Results of Proficiency Test
Engine Oil (used)
June 2019

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CONTENTS

Appendices:

1   INTRODUCTION

Since 1997, a proficiency test for used Engine Oil (Lubricating Oil) is organised by the Institute for Interlaboratory Studies (iis) every year. During the annual proficiency testing program 2018/2019, it was decided to continue the round robin for the analysis of used Engine Oil in accordance with the latest applicable version of ASTM D4485 and SAE specifications.
In the interlaboratory studies for used Engine Oil and Metals in used Engine Oil, in total 82 laboratories from 44 different countries registered for participation. See appendix 2 for the number of participants per country. In this report the results of the 2019 proficiency tests on used Engine Oil 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/IEC17025 accredited laboratory. It was decided depending on the registration, to send one sample of used Engine Oil of 0.5L labelled #19096 and one sample of 50mL especially for wear metals analyses, labelled #19097.
The participants were requested to report rounded and unrounded test results.
The unrounded test results were preferably used for statistical evaluation.

2.1   ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2   PROTOCOL

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

2.3   CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

The necessary bulk material for used Engine Oil, approximately 165 liters, was obtained from a third-party laboratory. After homogenisation 108 amber glass bottles of 0.5 liter were filled and labelled #19096. The homogeneity of the subsamples #19096 was checked by determination of Density at 15°C in accordance with ASTM D4052 and Kinematic Viscosity at 40°C in accordance with ASTM D445 on 8 stratified randomly selected samples.

	Density at 15°C in kg/L	Kinematic Viscosity at 40°C in mm²/s
Sample #19096-1	0.89724	125.9
Sample #19096-2	0.89725	126.1
Sample #19096-3	0.89725	125.6
Sample #19096-4	0.89725	125.6
Sample #19096-5	0.89725	126.0
Sample #19096-6	0.89725	125.9
Sample #19096-7	0.89725	126.0
Sample #19096-8	0.89725	126.0

Table 1: homogeneity test results of subsamples #19096

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

	Density at 15°C in kg/L	Kinematic Viscosity at 40°C in mm²/s
r (observed)	0.00001	0.53
reference test method	ISO12185:96	ASTM D445:18
0.3 x R (reference test method)	0.00015	0.74

Table 2: evaluation of the repeatabilities of the subsamples #19096

The calculated repeatabilities are less than 0.3 times the corresponding reproducibility of the reference test methods. Therefore, homogeneity of the subsamples #19096 was assumed.

The necessary bulk material for Metals in used Engine Oil, approximately 4.5 liters, was also obtained by the same third-party laboratory. After homogenisation 90 PE bottles of 50mL were filled and labelled #19097. The homogeneity of the subsamples #19097 was checked by determination of Calcium in accordance with ASTM D5185 on 8 stratified randomly selected samples.

	Calcium in mg/kg
Sample #19097-1	3110
Sample #19097-2	3110
Sample #19097-3	3110
Sample #19097-4	3130

	Calcium in mg/kg
Sample #19097-5	3160
Sample #19097-6	3140
Sample #19097-7	3160
Sample #19097-8	3140

Table 3: homogeneity test results of subsamples #19097

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

	Calcium in mg/kg
r (observed)	59.4
reference test method	ASTM D5185:18
0.3 x R (reference test method)	157.71

Table 4: evaluation of repeatabilities of the subsamples #19097

The calculated repeatability is less than 0.3 times the corresponding reproducibility of the reference test method. Therefore, homogeneity of the subsamples #19097 was assumed.

Depending on the registration to each of the participating laboratories one 0.5L amber glass bottle labelled #19096 with used Engine Oil and/or one 50mL PE bottle labelled #19097 with used Engine Oil for Metals Analyses only were sent on May 22, 2019. An SDS was added to the sample package.

2.5   STABILITY OF THE SAMPLES

The stability of Engine Oil packed in the amber glass bottles and PE bottles was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6   ANALYSES

The participants were requested to determine on sample #19096: Acid Number (Total), Base Number ($HClO_4$ and HCl titration), Density at 15°C, Flash Point PMcc, Fuel Dilution, Kinematic Viscosity at 40°C & 100°C, Viscosity Index, Kinematic Viscosity by Houillon at 40°C & 100°C and Water. Also, some extra questions were asked about the determination of Acid Number. And to determine 23 elements (Wear metals: Al, Ba, B, Cd, Cr, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, K, Si, Ag, Na, Sn, Ti, V, Ca, P and Zn) on sample #19097.

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

To get comparable test results, a detailed report form and a letter of instructions are prepared. On the report form, the reporting units are given as well as the reference test methods 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 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 reanalyses). Additional or corrected test results are used for data analysis and original results are placed under 'Remarks' in the result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1 STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5).
For the statistical evaluation the unrounded (when available) figures were used instead of the rounded test results. Test results reported as '<…' or '>…' were 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 ISO5725 the original test results per determination were submitted to Dixon's, Grubbs' and/or Rosner's outlier tests. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

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

Finally, the 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 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 general, when no literature reproducibility is available, another target may be used, like Horwitz or an estimated reproducibility based on former iis proficiency tests.

When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test 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 result tables of appendix 1.

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

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

4   EVALUATION

In this interlaboratory study no problems with sample dispatch were encountered. For the main round with used Engine Oil four participants did not report any test results at all and three participants reported after the final reporting date. For the PT on wear metals nine participants did not report any test results at all and one participant reported after the final reporting date. Not all laboratories were able to report all analyses requested.

In total 78 participants reported 1545 test results. Observed were 89 statistically outlying test results, which is 5.8% 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, which were used 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 reported test results. The abbreviations, used in these tables, are listed in appendix 3.

In the iis PT reports, ASTM methods are referred to with a number (e.g. D4739) and an added designation for the year that the method was adopted or revised (e.g. D4739:11). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D4739:11(2017)). In the results tables of Appendix 1 only the method number and year of adoption or revision e.g. D4739:11 will be used.

Sample #19096

Acid Number (Total): This determination may be problematic depending on mode of the test method used. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D664-A:18e2, BEP pH=10 and 60 mL of titration solvent used. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the stricter requirements of ASTM D664-A:18e2, BEP pH=10 and 125 mL and IP 60 and 125 mL. Method ASTM D664 states in paragraph 13.1.2: "For all acid titrations on used oils, mark as an end point on the curve that corresponds to the meter reading for an aqueous basic buffer (pH 10)." Remarkably of all the

laboratories that reported a selection of the end point around 57% reported to have used the Inflection Point instead of the Buffer End Point. Furthermore, Method ASTM D664 was updated in 2018. One of the major changes is the buffer used in the end point detection (pH 11 is changed to pH 10). Still eight participants reported to have used pH=11 for BEP.

When evaluating separately over BEP and the IP test results the calculated reproducibility after rejection of the statistical outlier is again in agreement with the requirements of ASTM D664-A:18e2, BEP and 125 mL and not for the other three modes.

In this PT it appears that the volume of titration solvent has an influence on the reproducibility. The reproducibility is smaller over the 125 mL test results. This influence was not observed in the PT of 2018.

Base Number (HClO$_4$): This determination was very problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D2896:15-A forward titration.

About 36 participants reported to use forward titration which is more applicable to fresh oils. Back titration is the preferred method for a used oil. In this PT only six participants reported to have used a back titration.

When the forward titration test results of ASTM D2896 were evaluated separately for procedure A and B the calculated reproducibilities after rejection of the statistical outliers are not in agreement with the respective requirements of procedures A or B of the ASTM D2896:15 forward titration. Please note that some commercially available Perchloric Acid solutions do not conform to the requirements of ASTM D 2896, especially Acetic Anhydride which may or may not be added in sufficient quantity.

Base Number (HCl): 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 D4739:11(2017).

Density at 15°C: This determination may be problematic for a number of laboratories. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ISO12185:96.

Flash Point PMcc: It was decided to evaluate the test results for both procedures separately because a bias between procedure A and B exists.

Procedure A and other test methods: This determination was problematic. One statistical outlier was observed and one other test result was excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTM D93-A:18.

Procedure B: this determination was very problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not at all in agreement with the requirements of ASTM D93-B:18.

Fuel dilution: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D3524:14. The low number of reported test results may (partly) explain the large reproducibility.

Kinematic Viscosity at 40°C: This determination was not problematic. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D445:18.

Kinematic Viscosity at 100°C: 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 ASTM D445:18.

Viscosity Index: This determination was problematic. One statistical outlier was observed and four other test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTM D2270:10(2016).

Kinematic Viscosity Houillon at 40°C: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D7279:18.

Kinematic Viscosity Houillon at 100°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D7279:18.

Water: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D6304:16e1.

Sample #19097

Aluminum: 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 ASTM D5185:18.

Barium: Almost all reporting laboratories agreed on a value <1 mg/kg. Three participants reported a test value > 1 mg/kg.

Boron: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:18.

Cadmium: Almost all reporting laboratories agreed on a value <1 mg/kg. Four participants reported a test value > 1 mg/kg.

Chromium: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D5185:18.

Copper:
This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:18.

Iron:
This determination was not problematic. Six statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:18.

Lead:
This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:18.

Lithium:
All reporting laboratories agreed on a value <1 mg/kg. No participants reported a test value > 1 mg/kg.

Magnesium:
This determination was not problematic. Six statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:18.

Manganese:
Almost all reporting laboratories agreed on a value <5 mg/kg. Three participants reported a test value > 5 mg/kg.

Molybdenum:
Almost all reporting laboratories agreed on a value <5 mg/kg. One participant reported a test value > 5 mg/kg.

Nickel:
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 ASTM D5185:18.

Potassium:
All reporting laboratories agreed on a value <40 mg/kg. No participants reported a test value > 40 mg/kg.

Silicon:
This determination was not problematic. Six statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:18.

Silver:
Almost all reporting laboratories agreed on a value <5 mg/kg. Three participants reported a test value > 5 mg/kg.

Sodium:
This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:18.

Tin:
Almost all reporting laboratories agreed on a value <10 mg/kg. Two participants reported a test value > 10 mg/kg.

Titanium: Almost all reporting laboratories agreed on a value <5 mg/kg. Two participants reported a test value > 5 mg/kg.

Vanadium: Almost all reporting laboratories agreed on a value <1 mg/kg. Three participants reported a test value > 1 mg/kg.

Calcium: 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 ASTM D5185:18.

Phosphorus: This determination was problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:18.

Zinc: 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 ASTM D5185:18.

As used Engine Oil is a complex matrix to analyse, strict adherence to the test methods with regards to sample preparation, is advised. Improper sample preparation may be the cause of disagreement of the calculated reproducibility with the requirements of the respective reference test method. Also, one should be aware that for each element spectral interferences may occur, and differences may occur in uptake rates between test specimen and standard solutions through viscosity effects.

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, calculated reproducibilities and reproducibilities derived from literature reference test methods (in casu ASTM and IP test methods), are compared in the next tables.

Parameter	unit	n	average	2.8 * sd	R (lit.)
Acid Number (Total)	mg KOH/g	50	3.92	2.24	2.10
Base Number (HClO$_4$)	mg KOH/g	50	9.37	1.24	0.66
Base Number (HCl)	mg KOH/g	15	6.97	1.50	3.81
Density at 15°C	kg/L	57	0.8973	0.0006	0.0005
Flash Point PMcc – procedure A	°C	34	207.0	20.0	14.7
Flash Point PMcc – procedure B	°C	10	194.2	27.0	10
Fuel dilution	%M/M	8	0.8	1.9	1.6
Kinematic Viscosity at 40°C	mm^2/s	58	126.48	1.62	2.47
Kinematic Viscosity at 100°C	mm^2/s	57	14.510	0.228	0.168
Viscosity Index		54	115.5	2.9	2.0
Kinematic Viscosity Houillon at 40°C	mm^2/s	19	126.61	1.46	3.80
Kinematic Viscosity Houillon at 100°C	mm^2/s	18	14.575	0.241	0.816
Water	mg/kg	50	418	520	632

Table 5: reproducibilities of tests on sample #19096

Element	unit	n	average	2.8 * sd	R (lit.)
Aluminum as Al	mg/kg	54	12.7	4.0	7.4
Barium as Ba	mg/kg	48	<1	n.a.	n.a.
Boron as B	mg/kg	39	2.0	2.6	13.1
Cadmium as Cd	mg/kg	32	<1	n.a.	n.a.
Chromium as Cr	mg/kg	56	6.5	2.7	2.5
Copper as Cu	mg/kg	58	14.5	4.8	3.5
Iron as Fe	mg/kg	53	10.5	2.4	3.4
Lead as Pb	mg/kg	58	17.6	7.3	8.4
Lithium as Li	mg/kg	19	<1	n.a.	n.a.
Magnesium as Mg	mg/kg	52	7.3	2.7	3.3
Manganese as Mn	mg/kg	49	<5	n.a.	n.a.
Molybdenum as Mo	mg/kg	51	<5	n.a.	n.a.
Nickel as Ni	mg/kg	58	10.4	3.9	4.8
Potassium as K	mg/kg	44	<40	n.a.	n.a.
Silicon as Si	mg/kg	51	14.6	4.4	8.2
Silver as Ag	mg/kg	46	<5	n.a.	n.a.
Sodium as Na	mg/kg	45	2.5	3.4	2.1
Tin as Sn	mg/kg	53	<10	n.a.	n.a.
Titanium as Ti	mg/kg	46	<5	n.a.	n.a.
Vanadium as V	mg/kg	52	<1	n.a.	n.a.
Calcium as Ca	mg/kg	56	3080	459	514
Phosphorus as P	mg/kg	55	1059	207	140
Zinc as Zn	mg/kg	57	1244	203	211

Table 6: reproducibilities of tests on sample #19097

Without further statistical calculations, it could be concluded that for many tests there is a good compliance of the group of participating laboratories with the relevant reference test methods. The problematic tests have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE PROFICIENCY TEST OF JUNE 2019 WITH PREVIOUS PTS

	June 2019	June 2018	June 2017	June 2016	June 2015
Number of reporting labs	78	75	77	85	80
Number of test results	1545	1689	1679	1890	1555
Number of statistical outliers	89	63	72	57	66
Percentage outliers	5.8%	3.7%	4.3%	3.0%	4.2%

Table 7: comparison with previous proficiency tests

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

The performance of the determinations of the proficiency tests was compared against the requirements of the respective reference test methods. The conclusions are given the following table.

Determination	June 2019	June 2018	June 2017	June 2016	June 2015
Acid Number (Total)	+/-	-	+/-	--	--
Base Number (HClO$_4$)	--	+/-	-	--	-
Base Number (HCl)	++	++	++	++	++
Density at 15°C	-	+/-	+/-	-	+/-
Flash Point PMcc – procedure A	-	+	+	-	-
Flash Point PMcc – procedure B	--	--	-	--	--
Fuel dilution	-	-	-	++	+
Kinematic Viscosity at 40°C	+	+	+	++	+
Kinematic Viscosity at 100°C	-	-	-	++	+/-
Viscosity Index	-	-	+/-	--	--
Kinematic Viscosity Houillon at 40°C	++	++	+	++	++
Kinematic Viscosity Houillon at 100°C	++	++	++	++	++
Water	+	+	+	++	++
Wear-Metals	+	+	+	+	+

Table 8: comparison determinations against the reference test method

The performance of the determinations against the requirements of the 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 Acid Number (Total) on sample #19096; results in mg KOH/g

lab	method	value	mark	z(targ)	end point	vol. of titration
178	INH-1118	3.09		-1.11	---	---
179	D664-A	3.39		-0.71	Inflection Point	125 mL
211		-----		-----	---	---
212	D664-A	1.35	C,R(0.01)	-3.43	Inflection Point	125 mL
225		-----		-----	---	---
230	D664-A	3.461		-0.62	Inflection Point	125 mL
237	D664-A	3.28		-0.86	Inflection Point	125 mL
254		-----		-----	---	---
255		-----		-----	---	---
257		-----		-----	---	---
311		-----		-----	---	---
325	D664-A	4.44		0.69	Buffer End Point (pH 10)	125 mL
331	D664Mod.	4.03		0.14	---	---
333	D664-A	5.0		1.43	---	---
343		-----		-----	---	---
349	D664-A	4.36		0.58	Inflection Point	125 mL
398	D664-A	3.340		-0.78	Buffer End Point (pH 11)	125 mL
421	ISO6619	4.5		0.77	---	---
451		-----		-----	---	---
496	D664-A	4.03		0.14	Buffer End Point (pH 11)	60 mL
511	D974	4.20		0.37	Inflection Point	60 mL
512	D974	4.23		0.41	---	---
541		-----		-----	---	---
562		-----		-----	---	---
575	D664-A	4.47		0.73	Buffer End Point (pH 11)	60 mL
603		-----		-----	---	---
614		-----		-----	---	---
621		-----		-----	---	---
633	D664-A	5.87		2.59	Inflection Point	60 mL
634		-----		-----	---	---
657	D664-B	3.862		-0.08	Inflection Point	60 mL
663	D664-A	3.588		-0.45	Buffer End Point (pH 10)	60 mL
780	D664-A	3.00		-1.23	Buffer End Point (pH 10)	60 mL
823	D664-A	4.70		1.03	Inflection Point	125 mL
840	D664-A	3.66		-0.35	Buffer End Point (pH 10)	60 mL
862	D664-A	4.48		0.74	Inflection Point	60 mL
863	D664-A	4.69		1.02	Inflection Point	60 mL
864	D664-A	4.7		1.03	Inflection Point	60 mL
875		-----		-----	---	---
902	D664-A	3.84		-0.11	Inflection Point	60 mL
912		-----		-----	---	---
913		-----		-----	---	---
922	D664-A	3.00		-1.23	Inflection Point	125 mL
962		-----		-----	---	---
963	D664-A	3.682		-0.32	Inflection Point	60 mL
974	D664-A	3.3		-0.83	Buffer End Point (pH 10)	125 mL
994	D664-A	2.93		-1.32	Inflection Point	125 mL
1023		-----		-----	---	---
1026	D664-A	3.7		-0.30	Buffer End Point (pH 11)	60 mL
1059	ISO6619	3.68		-0.32	Buffer End Point (pH 11)	60 mL
1106	D664-A	3.2602		-0.88	---	---
1146	D664-A	4.393		0.62	Buffer End Point (pH 11)	125 mL
1213	D664-A	2.67		-1.67	---	---
1316	D664-A	2.94		-1.31	Buffer End Point (pH 11)	60 mL
1396		-----		-----	---	---
1435		-----		-----	---	---
1456	D974	3.82		-0.14	---	60 mL
1460	D664-A	4.01		0.12	Inflection Point	60 mL
1569	D664-A	5.45		2.03	Inflection Point	125 mL
1648	D664-A	4.05		0.17	Buffer End Point (pH 10)	60 mL
1740	D664-A	5.53		2.14	Inflection Point	60 mL
1743	D664-A	4.0		0.10	Buffer End Point (pH 11)	60 mL
1748	D664-A	3.397		-0.70	Inflection Point	125 mL
1792	D664-A	2.50		-1.89	Buffer End Point (pH 10)	60 mL
1807	D664-A	4.58	C	0.87	---	---
1850		-----		-----	---	---
1854	D664-A	5.3		1.83	---	---
1900	In house	4.85		1.23	---	---
1957	D664-A	3.37		-0.74	---	---
1969		-----		-----	---	---
2133		-----	W	-----	---	---
6016		-----		-----	---	---
6044	D664-A	4.00		0.10	---	---
6059	D664-A	4.38		0.61	Inflection Point	60 mL
6236	D8045	2.63		-1.72	Inflection Point	125 mL

lab	method	value	mark	z(targ)	end point	vol. of titration
6251	D664-A	2.54	C	-1.84	Inflection Point	---
9101		-----		-----	---	---
9142		-----		-----	---	---
9143		-----		-----	---	---
					---	---
					Inflection point (IP) only	BEP only
	normality	OK			OK	OK
	n	50			22	15
	outliers	1			1	0
	mean (n)	3.923			4.017	3.673
	st.dev. (n)	0.8014			0.9201	0.5820
	R(calc.)	2.244			2.576	1.630
	st.dev.(D664-A:18e2)	0.7513	BEP (pH-10) -60mL		0.4492	0.7044
	R(D664-A:18e2)	2.104	BEP (pH-10) -60mL		---	1.972
Compare						
	R(D664-A:18e2)	1.234	IP - 60mL		1.258	
	R(D664-A:18e2)	0.911	IP - 125mL		0.933	
	R(D664-A:18e2)	1.330	BEP (pH-10) -125mL		---	1.241

