Results of Proficiency Test
Ethanol (Fuel grade)
December 2017

CONTENTS

1   INTRODUCTION

Since 1995, the Institute for Interlaboratory Studies (iis) organizes a proficiency test (PT) for Ethanol (Fuel grade) in accordance with the latest applicable version of the specifications EN15376 and ASTM D4806.

In this interlaboratory study 61 laboratories from 31 different countries for the PT on Ethanol (Fuel grade) did register for participation. See appendix 2 for the number of participants per country. In this report, the results of the 2017 interlaboratory study on Ethanol (Fuel grade) 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 organiser of this proficiency test (PT). Sample analyses for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC 17025 accredited laboratory. In this proficiency test the participants received two different samples of Ethanol (Fuel grade), a 1 litre bottle (labelled #17240) and a 50 ml bottle (labelled #17241) for Chloride (Inorganic), Sulphate and total Sulphur. only. Participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for the statistical evaluation.

2.1   ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC 17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the 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 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

The necessary bulk material for sample #17240 was obtained from an European supplier. The approximately 100 litres bulk material was homogenised in a pre-cleaned drum. After homogenisation 83 amber glass bottles of 1 litre were filled and labelled #17240. The homogeneity of the subsamples #17240 was checked by determination of Density in accordance with ASTM D4052 and Water in accordance with ASTM E203 on 8 stratified randomly selected samples.

	Density at 20°C in kg/L	Water in %M/M
Sample #17240-1	0.79016	0.228
Sample #17240-2	0.79017	0.232
Sample #17240-3	0.79016	0.232
Sample #17240-4	0.79016	0.231
Sample #17240-5	0.79015	0.231
Sample #17240-6	0.79015	0.232
Sample #17240-7	0.79015	0.232
Sample #17240-8	0.79015	0.231

Table 1: homogeneity test results of subsamples #17240

From the above test results the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibilities of the reference test methods in agreement with the procedure of ISO 13528, Annex B2 in the next table.

	Density at 20°C in kg/L	Water in %M/M
r (observed)	0.00002	0.004
reference test method	ISO12185:96	EN15489:07
0.3 x R (ref. test method)	0.00015	0.007

Table 2: evaluation of the repeatabilities of subsamples #17240

The calculated repeatabilities were in agreement with 0.3 times the corresponding reproducibilities of the reference test methods. Therefore, homogeneity of the subsamples of #17240 was assumed.

The necessary bulk material for sample #17241 was obtained from an European supplier. To approximately 3.9 kg of this material, the components (dissolved in water) were added:

Component	Amount
Sodium Chloride (NaCl)	37 mg
Sodium Sulfate (Na_2SO_4)	73 mg

Table 3: preparation table for sample #17241

After homogenisation, 97 PE bottles of 50 mL were 60% filled and labelled #17241. The homogeneity of subsamples #17241 was checked by determination of Chloride (inorganic) as Cl in accordance with EN15492 on 8 stratified randomly selected samples.

	Chloride (inorganic) in mg Cl/kg
Sample #17241-1	5.00
Sample #17241-2	5.36
Sample #17241-3	5.43
Sample #17241-4	5.24
Sample #17241-5	5.34
Sample #17241-6	5.50
Sample #17241-7	5.77
Sample #17241-8	5.57

Table 4: homogeneity test results of subsamples #17241

From the above test results the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibilities of the reference test methods in agreement with the procedure of ISO 13528, Annex B2 in the next table.

	Chloride (inorganic) in mg Cl/kg
r (observed)	0.64
reference method	Horwitz
0.3 x R (ref. method)	0.56

Table 5: evaluation of the repeatabilities of subsamples #17241

The calculated repeatability was in agreement with 0.3 times the corresponding reproducibility of the reference method. Therefore, homogeneity of the subsamples of #17241 was assumed.

To each of the participating laboratories, 1 x 1 litre bottle (labelled #17240) and 1 x 50 ml bottle (60% filled and labelled #17241) was sent on November 8, 2017. A SDS was added to the sample package.

2.5   STABILITY OF THE SAMPLES

The stability of Ethanol (Fuel grade), packed in an amber glass bottle and in a PE bottle , was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6   ANALYSES

The participants were asked to determine on sample #17240: Acidity, Appearance, Copper as Cu, Density at 20°C, Electrical conductivity at 25°C, Nonvolatile matter, Nitrogen, pHe, Phosphorus as P, Water (coulometric and titrimetric), Ethanol incl. higher alcohols (acc. EN15721), Higher Alcohols (acc. EN15721), Impurities (acc. EN15721), Methanol (acc. EN15721) and Ethanol by mass and by volume (acc. ASTM D5501).

The participants were asked to determine on sample #17241: Chloride (Inorganic), Sulphate and total Sulphur.

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 calculations.

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 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/. 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/. 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 Organisation, 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 data set does not have a normal distribution, the results of the statistical evaluation should be used with due care.

According to ISO 5725 the original test results per determination were submitted to Dixon's, 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 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, e.g. ASTM, EN or ISO reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.
The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used. In 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:

$z_{(target)}$ = (test result - average of PT) / 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 proficiency test some problems were encountered with the dispatch of the samples.
Participants in Brasil, Peru and Turkey received the samples late or not at all.
Six participants reported the test results after the final reporting date and two participants did not
report any test results at all. Not all laboratories were able to report all analyses requested.

In total 59 laboratories reported 537 numerical test results. Observed were 22 outlying test
results, which is 4.1% of the numerical test results. In proficiency studies, outlier percentages of
3% - 7.5% are quite normal.

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

4.1   EVALUATION PER SAMPLE AND PER TEST

In this section, the reported test results are discussed per sample and per test. The test
methods, that are reported by the various laboratories were taken into account for explaining the
observed differences when possible and applicable. These methods are also in the tables
together with the original data. The abbreviations, used in these tables, are listed in appendix 3.

Unfortunately, a suitable standard test method, providing the precision data, is not available for
all determinations. For the test, that have no available precision data, the calculated
reproducibility was compared against the reproducibility estimated from the Horwitz equation.

In the iis PT reports, ASTM methods are referred to with a number (e.g. D5501) and an added
designation for the year that the method was adopted or revised (e.g. D5501:12). If applicable, a
designation in parentheses is added to designate the year of reapproval (e.g. D5501:12 (2016)).
In the results tables of Appendix 1 only the method number and year of adoption or revision will
be used.

Sample #17240

Acidity: This determination may be problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN15491:07 (and ASTM D1613:17 and ASTM D7795-B:15).

Appearance: This determination was not problematic. All reporting participants agreed about the appearance as Pass (Clear and Bright).

Copper: Almost all laboratories reported a 'less than' test result. Therefore no statistical conclusions were drawn.

Density at 20°C: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96.

Electrical Conductivity: This determination was very problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the requirements of EN15938:10.

Nonvolatile matter: All test results were below the application range of the method EN15691:09 (10 – 25 mg/100ml). Therefore no significant conclusions were drawn.

Nitrogen: This determination was problematic at the low level of 0.5 mg/kg. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D4629:12. The low number of reported test results may (partly) explain the large variation.

pHe: It is known that the pHe determined with a LiCl electrode will be lower than the pHe determined with a KCl electrode. Two test methods are available for the determination of the pHe of Ethanol: ASTM D6423, that describes the use of a KCl electrode and EN15490, that describes the use of a LiCl electrode. Both test methods are used in this PT and therefore the reported pHe test results for were split up into pHe (KCl) and pHe (LiCl) and evaluated separately.

pHe (KCl):   This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of D6423:14.

pHe (LiCl):   This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN15490:07. The low number of reported test results may (partly) explain the large variation.

Phosphorus: Almost all test results were near or below the application range of method EN15487:07 (0.15 – 1.50 mg/kg). Therefore no statistical conclusions were drawn.

Water (coulometric): This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of EN15489:07 (and in agreement with ASTM E1064:16 and ASTM D6304:16e1).

Water (titrimetric): This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM E203:16 (and in agreement with EN15692:09).

GC general: In previous round robins it became clear that the test results reported for the Ethanol content is depending on the test method used by the laboratory. The test method EN15721 uses a different definition for Ethanol than ASTM D5501 does. Therefore, the participants in this proficiency test were requested to report the ethanol content for each of the two definitions.

Ethanol (EN15721): In EN15721 the purity (the ethanol content) is defined as:
Ethanol (incl. higher alcohols) = 100% - impurity% - methanol %, where the higher alcohols consequently are not included in "impurity%".
This determination was problematic. One statistical outlier was observed. Two other laboratories probably did not include the "higher alcohols" in the Ethanol content. The test results of both laboratories were excluded from the statistical calculations. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of EN15721:13.

Higher Alcohols (EN15721): In EN15721 the higher alcohol content is defined as:
the sum of n-propanol%, n-butanol%, sec-butanol%, isopropanol%, 2-methyl-1-butanol% and 3-methyl-1-butanol%.
This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of EN15721:13.

Impurities (EN15721): This determination may be problematic. In EN15721 the impurity content is defined as: content of all components except for Ethanol%, Methanol% and the "higher alcohols"%. No statistical outlier was observed. One laboratory did probably include the "higher alcohols" in the Impurities content and three other laboratories showed statistical outliers in the Ethanol and/or MeOH content. The test result of these four laboratories were excluded from the statistical calculations. The calculated reproducibility after rejection of the suspect data is not in agreement with the estimated reproducibility limits using the Horwitz equation (nine components).

Methanol: This determination was problematic. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated requirements calculated using the Horwitz equation, but in agreement with the estimated requirements of ASTM D5501:12. When using standard EN15721:13 a negative value for the reproducibility is found at this concentration level.

Ethanol (D5501): This determination was not problematic for Ethanol by mass and Ethanol by volume. No statistical outliers were observed. The test result of one laboratory was excluded as the concentration of Ethanol by mass should be lower as the concentration of Ethanol by volume. For both Ethanol by mass and Ethanol by volume the calculated reproducibility after rejection of the suspect data is in agreement with the requirements of ASTM D5501:12 (2016).

Sample #17241

Chloride, Inorganic: This determination was not problematic. Two statistical outliers were observed and one test result was excluded. The calculated reproducibility after rejection of the suspect data is in agreement with the estimated requirements calculated using the Horwitz equation (and in agreement with ASTM D7319:17, but not in agreement with EN15492:12). The average recovery of Inorganic Chloride (theoretical increment of 5.70 mg Chloride/kg) may be good (<92%), the actual Chloride content is unknown.

Sulphate: This determination was very problematic. No statistical outliers were observed. The reported test results appear to be bimodally distributed. Therefore, no significant conclusions were drawn. Sodium Sulfate was added to sample #17241 (theoretical increment of 12.53 mg SO_4/kg), the actual Sulfate content is unknown. Regretfully it is unknown if all laboratories reported the Sulfate content as mg SO_4/kg. In future PTs the Sulfate content will be requested as mg SO_4/kg.

Total Sulphur: This determination may be problematic at the low level of 1.6 mg/kg, depending on the test method used for evaluation. No statistical outliers were observed. The calculated reproducibility is in good agreement with the requirements of EN15485:07. However, the calculated reproducibility is not in agreement with the reproducibility requirements of EN15486:07.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant reference test method and the reproducibility as found for the group of participating laboratories. The average results per sample, calculated reproducibilities and reproducibilities, derived from reference test methods (in casu ASTM, ISO and EN test methods) are compared in the next tables.

Parameter	unit	n	average	2.8 *sd	R (lit)
Acidity as Acetic acid, Total	mg/kg	49	24.7	16.8	13.7
Appearance		47	Pass	n.a.	n.a.
Copper as Cu	mg/kg	18	<0.07	n.a.	n.a.
Density at 20°C	kg/L	54	0.7902	0.0002	0.0005
Electrical conductivity at 25°C	µS/cm	27	0.5	0.3	0.1
Nonvolatile matter	mg/100mL	27	0.8	1.7	(0.2)
Nitrogen	mg/kg	9	0.5	0.7	0.5
pHe (KCl)		20	6.71	1.22	1.11
pHe (LiCl)		10	5.72	0.72	0.55
Phosphorus as P	mg/L	21	<0.15	n.a.	n.a.
Water (coulometric)	%M/M	42	0.240	0.022	0.023
Water (titrimetric)	%M/M	26	0.244	0.038	0.078
Ethanol incl. Higher Alcohols (EN15721)	%M/M	29	99.925	0.077	0.045
Higher Alcohols (EN15721)	%M/M	31	0.352	0.103	0.101
Impurities (EN15721)	%M/M	25	0.071	0.050	0.036 *)
Methanol	%M/M	37	0.010	0.003	0.002 *)
Ethanol (D5501)	%M/M	18	99.458	0.556	0.994
Ethanol (D5501)	%V/V	17	99.586	0.601	0.994

Table 6: reproducibilities of tests on sample #17240

Results between brackets should be used with care, because the average was near or below the application range.

*) Reproducibility via the Horwitz equation

Parameter	unit	n	average	2.8 *sd	R (lit)
Chloride, Inorganic as Cl	mg/kg	26	5.3	1.3	1.8 *)
Sulphate as SO$_4$	mg/kg	25	7.5	6.8	(1.7)
Total Sulphur	mg/kg	25	1.6	2.3	3.4

Table 7: reproducibilities of tests on sample #17241

Reproducibility between brackets is estimated and should be used with care.

*) Reproducibility via the Horwitz equation

Without further statistical calculations, it can be concluded that for several tests there is a good compliance of the group of participating laboratories with the relevant test methods or the rather strict calculated estimates using the Horwitz equation. The problematic tests have been discussed in paragraph 4.1.

