129 first reported: 31.44
 lab 2180 withdrawn first reported: 0.38
 lab 2212 withdrawn first reported: 149.5
 lab 2216 withdrawn first reported: <5
 lab 2218 first reported: <20
 lab 2228 first reported: 2.161
 lab 2293 first reported: 2.041
 lab 2298 withdrawn first reported: 150.33
 lab 2406 first reported: 2.605
 lab 2449 first reported: 0.00
 lab 3169 first reported: <5

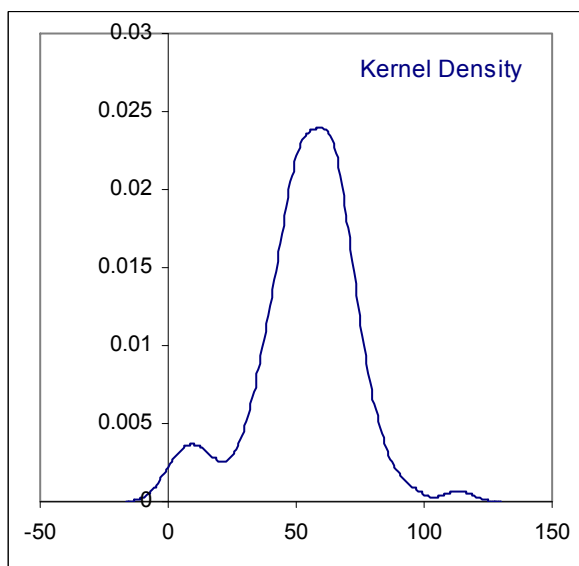
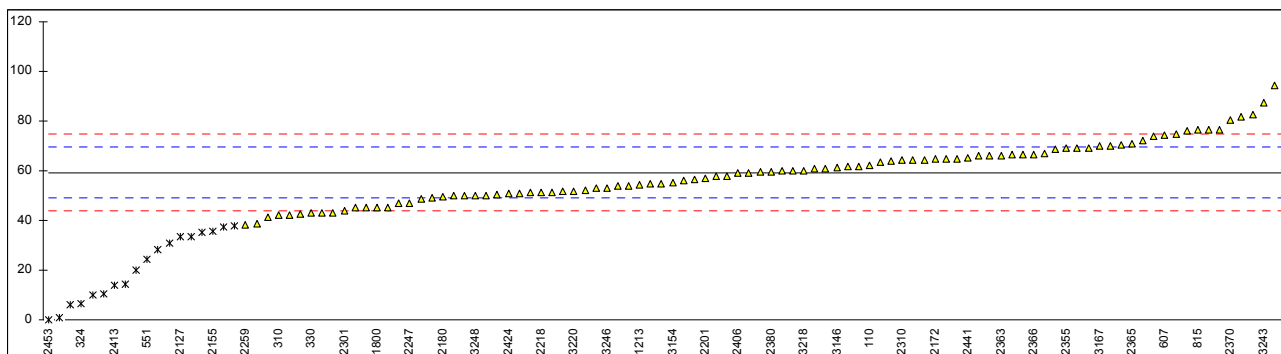


Determination of Mercury as Hg on sample #11050; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	62.21		0.56	2312	EPA3052	66.56		1.41
310	ICP-MS	42		-3.38	2316	EPA3052	76.69		3.38
324	IEC62321	6.43	ex	-10.30	2350	IEC62321	53.9		-1.06
330	in house	43		-3.18	2352	IEC62321	70.4944		2.17
357	in house	51.7		-1.49	2353	EPA3051	53.0		-1.23
452		----		----	2355	IEC62321	69.0983		1.90
551	IEC62321	24.2	ex	-6.84	2357	IEC62321	74.92		3.03
607	EPA3051A	74.16		2.89	2363	IEC62321	66.2		1.34
632	IEC62321	69.9		2.06	2365	IEC62321	70.8		2.23
657	IEC62321	57.9856		-0.26	2366	EPA3052	66.6		1.41
815	EPA3053	76.38		3.32	2369		----		----
840	IEC62321	51.14		-1.60	2370	IEC62321	80.5		4.12
1051		----		----	2372	Microwave	73.7		2.80
1126	ICP	38	ex	-4.16	2379	IEC62321	n.d.		----
1195	EN1122	n.d.		----	2380	EPA3052	59.48		0.03
1213	IEC62321	54.32		-0.98	2385	AAS	42.2		-3.34
1800	in house	45.2		-2.75	2406	IEC62321	59.20		-0.03
2115		----		----	2410	IEC62321	55		-0.85
2120	DIN54233	41.5		-3.47	2413	in house	13.98	ex	-8.83
2127	ICP-MS	33.5	ex	-5.03	2415	CPSC-CH-E1002	49.99		-1.82
2129	ISO11083	76.43		3.33	2418	EPA3060A/7196A	94.133		6.78
2131	in house	10.50	ex	-9.51	2421		----		----
2132	in house	50.96		-1.63	2424	CPSC-CH-E1002-08	50.7		-1.68
2135	AAS	<1	false-?	<-11.36	2432		----		----
2146		----		----	2433	EPA3050B	<2	false-?	<-11.17
2152	Microwave	45.40		-2.71	2438	ICP-OES	50.5		-1.72
2155	in house	35.8	ex	-4.58	2441	EPA3052/6020A	65.3		1.16
2156	IEC62321	28.1	C, ex	-6.08	2442		----		----
2160		----		----	2444	IEC62321	51.5052		-1.53
2165	IEC62321	67.12		1.51	2445	in house	19.95	ex	-7.67
2167	IEC62321	81.745		4.36	2449		----		----
2172	IEC62321	64.79		1.06	2451	IEC62321	69.25		1.93
2173	IEC62321	64.2		0.95	2453	IEC62321	0	ex	-11.56
2175	EPA3052	113.4	CG(0.01)	10.53	3100	IEC62321	66.17		1.33
2176	in house	43.1		-3.16	3104		----		----
2179	IEC62321	59.91		0.11	3107	EPA3051A	37.33	ex	-4.29
2180	in house	49.4		-1.94	3110	CPSC-CH-E1002-08	59.9		0.11
2184	EPA3052	56.0		-0.65	3113		----		----
2190	in house	6	ex	-10.39	3116		----		----
2196	IEC62321	61		0.32	3122	in house	10.09	ex	-9.59
2197		----		----	3124	EPA3052	42.4		-3.30
2201	IEC62321	57.00		-0.46	3126	INAA	n.d.		----
2202	in house	61.6		0.44	3134	in house	45.08		-2.78
2212		----		----	3146	EN1483	61.5		0.42
2214	XRF	58		-0.26	3153	IEC62321	56.5		-0.55
2215	EPA3052	69.28		1.94	3154	EN1122	55.15		-0.82
2216		----	W	----	3160	CPSC-CH-E1002-08	33.59	ex	-5.01
2217	IEC62321	47.1		-2.38	3163	in house	1.0	ex	-11.36
2218		51.16		-1.59	3167	IEC62321	69.80		2.04
2227	EPA3051A	50.2		-1.78	3169	EPA3052	45.1578		-2.76
2228	CPSD-AN-00067	35.180	ex	-4.70	3172	CPSC-CH-E1002-08	31.0	ex	-5.52
2229	IEC62321	82.6		4.53	3176	in house	48.8		-2.05
2236	CPSC-CH-E1002-08	72.28		2.52	3182	IEC62321	64.33		0.97
2241	IEC62321	61.9		0.50	3185	IEC62321	59.33		0.00
2246		----		----	3190	IEC62321	63.4		0.79
2247	IEC62321	47.12		-2.38	3191	IEC62321	54.6		-0.92
2251		----		----	3192		----		----
2253		----		----	3199	EPA3051	76.27		3.30
2255	EPA3052	38.6		-4.04	3210	EN17072	14.5	ex	-8.73
2256	EPA3052	64.9		1.08	3215	IEC62321	54.1		-1.02
2258	CPSD-AN-164	43.062		-3.17	3218	IEC62321	60.11		0.15
2259	IEC62321	38.3		-4.10	3220	EPA 5030B	51.7		-1.49
2272	EN17072	64.1		0.93	3225	IEC62321	59.41		0.01
2284	EPA3052	60.9		0.30	3228	IEC62321	52		-1.43
2290		----		----	3237		----		----
2293	CPSC-CH-E1002-08	49.995		-1.82	3239	IEC62321	65.91		1.28
2298		----		----	3242	Microwave	68.73		1.83
2301	CPSC-CH-E1002-08	43.98		-2.99	3243	EN1483	87.41		5.47
2303	ICP-MS	49.31		-1.95	3246	in house	53.2		-1.20
2309	EPA3052	65.0		1.10	3248	CHPA	50		-1.82
2310	EPA3052	64.2		0.95	8005		----		----
2311	EPA3052	66.6		1.41					

normality OK
 n 95
 outliers 1
 mean (n) 59.341
 st.dev. (n) 11.6109
 R(calc.) 32.511
 R(Horwitz) 14.379

lab 2156 first reported: 18.1
 lab 2175 first reported: 186.71
 lab 2216 withdrawn; first reported: 66.2
 lab 2453 ex: zero is not a real value.



