# Results of Proficiency Test
# Total Metals in Polymers
# September 2020


Organized 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 instance, in the European Directive 2011/65/EC maximum concentrations are specified for metals in plastic: the content of Lead (Pb), Mercury (Hg),) and Hexavalent Chromium (CrVI) may not exceed 0.1%M/M, while the maximum concentration for Cadmium (Cd) may not exceed 0.01%M/M.
Since 1998 a proficiency scheme for the determination of Metals in plastics is organized by the Institute for Interlaboratory Studies every year. Starting with only total Cadmium, over the years the scope was extended with other elements.

In this interlaboratory study 171 laboratories in 39 different countries registered for participation. See appendix 4 for the number of participants per country. In this report the results of this 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 (PT). Sample analyzes for fit-for-use and homogeneity were subcontracted to an ISO/IEC17025 accredited laboratory. It was decided to send 2 different polymer samples labelled #20650 and #20651 of approximately 6 grams each.
The participants were requested to report 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/IEC17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited 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

For the first sample a batch of dark grey PVC rings, artificially fortified to be positive on one or more metals, was selected. After homogenization 200 small bags were filled with approximately 6 grams of the polymer material and labelled #20650. The homogeneity of the subsamples was checked by determination of the totals of Copper and Nickel according to an in house method on 9 stratified randomly selected subsamples.

| | Copper in mg/kg | Nickel in mg/kg |
|---|---|---|
| sample #20650-1 | 292.2 | 198.9 |
| sample #20650-2 | 295.7 | 195.4 |
| sample #20650-3 | 299.7 | 198.7 |
| sample #20650-4 | 298.7 | 208.2 |
| sample #20650-5 | 295.5 | 200.7 |
| sample #20650-6 | 295.4 | 205.2 |
| sample #20650-7 | 292.6 | 202.2 |
| sample #20650-8 | 284.0 | 197.9 |
| sample #20650-9 | 287.2 | 193.9 |

Table 1: homogeneity test results of subsamples #20650

From the above test results the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibility estimated from the Horwitz equation in agreement with the procedure of ISO13528, Annex B2 in the next table.

| | Copper in mg/kg | Nickel in mg/kg |
|---|---|---|
| r (observed) | 14.4 | 12.7 |
| reference method | Horwitz | Horwitz |
| 0.3 * R (reference method) | 16.8 | 12.1 |

Table 2: evaluation of the repeatabilities of subsamples #20650

The calculated repeatabilities were in agreement with 0.3 times the corresponding target reproducibility estimated from the Horwitz equation. Therefore, homogeneity of the subsamples was assumed.

For the second sample a batch of beige Polypropylene bits, artificially fortified to be positive on one or more metals, was selected. After homogenization 200 small bags were filled with approximately 6 grams of the polymer material and labelled #20651. The homogeneity of the subsamples was checked by determination of total Cadmium using test method EN1122:01 on 4 stratified randomly selected subsamples.

| | Cadmium in mg/kg |
|---|---|
| sample #20651-1 | 85 |
| sample #20651-2 | 86 |
| sample #20651-3 | 85 |
| sample #20651-4 | 84 |

Table 3: homogeneity test results of subsamples #20651

From the above test results the repeatability was calculated and compared with 0.3 times the reproducibility of the reference test method in agreement with the procedure of ISO13528, Annex B2 in the next table.

| | Cadmium in mg/kg |
|---|---|
| r (observed) | 2.3 |
| reference test method | EN1122:01 |
| 0.3 * R (reference test method) | 8.5 |

Table 4: evaluation of the repeatability of subsamples #20651

The calculated repeatability was lower than 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

To each of the participating laboratories one sample labelled #20650 and one sample labelled #20651 were sent on August 12, 2020.

## 2.5 ANALYZES

The participants were requested to determine on both samples the total of: Antimony, Cadmium, Chromium, Hexavalent Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Manganese and Tin.
It was also requested to report if the laboratory was accredited for the requested elements that were determined 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 test 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 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 per determination in appendices 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-analysis). Additional or corrected test results are used for the data analysis and the original test results are placed under 'Remarks' in the test result tables in appendices 1 or 2. 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 Organisation, Statistics and Evaluation’ (iis-protocol, version 3.5) of June 2018. For statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as ‘<…’ or ‘>…’ were 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 dataset does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.

According to ISO5725 the original test results per determination were submitted to Dixon’s, 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 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 requirements 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 reproducibilities 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. This 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 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 variation in this interlaboratory study.

This 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, 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 result is fit-for-use.

The z-scores were calculated according to:

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

The $z_{(target)}$ scores are listed in the test 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

In this interlaboratory study some problems were encountered with the dispatch of the samples due to the COVID-19 pandemic. Therefore, the reporting time on the data entry portal was extended with one week. After this period still nine participants did not report any test results. Not all participants were able to report all elements requested.
Finally, 162 reporting laboratories submitted 519 numerical test results. Observed were 8 outlying test results, which is 1.5%. 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.

### 4.1 EVALUATION PER SAMPLE AND PER ELEMENT

In this section the results are discussed per sample and per element. 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 together with the reported test results in appendix 1. The abbreviations, used in these tables, are explained in appendix 5.

Test method EN1122 is considered to be the official test method for the determination of Cadmium in polymers. The precision data mentioned in EN1122 were used to evaluate the Cadmium test results. Unfortunately, a suitable reference test method, providing the precision data, is not available for all other elements. For tests that have no available precision data, the calculated reproducibility was compared against the reproducibility estimated from the Horwitz equation.

**Sample #20650**

Total Copper as Cu: This determination may be problematic. Five statistical outliers were observed. The calculated reproducibility after rejection of statistical outliers is not in agreement with the estimated reproducibility using the Horwitz equation.

Total Nickel as Ni: This determination may be problematic. One statistical outlier was observed. The calculated reproducibility after rejection of statistical outlier is not in agreement with the estimated reproducibility using the Horwitz equation.

Other metals: The majority of participants agreed on a concentration near or below the limit of detection for the other elements. The test results are given in appendix 2.

**Sample #20651**

Total Cadmium as Cd: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN1122:01.

Total Lead as Pb: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of statistical outlier is in full agreement with the estimated reproducibility using the Horwitz equation.

Other metals: The majority of participants agreed on a concentration near or below the limit of detection for the other elements. The test results are given in appendix 2.

### 4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the reference test method or 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, the calculated reproducibility (2.8 * standard deviation) and the target reproducibility derived from literature reference test methods (in casu EN test method) or estimated using the Horwitz equation are presented in the next table.

| Element | unit | n | average | 2.8 * sd | R(target) |
|---|---|---|---|---|---|
| Total Copper as Cu | mg/kg | 96 | 273.5 | 61.6 | 52.7 |
| Total Nickel as Ni | mg/kg | 105 | 187.6 | 43.5 | 38.2 |

Table 5: performance overview on sample #20650

| Element | unit | n | average | 2.8 * sd | R(target) |
|---|---|---|---|---|---|
| Total Cadmium as Cd | mg/kg | 156 | 94.5 | 18.6 | 23.6 |
| Total Lead as Pb | mg/kg | 154 | 95.1 | 20.4 | 21.5 |

Table 6: performance overview on sample #20651

Without further statistical calculations, it can be concluded that there is a good compliance of the group of participating laboratories with the reference test method/target for the elements Cadmium and Lead but not a good compliance for Copper and Nickel. See also the discussion in paragraphs 4.1 and 5.

### 4.3 COMPARISON OF THE PROFICIENCY TEST OF SEPTEMBER 2020 WITH PREVIOUS PTS

| | September 2020 | August 2019 | September 2018 | September 2017 | September 2016 |
|---|---|---|---|---|---|
| Number of reporting laboratories | 162 | 177 | 166 | 167 | 142 |
| Number of test results | 519 | 1253 | 1471 | 960 | 1041 |
| Number of statistical outliers | 8 | 42 | 46 | 24 | 24 |
| Percentage of statistical outliers | 1.5% | 3.4% | 3.1% | 2.5% | 2.3% |

Table 7: 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.

| Element | September 2020 | August 2019 | September 2018 | September 2017 | September 2016 | 2015 - 2004 | Target |
|---|---|---|---|---|---|---|---|
| Sb | -- | -- | 11-14% | 10% | -- | 9% | 7-9% |
| Cd | 7% | 7-10% | 8-12% | 8% | 9% | 7-12% | 9% |
| Cr | -- | 8-11% | 7% | -- | 10% | 7-24% | 7-10% |
| Cr6+ | -- | 9-22% | 6% | -- | 52% | 23-76% | 7-9% |
| Co | -- | -- | -- | 8% | 8% | 10-11% | 7-10% |
| Cu | 8% | -- | 6% | -- | 8% | 7% | 7-10% |
| Pb | 8% | 7% | 7% | 6% | 10% | 7-11% | 6-9% |
| Hg | -- | -- | 9-20% | -- | 8-14% | 13-46% | 7-13% |
| Ni | 8% | 8% | -- | 10% | 9% | -- | 7-10% |
| Mn | -- | 10% | -- | -- | -- | -- | 7-10% |
| Sn | -- | 13% | -- | -- | -- | -- | 7-10% |

Table 8: development of the uncertainties over the years

The RSDs observed in this PT are in line with RSDs observed in previous iis PTs.

Sample #20651 was used before in Proficiency Test iis06P03 as sample #0652. It is observed that the current PT findings of the polymer sample containing Cadmium and Lead show a very similar average concentration level and calculated reproducibility, see next table.

| Element | unit | #20651 | | | #0652 | | |
|---|---|---|---|---|---|---|---|
| | | n | average | R(calc) | n | average | R(calc) |
| Total Cadmium as Cd | mg/kg | 156 | 94.5 | 18.6 | 76 | 95.7 | 18.8 |
| Total Lead as Pb | mg/kg | 154 | 95.1 | 20.4 | 71 | 95.9 | 24.5 |

Table 9: comparison of sample #20651 with sample #0652

### 4.4 EVALUATION OF THE ANALYTICAL DETAILS

The participants were asked to provide several analytical details which are listed in appendix 3. Based on the reported answers the following can be summarized:

- A vast majority (90%) mentioned that they are ISO/IEC17025 accredited to determine the reported elements.
- About 72% further cut the samples prior to analysis, 17% used the samples as received and 11% further grinded the samples.
- Almost 90% used 0.5 grams or less of sample intake, mostly 0.1 to 0.2 grams.
- To release the metals from the sample about 80% used Microwave, 13% used Acid Digestion and 7% Other e.g. by XRF which does not actually release the metals from the sample.
- In case of Acid Digestion, Nitric Acid or a mixture of Nitric/Hydrochloric Acid was used.
- The technique to quantify the metals was most often ICP-OES (53%) or ICP-MS (28%) followed by other techniques like AAS, XRF, ICP-AES and UV-VIS.

As the majority of the group follow the same analytical procedures no separate statistical analysis has been performed.

## 5 DISCUSSION

In this proficiency test for the determination of total metals in polymers two different type of polymers were used: PVC (Polyvinylchloride) and Polypropylene. In the PVC sample two different metals were positively identified by the participants while two other metals were found in the Polypropylene sample. Based on the observed vs. target reproducibilities the metals in the Polypropylene sample could be less difficult to determine than in the PVC sample, but this could also be due to the different type of metals that were found in both samples. See also the discussion in §4.1.

## 6 CONCLUSION

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 Copper as Cu on sample #20650; results in mg/kg

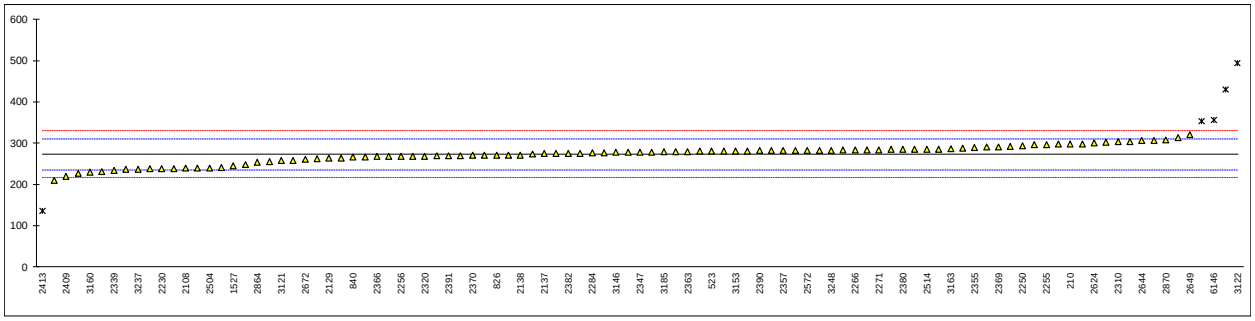
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 110 | | ----- | | ----- | 2375 | EN16711-1 | 286 | | 0.67 |
| 210 | CPSC-CH-E1002-08 | 298.39 | | 1.33 | 2378 | EN16711-1 | 276.0 | | 0.13 |
| 230 | | ----- | | ----- | 2379 | | ----- | | ----- |
| 339 | In house | 267.8 | | -0.30 | 2380 | CPSC-CH-E1002-08 | 286.00 | | 0.67 |
| 348 | | ----- | | ----- | 2381 | | Out Cap | | ----- |
| 362 | | ----- | | ----- | 2382 | EN16711-1 | 275.3 | | 0.10 |
| 523 | EPA3052 | 280.94 | | 0.40 | 2384 | | ----- | | ----- |
| 551 | | ----- | | ----- | 2385 | In house | 239 | | -1.83 |
| 623 | In house | 242.12 | | -1.67 | 2387 | | ----- | | ----- |
| 826 | EPA3052 | 271.7 | | -0.09 | 2390 | CPSC-CH-E1002-08 | 282.396 | | 0.47 |
| 840 | EN16711-1 | 266.560 | | -0.37 | 2391 | IEC62321-5 | 270.0 | | -0.18 |
| 841 | ISO8124-5 | 269 | | -0.24 | 2392 | | ----- | | ----- |
| 1051 | | ----- | | ----- | 2406 | | ----- | | ----- |
| 1082 | In house | 240 | | -1.78 | 2409 | In house | 220.75 | C | -2.80 |
| 1126 | | ----- | | ----- | 2410 | IEC62321-5 | 281 | | 0.40 |
| 1527 | In house | 245.6 | | -1.48 | 2413 | In house | 136.2 | R(0.01) | -7.30 |
| 1842 | | not analysed | | ----- | 2426 | EN16711-1 | 265.02 | | -0.45 |
| 1910 | | not analysed | | ----- | 2431 | In house | 288.30 | | 0.79 |
| 2108 | EN16711-1 | 239.6 | | -1.80 | 2444 | | ----- | | ----- |
| 2115 | EN16711-1 | 276.59 | | 0.17 | 2453 | | ----- | | ----- |
| 2118 | CPSC-CH-E1002-08 | 238.541 | | -1.86 | 2460 | | ----- | | ----- |
| 2120 | EN16711-1 | 211 | | -3.32 | 2475 | In house | not analysed | | ----- |
| 2129 | EN16711-1 | 264 | | -0.50 | 2477 | | ----- | | ----- |
| 2131 | In house | 286.316 | | 0.68 | 2488 | | ----- | | ----- |
| 2132 | | ----- | | ----- | 2492 | In house | not detected | | ----- |
| 2137 | KS M6959 | 275.032 | | 0.08 | 2500 | | ----- | | ----- |
| 2138 | CPSC-CH-E1002-08 | 271.9 | | -0.08 | 2504 | IEC62321-5 | 240.076 | | -1.78 |
| 2139 | IEC62321-5 | 273.7 | | 0.01 | 2511 | | ----- | | ----- |
| 2165 | | not applicable | | ----- | 2514 | In house | 286.0658 | | 0.67 |
| 2176 | IEC62321-5 | not analysed | | ----- | 2529 | | ----- | | ----- |
| 2182 | | ----- | | ----- | 2557 | | ----- | | ----- |
| 2184 | IEC62321-5 | not applicable | | ----- | 2560 | EN16711-1 | 296.35 | | 1.22 |
| 2201 | CPSC-CH-E1002-08 | 279.95 | | 0.34 | 2561 | CPSC-CH-E1002-08 | 248.11 | | -1.35 |
| 2202 | EPA3052 | 271 | | -0.13 | 2563 | | ----- | | ----- |
| 2216 | | ----- | | ----- | 2564 | | ----- | | ----- |
| 2218 | | ----- | | ----- | 2568 | | ----- | | ----- |
| 2229 | ASTM F963 | ----- | | ----- | 2569 | CPSC-CH-E1002-08 | 284 | | 0.56 |
| 2230 | EPA3051 | 239 | | -1.83 | 2572 | IEC62321-5 | 283 | | 0.51 |
| 2232 | IEC62321-5 | not applicable | | ----- | 2573 | EPA3052 | 227.479 | | -2.45 |
| 2236 | | ----- | | ----- | 2590 | EN16711-1 | 231.3 | | -2.24 |
| 2250 | EN16711-1 | 293.86 | | 1.08 | 2591 | | ----- | | ----- |
| 2255 | EN16711-1 | 297.2 | | 1.26 | 2603 | GB31604.49/5009.268 | 285.0510 | | 0.62 |
| 2256 | EPA3051 | 268.778 | | -0.25 | 2608 | | ----- | | ----- |
| 2258 | | not analysed | | ----- | 2621 | In house | 278.9 | | 0.29 |
| 2264 | | ----- | | ----- | 2624 | In house | 301.9 | | 1.51 |
| 2265 | | ----- | | ----- | 2630 | | ----- | | ----- |
| 2266 | In house | 284 | | 0.56 | 2643 | EN16711-1 | 269.67 | | -0.20 |
| 2271 | EPA3052 | 284.6 | | 0.59 | 2644 | EN16711-1 | 307.2 | | 1.79 |
| 2284 | EN16711-1 | 276.42 | | 0.16 | 2649 | CPSC-CH-E1002-08 | 320.8 | | 2.52 |
| 2290 | IEC62321-5 | 279 | | 0.29 | 2672 | IEC62321-5 | 261.052 | | -0.66 |
| 2293 | CPSC-CH-E1002-08 | 256.09 | | -0.92 | 2674 | | ----- | | ----- |
| 2294 | ISO8124-5 | not analysed | | ----- | 2678 | | ----- | | ----- |
| 2297 | IEC62321-5 | 259.2 | | -0.76 | 2734 | CPSC-CH-E1002-08 | 313.45 | | 2.13 |
| 2301 | EN16711-1 | 236.9 | | -1.94 | 2736 | | ----- | | ----- |
| 2310 | EN16711-1 | 304 | | 1.62 | 2794 | IEC62321-3-1 | 430 | R(0.01) | 8.32 |
| 2311 | CPSC-CH-E1002-08 | 302.78 | | 1.56 | 2804 | EN16711-1 | 304.199 | | 1.63 |
| 2314 | | ----- | | ----- | 2826 | | ----- | | ----- |
| 2316 | In house | 293.1 | | 1.04 | 2829 | | ----- | | ----- |
| 2320 | | 269 | | -0.24 | 2833 | IEC62321-3-1 | not analysed | | ----- |
| 2339 | In house | 235 | | -2.05 | 2835 | IEC62321-5 | 281.45 | | 0.42 |
| 2347 | EPA3052 | 279 | | 0.29 | 2853 | | ----- | | ----- |
| 2350 | EPA3052 | 282.4 | | 0.47 | 2864 | IEC62321-5 | 253.91 | | -1.04 |
| 2352 | In house | 275.2 | | 0.09 | 2870 | EN16711-1 | 308.7 | | 1.87 |
| 2353 | IEC62321-5 | NA | | ----- | 2885 | | ----- | | ----- |
| 2355 | EPA3052 | 289.8 | | 0.87 | 2900 | In house | not analysed | | ----- |
| 2357 | ISO8124-5 | 282.4 | | 0.47 | 3100 | CPSC-CH-E1002-08 | 283.532 | | 0.54 |
| 2358 | EPA3051 | N/A | | ----- | 3110 | | ----- | | ----- |
| 2363 | EPA3052 | 280 | | 0.35 | 3111 | | ----- | | ----- |
| 2365 | EN16711-1 | 268.2 | | -0.28 | 3116 | | ----- | | ----- |
| 2366 | IEC62321-5 | 268.14 | | -0.28 | 3118 | EN16711-1 | 262.62 | | -0.58 |
| 2369 | EPA3052 | 291.2 | | 0.94 | 3121 | In house | 259 | | -0.77 |
| 2370 | EPA3052 | 271 | | -0.13 | 3122 | CPSC-CH-E1002-08 | 495 | R(0.01) | 11.78 |
| 2372 | EPA3052 | 307.3 | | 1.80 | 3124 | EPA3052 | 354 | R(0.05) | 4.28 |
| 2374 | EN16711-1 | 270.02 | | -0.18 | 3146 | In house | 278 | | 0.24 |

