

Results of Proficiency Test
OPP & Chlorinated Phenols
in textile
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Organised by: Institute for Interlaboratory Studies (iis)
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1 INTRODUCTION

Since the 1990's, many countries have adopted environmental standards and requirements restricting the use of harmful chemicals in the production of textiles and clothing. Laws and regulations impose some of these standards and requirements. In addition to mandatory environmental standards and requirements for textiles, some Eco-labelling schemes are imposing environmental requirements for textile products on a voluntary basis, e.g. Milieukeur (Netherlands), Bluesign© (Switzerland) and Öko-Tex Standard 100 (Germany).

Since 2004, the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for Orthophenylphenol (OPP), Pentachlorophenol (PCP) and Tetrachlorophenols (TeCP) in textile. During the annual proficiency test program 2017/2018, it was decided to continue the proficiency test for Orthophenylphenol (OPP), Pentachlorophenol (PCP) and Tetrachlorophenols (TeCP) in textile.

In this interlaboratory study 85 laboratories in 22 different countries registered for participation. See appendix 3 for the number of participants per country. In this report, the results of the 2017 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 Spijkensisse, the Netherlands was the organiser of this proficiency test (PT). Sample analyses for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC 17025 accredited laboratory. It was decided to send two different samples (labelled #17645 and #17646, 3 grams each) which were positive on OPP and/or PCP (and TCEP). The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 QUALITY SYSTEM

The Institute for Interlaboratory Studies in Spijkensisse, the Netherlands, has implemented a quality system based on ISO/IEC 17043:2010. 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 organisation 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 March 2017 (iis-protocol, version 3.4). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

Two different batches of textile were obtained from a third party.

The first batch, a dark blue cotton fabric positive on OPP and PCP, was cut into pieces. The batch was used before in a previous interlaboratory study (iis10A02). Therefore, the samples were considered to be homogeneous (see report iis10A02). Each participant received a sample of approx. 3 grams packed in a polypropylene bag (labelled #17645).

The second bulk material, a black ribbon fabric positive on PCP, was cut into pieces. From this batch, after mixing well, 120 subsamples of 3 grams each were packed and labelled #17646. The homogeneity of 8 stratified randomly selected samples was checked by determination of PCP in accordance with an in-house test method for PCP. See the following table for the test results.

	<i>PCP in mg/kg</i>
Sample #17646-1	3.89
Sample #17646-2	3.97
Sample #17646-3	4.29
Sample #17646-4	3.92
Sample #17646-5	4.21
Sample #17646-6	3.81
Sample #17646-7	4.38
Sample #17646-8	4.02

Table 1: homogeneity test results of subsamples #17646

From the above test results the repeatability was calculated and compared with 0.3 times the corresponding reproducibility of the reference method in agreement with the procedure of ISO 13528, Annex B2 in the next table:

	<i>PCP in mg/kg</i>
r (observed)	0.58
reference method	iis-memo (see lit.18)
0.3 x R (reference method)	1.01

Table 2: evaluation of the repeatability of subsamples #17646

The calculated repeatability of Pentachlorophenol (PCP) was in agreement with 0.3 times the respective target requirement. Therefore, homogeneity of the subsamples was assumed.

To each participating laboratory one set of samples (1 sample of approx. 3 grams, labelled #17645 and 1 sample of approx. 3 grams, labelled #17646) were sent on November 15, 2017.

2.5 ANALYSES

The participants were requested to determine on samples #17645 and #17646 the concentrations of Orthophenylphenol (OPP), Pentachlorophenol (PCP), 2,3,4,5-Tetrachlorophenol, 2,3,4,6-Tetrachlorophenol and 2,3,5,6-Tetrachlorophenol applying the analysis procedure that is routinely used in the laboratory. Also some analytical details were requested to be reported.

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 to 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 evaluation.

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 appendix 1 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 reanalysis). Additional or corrected test results are used for data analysis and original test results are placed under 'Remarks' in the test result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1 STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organization, Statistics and Evaluation' of March 2017 (iis-protocol, version 3.4).

For the 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 ISO 5725 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 requirement based on the target reproducibility in accordance with ISO13528. When the uncertainty passed the evaluation, no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.

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

3.2 GRAPHICS

In order to visualise the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported 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 of this interlaboratory study.

The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used. In some cases, a reproducibility based on former iis proficiency tests could be used.

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:

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

The $z_{(\text{target})}$ 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

During the execution of this proficiency test no serious problems occurred. Two participants reported the test results after the final reporting date and one participant did not report any test result at all. Not all laboratories were able to report all analyses requested. In total 84 laboratories reported 475 numerical test results. Observed were 20 outlying test results, which is 4.2%. In proficiency studies outlier percentages of 3% - 7.5% are quite normal.

4.1 EVALUATION PER SAMPLE AND PER TEST

In this section, the test results are discussed per sample and per test. The test methods, which were used by the various laboratories were taken into account for explaining the observed differences when possible and applicable. These test methods are also in the tables in appendix 1 together with the original data. The abbreviations used in these tables are listed in appendix 4.

Due to the lack of relevant reference test methods for the determination of OPP, calculated reproducibilities were compared with reproducibilities estimated from the Horwitz equation until 2015. For Pentachlorophenol (PCP), both existing methods (LFGB 82.02-8 and ISO17070:2015, the latter method superseding DIN53313:1996 and DIN14494:2003), mention identical precision data for leather only. These precision data for leather are in full agreement with the Horwitz equation and were used in the calculation of the z-scores due to lack of a better alternative. In other PTs for other determinations, a quality improvement is visible over the years as a decrease of the dispersion is observed. However, in the case of OPP and PCP a quality improvement is not clearly visible and therefore it is doubtful whether the target reproducibility based on the Horwitz equation will ever be met. This goal may be unreachable. In 2015, it was decided to estimate a target reproducibility based on iis PT data of OPP/PCP proficiency tests from 2004 unto 2014. This estimation of the target reproducibilities for OPP and PCP was based on a Horwitz-like equation as it was assumed that the variation in the PT test results will be dependent on the concentration. This developed Horwitz-like equation to estimate the target reproducibilities for the evaluation of the quality of the PT test results is used by iis from 2015 (see lit.18).

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.

Sample #17645

OPP: The determination of this component may be problematic at the low level of 12 mg/kg. No statistical outliers were observed, but one test result was excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the estimated reproducibility found in previous iis PTs (see lit 18). The observed level of 12 mg/kg for OPP is lower than the Eco labelling Limit of 50 mg/kg for OPP, see also paragraph 5.

PCP: The determination of this component was problematic at the level of 35 mg/kg. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility found in previous iis PTs (see lit 18). See paragraph 5 for discussion.

2,3,4,5-TECP: The determination of this component may be problematic at the low level of 0.13 mg/kg. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility calculated using the Horwitz equation. See paragraph 5 for discussion.

2,3,4,6-TECP: The determination of this component was problematic at a level of 2.23 mg/kg. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility calculated using the Horwitz equation. See paragraph 5 for discussion.

2,3,5,6-TECP: The determination of this component was problematic at a low level of 0.19 mg/kg. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility calculated using the Horwitz equation. See paragraph 5 for discussion.

Other Chlorophenols: The concentrations reported were near or below the detection limit. Therefore, no significant conclusions were drawn.

Sample #17646

OPP: The determination of this component may be problematic at the low level of 1.0 mg/kg. One statistical outlier was observed and one test results was excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the estimated reproducibility found in previous iis PTs (see lit 18). The observed level of 1.0 mg/kg for OPP is far below the Eco labelling Limit of 50 mg/kg for OPP, see also paragraph 5.

PCP: The determination of this component was not problematic at the level of 3.4 mg/kg. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the estimated reproducibility found in previous iis PTs (see lit 18). See paragraph 5 for discussion.

2,3,4,5-TeCP / 2,3,4,6-TeCP / 2,3,5,6-TeCP and Other Chlorophenols:

The concentrations of these components were near or below the detection limit. Therefore, no significant conclusions were drawn.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the estimated target reproducibilities (see 4.1) and the reproducibilities as found for the group of participating laboratories.

The number of significant test results, the average results, the calculated reproducibilities (standard deviation*2.8) and the target reproducibilities (estimated from previous iis PTs and/or Horwitz equation) are compared in the next table:

	<i>unit</i>	<i>n</i>	<i>Average</i>	<i>2.8 * sd</i>	<i>R (lit)</i>
OPP	mg/kg	67	12.3	13.6	8.6
PCP	mg/kg	79	35.4	44.2	21.2
2,3,4,5-TeCP	mg/kg	36	0.13	0.14	0.08
2,3,4,6-TeCP	mg/kg	72	2.23	1.59	0.88
2,3,5,6-TeCP	mg/kg	40	0.19	0.21	0.11

Table 3: reproducibilities of tests on sample #17645

	<i>unit</i>	<i>n</i>	<i>Average</i>	<i>2.8 * sd</i>	<i>R (lit)</i>
OPP	mg/kg	56	(0.97)	1.47	1.00
PCP	mg/kg	79	3.39	2.63	2.89

Table 4: reproducibilities of tests on sample #17646

The figures between brackets: the level of OPP in the PT is below the range of OPP used in lit 18 (6 – 520 mg/kg).

Without further statistical calculations, it can be concluded that for OPP the total group of participating laboratories may have difficulties with the analysis. See also the discussion in paragraphs 4.1 and 5.

4.3 COMPARISON OF THE PROFICIENCY TEST OF DECEMBER 2017 WITH THE PREVIOUS PTS

The observed variation expressed as the relative standard deviation RSD of the test results is depending on the amount present in the sample in the 2017 PT. For sample #17646 the observed variation was similar as observed in the previous rounds. However, for sample #17645 the observed variation is not at all in agreement with the set target. For OPP, the observed variation was larger than in previous PTs. The large variation for sample #17646 may be explained by the low concentration (less than 1 mg/kg).