Determination of total Cadmium as Cd on sample #11051; results in mg/kg

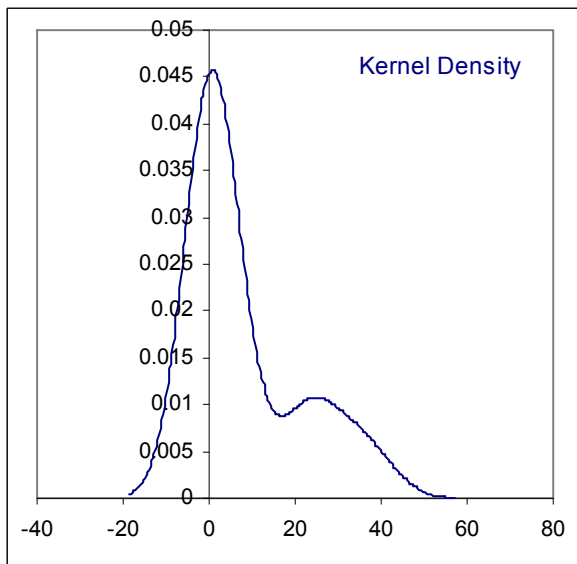
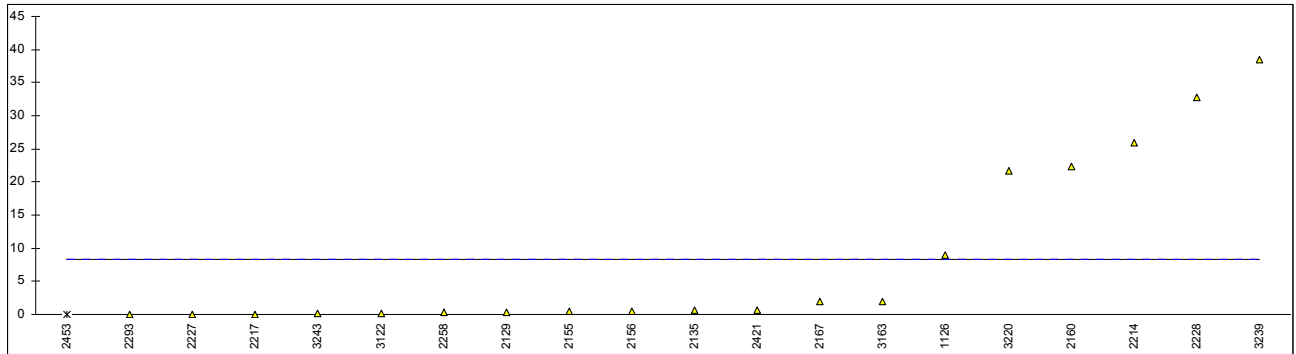
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	<5		----	2312	IEC62321	n.d.		----
310	ICP-MS	<1		----	2316	EPA3052	<5		----
324	IEC62321	<2		----	2350	IEC62321	n.d.		----
330	in house	<10		----	2352	IEC62321	n.d.		----
357	in house	<5		----	2353	EPA3051	n.d.		----
452		----		----	2355	IEC62321	<2		----
551	IEC62321	n.d.		----	2357	IEC62321	n.d.		----
607	EPA3051A	n.d.		----	2363	IEC62321	<2		----
632	IEC62321	n.d.		----	2365	IEC62321	<2		----
657	IEC62321	<2		----	2366	EPA3052	n.d.		----
815	EPA3051A	<2		----	2369	IEC62321	<2		----
840	IEC62321	n.d.		----	2370	IEC62321	n.d.		----
1051	EN1122	<5		----	2372	Microwave	n.d.		----
1126	XRF	9	false+?	----	2379	IEC62321	n.d.		----
1195	EN1122	n.d.		----	2380	EPA3052	n.d.		----
1213	IEC62321	<5		----	2385	ICP-OES	<0.5		----
1800	in house	<0.3		----	2406	IEC62321	<5		----
2115		----		----	2410	EN1122	<0.5		----
2120	DIN54233	<25		----	2413	in house	n.d.		----
2127	ICP-MS	<0.1		----	2415	CPSC-CH-E1002	n.d.		----
2129	EPA3050B	0.34		----	2418	EPA3050B/3052	n.d.		----
2131	in house	<0.01		----	2421		0.69		----
2132	in house	<1.7		----	2424	CPSC-CH-E1002-08	n.d.		----
2135	EN1122	0.65		----	2432	in house	n.d.		----
2146	EN1122	<n.d		----	2433	EPA3050B	<2		----
2152	Microwave	<2.0		----	2438	ICP-OES	<1		----
2155	Microwave	0.450		----	2441	EPA3052/6020A	n.d.		----
2156	IEC62321	0.5		----	2442	EN1122	n.d.		----
2160	in house	22.26	false+?	----	2444	IEC62321	<2.5		----
2165	IEC62321	<2		----	2445	in house	<0.02		----
2167	IEC62321	1.995		----	2449		----		----
2172	IEC62321	<2		----	2451	IEC62321	n.d.		----
2173	IEC62321	n.d.		----	2453	IEC62321	0	ex	----
2175	EPA3052	<1		----	3100	IEC62321	<2		----
2176	in house	n.d.		----	3104	EN1122	<10		----
2179	IEC62321	n.d.		----	3107	EPA3051AMod.	n.d.		----
2180		----		----	3110	EN1122	<15		----
2184	EPA3052	<1		----	3113		n.d.		----
2190	EN1122	<4		----	3116		----		----
2196	IEC62321	<10		----	3122	in house	0.24		----
2197	ICP-OES	<12.5		----	3124	EPA3052	<2	remark	----
2201	IEC62321	<2		----	3126	INAA	n.d.		----
2202	in house	n.d.		----	3134	in house	<2.4		----
2212		----		----	3146	EN11885	<5		----
2214	XRF	26	false+?	----	3153	IEC62321	n.d.		----
2215	EPA3052	<10		----	3154		----		----
2216	IEC62321	<5		----	3160	CPSC-CH-E1002-08	<16		----
2217	IEC62321	0.06		----	3163	in house	2.0		----
2218		<10		----	3167	IEC62321	n.d.		----
2227	EPA3051A	0.0276		----	3169	EN1122	<5		----
2228	CPSD-AN-00067	32.777	false+?	----	3172	EN1122	<20		----
2229	IEC62321	n.d.		----	3176	EN1122	n.d.		----
2236	CPSC-CH-E1002-08	<10		----	3182	IEC62321	<2		----
2241	IEC62321	n.d.		----	3185	IEC62321	<2		----
2246	EN1122	<20		----	3190	IEC62321	<2		----
2247	IEC62321	<10		----	3191	IEC62321	<5		----
2251		----		----	3192	EN1122	<5		----
2253		----		----	3199	EPA3051	<5.00		----
2255	EPA3052	<5		----	3210	EN17072	<25		----
2256	EN1122	<10		----	3215	IEC62321	<0.5		----
2258	CPSD-AN-164	0.2453		----	3218	IEC62321	<2		----
2259	IEC62321	<2.5		----	3220	EN1122	21.7	false+?	----
2272	EN17072	<10		----	3225	IEC62321	n.d.		----
2284	EPA3052	n.d.		----	3228	IEC62321	<10		----
2290	IEC62321	n.d.		----	3237	in house	n.d.		----
2293	EN1122	0.019		----	3239	IEC62321	38.4	C,false+?	----
2298		----		----	3242	Microwave	n.d.		----
2301	CPSC-CH-E1002-08	n.d		----	3243	EN1122	0.125		----
2303	ICP-MS	<0.01		----	3246	in house	<5		----
2309	IEC62321	<5		----	3248	EN11122	<5		----
2310	EPA3052	<2		----	8005		----		----
2311	EPA3052	<5		----					

normality not OK
 n 19
 outliers 0
 mean (n) 8.29
 st.dev. (n) 12.860
 R(calc.) 36.01
 R(EN1122:01) (2.07)

lab 3124 remarked to find an interference for Cd from a high Sn content present in this sample