Lab 212 first reported 0.15
Lab 1807 first reported 7.66
Lab 2133 test result withdrawn. First reported 6.84
Lab 6251 first reported 0.56

Kernel Density
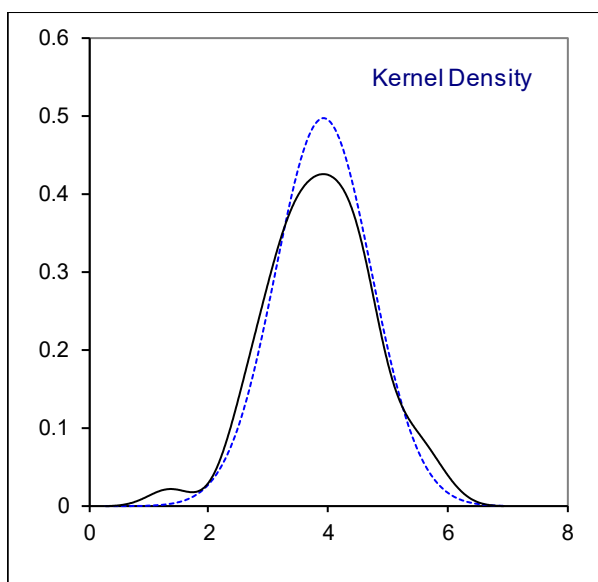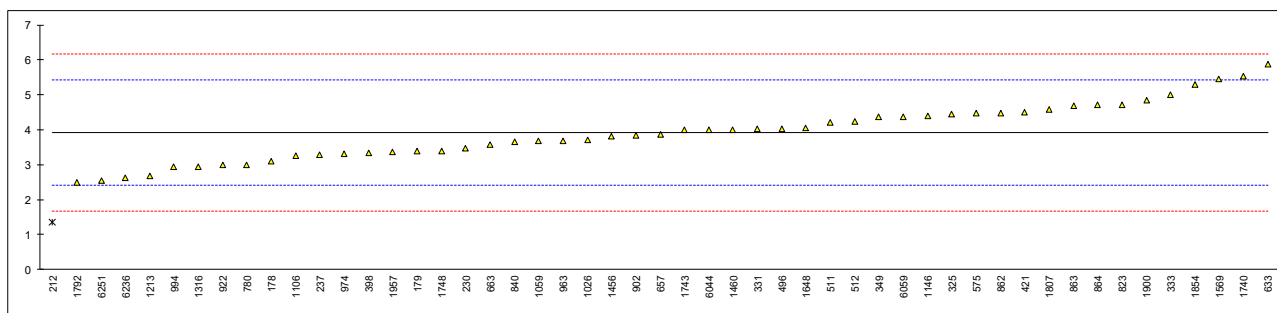
Determination of Base Number (HClO$_4$ titration) on sample #19096; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D2896-A forward	10.03		2.80	
211		-----		-----	
212	D2896-A forward	8.99		-1.64	
225	D2896-B forward	9.0		-1.59	
230	INH-10	9.41		0.16	
237	D2896-A forward	8.89		-2.06	
254		-----		-----	
255	D7889	10.10		3.10	
257	D7889	5.0	R(0.01)	-18.66	
311		-----		-----	
325	D2896-B forward	8.5		-3.73	
331	D2896Mod.	9.03		-1.47	
333		-----		-----	
343		-----		-----	
349		-----		-----	
398		-----		-----	
421	ISO3771	8.9	C	-2.02	first reported 8.0
451		-----		-----	
496	D2896-B back	9.36		-0.06	
511	INH-3	9.28		-0.40	
512	INH-3	9.01		-1.55	
541		-----		-----	
562		-----		-----	
575	D2896-B forward	9.4		0.11	
603		-----		-----	
614	D2896-B forward	9.33		-0.19	
621		-----		-----	
633	D2896-A forward	9.65		1.18	
634	D2896-B forward	10.54		4.98	
657	D2896-B forward	9.28		-0.40	
663	D2896-A forward	9.57		0.84	
780	D2896-B forward	9.71		1.44	
823	D2896-A forward	8.82		-2.36	
840	D2896-B forward	9.64		1.14	
862	D2896-B forward	9.6		0.97	
863	D2896-B forward	9.53		0.67	
864	D2896-B forward	9.5		0.54	
875		-----		-----	
902	D2896-B forward	9.74		1.56	
912	D2896-A forward	9.2		-0.74	
913		-----		-----	
922	D2896-B forward	9.5		0.54	
962		-----		-----	
963	D2896-B forward	8.96		-1.76	
974	D2896-A forward	9.32		-0.23	
994		-----		-----	
1023	D2896-B forward	9.43		0.24	
1026	D2896-B forward	9.1		-1.17	
1059	ISO3771	9.8		1.82	
1106		-----		-----	
1146	D2896-A forward	9.351		-0.10	
1213	D2896-A forward	9.295		-0.34	
1316		-----		-----	
1396		-----		-----	
1435	D2896-A forward	9.1004		-1.17	
1456	D2896-A forward	9.66		1.22	
1460	D2896-B forward	8.60	C	-3.30	first reported 10.81
1569	D2896-A forward	9.2		-0.74	
1648	D2896-A back	10.07		2.97	
1740	D2896-B forward	9.75		1.61	
1743	D2896-B back	9.3		-0.31	
1748	D2896-A back	9.656		1.21	
1792		-----		-----	
1807		-----		-----	
1850		-----		-----	
1854	D2896-A forward	8.7		-2.87	
1900	In house	8.2		-5.01	
1957	D2896-A back	10.2		3.53	
1969		-----		-----	
2133	D2896-B forward	9.39		0.07	
6016		-----		-----	
6044	D2896-A back	9.37		-0.01	
6059	D2896-B forward	9.60		0.97	
6236	D2896-B forward	9.63		1.09	

lab	method	value	mark	z(targ)	remarks
6251	D2896-B forward	9.483		0.47	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

				Only method A Forward	Only method B Forward
	normality	OK		OK	not OK
	n	50		14	22
	outliers	1		0	0
	mean (n)	9.374		9.270	9.419
	st.dev. (n)	0.4416		0.3682	0.4239
	R(calc.)	1.237		1.031	1.187
	st.dev.(D2896-A:15) forward	0.2343		0.2317	0.2355
	R(D2896-A:15) forward	0.656		0.649	---
Compare					
	R(D2896-A:15) back	3.000		---	---
	R(D2896-B:15) forward	0.656		---	0.659
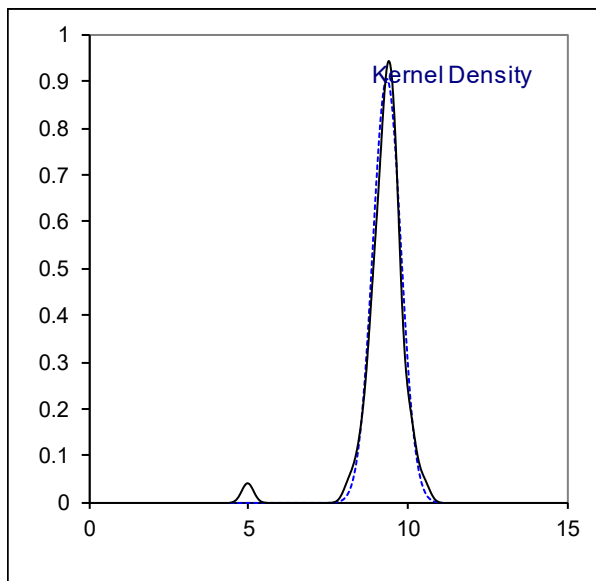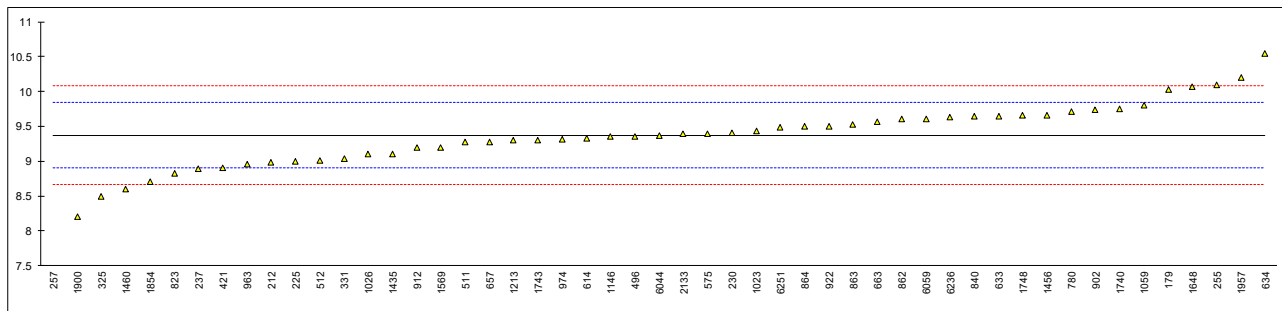
Determination of Base Number (HCl titration) on sample #19096; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
178	INH-1118	6.83		-0.11	
179	D4739	6.58		-0.29	
211		-----		-----	
212		-----		-----	
225		-----		-----	
230		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325		-----		-----	
331	D4739Mod.	6.67		-0.22	
333	D4739	7.4		0.31	
343		-----		-----	
349	D4739	5.88		-0.80	
398		-----		-----	
421		-----		-----	
451		-----		-----	
496	D4739	6.9		-0.05	
511		-----		-----	
512		-----		-----	
541		-----		-----	
562		-----		-----	
575		-----		-----	
603		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663	D4739	7.965		0.73	
780	D4739	6.59		-0.28	
823		-----		-----	
840		-----		-----	
862	D4739	7.35		0.28	
863	D4739	7.46		0.36	
864	D4739	7.6		0.46	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994	D4739	6.76		-0.16	
1023		-----		-----	
1026		-----		-----	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1213		-----		-----	
1316	D4739	6.8		-0.13	
1396		-----		-----	
1435		-----		-----	
1456		-----		-----	
1460	D4739	9.55	DG(0.01)	1.89	
1569		-----		-----	
1648		-----		-----	
1740		-----		-----	
1743	D4739	7.2		0.17	
1748		-----		-----	
1792	D4739	6.62		-0.26	
1807		-----		-----	
1850		-----		-----	
1854		-----		-----	
1900		-----		-----	
1957		-----		-----	
1969		-----		-----	
2133		-----		-----	
6016		-----		-----	
6044	D4739	9.46	DG(0.01)	1.83	
6059		-----		-----	
6236		-----		-----	

lab	method	value	mark	z(targ)	remarks
6251		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	
	normality	OK			
	n	15			
	outliers	2			
	mean (n)	6.974			
	st.dev. (n)	0.5212			
	R(calc.)	1.459			
	st.dev.(D4739:11)	1.3613			
	R(D4739:11)	3.812			

Kernel Density
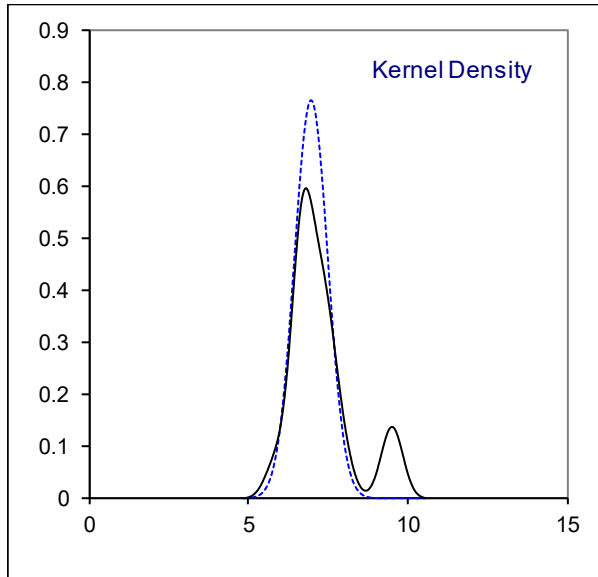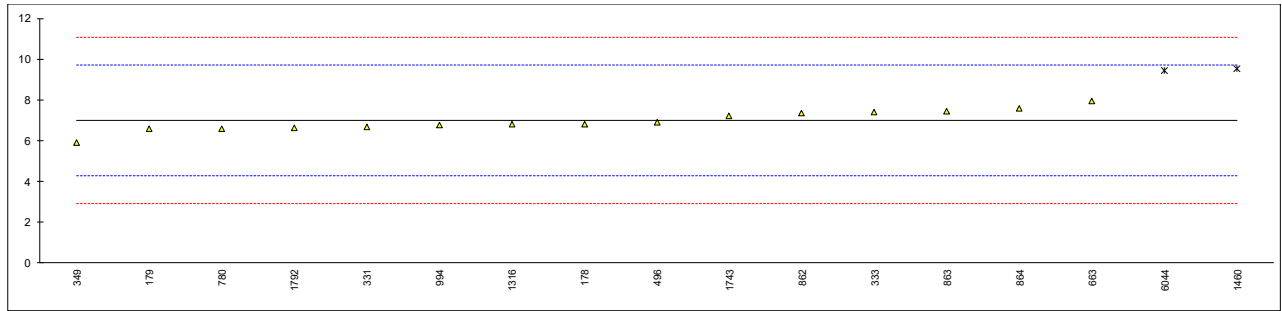
Determination of Density at 15°C on sample #19096; results in kg/L

lab	method	value	mark	z(targ)	remarks
178	D4052	0.8975		1.04	
179	D4052	0.8971		-1.20	
211	D4052	0.8971		-1.20	
212	ISO12185	0.8979		3.28	
225		-----		-----	
230		-----		-----	
237	D4052	0.8974		0.48	
254	D4052	0.8973		-0.08	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325	D4052	0.8974		0.48	
331	ISO12185	0.8975		1.04	
333	D4052	0.8973		-0.08	
343		-----		-----	
349	D4052	0.8972		-0.64	
398	D4052	0.8972		-0.64	
421	ISO12185	0.8978		2.72	
451		-----		-----	
496	D4052	0.89723		-0.47	
511		-----		-----	
512		-----		-----	
541	D4052	0.89730		-0.08	
562		-----		-----	
575		-----		-----	
603	D4052	0.8972		-0.64	
614	D4052	0.8977		2.16	
621	D4052	0.8973		-0.08	
633	D4052	0.8971		-1.20	
634	D4052	0.8973		-0.08	
657	D4052	0.89736		0.26	
663	D4052	0.89730		-0.08	
780	ISO12185	0.8971		-1.20	
823	D4052	0.8974		0.48	
840	D4052	0.89725		-0.36	
862	D4052	0.8980	C	3.84	first reported 898.0 kg/L
863		-----		-----	
864	D4052	0.8973		-0.08	
875	D4052	0.8976	C	1.60	first reported 0.8981
902	D4052	0.89724	C	-0.41	first reported 897.24 kg/L
912	D4052	0.8973		-0.08	
913	D4052	0.8972		-0.64	
922	D4052	0.8973		-0.08	
962	D4052	0.8973		-0.08	
963	D4052	0.8973		-0.08	
974	D4052	0.8971		-1.20	
994	ISO12185	0.8972		-0.64	
1023	D4052	0.8971		-1.20	
1026	D4052	0.8973		-0.08	
1059	D4052	0.8972		-0.64	
1106	D5002	0.8974		0.48	
1146	D4052	0.89729		-0.13	
1213	D4052	0.89688		-2.43	
1316		-----		-----	
1396	IP365	0.8971		-1.20	
1435	D4052	0.8969		-2.32	
1456	D4052	0.8973		-0.08	
1460	D4052	0.8972		-0.64	
1569	D4052	0.8976		1.60	
1648	D4052	0.89748		0.93	
1740	D4052	0.8975		1.04	
1743	ISO12185	0.8985	C,R(0.01)	6.64	first reported 900.0 kg/m^3
1748	D4052	0.8972		-0.64	
1792	D4052	0.8973	C	-0.08	first reported 897.8 kg/m^3
1807	D1298	0.8875	C,R(0.01)	-54.96	first reported 896.5 kg/m^3
1850	D4052	0.8973		-0.08	
1854		-----		-----	
1900	D4052	0.897		-1.76	
1957	D4052	0.8973		-0.08	
1969		-----		-----	
2133	D4052	0.89736		0.26	
6016		-----		-----	
6044	D4052	0.8971		-1.20	
6059	D4052	0.8972		-0.64	
6236	D1217	0.91180	C,R(0.01)	81.12	first reported 892.72 kg/m^3