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

	December 2017	December 2016	December 2015	November 2014	November 2013
Number of reporting labs	59	57	68	68	71
Number of results reported	537	476	899	817	880
Statistical outliers	22	31	39	42	41
Percentage outliers	4.1%	6.5%	4.3%	5.1%	4.7%

Table 8: 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 against the requirements of the respective reference test methods. The conclusions are given the following table:

Determination	December 2017	December 2016	December 2015	November 2014	November 2013
Acidity as Acetic Acid	-	+	+/-	+/-	+
Copper as Cu	n.e.	n.e.	n.e.	n.e.	n.e.
Density at 20ºC	++	++	++	++	+
Electrical conductivity	--	--	-	--	--
Nonvolatile matter	(--)	(--)	(--)	(--)	(--)
Nitrogen	-	--	--	--	-
pHe	-	+/-	n.e.	n.e.	n.e.
Phosphorus as P	n.e.	n.e.	n.e.	(+/-)	(--)
Water (coulometric)	+/-	+	+/-	+/-	+
Water (titrimetric)	++	++	++	++	++
Ethanol (EN15721)	-	-	--	n.e.	n.e.
Higher Alcohols (EN15721)	+/-	-	-	n.e.	n.e.
Impurities (EN15721)	-	--	--	n.e.	n.e.
Methanol	-	-	--	++	++
Ethanol (D5501)	+	++	++	--	++
Chloride, Inorganic as Cl	+	(++)	-	+	-
Sulphate as SO4	-- *)	--	(--)	(--)	(--)
Total Sulphur	+	+	++	++	++

Table 9: Comparison determinations against the reference test method

Results between brackets should used with care, because the average was near or below the application range.

*) Performance results should be used with care, because the reproducibility is estimated.

The performance of the determinations against the requirements of the respective reference test methods is listed in the above table. The following performance categories were used:

      ++:   group performed much better than the reference test method

      + :   group performed better than the reference test method

      +/-:   group performance equals the reference test method

      - :   group performed worse than the reference test method

      -- :   group performed much worse than the reference test method

      n.e.:   not evaluated

APPENDIX 1

Determination of Acidity, Total as Acetic Acid on sample #17240; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D1613	23		-0.35	
62	D1613	23		-0.35	
150	D1613	23.4		-0.27	
169	D7795	22.8		-0.39	
171	EN15491	300	R(0.01)	56.26	
174	D1613	18.9		-1.19	
175	D7795	28.7		0.82	
230	D1613	25.5		0.16	
311	EN15491	<30		-----	
323	EN15491	< 0.003	U	-----	probably reported in a different unit (%M/M ?)
329	EN15491	22		-0.55	
333	EN15491	<30		-----	
334	EN15491	20		-0.96	
337		-----		-----	
338	EN15491	35		2.10	
343	EN15491	30		1.08	
357	EN15491	21		-0.76	
360	EN15491	22		-0.55	
391	EN15491	20		-0.96	
396	EN15491	33		1.70	
402	EN15491	37		2.51	
444		-----		-----	
468	EN15491	17		-1.58	
496	EN15491	25		0.06	
511		-----		-----	
541	D1613	26.5		0.37	
551	D1613	22.27		-0.50	
554	D1613	18.0		-1.37	
556	NBR16047	11.4		-2.72	
631	D1613	20.3		-0.90	
633	D1613	26		0.26	
657	D1613	22.64		-0.42	
663	D1613	23.8		-0.19	
823	D1613	17		-1.58	
840	D1613	25.0		0.06	
902		-----		-----	
913	D1613	22.0		-0.55	
922	D1613	24		-0.14	
1047	EN15491	28.3		0.73	
1191		-----		-----	
1201	EN15491	23		-0.35	
1276	EN15491	25		0.06	
1359	EN15491	27.60		0.59	
1397	EN15491	20		-0.96	
1446	EN15491	31		1.29	
1468	EN15491	20		-0.96	
1523	ISO1388-2	29.3		0.94	
1563	EN15491	30		1.08	
1605		-----		-----	
1656	EN15491	40		3.13	
1667		-----		-----	
1710	EN15491	19.4		-1.08	
1726	EN15491	26.9		0.45	
1727	EN15491	23		-0.35	
1835	EN15491	29		0.88	
1852		-----		-----	
1919	EN15491	27.3		0.53	
1996	EN15491	40		3.13	
7002		27.6		0.59	
7015		25		0.06	
7016		12		-2.60	

	normality	OK			
	n	49			
	outliers	1			
	mean (n)	24.706			
	st.dev. (n)	6.0004			
	R(calc.)	16.801			
	st.dev.(EN15491:07)	4.8929			
	R(EN15491:07)	13.7			application range: 30 - 150 mg/kg
	For comparison:				
	R(D1613:17)	14			application range: <500 mg/kg
	R(D7795-B:15)	13.065			application range: <200 mg/kg

Kernel Density
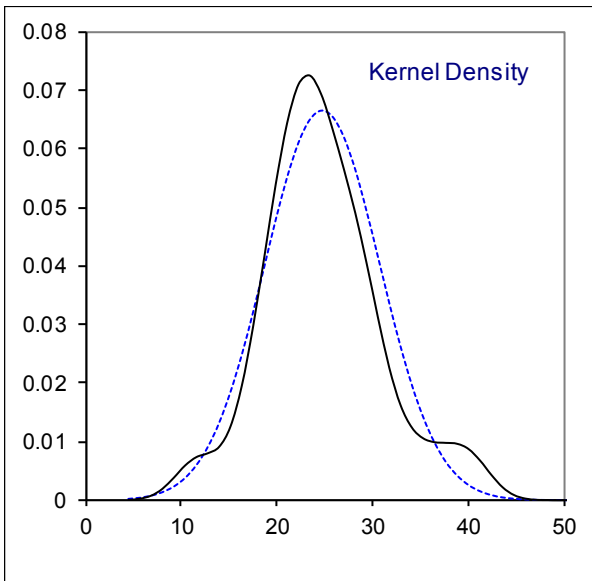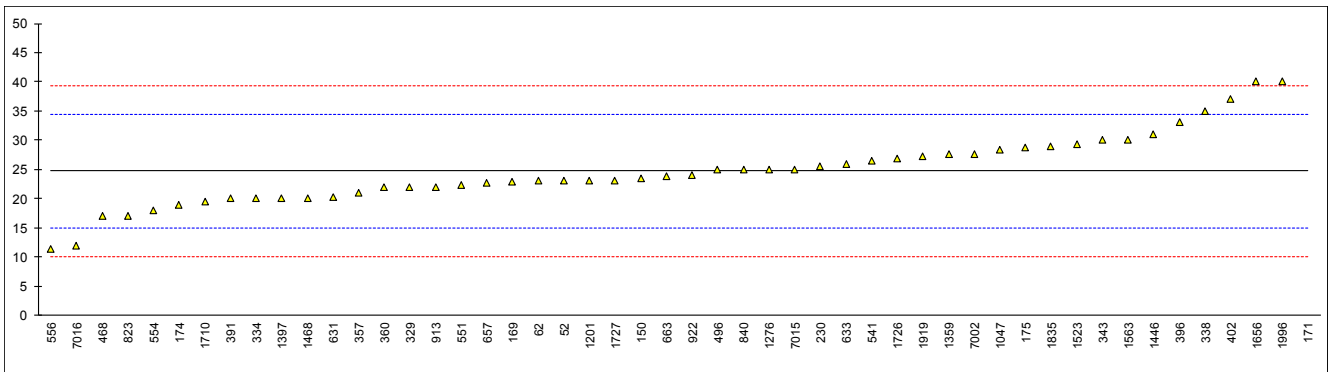
Determination of Appearance on sample #17240;

lab	method	value	mark	z(targ)	remarks
52	D4176	Pass		-----	
62		-----		-----	
150	E2680	Pass		-----	
169	D4176	Pass		-----	
171	EN15769	Clear and colourless		-----	
174	Visual	Clear & free		-----	
175	D4176	Clear and bright		-----	
230	Visual	Clear & Bright		-----	
311	EN15769	clear & colourless		-----	
323	E2680	clear & bright		-----	
329	Visual	clear		-----	
333	EN15769	clear and colourless		-----	
334		-----		-----	
337	Visual	Colourless		-----	
338	Visual	Clear and Bright		-----	
343	INH-1608	C&B		-----	
357	E2680	Pass		-----	
360	EN15376	Clear and Colourless		-----	
391	E2680	Pass		-----	
396	E2680	Pass		-----	
402		-----		-----	
444	EN15769	Pass		-----	
468	EN15769	C&C		-----	
496	Visual	clear colourless		-----	
511		-----		-----	
541	E2680	Pass		-----	
551	Visual	Clear		-----	
554	Visual	CFFSM		-----	reported: Clear and free from suspended matter
556		-----		-----	
631	Visual	Clear and Bright		-----	
633	Visual	Clear & Bright		-----	
657	E2680	Pass		-----	
663	Visual	Clear & Bright		-----	
823	E2680	Pass		-----	
840	E2680	Pass		-----	
902		-----		-----	
913	E2680	CFSM		-----	
922	Visual	clear and bright		-----	
1047	EN15769	Clear&Colourless		-----	
1191	D4176	C&B		-----	
1201	Visual	Bright and Clear		-----	
1276	EN15769	C&C		-----	
1359	EN15769	Clear and colourless		-----	
1397		-----		-----	
1446		-----		-----	
1468		-----		-----	
1523		-----		-----	
1563	EN15769	clear & colourless		-----	
1605		-----		-----	
1656	EN15769	Pass		-----	
1667		-----		-----	
1710	EN15769	Clear and Colourless		-----	
1726	EN15769	Clear and colourless		-----	
1727	Visual	Clear and colourless		-----	
1835	EN15769	CCL		-----	
1852	Visual	clear and bright		-----	
1919		-----		-----	
1996	Visual	l.p.p.s		-----	
7002		-----		-----	
7015		clear		-----	
7016		clear and without impurity		-----	
	n	47			
	mean (n)	Pass (Clear & Bright)			

Determination of Copper as Cu on sample #17240; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D1688	<0.05		-----	
62		-----		-----	
150	D1688	<0.5		-----	
169		-----		-----	
171	D1688	<0.05		-----	
174		-----		-----	
175	D1688	0.001		-----	
230		-----		-----	
311	EN15488	<0.0050		-----	
323	EN15488	< 0.070		-----	
329		-----		-----	
333	EN15488	<0.07		-----	
334		-----		-----	
337		-----		-----	
338		-----		-----	
343	EN15488	<0.07		-----	
357		-----		-----	
360	EN15837	< 0.050		-----	
391		-----		-----	
396		-----		-----	
402		-----		-----	
444		-----		-----	
468	EN15488	<0.1		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	INH-2047	<0.04		-----	
554		-----		-----	
556		-----		-----	
631	D1688	<0.05		-----	
633		-----		-----	
657		-----		-----	
663	INH-12414	0.002		-----	
823	D1688	<0.05		-----	
840	D1688	<0.05		-----	
902		-----		-----	
913		-----		-----	
922	D1688	<0.05		-----	
1047	EN15837	<0.03		-----	
1191		-----		-----	
1201	EN15488	<1		-----	
1276		-----		-----	
1359	EN15488	0.2083		-----	false positive test result?
1397		-----		-----	
1446		-----		-----	
1468	EN15837	<0.1		-----	
1523		-----		-----	
1563	EN15488	<0.070		-----	
1605		-----		-----	
1656	D1688-A	<0.01		-----	
1667		-----		-----	
1710		-----		-----	
1726		-----		-----	
1727		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
1996	EN15837	<0.05		-----	
7002		-----		-----	
7015		-----		-----	
7016		-----		-----	

normality	unknown	
n	18	
outliers	n.a.	
mean (n)	<0.07	
st.dev. (n)	n.a.	
R(calc.)	n.a.	
st.dev.(EN15488:07)	n.a.	
R(EN15488:07)	n.a	application range: 0.07 – 0.20 mg/kg
For comparison		
R(D1688:12)	n.a.	

Determination of Density at 20°C on sample #17240; results in kg/L

lab	method	value	mark	z(targ)	remarks
52	D4052	0.7902		0.08	
62		-----		-----	
150	D4052	0.7902		0.08	
169	D4052	0.7903		0.64	
171	ISO12185	0.7902		0.08	
174	D4052	0.7902		0.08	
175	D4052	0.79018		-0.03	
230	D4052	0.79018		-0.03	
311	ISO12185	0.7902		0.08	
323	D4052	0.7901		-0.48	
329	D4052	0.7902		0.08	
333	ISO12185	0.7900		-1.04	
334	ISO12185	0.7903		0.64	
337	ISO12185	0.7902		0.08	
338	ISO12185	0.7901		-0.48	
343	ISO12185	0.7901		-0.48	
357	D4052	0.79008		-0.59	
360	D4052	0.7902		0.08	
391	ISO12185	0.7902		0.08	
396	D4052	0.7903		0.64	
402		-----		-----	
444	D4052	0.7902		0.08	
468	ISO12185	0.7900		-1.04	
496	ISO12185	0.79018	C	-0.03	first reported 0.70918
511		-----		-----	
541	D4052	0.79020		0.08	
551	D4052	0.7902		0.08	
554	D4052	0.7903		0.64	
556	NBR5992	0.7900		-1.04	
631	D4052	0.79020		0.08	
633	D4052	0.7907	R(0.01)	2.88	
657	D4052	0.79023		0.25	
663	D4052	0.79039		1.14	
823	D4052	0.79022		0.19	
840	D4052	0.79028		0.53	
902		-----		-----	
913	D4052	0.7902		0.08	
922	D4052	0.79019		0.02	
1047	ISO12185	0.79015		-0.20	
1191	ISO12185	0.7901		-0.48	
1201	ISO12185	0.7902		0.08	
1276	ISO12185	0.79023		0.25	
1359	ISO12185	0.79015		-0.20	
1397	ISO12185	0.7902		0.08	
1446	ISO12185	0.79029		0.58	
1468	ISO12185	0.7902		0.08	
1523	D4052	0.790172		-0.08	
1563	INH-035	0.79020		0.08	
1605	D4052	0.790161		-0.14	
1656	D4052	0.7902		0.08	
1667	ISO3675	0.7900		-1.04	
1710	ISO12185	0.7903		0.64	
1726	D4052	0.79018		-0.03	
1727	D4052	0.79017		-0.09	
1835	ISO12185	0.79021		0.14	
1852	ISO12185	0.7902		0.08	
1919	ISO12185	0.790212		0.15	
1996	ISO12185	0.7912	R(0.01)	5.68	
7002	ISO12185	0.7911	R(0.01)	5.12	
7015	ISO12185	0.7903		0.64	
7016		0.790		-1.04	
	normality	OK			
	n	54			
	outliers	3			
	mean (n)	0.79019			
	st.dev. (n)	0.000083			
	R(calc.)	0.00023			
	st.dev.(ISO12185:96)	0.000179			
	R(ISO12185:96)	0.0005			
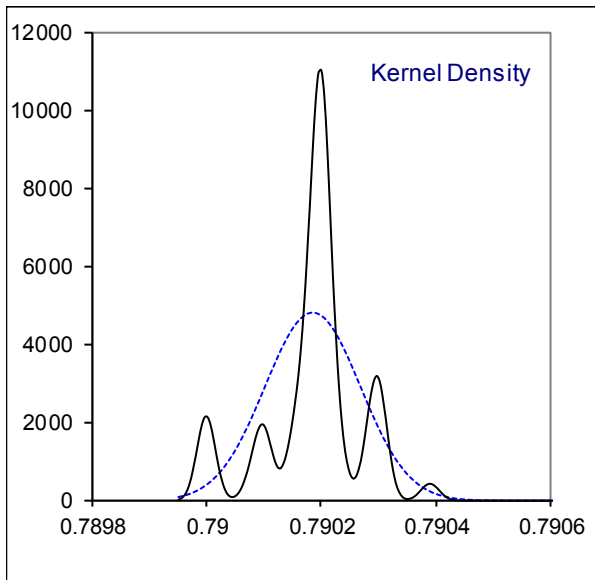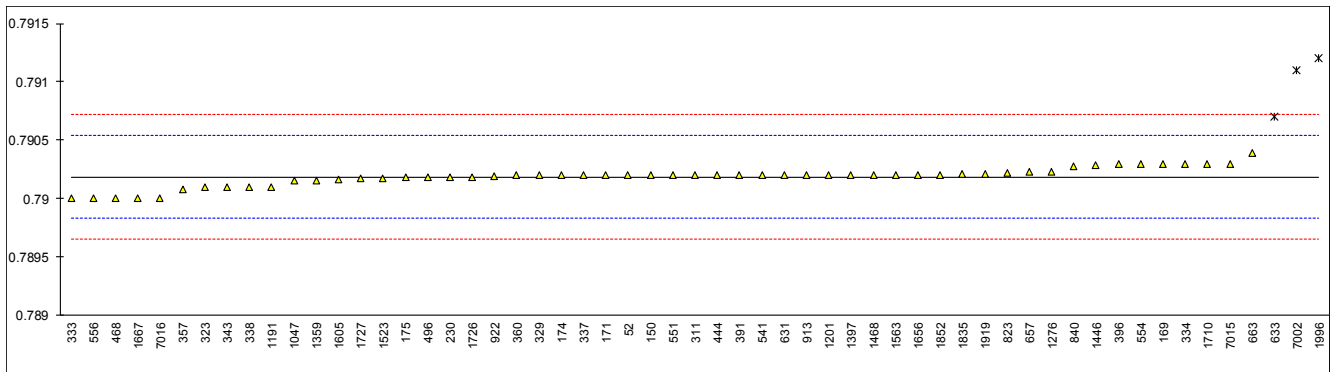
Determination of Electrical conductivity at 25°C on sample #17240; results in µS/cm