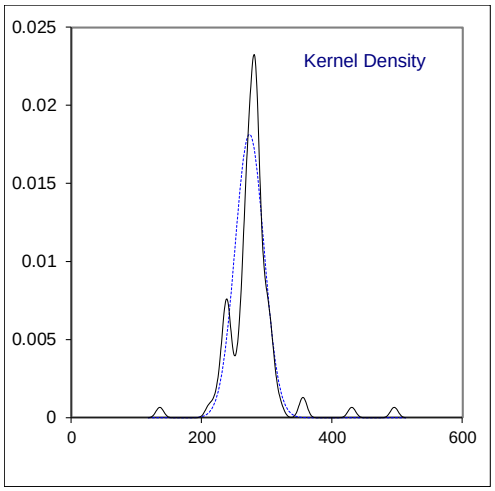
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 3153 | IEC62321-5 | 281.1 | | 0.41 | 3214 | EPA3052 | 280.80 | | 0.39 |
| 3154 | EN16711-1 | 297.76 | | 1.29 | 3216 | In house | 271.731 | | -0.09 |
| 3160 | CPSC-CH-E1002-08 | 230.66 | | -2.28 | 3225 | | not analysed | | ----- |
| 3163 | In house | 287 | | 0.72 | 3228 | | ----- | | ----- |
| 3166 | | ----- | | ----- | 3237 | EN16711-1 | 236.98 | | -1.94 |
| 3172 | | ----- | | ----- | 3239 | | ----- | | ----- |
| 3182 | IEC62321-5 | not analysed | | ----- | 3246 | EN16711-1 | 282.63 | | 0.49 |
| 3183 | | ----- | | ----- | 3248 | CPSC-CH-E1002-08 | 283 | | 0.51 |
| 3185 | CPSC-CH-E1002-08 | 279.7 | | 0.33 | 6146 | IEC62321-3-1 | 356.62 | R(0.05) | 4.42 |
| 3190 | IEC62321-5 | 283 | | 0.51 | 8005 | | ----- | | ----- |
| 3197 | EPA3052 | 299.0 | | 1.36 | 8008 | | ----- | | ----- |
| 3210 | In house | 291 | | 0.93 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 96 |
| outliers | 5 |
| mean (n) | 273.4716 |
| st.dev. (n) | 22.01543 |
| R(calc.) | 61.6432 |
| st.dev.(Horwitz) | 18.80357 |
| R(Horwitz) | 52.6500 |

RSD=8%

Lab 2409 first reported 171.800



## Determination of total Nickel as Ni on sample #20650; results in mg/kg

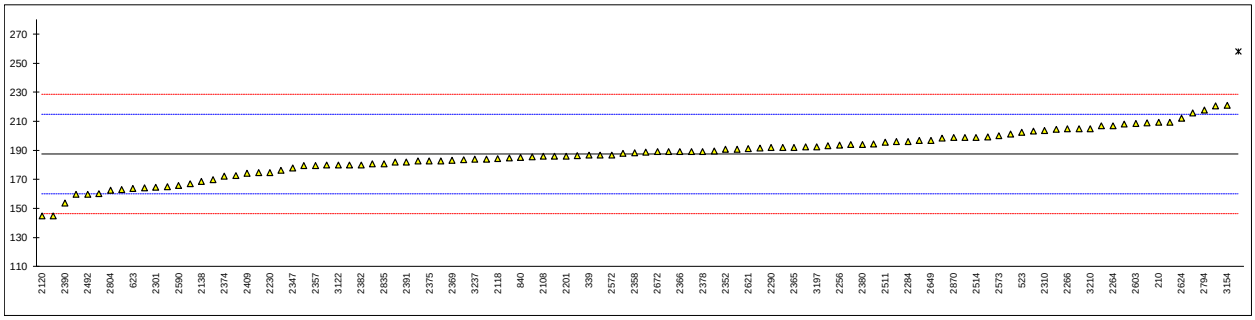
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 110 | | ----- | | ----- | 2375 | EN16711-1 | 183 | | -0.33 |
| 210 | CPSC-CH-E1002-08 | 209.28 | | 1.59 | 2378 | EN16711-1 | 189.4 | | 0.14 |
| 230 | | ----- | | ----- | 2379 | | ----- | | ----- |
| 339 | In house | 186.9 | | -0.05 | 2380 | CPSC-CH-E1002-08 | 194.340 | | 0.50 |
| 348 | | ----- | | ----- | 2381 | | Out Cap | | ----- |
| 362 | | ----- | | ----- | 2382 | EN16711-1 | 180.2 | | -0.54 |
| 523 | IEC62321-5 | 202.72 | | 1.11 | 2384 | | ----- | | ----- |
| 551 | | ----- | | ----- | 2385 | In house | 167 | | -1.51 |
| 623 | In house | 163.79 | | -1.74 | 2387 | | ----- | | ----- |
| 826 | In house | 186.1 | | -0.11 | 2390 | CPSC-CH-E1002-08 | 153.789 | | -2.47 |
| 840 | EN16711-1 | 185.459 | | -0.15 | 2391 | IEC62321-5 | 182.0 | | -0.41 |
| 841 | EN16711-1 | 160 | | -2.02 | 2392 | | ----- | | ----- |
| 1051 | | ----- | | ----- | 2406 | CPSC-CH-E1002-08 | 186.9 | | -0.05 |
| 1082 | In house | 175 | | -0.92 | 2409 | In house | 174.3 | C | -0.97 |
| 1126 | | ----- | | ----- | 2410 | IEC62321-5 | 180 | | -0.55 |
| 1527 | In house | 179.7 | | -0.58 | 2413 | | ----- | | ----- |
| 1842 | | not analysed | | ----- | 2426 | EN16711-1 | 185.81 | | -0.13 |
| 1910 | | not analysed | | ----- | 2431 | In house | 209.47 | | 1.61 |
| 2108 | EN16711-1 | 186.0 | | -0.11 | 2444 | | ----- | | ----- |
| 2115 | EN16711-1 | 206.93 | | 1.42 | 2453 | | ----- | | ----- |
| 2118 | CPSC-CH-E1002-08 | 184.43 | | -0.23 | 2460 | | ----- | | ----- |
| 2120 | EN16711-1 | 145 | | -3.12 | 2475 | In house | not analysed | | ----- |
| 2129 | EN16711-1 | 196 | | 0.62 | 2477 | | ----- | | ----- |
| 2131 | In house | 208.118 | | 1.51 | 2488 | | ----- | | ----- |
| 2132 | | ----- | | ----- | 2492 | In house | 160.0 | | -2.02 |
| 2137 | KS M6956 | 183.029 | | -0.33 | 2500 | | ----- | | ----- |
| 2138 | CPSC-CH-E1002-08 | 168.8 | | -1.37 | 2504 | IEC62321-5 | 165.189 | | -1.64 |
| 2139 | IEC62321-5 | 199.5 | | 0.88 | 2511 | | 195.8 | | 0.60 |
| 2165 | | not applicable | | ----- | 2514 | In house | 199.0417 | | 0.84 |
| 2176 | IEC62321-5 | not analysed | | ----- | 2529 | | ----- | | ----- |
| 2182 | | ----- | | ----- | 2557 | | ----- | | ----- |
| 2184 | IEC62321-5 | not applicable | | ----- | 2560 | EN16711-1 | 196.78 | | 0.68 |
| 2201 | CPSC-CH-E1002-08 | 186.25 | | -0.10 | 2561 | CPSC-CH-E1002-08 | 170.00 | | -1.29 |
| 2202 | In house | 184 | | -0.26 | 2563 | | ----- | | ----- |
| 2216 | | ----- | | ----- | 2564 | | ----- | | ----- |
| 2218 | | ----- | | ----- | 2568 | | ----- | | ----- |
| 2229 | | ----- | | ----- | 2569 | CPSC-CH-E1002-08 | 192 | | 0.33 |
| 2230 | CPSC-CH-E1002-08 | 175 | | -0.92 | 2572 | IEC62321-5 | 187 | | -0.04 |
| 2232 | IEC62321-5 | not applicable | | ----- | 2573 | EPA3052 | 200.178 | | 0.92 |
| 2236 | | ----- | | ----- | 2590 | EN16711-1 | 166.1 | | -1.57 |
| 2250 | EN16711-1 | 204.61 | | 1.25 | 2591 | | ----- | | ----- |
| 2255 | EN16711-1 | 199.0 | | 0.84 | 2603 | GB31604.49/5009.268 | 208.7920 | | 1.56 |
| 2256 | CPSC-CH-E1002-08 | 193.638 | | 0.45 | 2608 | | ----- | | ----- |
| 2258 | | not analysed | | ----- | 2621 | In house | 191.2 | | 0.27 |
| 2264 | CPSC-CH-E1002-08 | 207.0 | | 1.42 | 2624 | In house | 212.3 | | 1.81 |
| 2265 | | ----- | | ----- | 2630 | | ----- | | ----- |
| 2266 | In house | 205 | | 1.28 | 2643 | EN16711-1 | 160.25 | | -2.00 |
| 2271 | EN16711-1 | 192.5 | | 0.36 | 2644 | EN16711-1 | 209.1 | | 1.58 |
| 2284 | EN16711-1 | 196.11 | | 0.63 | 2649 | CPSC-CH-E1002-08 | 197.0 | | 0.69 |
| 2290 | IEC62321-5 | 192 | | 0.33 | 2672 | IEC62321-5 | 189.155 | | 0.12 |
| 2293 | CPSC-CH-E1002-08 | 183.79 | | -0.28 | 2674 | | ----- | | ----- |
| 2294 | CPSC-CH-E1002-08 | not analysed | | ----- | 2678 | | ----- | | ----- |
| 2297 | IEC62321-5 | 188.3 | | 0.05 | 2734 | CPSC-CH-E1002-08 | 182.79 | | -0.35 |
| 2301 | EN16711-1 | 164.85 | | -1.66 | 2736 | | ----- | | ----- |
| 2310 | EN16711-1 | 204 | | 1.20 | 2794 | IEC62321-3-1 | 218 | | 2.23 |
| 2311 | CPSC-CH-E1002-08 | 198.626 | | 0.81 | 2804 | EN16711-1 | 162.624 | | -1.83 |
| 2314 | | ----- | | ----- | 2826 | | ----- | | ----- |
| 2316 | In house | 220.6 | | 2.42 | 2829 | | ----- | | ----- |
| 2320 | | 173 | | -1.07 | 2833 | IEC62321-3-1 | not analysed | | ----- |
| 2339 | In house | 145 | | -3.12 | 2835 | IEC62321-5 | 181.00 | | -0.48 |
| 2347 | | 178 | | -0.70 | 2853 | | ----- | | ----- |
| 2350 | EPA3052 | 176.4 | | -0.82 | 2864 | IEC62321-5 | 163.00 | | -1.80 |
| 2352 | In house | 191.1 | | 0.26 | 2870 | EN16711-1 | 198.99 | | 0.84 |
| 2353 | IEC62321-5 | 189.3 | | 0.13 | 2885 | | ----- | | ----- |
| 2355 | EPA3052 | 191.6 | | 0.30 | 2900 | In house | not analysed | | ----- |
| 2357 | IEC62321-5 | 179.8 | | -0.57 | 3100 | CPSC-CH-E1002-08 | 189.753 | | 0.16 |
| 2358 | EPA3051 | 188.7 | | 0.08 | 3110 | | ----- | | ----- |
| 2363 | In house | 181 | | -0.48 | 3111 | | ----- | | ----- |
| 2365 | EN16711-1 | 192.2 | | 0.34 | 3116 | | ----- | | ----- |
| 2366 | IEC62321-5 | 189.30 | | 0.13 | 3118 | EN16711-1 | 186.56 | | -0.07 |
| 2369 | In house | 183.2 | | -0.32 | 3121 | In house | 189 | | 0.11 |
| 2370 | EPA3052 | 185 | | -0.19 | 3122 | CPSC-CH-E1002-08 | 180 | | -0.55 |
| 2372 | IEC62321-5 | 182.0 | | -0.41 | 3124 | In house | 258 | R(0.01) | 5.16 |
| 2374 | EN16711-1 | 172.23 | | -1.12 | 3146 | In house | 205 | | 1.28 |

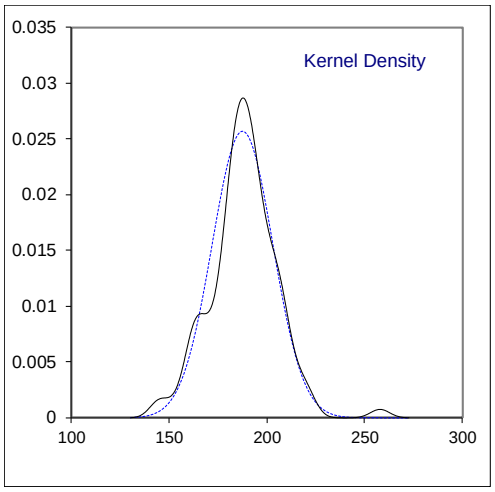
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 3153 | IEC62321-5 | 194.4 | | 0.50 | 3214 | EN16711-1 | 194.15 | | 0.48 |
| 3154 | EN16711-1 | 221.22 | | 2.47 | 3216 | In house | 189.385 | | 0.13 |
| 3160 | CPSC-CH-E1002-08 | 164.35 | | -1.70 | 3225 | | not analysed | | ----- |
| 3163 | In house | 216 | | 2.08 | 3228 | | ----- | | ----- |
| 3166 | | ----- | | ----- | 3237 | EN16711-1 | 183.92 | | -0.27 |
| 3172 | CPSC-CH-E1002-08 | 193.54 | | 0.44 | 3239 | | ----- | | ----- |
| 3182 | IEC62321-5 | not analysed | | ----- | 3246 | EN16711-1 | 201.58 | | 1.03 |
| 3183 | | ----- | | ----- | 3248 | CPSC-CH-E1002-08 | 180 | | -0.55 |
| 3185 | CPSC-CH-E1002-08 | 191.1 | | 0.26 | 6146 | IEC62321-3-1 | 203.29 | | 1.15 |
| 3190 | IEC62321-5 | <2 | f- | <-13.59 | 8005 | | ----- | | ----- |
| 3197 | IEC62321-5 | 192.6 | | 0.37 | 8008 | | ----- | | ----- |
| 3210 | In house | 205 | | 1.28 | | | | | |

| | |
|---|---|
| normality | OK |
| n | 105 |
| outliers | 1 |
| mean (n) | 187.5544 |
| st.dev. (n) | 15.53094 |
| R(calc.) | 43.4866 |
| st.dev.(Horwitz) | 13.64921 |
| R(Horwitz) | 38.2178 |

RSD=8%

Lab 2409 first reported 106.750
Lab 3190 possibly a false negative test result?