lab	method	value	mark	z(targ)	remarks
6251	D4052	0.8978	C	2.72	first reported 897.9 kg/m³
9101	D1298	0.8937	R(0.01)	-20.24	
9142		-----		-----	
9143	D1298	0.9181	R(0.01)	116.40	

normality	not OK	
n	57	
outliers	5	
mean (n)	0.89731	
st.dev. (n)	0.000221	
R(calc.)	0.00062	
st.dev.(ISO12185:96)	0.000179	
R(ISO12185:96)	0.0005	
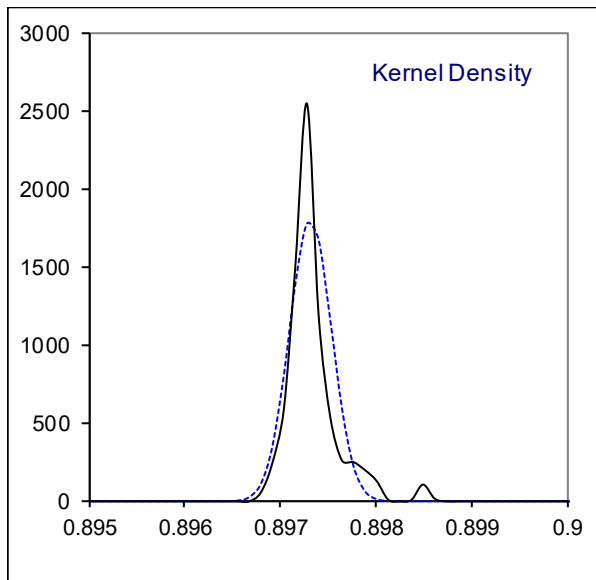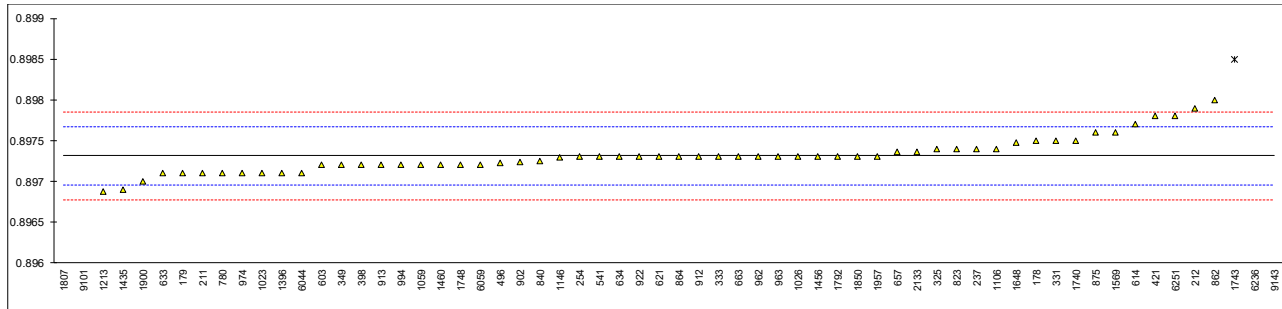
Determination of Flash Point PMcc (procedure A) on sample #19096; results in °C

lab	method	value	mark	z(targ)	remarks
178	D93-A	213.5		1.24	
179	D93-A	200.0		-1.33	
211	D92	245	C,ex	7.24	result excluded, method is an open cup method, fr. 254
212	ISO2719-A	204.0		-0.57	
225		-----		-----	
230	D3828	211.0		0.77	
237		-----		-----	
254	D93-A	200		-1.33	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325	D93-A	188.0		-3.62	
331		-----		-----	
333		-----		-----	
343	ISO2719-A	211.5		0.86	
349	D93-A	206		-0.19	
398		-----		-----	
421		-----		-----	
451		-----		-----	
496		-----		-----	
511		-----		-----	
512		-----		-----	
541	D93-A	205.50		-0.28	
562		-----		-----	
575		-----		-----	
603		-----		-----	
614	D93-A	208		0.19	
621		-----		-----	
633		-----		-----	
634	D93-A	218.4		2.18	
657		-----		-----	
663		-----		-----	
780	D93-A	202.0		-0.95	
823		-----		-----	
840		-----		-----	
862	D93-A	201.5		-1.04	
863		-----		-----	
864		-----		-----	
875		-----		-----	
902	D93-A	209		0.38	
912		-----		-----	
913	D93-A	200		-1.33	
922	D93-A	206		-0.19	
962	D93-A	206.0		-0.19	
963	D93-A	204.0		-0.57	
974		-----		-----	
994		-----		-----	
1023		-----		-----	
1026	D93-A	210		0.58	
1059		-----		-----	
1106	D93-A	208.0		0.19	
1146	D93-A	206.5		-0.09	
1213	D93-A	218		2.10	
1316		-----		-----	
1396		-----		-----	
1435	D93-A	211.5		0.86	
1456	D93-A	206.0		-0.19	
1460	D93-A	220		2.48	
1569	D93-A	>250		-----	
1648		-----		-----	
1740		-----		-----	
1743	ISO2719-A	207		0.00	
1748	D93-A	207.5		0.10	
1792		-----		-----	
1807	D93-A	222.0		2.86	
1850		-----		-----	
1854	D93-A	196		-2.09	
1900	D7094	201.4		-1.06	
1957	D93-A	179	R(0.01)	-5.33	
1969		-----		-----	
2133	D93-A	209.0		0.38	
6016		-----		-----	
6044	D93-A	211		0.77	
6059	D93-A	213		1.15	
6236		-----		-----	

lab	method	value	mark	z(targ)	remarks
6251	D93-A	196		-2.09	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK	
n	34	
outliers	1+1ex	
mean (n)	206.979	
st.dev. (n)	7.1267	
R(calc.)	19.955	
st.dev.(D93-A:18)	5.2484	
R(D93-A:18)	14.696	

Kernel Density
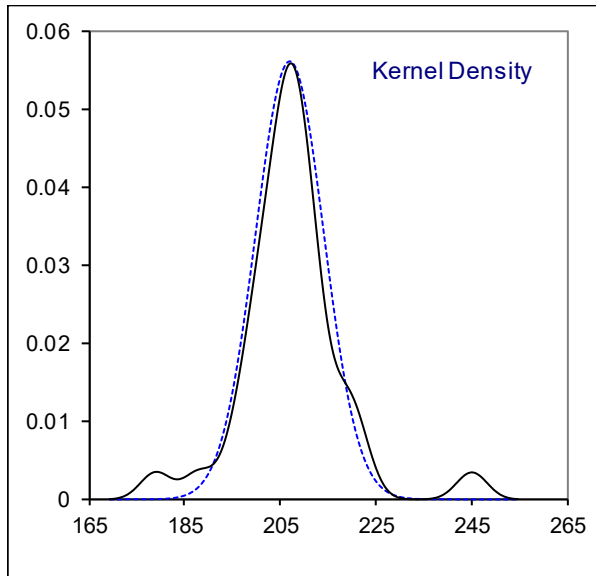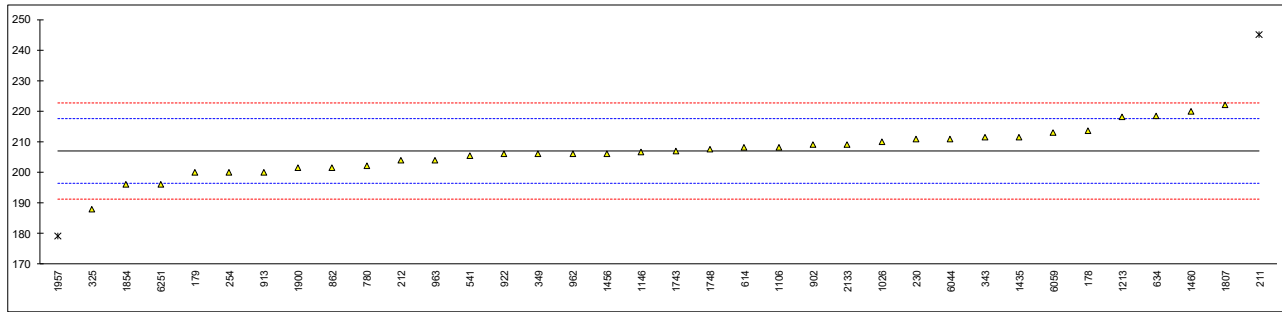
Determination of Flash Point PMcc (procedure B) on sample #19096; results in °C

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211		-----		-----	
212		-----		-----	
225		-----		-----	
230		-----		-----	
237	D93-B	190		-1.18	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325		-----		-----	
331		-----		-----	
333		-----		-----	
343		-----		-----	
349		-----		-----	
398		-----		-----	
421	ISO2719-B	206.5		3.44	
451		-----		-----	
496		-----		-----	
511		-----		-----	
512		-----		-----	
541		-----		-----	
562		-----		-----	
575		-----		-----	
603		-----		-----	
614		-----		-----	
621	D93-B	188.0		-1.74	
633	D93-B	228.4	D(0.05)	9.57	
634		-----		-----	
657		-----		-----	
663	D93-B	195.425		0.34	
780		-----		-----	
823		-----		-----	
840	D93-B	198.1		1.09	
862		-----		-----	
863		-----		-----	
864		-----		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994	D93-B	200.0		1.62	
1023		-----		-----	
1026		-----		-----	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1213		-----		-----	
1316		-----		-----	
1396		-----		-----	
1435		-----		-----	
1456		-----		-----	
1460		-----		-----	
1569		-----		-----	
1648		-----		-----	
1740		-----		-----	
1743		-----		-----	
1748		-----		-----	
1792	D93-B	188.0		-1.74	
1807		-----		-----	
1850	ISO2719-B	206		3.30	
1854		-----		-----	
1900		-----		-----	
1957		-----		-----	
1969	ISO2719-B	174.2	C	-5.61	first reported 184.175
2133		-----		-----	
6016		-----		-----	
6044		-----		-----	
6059		-----		-----	
6236		-----		-----	

lab	method	value	mark	z(targ)	remarks
6251	D93-A	196		0.50	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	10
outliers	1
mean (n)	194.223
st.dev. (n)	9.6531
R(calc.)	27.029
st.dev.(D93-B:18)	3.5714
R(D93-B:18)	10

Kernel Density
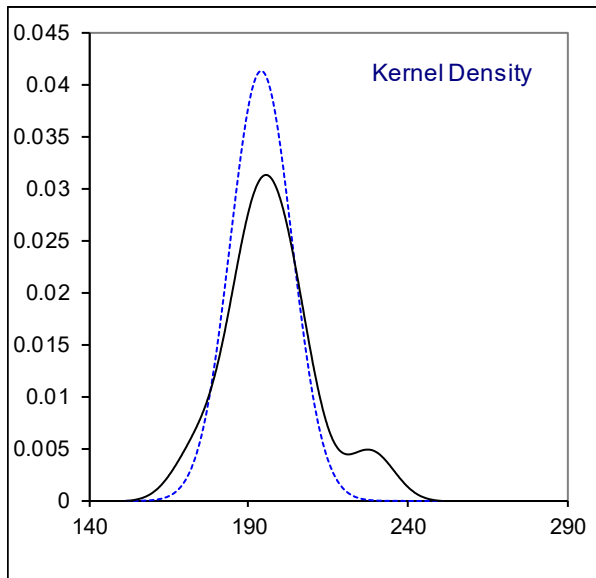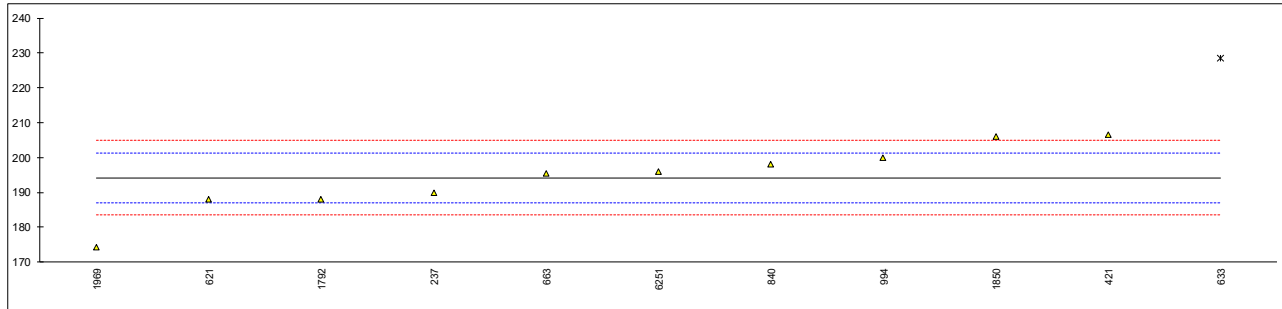
Determination of Fuel dilution on sample #19096; results in %M/M

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D3524	<0.1		-----	
211		-----		-----	
212		-----		-----	
225		-----		-----	
230		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325		-----		-----	
331	INH-26	<0.4		-----	
333		-----		-----	
343	D3524	1.76		1.66	
349	D3524	0.14		-1.18	
398		-----		-----	
421		-----		-----	
451		-----		-----	
496	DIN51454	1.67		1.50	
511		-----		-----	
512		-----		-----	
541		-----		-----	
562		-----		-----	
575		-----		-----	
603		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840	D3524	0.83		0.03	
862	D3524	<0.1		-----	
863		-----		-----	
864		-----		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963	D3524	1.3		0.85	
974		-----		-----	
994		-----		-----	
1023		-----		-----	
1026	D7593	0.4		-0.72	
1059	D3524	<0,5		-----	
1106		-----		-----	
1146	D3524	<0.5		-----	
1213		-----		-----	
1316	D3524	0		-1.42	
1396		-----		-----	
1435		-----		-----	
1456		-----		-----	
1460		-----		-----	
1569	D3524	<0.5		-----	
1648		-----		-----	
1740		-----		-----	
1743		-----		-----	
1748		-----		-----	
1792		-----		-----	
1807		-----		-----	
1850		-----		-----	
1854		-----		-----	
1900		-----		-----	
1957		-----		-----	
1969		-----		-----	
2133		-----		-----	
6016		-----		-----	
6044		-----		-----	
6059		-----		-----	
6236	D3524	0.40		-0.72	

lab	method	value	mark	z(targ)	remarks
6251		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	
	normality	unknown			
	n	8			
	outliers	0			
	mean (n)	0.813			
	st.dev. (n)	0.6891			
	R(calc.)	1.929			
	st.dev.(D3524:14)	0.5714			
	R(D3524:14)	1.6			
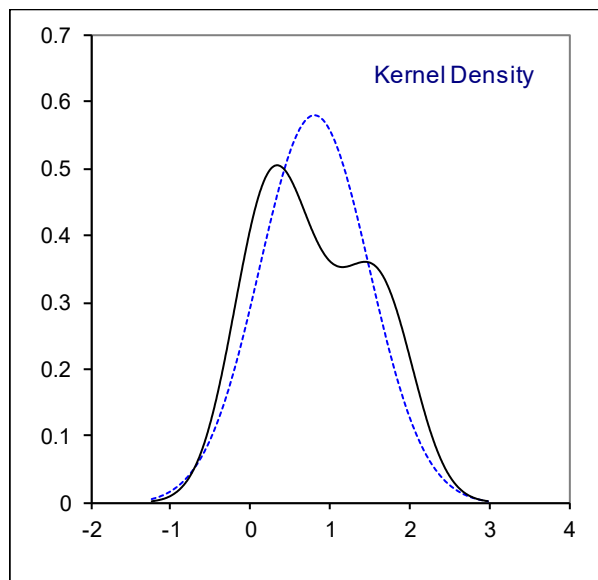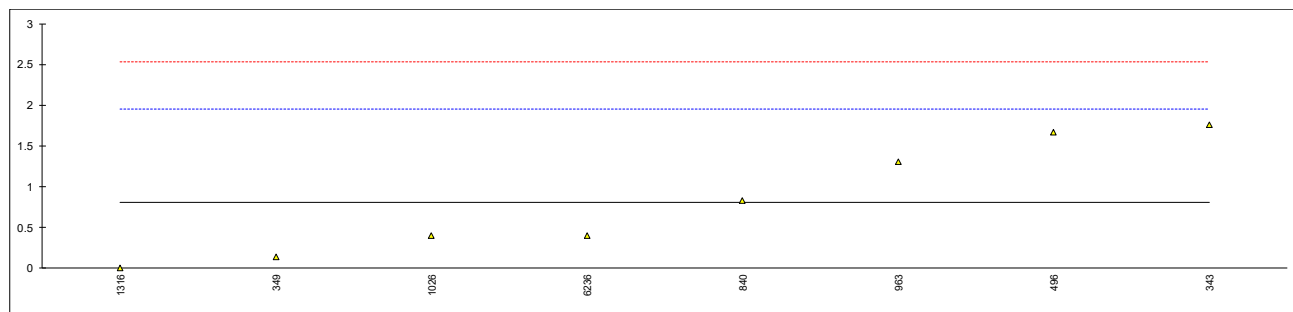
Determination of Kinematic Viscosity at 40°C on sample #19096; results in mm²/s

lab	method	value	mark	z(targ)	remarks
178	D445	126.9		0.47	
179	D445	126.3		-0.21	
211	D445	126.7		0.25	
212	D445	126.4		-0.09	
225	D445	127.0		0.59	
230		-----		-----	
237	D445	126.8349		0.40	
254	D445	126.3		-0.21	
255	D7279	123.8	R(0.01)	-3.03	
257	D7279	126.15		-0.38	
311		-----		-----	
325	D445	126.1		-0.43	
331		-----		-----	
333	D445	126.2		-0.32	
343	D445	126		-0.55	
349	D445	126.1		-0.43	
398	D7042	127.40		1.04	
421	ISO3104	125.4		-1.22	
451		-----		-----	
496	D445	126.18		-0.34	
511		-----		-----	
512		-----		-----	
541		-----		-----	
562		-----		-----	
575	D445	126.5		0.02	
603	D7042	130.27	R(0.01)	4.29	
614	D445	126.5		0.02	
621	D445	129.2	C,R(0.01)	3.08	first reported 130.5
633		-----		-----	
634	D445	126.15		-0.38	
657		-----		-----	
663	D445	126.25		-0.26	
780	D445	125.9		-0.66	
823	D445	126.5		0.02	
840	D445	126.31		-0.19	
862	D445	126.7064		0.25	
863		-----		-----	
864	D445	126.0		-0.55	
875	D445	126.4		-0.09	
902	D445	126.6		0.13	
912	D445	126.7	C	0.25	first reported 129.5
913	D445	128.9	R(0.01)	2.74	
922	D445	126.3		-0.21	
962	D445	126.4		-0.09	
963	D445	126.2		-0.32	
974	D445	127.8		1.49	
994	D7042	125.2		-1.45	
1023	D445	126.44		-0.05	
1026	D445	126.7		0.25	
1059	ISO3104	125.7		-0.88	
1106		-----		-----	
1146	D445	126.48		0.00	
1213	D445	126.7		0.25	
1316	D445	126.3		-0.21	
1396	IP71	128.1775395		1.92	
1435	D7042	127.36		0.99	
1456	D7042	127.1		0.70	
1460	D445	127.4	C	1.04	first reported 130.5
1569	D445	126.4		-0.09	
1648	D445	127.22		0.84	
1740	D445	126.2		-0.32	
1743	D7279 corrected to D445	127.2		0.81	
1748	D7042	126.91		0.48	
1792	D445	126.5		0.02	
1807	D445	125.8		-0.77	
1850	ISO3104	127.0		0.59	
1854	ISO3104	126.8		0.36	
1900	D445	124.7		-2.02	
1957	D7042	126.3		-0.21	
1969	ISO3104	126.1595		-0.36	
2133	D445	126.49		0.01	
6016		-----		-----	
6044	D445	126.8		0.36	
6059	D445	126.50		0.02	
6236		-----		-----	

lab	method	value	mark	z(targ)	remarks
6251	D7042	126.23		-0.29	
9101	D445	130.3571	R(0.01)	4.39	
9142		-----		-----	
9143		-----		-----	

normality	suspect	
n	58	
outliers	5	
mean (n)	126.482	
st.dev. (n)	0.5795	
R(calc.)	1.623	
st.dev.(D445:18)	0.8837	
R(D445:18)	2.474	