lab	method	value	mark	z(targ)	remarks
52		0.47		-0.08	
62		-----		-----	
150	EN15938	0.50		0.59	
169		-----		-----	
171	EN15938	70.00	R(0.01)	1558.66	
174	D1125	<10		-----	
175		-----		-----	
230		-----		-----	
311	EN15938	0.43		-0.98	
323	EN15938	0.49		0.37	
329	EN15938	0.44		-0.75	
333	EN15938	0.50		0.59	
334	EN15938	0.39		-1.87	
337		-----		-----	
338		-----		-----	
343		-----		-----	
357	EN15938	0.67		4.40	
360	EN15938	0.50		0.59	
391		-----		-----	
396		-----		-----	
402		-----		-----	
444	EN15938	3.81	C,R(0.01)	74.80	first reported 2.19
468	EN15938	0.48		0.14	
496	EN15938	0.50		0.59	
511		-----		-----	
541		-----		-----	
551	NBR10547	0.54		1.49	
554	NBR10547	0.5		0.59	
556		-----		-----	
631	D1125	0.193	C	-6.29	first reported 221.5; reported 193 mS/cm
633		-----		-----	
657		-----		-----	
663	D1125	0.61		3.06	
823		-----		-----	
840		-----		-----	
902		-----		-----	
913		-----		-----	
922		-----		-----	
1047		-----		-----	
1191		-----		-----	
1201	EN15938	0.462		-0.26	
1276	EN15938	0.4		-1.65	
1359	EN15938	0.2975		-3.95	
1397		-----		-----	
1446		-----		-----	
1468	EN15938	0.57		2.16	
1523	D2624	0.465		-0.19	
1563	EN15938	0.45		-0.53	
1605		-----		-----	
1656	EN15938	<1		-----	
1667		-----		-----	
1710		-----		-----	
1726	EN15938	0.470		-0.08	
1727	EN15938	0.49		0.37	
1835	EN15938	0.468		-0.12	
1852		-----		-----	
1919	EN15938	0.50		0.59	
1996	EN15938	0.8		7.32	
7002		0.2		-6.13	
7015		1.3	R(0.01)	18.53	
7016		-----		-----	
	normality	not OK			
	n	27			
	outliers	3			
	mean (n)	0.474			
	st.dev. (n)	0.1214			
	R(calc.)	0.340			
	st.dev.(EN15938:10)	0.0446			
	R(EN15938:10)	0.125			
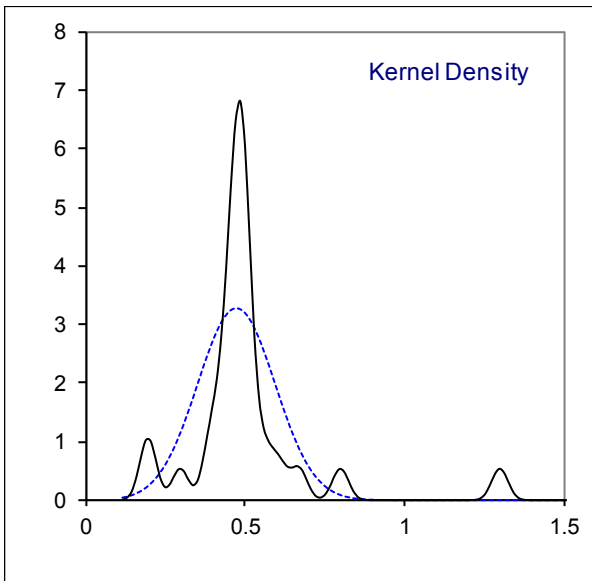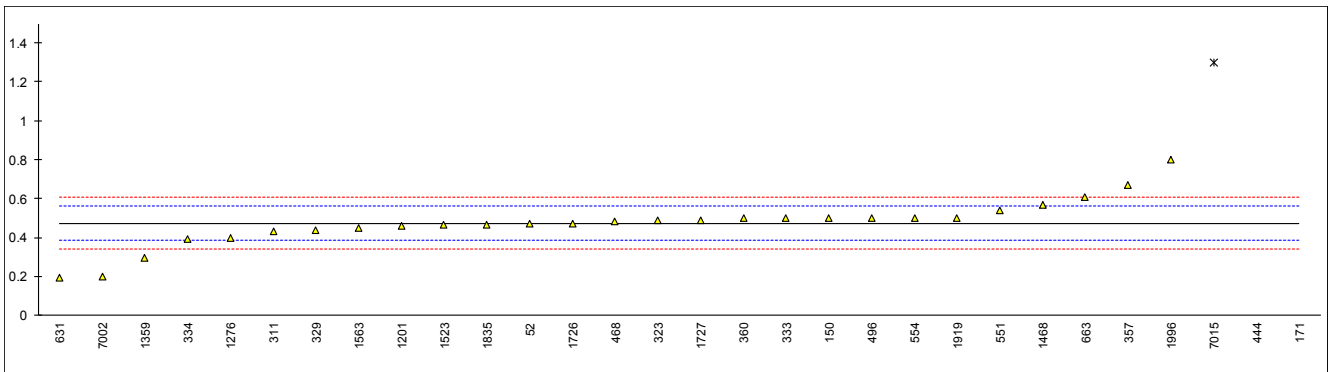
Determination of Nonvolatile matter on sample #17240; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
52	D1353	<1		-----	
62		-----		-----	
150	D1353	0.6		-----	
169	D1353	1.6		-----	
171	EN15691	<10		-----	
174	D1353	0.5		-----	
175		-----		-----	
230	D1353	3	C,R(0.05)	-----	first reported 4.0
311	EN15691	<10		-----	
323	EN15691	< 10		-----	
329	D1353	0.5		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
338		-----		-----	
343	EN15691	<10		-----	
357	EN15691	1.0		-----	
360	EN15691	1.3		-----	
391		-----		-----	
396	D1353	1.1		-----	
402		-----		-----	
444	EN15691	0.2		-----	
468	EN15691	1.7		-----	
496		-----		-----	
511		-----		-----	
541	D1353	<0.1		-----	
551	D1353	0.6		-----	
554	D1353	0.3		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657	D1353	0.5		-----	
663	D1353	0.20		-----	
823	D1353	0.6		-----	
840	D1353	0.9		-----	
902		-----		-----	
913	D1353	0.5		-----	
922	D1353	1.1		-----	
1047	EN15691	0.7		-----	
1191		-----		-----	
1201	EN15691	1.2		-----	
1276	EN15691	3.2	R(0.05)	-----	
1359	EN15691	1.0		-----	
1397	EN15691	0.2		-----	
1446		-----		-----	
1468	EN15691	<1		-----	
1523		-----		-----	
1563	EN15691	0		-----	
1605		-----		-----	
1656	EN15691	<1		-----	
1667		-----		-----	
1710	EN15691	1.7		-----	
1726	EN15691	0.5		-----	
1727	EN15691	1		-----	
1835	EN15691	<10		-----	
1852		-----		-----	
1919		-----		-----	
1996		-----		-----	
7002		0.0013		-----	
7015		2.48		-----	
7016		Zero		-----	

normality	suspect	
n	27	
outliers	2	
mean (n)	0.81	
st.dev. (n)	0.588	
R(calc.)	1.65	
st.dev.(EN15691:09)	(0.054)	
R(EN15691:09)	(0.15)	application range: 10- 25 mg/100mL
For comparison		
R(D1353:13)	(0.35)	
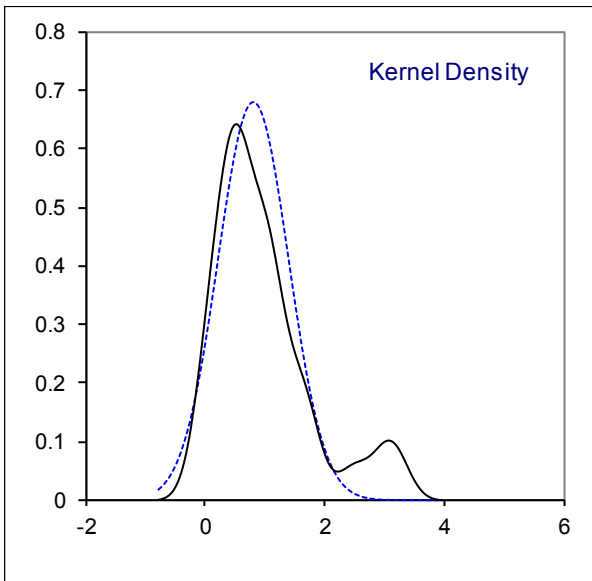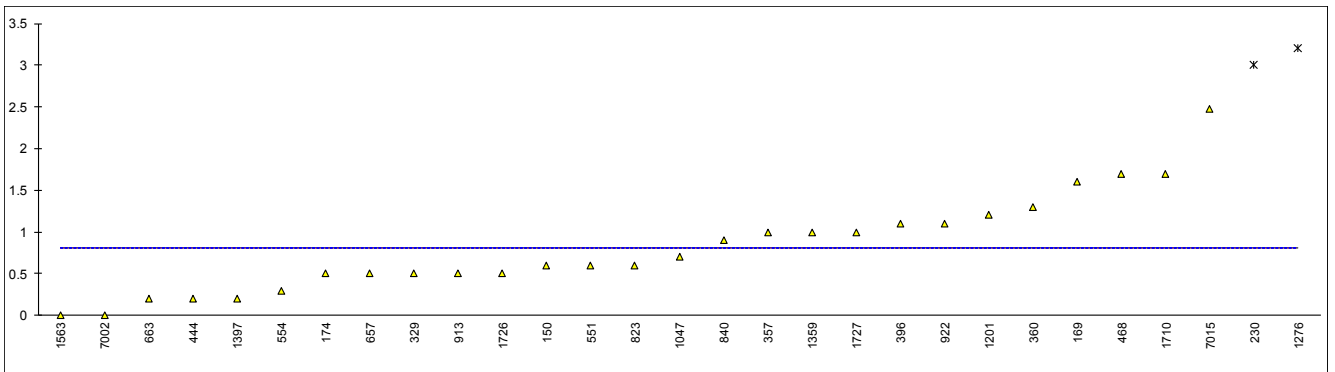
Determination of Nitrogen on sample #17240; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
150		-----		-----	
169		-----		-----	
171	D4629	<0.3		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	D4629	<0.3		-----	
323	D4629	< 1		-----	
329		-----		-----	
333	D4629	<0.3		-----	
334		-----		-----	
337		-----		-----	
338		-----		-----	
343		-----		-----	
357	D4629	0.5		0.26	
360		-----		-----	
391		-----		-----	
396		-----		-----	
402	D4629	0.56		0.57	
444		-----		-----	
468	D4629	<0.5		-----	
496	D4629	0.33		-0.63	
511		-----		-----	
541		-----		-----	
551	D4629	0.81		1.88	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657	D4629	< 0.3		-----	
663	D4629	0.13		-1.67	
823	D4629	0.86		2.14	
840		-----		-----	
902		-----		-----	
913		-----		-----	
922	D4629	<0.3		-----	
1047		-----		-----	
1191		-----		-----	
1201	D4629	<1		-----	
1276		-----		-----	
1359	D4629	0.15		-1.57	
1397		-----		-----	
1446		-----		-----	
1468		-----		-----	
1523		-----		-----	
1563		-----		-----	
1605		-----		-----	
1656	D4629	<1		-----	
1667		-----		-----	
1710	D4629	0.3		-0.78	
1726		-----		-----	
1727		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
1996	D4629	0.41		-0.21	
7002		-----		-----	
7015		-----		-----	
7016		-----		-----	

	normality	OK		
	n	9		
	outliers	0		
	mean (n)	0.450		
	st.dev. (n)	0.2606		
	R(calc.)	0.730		
	st.dev.(D4629:12)	0.1916		
	R(D4629:12)	0.537		application range: 0.3 – 100 mg/kg