## Determination of Cadmium as Cd on sample #20651; results in mg/kg

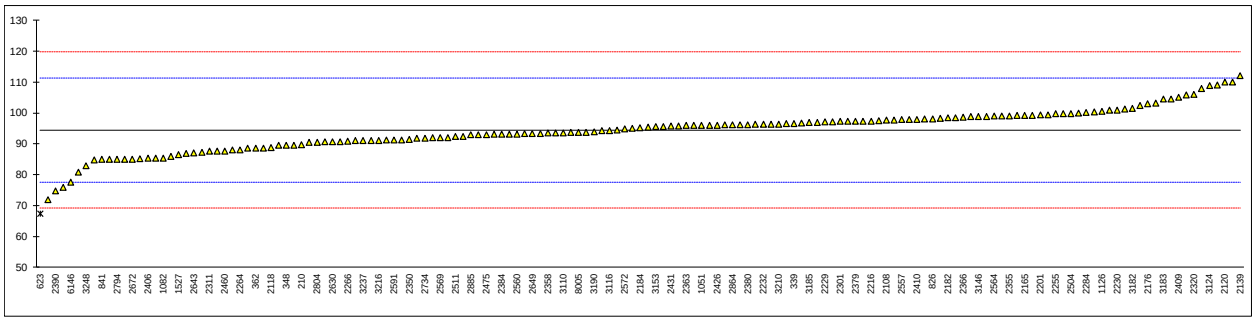
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 110 | | ----- | | ----- | 2375 | EN16711-1 | 85 | | -1.12 |
| 210 | CPSC-CH-E1002-08 | 89.77 | | -0.56 | 2378 | EN1122 | 97.4 | | 0.35 |
| 230 | | ----- | | ----- | 2379 | IEC62321-5 | 97.36 | | 0.34 |
| 339 | In house | 96.62 | | 0.25 | 2380 | CPSC-CH-E1002-08 | 96.261 | | 0.21 |
| 348 | In house | 89.602 | | -0.58 | 2381 | EN1122 | 96.10 | | 0.19 |
| 362 | EN1122 | 88.59 | | -0.70 | 2382 | EN16711-1 | 94.3 | | -0.02 |
| 523 | IEC62321-5 | 98.91 | | 0.53 | 2384 | IEC62321-5 | 93.20 | | -0.15 |
| 551 | | ----- | | ----- | 2385 | In house | 100 | | 0.65 |
| 623 | EN1122 | 67.37 | R(0.05) | -3.21 | 2387 | IEC62321-5 | 105.927 | | 1.36 |
| 826 | IEC62321-5 | 98.15 | | 0.44 | 2390 | CPSC-CH-E1002-08 | 74.901 | | -2.32 |
| 840 | EN16711-1 | 88.564 | | -0.70 | 2391 | IEC62321-5 | 86.0 | | -1.01 |
| 841 | ISO8124-5 | 85 | | -1.12 | 2392 | IEC62321-5 | 96.15 | | 0.20 |
| 1051 | EN1122 | 96.02 | | 0.18 | 2406 | CPSC-CH-E1002-08 | 85.46 | | -1.07 |
| 1082 | In house | 85.5 | | -1.06 | 2409 | EPA3052 | 105.1 | C | 1.26 |
| 1126 | In house | 100.5 | | 0.71 | 2410 | EN1122 | 98 | | 0.42 |
| 1527 | In house | 86.65 | | -0.93 | 2413 | In house | 80.8 | | -1.62 |
| 1842 | IEC62321-3-1 | 92 | | -0.29 | 2426 | EN16711-1 | 96.10 | | 0.19 |
| 1910 | In house | 92.962 | | -0.18 | 2431 | In house | 95.79 | | 0.16 |
| 2108 | EN16711-1 | 97.80 | | 0.39 | 2444 | IEC62321-5 | 92.45 | | -0.24 |
| 2115 | EN16711-1 | 87.04 | | -0.88 | 2453 | EN1122 | 93.4 | | -0.13 |
| 2118 | CPSC-CH-E1002-08 | 88.832 | | -0.67 | 2460 | EN1122 | 87.7 | | -0.80 |
| 2120 | EN1122 | 110 | | 1.84 | 2475 | In house | 93.06 | | -0.17 |
| 2129 | EN16711-1 | 96.6 | | 0.25 | 2477 | | ----- | | ----- |
| 2131 | In house | 95.419 | | 0.11 | 2488 | IEC-5 | 87.3 | | -0.85 |
| 2132 | EN1122 | 90.82 | | -0.43 | 2492 | In house | 99.3 | | 0.57 |
| 2137 | KS M6956 | 90.662 | | -0.45 | 2500 | EN16711-1 | 97.83 | | 0.40 |
| 2138 | CPSC-CH-E1002-08 | 100.4 | | 0.70 | 2504 | EN1122 | 99.842 | | 0.64 |
| 2139 | IEC62321-5 | 112.1 | | 2.09 | 2511 | | 92.4 | | -0.25 |
| 2165 | IEC62321-5 | 99.3 | | 0.57 | 2514 | In house | 91.3541 | | -0.37 |
| 2176 | IEC62321-5 | 103.0 | | 1.01 | 2529 | | ----- | | ----- |
| 2182 | EN1122 | 98.51 | | 0.48 | 2557 | IEC62321-5 | 97.9301 | | 0.41 |
| 2184 | EN1122 | 95.2 | | 0.09 | 2560 | EN16711-1 | 93.23 | | -0.15 |
| 2201 | CPSC-CH-E1002-08 | 99.52 | | 0.60 | 2561 | CPSC-CH-E1002-08 | 93.85 | | -0.07 |
| 2202 | IEC62321-5 | 110 | | 1.84 | 2563 | | ----- | | ----- |
| 2216 | CPSC-CH-E1002-08 | 97.411 | | 0.35 | 2564 | CPSC-CH-E1002-08 | 98.992 | | 0.53 |
| 2218 | CPSC-CH-E1002-08 | 94.494 | | 0.00 | 2568 | | ----- | | ----- |
| 2229 | ASTM F963 | 97.1464 | | 0.32 | 2569 | CPSC-CH-E1002-08 | 92 | | -0.29 |
| 2230 | EN1122 | 101 | | 0.77 | 2572 | EN1122 | 95 | | 0.06 |
| 2232 | IEC62321-5 | 96.496 | | 0.24 | 2573 | EN1122 | 93.741 | | -0.09 |
| 2236 | In house | 90.48 | | -0.47 | 2590 | EN1122 | 108.0 | | 1.60 |
| 2250 | EN16711-1 | 97.24 | | 0.33 | 2591 | CPSC-CH-E1002-08 | 91.324 | | -0.37 |
| 2255 | EN16711-1 | 99.8 | | 0.63 | 2603 | GB31604.49/5009.268 | 99.2450 | | 0.56 |
| 2256 | CPSC-CH-E1002-08 | 91.313 | | -0.38 | 2608 | | ----- | | ----- |
| 2258 | EN16711-1 | 100.97 | | 0.77 | 2621 | IEC62321-5 | 93.2 | | -0.15 |
| 2264 | CPSC-CH-E1002-08 | 88.038 | | -0.76 | 2624 | EPA3052 | 96.5 | | 0.24 |
| 2265 | EN16711-1 | 98.1 | | 0.43 | 2630 | IEC62321-5 | 90.8 | | -0.44 |
| 2266 | In house | 91 | | -0.41 | 2643 | EN16711-1 | 87.05 | | -0.88 |
| 2271 | EN1122 | 93.2 | | -0.15 | 2644 | EN16711-1 | 104.6 | | 1.20 |
| 2284 | EN1122 | 100.23 | | 0.68 | 2649 | EN1122 | 93.4 | | -0.13 |
| 2290 | EN1122 | 98 | | 0.42 | 2672 | IEC62321-5 | 85.104 | | -1.11 |
| 2293 | CPSC-CH-E1002-08 | 84.85 | | -1.14 | 2674 | EN1122 | 99.5398 | | 0.60 |
| 2294 | ISO8124-5 | not analysed | | ----- | 2678 | | ----- | | ----- |
| 2297 | EN1122 | 95.7 | | 0.14 | 2734 | CPSC-CH-E1002-08 | 91.92 | | -0.30 |
| 2301 | EN1122 | 97.3 | | 0.33 | 2736 | | ----- | | ----- |
| 2310 | EN1122 | 87.7 | | -0.80 | 2794 | IEC62321-3-1 | 85 | | -1.12 |
| 2311 | CPSC-CH-E1002-08 | 87.69 | | -0.80 | 2804 | EN16711-1 | 90.5444 | | -0.47 |
| 2314 | CPSC-CH-E1002-08 | 88.009 | | -0.77 | 2826 | IEC62321-5 | 89.6414 | | -0.57 |
| 2316 | IEC62321-5 | 89.6 | | -0.58 | 2829 | EN1122 | 92.16 | | -0.28 |
| 2320 | | 106 | | 1.37 | 2833 | IEC62321-3-1 | 76 | | -2.19 |
| 2339 | In house | 72 | | -2.66 | 2835 | IEC62321-5 | 96.35 | | 0.22 |
| 2347 | EN1122 | 99 | | 0.54 | 2853 | | ----- | | ----- |
| 2350 | EN1122 | 91.44 | | -0.36 | 2864 | IEC62321-5 | 96.19 | | 0.20 |
| 2352 | EN1122 | 97.3 | | 0.33 | 2870 | EN16711-1 | 109.11 | | 1.73 |
| 2353 | IEC62321-5 | 91.11 | | -0.40 | 2885 | IEC62321-5 | 92.96 | | -0.18 |
| 2355 | EN1122 | 99.1 | | 0.55 | 2900 | IEC62321-5 | 103.2 | | 1.03 |
| 2357 | IEC62321-5 | 95.93 | | 0.17 | 3100 | EN1122 | 98.2575 | | 0.45 |
| 2358 | EPA3051 | 93.5 | | -0.12 | 3110 | ASTM F963 | 93.65 | | -0.10 |
| 2363 | EPA3052 | 96 | | 0.18 | 3111 | EPA3052 | 101.3 | | 0.81 |
| 2365 | EN16711-1 | 98.9 | | 0.52 | 3116 | CPSC-CH-E1002-08 | 94.4 | | -0.01 |
| 2366 | IEC62321-5 | 98.733 | | 0.50 | 3118 | EN1122 | 96.25 | | 0.21 |
| 2369 | IEC62321-5 | 96.8 | | 0.28 | 3121 | | ----- | | ----- |
| 2370 | EN1122 | 91.8 | | -0.32 | 3122 | CPSC-CH-E1002-08 | 96 | | 0.18 |
| 2372 | EPA3052 | 88.7 | | -0.69 | 3124 | EPA3052 | 109 | | 1.72 |
| 2374 | EN1122 | 93.42 | | -0.13 | 3146 | In house | 98.9 | | 0.52 |

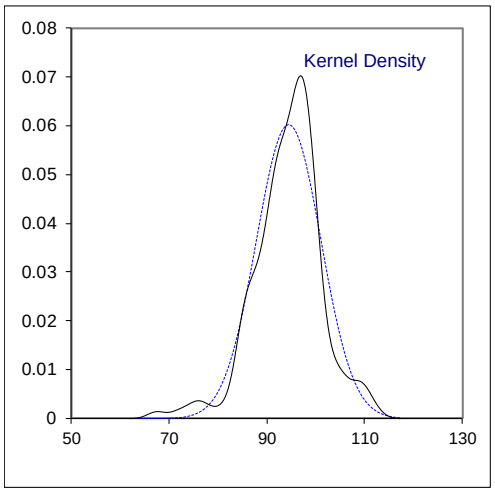
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 3153 | EN1122 | 95.6 | | 0.13 | 3214 | EN1122 | 99.80 | | 0.63 |
| 3154 | EN1122 | 85.27 | | -1.09 | 3216 | In house | 91.153 | | -0.39 |
| 3160 | CPSC-CH-E1002-08 | 85.47 | | -1.07 | 3225 | EN1122 | 95.05 | | 0.07 |
| 3163 | | 85 | | -1.12 | 3228 | IEC62321-5 | 97.0 | | 0.30 |
| 3166 | | ----- | | ----- | 3237 | EN16711-1 | 91.03 | | -0.41 |
| 3172 | CPSC-CH-E1002-08 | 91.03 | | -0.41 | 3239 | IEC62321-5 | 102.494 | | 0.95 |
| 3182 | EN1122 | 101.600 | | 0.84 | 3246 | EN16711-1 | 98.60 | | 0.49 |
| 3183 | In house | 104.5965 | | 1.20 | 3248 | EN1122 | 83 | | -1.36 |
| 3185 | EN1122 | 96.9 | | 0.29 | 6146 | IEC62321-3-1 | 77.57 | | -2.00 |
| 3190 | IEC62321-5 | 94 | | -0.06 | 8005 | EN1122 | 93.8 | | -0.08 |
| 3197 | EN1122 | 97.5 | | 0.36 | 8008 | EN1122 | 93.56 | | -0.11 |
| 3210 | In house | 96.5 | | 0.24 | | | | | |

| | |
|---|---|
| normality | suspect |
| n | 156 |
| outliers | 1 |
| mean (n) | 94.4801 |
| st.dev. (n) | 6.62720 |
| R(calc.) | 18.5562 |
| st.dev.(EN1122:01) | 8.43572 |
| R(EN1122:01) | 23.6200 |