Kernel Density
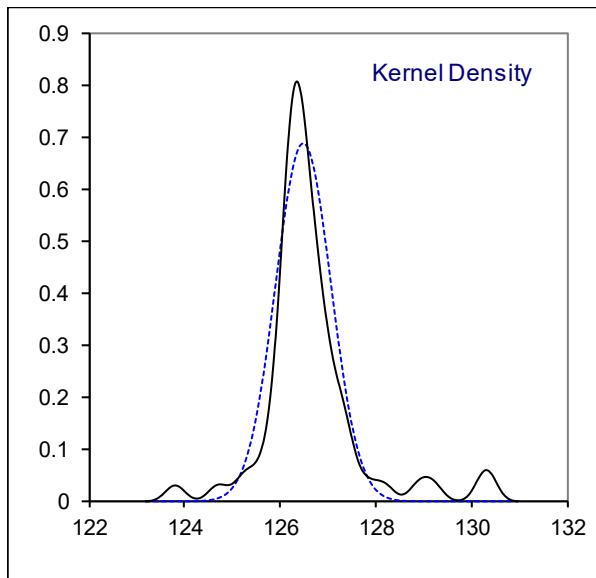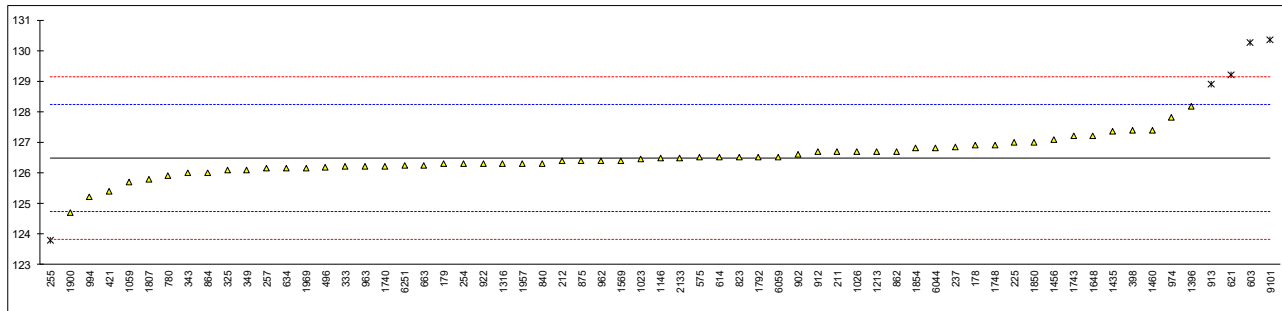
Determination of Kinematic Viscosity at 100°C on sample #19096; results in mm²/s

lab	method	value	mark	z(targ)	remarks
178	D445	14.45		-1.00	
179	D445	14.67		2.66	
211	D445	14.50		-0.17	
212	D445	14.65		2.33	
225	D445	14.40		-1.83	
230		-----		-----	
237	D445	14.515		0.08	
254		-----		-----	
255	D7279	14.46		-0.83	
257	D7279	14.83	R(0.05)	5.32	
311		-----		-----	
325	D445	14.46		-0.83	
331		-----		-----	
333	D445	14.50		-0.17	
343	D445	14.492		-0.30	
349	D445	14.53		0.33	
398	D7042	14.66		2.50	
421	ISO3104	14.50		-0.17	
451		-----		-----	
496	D445	14.487		-0.38	
511		-----		-----	
512		-----		-----	
541		-----		-----	
562		-----		-----	
575	D445	14.48		-0.50	
603	D7042	14.355		-2.58	
614	D445	14.61		1.66	
621	D445	14.63		2.00	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663	D445	14.483		-0.45	
780	D445	14.49		-0.33	
823	D445	14.53		0.33	
840	D445	14.557		0.78	
862	D445	14.5042		-0.10	
863		-----		-----	
864	D445	14.67		2.66	
875	D445	14.53		0.33	
902	D445	14.52		0.17	
912	D445	14.48	C	-0.50	first reported 14.30
913	D445	14.40	C	-1.83	first reported 14.81
922	D445	14.53		0.33	
962		-----		-----	
963	D445	14.44		-1.16	
974	D445	14.50		-0.17	
994	D7042	14.607		1.61	
1023	D445	14.454		-0.93	
1026	D445	14.51		0.00	
1059	ISO3104	14.51		0.00	
1106		-----		-----	
1146	D445	14.481		-0.48	
1213	D445	14.49		-0.33	
1316	D445	14.50		-0.17	
1396		-----		-----	
1435	D7042	14.63		2.00	
1456	D7042	14.49		-0.33	
1460	D445	14.52	C	0.17	first reported 14.74
1569	D445	14.53		0.33	
1648		-----	W	-----	test result withdrawn. first reported 14.872
1740	D445	14.51		0.00	
1743	D7279 corrected to D445	14.27	C	-3.99	first reported 14.32
1748	D7042	14.53		0.33	
1792	D445	14.50		-0.17	
1807	D445	14.50		-0.17	
1850	ISO3104	14.62		1.83	
1854	ISO3104	14.42		-1.50	
1900	D445	14.3		-3.49	
1957	D7042	14.58		1.17	
1969	ISO3104	14.6295		1.99	
2133	D445	14.43		-1.33	
6016		-----		-----	
6044	D445	14.53		0.33	
6059	D445	14.49		-0.33	
6236		-----		-----	

lab	method	value	mark	z(targ)	remarks
6251	D7042	14.578		1.13	
9101	D445	14.4728		-0.62	
9142		-----		-----	
9143		-----		-----	

normality	suspect
n	57
outliers	1
mean (n)	14.5099
st.dev. (n)	0.08147
R(calc.)	0.2281
st.dev.(D445:18)	0.06014
R(D445:18)	0.1684
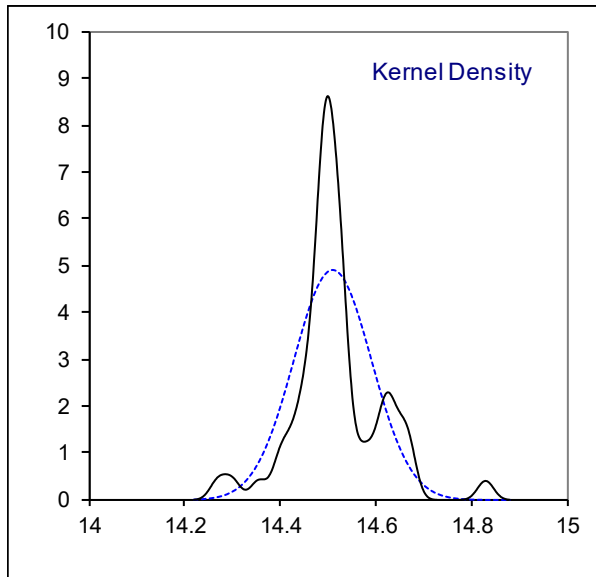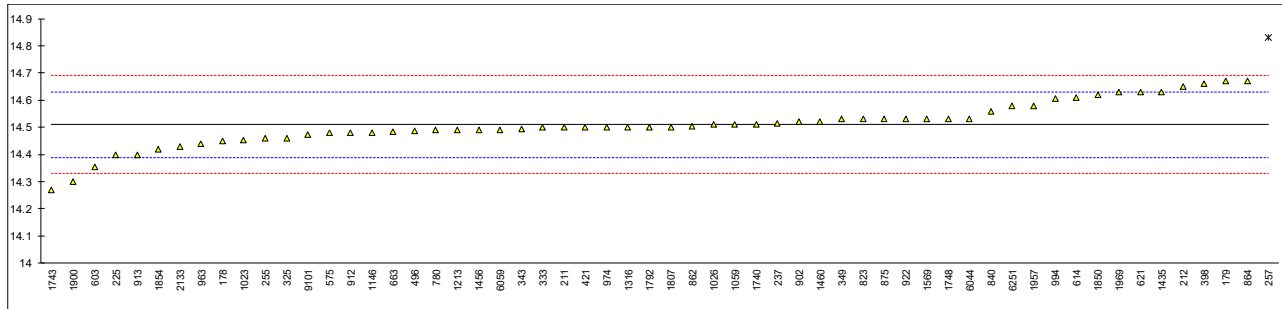
Determination of Viscosity Index on sample #19096

lab	method	value	mark	z(targ)	remarks
178	D2270	114		-2.08	
179	D2270	117		2.12	
211	D2270	114.8		-0.96	
212	D2270	117		2.12	
225		-----		-----	
230		-----		-----	
237	D2270	114.967		-0.73	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325	D2270	115		-0.68	
331		-----		-----	
333	D2270	115		-0.68	
343	D2270	115		-0.68	
349	D2270	116		0.72	
398	D2270	116.2		1.00	
421	ISO2909	116		0.72	
451		-----		-----	
496	D2270	115.18		-0.43	
511		-----		-----	
512		-----		-----	
541		-----		-----	
562	D2270	115		-0.68	
575	D2270	115		-0.68	
603	D2270	109.3	ex	-8.66	test result excluded, outlier in KV at 40°C
614	D2270	116		0.72	
621	D2270	113.9	C,ex	-2.22	first reported 113. Test result excluded, outlier in KV at 40°C
633	D2270	116.5		1.42	
634	D2270	118.6		4.36	
657		-----		-----	
663	D2270	115.13		-0.50	
780	D2270	116		0.72	
823	D2270	115		-0.68	
840	D2270	116.0		0.72	
862	D2270	115		-0.68	
863	D2270	115		-0.68	
864	D2270	116	E	0.72	calculation error? iis calculated 113
875	D2270	116		0.72	
902	D2270	115		-0.68	
912	D2270	115	C	-0.68	first reported 109
913	D2270	116.5	ex, E	1.42	excluded, outlier in KV at 40°C. Calculation error? iis calculated 111
922	D2270	115.6		0.16	
962		-----		-----	
963	D2270	115		-0.68	
974	D2270	114		-2.08	
994	D2270	118		3.52	
1023		-----		-----	
1026	D2270	115		-0.68	
1059	ISO2909	116		0.72	
1106		-----		-----	
1146	D2270	115		-0.68	
1213	D2270	115		-0.68	
1316	D2270	115		-0.68	
1396		-----		-----	
1435	D2270	115.84		0.50	
1456	D2270	114		-2.08	
1460	D2270	114		-2.08	
1569	D2270	116		0.72	
1648	D2270	119.09	ex	5.05	excluded, KV at 100°C test result withdrawn
1740	D2270	115		-0.68	
1743	ISO2909	112	R(0.01)	-4.88	
1748	D2270	114.98		-0.71	
1792	D2270	115.1		-0.54	
1807	ISO2909	116		0.72	
1850	ISO2909	116		0.72	
1854	D2270	114		-2.08	
1900	D2270	114		-2.08	
1957	D2270	116.2		1.00	
1969	ISO2909	117.10		2.26	
2133	D2270	114.12		-1.91	
6016		-----		-----	
6044	D2270	115		-0.68	
6059	D2270	115		-0.68	
6236	D2270	118		3.52	

lab	method	value	mark	z(targ)	remarks
6251	D2270	115.9		0.58	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	suspect	
n	54	
outliers	1+4ex	
mean (n)	115.49	
st.dev. (n)	1.024	
R(calc.)	2.87	
st.dev.(D2270:10)	0.714	
R(D2270:10)	2	
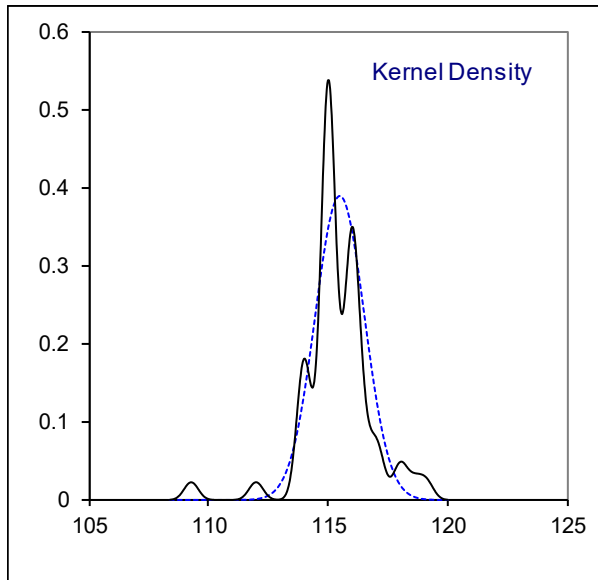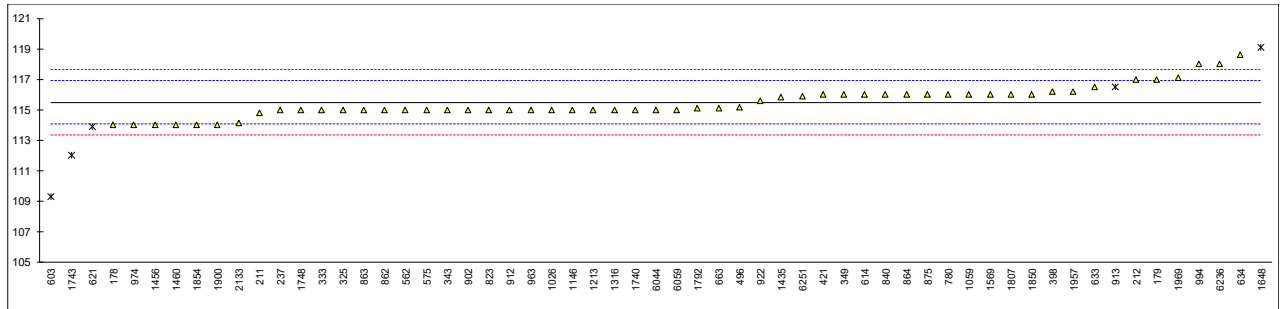
Determination of Kinematic Viscosity Houillon at 40°C on sample #19096; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211		-----		-----	
212	D7279	126.1		-0.37	
225		-----		-----	
230	INH-20	127.07	C	0.34	first reported 118.13
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325		-----		-----	
331	D7279Mod.	122.96	R(0.01)	-2.69	
333		-----		-----	
343		-----		-----	
349		-----		-----	
398		-----		-----	
421		-----		-----	
451		-----		-----	
496		-----		-----	
511	D7279	126.2		-0.30	
512	D7279	126.6		-0.01	
541		-----		-----	
562	D7279	126.6		-0.01	
575	D7279	126.5		-0.08	
603		-----		-----	
614		-----		-----	
621		-----		-----	
633	D7279	126.23		-0.28	
634	D7279	125.8		-0.60	
657	D7279	126.36		-0.18	
663	D7279	126.82		0.16	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862		-----		-----	
863	D7279	126.9		0.22	
864	D7279	126.5		-0.08	
875		-----		-----	
902	D7279	126.7		0.07	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963	D7279	126.3		-0.23	
974		-----		-----	
994		-----		-----	
1023		-----		-----	
1026		-----		-----	
1059	D7279	127.9		0.95	
1106		-----		-----	
1146		-----		-----	
1213		-----		-----	
1316		-----		-----	
1396		-----		-----	
1435		-----		-----	
1456		-----		-----	
1460		-----		-----	
1569		-----		-----	
1648		-----		-----	
1740	D7279	126		-0.45	
1743	D7279	127.5		0.66	
1748		-----		-----	
1792		-----		-----	
1807		-----		-----	
1850		-----		-----	
1854		-----		-----	
1900		-----		-----	
1957		-----		-----	
1969		-----		-----	
2133		-----		-----	
6016		-----		-----	
6044	D7279	127.09		0.36	
6059		-----		-----	
6236	D7279	126.379		-0.17	

lab	method	value	mark	z(targ)	remarks
6251		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	
	normality	OK			
	n	19			
	outliers	1			
	mean (n)	126.608			
	st.dev. (n)	0.5202			
	R(calc.)	1.457			
	st.dev.(D7279:18)	1.3565			
	R(D7279:18)	3.798			