lab 3239 first reported: <2

lab 2453 ex: zero is not a real value

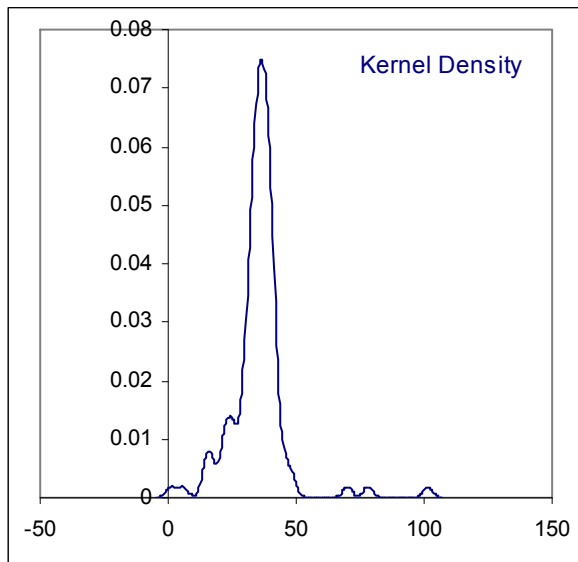
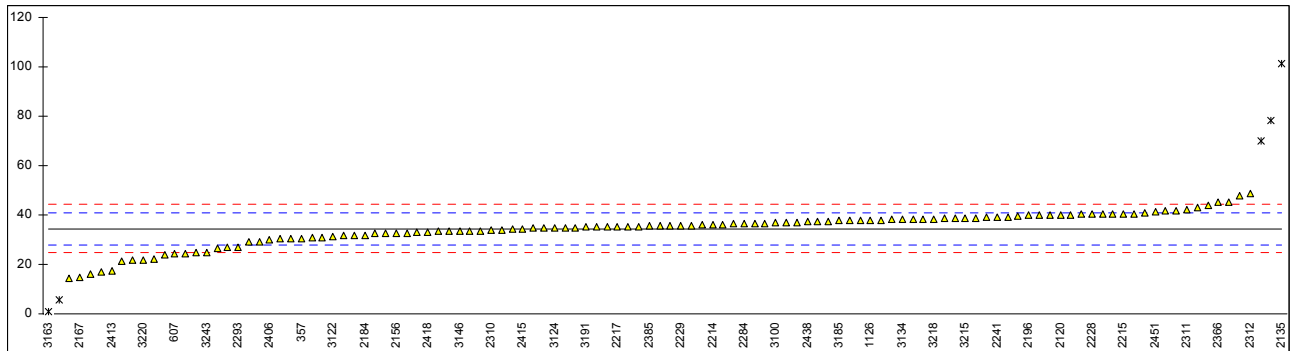


Determination of Chromium as Cr on sample #11051; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	36.8		0.72	2312	IEC62321	48.49		4.33
310	ICP-MS	39		1.40	2316	EPA3052	34.85		0.12
324	IEC62321	37.3		0.88	2350	IEC62321	38.8		1.34
330	in house	27		-2.31	2352	IEC62321	41.662		2.22
357	in house	30.6		-1.19	2353	EPA3051	31.0		-1.07
452		----		----	2355	IEC62321	40.1652		1.76
551	IEC62321	36.4		0.60	2357	IEC62321	40.20		1.77
607	EPA3051A	24.15		-3.19	2363	IEC62321	40.6		1.89
632	IEC62321	5.65	G(0.05)	-8.90	2365	IEC62321	43.1		2.67
657	IEC62321	30.9495		-1.09	2366	EPA3052	45.2		3.32
815	EPA3051A	35.13		0.20	2369	IEC62321	39.7084		1.62
840	IEC62321	40.22	C	1.78	2370	IEC62321	38.5		1.25
1051		----		----	2372	Microwave	38.4		1.22
1126	ICP	38		1.09	2379	IEC62321	29.24		-1.61
1195	EN1122	n.d.		----	2380	EPA3052	35.23		0.24
1213	IEC62321	32.83		-0.51	2385	ICP-OES	35.6		0.35
1800	in house	14.5		-6.17	2406	IEC62321	30.20		-1.32
2115		----		----	2410	EPA3052	38		1.09
2120	DIN54233	40.2		1.77	2413	in house	17.18		-5.34
2127	ICP-MS	33.6		-0.27	2415	CPSC-CH-E1002	34.5		0.01
2129	ISO17294	34.00		-0.14	2418	EPA3050B/3052	32.911		-0.48
2131	in house	35.20		0.23	2421		----		----
2132	in house	32.65		-0.56	2424	CPSC-CH-E1002-08	36.1		0.50
2135	AAS	101.5	G(0.01)	20.71	2432		----		----
2146		----		----	2433	EPA3050B	39.18		1.46
2152	Microwave	22.29		-3.76	2438	ICP-OES	37.28		0.87
2155	Acid digest	41.0		2.02	2441	EPA3052/6020A	38.8		1.34
2156	IEC62321	32.7		-0.55	2442		----		----
							21.1295		
2160	in house	78.27	G(0.01)	13.53	2444	IEC62321	5		-4.12
2165	IEC62321	30.32		-1.28	2445	in house	17.00		-5.40
2167	IEC62321	14.885		-6.05	2449		----		----
2172	IEC62321	40.43		1.84	2451	IEC62321	41.25		2.10
2173	IEC62321	40.3		1.80	2453		----		----
2175	EPA3052	35.83		0.42	3100	IEC62321	36.75		0.71
2176	in house	38.1		1.12	3104		----		----
2179	IEC62321	70.18	C,G(0.01)	11.03	3107	EPA3051AMod.	35.27		0.25
2180	ICP-OES	31.6		-0.89	3110	CPSC-CH-E1002-08	34.7		0.07
2184	EPA3052	31.8		-0.82	3113		----		----
2190	in house	16		-5.71	3116		----		----
2196	IEC62321	40		1.71	3122	in house	31.1		-1.04
2197		----		----	3124	EPA3052	34.8		0.10
2201	IEC62321	41.83		2.27	3126	INAA	32.5		-0.61
2202	in house	38.4		1.22	3134	in house	38.15		1.14
2212		----		----	3146	EN11885	33.5		-0.30
2214	XRF	36		0.47	3153	IEC62321	40.2		1.77
2215	EPA3052	40.49		1.86	3154	EN1122	35.65		0.37
2216	IEC62321	24.2		-3.17	3160	CPSC-CH-E1002-08	34.30		-0.05
2217	IEC62321	35.23		0.24	3163	in house	1.0	G(0.05)	-10.34
2218		----		----	3167	IEC62321	33.34		-0.35
2227	EPA3051A	24.8		-2.99	3169	EPA3052	43.7488		2.87
2228	CPSD-AN-00067	40.260		1.79	3172	CH-E1002-08.1	35.0		0.16
2229	IEC62321	35.8		0.41	3176	in house	31.8		-0.82
2236	CPSC-CH-E1002-08	26.49		-2.46	3182	IEC62321	37.82		1.04
2241	IEC62321	39.1		1.43	3185	IEC62321	37.62		0.97
2246		----		----	3190	IEC62321	34.7		0.07
2247	IEC62321	37.42		0.91	3191	IEC62321	35.1		0.20
2251		----		----	3192	in house	32.72		-0.54
2253		----		----	3199	EPA3051	30.42		-1.25
2255	EPA3052	45.3		3.35	3210	EN17072	<25		<-2.92
2256	EPA3052	37.7		1.00	3215	IEC62321	38.8		1.34
2258		----		----	3218	IEC62321	38.46		1.23
2259	IEC62321	36.0		0.47	3220	EPA5030B	21.7		-3.94
2272	EN17072	<10	false-?	<-7.56	3225	IEC62321	35.61		0.35
2284	EPA3052	36.4		0.60	3228	IEC62321	37		0.78
2290	IEC62321	33.3		-0.36	3237		----		----
2293	CPSC-CH-E1002-08	27.096		-2.28	3239	IEC62321	21.55		-3.99
2298		----		----	3242	Microwave	23.7		-3.33
2301	CPSC-CH-E1002-08	33.58		-0.27	3243	ISO1185	25.00		-2.92
2303	ICP-MS	29.26		-1.61	3246	in house	36.7		0.69
2309	IEC62321	36.48		0.62	3248	CPSC	48		4.18
2310	EPA3052	33.9		-0.18	8005		----		----
2311	EPA3052	41.97		2.32					

normality not OK
 n 113
 outliers 5
 mean (n) 34.467
 st.dev. (n) 6.7072
 R(calc.) 18.780
 R(Horwitz) 9.063

lab 840 first reported: 52.4
 lab 2179 first reported: 52.54

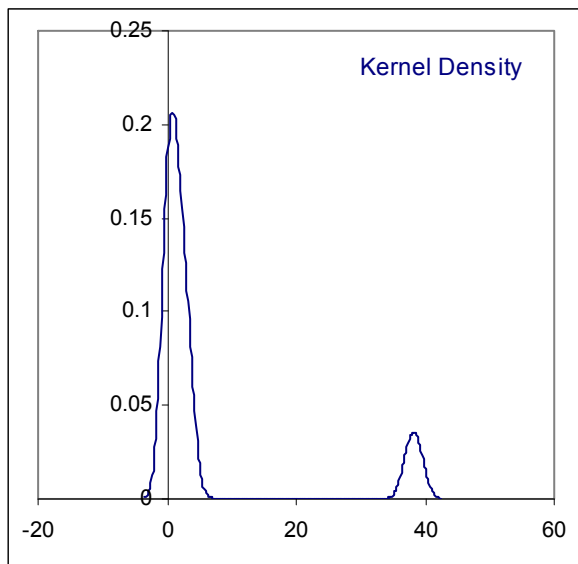
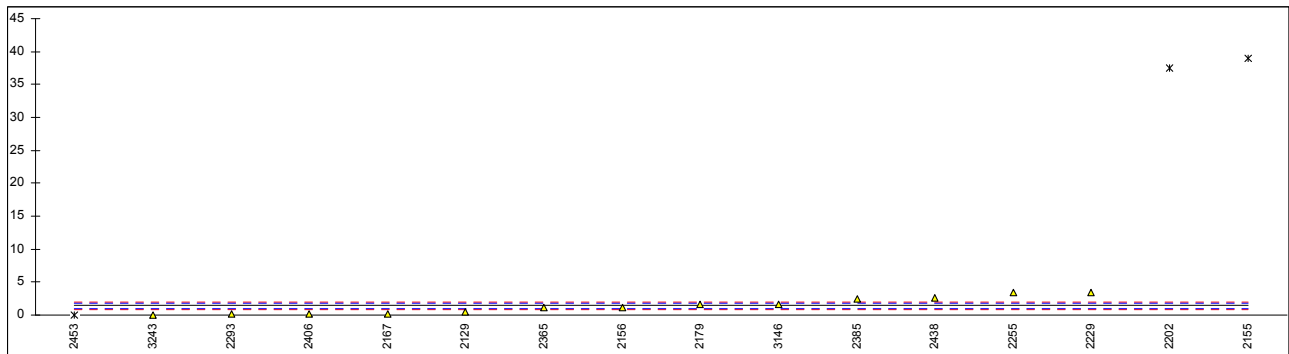