RSD=7%

Lab 2409 first reported 53.585



## Determination of total Lead as Pb on sample #20651; results in mg/kg

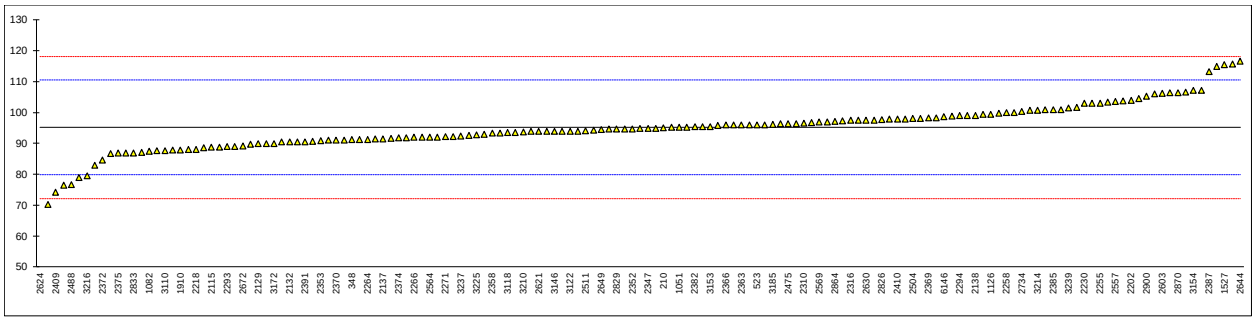
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 110 | | ----- | | ----- | 2375 | EN16711-1 | 87 | | -1.06 |
| 210 | CPSC-CH-E1002-08 | 95.09 | | -0.01 | 2378 | EN16711-1 | 94.9 | | -0.03 |
| 230 | | ----- | | ----- | 2379 | IEC62321-5 | 99.86 | | 0.61 |
| 339 | | ----- | | ----- | 2380 | CPSC-CH-E1002-08 | 94.034 | | -0.14 |
| 348 | CPSC-CH-E1002-08.3 | 91.254 | | -0.51 | 2381 | CPSC-CH-E1002-08.1 | 97.60 | | 0.32 |
| 362 | | ----- | | ----- | 2382 | EN16711-1 | 95.4 | | 0.03 |
| 523 | IEC62321-5 | 96.057 | | 0.12 | 2384 | IEC62321-5 | 92.11 | | -0.40 |
| 551 | | ----- | | ----- | 2385 | In house | 101 | | 0.76 |
| 623 | In house | 70.36 | | -3.23 | 2387 | IEC62321-5 | 113.335 | | 2.37 |
| 826 | IEC62321-5 | 96.43 | | 0.17 | 2390 | CPSC-CH-E1002-08 | 76.513 | | -2.43 |
| 840 | EN16711-1 | 91.047 | | -0.53 | 2391 | IEC62321-5 | 90.6 | | -0.59 |
| 841 | ISO8124-5 | 87 | | -1.06 | 2392 | IEC62321-5 | 104.58 | | 1.23 |
| 1051 | CPSC-CH-E1002-08.3 | 95.25 | | 0.01 | 2406 | CPSC-CH-E1002-08.3 | 89.72 | | -0.71 |
| 1082 | In house | 87.5 | | -1.00 | 2409 | EPA3052 | 74.245 | | -2.73 |
| 1126 | In house | 99.5 | | 0.57 | 2410 | IEC62321-5 | 98 | | 0.37 |
| 1527 | In house | 115.5 | | 2.65 | 2413 | In house | 91.2 | | -0.51 |
| 1842 | IEC62321-3-1 | 88 | | -0.93 | 2426 | EN16711-1 | 100.74 | | 0.73 |
| 1910 | In house | 87.959 | | -0.94 | 2431 | In house | 95.99 | | 0.11 |
| 2108 | CPSC-CH-E1002-08 | 93.33 | | -0.24 | 2444 | IEC62321-5 | 93.56 | | -0.21 |
| 2115 | EN16711-1 | 88.89 | | -0.82 | 2453 | | ----- | | ----- |
| 2118 | CPSC-CH-E1002-08 | 94.657 | | -0.06 | 2460 | CPSC-CH-E1002-08.3 | 91.95 | | -0.42 |
| 2120 | CPSC-CH-E1002-08.3 | 92 | | -0.41 | 2475 | In house | 96.4 | | 0.16 |
| 2129 | EN16711-1 | 90 | | -0.67 | 2477 | CPSC-CH-E1002-08.3 | 88.99 | | -0.80 |
| 2131 | In house | 93.8825 | | -0.16 | 2488 | IEC-5 | 76.7 | | -2.41 |
| 2132 | CPSC-CH-E1002-08 | 90.46 | | -0.61 | 2492 | In house | 91.5 | | -0.48 |
| 2137 | KS M6956 | 91.527 | | -0.47 | 2500 | EN16711-1 | 91.34 | | -0.50 |
| 2138 | CPSC-CH-E1002-08 | 99.1 | | 0.52 | 2504 | IEC62321-5 | 98.131 | | 0.39 |
| 2139 | IEC62321-5 | 115.7 | | 2.68 | 2511 | CPSC-CH-E1002-08.3 | 94.1 | | -0.14 |
| 2165 | IEC62321-5 | 103.9 | | 1.14 | 2514 | In house | 99.0266 | | 0.51 |
| 2176 | IEC62321-5 | 106.6 | | 1.49 | 2529 | | ----- | | ----- |
| 2182 | CPSC-CH-E1002-08.3 | 87.62 | | -0.98 | 2557 | IEC62321-5 | 103.7066 | | 1.12 |
| 2184 | IEC62321-5 | 95.5 | | 0.05 | 2560 | EN16711-1 | 97.89 | | 0.36 |
| 2201 | CPSC-CH-E1002-08 | 97.63 | | 0.32 | 2561 | CPSC-CH-E1002-08 | 98.92 | | 0.49 |
| 2202 | IEC62321-5 | 104 | | 1.15 | 2563 | | ----- | | ----- |
| 2216 | CPSC-CH-E1002-08 | 94.327 | | -0.11 | 2564 | CPSC-CH-E1002-08 | 92.090 | | -0.40 |
| 2218 | CPSC-CH-E1002-08.1 | 88.1167 | | -0.92 | 2568 | | ----- | | ----- |
| 2229 | ASTM F963 | 100.9905 | | 0.76 | 2569 | CPSC-CH-E1002-08 | 97 | | 0.24 |
| 2230 | EPA3051 | 103 | | 1.02 | 2572 | IEC62321-5 | 94 | | -0.15 |
| 2232 | IEC62321-5 | 98.320 | | 0.41 | 2573 | EPA3052 | 93.048 | | -0.27 |
| 2236 | In house | 97.03 | | 0.25 | 2590 | EN16711-1 | 88.907 | C | -0.81 |
| 2250 | EN16711-1 | 90.46 | | -0.61 | 2591 | CPSC-CH-E1002-08.3 | 90.703 | | -0.58 |
| 2255 | EN16711-1 | 103.05 | | 1.03 | 2603 | GB31604.49/5009.268 | 106.2470 | | 1.45 |
| 2256 | CPSC-CH-E1002-08 | 87.844 | | -0.95 | 2608 | | ----- | | ----- |
| 2258 | EN16711-1 | 99.989 | | 0.63 | 2621 | IEC62321-5 | 93.9 | | -0.16 |
| 2264 | CPSC-CH-E1002-08 | 91.341 | | -0.50 | 2624 | EPA3052 | 25.4 | R(0.01) | -9.09 |
| 2265 | EN16711-1 | 86.8 | | -1.09 | 2630 | IEC62321-5 | 97.6 | | 0.32 |
| 2266 | In house | 92 | | -0.41 | 2643 | CPSC-CH-E1002-08.3 | 88.60 | | -0.85 |
| 2271 | EPA3052 | 92.2 | | -0.38 | 2644 | EN16711-1 | 116.7 | | 2.81 |
| 2284 | EN16711-1 | 98.22 | | 0.40 | 2649 | CPSC-CH-E1002-08 | 94.5 | | -0.08 |
| 2290 | IEC62321-5 | 95 | | -0.02 | 2672 | IEC62321-5 | 89.144 | | -0.78 |
| 2293 | CPSC-CH-E1002-08 | 88.98 | | -0.80 | 2674 | CPSC-CH-E1002-08.3 | 99.3666 | | 0.55 |
| 2294 | CPSC-CH-E1002-08.3 | 99 | | 0.50 | 2678 | | ----- | | ----- |
| 2297 | IEC62321-5 | 91.6 | | -0.46 | 2734 | CPSC-CH-E1002-08 | 100.34 | | 0.68 |
| 2301 | EN16711-1 | 96.4 | | 0.16 | 2736 | | ----- | | ----- |
| 2310 | EN16711-1 | 96.7 | | 0.20 | 2794 | IEC62321-3-1 | 103 | | 1.02 |
| 2311 | CPSC-CH-E1002-08.3 | 100.03 | | 0.64 | 2804 | EN16711-1 | 96.0717 | | 0.12 |
| 2314 | CPSC-CH-E1002-08 | 90.462 | | -0.61 | 2826 | IEC62321-5 | 97.7879 | | 0.34 |
| 2316 | IEC62321-5 | 97.6 | | 0.32 | 2829 | CPSC-CH-E1002-08 | 94.67 | | -0.06 |
| 2320 | | 106 | | 1.42 | 2833 | IEC62321-3-1 | 87 | | -1.06 |
| 2339 | In house | 79 | | -2.11 | 2835 | IEC62321-5 | 94.79 | | -0.05 |
| 2347 | IEC62321-5 | 95 | | -0.02 | 2853 | CPSC-CH-E1002-08.3 | 92.55 | | -0.34 |
| 2350 | IEC62321-5 | 95.93 | | 0.10 | 2864 | IEC62321-5 | 97.17 | | 0.26 |
| 2352 | CPSC-CH-E1002-08.3 | 94.8 | | -0.05 | 2870 | EN16711-1 | 106.55 | | 1.49 |
| 2353 | IEC62321-5 | 90.99 | | -0.54 | 2885 | IEC62321-5 | 101.8 | | 0.87 |
| 2355 | EPA3052 | 97.4 | | 0.29 | 2900 | IEC62321-5 | 105.4 | | 1.34 |
| 2357 | IEC62321-5 | 96.82 | | 0.22 | 3100 | CPSC-CH-E1002-08.3 | 96.03135 | | 0.12 |
| 2358 | EPA3051 | 93.3 | | -0.24 | 3110 | ASTM F963 | 87.7 | | -0.97 |
| 2363 | EPA3052 | 96 | | 0.11 | 3111 | EPA3052 | 106.5 | | 1.48 |
| 2365 | EN16711-1 | 95.2 | | 0.01 | 3116 | CPSC-CH-E1002-08.3 | 93.9 | | -0.16 |
| 2366 | IEC62321-5 | 95.97 | | 0.11 | 3118 | EN16711-1 | 93.54 | | -0.21 |
| 2369 | IEC62321-5 | 98.3 | | 0.41 | 3121 | | ----- | | ----- |
| 2370 | EPA3052 | 91.2 | | -0.51 | 3122 | CPSC-CH-E1002-08 | 94 | | -0.15 |
| 2372 | EPA3052 | 84.7 | | -1.36 | 3124 | EPA3052 | 115 | | 2.59 |
| 2374 | CPSC-CH-E1002-08.3 | 91.84 | | -0.43 | 3146 | In house | 93.9 | | -0.16 |

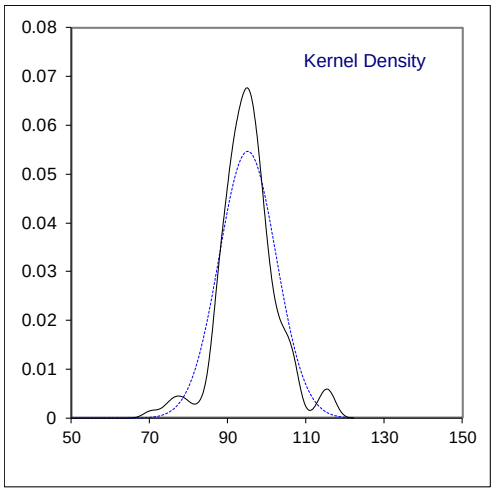
| lab | method | value | mark | z(targ) | lab | method | value | mark | z(targ) |
|---|---|---|---|---|---|---|---|---|---|
| 3153 | IEC62321-5 | 95.5 | | 0.05 | 3214 | EPA3052 | 100.80 | | 0.74 |
| 3154 | EN16711-1 | 107.2 | | 1.57 | 3216 | In house | 79.568 | | -2.03 |
| 3160 | CPSC-CH-E1002-08.3 | 87.08 | | -1.05 | 3225 | CPSC-CH-E1002-08.3 | 92.88 | | -0.30 |
| 3163 | | 90 | | -0.67 | 3228 | IEC62321-5 | 101.0 | | 0.76 |
| 3166 | | ----- | | ----- | 3237 | EN16711-1 | 92.40 | | -0.36 |
| 3172 | CPSC-CH-E1002-08 | 90.02 | | -0.67 | 3239 | IEC62321-5 | 101.592 | | 0.84 |
| 3182 | IEC62321-5 | 95.370 | | 0.03 | 3246 | EN16711-1 | 103.49 | | 1.09 |
| 3183 | In house | < 0.1 | f- | <-12.39 | 3248 | CPSC-CH-E1002-08 | 83 | | -1.58 |
| 3185 | CPSC-CH-E1002-08.3 | 96.3 | | 0.15 | 6146 | IEC62321-3-1 | 98.73 | | 0.47 |
| 3190 | IEC62321-5 | 98 | | 0.37 | 8005 | | 92.3 | | -0.37 |
| 3197 | IEC62321-5 | 107.3 | | 1.58 | 8008 | | ----- | | ----- |
| 3210 | In house | 93.7 | | -0.19 | | | | | |

| | |
|---|---|
| normality | suspect |
| n | 154 |
| outliers | 1 |
| mean (n) | 95.1457 |
| st.dev. (n) | 7.29595 |
| R(calc.) | 20.4286 |
| st.dev.(Horwitz) | 7.66888 |
| R(Horwitz) | 21.4729 |

RSD=8%

Lab 2590 first reported 62.163
Lab 3183 possibly a false negative test result?



## APPENDIX 2

### Other reported Metals in sample #20650; results in mg/kg

| lab | Sb | Cd | Cr | | Cr6+ | Co | Pb |
|---|---|---|---|---|---|---|---|
| 110 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 210 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 230 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 339 | <12.5 | <1.5 | <3 | | ----- | <1.5 | ----- |
| 348 | ----- | < 5 | < 5 | | ----- | ----- | < 10 |
| 362 | ----- | < 5.0 | ----- | | ----- | ----- | ----- |
| 523 | <2 | <2 | <2 | | <8 | <2 | <2 |
| 551 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 623 | not detected | not detected | not detected | | not detected | not detected | not detected |
| 826 | N.D. | N.D. | N.D. | | not detected | N.D. | N.D. |
| 840 | <2 | <2 | <2 | | <8 | <2 | <2 |
| 841 | < 10 | < 10 | < 10 | | < 8 | < 10 | < 10 |
| 1051 | ----- | <5 | ----- | | ----- | ----- | <10 |
| 1082 | ----- | 0.0335 | 1.6 | | ----- | 0.0255 | 0.175 |
| 1126 | ----- | 0.958 | ----- | | ----- | ----- | ----- |
| 1527 | 0.071 | 0.0358 | 1.72 | | ----- | 0.186 | 0.307 |
| 1842 | not analysed | not detected | not detected | | not analysed | not analysed | not detected |
| 1910 | not analysed | < 0,34 | not analysed | | not analysed | not analysed | < 8,2 |
| 2108 | not detected | not detected | not detected | | not detected | not detected | not detected |
| 2115 | ----- | ----- | 1.73 | | ----- | ----- | ----- |
| 2118 | 0 | 0.025 | 1.632 | | 0 | 0.031 | 0 |
| 2120 | < 33 | < 33 | **19.1** | **f+** | ----- | < 33 | < 33 |
| 2129 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2131 | 0.6495 | 0 | 8.4345 | | ----- | 0.136 | 0.265 |
| 2132 | <10.0 | <10.0 | <10.0 | | ----- | ----- | <10.0 |
| 2137 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2138 | Not Detected | Not Detected | Not Detected | | Not Detected | Not Detected | Not Detected |
| 2139 | < 10 | < 10 | < 10 | | < 10 | < 10 | < 10 |
| 2165 | Not applicable | <10 | <10 | | Not applicable | Not applicable | <10 |
| 2176 | not analysed | not detected | not detected | | not detected | not analysed | not detected |
| 2182 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2184 | Not applicable | <10 | <10 | | <10 | Not applicable | <10 |
| 2201 | <10 | <10 | <10 | | <10 | <10 | <10 |
| 2202 | N.D. | N.D. | N.D. | | N.D. | N.D. | N.D. |
| 2216 | ----- | less than 2 | less than 5 | | ----- | ----- | less than 5 |
| 2218 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2229 | not detected | not detected | not detected | | ----- | ----- | not detected |
| 2230 | <10 | <10 | <10 | | <10 | <10 | <10 |
| 2232 | Not applicable | <10 | <10 | | <10 | Not applicable | <10 |
| 2236 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2250 | not detected | not detected | 1.7337 | | ----- | not detected | not detected |
| 2255 | n.d | n.d | n.d | | n.d | n.d | n.d |
| 2256 | ND | ND | ND | | ND | ND | ND |
| 2258 | Not Detected | Not Detected | Not Detected | | not analysed | not analysed | Not Detected |
| 2264 | ----- | less than 3.6 | ----- | | ----- | ----- | less than 17.8 |
| 2265 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2266 | < detect. limit | < detect. limit | < detect. limit | | ----- | < detect. limit | < detect. limit |
| 2271 | ND | ND | ND | | ND | ND | ND |
| 2284 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2290 | <20 | <20 | <20 | | ----- | <20 | <20 |
| 2293 | Not detected | Not detected | Not detected | | Not detected | Not detected | Not detected |
| 2294 | Not analysed | Not analysed | Not analysed | | Not analysed | Not analysed | Not detected |
| 2297 | <10 | <10 | <10 | | <10 | <10 | <10 |
| 2301 | <10 | <10 | <10 | | <10 | <10 | <10 |
| 2310 | 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 |
| 2314 | ----- | ND | ----- | | ----- | ----- | ND |
| 2316 | ----- | not detected | **74.6** | **f+** | not detected | ----- | not detected |
| 2320 | <1.0 | <0.5 | 1.4 | | ----- | <0.5 | <0.5 |
| 2339 | <5 | <1 | <5 | | ----- | <5 | <5 |
| 2347 | <10 | <2 | <8 | | <8 | <5 | <2 |
| 2350 | <10 | <1 | <5 | | <8 | <5 | <5 |
| 2352 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2353 | <10 | <10 | <10 | | <10 | <10 | <10 |
| 2355 | <10 | <5 | <2 | | <8 | <10 | <2 |
| 2357 | <10 | <10 | <10 | | ----- | <10 | <10 |
| 2358 | n.d. | n.d. | n.d. | | n.d. | n.d. | n.d. |
| 2363 | <10 | <2 | <2 | | <8 | <5 | <2 |
| 2365 | <10 | <10 | <10 | | ----- | <10 | <10 |
| 2366 | <10 | <5 | <10 | | <8 | <10 | <10 |
| 2369 | <5 | <2 | <2 | | <8 | <5 | <2 |
| 2370 | <4 | <2 | <4 | | <8 | <6 | <2 |
| 2372 | < 2 | < 2 | < 2 | | < 8 | < 2 | < 2 |
| 2374 | not detected | not detected | not detected | | not analyzed | not detected | not detected |