Kernel Density
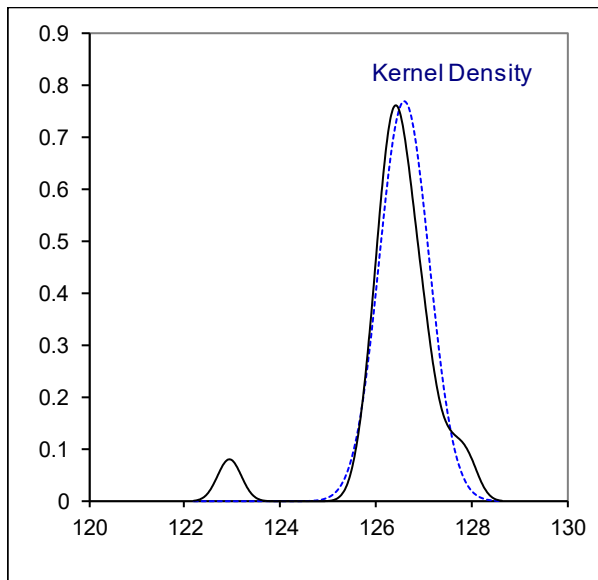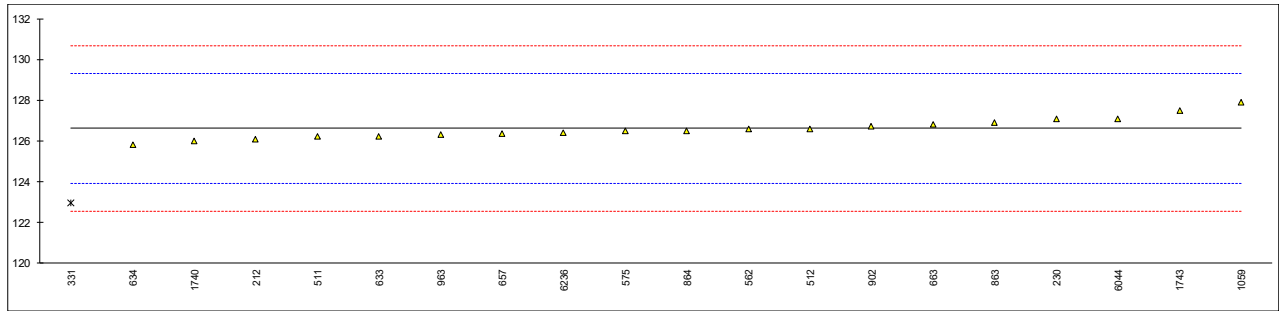
Determination of Kinematic Viscosity Houillon at 100°C on sample #19096; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
211		-----		-----	
212		-----		-----	
225		-----		-----	
230	INH-20	14.617		0.15	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325		-----		-----	
331	D7279Mod.	14.67		0.33	
333		-----		-----	
343		-----		-----	
349		-----		-----	
398		-----		-----	
421		-----		-----	
451		-----		-----	
496		-----		-----	
511	D7279	14.63		0.19	
512	D7279	14.59		0.05	
541		-----		-----	
562	D7279	14.49		-0.29	
575	D7279	14.51		-0.22	
603		-----		-----	
614		-----		-----	
621		-----		-----	
633	D7279	14.591		0.06	
634	D7279	14.72		0.50	
657	D7279	14.557		-0.06	
663	D7279	14.592		0.06	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862		-----		-----	
863	D7279	14.56		-0.05	
864	D7279	14.60		0.09	
875		-----		-----	
902	D7279	14.56		-0.05	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963	D7279	14.51		-0.22	
974		-----		-----	
994		-----		-----	
1023		-----		-----	
1026		-----		-----	
1059	D7279	14.37		-0.70	
1106		-----		-----	
1146		-----		-----	
1213		-----		-----	
1316		-----		-----	
1396		-----		-----	
1435		-----		-----	
1456		-----		-----	
1460		-----		-----	
1569		-----		-----	
1648		-----		-----	
1740		-----		-----	
1743	D7279	14.45		-0.43	
1748		-----		-----	
1792		-----		-----	
1807		-----		-----	
1850		-----		-----	
1854		-----		-----	
1900		-----		-----	
1957		-----		-----	
1969		-----		-----	
2133		-----		-----	
6016		-----		-----	
6044	D7279	14.663		0.30	
6059		-----		-----	
6236	D7279	14.665		0.31	

lab	method	value	mark	z(targ)	remarks
6251		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	18
outliers	0
mean (n)	14.5747
st.dev. (n)	0.08615
R(calc.)	0.2412
st.dev.(D7279:18)	0.29149
R(D7279:18)	0.8162

Kernel Density
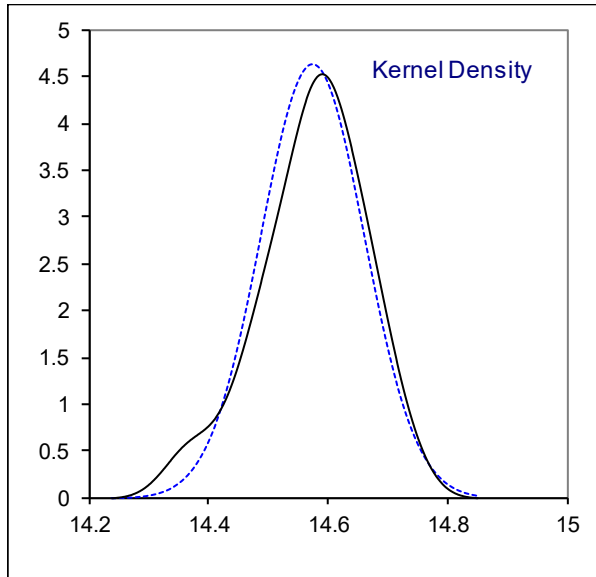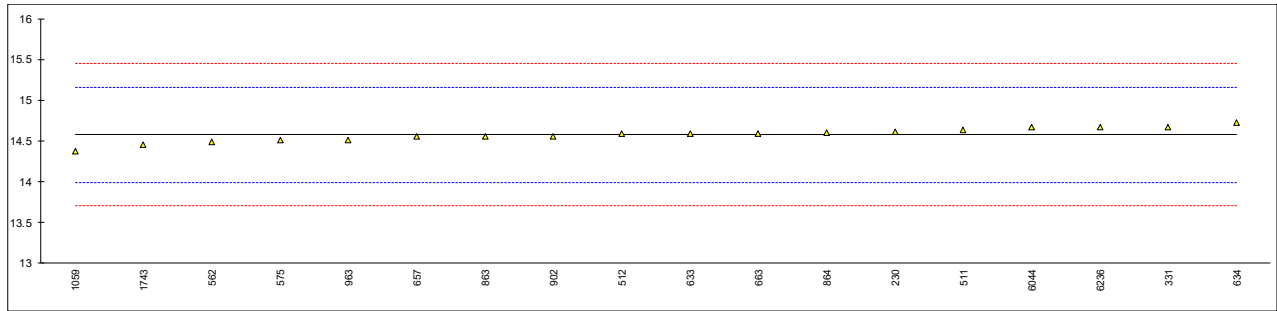
Determination of Water on sample #19096; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D6304	420		0.01	
179	D6304-C	377		-0.18	
211		-----		-----	
212		-----		-----	
225	D6304-A	290		-0.57	
230		-----		-----	
237	D6304-C	211		-0.92	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325	D6304-C	421		0.01	
331	INH-06	546.0		0.57	
333		-----		-----	
343		-----		-----	
349	D6304-A	957		2.39	
398	D6304-C	422		0.02	
421	D6304-C	221		-0.87	
451		-----		-----	
496	D6304-C	354		-0.28	
511		-----		-----	
512		-----		-----	
541		-----		-----	
562	E203	1253	R(0.01)	3.70	
575		-----		-----	
603		-----		-----	
614	D6304-C	419		0.00	
621	D6304-A	465.53		0.21	
633	D6304-C	346.2		-0.32	
634	D6304-C	429.2		0.05	
657	D6304-C	530.1		0.50	
663	D6304-C	430		0.05	
780	D6304-C	716		1.32	
823	D6304-C	486		0.30	
840	D6304-C	755.1		1.49	
862	D6304-C	615		0.87	
863		-----		-----	
864	D6304-C	375		-0.19	
875		-----		-----	
902	D6304-C	453.74		0.16	
912	D6304-C	335		-0.37	
913	D6304-C	340		-0.35	
922	D6304-A	350		-0.30	
962		-----		-----	
963	D6304-C	290		-0.57	
974		-----		-----	
994	IP438	524		0.47	
1023	D6304-C	19.3		-1.77	
1026	D6304-C	98		-1.42	
1059	D6304-C	390		-0.12	
1106		-----		-----	
1146	D6304-C	480		0.27	
1213		-----		-----	
1316	D6304-C	430		0.05	
1396	IP74	0		-1.85	
1435	D6304-A	541		0.54	
1456	D6304-C	490		0.32	
1460	D6304-A	570		0.67	
1569	D6304-C	421		0.01	
1648	D6304-C	322.8		-0.42	
1740	D6304-C	390		-0.12	
1743		125		-1.30	
1748		-----		-----	
1792		-----		-----	
1807		-----		-----	
1850		-----		-----	
1854	D6304-C	410		-0.04	
1900	D6304-C	541		0.54	
1957	D6304-A	870		2.00	
1969		-----		-----	
2133	D6304-C	366		-0.23	
6016		-----		-----	
6044	D6304-C	532		0.51	
6059	D6304-A	546		0.57	
6236	D6304-A	301		-0.52	

lab	method	value	mark	z(targ)	remarks
6251	D6304-A	77.98		-1.51	
9101	D4006	446.85		0.13	
9142		-----		-----	
9143	D4006	457.5		0.17	

normality	suspect
n	50
outliers	1
mean (n)	418.09
st.dev. (n)	185.631
R(calc.)	519.77
st.dev.(D6304:16e1)	225.566
R(D6304:16e1)	631.59

Kernel Density
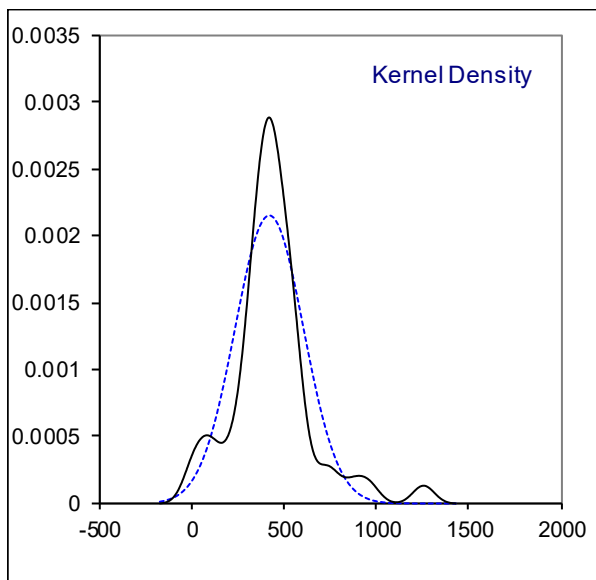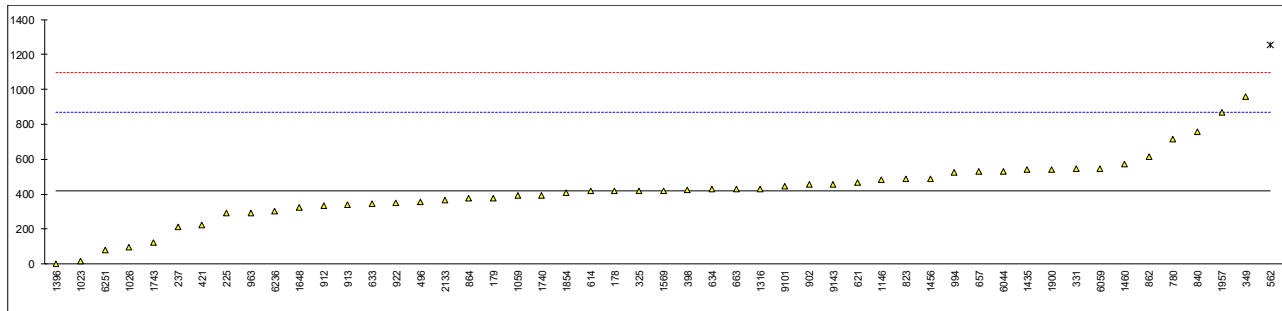
Determination of Aluminum as Al on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	12		-0.26	
179	D5185	13		0.12	
212	D5185	16		1.27	
225	D6595	14		0.50	
230	D5185	12.2		-0.18	
237		-----		-----	
254		-----		-----	
255	D6595	13.82		0.44	
257	D6595	13.14		0.18	
311		-----		-----	
325	D5185	13		0.12	
331	D5185Mod.	10.3		-0.90	
333		-----		-----	
343	D5185	11.46		-0.46	
349	D5185	13		0.12	
398		-----		-----	
421	D5185	12.2		-0.18	
451		-----		-----	
496	D5185	12.352		-0.12	
511	D5185	11.92		-0.29	
512	D5185	12.71		0.01	
541	D5185	12.3		-0.14	
562	D6595	14		0.50	
575	D6595	14.73		0.78	
614	D5185	12.4		-0.10	
633	D6595	12.1		-0.22	
634	D5185	15.24		0.98	
657	D5185	12.11		-0.21	
663	D5185	11.96		-0.27	
780	D5185	11.3		-0.52	
823	D5185	12.1		-0.22	
840	D5185	13.2		0.20	
862	D5185	12		-0.26	
863	D5185	12		-0.26	
864	D5185	13.5		0.31	
875		-----		-----	
902	D5185	12.15		-0.20	
912		11.6		-0.41	
913	D5185	14.07		0.53	
922	D5185	12		-0.26	
962	D5185	12		-0.26	
963	D5185	12.33		-0.13	
974	D5185	11		-0.64	
994	D5185	11.67		-0.38	
1026	D5185	11.6		-0.41	
1059		-----		-----	
1146	In house	12.08		-0.23	
1278	D5185	12.40		-0.10	
1316	D5185	11.3		-0.52	
1396		-----		-----	
1435	D5185	7.118	R(0.05)	-2.12	
1456	D5185	13		0.12	
1460	D5185	24	R(0.01)	4.31	
1495		-----		-----	
1569	D5185	13		0.12	
1648	D5185	9.92		-1.05	
1740	D5185	11		-0.64	
1743	D5185	13		0.12	
1748		-----		-----	
1807		17		1.65	
1850		-----		-----	
1854	D5185	13.1		0.16	
1900	D5185	12		-0.26	
1957	D5185	7	R(0.05)	-2.16	
2133	D5185	10.773	C	-0.72	first reported 1.826
6016		-----		-----	
6044	D5185	12.502		-0.07	
6059	D5185	14.90		0.85	
6080	D5185	17		1.65	
6236	D5185	12.938	C	0.10	first reported 0

normality	not OK
n	54
outliers	3
mean (n)	12.674
st.dev. (n)	1.4440
R(calc.)	4.043
st.dev.(D5185:18)	2.6265
R(D5185:18)	7.354
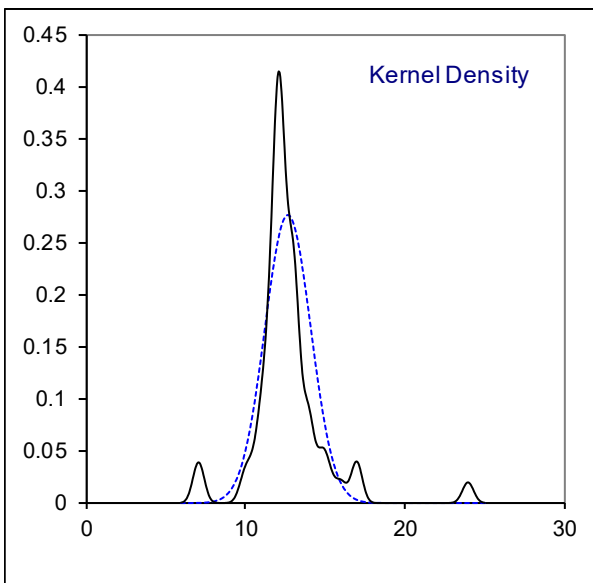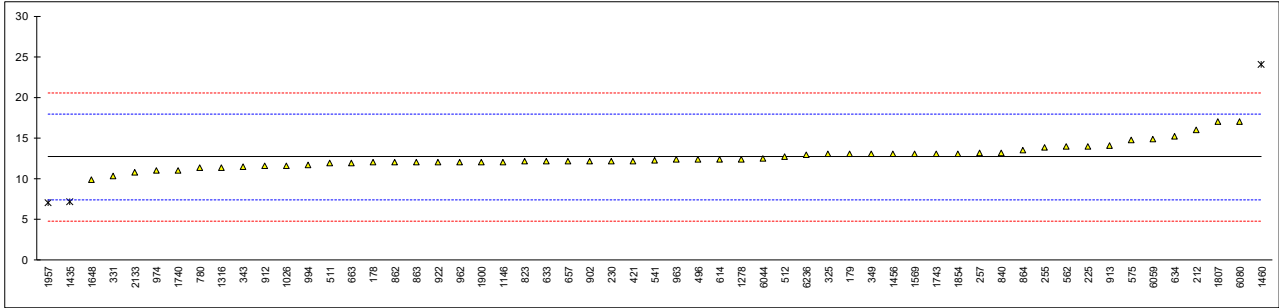
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Determination of Barium as Ba on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	<1		-----	
179	D5185	<1		-----	
212	D5185	4		-----	possibly a false positive test result?
225	D6595	0.2		-----	
230	D5185	0.0		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257	D6595	0.15		-----	
311		-----		-----	
325	D5185	0		-----	
331	D5185Mod.	<1		-----	
333		-----		-----	
343	D5185	<1		-----	
349	D5185	<2		-----	
398		-----		-----	
421	D5185	<1,0		-----	
451		-----		-----	
496	D5185	0.157		-----	
511	D5185	0.182		-----	
512	D5185	0.17		-----	
541	D5185	0.501		-----	
562	D6595	<28		-----	
575	D6595	0.14		-----	
614	D5185	0.13		-----	
633	D6595	0.17		-----	
634	D5185	0.2095		-----	
657	D5185	< 1		-----	
663	D5185	0.143		-----	
780	D5185	<1		-----	
823	D5185	0.2		-----	
840	D5185	<1		-----	
862	D5185	<1		-----	
863	D5185	<1		-----	
864	D5185	<1.0		-----	
875		-----		-----	
902	D5185	<0.5		-----	
912		<0.5		-----	
913		-----		-----	
922	D5185	<0.5		-----	
962		-----		-----	
963	D5185	0.140		-----	
974	D5185	<1		-----	
994	D5185	<1		-----	
1026	D5185	0		-----	
1059		-----		-----	
1146	In house	0.1507		-----	
1278	D5185	0.192		-----	
1316	D5185	0.13		-----	
1396		-----		-----	
1435	D5185	0.1545		-----	
1456	D5185	0.20		-----	
1460	D5185	14		-----	possibly a false positive test result?
1495		-----		-----	
1569	D5185	<1		-----	
1648		-----		-----	
1740	D5185	0.6		-----	
1743	D5185	0.18		-----	
1748		-----		-----	
1807		<2,5		-----	
1850	In house	9		-----	possibly a false positive test result?
1854	D5185	<1		-----	
1900	D5185	0		-----	
1957	D5185	0		-----	
2133	D5185	0.129		-----	
6016		-----		-----	
6044	D5185	0.417		-----	
6059	D5185	0.30		-----	
6080	D5185	<1		-----	
6236	D5185	0.164		-----	
	n	48			
	mean (n)	<1			Application range : 0.5 – 4 mg/kg