Kernel Density
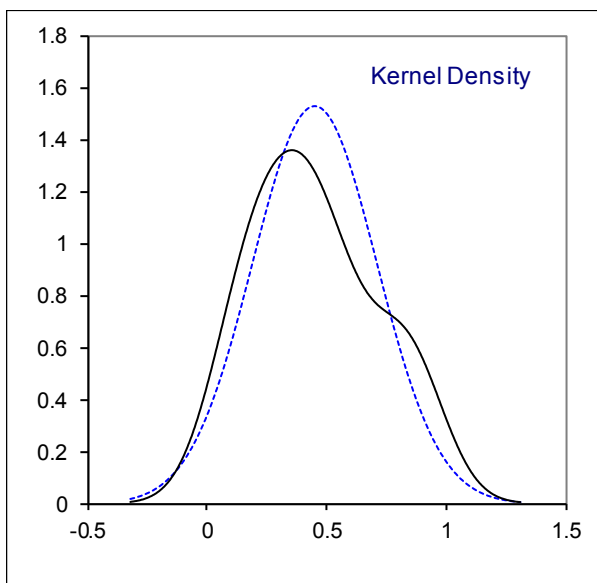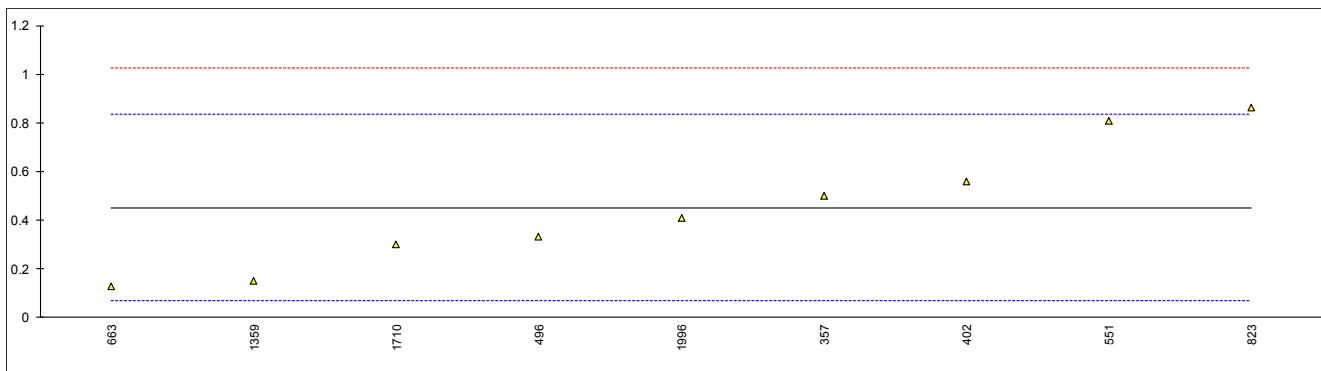
Determination of pHe (KCl) on sample #17240;

lab	method	value	mark	z(targ)	remarks
52	D6423	6.5		-0.53	
62		-----		-----	
150	D6423	6.46		-0.63	
169	D6423	6.2	C	-1.29	first reported 10.18
171	D6423	7.0		0.73	no details on which type of electrode was used
174	D6423	6.4		-0.78	
175		-----		-----	
230		-----		-----	
311		-----		-----	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
338	EN15490	6.32		-0.99	
343		-----		-----	
357	D6423	7.3	C	1.49	first reported as LiCl electrode
360		-----		-----	
391		-----		-----	
396		-----		-----	
402		-----		-----	
444		-----		-----	
468		-----		-----	
496	D6423	6.17		-1.37	
511		-----		-----	
541		-----		-----	
551	D6423	6.37		-0.86	
554	D6423	6.5		-0.53	
556		-----		-----	
631	D6423	7.13		1.06	
633	D6423	7.07		0.91	
657		-----		-----	
663	D6423	7.71		2.52	
823	D6423	6.672		-0.10	
840	D6423	6.32		-0.99	
902		-----		-----	
913		-----		-----	
922	D6423	6.7		-0.03	
1047		-----		-----	
1191		-----		-----	
1201		-----		-----	
1276		-----		-----	
1359		7.32		1.54	
1397	EN15490	6.47		-0.61	
1446		-----		-----	
1468		-----		-----	
1523	D6423	7.1		0.98	
1563		-----		-----	
1605		-----		-----	
1656		-----		-----	
1667		-----		-----	
1710		-----		-----	
1726		-----		-----	
1727		-----		-----	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
1996		-----		-----	
7002		-----		-----	
7015		6.5		-0.53	no details on which type of electrode was used
7016		-----		-----	

normality	OK	
n	20	
outliers	0	
mean (n)	6.711	
st.dev. (n)	0.4343	
R(calc.)	1.216	
st.dev.(D6423:14)	0.3958	
R(D6423:14)	1.108	

Kernel Density
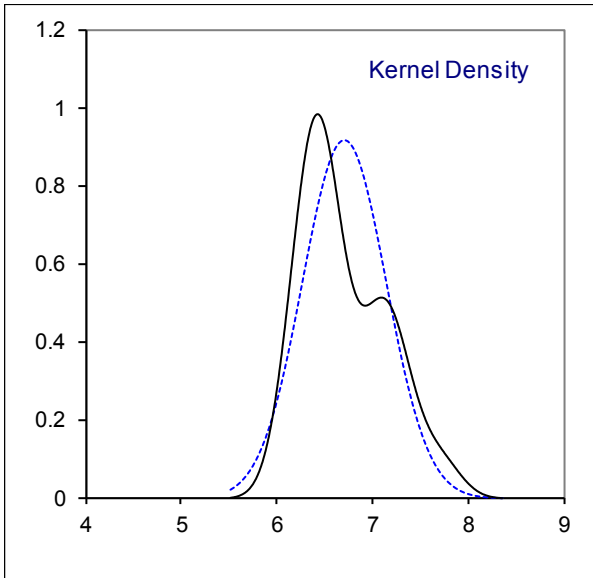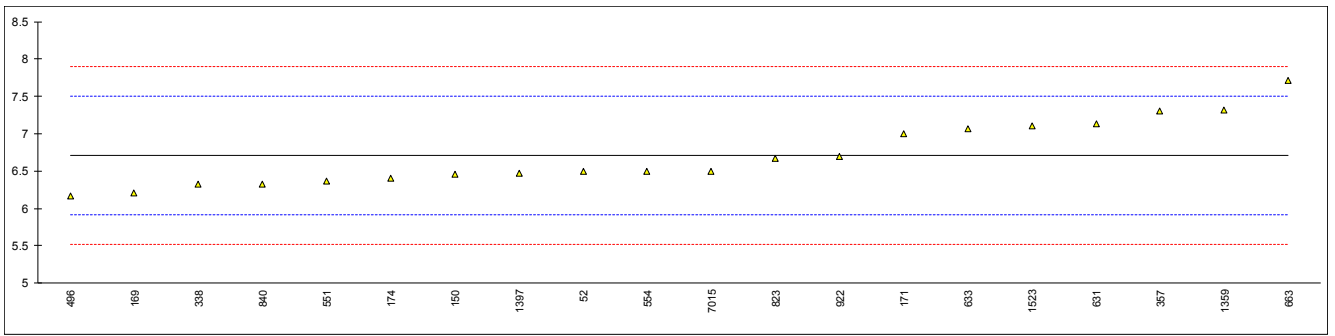
Determination of pHe (LiCl) on sample #17240;

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
150		-----		-----	
169		-----		-----	
171		-----		-----	
174		-----		-----	
175	D6423	5.4		-1.62	
230		-----		-----	
311	EN15490	6.05		1.70	
323	EN15490	5.5		-1.11	
329		-----		-----	
333	EN15490	7.4	D(0.01)	8.58	
334	EN15490	5.62		-0.50	
337		-----		-----	
338		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
391		-----		-----	
396		-----		-----	
402		-----		-----	
444	EN15490	6.1		1.95	
468		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551		-----		-----	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657		-----		-----	
663		-----		-----	
823		-----		-----	
840		-----		-----	
902		-----		-----	
913		-----		-----	
922		-----		-----	
1047	EN15490	5.485		-1.19	
1191		-----		-----	
1201		-----		-----	
1276		-----		-----	
1359		-----		-----	
1397		-----		-----	
1446	EN15490	5.53		-0.96	
1468		-----		-----	
1523		-----		-----	
1563		-----		-----	
1605		-----		-----	
1656		-----		-----	
1667		-----		-----	
1710		-----		-----	
1726	EN15490	5.82		0.52	
1727	EN15490	5.68		-0.19	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
1996		-----		-----	
7002		5.99		1.39	no details on which type of electrode was used
7015		-----		-----	
7016		-----		-----	

	normality	OK	
	n	10	
	outliers	1	
	mean (n)	5.717	
	st.dev. (n)	0.2560	
	R(calc.)	0.717	
	st.dev.(EN15490:07)	0.1960	
	R(EN15490:07)	0.549	

Kernel Density
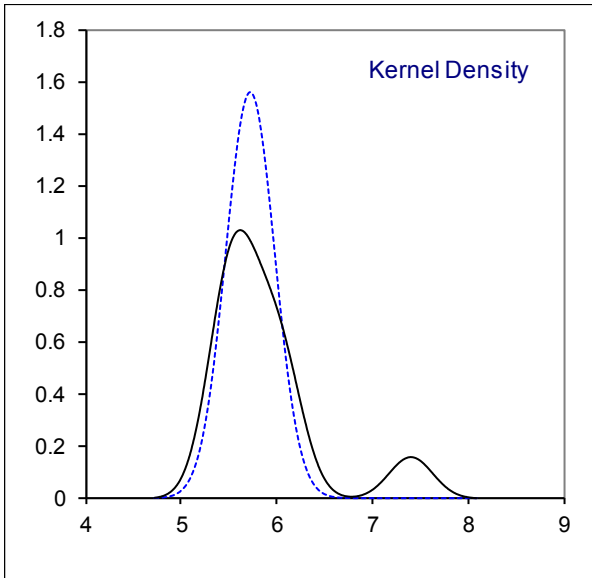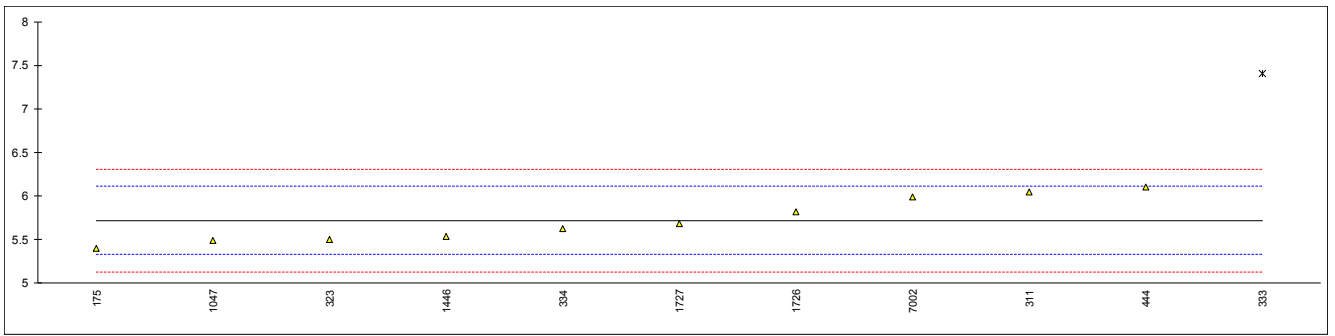
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Determination of Phosphorus as P on sample #17240; results in mg/L

lab	method	value	mark	z(targ)	remarks
52	D3231	<0.20		-----	
62	D3231	<0.2		-----	
150		-----		-----	
169		-----		-----	
171	EN15487	<0.15		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	EN15487	<0.13		-----	
323	EN15487	< 0.10		-----	
329	EN15487	<0.15		-----	
333	EN15487	<0.15		-----	
334		-----		-----	
337		-----		-----	
338		-----		-----	
343		-----		-----	
357		-----		-----	
360	EN15837	0.05		-----	
391		-----		-----	
396		-----		-----	
402	EN15487	<0.15		-----	
444	EN15487	0.005		-----	
468		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	INH-2047	<0.13		-----	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657		-----		-----	
663		-----		-----	
823	UOP389	<0.11		-----	
840		-----		-----	
902		-----		-----	
913		-----		-----	
922		-----		-----	
1047	EN15837	<0.09		-----	
1191		-----		-----	
1201	EN15487	<0.15	C	-----	first reported 6.7
1276	EN15487	0.01		-----	
1359	EN15487	0.00475		-----	
1397		-----		-----	
1446		-----		-----	
1468	EN15487	<0.1		-----	
1523		-----		-----	
1563	EN15487	0.00		-----	
1605		-----		-----	
1656	EN15487	<0.01		-----	
1667		-----		-----	
1710		-----		-----	
1726	EN15487	0.0059		-----	
1727	EN15487	<0.01		-----	
1835	EN15487	<0.15		-----	
1852		-----		-----	
1919		-----		-----	
1996	EN15487	<0.15		-----	
7002		-----		-----	
7015		-----		-----	
7016		-----		-----	

normality	unknown	
n	21	
outliers	0	
mean (n)	<0.15	
st.dev. (n)	n.a.	
R(calc.)	n.a.	
st.dev.(EN15487:07)	n.a.	
R(EN15487:07)	n.a	application range: 0.15 – 1.50 mg/L