	<i>Dec 2017</i>	<i>Dec 2016</i>	<i>Nov 2015</i>	<i>Nov 2014</i>	<i>Nov 2013</i>	<i>2012 - 2009</i>	<i>lit. 18</i>
OPP	39-54%	38%	24%	27%	29%	17 - 35%	24%
PCP	28-45%	28%	38%	26%	20%	15 - 31%	26%
2,3,4,6-TeCP	26%	n.e.	n.e.	n.e.	n.e.	n.e.	14% *)

Table 5: Comparison of uncertainties in iis proficiency tests

*) Horwitz equation is used

4.4 EVALUATION OF THE ANALYTICAL DETAILS

The reported details of the analytical test methods that were used by the participants are listed in appendix 2. About 76% of the participating laboratories reported to be accredited for the determination of OPP and/or PCP in textile.

For this PT one critical analytical detail was requested: "Which technique was used to release/extract the components".

It appeared that some effect was observed by using steam distillation as release/extract technique on the reported test results for OPP/PCP for sample #17645 (see also paragraph 5). No effect was found for sample #17646.

5 DISCUSSION

The effect of the reported analytical details (see appendix 2) on the determination of OPP and PCP in sample #17645 were investigated, see table 6 for OPP and table 7 for PCP.

<i>Analytical Details</i>	<i>unit</i>	<i>n</i>	<i>Average</i>	<i>2.8 * sd</i>	<i>R (lit)</i>
ISO/IEC 17025 accredited	mg/kg	53	12.4	13.3	8.7
Not ISO/IEC 17025 accredited	mg/kg	10	12.4	17.9	8.7
Basic / Ultrasonic extraction	mg/kg	46	12.3	12.6	8.6
Steam distillation	mg/kg	16	13.1	15.6	9.1
Soxhlet distillation	mg/kg	5	10.0	16.1	7.2

Table 6: reproducibility of OPP on textile sample #17645

<i>Analytical Details</i>	<i>unit</i>	<i>n</i>	<i>Average</i>	<i>2.8 * sd</i>	<i>R (lit)</i>
ISO/IEC 17025 accredited	mg/kg	63	34.5	43.5	20.7
Not ISO/IEC 17025 accredited	mg/kg	11	38.1	52.0	22.6
Basic / Ultrasonic extraction	mg/kg	55	33.4	41.4	20.2
Steam distillation	mg/kg	18	42.0	47.4	24.5
Soxhlet distillation	mg/kg	6	33.3	52.6	20.2

Table 7: reproducibility of PCP on textile sample #17645

The performance of the ISO/IEC 17025 accredited laboratories is slightly different from the performance of the not accredited laboratories for sample #17645. The reproducibility ($=2.8 * sd$) of the ISO/IEC 17025 accredited laboratories is smaller than the reproducibility of the laboratories without ISO/IEC 17025 accreditation for both the OPP and for the PCP determination. The differences in the consensus values are less significant for both the OPP and the PCP determination.

Remarkable is the effect of steam distillation on the reproducibility for sample #17645. It appears that the average for the OPP and PCP determination with steam distillation, is somewhat larger than the average for basic/ultrasonic extraction. The reproducibilities found for the different extraction/release technique are large and not at all in agreement with the reproducibilities observed in previous iis PTs (see lit 18).

Surprisingly this effect is not noticed for the PCP determination on sample #17646, where the reproducibility of the group meets the estimated reproducibility found in previous iis PTs (see lit 18). The OPP concentration in sample #17646 is near the detection limit. Therefore, it is not clear if the estimated reproducibility is still valid at this low level (1.0 mg/kg).

When the test results of this interlaboratory study were compared to the Ecolabelling Standards and Requirements for Textiles in EU (see table 8) it could be noticed that the majority of the participants was able to detect OPP and PCP in sample #17645 and in sample #17646. All reported test values for OPP were <50.0 mg/kg for both samples #17645 and #17646. Thus, both textile materials would have been accepted based on the OPP analyses for all four classes mentioned in table 8 by all reporting laboratories.

Further it could be noticed that all reported test values for PCP are above >0.5 mg/kg for sample #17645. Thus, this textile material would have been rejected for all classes by all reported laboratories.

For sample #17646, also all, except one, reported test values for PCP are above >0.5 mg/kg. Thus, this textile material would also have been rejected for all classes by all reported laboratories, except one.

Also noticeable are the test results for the sum of TeCPs on samples #17645 and #17646. All laboratories would have rejected sample #17645 based on the sum of TeCPs (>0.5 mg/kg). For sample #17646, forty-four laboratories would accept this sample based on the sum of TeCPs (<0.05 mg/kg) by means of a total value smaller than 0.05 or a "less than" result. Eight laboratories reported a larger value for less than' than the specification for baby clothes (0.05 mg/kg). Ten other laboratories would reject the sample for class 1 (Baby clothes). Two of the ten laboratories would also reject this sample for all four classes.

<i>Ecolabel</i>	Class 1 Baby clothes (mg/kg)	Class 2 Clothes direct skin contact (mg/kg)	Class 3 Clothes, no direct contact with skin (mg/kg)	Class 4 Decoration material (mg/kg)
Orthophenylphenol	50.0	100.0	100.0	100.0
Pentachlorophenol	0.05	0.5	0.5	0.5
Sum of Tetrachlorophenols	0.05	0.5	0.5	0.5

Table 8: Ecolabelling Standards and Requirements for Textiles in EU

6 CONCLUSION

In this proficiency test, the OPP, PCP and TeCPs content were determined. The variation observed for PCP (sample #17646) in this interlaboratory study is in line with observations in the previous proficiency tests. The variation observed for OPP in sample #17645 and #17646 and PCP in sample #17645 are not at all in line. A possible explanation for the variation could be the preparation or the conditioning of the sample and/or by the performance of the analysis by the laboratory. Each laboratory should evaluate its performance in this study and make decisions about necessary corrective actions. 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.

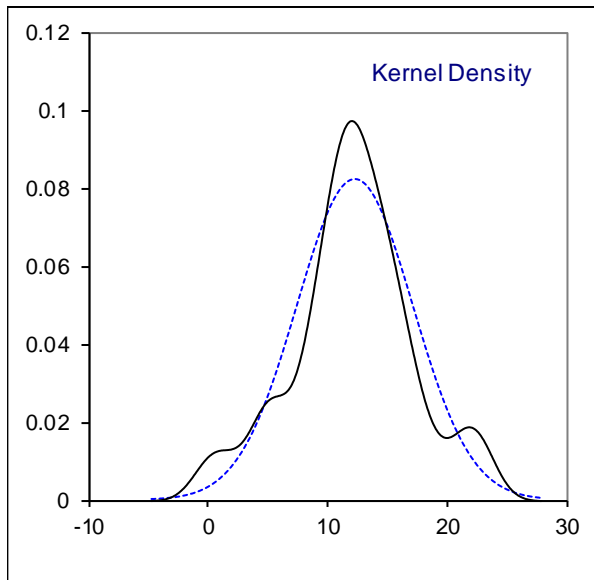
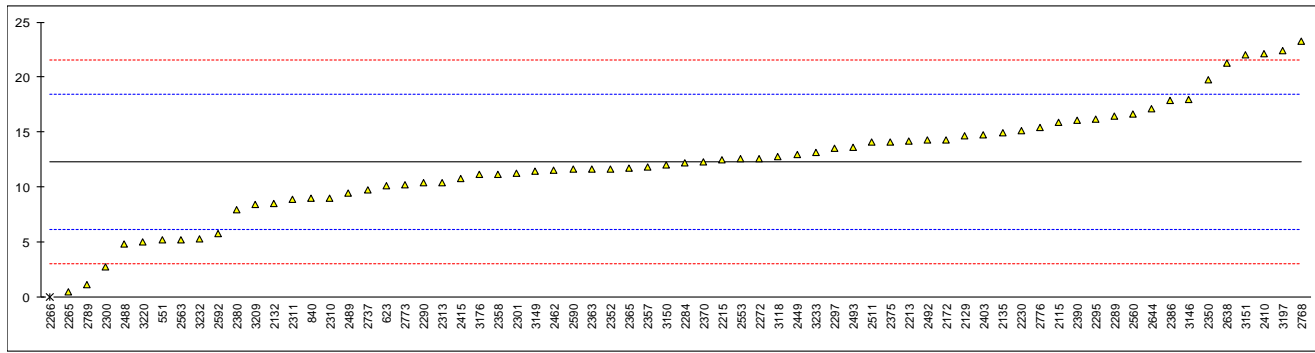
APPENDIX 1**Determination of Orthophenylphenol (OPP) on sample #17645; results in mg/kg**

lab	method	value	mark	z(targ)	remarks
213		----		----	
551	In house	5.20	C	-2.30	First reported n.d.
623	In house	10.08		-0.72	
840	LFGB B82.02.8	9.01		-1.07	
2115	In house	15.92		1.17	
2129	ISO17070Mod.	14.65		0.76	
2132	In house	8.5		-1.23	
2135	In house	14.97		0.86	
2165		----		----	
2172	In house	14.32		0.65	
2181		----		----	
2184		----		----	
2213	ISO17070	14.2		0.61	
2215	In house	12.5		0.06	
2230	LFGB B82.02.8	15.1		0.90	
2241		----		----	
2265	In house	0.460	C	-3.84	First reported 1.281
2266	ISO17070	0	ex	-3.99	Test result excluded as zero is not a real result
2272	XP G 08-015	12.589		0.09	
2284	ISO17070	12.19		-0.04	
2289	ISO17070	16.43		1.34	
2290	ISO17070	10.42		-0.61	
2295		16.2		1.26	
2297	ISO17070	13.52		0.39	
2300	In house	2.8		-3.08	
2301	In house	11.26	C	-0.34	First reported 26.02
2310	LFGB B82.02.8	9.03		-1.06	
2311	LFGB B82.02.8	8.92		-1.10	
2313	LFGB B82.02.8	10.423		-0.61	
2347		----		----	
2350	In house	19.7522		2.41	
2352	In house	11.676		-0.20	
2357	In house	11.83		-0.15	
2358	In house	11.15		-0.38	
2363	In house	11.64		-0.22	
2365	In house	11.74		-0.18	
2370	In house	12.28		-0.01	
2375	LFGB B82.02.8	14.10		0.58	
2380	LFGB B82.02.8Mod.	7.972		-1.40	
2386	ISO17070	17.88		1.81	
2390	In house	16.078		1.22	
2403	GB/T20386	14.782		0.80	
2410	LFGB B82.02.8	22.1145		3.18	
2415	In house	10.776		-0.50	
2449	LFGB B82.02.8	12.93		0.20	
2462		11.5		-0.26	
2477		----		----	
2488	In house	4.88	C	-2.41	First reported 48.83
2489	LFGB B82.02.8	9.42		-0.94	
2492	In house	14.307		0.65	
2493	In house	13.65		0.43	
2511	LFGB B82.02.8	14.064		0.57	
2538		----		----	
2553	In house	12.56		0.08	
2560	ISO17070	16.608		1.39	
2563	ISO17070	5.25		-2.29	
2590	LFGB B82.02.8	11.601		-0.23	
2591		----		----	
2592	ISO17070	5.75		-2.12	
2638	ISO17070	21.294		2.91	
2644	UNI11057	17.1		1.55	
2730		----		----	
2737	In house	9.742		-0.83	
2768	LFGB B82.02.8	23.218	C	3.54	First reported 34.071
2773	ISO17070	10.2		-0.68	
2776	GB/T20386	15.38		1.00	
2789	UNE59510	1.125		-3.62	
3118	In house	12.75		0.14	
3146	In house	17.99067		1.84	
3149	In house	11.4		-0.29	
3150	ISO17070	12.01		-0.10	
3151	In house	22		3.14	
3153		----		----	
3154		----		----	