Determination of Boron as B on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	3		0.21	
179	D5185	2		0.00	
212	D5185	7	R(0.01)	1.07	
225	D6595	1.2		-0.17	
230	D5185	11.3	R(0.01)	1.99	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257	D6595	0.95		-0.22	
311		-----		-----	
325	D5185	2		0.00	
331	D5185Mod.	2.3		0.06	
333		-----		-----	
343		-----		-----	
349	D5185	<2		-----	
398		-----		-----	
421	D5185	2.1		0.02	
451		-----		-----	
496	D5185	2.178		0.04	
511	D5185	1.86		-0.03	
512	D5185	1.75		-0.05	
541	D5185	<4		-----	
562	D6595	1.5		-0.11	
575	D6595	1.56		-0.09	
614	D5185	1.3		-0.15	
633	D6595	2.86		0.18	
634	D5185	1.15		-0.18	
657	D5185	< 1		-----	
663	D5185	1.39		-0.13	
780	D5185	3.4		0.30	
823	D5185	3.6		0.34	
840	D5185	11.5	R(0.01)	2.03	
862	D5185	1		-0.21	
863	D5185	2		0.00	
864	D5185	1.7		-0.06	
875		-----		-----	
902		-----		-----	
912		1	C	-0.21	first reported <1
913		-----		-----	
922		-----		-----	
962		-----		-----	
963	D5185	2.17		0.04	
974		-----		-----	
994	D5185	1.912		-0.02	
1026	D5185	1.55		-0.10	
1059		-----		-----	
1146		-----		-----	
1278	D5185	1.72		-0.06	
1316	D5185	1.17		-0.18	
1396		-----		-----	
1435	D5185	1.453		-0.12	
1456	D5185	1.9		-0.02	
1460	D5185	14	R(0.01)	2.57	
1495		-----		-----	
1569	D5185	5		0.64	
1648		-----		-----	
1740	D5185	1.7		-0.06	
1743	D5185	2.3		0.06	
1748		-----		-----	
1807		3.0	C	0.21	first reported <2.5
1850		-----		-----	
1854		-----		-----	
1900		-----		-----	
1957	D5185	0		-0.43	
2133	D5185	3.663		0.36	
6016		-----		-----	
6044	D5185	2.181		0.04	
6059	D5185	1.71		-0.06	
6080	D5185	3		0.21	
6236	D5185	1.735		-0.06	

normality	not OK
n	39
outliers	4
mean (n)	1.999
st.dev. (n)	0.9145
R(calc.)	2.561
st.dev.(D5185:18)	4.6751
R(D5185:18)	13.090

Appplication range : 4 – 30 mg/kg

Kernel Density
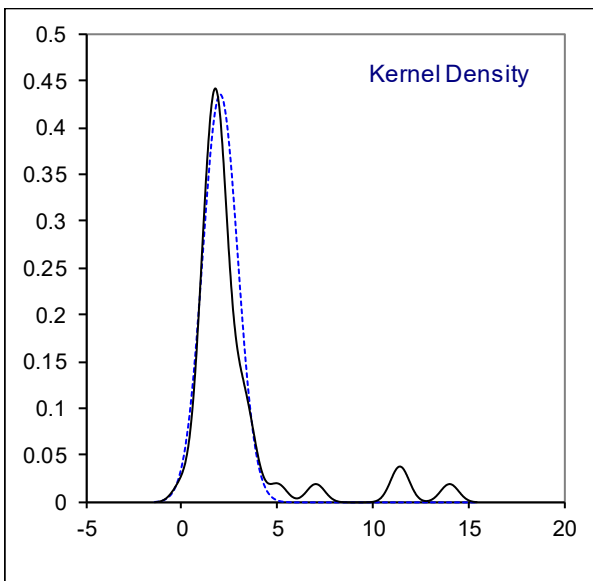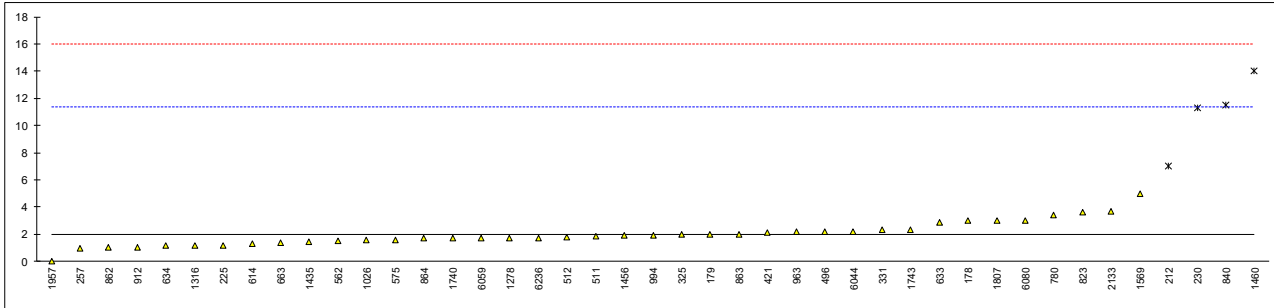
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Determination of Cadmium as Cd on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D5185	<1		-----	
212	D5185	14		-----	possibly a false positive test result?
225	D6595	0.1		-----	
230		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325		-----		-----	
331	D5185Mod.	<1		-----	
333		-----		-----	
343	D5185	<1		-----	
349	D5185	<2		-----	
398		-----		-----	
421	D5185	<1,0		-----	
451		-----		-----	
496	D5185	0.081		-----	
511	D5185	0.07		-----	
512	D5185	0.075		-----	
541		-----		-----	
562		-----		-----	
575		-----		-----	
614	D5185	0.07		-----	
633	D6595	0.26		-----	
634	D5185	0.000		-----	
657	D5185	< 1		-----	
663		-----		-----	
780	D5185	<1		-----	
823	D5185	<0.1		-----	
840	D5185	<5		-----	
862	D5185	<1		-----	
863	D5185	<1		-----	
864	D5185	<1.0		-----	
875		-----		-----	
902		-----		-----	
912		<1		-----	
913		-----		-----	
922	D5185	<1		-----	
962		-----		-----	
963	D5185	0.09		-----	
974	D5185	<1		-----	
994	D5185	<1		-----	
1026		-----		-----	
1059		-----		-----	
1146		-----		-----	
1278	D5185	0.091		-----	
1316	D5185	0.07		-----	
1396	In house	<1		-----	
1435	D5185	0.1055		-----	
1456	D5185	0		-----	
1460	D5185	12		-----	possibly a false positive test result?
1495	IP PM-ED/09	2.6		-----	possibly a false positive test result?
1569		-----		-----	
1648		-----		-----	
1740		-----		-----	
1743	D5185	0.12		-----	
1748		-----		-----	
1807		<2,5		-----	
1850	In house	5		-----	possibly a false positive test result?
1854		-----		-----	
1900		-----		-----	
1957		-----		-----	
2133	D5185	0.074		-----	
6016		-----		-----	
6044	D5185	0.335		-----	
6059	D5185	0.20		-----	
6080	D5185	<1		-----	
6236		-----		-----	
	n	32			
	mean (n)	<1			

Determination of Chromium as Cr on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	7		0.58	
179	D5185	6		-0.53	
212	D5185	6		-0.53	
225	D6595	8.3		2.02	
230	D5185	1.5	C,R(0.01)	-5.50	first reported 0
237		-----		-----	
254		-----		-----	
255	D6595	7.24		0.84	
257	D6595	8.79		2.56	
311		-----		-----	
325	D5185	6		-0.53	
331	D5185Mod.	5.7		-0.86	
333		-----		-----	
343	D5185	5.9		-0.64	
349	D5185	7		0.58	
398		-----		-----	
421	D5185	4.9		-1.74	
451		-----		-----	
496	D5185	6.113		-0.40	
511	D5185	6.22		-0.29	
512	D5185	6.66		0.20	
541	D5185	6.27		-0.23	
562	D6595	8.3		2.02	
575	D6595	9.47		3.31	
614	D5185	6.27		-0.23	
633	D6595	5.87		-0.67	
634	D5185	8.389		2.11	
657	D5185	6.15		-0.36	
663	D5185	6.01		-0.52	
780	D5185	5.8		-0.75	
823	D5185	5.9		-0.64	
840	D5185	7.2		0.80	
862	D5185	6		-0.53	
863	D5185	7		0.58	
864	D5185	6.4		-0.09	
875		-----		-----	
902	D5185	6.16		-0.35	
912		6.3		-0.20	
913		-----		-----	
922	D5185	7		0.58	
962	D5185	7		0.58	
963	D5185	6.44		-0.04	
974	D5185	8		1.68	
994	D5185	6.028		-0.50	
1026	D5185	5.80		-0.75	
1059	In house	5		-1.63	
1146	In house	5.984		-0.55	
1278	D5185	6.61		0.15	
1316	D5185	5.34		-1.26	
1396	In house	4.8		-1.86	
1435	D5185	5.739		-0.82	
1456	D5185	6.6		0.14	
1460	D5185	20	R(0.01)	14.95	
1495	IP PM-ED/09	1.3	R(0.01)	-5.73	
1569	D5185	6		-0.53	
1648	D5185	6.35		-0.14	
1740	D5185	6.2		-0.31	
1743	D5185	6.7		0.25	
1748		-----		-----	
1807		7.1		0.69	
1850	In house	3	R(0.05)	-3.85	
1854	D5185	7.0		0.58	
1900	D5185	5.5		-1.08	
1957	D5185	5		-1.63	
2133	D5185	5.656		-0.91	
6016		-----		-----	
6044	D5185	7.919		1.59	
6059	D5185	6.19		-0.32	
6080	D5185	7		0.58	
6236	D5185	6.491		0.01	

normality	suspect
n	56
outliers	4
mean (n)	6.478
st.dev. (n)	0.9603
R(calc.)	2.689
st.dev.(D5185:18)	0.9043
R(D5185:18)	2.532
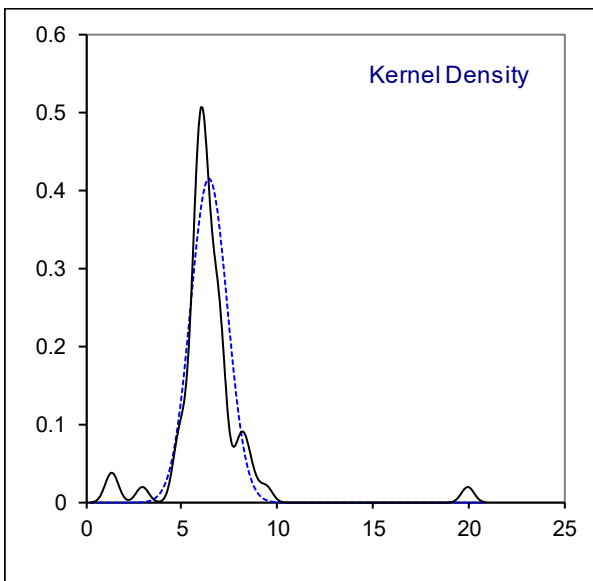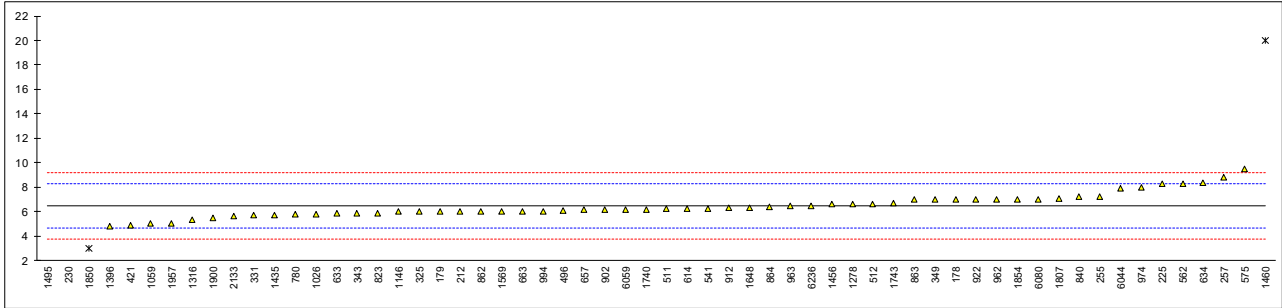
Determination of Copper as Cu on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	13		-1.23	
179	D5185	14		-0.43	
212	D5185	19		3.59	
225	D6595	17		1.98	
230	D5185	17.3		2.22	
237		-----		-----	
254		-----		-----	
255	D6595	15.66		0.91	
257	D6595	15.59		0.85	
311		-----		-----	
325	D5185	14		-0.43	
331	D5185Mod.	12.7		-1.47	
333		-----		-----	
343	D5185	13.3		-0.99	
349	D5185	15		0.38	
398		-----		-----	
421	D5185	13.8		-0.59	
451		-----		-----	
496	D5185	13.616		-0.73	
511	D5185	13.83		-0.56	
512	D5185	14.88		0.28	
541	D5185	13.8		-0.59	
562	D6595	18		2.78	
575	D6595	17.17	C	2.12	first reported 19.8
614	D5185	14.51		-0.02	
633	D6595	15.0		0.38	
634	D5185	17.436		2.33	
657	D5185	13.86		-0.54	
663	D5185	13.15		-1.11	
780	D5185	13.9		-0.51	
823	D5185	14.4		-0.11	
840	D5185	15.4		0.70	
862	D5185	14		-0.43	
863	D5185	13		-1.23	
864	D5185	14.4		-0.11	
875		-----		-----	
902	D5185	13.77		-0.61	
912		14.7		0.14	
913	D5185	14.82		0.23	
922	D5185	13		-1.23	
962		-----		-----	
963	D5185	13.62		-0.73	
974	D5185	15		0.38	
994	D5185	13.22		-1.05	
1026	D5185	12.2		-1.87	
1059	In house	18		2.78	
1146	In house	13.55		-0.79	
1278	D5185	14.2		-0.27	
1316	D5185	11.6		-2.35	
1396	In house	11.5		-2.43	
1435	D5185	14.28		-0.20	
1456	D5185	15		0.38	
1460	D5185	24	R(0.01)	7.60	
1495	IP PM-ED/09	4.2	R(0.01)	-8.29	
1569	D5185	16		1.18	
1648	D5185	13.88		-0.52	
1740	D5185	13.6		-0.75	
1743	D5185	15		0.38	
1748		-----		-----	
1807		18	C	2.78	first reported 19
1850	In house	15		0.38	
1854	D5185	14.5		-0.03	
1900	D5185	14		-0.43	
1957	D5185	10		-3.64	
2133	D5185	12.736		-1.44	
6016		-----		-----	
6044	D5185	14.695		0.13	
6059	D5185	16.93		1.93	
6080	D5185	15		0.38	
6236	D5185	14.320		-0.17	

normality	OK
n	58
outliers	2
mean (n)	14.531
st.dev. (n)	1.7213
R(calc.)	4.820
st.dev.(D5185:18)	1.2456
R(D5185:18)	3.488