Determination of Water (coulometric) on sample #17240; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	E1064	0.236		-0.53	
62	E1064	0.234		-0.77	
150	E1064	0.248		0.91	
169	E1064	0.2359		-0.55	
171	EN15489	0.257		1.99	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	EN15489	0.235		-0.65	
323	EN15489	0.2390		-0.17	
329	E1064	0.2398		-0.08	
333	EN15489	0.244		0.43	
334	EN15489	0.24		-0.05	
337		-----		-----	
338		-----		-----	
343	EN15489	0.234		-0.77	
357	E1064	0.2240		-1.97	
360	E1064	0.2300		-1.25	
391	EN15489	0.241		0.07	
396	EN15489	0.2365		-0.47	
402	EN15489	0.245		0.55	
444	EN15489	0.2486		0.98	
468	EN15489	0.23		-1.25	
496	EN15489	0.254		1.63	
511		-----		-----	
541	E1064	0.2428		0.28	
551	E1064	0.263		2.71	
554	D6304	0.2442		0.45	
556		-----		-----	
631		-----		-----	
633	D6304	0.2391		-0.16	
657	E1064	0.2355		-0.59	
663	E1064	0.3195	R(0.01)	9.49	
823	E1064	0.2334		-0.85	
840	E1064	0.2506		1.22	
902		-----		-----	
913		-----		-----	
922	D6304	0.24		-0.05	
1047	EN15489	0.2456		0.62	
1191		-----		-----	
1201	EN15489	0.235		-0.65	
1276	EN15489	0.2489		1.02	
1359	EN15489	0.23476		-0.68	
1397	EN15489	0.233		-0.89	
1446		-----		-----	
1468	EN15489	0.2361		-0.52	
1523		-----		-----	
1563	EN15489	0.232		-1.01	
1605		-----		-----	
1656	EN15489	0.3260	C,R(0.01)	10.27	first reported 2890 mg/kg
1667	EN15489	0.235	C	-0.65	first reported 0.198
1710	EN15489	0.2386		-0.22	
1726	EN15489	0.243		0.31	
1727	EN15489	0.2497		1.11	
1835	EN15489	0.2352		-0.63	
1852	EN15489	0.2375		-0.35	
1919	EN15489	0.25383	C	1.61	first reported 0.28516
1996	E1064	0.240		-0.05	
7002		-----		-----	
7015		-----		-----	first reported as Water (titrimetric)
7016		-----		-----	

|			
	normality	OK	
	n	42	
	outliers	2	
	mean (n)	0.24044	
	st.dev. (n)	0.008008	
	R(calc.)	0.02242	
	st.dev.(EN15489:07)	0.008329	
	R(EN15489:07)	0.02332	
	For comparison		
	R(E1064:16)	0.04112	
	R(D6304:16e1)	0.18042	

Kernel Density
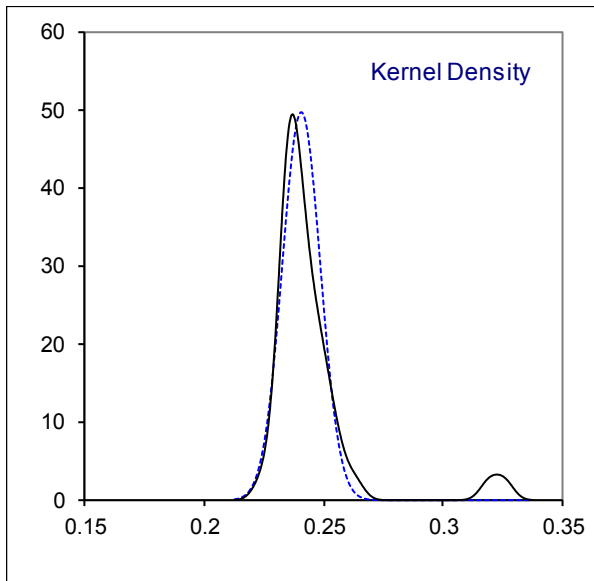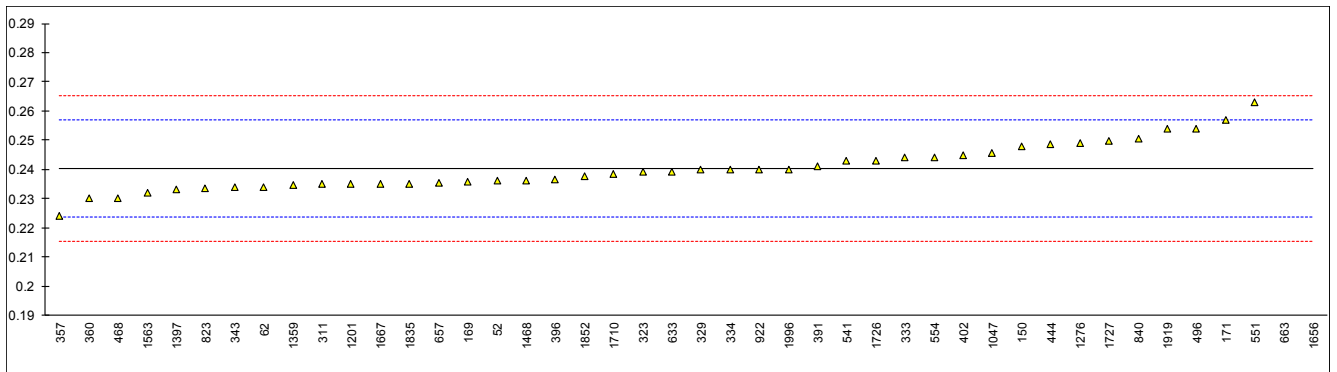
Determination of Water (titrimetric) on sample #17240; results in %M/M

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
150		-----		-----	
169	E203	0.2592		0.55	
171	E203	0.270		0.93	
174	E203	0.2359		-0.29	
175		-----		-----	
230		-----		-----	
311	E203	0.240		-0.14	
323	E203	0.2335		-0.38	
329	E203	0.2356		-0.30	
333		-----		-----	
334	E203	0.23		-0.50	
337		-----		-----	
338	E203	0.2445		0.02	
343	E203	0.233		-0.39	
357	E203	0.2357		-0.30	
360		-----		-----	
391		-----		-----	
396		-----		-----	
402		-----		-----	
444	E203	0.2624		0.66	
468		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	E203	0.238		-0.21	
554		-----		-----	
556		-----		-----	
631	E203	0.2295		-0.52	
633		-----		-----	
657	E203	0.2425		-0.05	
663	E203	0.2363		-0.28	
823	E203	0.2333		-0.38	
840	E203	0.2610		0.61	
902		-----		-----	
913	E203	0.23		-0.50	
922	E203	0.28		1.29	
1047		-----		-----	
1191	ISO10336	0.24		-0.14	
1201	E203	0.238		-0.21	
1276		-----		-----	
1359		-----		-----	
1397		-----		-----	
1446	ISO760	0.2340		-0.36	
1468		-----		-----	
1523	E203	0.26		0.58	
1563		-----		-----	
1605		-----		-----	
1656	E203	0.3200	R(0.01)	2.73	
1667		-----		-----	
1710		-----		-----	
1726	EN15692	0.2420		-0.07	
1727	EN15692	0.2489		0.18	
1835		-----		-----	
1852		-----		-----	
1919		-----		-----	
1996		-----		-----	
7002		-----		-----	
7015		0.16	C,R(0.01)	-3.01	first reported as Water (coulometric)
7016		0.25		0.22	

|			
	normality	suspect	
	n	26	
	outliers	2	
	mean (n)	0.24397	
	st.dev. (n)	0.013520	
	R(calc.)	0.03785	
	st.dev.(E203:16)	0.027857	
	R(E203:16)	0.078	
	For comparison		
	R(EN15692:09)	0.09788	

Kernel Density
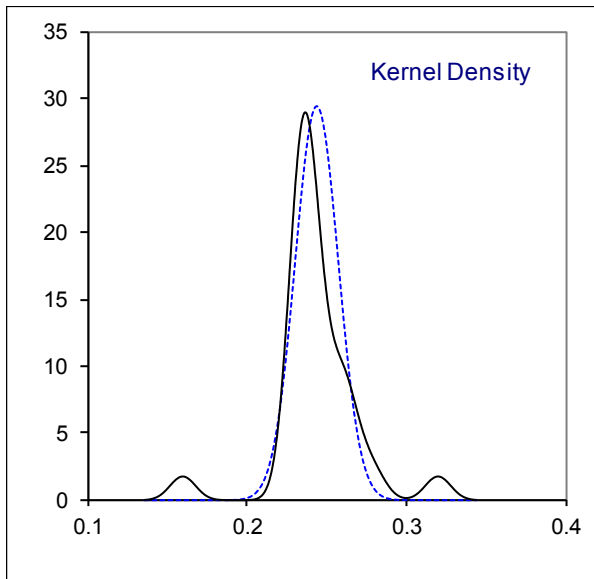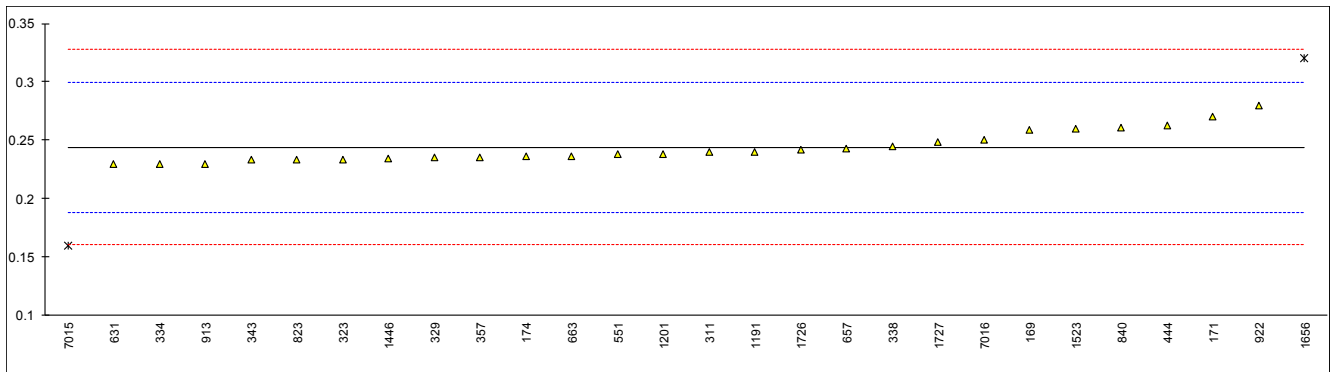
Determination of Ethanol incl. Higher Alcohols acc. to EN15721 on sample #17240 in %M/M

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
150		-----		-----	
169		-----		-----	
171		-----		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	EN15721	99.90		-1.56	
323	EN15721	99.920		-0.30	
329	EN15721	99.926		0.08	
333	EN15721	99.68	ex	-15.39	result excluded: probably without higher alcohols
334	EN15721	99.917		-0.49	
337		-----		-----	
338	EN15721	99.937		0.77	
343	EN15721	99.908	C	-1.06	first reported 99.674
357	EN15721	99.935		0.64	
360	EN15721	99.8830		-2.63	
391		-----		-----	
396		-----		-----	
402	EN15721	99.815	C,R(0.05)	-6.90	first reported 99.72435
444	EN15721	99.868	C	-3.57	first reported 99.63
468	EN15721	99.937		0.77	
496	EN15721	99.9021		-1.43	
511		-----		-----	
541		-----		-----	
551	INH-1313	99.9238		-0.06	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657	INH-02	99.9206		-0.26	
663		-----		-----	
823		-----		-----	
840		-----		-----	
902		-----		-----	
913		-----		-----	
922		-----		-----	
1047	EN15721	99.921		-0.24	
1191		-----		-----	
1201	EN15721	99.918		-0.43	
1276	EN15721	99.944		1.21	
1359	EN15721	99.923	C	-0.11	first reported 99.6885
1397	EN15721	99.983		3.66	
1446	EN15721	99.98		3.47	
1468	EN15721	99.895		-1.87	
1523		-----		-----	
1563	EN15721	99.893		-2.00	
1605		-----		-----	
1656	EN15721	99.93		0.33	
1667	EN15721	99.991		4.16	
1710	EN15721	99.950		1.58	
1726	EN15721	99.9022		-1.42	
1727	EN15721	99.925		0.01	
1835	EN15721	99.924		-0.05	
1852	EN15721	99.9323		0.47	
1919	EN15721	99.93		0.33	
1996	IMPCA001Mod.	99.600	ex	-20.42	result excluded: probably without higher alcohols
7002		-----		-----	
7015		-----		-----	
7016		-----		-----	

|		
normality	OK	
n	29	
outliers	1 (+2 ex)	
mean (n)	99.92480	
st.dev. (n)	0.027579	
R(calc.)	0.07722	
st.dev.(EN15721:13)	0.015906	
R(EN15721:13)	0.04454	
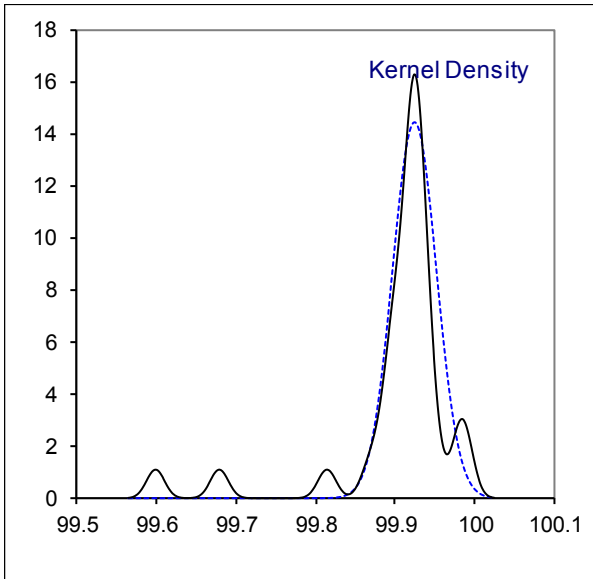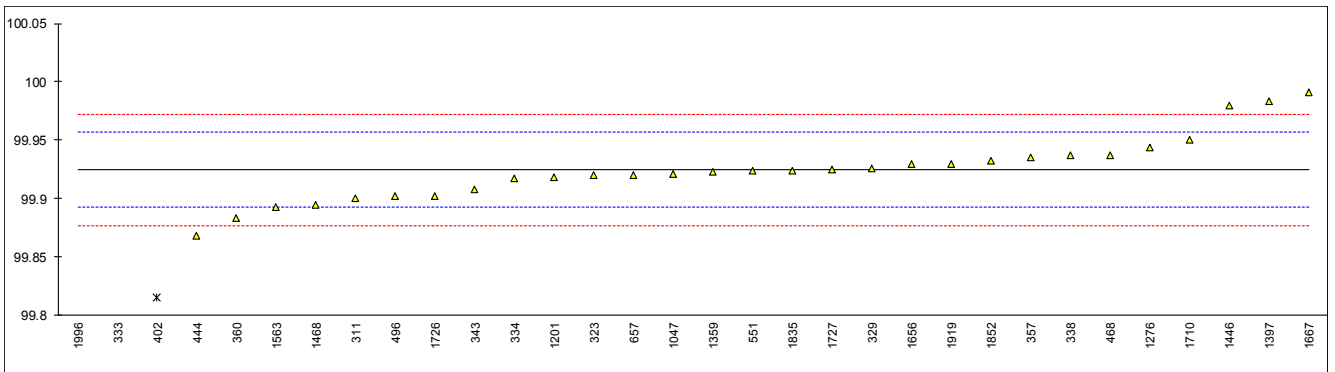
Determination of Higher Alcohols acc. to EN15721 on sample #17240; results in %M/M