lab	method	value	mark	z(targ)	remarks
3163		----		----	
3172		----		----	
3176	LFGB B82.02.8	11.12		-0.38	
3192		----		----	
3197	LFGB B82.02.8	22.44		3.28	
3209	ISO17070	8.43		-1.26	
3210	In house	<40		----	
3220	In house	5.04	C	-2.36	First reported 0.34
3228		----		----	
3232	ISO17070	5.30		-2.27	
3233	In house	13.11		0.26	

normality OK
n 67
outliers 0 (+1excl)
mean (n) 12.308
st.dev. (n) 4.8454
R(calc.) 13.567
st.dev.(iis-memo) 3.0861
R(iis-memo) 8.641

Compare
R(Horwitz) 3.757

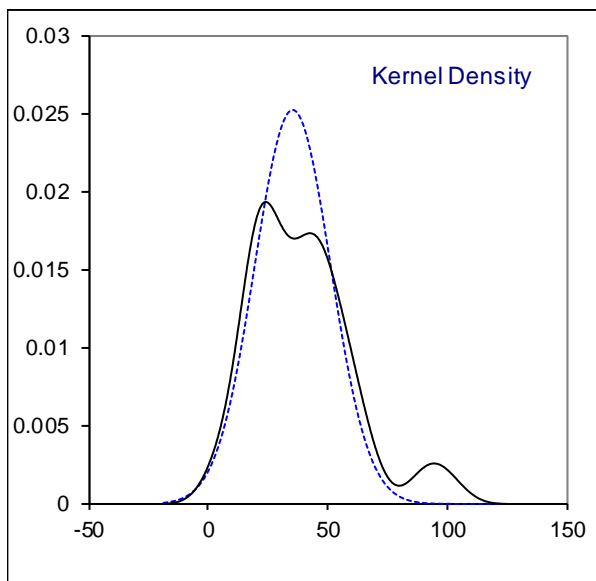
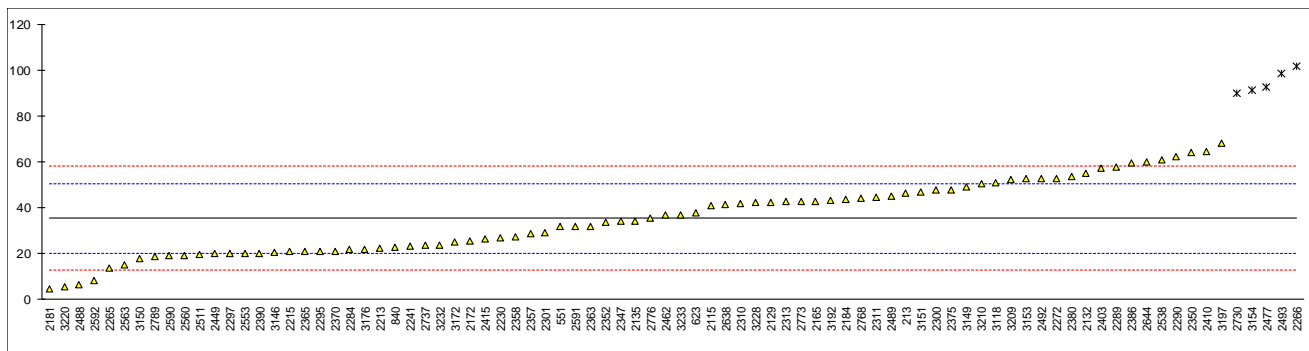


Determination of Pentachlorophenol (PCP) on sample #17645; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213	In house	46.44		1.46	
551	In house	31.62	C	-0.49	First reported 4.14
623	In house	37.9		0.34	
840	LFGB B82.02.8	22.57		-1.69	
2115	In house	41.04		0.75	
2129	ISO17070Mod.	42.31		0.92	
2132	In house	55		2.59	
2135	In house	34.18		-0.16	
2165	LFGB B82.02.8	42.7		0.97	
2172	In house	25.53		-1.30	
2181	In house	4.685		-4.05	
2184	LFGB B82.02.8	43.5		1.08	
2213	ISO17070	22.2		-1.74	
2215	In house	20.8		-1.92	
2230	LFGB B82.02.8	26.8		-1.13	
2241	In house	23.193		-1.61	
2265	In house	13.845		-2.84	
2266	ISO17070	101.75	R(0.05)	8.77	
2272	XP G 08-015	52.720		2.29	
2284	ISO17070	21.74		-1.80	
2289	ISO17070	57.51		2.93	
2290	ISO17070	62.31		3.56	
2295		21		-1.90	
2297	ISO17070	19.91		-2.04	
2300	In house	47.86		1.65	
2301	In house	28.96	C	-0.85	First reported 45.97
2310	LFGB B82.02.8	42		0.88	
2311	LFGB B82.02.8	44.7		1.23	
2313	LFGB B82.02.8	42.534		0.95	
2347	In house	34.05		-0.17	
2350	In house	63.9909		3.78	
2352	In house	33.607		-0.23	
2357	In house	28.73		-0.88	
2358	In house	27.26		-1.07	
2363	In house	32.04		-0.44	
2365	In house	20.915		-1.91	
2370	LFGB B82.02.8	21.03		-1.89	
2375	LFGB B82.02.8	47.89		1.66	
2380	LFGB B82.02.8Mod.	53.560		2.40	
2386	ISO17070	59.44		3.18	
2390	In house	20.246		-2.00	
2403	ISO17070	57.282		2.90	
2410	LFGB B82.02.8	64.6305		3.87	
2415	In house	26.360		-1.19	
2449	LFGB B82.02.8	19.87		-2.05	
2462		36.8		0.19	
2477		92.71	R(0.05)	7.58	
2488	In house	6.30		-3.84	
2489	LFGB B82.02.8	45.0		1.27	
2492	In house	52.680		2.29	
2493	In house	98.6	R(0.05)	8.36	
2511	LFGB B82.02.8	19.510		-2.09	
2538	LFGB B82.02.8	60.627		3.34	
2553	In house	20.15		-2.01	
2560	ISO17070	19.148		-2.14	
2563	ISO17070	14.88		-2.71	
2590	LFGB B82.02.8	19.021		-2.16	
2591	In house	32.014		-0.44	
2592	ISO17070	8.40		-3.56	
2638	ISO17070	41.223		0.77	
2644	UNI11057	60.1		3.27	
2730	XP G 08-015	89.76	R(0.05)	7.19	
2737	In house	23.601		-1.55	
2768	LFGB B82.02.8	44.050		1.15	
2773	ISO17070	42.6		0.96	
2776	GB/T18414	35.39		0.00	
2789	UNE59510	18.666		-2.21	
3118	In house	50.87		2.05	
3146	In house	20.644		-1.94	
3149	In house	49.2		1.83	
3150	ISO17070	17.56		-2.35	
3151	In house	47		1.54	
3153	64 LFGB B82.02.8	52.58		2.28	
3154	In house	91.36	R(0.05)	7.40	

lab	method	value	mark	z(targ)	remarks
3163					
3172	In house	25.185		-1.34	
3176	LFG B82.02.8	22.02		-1.76	
3192	In house	43.00		1.01	
3197	LFG B82.02.8	67.98		4.31	
3209	ISO17070	52.32		2.24	
3210	In house	50.26		1.97	
3220	In house	5.43	C	-3.95	First reported 1.18
3228	LFG B82.02.8	42.1		0.89	
3232	ISO17070	23.80		-1.53	
3233	In house	36.96		0.21	