| lab | Sb | Cd | Cr | | Cr6+ | Co | Pb |
|---|---|---|---|---|---|---|---|
| 2375 | <10 | <10 | <10 | | <8 | <10 | <10 |
| 2378 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2379 | ----- | Not detected | ----- | | Not detected | ----- | Not detected |
| 2380 | ND | ND | ND | | ND | ND | ND |
| 2381 | Out Cap | <5 | Out Cap | | Out Cap | Out Cap | <10 |
| 2382 | ＜20.0 | ＜5.0 | ＜10.0 | | NA | ＜10.0 | ＜5.0 |
| 2384 | 3.59 | not detected | not detected | | not detected | ----- | not detected |
| 2385 | <5 | <0,5 | <5 | | <1,0 | <5 | <5 |
| 2387 | ----- | Not Detected [<2] | Not Detected [<2] | | Not Detected [<8] | ----- | Not Detected [<2] |
| 2390 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2391 | <3 | <3 | <3 | | <2 | <3 | <3 |
| 2392 | ----- | Not detected | ----- | | Not detected | ----- | Not detected |
| 2406 | not detected | not detected | not detected | | ----- | ----- | not detected |
| 2409 | 0.077 | 0.169 | 6.986 | | 4.775 | 0.594 | 0.125 |
| 2410 | < 5 | < 0.5 | < 5 | | < 8 | < 5 | < 5 |
| 2413 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2426 | <20 | <20 | <20 | | ----- | <20 | <20 |
| 2431 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2444 | ----- | 0 | ----- | | 0 | ----- | 0 |
| 2453 | ----- | ND | ----- | | ----- | ----- | ----- |
| 2460 | ----- | <6.0 | ----- | | ----- | ----- | <25 |
| 2475 | not analysed | <5 | not analysed | | not analysed | not analysed | <25 |
| 2477 | ----- | ----- | ----- | | ----- | ----- | < L.O.Q. |
| 2488 | ----- | <10 | <10 | | ----- | ----- | <10 |
| 2492 | not detected | not detected | not detected | | not detected | not detected | not detected |
| 2500 | ----- | not detected | ----- | | ----- | ----- | not detected |
| 2504 | < 2 | <2 | <2 | | <5 | <2 | <2 |
| 2511 | <10 | <10 | <10 | | <10 | <10 | <10 |
| 2514 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2529 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2557 | ----- | < 2 | < 2 | | < 8 | ----- | < 2 |
| 2560 | <10 | <10 | <10 | | <10 | <10 | <10 |
| 2561 | <0.1 | <0.1 | 4.06 | | ----- | <0.1 | <0.1 |
| 2563 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2564 | ----- | not detected | ----- | | ----- | ----- | not detected |
| 2568 | ----- | ----- | ----- | | <50 | ----- | ----- |
| 2569 | ND | ND | ND | | ----- | ND | ND |
| 2572 | <20 | <20 | <20 | | ----- | <20 | <20 |
| 2573 | not detected | not detected | not detected | | not detected | not detected | not detected |
| 2590 | < L.O.Q. | < L.O.Q. | 2.3 | | ----- | < L.O.Q. | < L.O.Q. |
| 2591 | ----- | not detected | ----- | | ----- | ----- | not detected |
| 2603 | ----- | 0.0298 | 1.7392 | | ----- | ----- | 0.3192 |
| 2608 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2621 | <5 | <5 | <5 | | <5 | <5 | <5 |
| 2624 | < 20 | < 1 | **265.3** | **f+** | not determined | not determined | < 1 |
| 2630 | ----- | not detected | not detected | | not detected | ----- | not detected |
| 2643 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2644 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2649 | <10 | <10 | <10 | | <10 | <10 | <10 |
| 2672 | < 5 | <5 | <5 | | <5 | <5 | <5 |
| 2674 | ----- | < 10 | < 10 | | < 10 | ----- | < 10 |
| 2678 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2734 | not detected | not detected | not detected | | not detected | not detected | not detected |
| 2736 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2794 | not detected | not detected | not detected | | not analysed | not detected | not detected |
| 2804 | <20 | <20 | <20 | | ----- | <20 | <20 |
| 2826 | ----- | <20 | <20 | | <20 | ----- | <20 |
| 2829 | ----- | ----- | ----- | | ----- | ----- | ----- |
| 2833 | Not detected | Not detected | Not detected | | Not applicable | Not detected | Not detected |
| 2835 | Not Detected | Not Detected | Not Detected | | Not Detected | Not Detected | Not Detected |
| 2853 | ----- | ----- | ----- | | ----- | ----- | Not detected |
| 2864 | not detected | not detected | not detected | | not detected | not detected | not detected |
| 2870 | ----- | ----- | 2.96 | | ----- | ----- | ----- |
| 2885 | ----- | N.D. | ----- | | ----- | ----- | N.D. |
| 2900 | not analysed | not detected | not analysed | | not analysed | not analysed | not detected |
| 3100 | <10 | <5 | <10 | | <10 | <10 | <10 |
| 3110 | <15 | <15 | <15 | | ----- | ----- | <15 |
| 3111 | ----- | 0.011 | ----- | | ----- | ----- | 1.197 |
| 3116 | not detected | not detected | not detected | | ----- | ----- | not detected |
| 3118 | ND | ND | ND | | ND | ND | ND |
| 3121 | < 0,5 | < 0,5 | 1.77 | | < 0,25 | < 0,5 | < 0,5 |
| 3122 | < 5 | < 5 | < 5 | | < 5 | < 5 | < 5 |
| 3124 | <0,5 | <0,1 | ----- | | ----- | <0,2 | <1 |
| 3146 | not detected | not detected | not detected | | ----- | not detected | not detected |
| 3153 | not detected | not detected | not detected | | not detected | not detected | not detected |
| 3154 | ----- | ----- | 5.862 | | ----- | ----- | 0.22 |
| 3160 | <16 | <16 | <16 | | ----- | <16 | <16 |

| lab | Sb | Cd | Cr | Cr6+ | Co | Pb | |
|---|---|---|---|---|---|---|---|
| 3163 | not detected | not detected | not detected | not analysed | not detected | not detected | |
| 3166 | ----- | ----- | ----- | ----- | ----- | ----- | |
| 3172 | < 10 | < 10 | < 10 | ----- | < 10 | < 10 | |
| 3182 | not analysed | <5 | <5 | not detected | not analysed | not detected | |
| 3183 | ----- | < 0.01 | ----- | ----- | ----- | < detect. limit | |
| 3185 | <10 | <10 | <10 | <10 | <10 | <10 | |
| 3190 | <2 | <2 | <2 | <1 | <2 | **179** | **f+** |
| 3197 | <10 | <10 | <10 | <10 | <10 | <10 | |
| 3210 | <25 | <10 | <10 | ----- | <10 | <25 | |
| 3214 | <5 | <2 | <5 | <8 | <5 | <2 | |
| 3216 | 0.051 | 0.041 | 2.178 | Not analysed | 0.246 | 0.147 | |
| 3225 | Not analysed | <25 | Not analysed | Not analysed | Not analysed | <15 | |
| 3228 | ----- | <10 | <10 | ----- | ----- | <10 | |
| 3237 | ----- | ----- | ----- | ----- | ----- | ----- | |
| 3239 | ----- | not detected | not detected | not detected | ----- | not detected | |
| 3246 | not detected | not detected | not detected | not detected | not detected | not detected | |
| 3248 | <10 | <10 | <10 | <10 | <10 | <10 | |
| 6146 | Not detected | Not detected | Not detected | Not determined | Not detected | Not detected | |
| 8005 | not detected | not detected | not detected | ----- | ----- | not detected | |
| 8008 | ----- | <5 | ----- | ----- | ----- | ----- | |

Lab 2120 possibly a false positive test result for Cr
Lab 2316 possibly a false positive test result for Cr
Lab 2624 possibly a false positive test result for Cr
Lab 3190 possibly a false positive test result for Pb

**Other reported Metals in sample #20650; results in mg/kg - continued -**

| lab | Hg | Mn | Sn | |
|---|---|---|---|---|
| 110 | ----- | ----- | ----- | |
| 210 | ----- | ----- | ----- | |
| 230 | ----- | ----- | ----- | |
| 339 | <3 | 5.23 | <12.5 | |
| 348 | ----- | ----- | ----- | |
| 362 | ----- | ----- | ----- | |
| 523 | <2 | 4.764 | <2 | |
| 551 | ----- | ----- | ----- | |
| 623 | not detected | not detected | not detected | |
| 826 | N.D. | N.D. | ----- | |
| 840 | <2 | <2 | <2 | |
| 841 | < 10 | < 10 | < 10 | |
| 1051 | ----- | ----- | ----- | |
| 1082 | ----- | 4.88 | 0.030 | |
| 1126 | ----- | ----- | ----- | |
| 1527 | 0.542 | ----- | ----- | |
| 1842 | not detected | not analysed | not analysed | |
| 1910 | not analysed | not analysed | not analysed | |
| 2108 | 0.4133 | not detected | not detected | |
| 2115 | 0.42 | 5.10 | ----- | |
| 2118 | 0.207 | 4.92 | 0 | |
| 2120 | < 0,83 | ----- | ----- | |
| 2129 | ----- | ----- | ----- | |
| 2131 | 0 | 5.21 | **78.5965** | **f+** |
| 2132 | <10.0 | ----- | <10.0 | |
| 2137 | ----- | ----- | ----- | |
| 2138 | Not Detected | Not Detected | Not Detected | |
| 2139 | < 10 | < 10 | < 10 | |
| 2165 | <10 | Not applicable | Not applicable | |
| 2176 | not detected | not analysed | not analysed | |
| 2182 | ----- | ----- | ----- | |
| 2184 | <10 | Not applicable | Not applicable | |
| 2201 | <10 | <10 | <10 | |
| 2202 | N.D. | N.D. | N.D. | |
| 2216 | less than 5 | ----- | ----- | |
| 2218 | ----- | ----- | ----- | |
| 2229 | not detected | ----- | ----- | |
| 2230 | <10 | <10 | <10 | |
| 2232 | <10 | Not applicable | Not applicable | |
| 2236 | ----- | ----- | ----- | |
| 2250 | 0.4262 | 5.119 | not detected | |
| 2255 | n.d | n.d | n.d | |
| 2256 | ND | ND | ND | |
| 2258 | Not Detected | not analysed | not analysed | |
| 2264 | ----- | ----- | ----- | |
| 2265 | ----- | ----- | ----- | |
| 2266 | < detect. limit | < detect. limit | 11 | |
| 2271 | ND | ND | ND | |
| 2284 | ----- | ----- | ----- | |
| 2290 | <20 | <20 | <20 | |
| 2293 | Not detected | Not Analysed | Not Analysed | |
| 2294 | Not analysed | Not analysed | Not analysed | |
| 2297 | <10 | <10 | <10 | |
| 2301 | <10 | <10 | <10 | |
| 2310 | Not detected | <10 | Not detected | |
| 2311 | Not Detected | Not Detected | Not Detected | |
| 2314 | ----- | ----- | ----- | |
| 2316 | not detected | 9.3 | ----- | |
| 2320 | 0.25 | 5.0 | <1.0 | |
| 2339 | <1 | ----- | <5 | |
| 2347 | <2 | <5 | <5 | |
| 2350 | <2 | <5 | <10 | |
| 2352 | ----- | ----- | ----- | |
| 2353 | <5 | NA | <10 | |
| 2355 | <2 | <10 | <10 | |
| 2357 | <10 | <10 | <10 | |
| 2358 | n.d. | N/A | n.d. | |
| 2363 | <2 | <5 | <5 | |
| 2365 | <10 | <10 | <10 | |
| 2366 | <10 | <50 | <10 | |
| 2369 | <2 | <5 | <5 | |
| 2370 | <2 | <6 | <3 | |
| 2372 | < 2 | <6 | < 2 | |
| 2374 | not detected | not analyzed | not analyzed | |
| 2375 | <10 | <10 | <10 | |

| lab | Hg | Mn | Sn | |
|---|---|---|---|---|
| 2378 | ----- | ----- | ----- | |
| 2379 | Not detected | ----- | ----- | |
| 2380 | ND | ND | ND | |
| 2381 | Out Cap | Out Cap | Out Cap | |
| 2382 | ＜5.0 | NA | NA | |
| 2384 | not detected | ----- | ----- | |
| 2385 | 0.40 | <5 | <5 | |
| 2387 | Not Detected [<2] | ----- | ----- | |
| 2390 | ----- | ----- | ----- | |
| 2391 | <3 | <3 | <3 | |
| 2392 | Not detected | ----- | ----- | |
| 2406 | not detected | ----- | ----- | |
| 2409 | 1.003 | 4.905 | not analyzed | |
| 2410 | < 2 | < 5 | < 5 | |
| 2413 | ----- | ----- | **115.3** | **f+** |
| 2426 | <10 | ----- | ----- | |
| 2431 | ----- | ----- | ----- | |
| 2444 | 0 | ----- | ----- | |
| 2453 | ----- | ----- | ----- | |
| 2460 | ----- | ----- | ----- | |
| 2475 | not analysed | not analysed | not analysed | |
| 2477 | ----- | ----- | ----- | |
| 2488 | <10 | ----- | ----- | |
| 2492 | not detected | not detected | not detected | |
| 2500 | ----- | ----- | ----- | |
| 2504 | <2 | <10 | <2 | |
| 2511 | <10 | <10 | <10 | |
| 2514 | ----- | ----- | ----- | |
| 2529 | ----- | ----- | ----- | |
| 2557 | < 0.5 | ----- | ----- | |
| 2560 | <10 | <10 | <10 | |
| 2561 | 0.44 | 4.04 | <0.1 | |
| 2563 | ----- | ----- | ----- | |
| 2564 | ----- | ----- | ----- | |
| 2568 | ----- | ----- | ----- | |
| 2569 | ND | ND | ND | |
| 2572 | <20 | ----- | ----- | |
| 2573 | not detected | not detected | not detected | |
| 2590 | < L.O.Q. | 6.1 | < L.O.Q. | |
| 2591 | ----- | ----- | ----- | |
| 2603 | ----- | ----- | ----- | |
| 2608 | ----- | ----- | ----- | |
| 2621 | <5 | <5 | <5 | |
| 2624 | < 35 | 12.1 | < 20 | |
| 2630 | not detected | ----- | ----- | |
| 2643 | ----- | ----- | ----- | |
| 2644 | ----- | ----- | ----- | |
| 2649 | <10 | <10 | <10 | |
| 2672 | <5 | 5.479 | <5 | |
| 2674 | < 10 | ----- | ----- | |
| 2678 | ----- | ----- | ----- | |
| 2734 | not detected | not detected | not detected | |
| 2736 | ----- | ----- | ----- | |
| 2794 | not detected | not detected | not detected | |
| 2804 | <20 | ----- | ----- | |
| 2826 | <20 | ----- | ----- | |
| 2829 | ----- | ----- | ----- | |
| 2833 | Not detected | Not detected | Not analysed | |
| 2835 | Not Detected | Not Detected | 9.88 | |
| 2853 | ----- | ----- | ----- | |
| 2864 | not detected | not detected | not detected | |
| 2870 | 0.688 | 5.25 | 0.75 | |
| 2885 | N.D. | ----- | ----- | |
| 2900 | not analysed | not analysed | not analysed | |
| 3100 | <10 | <10 | <10 | |
| 3110 | <15 | ----- | ----- | |
| 3111 | 0 | ----- | ----- | |
| 3116 | not detected | ----- | ----- | |
| 3118 | ND | ND | ND | |
| 3121 | 0.37 | 4.90 | < 0,5 | |
| 3122 | < 5 | < 10 | < 5 | |
| 3124 | 0.414 | <50 | ----- | |
| 3146 | not detected | not detected | not detected | |
| 3153 | not detected | not detected | not detected | |
| 3154 | ----- | 5.801 | **41.78** | **f+** |
| 3160 | ----- | <16 | <16 | |
| 3163 | not detected | not detected | not detected | |

| lab | Hg | Mn | Sn |
|---|---|---|---|
| 3166 | ----- | ----- | ----- |
| 3172 | < 10 | ----- | < 10 |
| 3182 | not detected | not analysed | not analysed |
| 3183 | ----- | ----- | ----- |
| 3185 | <10 | <10 | <10 |
| 3190 | <2 | <2 | <2 |
| 3197 | <10 | <10 | <10 |
| 3210 | 0.32 | <10 | <10 |
| 3214 | <2 | <5 | <5 |
| 3216 | 0.587 | 6.124 | 0.037 |
| 3225 | Not analysed | Not analysed | Not analysed |
| 3228 | <10 | ----- | ----- |
| 3237 | ----- | ----- | ----- |
| 3239 | not detected | ----- | ----- |
| 3246 | not detected | 6.57 | not detected |
| 3248 | <10 | <10 | <10 |
| 6146 | Not detected | Not detected | Not detected |
| 8005 | not detected | ----- | ----- |
| 8008 | ----- | ----- | ----- |

Lab 2131 possibly a false positive test result for Sn
Lab 2413 possibly a false positive test result for Sn
Lab 3154 possibly a false positive test result for Sn

## Other reported Metals in sample #20651; results in mg/kg

| lab | Sb | | Cr | | Cr6+ | Co | Cu | Hg |
|---|---|---|---|---|---|---|---|---|
| 110 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 210 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 230 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 339 | <12.5 | | <3 | | ----- | <1.5 | <1.5 | <3 |
| 348 | ----- | | <5 | | ----- | ----- | ----- | ----- |
| 362 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 523 | <2 | | <2 | | <8 | <2 | <2 | <2 |
| 551 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 623 | not detected | | not detected | | not detected | not detected | not detected | not detected |
| 826 | N.D. | | N.D. | | not detected | N.D. | N.D. | N.D. |
| 840 | <2 | | <2 | | <8 | <2 | <2 | <2 |
| 841 | < 10 | | < 10 | | < 8 | < 10 | < 10 | < 10 |
| 1051 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 1082 | ----- | | 1.15 | | ----- | 0.010 | 1.1 | ----- |
| 1126 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 1527 | 1.322 | | 0.976 | | ----- | 0.044 | 1.44 | ----- |
| 1842 | not analysed | | not detected | | not analysed | not analysed | not analysed | not detected |
| 1910 | not analysed | | not analysed | | not analysed | not analysed | not analysed | not analysed |
| 2108 | not detected | | not detected | | not detected | not detected | not detected | not detected |
| 2115 | 0.85 | | 0.76 | | ----- | ----- | 2.91 | ----- |
| 2118 | 0 | | 0.595 | | 0 | 0.015 | 0 | 0 |
| 2120 | < 33 | | < 33 | | ----- | < 33 | < 33 | < 0,83 |
| 2129 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 2131 | **19.1955** | **f+** | 5.758 | | ----- | 0.0525 | 7.922 | 0 |
| 2132 | <10.0 | | <10.0 | | ----- | ----- | ----- | <10.0 |
| 2137 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 2138 | Not Detected | | Not Detected | | Not Detected | Not Detected | Not Detected | Not Detected |
| 2139 | < 10 | | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 2165 | Not applicable | | <10 | | Not applicable | Not applicable | Not applicable | <10 |
| 2176 | not analysed | | not detected | | not detected | not analysed | not analysed | not detected |
| 2182 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 2184 | Not applicable | | <10 | | <10 | Not applicable | Not applicable | <10 |
| 2201 | <10 | | <10 | | <10 | <10 | <10 | <10 |
| 2202 | N.D. | | N.D. | | N.D. | N.D. | N.D. | N.D. |
| 2216 | ----- | | less than 5 | | ----- | ----- | ----- | less than 5 |
| 2218 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 2229 | not detected | | not detected | | ----- | ----- | ----- | not detected |
| 2230 | <10 | | <10 | | <10 | <10 | <10 | <10 |
| 2232 | Not applicable | | <10 | | <10 | Not applicable | Not applicable | <10 |
| 2236 | <10.0 | | <10.0 | | ----- | ----- | ----- | <10.0 |
| 2250 | not detected | | not detected | | ----- | not detected | not detected | not detected |
| 2255 | n.d | | n.d | | n.d | n.d | n.d | n.d |
| 2256 | ND | | ND | | ND | ND | ND | ND |
| 2258 | not detected | | not detected | | not analysed | not analysed | not analysed | not detected |
| 2264 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 2265 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 2266 | < detect. limit | | < detect. limit | | ----- | < detect. limit | < detect. limit | < detect. limit |
| 2271 | ND | | ND | | ND | ND | ND | ND |
| 2284 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 2290 | <20 | | <20 | | ----- | <20 | <20 | <20 |
| 2293 | Not detected | | Not detected | | Not detected | Not detected | Not detected | Not detected |
| 2294 | Not analysed | | Not analysed | | Not analysed | Not analysed | Not analysed | Not analysed |
| 2297 | <10 | | <10 | | <10 | <10 | <10 | <10 |
| 2301 | <10 | | <10 | | <10 | <10 | <10 | <10 |
| 2310 | Not detected | | Not detected | | Not detected | Not detected | <10 | Not detected |
| 2311 | Not Detected | | Not Detected | | Not Detected | Not Detected | Not Detected | Not Detected |
| 2314 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 2316 | ----- | | **78.7** | **f+** | not detected | ----- | 6.3 | not detected |
| 2320 | <1.0 | | 0.70 | | ----- | <0.5 | 1.5 | <0.1 |
| 2339 | <5 | | <5 | | ----- | <5 | <5 | <1 |
| 2347 | <10 | | <8 | | <8 | <5 | <5 | <2 |
| 2350 | <10 | | <5 | | <8 | <5 | <5 | <2 |
| 2352 | ----- | | ----- | | ----- | ----- | ----- | ----- |
| 2353 | <10 | | <10 | | <10 | <10 | NA | <5 |
| 2355 | <10 | | <2 | | <8 | <10 | <10 | <2 |
| 2357 | <10 | | <10 | | ----- | <10 | <10 | <10 |
| 2358 | n.d. | | n.d. | | n.d. | n.d. | N/A | n.d. |
| 2363 | <10 | | <2 | | <8 | <5 | <5 | <2 |
| 2365 | <10 | | <10 | | ----- | <10 | <10 | <10 |
| 2366 | <10 | | <10 | | <8 | <10 | <50 | <10 |
| 2369 | <10 | | <2 | | <8 | <5 | <5 | <2 |
| 2370 | <4 | | <4 | | <8 | <6 | <6 | <2 |
| 2372 | <2 | | <2 | | <28 | <2 | <2 | <2 |
| 2374 | not detected | | not detected | | not analyzed | not detected | not detected | not detected |
| 2375 | <10 | | <10 | | <8 | <10 | <10 | <10 |
| 2378 | ----- | | ----- | | ----- | ----- | ----- | ----- |