Determination of Hexavalent Chromium as Cr⁶⁺ on sample #11051; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	<5		----	2312	IEC62321	n.d.		----
310		----		----	2316	IEC62321	<2		----
324	IEC62321	<2		----	2350	IEC62321	n.d.		----
330		----		----	2352	IEC62321	n.d.		----
357		----		----	2353	EPA3060	n.d.		----
452		----		----	2355	IEC62321	<2		----
551	IEC62321	n.d.		----	2357	IEC62321	n.d.		----
607	IEC62321	n.d.		----	2363	IEC62321	<2		----
632	IEC62321	n.d.		----	2365	IEC62321	1.1		----
657	IEC62321	<2		----	2366	IEC62321	n.d.		----
815	IEC62321	<2		----	2369	IEC62321	<2		----
840	IEC62321	n.d.		----	2370	IEC62321	n.d.		----
1051		----		----	2372	Alkaline extraction	n.d.		----
1126		----		----	2379	IEC62321	n.d.		----
1195		----		----	2380	EPA3052	n.d.		----
1213	IEC62321	<5		----	2385	EPA3060A	2.40		----
1800		----		----	2406	IEC62321	0.1975		----
2115		----		----	2410		----		----
2120	IEC62321	<1.0		----	2413		----		----
2127		----		----	2415	IEC62321	n.d.	C	----
2129	ISO17294	0.47		----	2418	EPA3060A/7196A	n.d.		----
2131		----		----	2421		----		----
2132	EPA3060A/7196	<2.0		----	2424	CPSC-CH-E1002-08	n.d.		----
2135	DIN17075	<3		----	2432		----		----
2146		----		----	2433	EPA7196A	<1		----
2152		----		----	2438	ICP-OES	2.56		----
2155	INH-0169	39.0	DG(0.01)	----	2441		----		----
2156	IEC62321	1.1		----	2442		----		----
2160		----		----	2444		----		----
2165	IEC62321	<2		----	2445	IEC62321	<5.2		----
2167	IEC62321	0.243		----	2449		----		----
2172	IEC62321	<2		----	2451		----		----
2173	IEC62321	n.d.		----	2453	IEC62321	0	ex	----
2175	EPA3060A/7196A	<1		----	3100	IEC62321	<1		----
2176	in house	n.d.		----	3104		----		----
2179	IEC62321	1.62		----	3107		----		----
2180		----		----	3110		----		----
2184	IEC62321	<2.5		----	3113		----		----
2190		----		----	3116		----		----
2196	IEC62321	<1		----	3122		----		----
2197		----		----	3124		----		----
2201	IEC62321	<1		----	3126		----		----
2202	in house	37.5	DG(0.01)	----	3134		----		----
2212		----		----	3146	IEC62321	1.64		----
2214		----		----	3153	IEC62321	n.d.		----
2215	EPA3060A	<2		----	3154		----		----
2216	IEC62321	<5		----	3160		----		----
2217	IEC62321	<1		----	3163		----		----
2218		----		----	3167		----		----
2227		----		----	3169	IEC62321	<5		----
2228		----		----	3172		----		----
2229	IEC62321	3.4		----	3176	ISO11083	n.d.		----
2236		----		----	3182	IEC62321	<1		----
2241	IEC62321	n.d.		----	3185	IEC62321	<1		----
2246		----		----	3190	IEC62321	<1		----
2247	IEC62321	<2		----	3191	IEC62321	<5		----
2251		----		----	3192		----		----
2253		----		----	3199	EPA3060A/7196A	<1		----
2255	EPA3060	3.36		----	3210	EN17075	<3		----
2256	EPA3060A	<2		----	3215	IEC62321	<2		----
2258		----		----	3218	IEC62321	<1		----
2259		----		----	3220	EPA3060BMod.	n.d.		----
2272	EN17072	<10		----	3225	IEC62321	n.d.		----
2284	EPA3060A	n.d.		----	3228	IEC62321	<2		----
2290	IEC62321	n.d.		----	3237		----		----
2293	DIN53314/17075	0.106		----	3239	IEC62321	<2.0		----
2298		----		----	3242		----		----
2301		----		----	3243	ISO62321	0.074		----
2303		----		----	3246	IEC62321	<5		----
2309	IEC62321	<2		----	3248	EPA3060B	<2		----
2310		----		----	8005		----		----
2311		----		----					----

normality OK
 n 13
 outliers 2
 mean (n) 1.405
 st.dev. (n) 1.2095
 R(calc.) 3.387
 R(Horwitz) (0.598)

lab 2415 first reported: 8.89
 lab 2453 ex : zero is not a real value

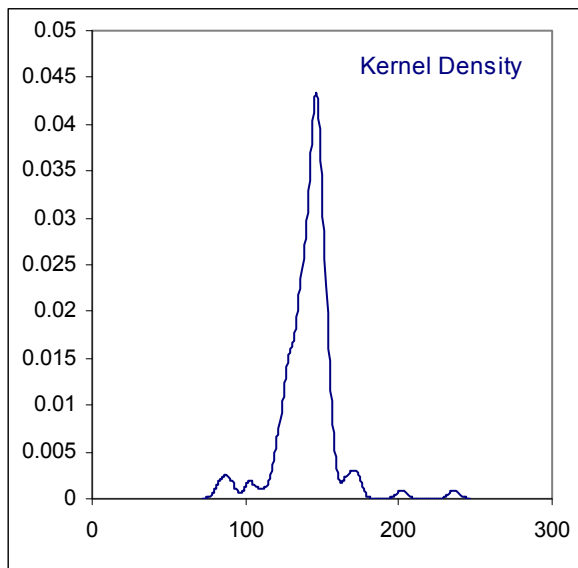
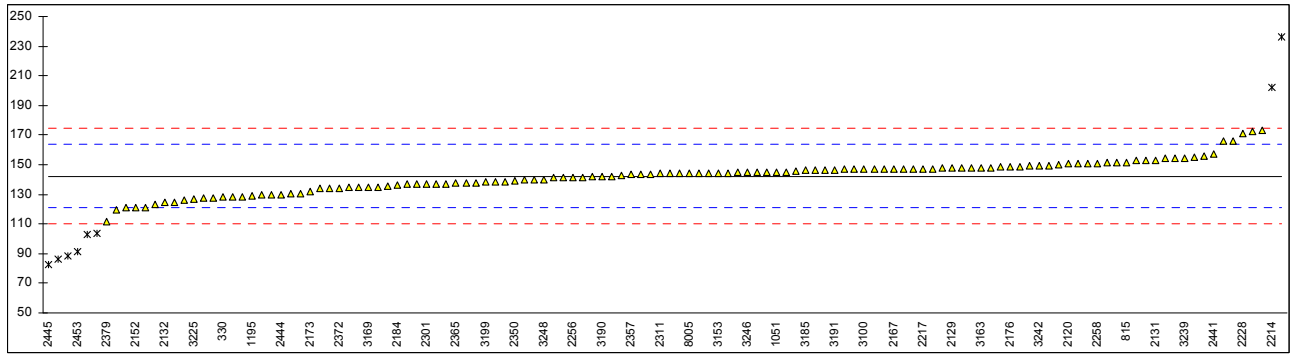