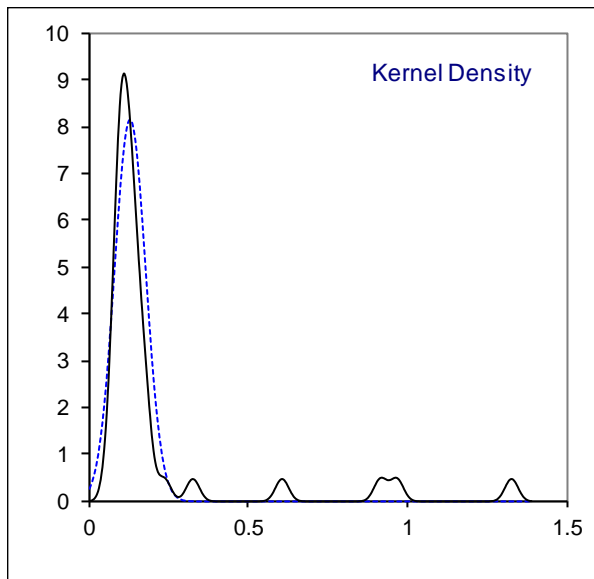
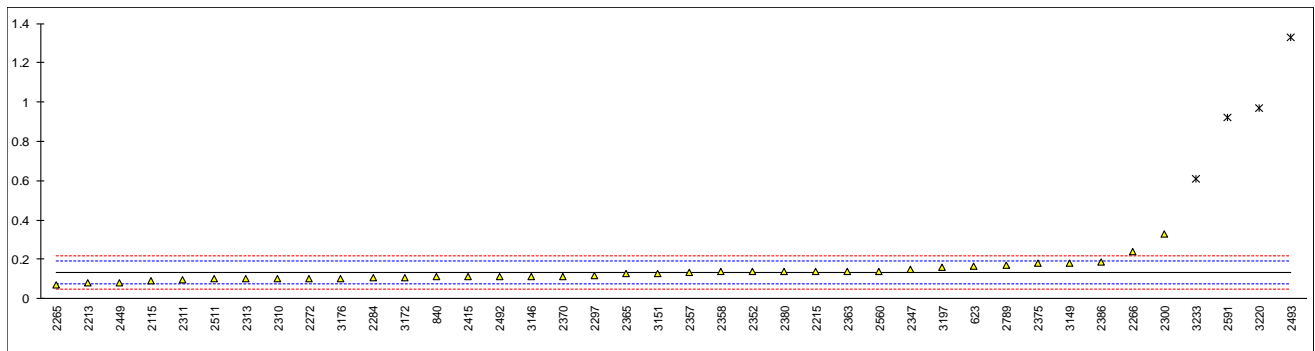
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 n 79
 outliers 5
 mean (n) 35.361
 st.dev. (n) 15.7999
 R(calc.) 44.240
 st.dev.(iis-memo) 7.5684
 R(iis-memo) 21.192



Determination of 2,3,4,5-Tetrachlorophenol on sample #17645; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213		----		----	
551	In house	N.D.		----	
623	In house	0.165		1.12	
840	LFGB B82.02.8	0.11		-0.81	
2115	In house	0.091		-1.47	
2129	ISO17070Mod.	<0,1		----	
2132	In house	<0.5		----	
2135		----		----	
2165		----		----	
2172	In house	ND		----	
2181		----		----	
2184		----		----	
2213	ISO17070	0.08		-1.85	
2215	In house	0.14		0.24	
2230	LFGB B82.02.8	<0.05		----	
2241	In house	< 0.1		----	
2265	In house	0.068		-2.27	
2266	ISO17070	0.24		3.74	
2272	XP G 08-015	0.100		-1.15	
2284	ISO17070	0.106		-0.95	
2289	ISO17070	ND		----	
2290	ISO17070	<0.5		----	
2295		----		----	
2297	ISO17070	0.12		-0.46	
2300	In house	0.33	C	6.89	First reported 0.91
2301		----		----	
2310	LFGB B82.02.8	0.10		-1.15	
2311	LFGB B82.02.8	0.094		-1.36	
2313	LFGB B82.02.8	0.100		-1.15	
2347	In house	0.15		0.59	
2350	In house	<0.125		----	
2352	In house	0.139		0.21	
2357	In house	0.131		-0.07	
2358	In house	0.136		0.10	
2363	In house	0.14		0.24	
2365	In house	0.130		-0.11	
2370	LFGB B82.02.8	0.1123		-0.72	
2375	LFGB B82.02.8	0.18		1.64	
2380	LFGB B82.02.8Mod.	0.139		0.21	
2386	ISO17070	0.186		1.85	
2390		----		----	
2403	ISO17070	ND		----	
2410		----		----	
2415	In house	0.110		-0.81	
2449	LFGB B82.02.8	0.08		-1.85	
2462		N.D.		----	
2477		----		----	
2488		----		----	
2489	LFGB B82.02.8	ND		----	
2492	In house	0.110		-0.81	
2493	In house	1.33	C,R(0.01)	41.85	First reported 0.696
2511	LFGB B82.02.8	0.099		-1.19	
2538		----		----	
2553	In house	ND		----	
2560	ISO17070	0.141		0.28	
2563	ISO17070	n. d.		----	
2590	LFGB B82.02.8	<L.O.Q.		----	
2591	In house	0.919	R(0.01)	27.48	
2592		----		----	
2638	ISO17070	n.d		----	
2644		----		----	
2730		----		----	
2737		----		----	
2768		----		----	
2773	ISO17070	N.D.		----	
2776	GB/T18414	N.D.		----	
2789	UNE59510	0.170		1.29	
3118	In house	ND		----	
3146	In house	0.11075		-0.78	
3149	In house	0.18		1.64	
3150		----		----	
3151	In house	0.13		-0.11	
3153		----		----	
3154		----		----	

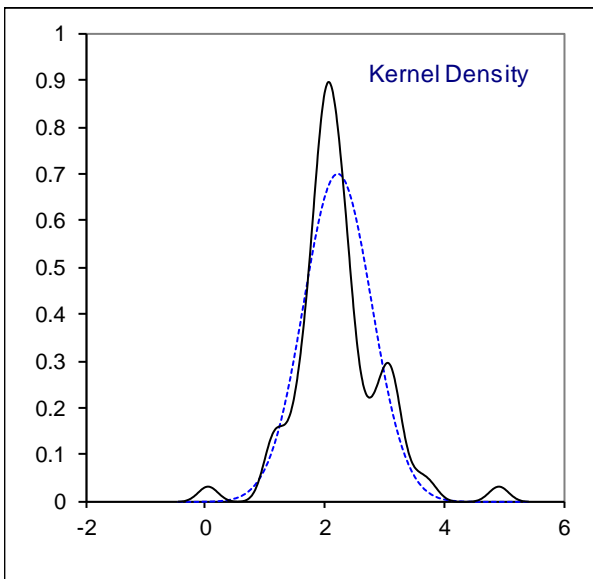
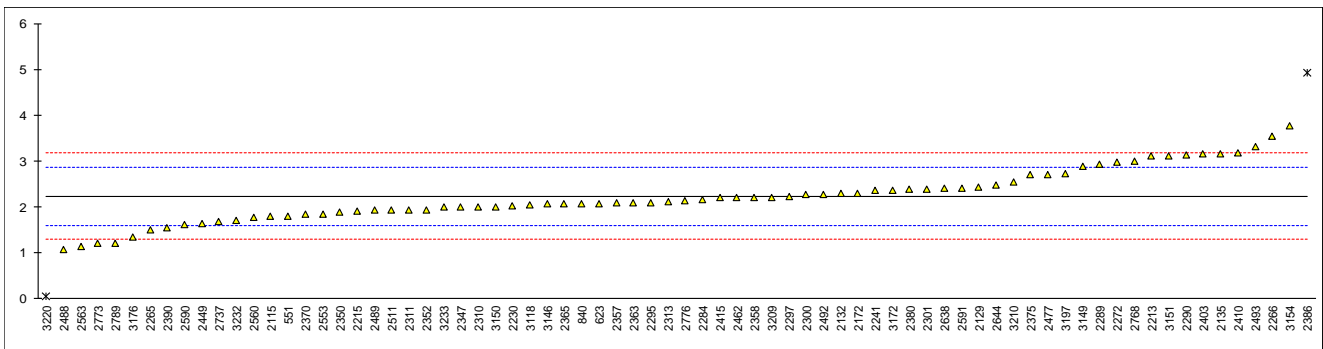
lab	method	value	mark	z(targ)	remarks
3163		-----		-----	
3172	In house	0.108		-0.88	
3176	LFGB B82.02.8	0.103		-1.05	
3192		-----		-----	
3197	LFGB B82.02.8	0.16		0.94	
3209	ISO17070	<0.5		-----	
3210	In house	<0.05		-----	
3220	In house	0.97	C,R(0.01)	29.26	First reported 0.06
3228		-----		-----	
3232	ISO17070	n.d		-----	
3233	In house	0.61	C,R(0.01)	16.68	First reported 0.48
normality		not OK			
n		36			
outliers		4			
mean (n)		0.1330			
st.dev. (n)		0.04889			
R(calc.)		0.1369			
st.dev.(Horwitz)		0.02860			
R(Horwitz)		0.0801			



Determination of 2,3,4,6-Tetrachlorophenol on sample #17645; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213		-----		-----	
551	In house	1.80	C	-1.37	First reported ND
623	In house	2.075		-0.49	
840	LFGB B82.02.8	2.07		-0.51	
2115	In house	1.794		-1.39	
2129	ISO17070Mod.	2.44		0.67	
2132	In house	2.3		0.22	
2135	In house	3.165		2.98	
2165		-----		-----	
2172	In house	2.301		0.23	
2181		-----		-----	
2184		-----		-----	
2213	ISO17070	3.1		2.77	
2215	In house	1.91		-1.02	
2230	LFGB B82.02.8	2.02		-0.67	
2241	In house	2.353		0.39	
2265	In house	1.503		-2.31	
2266	ISO17070	3.55		4.20	
2272	XP G 08-015	2.970		2.36	
2284	ISO17070	2.16		-0.22	
2289	ISO17070	2.93		2.23	
2290	ISO17070	3.13		2.87	
2295		2.1		-0.41	
2297	ISO17070	2.23		0.00	
2300	In house	2.26		0.10	
2301	In house	2.39	C	0.51	First reported 0.15
2310	LFGB B82.02.8	2.01		-0.70	
2311	LFGB B82.02.8	1.94		-0.92	
2313	LFGB B82.02.8	2.116		-0.36	
2347	In house	2.00		-0.73	
2350	In house	1.8917		-1.08	
2352	In house	1.941		-0.92	
2357	In house	2.08		-0.48	
2358	In house	2.207		-0.07	
2363	In house	2.09		-0.45	
2365	In house	2.068		-0.52	
2370	LFGB B82.02.8	1.831		-1.27	
2375	LFGB B82.02.8	2.70		1.50	
2380	LFGB BVL B82.02.8Mod.	2.380		0.48	
2386	ISO17070	4.927	R(0.01)	8.59	
2390	In house	1.540		-2.20	
2403	ISO17070	3.146		2.92	
2410	LFGB B82.02.8	3.1745		3.01	
2415	In house	2.200		-0.10	
2449	LFGB B82.02.8	1.63		-1.91	
2462		2.2		-0.10	
2477		2.70		1.50	
2488	In house	1.08		-3.66	
2489	LFGB B82.02.8	1.92		-0.99	
2492	In house	2.276		0.15	
2493	In house	3.32	C	3.47	First reported 3.975
2511	LFGB B82.02.8	1.932		-0.95	
2538		-----		-----	
2553	In house	1.84		-1.24	
2560	ISO17070	1.78		-1.43	
2563	ISO17070	1.14	C	-3.47	First reported 0.57
2590	LFGB B82.02.8	1.621		-1.94	
2591	In house	2.416		0.59	
2592		-----	W	-----	Result withdrawn, reported 0.54
2638	ISO17070	2.407		0.56	
2644	UNI11057	2.47		0.76	
2730		-----		-----	
2737	In house	1.693		-1.71	
2768	LFGB B82.02.8	2.996		2.44	
2773	ISO17070	1.2		-3.28	
2776	GB/T18414	2.13		-0.32	
2789	UNE59510	1.210		-3.25	
3118	In house	2.04		-0.60	
3146	In house	2.05803		-0.55	
3149	In house	2.89		2.10	
3150	ISO17070	2.01	C	-0.70	First reported as 2,3,5,6-Tetrachlorophenol
3151	In house	3.1		2.77	
3153		-----		-----	
3154	In house	3.76		4.87	