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
150		-----		-----	
169		-----		-----	
171		-----		-----	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	EN15721	0.447		2.63	
323	EN15721	0.361		0.25	
329	EN15721	0.3710		0.52	
333	EN15721	0.341		-0.31	
334	EN15721	0.370		0.50	
337		-----		-----	
338	EN15721	0.4272		2.08	
343		-----		-----	
357	EN15721	0.384		0.88	
360	EN15721	0.3610		0.25	
391		-----		-----	
396		-----		-----	
402	EN15721	0.285868		-1.84	
444	EN15721	0.3751		0.64	
468	EN15721	0.337		-0.42	
496	EN15721	0.2996		-1.46	
511		-----		-----	
541		-----		-----	
551	INH-1313	0.3622		0.28	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657	INH-02	0.2965		-1.54	
663		-----		-----	
823		-----		-----	
840		-----		-----	
902		-----		-----	
913	INH-001	0.518	R(0.01)	4.60	
922	INH-001	0.3837		0.88	
1047	EN15721	0.347		-0.14	
1191		-----		-----	
1201	EN15721	0.294		-1.61	
1276	EN15721	0.337		-0.42	
1359	EN15721	0.3348		-0.48	
1397	EN15721	0.392		1.11	
1446	EN15721	0.3682		0.45	
1468	EN15721	0.34		-0.34	
1523		-----		-----	
1563	EN15721	0.351		-0.03	
1605		-----		-----	
1656	EN15721	0.31		-1.17	
1667	EN15721	0.351	C	-0.03	first reported 0.173
1710	EN15721	0.376		0.66	
1726	EN15721	0.3387		-0.37	
1727	EN15721	0.3748		0.63	
1835	EN15721	0.3562		0.11	
1852	EN15721	0.3464		-0.16	
1919	EN15721	0.2959		-1.56	
1996		-----		-----	
7002		-----		-----	
7015		-----		-----	
7016		-----		-----	

|			
	normality	OK	
	n	31	
	outliers	1	
	mean (n)	0.35210	
	st.dev. (n)	0.036919	
	R(calc.)	0.10337	
	st.dev.(EN15721:13)	0.036065	
	R(EN15721:13)	0.10098	
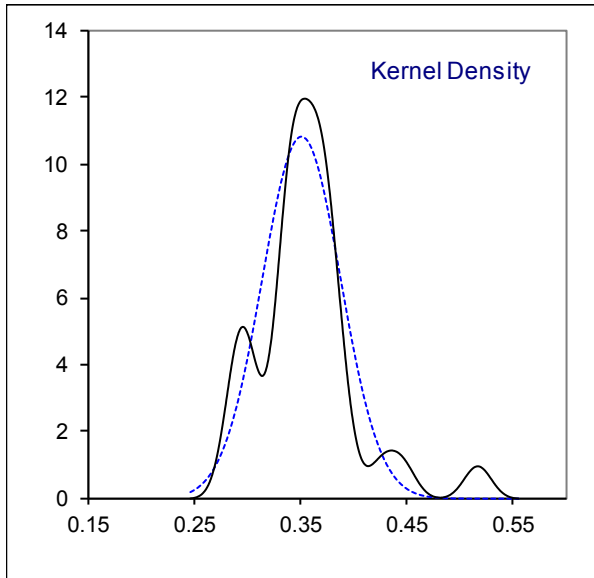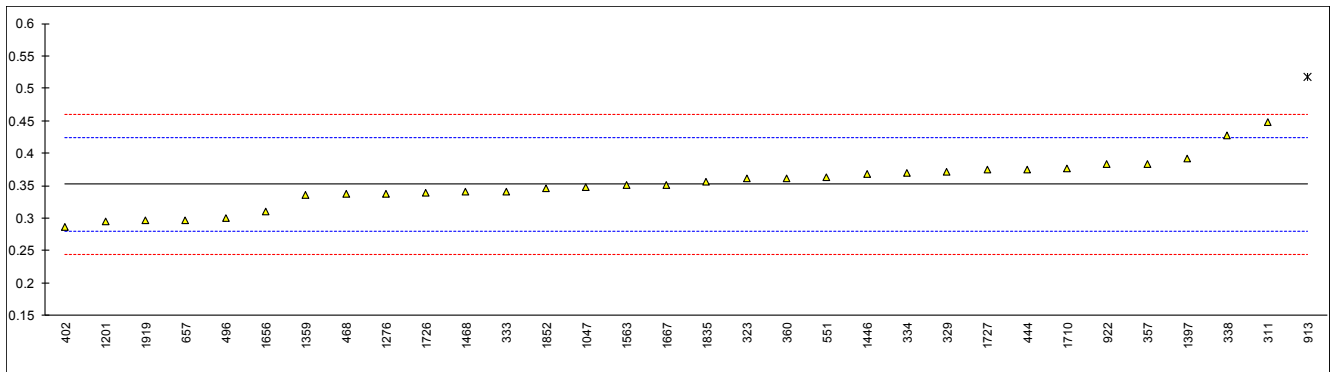
Determination of Impurities acc. to EN15721 on sample #17240; results in %M/M

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
150		-----		-----	
169		-----		-----	
171	EN15721	0.076		0.38	
174		-----		-----	
175		-----		-----	
230		-----		-----	
311	EN15721	0.094	C	1.80	first reported 0.551
323	EN15721	0.068		-0.25	
329	EN15721	0.0640		-0.56	
333	EN15721	0.068		-0.25	
334	EN15721	0.0600	C	-0.88	first reported 0.453
337		-----		-----	
338	EN15721	0.4939	ex	33.28	result excluded: probably included higher alcohols
343		-----		-----	
357	EN15721	0.057		-1.11	
360	EN15721	0.1062		2.76	
391		-----		-----	
396		-----		-----	
402	EN15721	0.182	C,ex	8.73	first reported 0.27398, result excluded: outlier in MeOH + EtOH
444	EN15721	0.1117		3.19	
468	EN15721	0.0547		-1.29	
496	EN15721	0.0891		1.42	
511		-----		-----	
541		-----		-----	
551	INH-1313	0.0619		-0.73	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657	INH-02	0.0695		-0.13	
663		-----		-----	
823		-----		-----	
840		-----		-----	
902		-----		-----	
913		-----		-----	
922		-----		-----	
1047	EN15721	0.07		-0.09	
1191		-----		-----	
1201	EN15721	0.0740	C	0.23	first reported 0.376
1276	EN15721	0.046		-1.98	
1359	EN15721	0.06740		-0.29	
1397	EN15721	0.010	ex	-4.81	result excluded: outlier in MeOH
1446		-----		-----	
1468		-----		-----	
1523		-----		-----	
1563	EN15721	0.099		2.19	
1605		-----		-----	
1656	EN15721	0.06		-0.88	
1667		-----		-----	
1710	EN15721	0.041		-2.37	
1726	EN15721	0.08837		1.36	
1727	EN15721	0.0653		-0.46	
1835	EN15721	0.0671		-0.32	
1852	EN15721	0.0571		-1.10	
1919	EN15721	0.0626		-0.67	
1996	IMPCA001Mod.	0.0003955	ex	-5.57	result excluded: outlier in MeOH
7002		-----		-----	
7015		-----		-----	
7016		-----		-----	

normality	OK
n	25
outliers	0 (+4 ex)
mean (n)	0.07112
st.dev. (n)	0.017769
R(calc.)	0.04975
st.dev.(Horwitz (n=9))	0.012705
R(Horwitz (n=9))	0.03557

Kernel Density
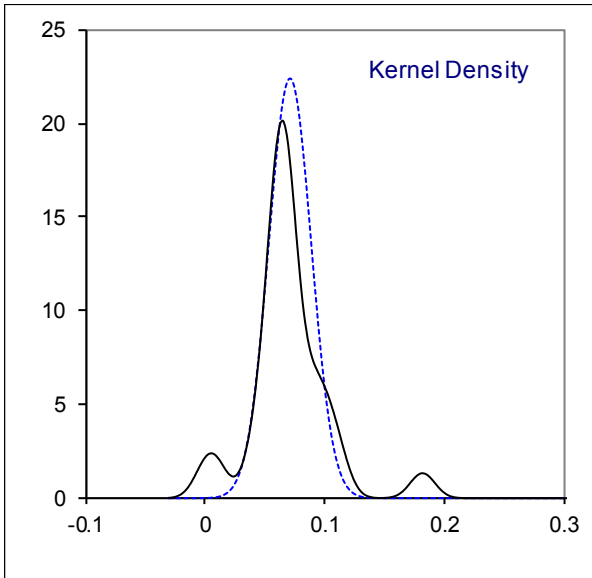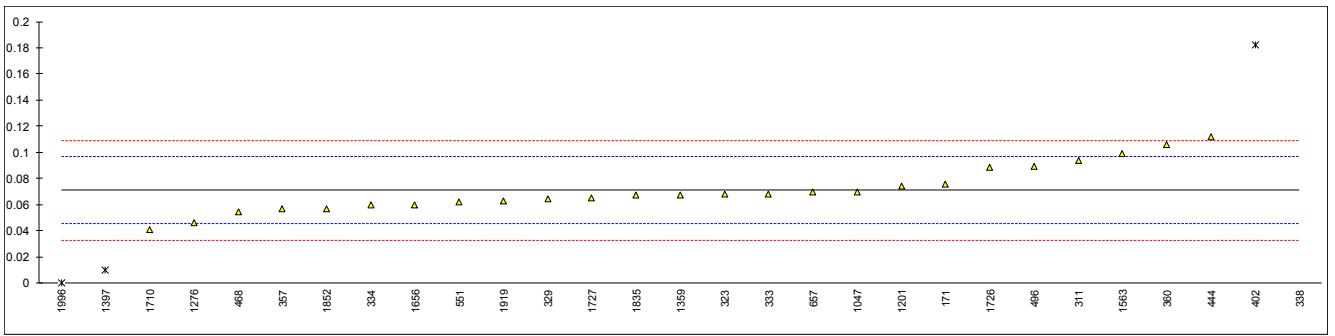
Determination of Methanol on sample #17240; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5501	0.01		0.14	
62		-----		-----	
150		-----		-----	
169	INH-02	0.00879		-1.39	
171	EN15721	0.012		2.66	
174	D5501	0.01		0.14	
175		-----		-----	
230		-----		-----	
311	EN15721	0.010		0.14	
323	EN15721	0.012		2.66	
329	EN15721	0.0102		0.39	
333	EN15721	<0.100		-----	
334	EN15721	0.009		-1.12	
337		-----		-----	
338	EN15721	0.0128		3.67	
343	EN15721	0.010		0.14	
357	EN15721	0.008		-2.38	
360	EN15721	0.0108		1.15	
391		-----		-----	
396		-----		-----	
402	EN15721	0.003	C,R(0.05)	-8.69	first reported 0.001753
444	EN15721	0.0100		0.14	
468	EN15721	0.0079		-2.51	
496	EN15721	0.0089		-1.25	
511		-----		-----	
541		-----		-----	
551	INH-1313	0.0110		1.40	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657	INH-02	0.0099		0.01	
663	D5501	<0.01		-----	
823	D5501	0.0095		-0.49	
840		-----		-----	
902		-----		-----	
913	INH-0001	0.0127		3.55	
922	INH-0001	0.0103		0.52	
1047	EN15721	0.0086		-1.63	
1191	D5501	0.012		2.66	
1201	EN15721	0.0083		-2.00	
1276	EN15721	0.010		0.14	
1359	EN15721	0.00941		-0.60	
1397	EN15721	0.005	R(0.05)	-6.17	
1446	EN15721	0.0103		0.52	
1468	EN15721	0.01		0.14	
1523	D5501	0.009582		-0.39	
1563	EN15721	0.008		-2.38	
1605		-----		-----	
1656	EN15721	0.01		0.14	
1667	EN15721	0.009		-1.12	
1710	EN15721	0.009		-1.12	
1726	EN15721	0.00940		-0.62	
1727	EN15721	0.0096		-0.36	
1835	EN15721	0.009		-1.12	
1852	EN15721	0.0106		0.90	
1919	EN15721	0.0093		-0.74	
1996	IMPCA001Mod.	0.0045	R(0.05)	-6.80	
7002		-----		-----	
7015		0.0033	C,R(0.05)	-8.31	first reported 0.005
7016		-----		-----	

normality	OK	
n	37	
outliers	4	
mean (n)	0.00989	
st.dev. (n)	0.001232	
R(calc.)	0.00345	
st.dev.(Horwitz)	0.000792	
R(Horwitz)	0.00222	
For comparison		
R(D5501:12)	0.013733	application range: 0.01 – 0.6 %M/M
R(EN15721:13)	-0.00299	application range: 0.1 – 3 %M/M
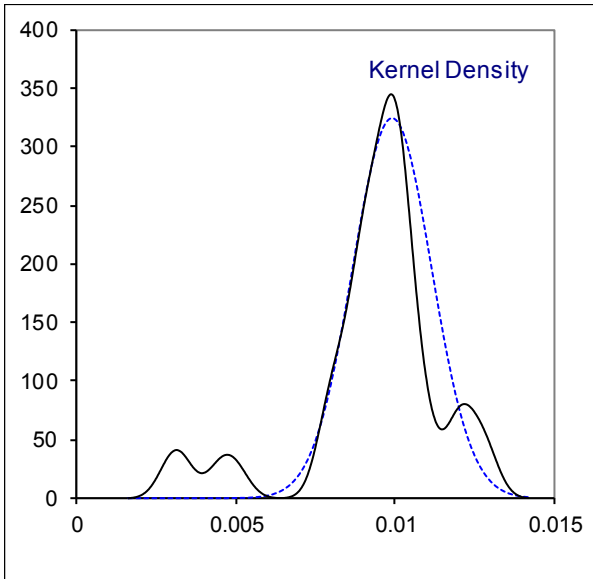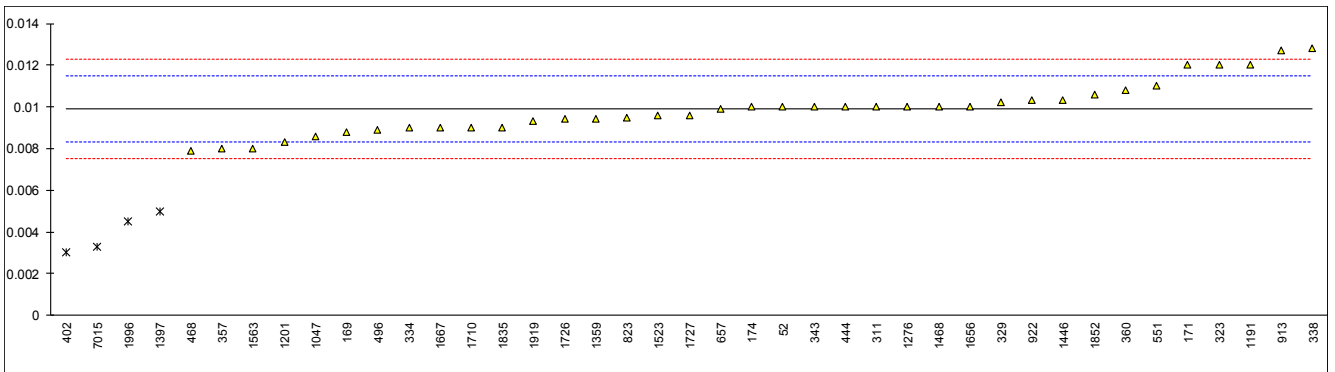
Kernel Density