Determination of total Lead as Pb in sample #11051; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	138		-0.40	2312	IEC62321	172.80		2.84
310	ICP-MS	135		-0.68	2316	EPA3052	142.88		0.06
324	IEC62321	165.9		2.20	2350	IEC62321	139		-0.30
330	in house	128		-1.33	2352	IEC62321	145.096		0.26
357	in house	136.7		-0.52	2353	EPA3051	138.5		-0.35
452	INH-004	128.0		-1.33	2355	IEC62321	136.664		-0.52
551	IEC62321	129.5		-1.19	2357	IEC62321	143.44		0.11
607	EPA3051A	119.25		-2.14	2363	IEC62321	148.0		0.53
632	IEC62321	n.d.		----	2365	IEC62321	137.7		-0.42
657	IEC62321	120.693		-2.01	2366	EPA3052	149.4		0.66
815	EPA3051A	151.8		0.89	2369	IEC62321	144.147		0.18
840	IEC62321	148.79		0.61	2370	IEC62321	144		0.16
1051	CPSC-CH-E1002-08.1	145.18		0.27	2372	Microwave	134		-0.77
1126	ICP	146.5		0.39	2379	IEC62321	111.54	C	-2.86
1195	EN1122	128.8		-1.25	2380	EPA3052	141.51		-0.07
1213	IEC62321	155.67		1.25	2385	ICP-OES	150.8		0.80
1800	in house	150.8		0.80	2406	IEC62321	121.0		-1.98
2115		----		----	2410	IEC62321	140		-0.21
2120	DIN54233	150.5		0.77	2413	in house	124.94		-1.61
2127	ICP-MS	154.3		1.12	2415	CPSC-CH-E1002	166.2		2.23
2129	ISO105	147.98		0.53	2418	EPA3050B/3052	127.543		-1.37
2131	in house	153		1.00	2421		----		----
2132	in house	124.70		-1.64	2424	CPSC-CH-E1002-08	146.8		0.42
2135	AAS	173.3		2.89	2432		----		----
2146		----		----	2433	EPA3050B	144.20		0.18
2152	Microwave	120.75		-2.00	2438	ICP-OES	138.35		-0.36
2155	Microwave	147		0.44	2441	EPA3052/6020A	157.5		1.42
2156	IEC62321	133.7		-0.80	2442		----		----
2160	in house	235.9	G(0.01)	8.72	2444	IEC62321	129.8622		-1.15
2165	EPA3052	145.17		0.27	2445	in house	82.30	G(0.05)	-5.58
2167	IEC62321	147.10		0.45	2449	CPSC-CH-E1002-08	123.50		-1.75
2172	IEC62321	147.4		0.48	2451	IEC62321	146.79		0.42
2173	IEC62321	131.8		-0.97	2453	IEC62321	91.32	G(0.01)	-4.74
2175	EPA3052	127.42		-1.38	3100	IEC62321	147.0		0.44
2176	in house	148.6		0.59	3104		----		----
2179	IEC62321	102.80	C,DG(0.05)	-3.67	3107	EPA3051AMod.	148.40		0.57
2180	ICP-OES	138		-0.40	3110	CPSC-CH-E1002-08	143.7		0.13
2184	EPA3052	136.1		-0.57	3113		129.38		-1.20
2190	in house	86	G(0.05)	-5.24	3116	CHPA C-02.3	139.61		-0.25
2196	IEC62321	141		-0.12	3122	in house	154.8		1.17
2197		----		----	3124	EPA3052	141.8		-0.04
2201	IEC62321	154.2		1.11	3126		----		----
2202	in house	143.6		0.12	3134	in house	146.59		0.40
2212	CPSC-CH-E1002-08.1	137.0		-0.49	3146	EN11885	148		0.53
2214	XRF	202	G(0.01)	5.56	3153	IEC62321	144.2		0.18
2215	EPA3052	144.94		0.25	3154	EN1122	126.2		-1.50
2216	CPSC-CH-E1002-08	130.2		-1.12	3160	CPSC-CH-E1002-08	134.84		-0.69
2217	IEC62321	147.4		0.48	3163	in house	148		0.53
2218		137.28		-0.46	3167	IEC62321	130.4		-1.10
2227	EPA3051A	151.3		0.84	3169	CPSC-CH-E1002-08	134.926		-0.68
2228	CPSD-AN-00067	171.329		2.71	3172	CH-E1002-08	149.0		0.63
2229	IEC62321	135.2		-0.66	3176	INH-1303	128.4		-1.29
2236	CPSC-1002-08	142.0		-0.02	3182	IEC62321	151.29		0.84
2241	IEC62321	148.1		0.54	3185	IEC62321	146.1		0.36
2246	CPSC-CH-E1002-08	143.94		0.16	3190	IEC62321	142		-0.02
2247	IEC62321	147.4		0.48	3191	IEC62321	146.7		0.41
2251		----		----	3192	in house	147.7		0.51
2253		----		----	3199	EPA3051	138.2		-0.38
2255	EPA3052	144.3	C	0.19	3210	EN17072	<25	false -?	<-10.86
2256	CPSC-CH-E1002-08	141.5		-0.07	3215	IEC62321	152.8		0.98
2258	CPSD-AN-164	150.95		0.81	3218	IEC62321	149.85		0.71
2259	IEC62321	146		0.35	3220	EPA5030B	88.1	G(0.01)	-5.04
2272	EN17072	<10	false -?	<-12.25	3225	IEC62321	127.08		-1.41
2284	EPA3052	147.3		0.47	3228	IEC62321	147		0.44
2290	IEC62321	145.2		0.27	3237		----		----
2293	CPSC-CH-E1002-08	133.755		-0.79	3239	IEC62321	154.4	C	1.13
2298	CPSC-CH-E1002-08	134.75		-0.70	3242	Microwave	149.06		0.63
2301	CPSC-CH-E1002-08	136.93		-0.50	3243	DIN38406	103.4	DG(0.05)	-3.62
2303		----		----	3246	in house	145.0		0.26
2309	IEC62321	152.6		0.96	3248	CPSC	140		-0.21
2310	EPA3052	141		-0.12	8005	CPSC-CH-E1002-08	144.13		0.17
2311	EPA3052	143.88		0.15					

normality not OK
 n 120
 outliers 8
 mean (n) 142.260
 st.dev. (n) 10.7952
 R(calc.) 30.227
 R(Horwitz) 30.220

lab 2179 first reported: 80.02
 lab 2255 first reported: 190.6
 lab 2379 first reported: 98.59
 lab 3242 first reported: 88.03

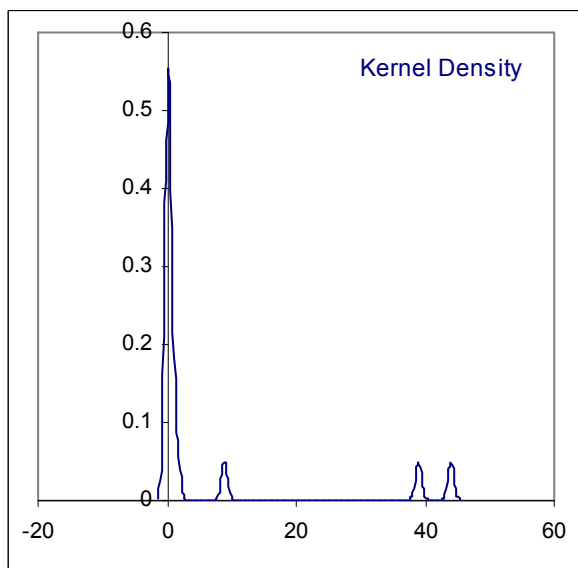
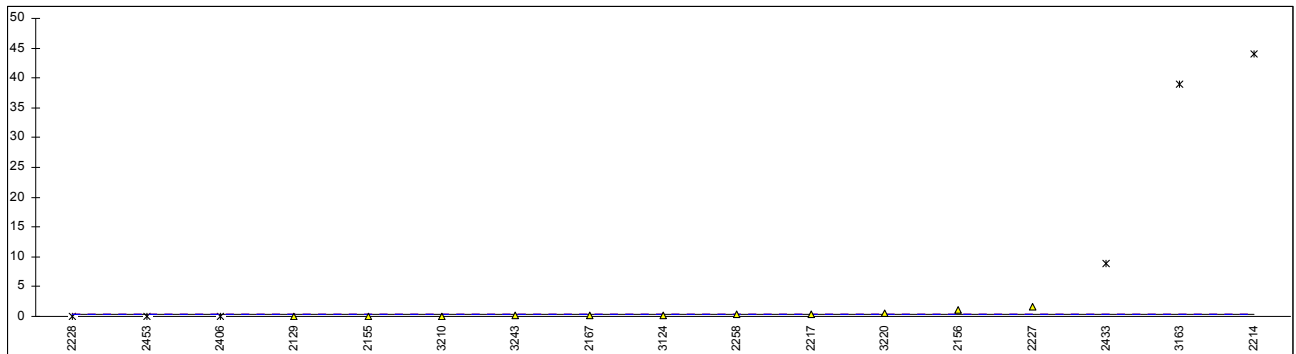