Kernel Density
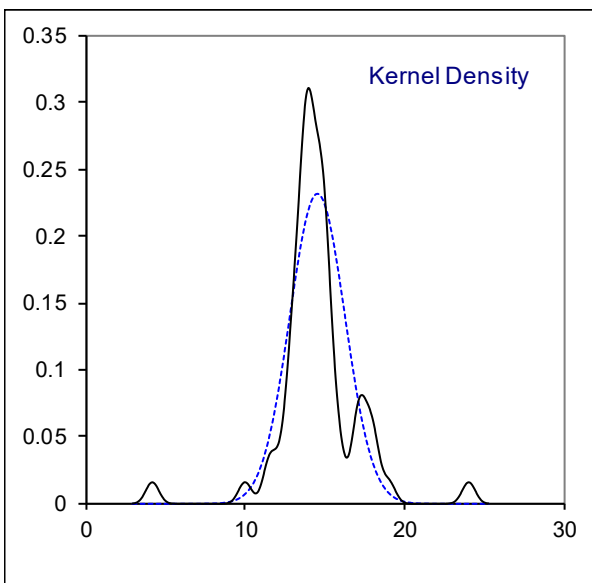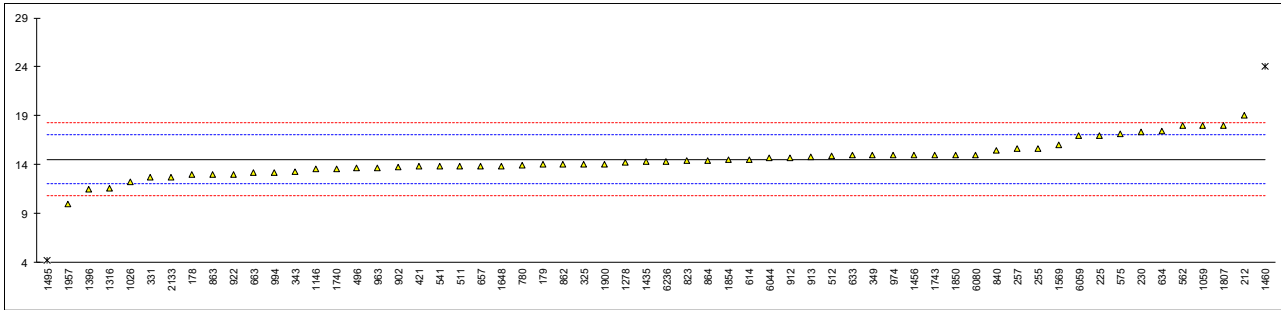
Determination of Iron as Fe on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	11		0.45	
179	D5185	11		0.45	
212	D5185	17	R(0.01)	5.39	
225	D6595	12		1.27	
230	D5185	6.9	R(0.05)	-2.93	
237		-----		-----	
254		-----		-----	
255	D6595	11.28		0.68	
257	D6595	11.46		0.83	
311		-----		-----	
325	D5185	11		0.45	
331	D5185Mod.	9.7		-0.62	
333		-----		-----	
343	D5185	9.9		-0.46	
349	D5185	12		1.27	
398		-----		-----	
421	D5185	8.9		-1.28	
451		-----		-----	
496	D5185	9.981		-0.39	
511	D5185	9.735		-0.60	
512	D5185	10.46		0.00	
541	D5185	10.1		-0.29	
562	D6595	12		1.27	
575	D6595	11.1		0.53	
614	D5185	10.54		0.07	
633	D6595	10.6		0.12	
634	D5185	11.278		0.68	
657	D5185	9.93		-0.43	
663	D5185	9.73		-0.60	
780	D5185	10.3		-0.13	
823	D5185	9.9		-0.46	
840	D5185	11.6		0.94	
862	D5185	10		-0.38	
863	D5185	11		0.45	
864	D5185	10.4		-0.05	
875		-----		-----	
902	D5185	10.31		-0.12	
912		9.6		-0.71	
913	D5185	10.11		-0.29	
922	D5185	10		-0.38	
962	D5185	10		-0.38	
963	D5185	10.50		0.03	
974	D5185	12		1.27	
994	D5185	9.26		-0.99	
1026	D5185	9.73		-0.60	
1059	In house	7	R(0.05)	-2.85	
1146	In house	9.883		-0.47	
1278	D5185	10.58		0.10	
1316	D5185	8.78		-1.38	
1396		-----		-----	
1435	D5185	9.476		-0.81	
1456	D5185	11		0.45	
1460	D5185	20	R(0.01)	7.86	
1495		-----		-----	
1569	D5185	10		-0.38	
1648	D5185	10.02		-0.36	
1740	D5185	9.7		-0.62	
1743	D5185	11		0.45	
1748		-----		-----	
1807		11		0.45	
1850	In house	4	R(0.01)	-5.32	
1854	D5185	10.5		0.03	
1900	D5185	9		-1.20	
1957	D5185	6	R(0.05)	-3.67	
2133	D5185	9.307		-0.95	
6016		-----		-----	
6044	D5185	12.502		1.68	
6059	D5185	11.37		0.75	
6080	D5185	11		0.45	
6236	D5185	10.747		0.24	

normality	OK
n	53
outliers	6
mean (n)	10.458
st.dev. (n)	0.8596
R(calc.)	2.407
st.dev.(D5185:18)	1.2145
R(D5185:18)	3.401

Kernel Density
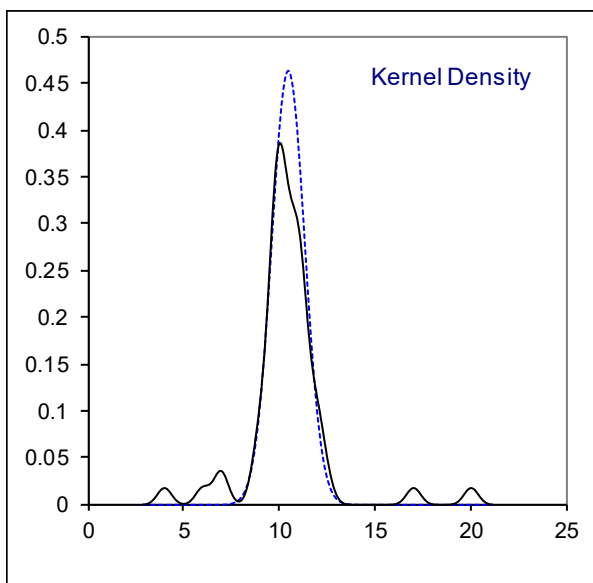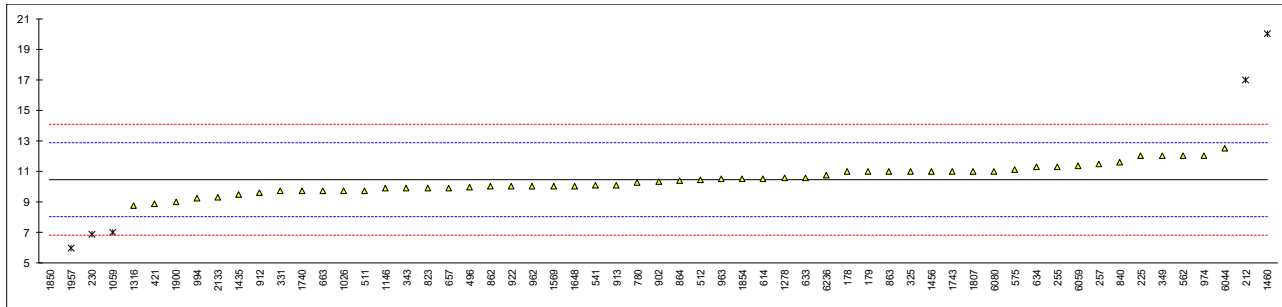
Determination of Lead as Pb on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	18		0.13	
179	D5185	18		0.13	
212	D5185	19		0.46	
225	D6595	20		0.79	
230	D5185	20.1		0.83	
237		-----		-----	
254		-----		-----	
255	EOL/MTH/OL1PB	17.00		-0.20	
257	D6595	22.66		1.68	
311		-----		-----	
325	D5185	18		0.13	
331	D5185Mod.	15.3		-0.77	
333		-----		-----	
343	D5185	15.7		-0.64	
349	D5185	19		0.46	
398		-----		-----	
421	D5185	15.8		-0.60	
451		-----		-----	
496	D5185	16.340		-0.42	
511	D5185	17.91		0.10	
512	D5185	17.85		0.08	
541	D5185	16.7		-0.30	
562	D6595	25		2.45	
575	D6595	23.28	C	1.88	first reported 30.0
614	D5185	17.40		-0.07	
633	D6595	21.0		1.13	
634	D5185	22.877		1.75	
657	D5185	17.48		-0.04	
663	D5185	16.03		-0.53	
780	D5185	15.3		-0.77	
823	D5185	15.7		-0.64	
840	D5185	17.2		-0.14	
862	D5185	17		-0.20	
863	D5185	18		0.13	
864	D5185	17.3		-0.10	
875		-----		-----	
902	D5185	17.27		-0.11	
912		17		-0.20	
913	D5185	18.99		0.46	
922	D5185	17		-0.20	
962		-----		-----	
963	D5185	16.08		-0.51	
974	D5185	18		0.13	
994	D5185	15.0		-0.87	
1026	D5185	18.1		0.16	
1059	In house	18		0.13	
1146	In house	16.20		-0.47	
1278	D5185	16.7		-0.30	
1316	D5185	12.8		-1.60	
1396	In house	16.9		-0.24	
1435	D5185	14.98		-0.88	
1456	D5185	18		0.13	
1460	D5185	27	R(0.05)	3.12	
1495	IP PM-ED/09	7.3	R(0.05)	-3.43	
1569	D5185	16		-0.54	
1648	D5185	17.02		-0.20	
1740	D5185	16.7		-0.30	
1743	D5185	19		0.46	
1748		-----		-----	
1807		18		0.13	
1850	In house	11		-2.20	
1854	D5185	18.7		0.36	
1900	D5185	15.7		-0.64	
1957	D5185	12		-1.87	
2133	D5185	15.200		-0.80	
6016		-----		-----	
6044	D5185	23.338		1.90	
6059	D5185	21.67		1.35	
6080	D5185	18		0.13	
6236	D5185	17.325		-0.10	

normality	suspect
n	58
outliers	2
mean (n)	17.614
st.dev. (n)	2.5903
R(calc.)	7.253
st.dev.(D5185:18)	3.0093
R(D5185:18)	8.426

Kernel Density
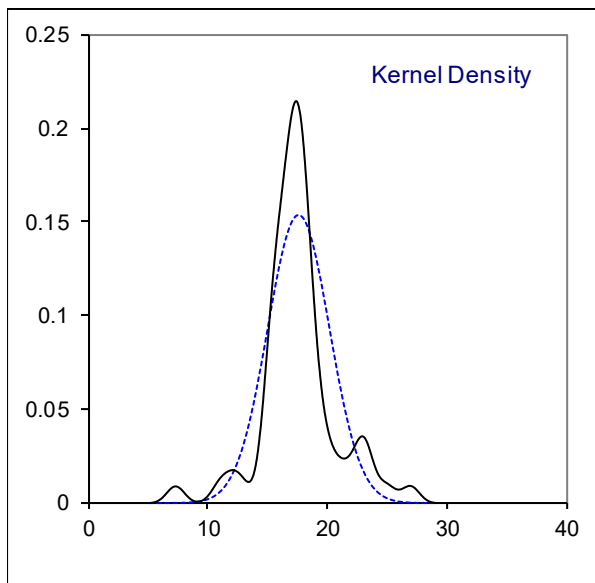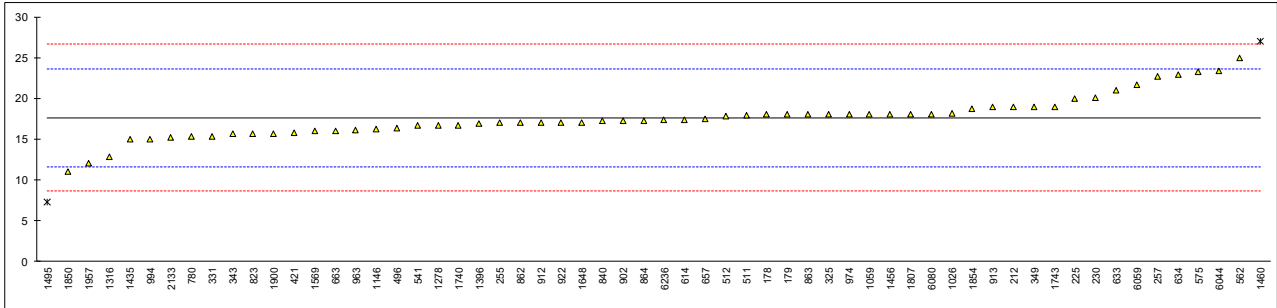
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Determination of Lithium as Li on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D5185	<1		-----	
212	D5185	0		-----	
225		-----		-----	
230		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325		-----		-----	
331	D5185Mod.	<1		-----	
333		-----		-----	
343		-----		-----	
349	D5185	<2		-----	
398		-----		-----	
421		-----		-----	
451		-----		-----	
496	D5185	<0.1		-----	
511		-----		-----	
512		-----		-----	
541		-----		-----	
562		-----		-----	
575		-----		-----	
614	D5185	0.0		-----	
633	D6595	0		-----	
634		-----		-----	
657	D5185	< 1		-----	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862	D5185	<1		-----	
863		-----		-----	
864	D5185	<1.0		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D5185	<1		-----	
994		-----		-----	
1026		-----		-----	
1059		-----		-----	
1146	In house	0.1432		-----	
1278		-----		-----	
1316		-----		-----	
1396		-----		-----	
1435	D5185	0.0231		-----	
1456	D5185	0		-----	
1460	D5185	1		-----	
1495		-----		-----	
1569		-----		-----	
1648		-----		-----	
1740		-----		-----	
1743	D5185	0.81		-----	
1748		-----		-----	
1807		-----		-----	
1850		-----		-----	
1854		-----		-----	
1900		-----		-----	
1957	D5185	0		-----	
2133		-----		-----	
6016		-----		-----	
6044	D5185	0.469		-----	
6059	D5185	0.50		-----	
6080		-----		-----	
6236	D5185	0		-----	
	n	19			
	mean (n)	<1			

Determination of Magnesium as Mg on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	8		0.61	
179	D5185	8		0.61	
212	D5185	6		-1.08	
225	D6595	8.1		0.69	
230	D5185	5.50		-1.50	
237		-----		-----	
254		-----		-----	
255	D6595	9.27		1.68	
257	D6595	8.81		1.29	
311		-----		-----	
325	D5185	8		0.61	
331	D5185Mod.	7.0		-0.24	
333		-----		-----	
343	D5185	6.8		-0.40	
349	D5185	8		0.61	
398		-----		-----	
421	D5185	5.9		-1.16	
451		-----		-----	
496	D5185	7.104		-0.15	
511	D5185	7.51		0.19	
512	D5185	7.84		0.47	
541	D5185	7.21		-0.06	
562	D6595	11	R(0.05)	3.14	
575	D6595	8.8		1.28	
614	D5185	6.75		-0.45	
633	D6595	5.51		-1.49	
634	D5185	10.236		2.49	
657	D5185	6.71		-0.48	
663	D5185	7.03		-0.21	
780	D5185	7.1		-0.15	
823	D5185	6.4		-0.74	
840	D5185	7.8		0.44	
862	D5185	7		-0.24	
863	D5185	7		-0.24	
864	D5185	7.3		0.02	
875		-----		-----	
902	D5185	7.27		-0.01	
912		7.2		-0.07	
913	D5185	6.75		-0.45	
922	D5185	7		-0.24	
962	D5185	8		0.61	
963	D5185	7.21		-0.06	
974	D5185	4	R(0.05)	-2.77	
994	D5185	6.78		-0.42	
1026	D5185	7		-0.24	
1059		-----		-----	
1146	In house	6.737		-0.46	
1278	D5185	7.38		0.09	
1316	D5185	6.33		-0.80	
1396		-----		-----	
1435	D5185	6.578		-0.59	
1456	D5185	8.10		0.69	
1460	D5185	28	R(0.01)	17.48	
1495	IP PM-ED/09	34	R(0.01)	22.54	
1569	D5185	7		-0.24	
1648	D5185	6.45		-0.70	
1740	D5185	6.9		-0.32	
1743	D5185	7.55		0.23	
1748		-----		-----	
1807		8.1		0.69	
1850		-----		-----	
1854	D5185	7.3		0.02	
1900	D5185	5		-1.92	
1957	D5185	3	R(0.05)	-3.61	
2133	D5185	6.575		-0.59	
6016		-----		-----	
6044	D5185	8.869		1.34	
6059	D5185	8.33		0.89	
6080	D5185	4	C,R(0.05)	-2.77	first reported <1
6236	D5185	7.411		0.11	

normality	suspect
n	52
outliers	6
mean (n)	7.279
st.dev. (n)	0.9614
R(calc.)	2.692
st.dev.(D5185:18)	1.1857
R(D5185:18)	3.320
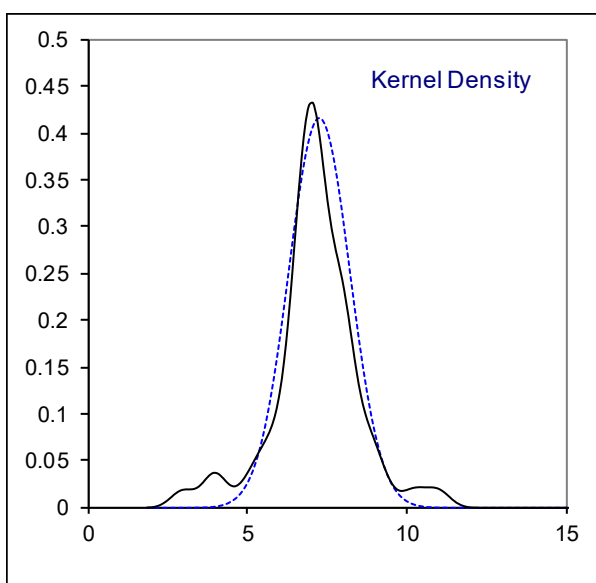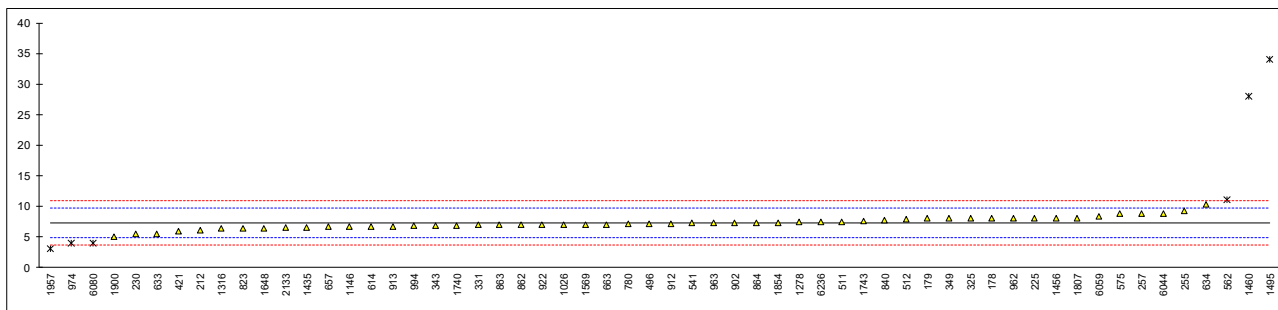
Determination of Manganese as Mn on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D5185	8		-----	possibly a false positive test result?
212	D5185	8		-----	possibly a false positive test result?
225	D6595	1.0		-----	
230	D5185	0.6		-----	
237		-----		-----	
254		-----		-----	
255	D6595	0.62		-----	
257	D6595	0.59		-----	
311		-----		-----	
325	D5185	0		-----	
331	D5185Mod.	1.0		-----	
333		-----		-----	
343	D5185	<1		-----	
349	D5185	<2		-----	
398		-----		-----	
421	D5185	<1,0		-----	
451		-----		-----	
496	D5185	0.671		-----	
511	D5185	0.5134		-----	
512	D5185	0.505		-----	
541	D5185	<5		-----	
562		-----		-----	
575		-----		-----	
614	D5185	0.6		-----	
633	D6595	0.55		-----	
634	D5185	1.053		-----	
657	D5185	< 1		-----	
663	D5185	0.68		-----	
780	D5185	<1		-----	
823	D5185	0.6		-----	
840	D5185	<5		-----	
862	D5185	1		-----	
863	D5185	<1		-----	
864	D5185	<1.0		-----	
875		-----		-----	
902	D5185	1.06		-----	
912		<1		-----	
913		-----		-----	
922	D5185	<5		-----	
962		-----		-----	
963	D5185	0.74		-----	
974	D5185	<1		-----	
994	D5185	<5		-----	
1026		-----		-----	
1059	In house	<4		-----	
1146	In house	0.6238		-----	
1278	D5185	0.594		-----	
1316	D5185	0.53		-----	
1396	In house	<1		-----	
1435	D5185	0.5458		-----	
1456	D5185	0.7		-----	
1460	D5185	12		-----	possibly a false positive test result?
1495	IP PM-ED/09	1		-----	
1569		-----		-----	
1648	D5185	1.07		-----	
1740	D5185	0.9		-----	
1743	D5185	0.71		-----	
1748		-----		-----	
1807		-----		-----	
1850	In house	3		-----	
1854	D5185	<1		-----	
1900		-----		-----	
1957	D5185	0		-----	
2133	D5185	0.615		-----	
6016		-----		-----	
6044	D5185	0.904		-----	
6059	D5185	1.00		-----	
6080	D5185	4		-----	
6236	D5185	0.683		-----	
	n	49			
	mean (n)	<5			Application range : 5 – 700 mg/kg