| lab | Sb | | Cr | Cr6+ | Co | Cu | | Hg |
|---|---|---|---|---|---|---|---|---|
| 2379 | ----- | | ----- | Not detected | ----- | ----- | | Not detected |
| 2380 | ND | | ND | ND | ND | ND | | ND |
| 2381 | Out Cap | | Out Cap | Out Cap | Out Cap | Out Cap | | Out Cap |
| 2382 | ＜20.0 | | ＜10.0 | NA | ＜10.0 | ＜10.0 | | ＜5.0 |
| 2384 | not detected | | not detected | not detected | ----- | ----- | | not detected |
| 2385 | <5 | | <5 | <1,0 | <5 | <5 | | <0,1 |
| 2387 | ----- | | Not Detected [<2] | Not Detected [<8] | ----- | ----- | | Not Detected [<2] |
| 2390 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2391 | <3 | | <3 | <2 | <3 | <3 | | <3 |
| 2392 | ----- | | ----- | Not detected | ----- | ----- | | Not detected |
| 2406 | not detected | | not detected | ----- | ----- | ----- | | not detected |
| 2409 | 0.839 | | 1.952 | not detected | not detected | 0.487 | | 0.217 |
| 2410 | < 5 | | < 5 | < 8 | < 5 | < 5 | | < 2 |
| 2413 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2426 | <20 | | <20 | ----- | <20 | <20 | | <10 |
| 2431 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2444 | ----- | | ----- | 0 | ----- | ----- | | 0 |
| 2453 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2460 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2475 | not analysed | | not analysed | not analysed | not analysed | not analysed | | not analysed |
| 2477 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2488 | ----- | | <10 | ----- | ----- | ----- | | <10 |
| 2492 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2500 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2504 | < 2 | | <2 | <5 | <2 | <2 | | <2 |
| 2511 | <10 | | <10 | <10 | <10 | ----- | | <10 |
| 2514 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2529 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2557 | ----- | | < 2 | < 8 | ----- | ----- | | < 0.5 |
| 2560 | <10 | | <10 | Not analysed | <10 | <10 | | <10 |
| 2561 | 0.42 | | <0.1 | ----- | <0.1 | <0.1 | | <0.1 |
| 2563 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2564 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2568 | ----- | | ----- | <50 | ----- | ----- | | ----- |
| 2569 | ND | | ND | ND | ND | ND | | ND |
| 2572 | <20 | | <20 | ----- | <20 | <20 | | <20 |
| 2573 | not detected | | not detected | not detected | not detected | not detected | | not detected |
| 2590 | < L.O.Q. | | < L.O.Q. | ----- | < L.O.Q. | < L.O.Q. | | < L.O.Q. |
| 2591 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2603 | ----- | | 0.6054 | ----- | ----- | 1.0740 | | ----- |
| 2608 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2621 | <5 | | <5 | <5 | <5 | <5 | | <5 |
| 2624 | **16.0** | **f+** | < 40 | not determined | not determined | 9.6 | | < 4 |
| 2630 | ----- | | not detected | not detected | ----- | ----- | | not detected |
| 2643 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2644 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2649 | <10 | | <10 | <10 | <10 | <10 | | <10 |
| 2672 | <5 | | <5 | <5 | <5 | <5 | | <5 |
| 2674 | ----- | | < 10 | < 10 | ----- | ----- | | < 10 |
| 2678 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2734 | not detected | | not detected | not detected | not detected | not detected | | not detected |
| 2736 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2794 | not detected | | not detected | not analysed | not detected | not detected | | not detected |
| 2804 | <20 | | <20 | ----- | <20 | <20 | | <20 |
| 2826 | ----- | | <20 | <20 | ----- | ----- | | <20 |
| 2829 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2833 | Not detected | | Not detected | Not applicable | Not detected | Not analysed | | Not detected |
| 2835 | Not Detected | | Not Detected | Not Detected | Not Detected | Not Detected | | Not Detected |
| 2853 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 2864 | not detected | | not detected | not detected | not detected | not detected | | not detected |
| 2870 | ----- | | ----- | ----- | ----- | **29.32** | **f+** | ----- |
| 2885 | ----- | | ----- | ----- | ----- | ----- | | N.D. |
| 2900 | not analysed | | not analysed | not analysed | not analysed | not analysed | | not analysed |
| 3100 | <10 | | <10 | <10 | <10 | <10 | | <10 |
| 3110 | <15 | | <15 | ----- | ----- | ----- | | <15 |
| 3111 | ----- | | ----- | ----- | ----- | ----- | | 0 |
| 3116 | not detected | | not detected | ----- | ----- | ----- | | not detected |
| 3118 | ND | | ND | ND | ND | ND | | ND |
| 3121 | ----- | | ----- | ----- | ----- | ----- | | ----- |
| 3122 | < 5 | | < 5 | < 5 | < 5 | < 5 | | < 5 |
| 3124 | <0,5 | | 1.52 | ----- | <0,2 | <1 | | <0,1 |
| 3146 | not detected | | not detected | ----- | not detected | not detected | | not detected |
| 3153 | not detected | | not detected | not detected | not detected | not detected | | not detected |
| 3154 | ----- | | 3.482 | ----- | ----- | 3.562 | | ----- |
| 3160 | <16 | | <16 | ----- | <16 | <16 | | ----- |
| 3163 | not detected | | not detected | not analysed | not detected | not detected | | not detected |
| 3166 | ----- | | ----- | ----- | ----- | ----- | | ----- |

| lab | Sb | Cr | Cr6+ | Co | Cu | Hg |
|---|---|---|---|---|---|---|
| 3172 | < 10 | < 10 | ----- | < 10 | ----- | < 10 |
| 3182 | not analysed | <5 | not detected | not analysed | not analysed | not detected |
| 3183 | ----- | ----- | ----- | ----- | ----- | ----- |
| 3185 | <10 | <10 | <10 | <10 | <10 | <10 |
| 3190 | ＜2 | ＜2 | ＜1 | ＜2 | ＜2 | ＜2 |
| 3197 | <10 | <10 | <10 | <10 | <10 | <10 |
| 3210 | <25 | <10 | ----- | <10 | <10 | <0.02 |
| 3214 | <5 | <5 | <8 | <5 | <5 | <2 |
| 3216 | 0.584 | 0.819 | Not analysed | 0.017 | 0.575 | Not detected |
| 3225 | Not analysed | Not analysed | Not analysed | Not analysed | Not analysed | Not analysed |
| 3228 | ----- | <10 | ----- | ----- | ----- | <10 |
| 3237 | ----- | ----- | ----- | ----- | ----- | ----- |
| 3239 | ----- | not detected | not detected | ----- | ----- | not detected |
| 3246 | not detected | not detected | not detected | not detected | not detected | not detected |
| 3248 | <10 | <10 | <10 | <10 | <10 | <10 |
| 6146 | Not detected | Not detected | Not determined | Not detected | Not detected | Not detected |
| 8005 | not detected | not detected | ----- | ----- | ----- | not detected |
| 8008 | ----- | ----- | ----- | ----- | ----- | ----- |

Lab 2131 possibly a false positive test result for Sb
Lab 2316 possibly a false positive test result for Cr
Lab 2624 possibly a false positive test result for Sb
Lab 2870 possibly a false positive test result for Cu

**Other reported Metals in sample #20651; results in mg/kg - continued -**

| lab | Ni | | Mn | Sn | |
|---|---|---|---|---|---|
| 110 | ----- | | ----- | ----- | |
| 210 | ----- | | ----- | ----- | |
| 230 | ----- | | ----- | ----- | |
| 339 | <1.5 | | <1.5 | <12.5 | |
| 348 | ----- | | ----- | ----- | |
| 362 | ----- | | ----- | ----- | |
| 523 | <2 | | <2 | <2 | |
| 551 | ----- | | ----- | ----- | |
| 623 | not detected | | not detected | not detected | |
| 826 | N.D. | | N.D. | ----- | |
| 840 | <2 | | <2 | <2 | |
| 841 | < 10 | | < 10 | < 10 | |
| 1051 | ----- | | ----- | ----- | |
| 1082 | 0.313 | | 0.335 | 0.0405 | |
| 1126 | ----- | | ----- | ----- | |
| 1527 | 0.173 | | ----- | ----- | |
| 1842 | not analysed | | not analysed | not analysed | |
| 1910 | not analysed | | not analysed | not analysed | |
| 2108 | not detected | | not detected | not detected | |
| 2115 | ----- | | 0.38 | 0.26 | |
| 2118 | 0.184 | | 0.256 | 0.272 | |
| 2120 | < 33 | | ----- | ----- | |
| 2129 | ----- | | ----- | ----- | |
| 2131 | 0.8285 | | 0.4295 | **60.777** | **f+** |
| 2132 | ----- | | ----- | <10.0 | |
| 2137 | ----- | | ----- | ----- | |
| 2138 | Not Detected | | Not Detected | Not Detected | |
| 2139 | < 10 | | < 10 | < 10 | |
| 2165 | Not applicable | | Not applicable | Not applicable | |
| 2176 | not analysed | | not analysed | not analysed | |
| 2182 | ----- | | ----- | ----- | |
| 2184 | Not applicable | | Not applicable | Not applicable | |
| 2201 | <10 | | <10 | <10 | |
| 2202 | N.D. | | N.D. | N.D. | |
| 2216 | ----- | | ----- | ----- | |
| 2218 | ----- | | ----- | ----- | |
| 2229 | ----- | | ----- | ----- | |
| 2230 | <10 | | <10 | <10 | |
| 2232 | Not applicable | | Not applicable | Not applicable | |
| 2236 | ----- | | ----- | ----- | |
| 2250 | not detected | | not detected | not detected | |
| 2255 | n.d | | n.d | n.d | |
| 2256 | ND | | ND | ND | |
| 2258 | not analysed | | not analysed | not analysed | |
| 2264 | 5.397 | | ----- | ----- | |
| 2265 | ----- | | ----- | ----- | |
| 2266 | < detect. limit | | < detect. limit | < detect. limit | |
| 2271 | ND | | ND | ND | |
| 2284 | ----- | | ----- | ----- | |
| 2290 | <20 | | <20 | <20 | |
| 2293 | Not detected | | Not Analysed | Not Analysed | |
| 2294 | Not analysed | | Not analysed | Not analysed | |
| 2297 | <10 | | <10 | <10 | |
| 2301 | <10 | | <10 | <10 | |
| 2310 | Not detected | | Not detected | Not detected | |
| 2311 | Not Detected | | Not Detected | Not Detected | |
| 2314 | ----- | | ----- | ----- | |
| 2316 | **57.2** | **f+** | 6.6 | ----- | |
| 2320 | 3.6 | | 0.94 | <1.0 | |
| 2339 | ----- | | <5 | <5 | |
| 2347 | <5 | | <5 | <5 | |
| 2350 | <5 | | <5 | <10 | |
| 2352 | ----- | | ----- | ----- | |
| 2353 | <10 | | NA | <10 | |
| 2355 | <10 | | <10 | <10 | |
| 2357 | <10 | | <10 | <10 | |
| 2358 | n.d. | | N/A | n.d. | |
| 2363 | <5 | | <5 | <5 | |
| 2365 | <10 | | <10 | <10 | |
| 2366 | <50 | | <50 | <10 | |
| 2369 | <5 | | <5 | <5 | |
| 2370 | <6 | | <6 | <3 | |
| 2372 | <2 | | <6 | <2 | |
| 2374 | not detected | | not analyzed | not analyzed | |
| 2375 | <10 | | <10 | <10 | |

| lab | Ni | Mn | Sn |
|---|---|---|---|
| 2378 | ----- | ----- | ----- |
| 2379 | ----- | ----- | ----- |
| 2380 | ND | ND | ND |
| 2381 | Out Cap | Out Cap | Out Cap |
| 2382 | ＜10.0 | NA | NA |
| 2384 | ----- | ----- | ----- |
| 2385 | <5 | <5 | <5 |
| 2387 | ----- | ----- | ----- |
| 2390 | ----- | ----- | ----- |
| 2391 | <3 | <3 | <3 |
| 2392 | ----- | ----- | ----- |
| 2406 | not detected | ----- | ----- |
| 2409 | 0.105 | 0.189 | not analyzed |
| 2410 | < 5 | < 5 | < 5 |
| 2413 | ----- | ----- | ----- |
| 2426 | <20 | ----- | ----- |
| 2431 | ----- | ----- | ----- |
| 2444 | ----- | ----- | ----- |
| 2453 | ----- | ----- | ----- |
| 2460 | ----- | ----- | ----- |
| 2475 | not analysed | not analysed | not analysed |
| 2477 | ----- | ----- | ----- |
| 2488 | ----- | ----- | ----- |
| 2492 | ----- | ----- | ----- |
| 2500 | ----- | ----- | ----- |
| 2504 | <2 | <2 | <2 |
| 2511 | <10 | <10 | <10 |
| 2514 | ----- | ----- | ----- |
| 2529 | ----- | ----- | ----- |
| 2557 | ----- | ----- | ----- |
| 2560 | <10 | <10 | <10 |
| 2561 | <0.1 | 1.62 | 0.99 |
| 2563 | ----- | ----- | ----- |
| 2564 | ----- | ----- | ----- |
| 2568 | ----- | ----- | ----- |
| 2569 | ND | ND | ND |
| 2572 | <20 | ----- | ----- |
| 2573 | not detected | not detected | not detected |
| 2590 | < L.O.Q. | < L.O.Q. | < L.O.Q. |
| 2591 | ----- | ----- | ----- |
| 2603 | 0.3492 | ----- | ----- |
| 2608 | ----- | ----- | ----- |
| 2621 | <5 | <5 | <5 |
| 2624 | < 7 | not determined | < 10 |
| 2630 | ----- | ----- | ----- |
| 2643 | ----- | ----- | ----- |
| 2644 | ----- | ----- | ----- |
| 2649 | <10 | <10 | <10 |
| 2672 | <5 | <5 | <5 |
| 2674 | ----- | ----- | ----- |
| 2678 | ----- | ----- | ----- |
| 2734 | not detected | not detected | not detected |
| 2736 | ----- | ----- | ----- |
| 2794 | not detected | not detected | not detected |
| 2804 | <20 | ----- | ----- |
| 2826 | ----- | ----- | ----- |
| 2829 | ----- | ----- | ----- |
| 2833 | Not analysed | Not detected | Not analysed |
| 2835 | Not Detected | Not Detected | 15.1 |
| 2853 | ----- | ----- | ----- |
| 2864 | not detected | not detected | not detected |
| 2870 | 3.42 | ----- | 1.16 |
| 2885 | ----- | ----- | ----- |
| 2900 | not analysed | not analysed | not analysed |
| 3100 | <10 | <10 | <10 |
| 3110 | ----- | ----- | ----- |
| 3111 | ----- | ----- | ----- |
| 3116 | ----- | ----- | ----- |
| 3118 | ND | ND | ND |
| 3121 | ----- | ----- | ----- |
| 3122 | < 5 | < 5 | < 5 |
| 3124 | 1.68 | <50 | ----- |
| 3146 | not detected | not detected | not detected |
| 3153 | not detected | not detected | not detected |
| 3154 | ----- | ----- | 0.821 |
| 3160 | <16 | <16 | <16 |
| 3163 | not detected | not detected | not detected |

| lab | Ni | Mn | Sn |
|---|---|---|---|
| 3166 | ----- | ----- | ----- |
| 3172 | < 10 | ----- | < 10 |
| 3182 | not analysed | not analysed | not analysed |
| 3183 | ----- | ----- | ----- |
| 3185 | <10 | <10 | <10 |
| 3190 | ＜2 | ＜2 | ＜2 |
| 3197 | <10 | <10 | <10 |
| 3210 | <10 | <10 | <10 |
| 3214 | <5 | <5 | <5 |
| 3216 | 0.787 | 1.292 | 0.031 |
| 3225 | Not analysed | Not analysed | Not analysed |
| 3228 | ----- | ----- | ----- |
| 3237 | ----- | ----- | ----- |
| 3239 | ----- | ----- | ----- |
| 3246 | not detected | not detected | not detected |
| 3248 | <10 | <10 | <10 |
| 6146 | Not detected | Not detected | Not detected |
| 8005 | ----- | ----- | ----- |
| 8008 | ----- | ----- | ----- |