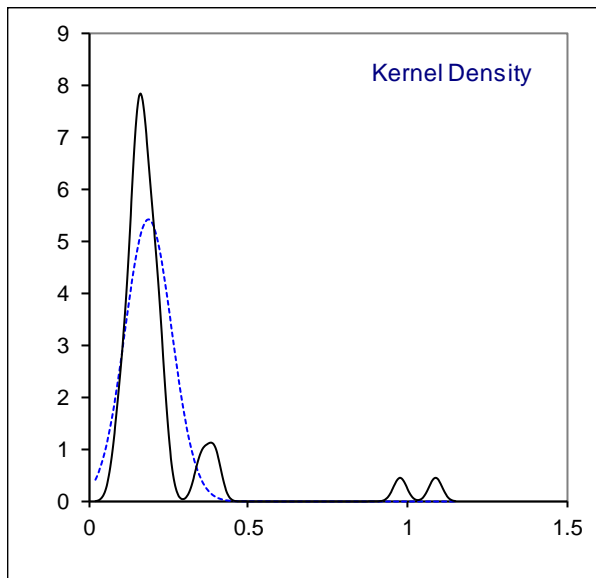
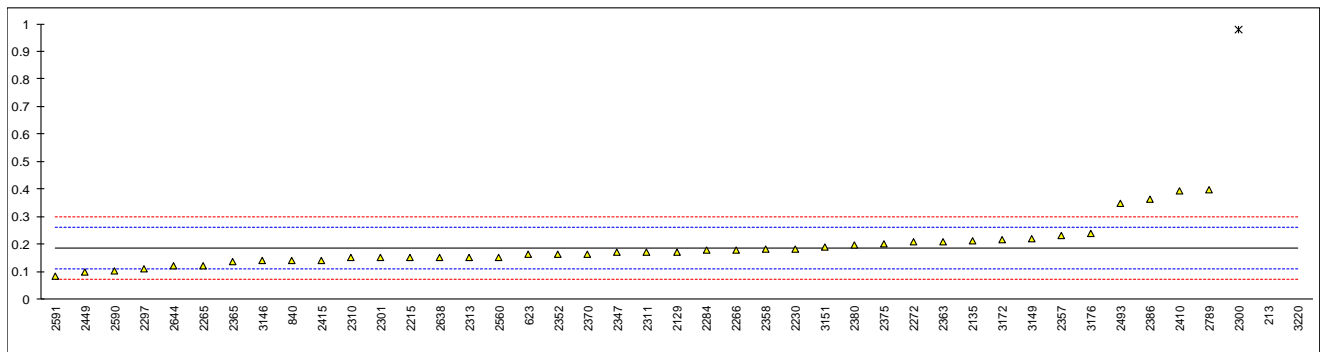
lab	method	value	mark	z(targ)	remarks
3163		-----		-----	
3172	In house	2.366		0.43	
3176	LFGB B82.02.8	1.34		-2.83	
3192		-----		-----	
3197	LFGB B82.02.8	2.73		1.59	
3209	ISO17070	2.21		-0.06	
3210	In house	2.54		0.99	
3220	In house	0.06	C,R(0.05)	-6.91	First reported not detected
3228		-----		-----	
3232	ISO17070	1.70	C	-1.69	First reported 0.6
3233	In house	1.99		-0.76	
normality		OK			
n		72			
outliers		2			
mean (n)		2.230			
st.dev. (n)		0.5687			
R(calc.)		1.592			
st.dev.(Horwitz)		0.3141			
R(Horwitz)		0.880			



Determination of 2,3,5,6-Tetrachlorophenol on sample #17645; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213	In house	1.092	C,R(0.01)	23.77	First reported 4.37
551	In house	N.D.		----	
623	In house	0.163		-0.61	
840	LFGB B82.02.8	0.14		-1.22	
2115		----		----	
2129	ISO17070Mod.	0.17		-0.43	
2132	In house	<0.5		----	
2135	In house	0.213		0.70	
2165		----		----	
2172	In house	ND		----	
2181		----		----	
2184		----		----	
2213	ISO17070	<0.05		----	
2215	In house	0.15		-0.96	
2230	LFGB B82.02.8	0.183		-0.09	
2241	In house	< 0.1		----	
2265	In house	0.122		-1.69	
2266	ISO17070	0.18		-0.17	
2272	XP G 08-015	0.210		0.62	
2284	ISO17070	0.180		-0.17	
2289	ISO17070	ND		----	
2290	ISO17070	<0.5		----	
2295		----		----	
2297	ISO17070	0.11		-2.01	
2300	In house	0.98	C,R(0.01)	20.83	First reported 1.43
2301	In house	0.15	C	-0.96	First reported 2.99
2310	LFGB B82.02.8	0.15		-0.96	
2311	LFGB B82.02.8	0.17		-0.43	
2313	LFGB B82.02.8	0.152		-0.90	
2347	In house	0.17		-0.43	
2350	In house	<0.125		----	
2352	In house	0.164		-0.59	
2357	In house	0.232		1.20	
2358	In house	0.182		-0.12	
2363	In house	0.21		0.62	
2365	In house	0.136		-1.32	
2370	In house / LFGB B82.02.8	0.1650		-0.56	
2375	LFGB B82.02.8	0.20		0.36	
2380	LFGB BVL B82.02.8Mod.	0.199		0.33	
2386	ISO17070	0.362		4.61	
2390		----		----	
2403	ISO17070	ND		----	
2410	LFGB B82.02.8	0.3955		5.49	
2415	In house	0.142		-1.17	
2449	LFGB B82.02.8	0.10		-2.27	
2462		N.D.		----	
2477		----		----	
2488		----		----	
2489	LFGB B82.02.8	ND		----	
2492		----		----	
2493	In house	0.347		4.21	
2511		----		----	
2538		----		----	
2553	In house	ND		----	
2560	ISO17070	0.1536		-0.86	
2563	ISO17070	n. d.		----	
2590	LFGB B82.02.8	0.101		-2.24	
2591	In house	0.082		-2.74	
2592		----		----	
2638	ISO17070	0.151		-0.93	
2644	UNI11057	0.12		-1.74	
2730		----		----	
2737		----		----	
2768		----		----	
2773	ISO17070	N.D.		----	
2776	GB/T18414	N.D.		----	
2789	UNE59510	0.396		5.50	
3118	In house	ND		----	
3146	In house	0.1398		-1.22	
3149	In house	0.22		0.88	
3150		----		----	
3151	In house	0.19		0.09	
3153		----		----	
3154		----		----	

lab	method	value	mark	z(targ)	remarks
3163					
3172	In house	0.216		0.78	
3176	LFGB B82.02.8	0.24		1.41	
3192					
3197	LFGB B82.02.8	<0,05			
3209	ISO17070	<0.5			
3210	In house	<0.05			
3220	In house	5.63	C,R(0.01)	142.87	First reported not detected
3228					
3232	ISO17070	n.d			
3233	In house	< 0.05			
normality		not OK			
n		40			
outliers		3			
mean (n)		0.1864			
st.dev. (n)		0.07377			
R(calc.)		0.2065			
st.dev.(Horwitz)		0.03810			
R(Horwitz)		0.1069			