Determination of Mercury as Hg on sample #11051; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
110	IEC62321	<5		----	2312	IEC62321	n.d.		----
310	ICP-MS	<1		----	2316	EPA3052	<5		----
324	IEC62321	<2		----	2350	IEC62321	n.d.		----
330	in house	<10		----	2352	IEC62321	n.d.		----
357	in house	<2		----	2353	EPA3051	n.d.		----
452		----		----	2355	IEC62321	<2		----
551	IEC62321	n.d.		----	2357	IEC62321	n.d.		----
607	EPA3051A	n.d.		----	2363	IEC62321	<2		----
632	IEC62321	n.d.		----	2365	IEC62321	<2		----
657	IEC62321	<2		----	2366	EPA3052	n.d.		----
815	EPA3052A	<2		----	2369	IEC62321	<2		----
840	IEC62321	n.d.		----	2370	IEC62321	n.d.		----
1051		----		----	2372	Microwave	n.d.		----
1126		----		----	2379	IEC62321	n.d.		----
1195	EN1122	n.d.		----	2380	EPA3052	n.d.		----
1213	IEC62321	<5.0		----	2385	ICP-OES	<0.5		----
1800	in house	<0.3		----	2406	IEC62321	0	ex	----
2115		----		----	2410	IEC62321	<2		----
2120	DIN54233	<5		----	2413	in house	n.d.		----
2127	ICP-MS	<0.1		----	2415	CPS-CH-E1002	n.d.		----
2129	ISO11083	0.01		----	2418	EPA3050B/3052	n.d.		----
2131	in house	<0.01		----	2421		----		----
2132	in house	<10.0		----	2424	CPSC-CH-E1002-08	n.d.		----
2135	AAS	<1		----	2432		----		----
2146		----		----	2433	EPA3050B	8.88	G(0.01)	----
2152	Microwave	<2		----	2438	ICP-OES	<1		----
2155	in house	0.025		----	2441	EPA3052/6020A	n.d.		----
2156	IEC62321	1.0		----	2442		----		----
2160	in house	<5		----	2444	IEC62321	<2.5		----
2165	EPA3052	<2		----	2445	in house	<0.10		----
2167	IEC62321	0.265		----	2449		----		----
2172	IEC62321	<2		----	2451	IEC62321	n.d.		----
2173	IEC62321	n.d.		----	2453	IEC62321	0	ex	----
2175	EPA3052	<1	C	----	3100	IEC62321	<2		----
2176	in house	n.d.		----	3104		----		----
2179	IEC62321	n.d.		----	3107		----		----
2180		----		----	3110	CPSC-CH-E1002-08	<15		----
2184	EPA3052	<1		----	3113		----		----
2190	in house	<4		----	3116		----		----
2196	IEC62321	<10		----	3122	in house	<5		----
2197		----		----	3124	EPA3052	0.267		----
2201	IEC62321	<2		----	3126	INAA	n.d.		----
2202	in house	n.d.		----	3134	in house	<1		----
2212		----		----	3146	EN1483	<1		----
2214	XRF	44	DG(0.01)	----	3153	IEC62321	n.d.		----
2215	EPA3052	<10		----	3154		----		----
2216	IEC62321	<2		----	3160	CPSC-CH-E1002-08	<1		----
2217	IEC62321	0.40		----	3163	in house	39	DG(0.01)	----
2218		<20		----	3167	IEC62321	n.d.		----
2227	EPA3051A	1.6		----	3169	EPA3052	<5	C	----
2228	CPSD-AN-00067	0.000	ex	----	3172	CH-E1002-08	<20		----
2229	IEC62321	n.d.		----	3176	in house	n.d.		----
2236	CPSC-1002-08	<10		----	3182	IEC62321	<2		----
2241	IEC62321	n.d.		----	3185	IEC62321	<2		----
2246		----		----	3190	IEC62321	<2		----
2247	IEC62321	<2		----	3191	IEC62321	<5		----
2251		----		----	3192		----		----
2253		----		----	3199	EPA3051	<5.00		----
2255	EPA3052	<5		----	3210	EN17072	0.05		----
2256	EPA3052	<10		----	3215	IEC62321	<2		----
2258	CPSD-AN-164	0.3047		----	3218	IEC62321	<2		----
2259	IEC62321	<2.5		----	3220	EPA5030B	0.5		----
2272	EN17072	<10		----	3225	IEC62321	n.d.		----
2284	EPA3052	n.d.		----	3228	IEC62321	<10		----
2290		----		----	3237		----		----
2293	CPSC-CH-E1002-08	n.d.		----	3239	IEC62321	<2.0		----
2298		----		----	3242	Microwave	n.d.		----
2301	CPSC-CH-E1002-08	n.d.		----	3243	EN1483	0.252		----
2303	ICP-MS	<0.01		----	3246	in house	<5		----
2309	IEC62321	<5		----	3248	CHPA	<0.07		----
2310	EPA3052	<2		----	8005		----		----
2311	EPA3052	<5		----					

normality not OK
 n 11
 outliers 3
 mean (n) 0.425
 st.dev. (n) 0.4780
 R(calc.) 1.338
 R(Horwitz) (0.216)

lab 2175 first reported: 32.24
 lab 3169 first reported: 9.25457
 lab 2228 ex: zero is not a real value
 lab 2406 ex: zero is not a real value
 lab 2453 ex: zero is not a real value



APPENDIX 2; Analytical details regarding Cadmium, Lead and Mercury determinations

Lab	Technique to release/ extract the metal (Cd)	Acid / acid mixture used (Cd)	Technique to release/ extract the metal (Pb)	Acid / acid mixture used (Pb)	Technique to release/ extract the metal (Hg)	Acid / acid mixture used (Hg)
110	Acid digestion		Acid digestion		Acid digestion	
310	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
324						
330						
357	Microwave	(HNO3 first trial)	Microwave	HNO3	Microwave	HNO3
452	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
551	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
607	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
632	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3, HF
657	Microwave	HF, HNO3	Microwave	HF, HNO3	Microwave	HF, HNO3
815	Microwave	HF, HNO3	Microwave	HF, HNO3	Microwave	HF, HNO3
840	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
1051	Acid digestion	H2SO4	Microwave	HNO3		
1126	none	none	microwave	HCl, HNO3, H2O2	microwave	HCl, HNO3, H2O2
1195	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1213	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
1800	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2115						
2120	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3
2127	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2129	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2131	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2132	Microwave	HF, HNO3	Microwave	HF, HNO3	Microwave	HF, HNO3
2135	Acid digestion	H2SO4, H2O2	Acid digestion	H2SO4, H2O2	Acid digestion	H2SO4, H2O2
2146	Acid digestion	H2SO4, H2O2				
2152	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2155	Microwave	(#11050)H2SO4, HNO3, HF (#11051)H2SO4, HNO3	Microwave	(#11050)H2SO4, HNO3, HF (#11051)H2SO4, HNO3	DMA	none
2156	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
2160	Milling/pressed tablet, EDXRF spectrom.		Milling/pressed tablet, EDXRF spectrom.		Milling/pressed tablet, EDXRF spectrom.	
2165	Microwave	HF, HNO3	Microwave	HF, HNO3	Microwave	HF, HNO3
2167	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2172	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2173	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2175	Microwave	HNO3, HCl, H2O2	Microwave	HNO3, HCl, H2O2	Microwave	HNO3, HCl, H2O2
2176	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2179	Microwave	HNO3, HCl	Microwave	HNO3, HCl	Microwave	HNO3, HCl
2180	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2184	Microwave	HF, HNO3	Microwave	HF, HNO3	Microwave	HF, HNO3
2190	Acid digestion	HNO3, HCl	Acid digestion	HNO3, HCl	Acid digestion	HNO3, HCl
2196	Microwave	HNO3, H2O2, HF	Microwave	HNO3, H2O2, HF	Microwave	HNO3, H2O2
2197	Microwave	HF, HNO3				
2201	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3, HF
2202	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3, HF
2212			Microwave	HNO3, HF		
2214	XRF	none	XRF	none	XRF	none
2215						
2216	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2217	Acid digestion	HNO3, H2O2	Acid digestion	HNO3, H2O2	Acid digestion	HNO3, H2O2
2218	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3