Lab 2316 possibly a false positive test result for Ni
Lab 2131 possibly a false positive test result for Sn

## **APPENDIX 3** Analytical details

| lab | ISO 17025 accred | sample intake (g) | sample preparation | release method | temperature program | acid mixture | analyze technique |
|---|---|---|---|---|---|---|---|
| 110 | --- | --- | --- | --- | --- | --- | --- |
| 210 | No | --- | Further cut | Microwave | --- | --- | ICP-MS |
| 230 | --- | --- | --- | --- | --- | --- | --- |
| 339 | No | 0.1 | Used as received | Acid digestion + microwave | Adding HNO3 + H2O2 Step1: 120°C 11min Step2: 240°C 9min Step3: 240°C 8min Adding HF after cooling Step4: 200°C 8min Step5: 200°C 5min | 4mL HNO3 + 1mL H2O2 1mL HF | ICP-AES |
| 348 | Yes | 0.15 | Further cut | Acid Digestion + microwave | 850 W max, Temperature max: 210ºC, Time: 1h 30 min (including cool down step) | 10 ml HNO3 (67-69%); 2 ml H2O2 (30-32%); 3 ml HCL (32-35%) | ICP-MS |
| 362 | Yes | 0.5000 | Further cut | Acid Digestion | --- | H2SO4; H2O2 | ICP-OES |
| 523 | Yes | 0.2 | Further cut | Acid Digestion | 195 °C | HNO3/HCl | ICP-MS |
| 551 | --- | --- | --- | --- | --- | --- | --- |
| 623 | Yes | 0.5 | Further cut | Microwave | Time 40 minutes Temperature min 140 C and max 210 C | HNO3 concentration 65% H2O2 30% | ICP-MS |
| 826 | --- | --- | Further grinded | --- | --- | --- | --- |
| 840 | Yes | 1 | Further cut | Acid Digestion | 5 minutes RAM to 190°C,HOLD 1 minute, 8 minutes RAM to 210°C, HOLD 45 minutes | HNO3+HCl+H2O2 | UV-VIS |
| 841 | Yes | 0.1009 | Further cut | Microwave | --- | --- | ICP-OES |
| 1051 | Yes | --- | Further cut | --- | --- | --- | --- |
| 1082 | No | 0.2 | Used as received | Microwave | 25min --> 50C 15min --> 100C 15min --> 180C 5min --> 220C | 65 w% HNO3 5ml + H2O 3ml | ICP-MS |
| 1126 | Yes | 2 mm thick | Further cut | Since XRF was used, the metals were not released from the sample | Not applicable for our in house method | Not applicable for our in house method | XRF |
| 1527 | Yes | 0.25 | Further cut | Microwave | step1 5min 70°C step2 5min 95°C step3 5min 135°C step4 6min 175°C step5 16min 210°C step6 20min 220°C vent 15min | nitric acid+hydrogen peroxide | ICP-MS |
| 1842 | Yes | --- | Used as received | --- | --- | --- | XRF |
| 1910 | Yes | 0.1 (Pb) 0.8 (Cd) | Further cut | microwave (Pb) - dry ashing (Cd) | 3h to achive 500C (Cd) (dry ashing) | 8 ml HNO3 (Pb) (microwave) | AAS |
| 2108 | Yes | 0.1 | Further cut | Acid Digestion | Ramp to 120°C, hold for 0 min Ramp to 180°C, hold for 5 min Ramp to 200°C, hold for 5 min Ramp to 230°C, hold for 30 min | 8 ml HNO3 (concentrated) + 2 ml HCl (concentrated) | ICP-MS |
| 2115 | Yes | 0.15 | Further cut | Microwave | --- | HNO3 | ICP-MS |
| 2118 | Yes | 0.1 | Further cut | Microwave | 5 min Max. 1000 W 140 °C 5 min Max. 1000 W 190 °C 5 min Max. 1000 W 210 °C 35 min Max. 1000 W 210 °C | | ICP-MS |
| 2120 | Yes | to standard used: EN 1122: 0,5g CPSC-CH-E1002-08.3: 0,3g EN 16711-1: 0,15g | Further cut | Microwave | Power Ramp Pressure Temperature Hold 800 W 20 800 psi 140ºC 5 min 800 W 25 800 psi 200ºC 40 min | See remarks | ICP-MS |
| 2129 | Yes | 0.05 - 0.200 | Further cut | Microwave | in 40 min heated up to 230°C | HNO3 conc. | ICP-MS |
| 2131 | Yes | 0.12 | Used as received | Microwave | 1200 W for 15 min 1200 W for 30 min 450 W for 15 min | Nitric Acid & Hydrogen peroxide | ICP-MS |
| 2132 | Yes | 0.15 | Further grinded | Microwave | 210 °C, 30 min | HNO3 + H2O2 | ICP-OES |
| 2137 | Yes | 2g (0.1g / test) | Used as received | Microwave | Ramping time 30 min. ramping Temp. 190°C Holding time 15 min.(at 190°C) | only HNO3 (for microwave) | ICP-OES |
| 2138 | Yes | 0.2 | Further cut | Microwave | --- | --- | ICP-OES |
| 2139 | Yes | 0.1 | Further cut | Microwave | step1: temp 25 to 110°C 10 min step2: temp 110 to 180°C 10 min step3: temp 180 to 230°C 10 min step4: maintain temp 230°C 7 min | nitric acid 20 % only | ICP-OES |
| 2165 | Yes | 0.1 | Further cut | Microwave | temp to 220°C in 30 minutes, keep 10 minutes | Nitric acid and hydrochloric acid. | ICP-OES |
| 2176 | Yes | ICP-OES: 0.1 UV-VIS: 0.15 | Further cut | Microwave | 220 - 235 °C | HNO3 and H2O2 | ICP-OES |

| lab | ISO 17025 accred | sample intake (g) | sample preparation | release method | temperature program | acid mixture | analyze technique |
|---|---|---|---|---|---|---|---|
| 2182 | Yes | Lead: 0.15 Cadmium: 0.50 | Further cut | Microwave | For Lead Time ,min Temperature, ℃ Voltage, W 20 210 1000 10 210 1000 | 5mL of concentrated nitric acid for lead | ICP-OES |
| 2184 | --- | --- | --- | --- | --- | --- | --- |
| 2201 | Yes | 0.2 | Further cut | Microwave | room temperature to 205°C,25 min(800W),Cool down 30min | 7MLHNO3/1H2 o2 | ICP-OES |
| 2202 | Yes | 0.4 | Used as received | Microwave | Microwave program / 1hour / 240°C | Nitric acid + Hydrogen peroxide | ICP-OES |
| 2216 | Yes | 0.1 | Further grinded | Acid Digestion | tempto 200C in 20 min then hold for 10 minutes at 200C | 5 mL nitric acid | ICP-OES |
| 2218 | Yes | 0.15 | Further cut | Microwave | --- | --- | ICP-OES |
| 2229 | Yes | #20650: ASTM F963-17: 0.1012/ 0.1013 EN1122: 0.1018/ 0.0999 #20651 ASTM F963-17: 0.1020/ 0.0999 EN1122: 0.0991/0.1003 | Further cut | Microwave | Microwave procedure: step1:100℃, 2min , 10atm step2:140℃, 3min, 20atm step3:170℃, 3min, 25atm step4:190℃, 4min, 35atm step5:210℃, 15min, 40atm | All samples are tested by microwave, we used nitric acid and hydrogen peroxide. | ICP-OES |
| 2230 | Yes | 0.2 | Further cut | Microwave | 210°C | HNO3+HF | ICP-OES |
| 2232 | Yes | 0.2 | Further cut | Microwave | Stage Temperature (°C) Hold Time (min) Ramp Time (min) 1 150 0 10 2 190 0 5 3 210 30 5 | Nitric acid and hydrogen peroxide | ICP-OES |
| 2236 | Yes | 0.1 | Further grinded | Microwave | Ramp to 205°C for 25 minutes Hold at 205°C for 25 minutes | 4.5mL Conc. nitric acid 1.5mL Conc. hydrochloric acid 1.0mL 50% Hydrogen peroxide | ICP-OES |
| 2250 | Yes | 0.1 0.0947 S #20650 and 0.0916 S | Used as received | Microwave | Step 1: 10 min; 1000 W to reach 110 °C; Step 2: 10 min, 1000 W to reach 180 °C and Step 3: 30 min, 1000 W to hold 180 °C | 3 different: Nitric acid only; Hydrochloric acid/Nitric acid mixture and for Cadmium a mixture from sulfuric acid and nitric acid | ICP-MS |
| 2255 | Yes | #20651 | Further cut | Microwave | Temp 180°C ; Ramping 15 mins , Hold for 10 mins at same temp | HNO3 | ICP-MS |
| 2256 | Yes | 0.2016 | Further cut | Microwave | 60 min, 210°C | 10 mL HNO3 + 1 mL H2O2 | ICP-AES |
| 2258 | Yes | #20650 0.2005 #20651 0.2002 | Further cut | Microwave | 150°C Ramp Time 10 Min. Hold Time 0 Min. -190°C Ramp Time 5 Min. Hold Time 0 Min. -210°C Ramp Time 5 Min. Hold Time 60 Min. | n/a | ICP-OES |
| 2264 | No | 150 | Further grinded | Microwave | 210°C / 45 minutes | Nitric acid concentrated | AAS |
| 2265 | Yes | 0.1 | Further cut | Microwave | First Step 5 minutes, 160C° Second Step 10 minutes, 200C° | HNO3 | ICP-OES |
| 2266 | Yes | 0.2 | Further cut | Microwave | --- | --- | ICP-MS |
| 2271 | Yes | 0.1 | Further cut | Other | 120°C 5min 150°C 5min 180°C 10min 210°C 30min | HNO3+HCL | ICP-OES |
| 2284 | Yes | 0.15 | Further cut | Microwave | 120°C 5min, 150°C 5min, 180°C 10min, 210°C 30min | 8mlHNO3+2.5m lH2O2 | ICP-OES |
| 2290 | Yes | --- | --- | --- | --- | --- | --- |
| 2293 | Yes | 0.3 | Further cut | Microwave | 20°C to 200°C / 10°C per min, total 30 min. | Nitric acid | ICP-MS |
| 2294 | Yes | #20650: 0.0952 #20651: 0.1005 | Further cut | Microwave | Temperature ramp 200°C in 25 minutes Hold 10 minutes These conditions for both samples | NHO3 concentrated in both samples 8mL | ICP-OES |
| 2297 | Yes | 0.2 | Further cut | Microwave | up to 190°C within 20min, and keep for 15mins | HNO3+2mL H2O2 | ICP-OES |
| 2301 | Yes | 0.2 | Further cut | Microwave | 150,190,210 60 menit | --- | ICP-MS |
| 2310 | Yes | 0.25 | Further cut | Microwave | 180°C | 10ML | ICP-MS |

| lab | ISO 17025 accred | sample intake (g) | sample preparation | release method | temperature program | acid mixture | analyze technique |
|---|---|---|---|---|---|---|---|
| 2311 | Yes | 0.1 | Further cut | Microwave | 15-100-10hold 10-150-10hold 10-200-30hold | --- | ICP-MS |
| 2314 | Yes | 0.2 | Further cut | Acid Digestion | 180 | HNo3 | AAS |
| 2316 | Yes | 0.2 heavy metal; 0.15 Hexavalent Chromium | Further cut | Microwave | 200°C for 40 minutes @ energy 1000W then cooling it for 10 minutes | Microwave digestion with acid combination of HNo3 and HF. | ICP-OES |
| 2320 | --- | --- | --- | --- | --- | --- | --- |
| 2339 | No | 0.2 | Further cut | Microwave | --- | --- | ICP-AES |
| 2347 | Yes | --- | --- | --- | --- | --- | --- |
| 2350 | Yes | Cr6+: #20650: 0.1, #20651: 0.15 Cd: #20650, #20651: 0.5 Pb, Hg: #20650, #20651: 0.2 Sb, Cr, Co, Cu, Ni, Mn, Sn: #20650, #20651: 0.2 | Further cut | Microwave | Cr6+ : #20650(60°C 1Hr), #20651(Ambient --> 155°C : 10min, 155°C holding : 1.5 Hr, cooling time : 20 min) Cd : #20650, #20651 (210°C) Pb, Hg, Sb, Cr, Co, Cu, Ni, Mn, Sn : #20650, #20651 (Ambient --> 80°C :5min, 80°C --> 40°C : 5min, 40°C --> 210°C : 15min, 210°C holding : 15min, cooling time : 20 | Cd : #20650, #20651(H2SO4 + H2O2) Pb, Hg, Sb, Cr, Co, Cu, Ni, Mn, Sn : #20650, #20651 (HNO3 + HF) | ICP-OES |
| 2352 | Yes | 0.25 | Other | Microwave | The temperature was raised to 130°C for 6 min and keep for 3 min 5 min, 130°C rise to 160°C and keep for 3 min 5 min, 160°C rise to 180 °C and keep for 15 min | HNO3:HCL=4:1 | ICP-OES |
| 2353 | Yes | 0.25 | Further cut | Acid Digestion | 210 C , 40 minutes | HNO3 | ICP-OES |
| 2355 | Yes | 0.25 | Further cut | Acid Digestion | 200°C for 30mins | 7ml HNO3+3ml HCl | ICP-OES |
| 2357 | --- | --- | --- | --- | --- | --- | --- |
| 2358 | Yes | 0.25 | Further cut | Microwave | 210 degree C | HNO3 | ICP-OES |
| 2363 | Yes | 0.25 | Further cut | Microwave | max temperature £º210°C | HNO3+HCl+HF | ICP-OES |
| 2365 | Yes | 0.2 | Further cut | Microwave | Nr t [h£ºm£ºs] T [¡æ] 1 00£º10£º00 165 2 00£º04£º00 165 3 00£º07£º00 205 4 00£º30£º00 205 | HNO3¡¢H2O2¡¢HBF4 | ICP-OES |
| 2366 | Yes | 0.2 | Further cut | Microwave | rise to 165℃ within 10min, then hold 4min; rise to 205℃ within 7min, then hold 30min, cooled to r.m. finally | | ICP-OES |
| 2369 | --- | --- | --- | --- | --- | --- | --- |
| 2370 | Yes | EN1122 about 0.5 g; US EPA 3052 about 0.2 g; IEC 62321-7-2 about 0.1~0.15 g | Further grinded | Acid Digestion | Step 1: Heat from room temperature to 170¢J within 10 minutes. Step 2: Maintain at 170¢XC for 5 minutes. Step 3: Heat from 170¢XC to 190¢XC in 10 minutes. Step 3: Maintain at 190¢XC for 25 minutes. | HNO3 & HF. | ICP-OES |
| 2372 | No | 0.1 | Further cut | Microwave | --- | HNO3 | ICP-OES |
| 2374 | Yes | 0.2g EN 1122; others : 0.1g | Used as received | For EN 1122: hot plate others: microwave | 7 min ramp to 150°C and hold for 3 min; 5 min ramp to 180°C and hold for 3 min; 5 min ramp to (200¡À5) ¡æ and hold for 15 min. | 6mL HNO3+ 2mL HCL | ICP-OES |
| 2375 | Yes | 0.15 | Used as received | Microwave | --- | Nitric Acid - Peroxide | ICP-MS |
| 2378 | Yes | 0.1 | Used as received | Microwave | 210℃,20min | --- | ICP-OES |
| 2379 | Yes | 0.25g For 2 samples of Chromium as Cr6+ used 0.15g | Further grinded | Microwave | 180 degree Celsius For sample 20650 of Chromium as Cr6+ used 63 degree Celsius/ 6 hr. For sample 20651 of Chromium as Cr6+ used 155 degree Celsius/ 5 hr | HNO3+H2O2 None for Chromium as Cr6+ | ICP-OES |
| 2380 | Yes | 0.25 | Further cut | Microwave | Time Duration (in min) Temperature 3 140 2 140 5 190 5 190 5 210 20 210 | HNO3 & H2O2 | ICP-OES |
| 2381 | Yes | 0.25 | Further cut | Microwave | Step 1: 3 min & 140°C Step 2: 2 min & 140°C Step 3: 5 min & 190°C Step 4: 5 min & 190°C Step 5: 5 min & 210°C Step 6: 20 min & 210°C | | AAS |
| 2382 | Yes | 0.1 | Further cut | Microwave | 1、7min ramp to 150℃ and hold for 3 min 2、5min ramp to 180℃ | 1ml HCL+5ml HNO3+1ml HF | ICP-OES |