Determination of Other Chlorophenols on sample #17645; results in mg/kg

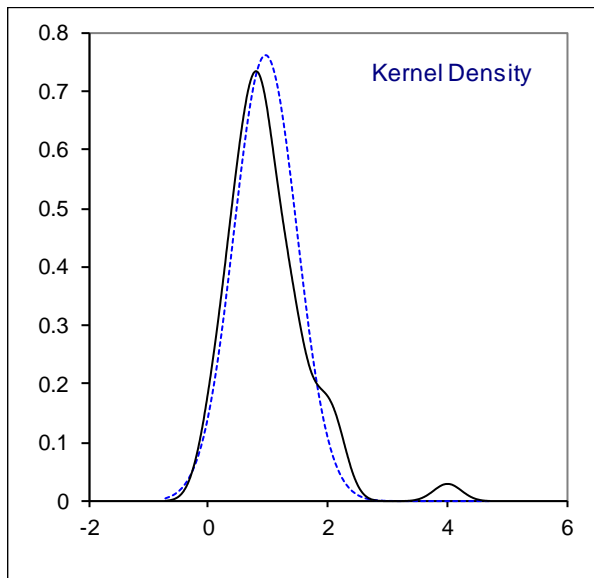
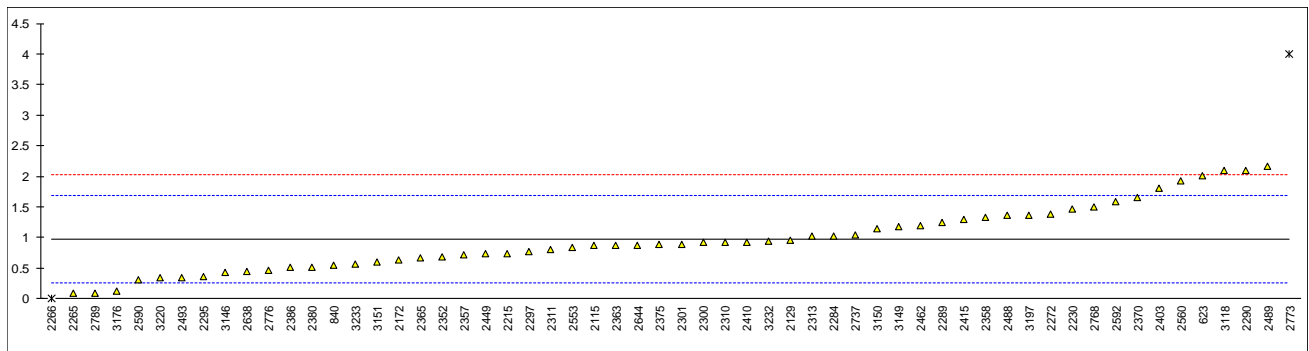
lab	method	value	mark	z(targ)	remarks
213		----		----	
551	In house	N.D.		----	
623		----		----	
840		----		----	
2115		----		----	
2129	ISO17070Mod.	<0,1		----	
2132	In house	N/A		----	
2135		----		----	
2165		----		----	
2172	In house	ND		----	
2181		----		----	
2184		----		----	
2213	ISO17070	<0.05		----	
2215	In house	<0.05		----	
2230	LFGB B82.02.8	<0.05		----	
2241	In house	< 0.1		----	
2265		----		----	
2266	ISO17070	0		----	
2272	XP G 08-015	ND		----	
2284		----		----	
2289	ISO17070	ND		----	
2290	ISO17070	<0.5		----	
2295		----		----	
2297	ISO17070	n.a		----	
2300	In house	ND		----	
2301		----		----	
2310	LFGB B82.02.8	Not Detected		----	
2311	LFGB B82.02.8	Not Detected		----	
2313		----		----	
2347		----		----	
2350	In house	<0.125		----	
2352		----		----	
2357		----		----	
2358	In house	<0.1		----	
2363	In house	ND		----	
2365	In house	ND		----	
2370	In house / LFGB B82.02.8	n.d.		----	
2375		----		----	
2380	LFGB BVL B82.02.8Mod.	N.D.		----	
2386		----		----	
2390		----		----	
2403	GB/T20386 / ISO17070	ND		----	
2410		----		----	
2415	In house	<0.05		----	
2449		----		----	
2462		N.D.		----	
2477		----		----	
2488		----		----	
2489	LFGB B82.02.8	ND		----	
2492		----		----	
2493	In house	0		----	
2511		----		----	
2538		----		----	
2553	In house	ND		----	
2560	ISO17070	nd		----	
2563	ISO17070	n. d.		----	
2590	LFGB B82.02.8	<L.O.Q.		----	
2591		----		----	
2592		----		----	
2638	ISO17070	n.d		----	
2644		----		----	
2730		----		----	
2737		----		----	
2768		----		----	
2773	ISO17070	N.D.		----	
2776	GB/T20386 / GB/T18414	N.D.		----	
2789	UNE59510	0.019		----	
3118		----		----	
3146	In house	<0,1		----	
3149		----		----	
3150		----		----	
3151		----		----	
3153		----		----	
3154		----		----	

lab	method	value	mark	z(targ)	remarks
3163		----		----	
3172		----		----	
3176		----		----	
3192		----		----	
3197		----		----	
3209	In house	NA		----	
3210		----		----	
3220		----		----	
3228		----		----	
3232	In house	n.d		----	
3233		< 0.05		----	

Determination of Orthophenylphenol (OPP) on sample #17646; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213		----		----	
551	In house	nd	C	----	First reported 5.20
623	In house	2.01	C	2.93	First reported 3.54
840	LFGB B82.02.8	0.55		-1.18	
2115	In house	0.864		-0.29	
2129	ISO17070Mod.	0.95		-0.05	
2132	In house	<1.0		----	
2135		----		----	
2165		----		----	
2172	In house	0.6312		-0.95	
2181		----		----	
2184		----		----	
2213	ISO17070	<10		----	
2215	In house	0.74		-0.64	
2230	LFGB B82.02.8	1.47		1.41	
2241		----		----	
2265	In house	0.092		-2.46	
2266		0	ex	-2.72	Test result excluded as zero is not a real result
2272	XP G 08-015	1.380		1.16	
2284	ISO17070	1.03		0.17	
2289	ISO17070	1.25		0.79	
2290	ISO17070	2.1	C	3.18	First reported 4.21
2295		0.36		-1.71	
2297		0.76		-0.59	
2300	In house	0.92		-0.14	
2301	In house	0.89	C	-0.22	First reported 2.96
2310	LFGB B82.02.8	0.92		-0.14	
2311	LFGB B82.02.8	0.81		-0.45	
2313	LFGB B82.02.8	1.030		0.17	
2347		----		----	
2350	In house	<1		----	
2352	In house	0.690		-0.78	
2357	In house	0.712		-0.72	
2358	In house	1.328		1.01	
2363	In house	0.87		-0.28	
2365	In house	0.67		-0.84	
2370	In house	1.660		1.95	
2375	LFGB B82.02.8	0.88		-0.25	
2380	LFGB BVL B82.02.8Mod.	0.521		-1.26	
2386	ISO17070	0.512		-1.28	
2390	In house	ND		----	
2403	GB/T20386	1.798		2.33	
2410	In house	0.9297		-0.11	
2415		1.291		0.91	
2449	LFGB B82.02.8	0.73		-0.67	
2462		1.2		0.65	
2477		----		----	
2488	In house	1.37		1.13	
2489	LFGB B82.02.8	2.16		3.35	
2492		----		----	
2493	In house	0.344		-1.76	
2511		----		----	
2538		----		----	
2553	In house	0.84		-0.36	
2560	ISO17070	1.925		2.69	
2563	ISO17070	< 0,5		----	
2590	LFGB B82.02.8	0.301		-1.88	
2591		----		----	
2592	ISO17070	1.58		1.72	
2638	ISO17070	0.439		-1.49	
2644	UNI11057	0.87		-0.28	
2730		----		----	
2737	In house	1.033		0.18	
2768	LFGB B82.02.8	1.491		1.47	
2773	ISO17070	4.0	R(0.01)	8.53	
2776	GB/T20386	0.47		-1.40	
2789	UNE59510	0.096		-2.45	
3118		2.09	C	3.16	First reported 3.22
3146	In house	0.427		-1.52	
3149	In house	1.17		0.57	
3150	ISO17070	1.14		0.48	
3151	In house	0.6		-1.04	
3153		----		----	
3154		----		----	

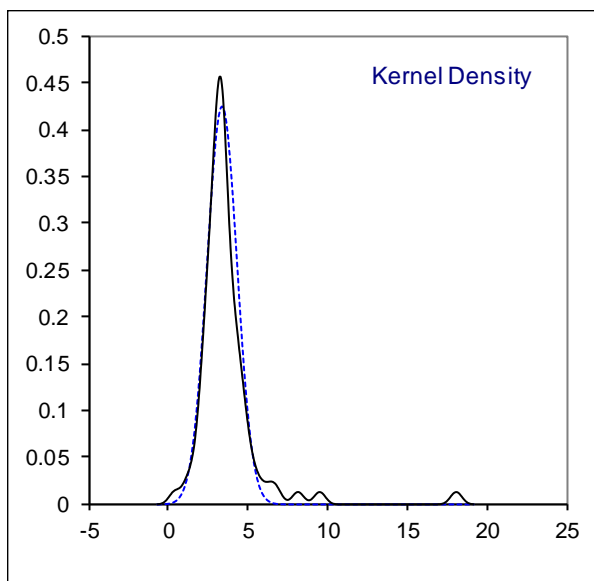
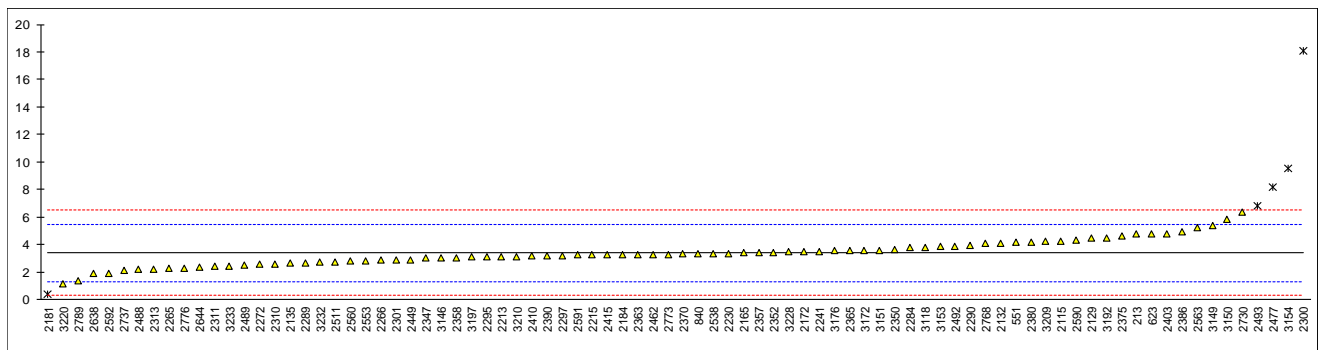
lab	method	value	mark	z(targ)	remarks
3163		----		----	
3172		----		----	
3176	LFGB B82.02.8	0.116		-2.40	
3192		----		----	
3197	LFGB B82.02.8	1.37	C	1.13	First reported 2.74
3209	ISO17070	<1		----	
3210	In house	<40		----	
3220		0.34		-1.77	
3228		----		----	
3232	ISO17070	0.94		-0.08	
3233	In house	0.56		-1.15	
normality		OK			
n		56			
outliers		1 (+1excl)			
mean (n)		0.9682			
st.dev. (n)		0.52431			
R(calc.)		1.4681			
st.dev.(iis-memo)		0.35550			
R(iis-memo)		0.9954			