2227	Microwave	HNO3	Microwave	Microwave	Microwave	HNO3
2228	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2229	Microwave	HNO3,H2O2	Microwave	HNO3,H2O2	Microwave	HNO3,H2O2
2236	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2241	Microwave	HNO3, HCl, HF	Microwave	HNO3, HCl, HF	Microwave	HNO3, HCl, HF
2246	Acid digestion	H2O2, H2SO4	Microwave	HNO3		
2247	Acid digestion	H2SO4+H2O2	Microwave	HNO3+HF	Microwave	HNO3+HF
2251						
2253						
2255	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3, HF
2256	Acid digestion hotplate	H2SO4	Microwave	HNO3	Acid digestion	HNO3
2258	Microwave	HNO3,H2O2	Microwave	HNO3,H2O2	Microwave	HNO3,H2O2
2259	Microwave	11050:HNO3/ HF 11051: HNO3/H2O2	Microwave	11050:HNO3/ HF 11051: HNO3/H2O2	Microwave	11050:HNO3/ HF 11051: HNO3/H2O2
2272	Microwave		Microwave		microwave	
2284	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3, HF
2290	Microwave	HNO3	Microwave	HNO3	n.a.	n.a.
2293	Microwave	H2SO4+H2O2	Microwave	HNO3	Microwave	HNO3
2298						
2301	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2303	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2309	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3, HF
2310	Microwave	HNO3,H2O2, HF	Microwave	HNO3,H2O2, HF	Microwave	HNO3,H2O2, HF
2311	Microwave	HNO3,HF	Microwave	HNO3,HF	Microwave	HNO3,HF
2312	Microwave		Microwave		Microwave	
2316	Microwave	11050:HNO3/ HF 11051: HNO3	Microwave	11050:HNO3/ HF 11051: HNO3	Microwave	11050:HNO3/ HF 11051: HNO3
2350	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3, HF
2352	Microwave	HNO3, HCl, HF	Microwave	HNO3, HCl, HF	Microwave	HNO3, HCl, HF
2353	Microwave	HNO3,HF	Microwave	HNO3,HF	Microwave	HNO3,HF
2355	Microwave	HNO3,HCl,HF,H2O2	Microwave	HNO3,HCl,HF,H2O2	Microwave	HNO3,H2O2
2357						
2363	Microwave	HNO3,HF, HCl	Microwave	HNO3,HF, HCl	Microwave	HNO3,HF, HCl
2365	Microwave	HNO3,H2O2, HF	Microwave	HNO3,H2O2, HF	Microwave	HNO3,H2O2, HF
2366	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3, HF
2369	Microwave	HNO3,H2O2, HF	Microwave	HNO3,H2O2, HF	Microwave	HNO3,H2O2, HF
2370	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2372	Microwave	HCl,HNO3,HF	Microwave	HCl,HNO3,HF	Microwave	HCl,HNO3,HF
2379	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2380	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2385	Microwave	HNO3,H2O2	Microwave	HNO3,H2O2	Microwave	HNO3,H2O2
2406	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2410	Acid digestion	H2SO4+H2O2	Microwave	HNO3+H2O2	Microwave	HNO3+H2O2
2413	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
2415	Microwave	HNO3+HF	Microwave	HNO3+HF	Microwave	HNO3+HF
2418	Microwave	acid mixture	Microwave	acid mixture	Microwave	acid mixture
2421	Microwave	HNO3, H2O2				
2424	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3
2432	Hot plate	H2SO4, HCl, HNO3				
2433	Acid digestion	HNO3	Acid digestion	HNO3	Acid digestion	HNO3
2438	Microwave	HNO3, HF	Microwave	HNO3, HF	Microwave	HNO3, HF, HCl
2441	Microwave	HNO3, H2O2, HF	Microwave	HNO3, H2O2, HF	Microwave	HNO3, H2O2, HF
2442	Acid digestion	H2SO4, HCl, HNO3				
2444	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
2445	Acid digestion oven in closed teflon vessels	HNO3 + HF	Acid digestion oven in closed teflon vessels	HNO3 + HF	Acid digestion oven in closed teflon vessels	HNO3 + HF

2449						
2451	Microwave	HNO3 + HCl	Microwave	HNO3 + HCl	Microwave	HNO3 + HCl
2453	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
3100	Microwave	HNO3 + HF	Microwave	HNO3 + HF	Microwave	HNO3, HF
3104	Acid digestion	H2SO4, H2O2				
3107	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
3110	Acid digestion	H2SO4, H2O2	Microwave	HNO3, HF	Microwave	HNO3, HF
3113	Char with acid, Ash, Acid digestion	H2SO4, HNO3	Char with acid, Ash, Acid digestion	H2SO4, HNO3		
3116	Acid digestion	H2SO4	microwave	HNO3		
3122	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
3124	Microwave	HNO3,HCl,HF	Microwave	HNO3,HCl,HF	Microwave	HNO3,HCl,HF
3126	INAA	none	INAA	none	INAA	none
3134	Acid digestion	H2SO4/HNO3	Acid digestion	H2SO4/HNO3	Acid digestion	H2SO4/HNO3
3146	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
3153	Microwave	HNO3,HF	Microwave	HNO3,HF	Microwave	HNO3,HF
3154	Microwave	HNO3,H2O2	Microwave	HNO3,H2O2	Microwave	HNO3,H2O2
3160	Microwave	HNO3,H2O2,HCl	Microwave	HNO3,H2O2,HCl	Microwave	HNO3,H2O2,HCl
3163	XRF	none	XRF	none	XRF	none
3167	Acid digestion	H2SO4, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
3169	Acid digestion	H2SO4	Microwave	HNO3	Microwave	HNO3
3172	Heating on plate		Acid digestion	HNO3	Acid digestion	HNO3
3176	Microwave	HNO3 +H2SO4	Microwave	HNO3 +H2SO4	Microwave	HNO3 +H2SO4
3182	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
3185	Microwave	HNO3,HF	Microwave	HNO3,HF	Microwave	HNO3,HF
3190	Microwave	HNO3,HF	Microwave	HNO3,HF	Microwave	HNO3,HF
3191	Microwave	HNO3, HBF4 ,H2O2	Microwave	HNO3, HBF4 H2O2	Microwave	HNO3, HBF4, H2O2
3192	Microwave	HNO3	Microwave	HNO3		
3199	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
3210	Acid digestion	HNO3, HCl	Acid digestion	HNO3, HCl	Acid digestion	HNO3, HCl
3215	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
3218	Microwave	HNO3,HF	Microwave	HNO3,HF	Microwave	HNO3,HF
3220	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
3225	Microwave	#11050:HNO3,HF #11051:HNO3	Microwave	#11050:HNO3, HF #11051HNO3	Microwave	#11050:HNO3,HF #11051:HNO3
3228	Microwave	HNO3,H2O2,HF	Microwave	HNO3,H2O2,HF	Microwave	HNO3,H2O2,HF
3237	Acid digestion	H2SO4, HNO3, HCl				
3239	Acid digestion	HNO3, HCl	Acid digestion	HNO3 , HCl	Acid digestion	HNO3 , HCl
3242	Microwave	HNO3,HF	Microwave	HNO3/HF	Microwave	HNO3, HF
3243	Microwave	HNO3, HCl	Microwave	HNO3, HCl	Microwave	HNO3, HCl
3246	Microwave	HNO3	Microwave	HNO3	Microwave	HNO3
3248	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2	Microwave	HNO3, H2O2
8005	Microwave	HNO3	Microwave	HNO3		

Analytical details regarding Hexavalent Chromium determination

Lab	Particle size	Solution	Solid/liquid ratio g/mL	Extraction conditions	Other details
110	2mm*2mm*2mm	NaOH, Na ₂ CO ₃ , MgCl ₂ , Phosphate buffer	0.05 g/ml	3 hrs at 90-95°C	continuous stirring
310					
324					
330					
357					
452					
551	500 µm	alkaline solution digestion	0.05 g/ml	3hrs at 90-95°C with constant stirring	pH 7.5 and filtered with 0.45 µm membrane
607	250	Alkaline	0.05 g/ml	3hrs at 90°C	
632	2X2X2mm	Alkaline	0.025 g/ml	3hrs at 90-95°C	
657	approx. 500 µm	NaOH,Na ₂ CO ₃	0.05 g/ml	3hrs at appro 93°C	shaker 100rpm
815	<250 µm	Alkaline	0.025 g/ml	3hrs at 90-95°C,	shaker
840					
1051					
1126					
1195					
1213		NaOH,Na ₂ CO ₃	0.02 g/ml	3hrs at 90-95°C	with continous stirring
1800					
2115					
2120	250 µm	NaOH, Na ₂ CO ₃ , MgCl ₂ , Phosphate buffer	0.025 g/ml	95°C with agitation	standard calib curve too high (0.1 to 5 mg/l) adjusted to 0.02 mg/l to 0.2 mg/l
2127					
2129	grinded to 0.1mm	sweat according ISO105E04	0.02 g/ml	0.5 hr at 40°C	
2131					
2132	2mmx2mm	diphenylcarbazine	2g/50ml	1hr at 90-95°C	continuous stirring
2135	as received	Phosphate buffer	2g/100ml	3hrs at 20°C	shaker
2146					
2152					
2155	as received	THF	0.02 g/ml	Room temp, stirring	
2156	<1mm	Alkaline	0.025 g/ml	3hrs at 95°C	
2160					
2165	<1mm*1mm	NaOH, Na ₂ CO ₃	0.05 g/ml	3hrs at 93°C	photometrical determination
2167	150µm	Na ₂ CO ₃ , NaOH, MgCl ₂	1g/25ml	1hr at 90-95°C	0.45µm Filter
2172	1mm*1mm	NaOH, Na ₂ CO ₃		3hrs at 95°C	Surfactant: Triton X100
2173	1mmx5mm	NaOH, Na ₂ CO ₃ , MgCl ₂ , Phosphate buffer	1g/20ml	1hr at 90°C	
2175	2X2X2mm	NaOH, Na ₂ CO ₃	1g/50ml	1hr at 90-95°C	
2176	90-250 µm	NaOH, Na ₂ CO ₃ , MgCl ₂ , Phosphate buffer	0.5g/50ml	3 hrs at 90-95°	hotplate extraction
2179	powder	Na ₂ CO ₃ , NaOH, MgCl ₂	1g/75ml	3 hrs at 90-96°	
2180					
2184	grinding	NaOH, Na ₂ CO ₃	0.25g/25ml	3hrs at 90°C	
2190					
2196	500 µm	NaOH, Na ₂ CO ₃	0.025 g/ml	3 hrs at 90-95°	
2197					
2201	250 µm	NaOH, Na ₂ CO ₃	0.5g/20ml	3hrs at 95°C	waterbath, 150 rpm/min.
2202	no grinding	THF+NMP /alkali solution	0.2g/40ml	30 min, no heating	
2212					
2214					
2215					
2216	<250 µm	NaOH, Na ₂ CO ₃	0.02 g/ml	4hrs at 90°C	
2217	as received	Na ₂ CO ₃ , NaOH, MgCl ₂	0.08g/ml	1hr at 95°C	photometrical determination
2218					