Determination of Ethanol acc. to ASTM D5501 on sample #17240; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5501	99.34		-0.33	
62		-----		-----	
150	D5501	99.34	ex	-0.33	result excluded as Ethanol %M/M is < Ethanol %V/V
169	INH-02	99.61		0.43	
171	D5501	99.39		-0.19	
174	D5501	99.42		-0.11	
175		-----		-----	
230		-----		-----	
311	D5501	99.72		0.74	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
338		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
391		-----		-----	
396		-----		-----	
402		-----		-----	
444		-----		-----	
468		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	D5501	99.08		-1.06	
554	D5501	99.13		-0.92	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657	D5501	99.4561		0.00	
663	D5501	99.434		-0.07	
823	D5501	99.4676		0.03	
840	D5501	99.424		-0.09	
902		-----		-----	
913	D5501	99.25		-0.58	
922		-----		-----	
1047		-----		-----	
1191	D5501	99.378		-0.22	
1201		-----		-----	
1276		-----		-----	
1359	D5501	99.71		0.71	
1397		-----		-----	
1446		-----		-----	
1468		-----		-----	
1523		-----		-----	
1563		-----		-----	
1605		-----		-----	
1656		-----		-----	
1667		-----		-----	
1710		-----		-----	
1726		-----		-----	
1727		-----		-----	
1835	D5501	99.447		-0.03	
1852	EN15721	99.5859		0.36	
1919		-----		-----	
1996		-----		-----	
7002		99.874		1.17	
7015		99.52		0.18	
7016		-----		-----	

normality	OK	
n	18	
outliers	0 (+1 ex)	
mean (n)	99.45760	
st.dev. (n)	0.198610	
R(calc.)	0.55611	
st.dev.(D5501:12)	0.355124	
R(D5501:12)	0.99435	

Kernel Density
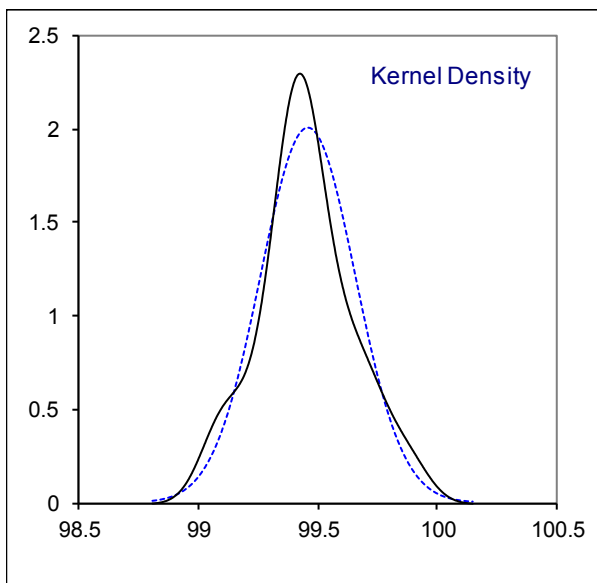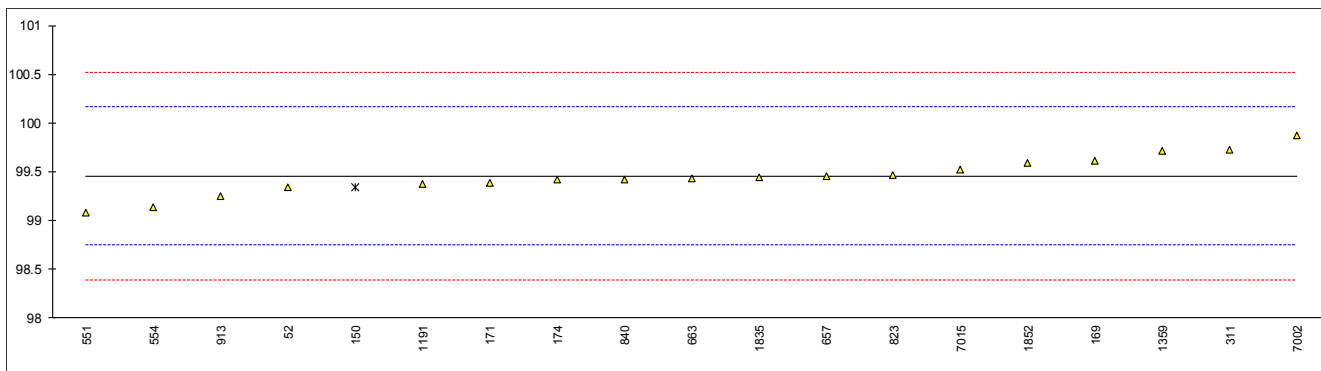
## Determination of Ethanol acc. to ASTM D5501 on sample #17240; results in %V/V

lab	method	value	mark	z(targ)	remarks
52	D5501	99.44		-0.41	
62		-----		-----	
150	D5501	99.33	ex	-0.72	result excluded as Ethanol %M/M is < Ethanol %V/V
169		-----		-----	
171	D5501	99.46		-0.35	
174	D5501	99.50		-0.24	
175		-----		-----	
230		-----		-----	
311	D5501	99.87		0.80	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
337		-----		-----	
338		-----		-----	
343		-----		-----	
357		-----		-----	
360		-----		-----	
391		-----		-----	
396		-----		-----	
402		-----		-----	
444		-----		-----	
468		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551	D5501	99.19		-1.11	
554	D5501	99.25		-0.95	
556		-----		-----	
631	D5501	99.42		-0.47	
633		-----		-----	
657	D5501	99.6112		0.07	
663	D5501	99.610		0.07	
823	D5501	99.4760		-0.31	
840	D5501	99.557		-0.08	
902		-----		-----	
913	D5501	99.92		0.94	
922		-----		-----	
1047		-----		-----	
1191	D5501	99.627		0.12	
1201		-----		-----	
1276		-----		-----	
1359	D5501	99.83		0.69	
1397		-----		-----	
1446		-----		-----	
1468		-----		-----	
1523		-----		-----	
1563		-----		-----	
1605		-----		-----	
1656		-----		-----	
1667		-----		-----	
1710		-----		-----	
1726		-----		-----	
1727		-----		-----	
1835	D5501	99.571		-0.04	
1852		-----		-----	
1919		-----		-----	
1996		-----		-----	
7002		99.923		0.95	
7015		-----		-----	
7016		99.7		0.32	

|		
normality	OK	
n	17	
outliers	0 (+1 ex)	
mean (n)	99.58559	
st.dev. (n)	0.214508	
R(calc.)	0.60062	
st.dev.(D5501:12)	0.354850	
R(D5501:12)	0.99358	

Kernel Density
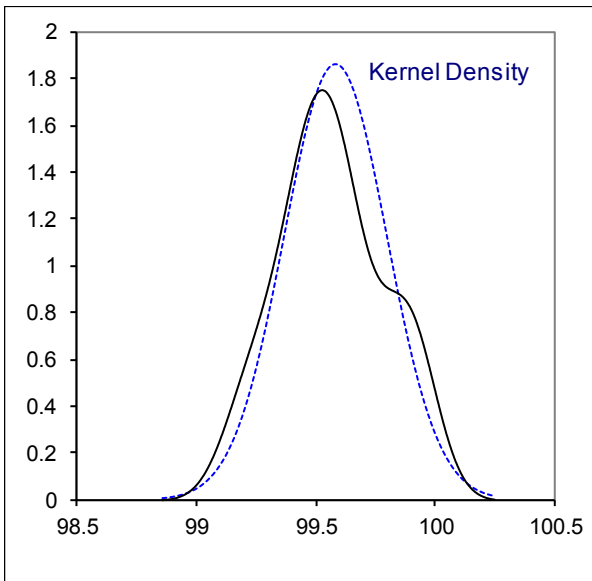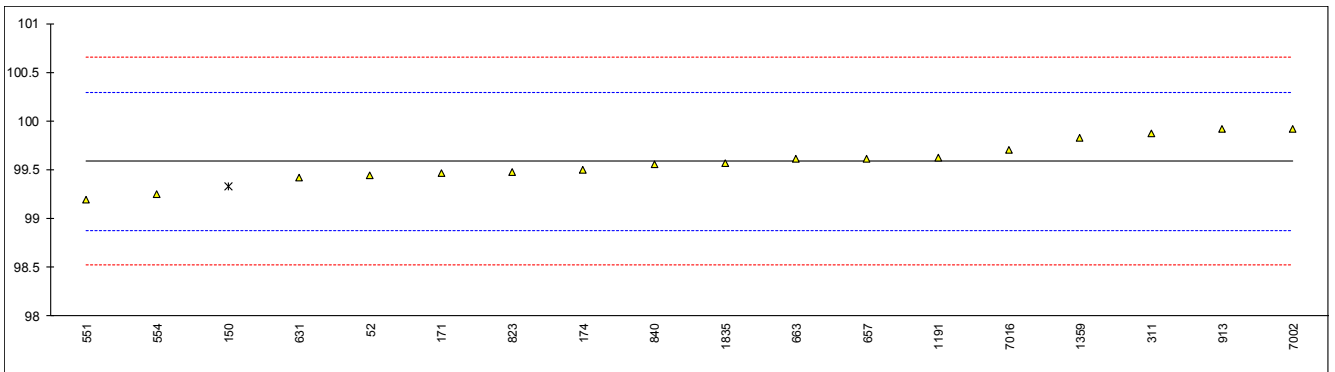
Determination of Chlorides, Inorganic as Cl on sample #17241; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
150	D7328	6.06		1.22	
169	D7319	5.322		0.09	
171		-----		-----	
174	D7319	5.6		0.52	
175	D7319	5.7		0.67	
230	INH-20404	>2		-----	
311	EN15492	5.3		0.06	
323	EN15492	5.7		0.67	
329		-----		-----	
333	EN15492	4.6		-1.01	
334	EN15492	4.6		-1.01	
337		-----		-----	
338		-----		-----	
343	EN15492	3.3	DG(0.05)	-2.99	
357	EN15492	5.67		0.62	
360	EN15492	4.78		-0.73	
391		-----		-----	
396		-----		-----	
402		-----		-----	
444	EN15492	5.8		0.82	
468		-----		-----	
496	EN15492	5.79		0.81	
511		-----		-----	
541	D7328	5.26		0.00	
551	D7319	4.5		-1.16	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633	D512	0	ex	-8.02	result excluded: 0 is not a value
657	D7328	5.7		0.67	
663		-----		-----	
823	D7319	5.4		0.21	
840	D7319	4.94		-0.49	
902		-----		-----	
913		-----		-----	
922	D7328	3.65	DG(0.05)	-2.46	
1047	EN15492	4.78		-0.73	
1191	EN15492	5.4		0.21	
1201	EN15492	4.7		-0.86	
1276	EN15492	4.23		-1.57	
1359	EN15492	5.360		0.15	
1397	EN15492	5.38		0.18	
1446		-----		-----	
1468		-----		-----	
1523		-----		-----	
1563	EN15492	5.3		0.06	
1605		-----		-----	
1656	EN15492	<1		<-6.26	false negative test result?
1667		-----		-----	
1710		-----		-----	
1726		-----		-----	
1727	EN15492	5.7		0.67	
1835	In house	5.21		-0.08	
1852		-----		-----	
1919		-----		-----	
1996		-----		-----	
7002		-----		-----	
7015		-----		-----	
7016		-----		-----	
	normality	OK			
	n	26			
	outliers	2 (+1 ex)			spike
	mean (n)	5.261			5.70 (recovery <92%)
	st.dev. (n)	0.4788			
	R(calc.)	1.341			
	st.dev.(Horwitz)	0.6556			
	R(Horwitz)	1.836			
	For comparison				
	R(EN15492:12)	0.895			application range: 1 – 30 mg/kg
	R(D7319:17)	1.334			application range: 0.75 – 50 mg/kg