Determination of Pentachlorophenol (PCP) on sample #17646; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213		4.74		1.31	
551	In house	4.14	C	0.73	First reported 31.62
623	In house	4.74		1.31	
840	LFGB B82.02.8	3.33		-0.05	
2115	In house	4.253		0.84	
2129	ISO17070Mod.	4.44		1.02	
2132	In house	4.1		0.69	
2135		2.648		-0.72	
2165	LFGB B82.02.8	3.4		0.01	
2172	In house	3.501		0.11	
2181	In house	0.420	R(0.05)	-2.88	
2184	LFGB B82.02.8	3.3		-0.08	
2213	ISO17070	3.1		-0.28	
2215	In house	3.27		-0.11	
2230	LFGB B82.02.8	3.36		-0.03	
2241	In house	3.515		0.13	
2265	In house	2.259		-1.09	
2266		2.87		-0.50	
2272	XP G 08-015	2.596		-0.77	
2284	ISO17070	3.79		0.39	
2289	ISO17070	2.67		-0.69	
2290	ISO17070	3.92		0.52	
2295		3.1		-0.28	
2297		3.21		-0.17	
2300	In house	18.05	C,R(0.01)	14.23	First reported 14.18
2301	In house	2.88	C	-0.49	First reported 7.88
2310	LFGB B82.02.8	2.619		-0.74	
2311	LFGB B82.02.8	2.47		-0.89	
2313	LFGB B82.02.8	2.204		-1.15	
2347	In house	3.03		-0.35	
2350	In house	3.6425		0.25	
2352	In house	3.443		0.06	
2357	In house	3.43		0.04	
2358	In house	3.066		-0.31	
2363	In house	3.30		-0.08	
2365	In house	3.548		0.16	
2370	LFGB B82.02.8	3.305		-0.08	
2375	LFGB B82.02.8	4.60		1.18	
2380	LFGB BVL B82.02.8Mod.	4.175		0.77	
2386	ISO17070	4.899		1.47	
2390	In house	3.180		-0.20	
2403	ISO17070	4.743		1.32	
2410	In house	3.1633		-0.22	
2415		3.290		-0.09	
2449	LFGB B82.02.8	2.90		-0.47	
2462		3.3		-0.08	
2477		8.14	R(0.01)	4.61	
2488	In house	2.20		-1.15	
2489	LFGB B82.02.8	2.54		-0.82	
2492	In house	3.868		0.47	
2493	In house	6.8	C,R(0.05)	3.31	First reported 7.42
2511	LFGB B82.02.8	2.739		-0.63	
2538	LFGB B82.02.8	3.350		-0.03	
2553	In house	2.81		-0.56	
2560	ISO17070	2.784		-0.58	
2563	ISO17070	5.21		1.77	
2590	LFGB B82.02.8	4.311		0.90	
2591	In house	3.239		-0.14	
2592	ISO17070	1.90		-1.44	
2638	ISO17070	1.880		-1.46	
2644	UNI11057	2.35		-1.01	
2730	XP G 08-015	6.38		2.91	
2737	In house	2.102		-1.25	
2768	LFGB B82.02.8	4.074		0.67	
2773	ISO17070	3.3		-0.08	
2776	GB/T18414	2.26		-1.09	
2789	UNE59510	1.400		-1.93	
3118		3.79		0.39	
3146	In house	3.061		-0.32	
3149	In house	5.38		1.94	
3150	ISO17070	5.83		2.37	
3151	In house	3.6		0.21	
3153	64 LFGB B82.02.8	3.86		0.46	
3154	In house	9.50	R(0.01)	5.93	

lab	method	value	mark	z(targ)	remarks
3163		-----		-----	
3172	In house	3.581		0.19	
3176	LFG B82.02.8	3.546		0.16	
3192	In house	4.45		1.03	
3197	LFG B82.02.8	3.08		-0.30	
3209	ISO17070	4.21		0.80	
3210	In house	3.105		-0.27	
3220		1.18		-2.14	
3228	LFG B82.02.8	3.5		0.11	
3232	ISO17070	2.71		-0.66	
3233	In house	2.47		-0.89	
normality		OK			
n		79			
outliers		5			
mean (n)		3.386			
st.dev. (n)		0.9389			
R(calc.)		2.629			
st.dev.(iis-memo)		1.0304			
R(iis-memo)		2.885			



Determination of 2,3,4,5-Tetrachlorophenol on sample #17646; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213		----		----	
551	In house	N.D.		----	
623	In house	n.d.		----	
840	LFGB B82.02.8	nd		----	
2115		----		----	
2129	ISO17070Mod.	<0,1		----	
2132	In house	<0.5		----	
2135		----		----	
2165		----		----	
2172	In house	ND		----	
2181		----		----	
2184		----		----	
2213	ISO17070	<0.05		----	
2215	In house	<0.05		----	
2230	LFGB B82.02.8	<0.05		----	
2241	In house	< 0.1		----	
2265		----		----	
2266		0		----	
2272	XP G 08-015	ND		----	
2284		----		----	
2289	ISO17070	ND		----	
2290	ISO17070	<0.5		----	
2295		----		----	
2297		nd		----	
2300	In house	ND		----	
2301		----		----	
2310	LFGB B82.02.8	Not Detected		----	
2311	LFGB B82.02.8	Not Detected		----	
2313	LFGB B82.02.8	Not Detected		----	
2347	In house	<0.05		----	
2350	In house	<0.125		----	
2352		----		----	
2357	In house	ND		----	
2358	In house	<0.1		----	
2363	In house	ND		----	
2365	In house	ND		----	
2370	In house / LFGB B82.02.8	n.d.		----	
2375		----		----	
2380	LFGB BVL B82.02.8Mod.	N.D.		----	
2386		----		----	
2390	In house	ND		----	
2403	ISO17070	ND		----	
2410		----		----	
2415		<0.05		----	
2449		----		----	
2462		N.D.		----	
2477		----		----	
2488		----		----	
2489	LFGB B82.02.8	ND		----	
2492		----		----	
2493	In house	0.062		----	
2511		----		----	
2538		----		----	
2553	In house	ND		----	
2560	ISO17070	nd		----	
2563	ISO17070	n. d.		----	
2590	LFGB B82.02.8	<L.O.Q.		----	
2591	In house	<0.05		----	
2592		----		----	
2638	ISO17070	n.d		----	
2644		----		----	
2730		----		----	
2737		----		----	
2768		----		----	
2773	ISO17070	N.D.		----	
2776	GB/T18414	N.D.		----	
2789	UNE59510	0.0084		----	
3118		ND		----	
3146	In house	<0,1		----	
3149		----		----	
3150		----		----	
3151		----		----	
3153		----		----	
3154		----		----	

lab	method	value	mark	z(targ)	remarks
3163		----		----	
3172		----		----	
3176	LFGB B82.02.8	0.541		----	
3192		----		----	
3197	LFGB B82.02.8	<0,05		----	
3209	ISO17070	<0.5		----	
3210	In house	<0.05		----	
3220		0.06		----	
3228		----		----	
3232	ISO17070	n.d		----	
3233	In house	< 0.05		----	

Determination of 2,3,4,6-Tetrachlorophenol on sample #17646; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213		----		----	
551	In house	ND		----	
623	In house	0.21		----	
840	LFGB B82.02.8	0.14		----	
2115		----		----	
2129	ISO17070Mod.	<0,1		----	
2132	In house	<0.5		----	
2135		----		----	
2165		----		----	
2172	In house	ND		----	
2181		----		----	
2184		----		----	
2213	ISO17070	<0.05		----	
2215	In house	<0.05		----	
2230	LFGB B82.02.8	<0.05		----	
2241	In house	< 0.1		----	
2265	In house	0.036		----	
2266		0		----	
2272	XP G 08-015	0.066		----	
2284		----		----	
2289	ISO17070	ND		----	
2290	ISO17070	<0.5		----	
2295		----		----	
2297		nd		----	
2300	In house	0.07		----	
2301	In house	ND		----	
2310	LFGB B82.02.8	Not Detected		----	
2311	LFGB B82.02.8	Not Detected		----	
2313	LFGB B82.02.8	Not Detected		----	
2347	In house	<0.05		----	
2350	In house	<0.125		----	
2352		----		----	
2357	In house	ND		----	
2358	In house	<0.1		----	
2363	In house	ND		----	
2365	In house	ND		----	
2370	In house / LFGB B82.02.8	n.d.		----	
2375		----		----	
2380	LFGB BVL B82.02.8Mod.	N.D.		----	
2386		----		----	
2390	In house	ND		----	
2403	ISO17070	ND		----	
2410		----		----	
2415		0.086		----	
2449		----		----	
2462		N.D.		----	
2477		N.D.		----	
2488		----		----	
2489	LFGB B82.02.8	ND		----	
2492		----		----	
2493	In house	0.136		----	
2511		----		----	
2538		----		----	
2553	In house	0.23		----	
2560	ISO17070	nd		----	
2563	ISO17070	n. d.		----	
2590	LFGB B82.02.8	<L.O.Q.		----	
2591	In house	<0.05		----	
2592		----		----	
2638	ISO17070	n.d		----	
2644		----		----	
2730		----		----	
2737		----		----	
2768		----		----	
2773	ISO17070	N.D.		----	
2776	GB/T18414	N.D.		----	
2789	UNE59510	0.060		----	
3118		ND		----	
3146	In house	<0,1		----	
3149		----		----	
3150		----		----	
3151		----		----	
3153		----		----	
3154		----		----	

lab	method	value	mark	z(targ)	remarks
3163		----		----	
3172		----		----	
3176	In house	0.582		----	
3192		----		----	
3197	In house	<0,05		----	
3209	LFGB B82.02.8	<0.5		----	
3210	ISO17070	<0.05		----	
3220	In house	Not Detected		----	
3228		----		----	
3232	LFGB B82.02.8	n.d		----	
3233	ISO17070	< 0.05		----	