2227					
2228					
2229	1-2mm	phosphate buffer	0.1g/5ml	1hr at 30°C	43 KHz ultrasonic
2236					
2241	1mmx1mm	NaOH, Na ₂ CO ₃	2.5g/50ml	3hrs at 92.5°C	shake in waterbath
2246					
2247	Powder form by help of cryo mill	NaOH+Na ₂ CO ₃ + phosphate Buffer	1g/20ml	3hrs at 90°C	waterbath
2251					
2253					
2255	approx 1mm	Phosphate buffer, digestion solution, 5 M HNO ₃		1 hr at 90-95°C	water bath with constant stirring
2256	5mmx5mm pieces	NaOH + Na ₂ O ₃ as digestion solution, phosphate buffer.	0.5g/100ml	3hrs at 95°C	
2258					
2259					
2272					
2284	1mmx1mmx1mm	NaOH, Na ₂ CO ₃ , MgCl ₂ , Phosphate buffer	1g/50ml	3hrs at 95°C	waterbath
2290	1mmx1 mm	NaOH + Na ₂ O ₃	0.5g/25ml	3hrs at 90 °C	with constant stirring
2293	as received	phosphate buffer	1g/50ml	3hrs at 18-28°C	water bath
2298					
2301					
2303					
2309	250µm size sieve	phosphate buffer	0.025 g/ml	3hrs at 95°C	
2310					
2311					
2312	<1mm diameter	NaOH + Na ₂ O ₃	1.25g/50ml	3 hrs 89°C shaker bath with constant stirring.	Triton X was added in 11050 in order to dip the sample into the solution.
2316	250 µm	diphenylcarbazine	1.25g/50ml	3hrs at 90°C	shaker water bath
2350	Freezing grinding	Na ₂ CO ₃ , NaOH	0.02 g/ml	3 hrs at 90-95°C	shaker water bath
2352	<250 µm	Na ₂ CO ₃ , NaOH	0.05 g/ml	3hrs at 92.5°C	60 cycle/second
2353	<2X2X2mm	Na ₂ CO ₃ , NaOH	0.025 g/ml	3hrs at 90-95°C	with continuous shaking
2355	350µm	Alkaline solution	1g/20ml	3hrs at 92.5°C	
2357					
2363	250 µm	NaOH, Na ₂ CO ₃ , MgCl ₂ , phosphate buffer	0.05 g/ml	3hrs at 90-95°C	with continuous stirring
2365	<250 µm	NaOH + Na ₂ O ₃	2.5g/100ml	3hrs at 90-95°C	
2366	<500µm by cryo	NaOH, Na ₂ CO ₃ , MgCl ₂ , phosphate buffer	2.5g/50ml	3hrs at 90-95°C	with constant shaking
2369	<250x250x250µm	Na ₂ CO ₃ ,NaOH,MgCl ₂	1g/20ml	3hrs at 92.5°C	stirring waterbath
2370	0.5mm x 0.5mm	NaOH/Na ₂ CO ₃	2.5g/50ml	3hrs at 90°C	with continuous stirring
2372	<0.25mm	Na ₂ CO ₃ ,NaOH,MgCl ₂	2.5g/50ml	3hrs at 90-95°C	waterbath
2379	250µm	Alkaline extraction	1g/25ml	3hrs at 90°C	shaker water bath
2380	1.25g	Na ₂ CO ₃ ,NaOH,MgCl ₂	1.25g/25ml	1hr at 90-95°C	
2385	<0.1mm	NaOH, Na ₂ CO ₃ , phosphate buffer	1.25g/25ml	3hrs at 95°C	ionchromatography
2406	2mm*2mm	NaOH+Na ₂ CO ₃	0.01 g/ml	3hrs at 95°C	shaking water bath
2410					
2413					
2415	as received	NaOH + Na ₂ CO ₃	1g/50ml	1hr at 90-95°C	
2418		Solvent	0.5g/100ml	1hr at 95°C	
2421					
2424					
2432					
2433		H ₂ SO ₄	0.5 g sample	75°C	
2438	as received	NaPOH, Na ₂ CO ₃	0.02 g/ml	1hr at 90-95°C	shaking water bath
2441					

2442					
2444					
2445	Grinding <1mm	Na ₂ CO ₃ ,NaOH,MgCl ₂	0.0082 g/ml - 0.0198 g/ml	1hr, 90-95°C, stir	white sample is of smaller size then the yellow sample
2449					
2451					
2453	0.5mm	NaOH, Na ₂ CO ₃	2g/50ml	3hrs, 90-95°C	
3100	<250µm	NaOH, Na ₂ CO ₃	1g/25ml	3hrs, 90-95°C	
3104					
3107					
3110					
3113					
3116					
3122					
3124					
3126					
3134					
3146	powder	NaOH, Na ₂ CO ₃	1g/20ml	3hrs at 95°C, continous stirring	Measurement with IC/UV-VIS
3153	grind into powder	NaOH, Na ₂ CO ₃ , phosphate buffer	2.5g/50ml	3 hours, 90-95°C	stir bath, hot plate
3154					
3160					
3163					
3167					
3169	<250µm	NaOH, Na ₂ CO ₃ , MgCl ₂	1g/50ml	3hrs at 90±2°C	waterbath
3172					
3176	1g	Na ₂ CO ₃	1:2	30 min at 40°C	waterbath
3182	250µm	NaOH, Na ₂ CO ₃ , phosphate buffer	2.5g/50ml	3 hrs at 90°C	
3185	<250µm	NaOH, Na ₂ CO ₃	2.5g/50ml	3 hrs at 90°C	with constant stirring
3190	grinded	NaOH, Na ₂ CO ₃	1:20	3 hrs at 95°C	shaking water bath
3191	<250µm	NaOH, Na ₂ CO ₃	1:50	3hrs at 93±2°C	ultrasonic
3192					
3199	as received	NaOH, Na ₂ CO ₃	0.5g/50ml	1hr at 90-95°C	shaking water bath
3210	orginal	EN17075			
3215	<250µm	NaOH, Na ₂ CO ₃	1g/50ml	3hrs at 93°C	#11050 sample could not be grounded into fine powder
3218	250µm	NaOH, Na ₂ CO ₃	1g/50ml	3hrs at 95°C	
3220	approx 1.0 mm	NaOH, Na ₂ CO ₃	1:50	1hr at 90°C	
3225	2mm*1mm*1mm	NaOH, Na ₂ CO ₃ , MgCl ₂ , Phosphate buffer	0.5g/100ml	3hrs at 93°C	water shaking bath
3228	< 250 µm	Na ₂ CO ₃ , NaOH	1g/20ml	3hrs at 93°C	waterbath
3237					
3239	<500µm	Na ₂ CO ₃ , NaOH	1.25g/25ml	3hrs at 90-95°C	
3242					
3243	< 2 mm	phosphate buffer	1g/20ml	1hr at 37°C	shaking
3246	<1mm	K ₂ CO ₃ +KOH	0.01 g/ml	3hrs at 90-95°C	stirring
3248	powder	NaOH, Na ₂ CO ₃	1:50	2hrs at 90-95°C	
8005					

APPENDIX 3**Number of participating laboratories per country**

4 labs in BANGLADESH
1 lab in BELGIUM
3 labs in BRAZIL
1 lab in DENMARK
2 labs in FINLAND
3 labs in FRANCE
9 labs in GERMANY
1 lab in GREECE
2 labs in GUATEMALA
18 labs in HONG KONG
1 lab in HUNGARY
8 labs in INDIA
1 lab in ISRAEL
2 labs in ITALY
2 labs in JAPAN
4 labs in KOREA
2 labs in MALAYSIA
1 lab in MEXICO
30 labs in P.R. of CHINA
1 lab in PAKISTAN
3 labs in PHILIPPINES
2 labs in PORTUGAL
4 labs in SINGAPORE
3 labs in SPAIN
1 lab in SWEDEN
2 labs in SWITZERLAND
2 labs in TAIWAN R.O.C.
6 labs in THAILAND
4 labs in THE NETHERLANDS
3 labs in TURKEY
8 labs in U.S.A.
4 labs in UNITED KINGDOM
5 labs in VIETNAM

APPENDIX 4

Abbreviations:

C	= final result after checking of first reported suspect 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
n.a.	= not applicable

Literature:

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