| lab | ISO 17025 accred | sample intake (g) | sample preparation | release method | temperature program | acid mixture | analyze technique |
|---|---|---|---|---|---|---|---|
| | | | | | and hold for 3 min 3、5min ramp to 200℃ and hold for 15 min | | |
| 2384 | Yes | 0.2 | Further grinded | Microwave | --- | Nitric Acid | AAS |
| 2385 | Yes | 0.1 | Further cut | Microwave | --- | --- | ICP-OES |
| 2387 | Yes | 0.2 | Further grinded | Microwave | --- | --- | ICP-OES |
| 2390 | Yes | #20650: 0.2045 #20651: 0.2016 | Further cut | Microwave | 20 minutes ramp time to 210 c20 minutes hold time (like stage 6 of the method) | 10 ml Conc HNO3 | ICP-OES |
| 2391 | Yes | 0.10 | Further cut | Microwave | Step Target temp. (°C) Pressure max (bar) Ramp time (min) Hold time (min) Power (%) 1 150 60 10 2 90 2 200 60 5 10 90 3 50 60 10 0 0 4 50 60 0 0 0 5 50 60 0 0 0 | 5ml HNO3 + 5ml H2SO4 for sample #20650 10ml HNO3 for sample #20651 | ICP-OES |
| 2392 | Yes | 1.0 | Further grinded | Microwave | Temperature at 180+-5 degree Celsius, pressure 400 PSI, Ramping 20 min, Holding 20 min | HNO3 : H2O2 10 : 1 | ICP-OES |
| 2406 | Yes | 0.1 | Further cut | Microwave | Temperature is increased to 200°C within 20 minutes, then hold for 30 minutes, and cool down for 60 minutes at last. | | ICP-OES |
| 2409 | No | 0.2 | Further cut | Microwave | step1 : 120°C 10 min step2 : 180°C 15 min | Nitric acid | ICP-MS |
| 2410 | Yes | 0.2 | Further cut | Microwave | 200 ¡É25 min ramping, 25 min holding | HNO3, HF | ICP-OES |
| 2413 | Yes | Not Applicable | Used as received | Other | HDXRF Analysis at Room Temperature | Not Applicable | XRF |
| 2426 | --- | --- | --- | --- | --- | --- | --- |
| 2431 | Yes | 0.1 | Further cut | Microwave | 10 mins to 200C, hold 20mins | HNO3, HCl | ICP-MS |
| 2444 | Yes | 0.2 for Hg, Pb, Cd and 0.1 for Cr6+ | Further cut | Acid Digestion | 1st heatup: 0 to 220°C; 60 min, 2nd holding: 220°C; 60 min, 3rd cooldown: 220 to 40°C;15 min | HNO3 : H2O2 | ICP-OES |
| 2453 | Yes | 0.1 | Further cut | Microwave | --- | --- | ICP-OES |
| 2460 | Yes | 0.2–Pb 0.5-Cd | Further cut | Acid Digestion - Cd Microwave – Pb | Rampa a 200°C en 20 min, mantener 10 min – Pb Alta temperatura durante 1 h - Cd | H2SO4 y H2O2 -Cd HNO3- Pb | AAS |
| 2475 | Yes | 0.1394 | Used as received | Microwave | --- | --- | ICP-OES |
| 2477 | Yes | 0.15 | Further cut | Microwave | 200°C, 20 MIN, 10 MIN | HNO3 | ICP-OES |
| 2488 | Yes | --- | Further cut | Microwave | --- | --- | ICP-MS |
| 2492 | Yes | 0.1 | Used as received | Microwave | --- | --- | AAS |
| 2500 | Yes | 0.2003 | Further cut | Microwave | Temp.:210°C Hold time: 60 min | | ICP-OES |
| 2504 | Yes | 0.2 | Further cut | Microwave | Heat 10 min to 200°C Stand for 30C at 200C Cool down to RT 20 min | - | ICP-OES |
| 2511 | --- | --- | --- | Microwave | --- | --- | ICP-MS |
| 2514 | Yes | 20650=0.3861; 20651=0.3493 | Further cut | Microwave | 200°C in 20 min and holding at 200°C for 10 min | Nitric acid | AAS |
| 2529 | --- | --- | --- | --- | --- | --- | --- |
| 2557 | Yes | 0.1 | Further cut | Other | 210°C-30min | HNO3 | ICP-MS |
| 2560 | Yes | 0.1 | Further cut | Microwave | 65 mins and 190ºC | Not applicable 20650 - Nitric Acid only 20651 - 8ml nitric acid, 1 ml | ICP-MS |
| 2561 | Yes | 0.05 | Further cut | Microwave | Ramp 20 mins Room temperature to 200°C 10 min hold | Hydrochloric acid. | ICP-MS |
| 2563 | --- | --- | --- | --- | --- | --- | --- |
| 2564 | Yes | --- | Further cut | Acid Digestion | --- | --- | AAS |
| 2568 | Yes | 0.1 | Further grinded | Other | --- | --- | UV-VIS |
| 2569 | Yes | 0.25 | Further cut | Microwave | --- | --- | ICP-OES |
| 2572 | --- | --- | --- | --- | --- | --- | --- |
| 2573 | Yes | 2 | Further cut | Microwave | microwave method: increasing the temp. to 200°C in approx. 20 min., and holding for 25 mins. Step1: 11 mins to reach 120°C Step2: 2 mins stable at 120°C Step3: 9 mins to reach to 220°C Step4: 10 mins stable at 220°C | 8mL of HNO3 and 1mL of H2O2 | ICP-OES |
| 2590 | Yes | 0.2 | Further cut | Microwave | | | ICP-MS |
| 2591 | Yes | 0.25 | Further cut | Microwave | --- | HNO3 | ICP-MS |
| 2603 | Yes | 0.2 | Further cut | Microwave | Microwave digestion temperature:200°C; Keep the time:30 minutes. | 8mL Nitric acid + 2mL Hydrogen peroxide | ICP-MS |
| 2608 | --- | --- | --- | --- | --- | --- | --- |

| lab | ISO 17025 accred | sample intake (g) | sample preparation | release method | temperature program | acid mixture | analyze technique |
|---|---|---|---|---|---|---|---|
| 2621 | Yes | 0.1-0.2 | Further cut | Microwave | --- | 5N2NO3: 2H2O2 | ICP-OES |
| 2624 | No | 2 | Further cut | Microwave | --- | HCl 6 ml + HNO3 2 ml + H2O2 2 ml + H2O 5 ml | Cd Pb (AAS) Others (ICP-OES or XRF) |
| 2630 | Yes | 0.05 | Further grinded | Microwave | Step Heating(min) Target temp(℃) Lasting(min) 1. 14 120±5 1 2. 7 150±5 10 3. 10 180±5 10 4. Cool to room temp | | ICP-OES |
| 2643 | Yes | 0.15 | Further cut | Acid Digestion | --- | Sulfuric acid/Nitric acid | ICP-OES |
| 2644 | Yes | 0.5 | Further cut | Microwave | 140°C 5 min 250°C 30 min 50°C 10 min | --- | ICP-OES |
| 2649 | Yes | 1 | Further cut | Microwave | 210°C / 40 min | HNO3 + HCL | ICP-MS |
| 2672 | Yes | 0.1 | Further cut | Microwave | Step1: Ramp 30min /Hold 20 min / Temp 120°C / Power 700W Step2: Ramp 25 min / Hold 30 min / Temp 230°C / Power 1100W | HNO3 / HCl | ICP-MS |
| 2674 | Yes | 0.1~0.2 | Further cut | Microwave | Microwave digestion program: increase temp to 200°C and hold | 10 mL HNO3 | ICP-OES |
| 2678 | --- | --- | --- | --- | --- | --- | --- |
| 2734 | Yes | 2g each | Further cut | Microwave | --- | --- | ICP-OES |
| 2736 | --- | --- | --- | --- | --- | --- | --- |
| 2794 | Yes | not applicable; XRF analyzed | Used as received | --- | --- | --- | XRF |
| 2804 | Yes | 0.5 | Used as received | Microwave | Increase to at least 200°C within 20 mins, then hold for 10 mins. 30 mins cool down. | | ICP-OES |
| 2826 | Yes | 0.2 | Used as received | Microwave | Increase to at least 200°C within 20mins, then hold for 10 mins. 30 mins cool down. | | ICP-OES |
| 2829 | Yes | 150 | Further cut | Microwave | --- | --- | ICP-OES |
| 2833 | No | --- | Used as received | --- | --- | --- | XRF |
| 2835 | Yes | 0.2000 | Further cut | Microwave | Step 1:145°C Ramp 7 mins hold 3 mins Step 2: 210°C Ramp 10 mins hold 5 mins Step 3: 50°C hold 10 mins | HNO3 and H202 | ICP-OES |
| 2853 | Yes | 0.1 | Further cut | Microwave | raise to 200°C in 25 minutes, then hold for 20 minutes | 3% v/v Nitric acid | ICP-MS |
| 2864 | Yes | 0.25 | Further cut | Microwave | 195°C 45min | 5mL HNO3+1.5mL HF+1mL HCl+1mL H2O | ICP-OES |
| 2870 | Yes | 0.1 | Further cut | Microwave | Level max.Power Power Ramp Pressure Temperature Stirrer Hold 1 1600 W 100% 10:00 08.30 bar 120 3 00:00 2 1600 W 100% 15:00 08.30 bar 180 3 05:00 3 1600 W 100% 15:00 08.30 bar 200 3 05:00 4 1600 W 100% 15:00 08.30 bar 230 3 30:00:00 | Nitric acid and Hydrogen peroxide | ICP-MS |
| 2885 | No | 0.25 | Further cut | Microwave | --- | --- | ICP-OES |
| 2900 | No | 0.2 | Further cut | Microwave | Step 1: Incorporates reaching 210 °C for 20 mins; Step 2: Remaning at 210 degree for 15 minns; Step 3: Cooling for 20 mins, | HNO3 + HF | ICP-OES |
| 3100 | Yes | CPSC-CH-E1002-08.3: 0.1 EN1122:2001: 0.5 IEC 62321-7-2:2017: 0.1 | Further grinded | Microwave | Sample to 205℃ in 20 minutes, and holding at 205℃ for 12 minutes. | CPSC-CH-E1002-08.3 was used HNO3 EN 1122:2001 was used H2SO4,H2O2 | Other, please specify in the remarks below |
| 3110 | Yes | 0.1 | Further cut | Microwave | --- | --- | ICP-OES |
| 3111 | No | 0.2 | Used as received | Microwave | --- | HNO3 alone | ICP-OES |
| 3116 | --- | --- | --- | --- | --- | --- | --- |
| 3118 | Yes | 0.15 | Further cut | Microwave | --- | --- | ICP-MS |
| 3121 | No | Cr(VI) 2g Metals 0,1g | Used as received | Microwave | 0 – 1300W in 10 min. 1300 W in 30 min. Cool to 70 °C | HNO3 + HCl | ICP-MS |
| 3122 | Yes | 0.5 | Further cut | Microwave | 210ºC, 20 min | HNO3 | ICP-OES |
| 3124 | Yes | 150-200 | Used as received | Acid Digestion | A power controlled program was used with 210-230 degrees Celsius in minimum 10 minutes. | HNO3 + HF + HCL. | ICP-MS |

| lab | ISO 17025 accred | sample intake (g) | sample preparation | release method | temperature program | acid mixture | analyze technique |
|---|---|---|---|---|---|---|---|
| 3146 | Yes | 0.25 | Further cut | Microwave | Step 1: 02:30 min -> 70 °C Step 2: 12:00 min -> 200 °C Step 3: 18:00 min -> 250 °C | 4.5 ml HNO3 (65%) + 1.5 ml HCl (25%) | ICP-MS |
| 3153 | Yes | 0.1 | Further grinded | Microwave | Stage 1: Ramp from room temp to 140°C, hold for 5 mins. Stage 2: Ramp temp from 140°C to 200°C in 5 mins, hold for 20 mins | 3 HNO3 + 1 HCl | ICP-OES |
| 3154 | Yes | 0.2 | Further cut | Microwave | 20 min to 200°C, 25 min holding at 200°C, cooling to room temperature | HNO3/H2O2 | ICP-MS |
| 3160 | Yes | 0.15 | Further cut | Microwave | Step 1: 210ºC in 20 mins Step 2: Hold at 210ºC for 15 mins | --- | ICP-MS |
| 3163 | No | 1 | Used as received | --- | x | x | XRF |
| 3166 | --- | --- | --- | --- | --- | --- | --- |
| 3172 | Yes | 0.1 | Used as received | Acid Digestion | 210°C | HNO3 | ICP-OES |
| 3182 | Yes | 0.2 | Further cut | Microwave | Step 1 Room temp to 200°C use time 15 min and hold time 10 min Step 2 200°C to 180°C use time 10 min | Nitric acid and Hydrogen peroxide | ICP-OES |
| 3183 | Yes | #20650: 0.5-2.0 #20651: 0.5-0.8 | Used as received | Acid Digestion | --- | HNO3 and H2O2 | ICP-AES |
| 3185 | Yes | 0.1 | Further cut | Microwave | Increasing the temp of each sample to 210°C in 20 mins,and hold at 210°C for 10 mins | NA | UV-VIS |
| 3190 | Yes | 0.1 | Further cut | Microwave | Heat up to 120°C in 6 min,hold 2min; Heat up to 160°C in 5 min,hold 2min; Heat up to 190° in 7 min,hold 30min. | HNO3 :HCL 3:1 | ICP-OES |
| 3197 | Yes | --- | Further cut | Microwave | --- | --- | ICP-OES |
| 3210 | Yes | 0.1 | Further cut | Acid Digestion | 240°C 50min | HNO3+HCl | AAS |
| 3214 | Yes | 0.15 | Further grinded | Microwave | 210°C, Microwave 1 hr | 9 ml HNO3+ 3 ml HCl+ 1 ml HF | ICP-OES |
| 3216 | No | 0.2 | Used as received | Acid Digestion | Programa de digestión: rampa de 15 min para alcanzar 190ºC y se mantiene a 190ºC 15 minutos más. | Digestión ácida en microondas analítico con 10 ml de HNO3 concentrado ultrapuro (70%) La muestra obtenida se enrasa a 25 ml y se diluye 1:10 con solución acuosa 2% HNO3 para su análisis por ICPMS (Modelo Agilent 7500). | ICP-MS |
| 3225 | Yes | EN1122: 0.5 CPSC-CH-E1002-08.3: 0.1 | Further cut | acid digestion for EN1122 and microwave digestion for CPSC-CH-E1002-08.3 | 120°C for 5 mins, 160°C for 1 min, 190°C for 4 min | HNO3 | ICP-OES |
| 3228 | Yes | 0.1 | Further cut | Microwave | Power Time (mins) Temp (°C) Step 1 1000W 3:30 120 Step 2 1000W 15:00 180 Step 3 1000W 15:00 200 | | ICP-OES |
| 3237 | Yes | 0.2 | Further cut | Microwave | Stage 1:temp 160°C ,Ramp time 15 min, hold time 5 min, 1800 W Stage 2:temp 220°C ,Ramp time 10 min, hold time 10 min, 1800 W | 9 ml HNO3+3 ml HCL | ICP-MS |
| 3239 | Yes | 0.2g heavy metals ,Cd,Pb,Hg,Cr using the ICP-OES. 1.25g for Cr6+ using UV-Vis | Further grinded | Microwave | Sample was digested for 40 min at a temp from 120-200°C. Alkaline digestion solution (NaOH and Na2CO3) was used for the analysis of Cr6+.Sample extracted at 90°C for 180 min | 5 ml of nitric acid and 0.1 ul H202. | ICP-OES |
| 3246 | No | 0.1 to 0.2 | Used as received | Microwave | - Increase temperature to 185°C in 25 min. - Keep in 25 min. - Cool down to RT | Nitric acid 65% | ICP-MS |
| 3248 | Yes | 0.15 for microwave | Further cut | Microwave | 130°C for 1 min, then 170°C for 1 min, then 190°C 15 min | H2SO4 and H2O2 | AAS |

| lab | ISO 17025 accred | sample intake (g) | sample preparation | release method | temperature program | acid mixture | analyze technique |
|---|---|---|---|---|---|---|---|
| 6146 | Yes | digestion 0.2 for EN1122 Different spots were measured | Used as received | Other | Not performed | Not performed | XRF |
| 8005 | Yes | 0.1 | Further cut | Microwave | --- | --- | ICP-OES |
| 8008 | Yes | 0.5 | Further cut | Acid Digestion | --- | --- | AAS |

## APPENDIX 4

### Number of participants per country

6 labs in BANGLADESH
1 lab in BELGIUM
1 lab in BRAZIL
1 lab in BULGARIA
1 lab in CANADA
3 labs in DENMARK
1 lab in ESTONIA
1 lab in FINLAND
6 labs in FRANCE
10 labs in GERMANY
2 labs in GUATEMALA
21 labs in HONG KONG
6 labs in INDIA
3 labs in INDONESIA
7 labs in ITALY
2 labs in JAPAN
3 labs in MALAYSIA
1 lab in MAURITIUS
4 labs in MEXICO
1 lab in MOROCCO
26 labs in P.R. of CHINA
2 labs in PAKISTAN
1 lab in PERU
1 lab in POLAND
2 labs in PORTUGAL
1 lab in ROMANIA
3 labs in SINGAPORE
9 labs in SOUTH KOREA
5 labs in SPAIN
1 lab in SRI LANKA
1 lab in SWITZERLAND
7 labs in TAIWAN
7 labs in THAILAND
2 labs in THE NETHERLANDS
2 labs in TUNISIA
4 labs in TURKEY
7 labs in U.S.A.
3 labs in UNITED KINGDOM
6 labs in VIETNAM

**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 statistical evaluation |
| n.a. | = not applicable |
| n.e. | = not evaluated |
| n.d. | = not detected |
| fr. | = first reported |

**Literature**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