Determination of 2,3,5,6-Tetrachlorophenol on sample #17646; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213		----		----	
551	In house	N.D.		----	
623	In house	n.d.		----	
840	LFGB B82.02.8	nd		----	
2115		----		----	
2129	ISO17070Mod.	<0,1		----	
2132	In house	<0.5		----	
2135		----		----	
2165		----		----	
2172	In house	ND		----	
2181		----		----	
2184		----		----	
2213	ISO17070	<0.05		----	
2215	In house	<0.05		----	
2230	LFGB B82.02.8	<0.05		----	
2241	In house	< 0.1		----	
2265		----		----	
2266		0		----	
2272	XP G 08-015	ND		----	
2284		----		----	
2289	ISO17070	ND		----	
2290	ISO17070	<0.5		----	
2295		----		----	
2297		nd		----	
2300	In house	3.78		----	Possibly a false positive test result?
2301	In house	ND		----	
2310	LFGB B82.02.8	Not Detected		----	
2311	LFGB B82.02.8	Not Detected		----	
2313	LFGB B82.02.8	Not Detected		----	
2347	In house	<0.05		----	
2350	In house	<0.125		----	
2352		----		----	
2357	In house	ND		----	
2358	In house	<0.1		----	
2363	In house	ND		----	
2365	In house	ND		----	
2370	LFGB B82.02.8	n.d.		----	
2375		----		----	
2380	LFGB BVL B82.02.8Mod.	N.D.		----	
2386		----		----	
2390	In house	ND		----	
2403	ISO17070	ND		----	
2410		----		----	
2415		<0.05		----	
2449		----		----	
2462		N.D.		----	
2477		----		----	
2488		----		----	
2489	LFGB B82.02.8	ND		----	
2492		----		----	
2493	In house	0		----	
2511		----		----	
2538		----		----	
2553	In house	ND		----	
2560	ISO17070	nd		----	
2563	ISO17070	n. d.		----	
2590	LFGB B82.02.8	<L.O.Q.		----	
2591	In house	<0.05		----	
2592		----		----	
2638	ISO17070	n.d		----	
2644		----		----	
2730		----		----	
2737		----		----	
2768		----		----	
2773	ISO17070	N.D.		----	
2776	GB/T18414	N.D.		----	
2789	UNE59510	0.0413		----	
3118		ND		----	
3146	In house	<0,1		----	
3149		----		----	
3150		----		----	
3151		----		----	
3153		----		----	
3154		----		----	

lab	method	value	mark	z(targ)	remarks
3163		----		----	
3172		----		----	
3176	LFGB B82.02.8	0.146		----	
3192		----		----	
3197	LFGB B82.02.8	<0,05		----	
3209	ISO17070	<0.5		----	
3210	In house	<0.05		----	
3220		Not Detected		----	
3228		----		----	
3232	ISO17070	n.d		----	
3233	In house	< 0.05		----	

Determination of Other Chlorophenols on sample #17646; results in mg/kg

lab	method	value	mark	z(targ)	remarks
213		----		----	
551	In house	N.D.		----	
623		----		----	
840		----		----	
2115		----		----	
2129	ISO17070Mod.	<0,1		----	
2132	In house	N/A		----	
2135		----		----	
2165		----		----	
2172	In house	ND		----	
2181		----		----	
2184		----		----	
2213	ISO17070	<0.05		----	
2215	In house	<0.05		----	
2230	LFGB B82.02.8	<0.05		----	
2241	In house	< 0.1		----	
2265		----		----	
2266		0		----	
2272	XP G 08-015	ND		----	
2284		----		----	
2289	ISO17070	ND		----	
2290	ISO17070	<0.5		----	
2295		----		----	
2297		n.a		----	
2300	In house	ND		----	
2301		----		----	
2310	LFGB B82.02.8	Not Detected		----	
2311	LFGB B82.02.8	Not Detected		----	
2313		----		----	
2347		----		----	
2350	In house	<0.125		----	
2352		----		----	
2357		----		----	
2358	In house	<0.1		----	
2363	In house	ND		----	
2365	In house	ND		----	
2370	LFGB B82.02.8	n.d.		----	
2375		----		----	
2380	LFGB BVL B82.02.8Mod.	N.D.		----	
2386		----		----	
2390		----		----	
2403	ISO17070	ND		----	
2410		----		----	
2415		<0.05		----	
2449		----		----	
2462		N.D.		----	
2477		----		----	
2488		----		----	
2489	LFGB B82.02.8	ND		----	
2492		----		----	
2493	In house	0		----	
2511		----		----	
2538		----		----	
2553	In house	ND		----	
2560	ISO17070	nd		----	
2563	ISO17070	n. d.		----	
2590	LFGB B82.02.8	<L.O.Q.		----	
2591		----		----	
2592		----		----	
2638	ISO17070	n.d		----	
2644		----		----	
2730		----		----	
2737		----		----	
2768		----		----	
2773	ISO17070	N.D.		----	
2776	GB/T18414	N.D.		----	
2789	UNE59510	0.041		----	
3118		----		----	
3146	In house	<0,1		----	
3149		----		----	
3150		----		----	
3151		----		----	
3153		----		----	
3154		----		----	

lab	method	value	mark	z(targ)	remarks
3163		----		----	
3172		----		----	
3176		----		----	
3192		----		----	
3197		----		----	
3209	ISO17070	NA		----	
3210		----		----	
3220		----		----	
3228		----		----	
3232	ISO17070	n.d		----	
3233	In house	< 0.05		----	

APPENDIX 2**Details of the methods used by the participants**

lab	Accredited in accordance with ISO/IEC17025 to determine these components?	Which technique was used to release/extract the components
213	---	---
551	Yes	Basic / Ultrasonic extraction
623	No	Basic / Ultrasonic extraction
840	Yes	Basic / Ultrasonic extraction
2115	Yes	Soxhlet / AES extraction
2129	Yes	Soxhlet / AES extraction
2132	No	Basic / Ultrasonic extraction
2135	Yes	Basic / Ultrasonic extraction
2165	Yes	Basic / Ultrasonic extraction
2172	Yes	Basic / Ultrasonic extraction
2181	Yes	Soxhlet / AES extraction
2184	Yes	Basic / Ultrasonic extraction
2213	Yes	Steam distillation
2215	Yes	Basic / Ultrasonic extraction
2230	Yes	Basic / Ultrasonic extraction
2241	Yes	Basic / Ultrasonic extraction
2265	No	Basic / Ultrasonic extraction
2266	Yes	Steam distillation
2272	Yes	Basic / Ultrasonic extraction
2284	Yes	Steam distillation
2289	Yes	Steam distillation
2290	---	---
2295	Yes	Basic / Ultrasonic extraction
2297	Yes	Basic / Ultrasonic extraction
2300	Yes	Soxhlet / AES extraction
2301	---	---
2310	Yes	Steam distillation
2311	Yes	Steam distillation
2313	Yes	Steam distillation
2347	Yes	---
2350	No	Basic / Ultrasonic extraction
2352	Yes	Basic / Ultrasonic extraction
2357	---	---
2358	Yes	Basic / Ultrasonic extraction
2363	Yes	Basic / Ultrasonic extraction
2365	Yes	Basic / Ultrasonic extraction
2370	Yes	Steam distillation
2375	Yes	Basic / Ultrasonic extraction
2380	Yes	Basic / Ultrasonic extraction
2386	Yes	Basic / Ultrasonic extraction
2390	Yes	Basic / Ultrasonic extraction
2403	Yes	Steam distillation
2410	Yes	Steam distillation
2415	Yes	Basic / Ultrasonic extraction
2449	Yes	Basic / Ultrasonic extraction
2462	---	---
2477	No	Soxhlet / AES extraction
2488	Yes	Basic / Ultrasonic extraction
2489	Yes	Steam distillation
2492	Yes	Basic / Ultrasonic extraction
2493	No	Basic / Ultrasonic extraction
2511	No	Basic / Ultrasonic extraction
2538	Yes	Steam distillation
2553	Yes	Basic / Ultrasonic extraction
2560	Yes	Basic / Ultrasonic extraction
2563	Yes	Soxhlet / AES extraction
2590	Yes	Basic / Ultrasonic extraction
2591	No	Basic / Ultrasonic extraction

lab	Accredited in accordance with ISO/IEC17025 to determine these components?	Which technique was used to release/extract the components
2592	No	Steam distillation
2638	No	Basic / Ultrasonic extraction
2644	No	Basic / Ultrasonic extraction
2730	No	Basic / Ultrasonic extraction
2737	Yes	Basic / Ultrasonic extraction
2768	Yes	Steam distillation
2773	Yes	Steam distillation
2776	Yes	Basic / Ultrasonic extraction
2789	Yes	Basic / Ultrasonic extraction
3118	Yes	Basic / Ultrasonic extraction
3146	Yes	Basic / Ultrasonic extraction
3149	Yes	Soxhlet / AES extraction
3150	Yes	Basic / Ultrasonic extraction
3151	Yes	Basic / Ultrasonic extraction
3153	Yes	Steam distillation
3154	Yes	Basic / Ultrasonic extraction
3163	---	---
3172	Yes	Basic / Ultrasonic extraction
3176	Yes	Basic / Ultrasonic extraction
3192	Yes	Basic / Ultrasonic extraction
3197	Yes	Steam distillation
3209	Yes	Basic / Ultrasonic extraction
3210	No	Basic / Ultrasonic extraction
3220	Yes	Basic / Ultrasonic extraction
3228	Yes	Basic / Ultrasonic extraction
3232	Yes	Steam distillation
3233	No	Steam distillation

APPENDIX 3

Number of participants per country

2 labs in BANGLADESH

1 lab in BRAZIL

4 labs in FRANCE

12 labs in GERMANY

5 labs in HONG KONG

1 lab in HUNGARY

9 labs in INDIA

3 labs in INDONESIA

5 labs in ITALY

3 labs in KOREA

1 lab in MEXICO

1 lab in MOROCCO

1 lab in NETHERLANDS

19 labs in P.R. of CHINA

3 labs in PAKISTAN

1 lab in POLAND

2 labs in SPAIN

1 lab in SRI LANKA

2 labs in TAIWAN R.O.C.

1 lab in TUNISIA

5 labs in TURKEY

3 labs in VIETNAM

APPENDIX 4

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
n.a.	= not applicable
n.d.	= not detected
n.e.	= not evaluated
W	= test result withdrawn on request of participant
ex	= test result excluded from the statistical evaluation

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