Kernel Density
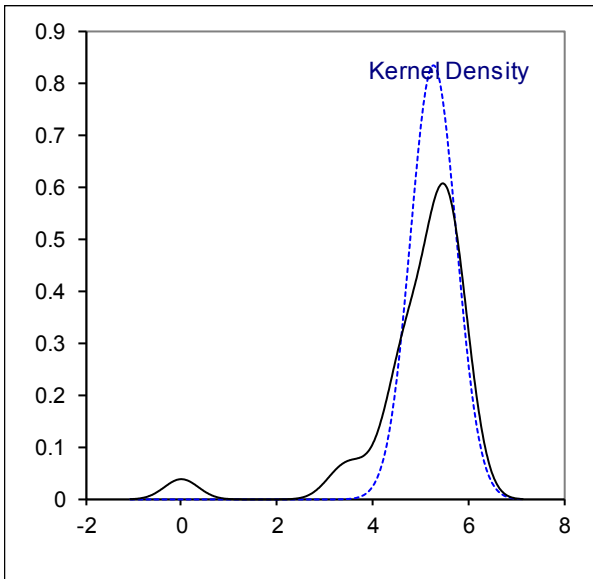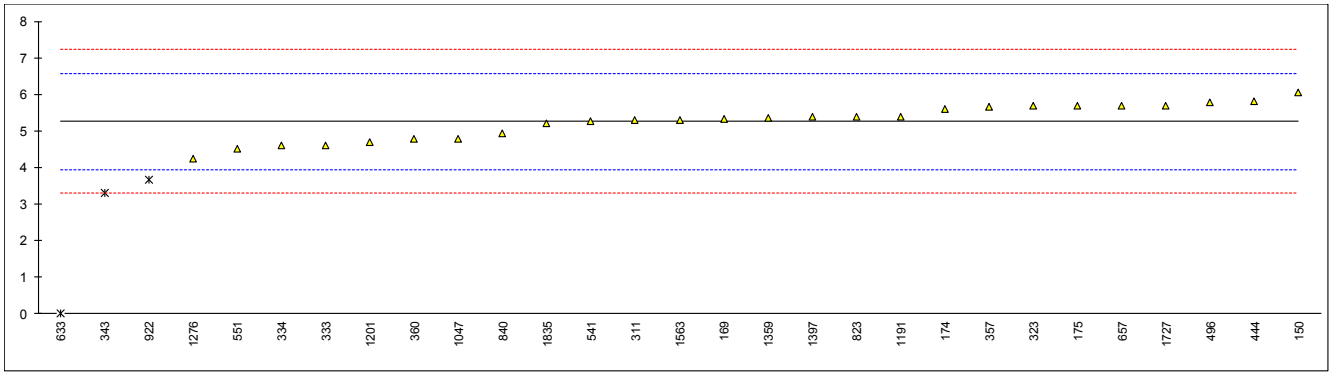
Determination of Sulphate as SO_4 on sample #17241; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
150	D7328	7.76		-----	
169	D7319	11.774		-----	
171		-----		-----	
174	D7319	9.1		-----	
175	D7319	5.7		-----	
230		-----		-----	
311	EN15492	10.8		-----	
323	EN15492	5.8		-----	
329		-----		-----	
333	EN15492	5.5		-----	
334	EN15492	4.1		-----	
337		-----		-----	
338		-----		-----	
343	EN15492	3.5		-----	
357	EN15492	9.43		-----	
360	EN15492	8.64		-----	
391		-----		-----	
396		-----		-----	
402		-----		-----	
444	EN15492	6.6		-----	
468		-----		-----	
496	EN15492	9.98		-----	
511		-----		-----	
541	D7328	10.10		-----	
551	D7319	1.9		-----	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657	D7328	8.6		-----	
663		-----		-----	
823		-----		-----	
840		-----		-----	
902		-----		-----	
913		-----		-----	
922	D7328	6.23		-----	
1047	EN15492	8.48		-----	
1191	EN15492	10.3		-----	
1201	EN15492	6.2		-----	
1276	EN15492	6.71		-----	
1359	EN15492	6.541		-----	
1397	EN15492	7.03		-----	
1446		-----		-----	
1468		-----		-----	
1523		-----		-----	
1563	EN15492	7.4		-----	
1605		-----		-----	
1656	EN15492	<1		-----	false negative test result?
1667		-----		-----	
1710		-----		-----	
1726		-----		-----	
1727		-----		-----	
1835	In house	10.16		-----	
1852		-----		-----	
1919		-----		-----	
1996		-----		-----	
7002		-----		-----	
7015		-----		-----	
7016		-----		-----	

	normality	OK			
	n	25			
	outliers	0			spike
	mean (n)	7.533			12.53 mg SO_4/kg
	st.dev. (n)	2.4300			
	R(calc.)	6.804			
	st.dev.(EN15492:12)	(0.6116)			
	R(EN15492:12)	(1.712)			application range: 1 – 20 mg/kg
	For comparison				
	R(D7319:17)	(5.753)			application range: 1 – 20 mg/kg
	R(D7328:16)	(2.356)			application range: 0.55 – 20 mg/kg
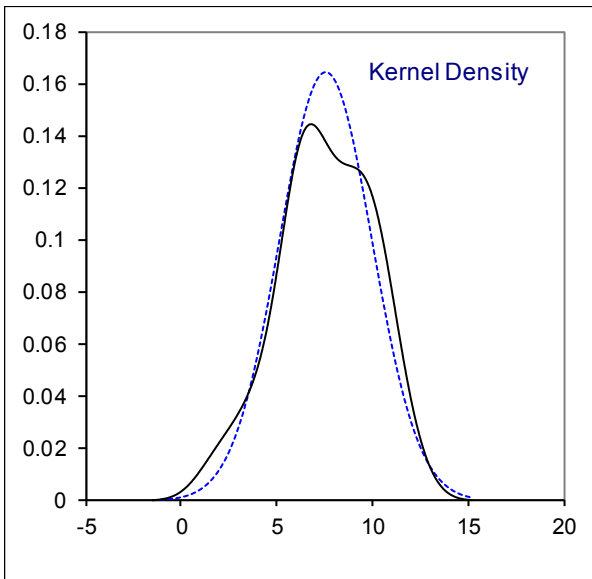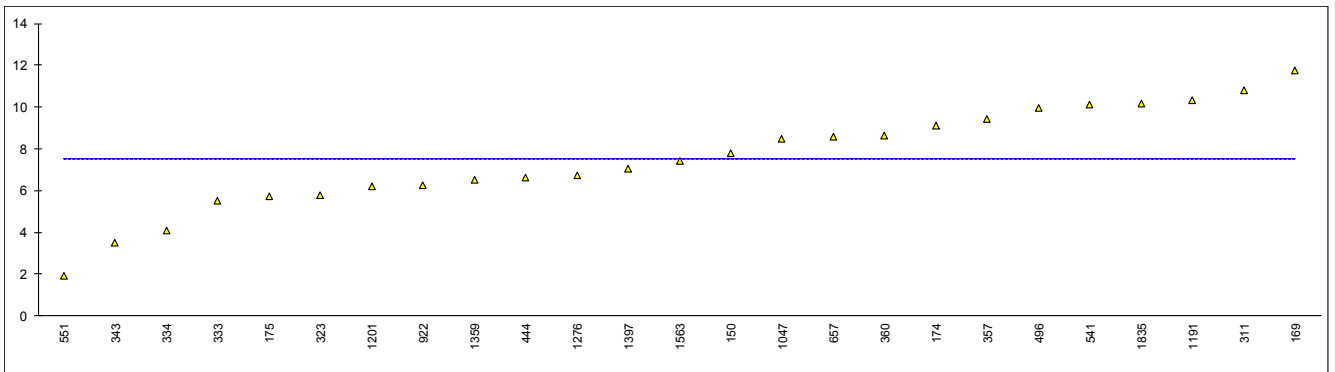
Determination of total Sulphur on sample #17241; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D5453	1.8		0.17	
62		-----		-----	
150	D5453	1.0		-0.49	
169	D5453	1.3	C	-0.25	
171		-----		-----	
174	D5453	2.9		1.08	
175		-----		-----	
230		-----		-----	
311	D5453	2.4		0.67	
323	EN15486	< 5		-----	
329		-----		-----	
333	ISO20846	1.5		-0.08	
334		-----		-----	
337		-----		-----	
338	ISO20846	0.72		-0.73	
343	D5453	1.2		-0.33	
357	D5453	1.44		-0.13	
360	EN15486	2.7		0.92	
391		-----		-----	
396		-----		-----	
402	ISO20846	1.76		0.14	
444		-----		-----	
468	EN15485	<2		-----	
496	ISO20846	1.39		-0.17	
511		-----		-----	
541	D5453	<1.0		-----	
551	D5453	1.03		-0.47	
554		-----		-----	
556		-----		-----	
631		-----		-----	
633		-----		-----	
657	D5453	0.949		-0.54	
663	D5453	1.25		-0.29	
823	D5453	0.9		-0.58	
840	D5453	1.90		0.25	
902		-----		-----	
913	D5453	1.6		0.00	
922	D5453	<1.0		-----	
1047	EN15486	0.4		-0.99	
1191		-----		-----	
1201	EN15485	0.15		-1.20	
1276		-----		-----	
1359	EN15485	2.60		0.83	
1397		-----		-----	
1446		-----		-----	
1468		-----		-----	
1523		-----		-----	
1563	EN15486	3.01		1.17	
1605		-----		-----	
1656	EN15486	<1		-----	
1667		-----		-----	
1710	ISO20846	0.8		-0.66	
1726		-----		-----	
1727		-----		-----	
1835	EN15486	2.6		0.83	
1852	ISO20846	2.60		0.83	
1919		-----		-----	
1996		-----		-----	
7002		-----		-----	
7015		-----		-----	
7016		-----		-----	

normality	OK			
n	25			
outliers	0			
mean (n)	1.596			
st.dev. (n)	0.8086			
R(calc.)	2.264			
st.dev.(EN15485:07)	1.2042			
R(EN15485:07)	3.372		application range: 7 – 20 mg/kg	
For comparison				
R(EN15486:07)	1.925		application range: 5 – 20 mg/kg	
R(D5453:16e1)	0.823		at a concentration < 400 mg/kg, application range: 1-8000 mg/kg	

Kernel Density
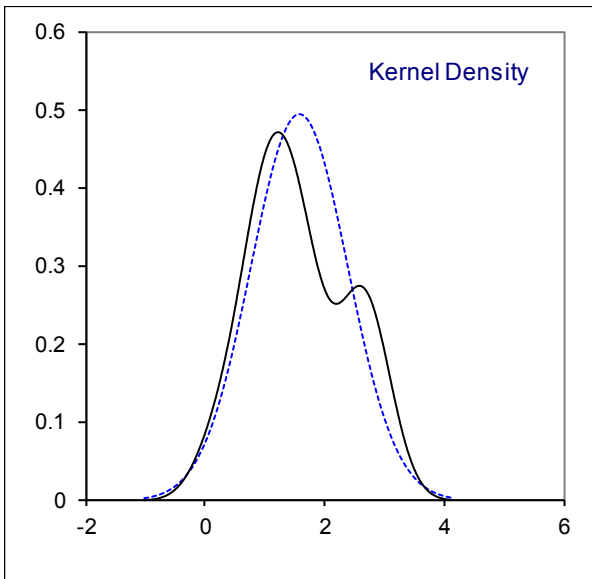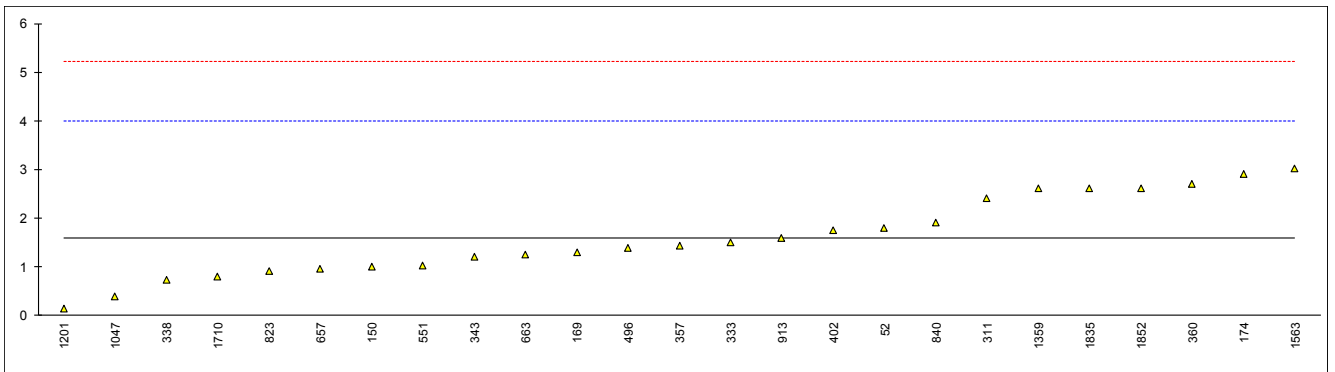
APPENDIX 2

Number of participating laboratories per country:

    1 lab in ARGENTINA
    1 lab in AUSTRIA
  3 labs in BELGIUM
  3 labs in BRAZIL
  2 labs in BULGARIA
  2 labs in CANADA
    1 lab in CROATIA
    1 lab in CZECH REPUBLIC
  2 labs in FINLAND
  4 labs in FRANCE
  2 labs in GERMANY
    1 lab in HUNGARY
    1 lab in INDIA
  3 labs in IRAN, Islamic Republic of
  3 labs in ITALY
    1 lab in MAURITIUS
  4 labs in NETHERLANDS
    1 lab in PAKISTAN
    1 lab in PERU
  2 labs in PHILIPPINES
    1 lab in POLAND
    1 lab in ROMANIA
    1 lab in SINGAPORE
    1 lab in SOUTH KOREA
  4 labs in SPAIN
  2 labs in SWEDEN
    1 lab in THAILAND
  2 labs in TURKEY
  3 labs in UNITED KINGDOM
  5 labs in UNITED STATES OF AMERICA
    1 lab in VIETNAM

APPENDIX 3

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
E	= probably an error in calculations
U	= test result probably reported in a different unit
W	= test result withdrawn on request participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e	= not evaluated
n.d.	= not detected
fr.	= first reported
SDS	= Safety Data Sheet

Literature:

1	iis, Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, March 2017
2	W. Horwitz and R. Albert, J. AOAC Int., Vol. 79, 3, p. 589, (1996)
3	ASTM E178:02
4	ASTM E1301:95(2003)
5	ISO 5725-86
6	ISO 5725, parts 1-6, 1994
7	ISO 13528
8	M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
9	W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
10	IP 367/84
11	DIN 38402 T41/42
12	P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
13	J.N. Miller, Analyst, 118, 455, (1993)
14	Analytical Methods Committee Technical brief, No 4.January 2001
15	P.J. Lowthian and M. Thompson, The Royal Society of Chemistry 2002, Analyst, 2002, 127, page 1359-1364.
16	Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, *Technometrics*, 25(2), pp. 165-172, (1983)
17	M.A. Gonçalves et.al., Sensors and Actuators B158, (2011), pages 327-332