Determination of Molybdenum as Mo on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	1		-----	
179	D5185	<1		-----	
212	D5185	5		-----	
225	D6595	1.9		-----	
230	D5185	3	C	-----	first reported 10.8
237		-----		-----	
254		-----		-----	
255		-----		-----	
257	D6595	0.95		-----	
311		-----		-----	
325	D5185	0		-----	
331	D5185Mod.	<1		-----	
333		-----		-----	
343	D5185	<1		-----	
349	D5185	<2		-----	
398		-----		-----	
421	D5185	<1,0		-----	
451		-----		-----	
496	D5185	0.506		-----	
511	D5185	0.10		-----	
512	D5185	0.08		-----	
541	D5185	<5		-----	
562	D6595	1.6		-----	
575	D6595	0.74		-----	
614	D5185	0.05		-----	
633	D6595	4.24		-----	
634	D5185	3.552		-----	
657	D5185	< 1		-----	
663	D5185	0.46		-----	
780	D5185	<1		-----	
823	D5185	1.3		-----	
840	D5185	<5		-----	
862	D5185	1		-----	
863	D5185	<1		-----	
864	D5185	<1.0		-----	
875		-----		-----	
902		-----		-----	
912		<1		-----	
913		-----		-----	
922	D5185	<5		-----	
962		-----		-----	
963	D5185	0.08		-----	
974	D5185	<1		-----	
994	D5185	<5		-----	
1026	D5185	0.505		-----	
1059	In house	<3		-----	
1146		-----		-----	
1278	D5185	0.42		-----	
1316	D5185	0.26		-----	
1396		-----		-----	
1435	D5185	0.5717		-----	
1456	D5185	0		-----	
1460	D5185	13		-----	possibly a false positive test result?
1495		-----		-----	
1569	D5185	1		-----	
1648		-----		-----	
1740	D5185	0.7		-----	
1743	D5185	0.54		-----	
1748		-----		-----	
1807		<2,5		-----	
1850		-----		-----	
1854	D5185	<1		-----	
1900	D5185	0		-----	
1957	D5185	0		-----	
2133	D5185	0.395		-----	
6016		-----		-----	
6044	D5185	0.473		-----	
6059	D5185	1.00		-----	
6080	D5185	<1		-----	
6236	D5185	0.340		-----	
	n	51			
	mean (n)	<5			Application range : 5 – 200 mg/kg

Determination of Nickel as Ni on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	10		-0.22	
179	D5185	10		-0.22	
212	D5185	13		1.52	
225	D6595	12		0.94	
230	D5185	25	C,R(0.01)	8.48	first reported 21.9
237		-----		-----	
254		-----		-----	
255	D6595	11.72		0.78	
257	D6595	12.56		1.27	
311		-----		-----	
325	D5185	10		-0.22	
331	D5185Mod.	9.7		-0.39	
333		-----		-----	
343	D5185	9.6		-0.45	
349	D5185	11		0.36	
398		-----		-----	
421	D5185	9.4		-0.57	
451		-----		-----	
496	D5185	10.205		-0.10	
511	D5185	10.18		-0.11	
512	D5185	10.1		-0.16	
541	D5185	10.6		0.13	
562	D6595	15		2.68	
575	D6595	14.34		2.30	
614	D5185	9.94		-0.25	
633	D6595	11.4		0.59	
634	D5185	13.200		1.64	
657	D5185	9.66		-0.41	
663	D5185	9.72		-0.38	
780	D5185	9.7		-0.39	
823	D5185	9.8		-0.33	
840	D5185	11.2		0.48	
862	D5185	10		-0.22	
863	D5185	11		0.36	
864	D5185	10.7		0.19	
875		-----		-----	
902	D5185	10.34		-0.02	
912		9.2		-0.68	
913	D5185	10.00		-0.22	
922	D5185	9		-0.80	
962	D5185	11		0.36	
963	D5185	10.25		-0.07	
974	D5185	11		0.36	
994	D5185	9.61		-0.44	
1026	D5185	9.98		-0.23	
1059	In house	9		-0.80	
1146	In house	9.627		-0.43	
1278	D5185	10.3		-0.04	
1316	D5185	8.23		-1.24	
1396	In house	8.8		-0.91	
1435	D5185	9.998		-0.22	
1456	D5185	10		-0.22	
1460	D5185	26	R(0.01)	9.05	
1495	IP PM-ED/09	9.7		-0.39	
1569	D5185	10		-0.22	
1648	D5185	9.38		-0.58	
1740	D5185	9.7		-0.39	
1743	D5185	11		0.36	
1748		-----		-----	
1807		10		-0.22	
1850	In house	3	R(0.01)	-4.27	
1854	D5185	10.9		0.30	
1900	D5185	8.7		-0.97	
1957	D5185	6		-2.54	
2133	D5185	9.366		-0.58	
6016		-----		-----	
6044	D5185	12.035		0.96	
6059	D5185	11.06		0.40	
6080	D5185	11		0.36	
6236	D5185	10.856		0.28	

normality	not OK
n	58
outliers	3
mean (n)	10.375
st.dev. (n)	1.4076
R(calc.)	3.941
st.dev.(D5185:18)	1.7256
R(D5185:18)	4.832
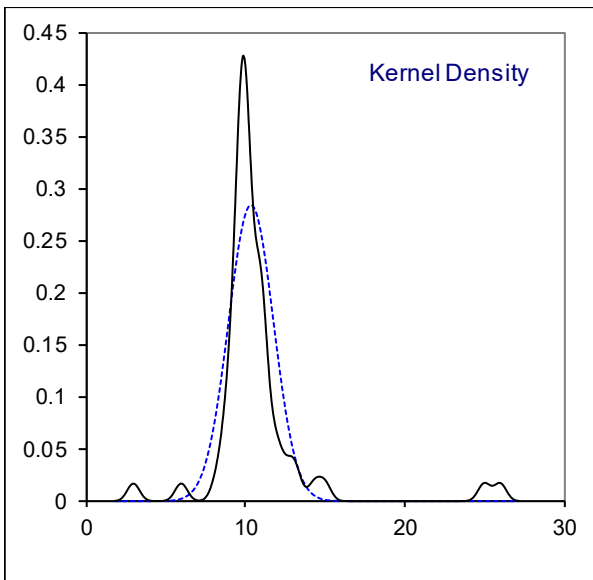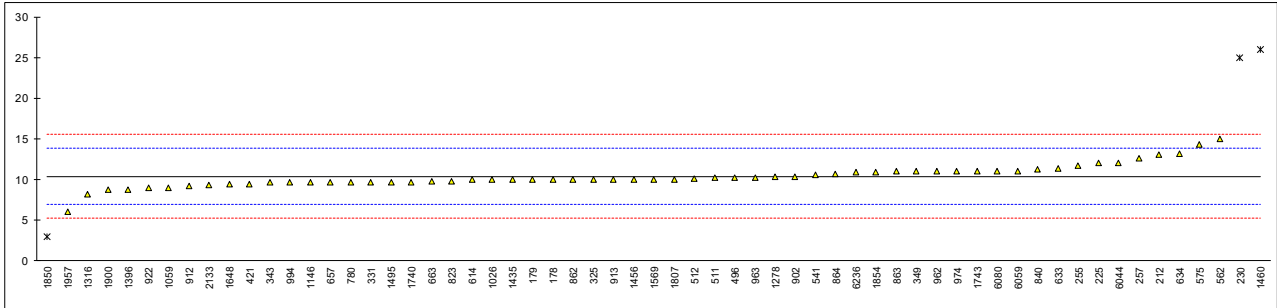
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Determination of Potassium as K on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	<3		-----	
179	D5185	<1		-----	
212	D5185	5		-----	
225	D6595	1		-----	
230	D5185	0.0		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257	D6595	0.84		-----	
311		-----		-----	
325	D5185	1		-----	
331	D5185Mod.	1.0		-----	
333		-----		-----	
343	D5185	<1		-----	
349	D5185	5		-----	
398		-----		-----	
421	D5185	<1,0		-----	
451		-----		-----	
496	D5185	0.791		-----	
511	D5185	0		-----	
512	D5185	0		-----	
541	D5185	<40		-----	
562	D6595	1.9		-----	
575		-----		-----	
614	D5185	3.2		-----	
633	D6595	0.99		-----	
634	D5185	1.210		-----	
657	D5185	< 1		-----	
663	D5185	7.62		-----	
780	D5185	1.8		-----	
823	D5185	0.5		-----	
840	D5185	<5		-----	
862	D5185	<1		-----	
863	D5185	1		-----	
864	D5185	1.0		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
913		-----		-----	
922	D5185	<10		-----	
962		-----		-----	
963	D5185	<1		-----	
974	D5185	<1		-----	
994		-----		-----	
1026		-----		-----	
1059		-----		-----	
1146		-----		-----	
1278	D5185	1.5		-----	
1316	D5185	4.34		-----	
1396		-----		-----	
1435	D5185	1.870		-----	
1456	D5185	0		-----	
1460	D5185	1		-----	
1495		-----		-----	
1569		-----		-----	
1648		-----		-----	
1740	D5185	1.6		-----	
1743	D5185	0.00		-----	
1748		-----		-----	
1807		4.0	C	-----	first reported 14
1850		-----		-----	
1854		-----		-----	
1900	D5185	0		-----	
1957	D5185	1.9		-----	
2133		-----		-----	
6016		-----		-----	
6044	D5185	0		-----	
6059	D5185	1.60		-----	
6080	D5185	<1		-----	
6236	D5185	0.074		-----	
	n	44			
	mean (n)	<40			Application range : 40-1200 mg/kg

Determination of Silicon as Si on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	14		-0.19	
179	D5185	20		1.85	
212	D5185	22	R(0.05)	2.53	
225	D6595	16		0.49	
230	D5185	8.8	C,R(0.05)	-1.96	first reported 0
237		-----		-----	
254		-----		-----	
255		-----		-----	
257	D6595	14.13		-0.15	
311		-----		-----	
325	D5185	16		0.49	
331	D5185Mod.	13.3		-0.43	
333		-----		-----	
343	D5185	13.1		-0.50	
349	D5185	15		0.15	
398		-----		-----	
421	D5185	13.0		-0.53	
451		-----		-----	
496	D5185	14.332		-0.08	
511	D5185	14.28		-0.09	
512	D5185	15.12		0.19	
541	D5185	13.4		-0.39	
562	D6595	16		0.49	
575	D6595	14.9		0.12	
614	D5185	13.7		-0.29	
633	D6595	17.4		0.97	
634	D5185	15.459		0.31	
657	D5185	13.25		-0.44	
663	D5185	14.22		-0.11	
780	D5185	13.9		-0.22	
823	D5185	13.4		-0.39	
840	D5185	15.5		0.32	
862	D5185	14		-0.19	
863	D5185	15		0.15	
864	D5185	14.4		-0.05	
875		-----		-----	
902	D5185	13.85		-0.24	
912		8.6	R(0.05)	-2.02	
913	D5185	13.13		-0.49	
922	D5185	14		-0.19	
962	D5185	14		-0.19	
963	D5185	14.12		-0.15	
974	D5185	16		0.49	
994	D5185	13.46		-0.37	
1026	D5185	10.9		-1.24	
1059	In house	6	R(0.05)	-2.91	
1146	In house	13.81		-0.25	
1278	D5185	15.3		0.25	
1316	D5185	12.7		-0.63	
1396		-----		-----	
1435	D5185	13.09		-0.50	
1456	D5185	15		0.15	
1460	D5185	25	R(0.05)	3.55	
1495		-----		-----	
1569	D5185	14		-0.19	
1648	D5185	12.55		-0.68	
1740	D5185	13.8		-0.26	
1743	D5185	17		0.83	
1748		-----		-----	
1807		18		1.17	
1850		-----		-----	
1854	D5185	14.8		0.08	
1900	D5185	13		-0.53	
1957	D5185	23	R(0.05)	2.87	
2133	D5185	13.000		-0.53	
6016		-----		-----	
6044	D5185	16.338		0.60	
6059	D5185	17.37		0.96	
6080	D5185	15		0.15	
6236	D5185	15.445		0.30	

normality	not OK
n	51
outliers	6
mean (n)	14.558
st.dev. (n)	1.5866
R(calc.)	4.442
st.dev.(D5185:18)	2.9434
R(D5185:18)	8.242

Kernel Density
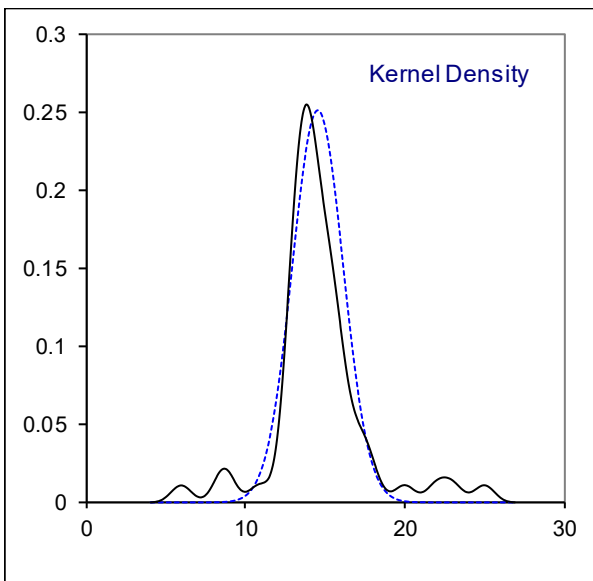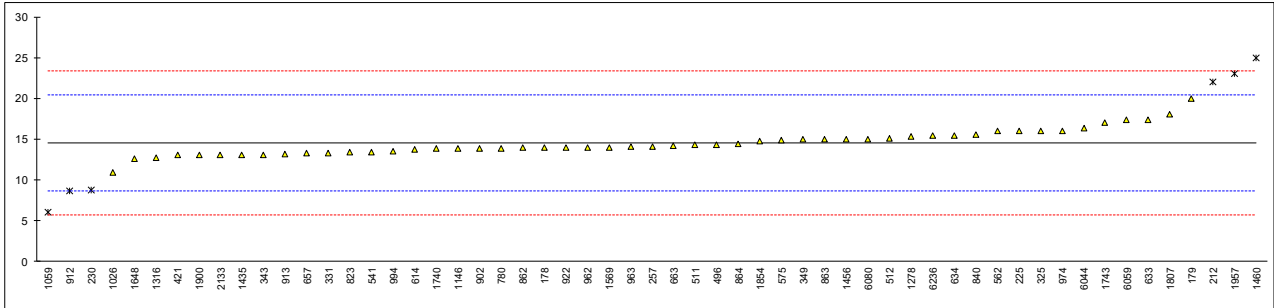
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Determination of Silver as Ag on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	<0.10		-----	
179	D5185	0.14		-----	
212	D5185	5		-----	
225	D6595	0		-----	
230		-----		-----	
237		-----		-----	
254		-----		-----	
255	D6595	0.21		-----	
257		-----		-----	
311		-----		-----	
325	D5185	0		-----	
331	D5185Mod.	<1		-----	
333		-----		-----	
343	D5185	<1		-----	
349	D5185	<2		-----	
398		-----		-----	
421	D5185	<1,0		-----	
451		-----		-----	
496	D5185	0.004		-----	
511	D5185	0		-----	
512	D5185	0		-----	
541	D5185	0.45		-----	
562	D6595	<31		-----	
575	D6595	0.01		-----	
614	D5185	0.0		-----	
633	D6595	0		-----	
634	D5185	0.037		-----	
657	D5185	< 1		-----	
663	D5185	0.00		-----	
780	D5185	<1		-----	
823	D5185	0.9		-----	
840	D5185	<1		-----	
862	D5185	<1		-----	
863	D5185	<1		-----	
864	D5185	<1.0		-----	
875		-----		-----	
902		-----		-----	
912		<1		-----	
913		-----		-----	
922	D5185	<0.5		-----	
962		-----		-----	
963	D5185	0.02		-----	
974	D5185	<1		-----	
994	D5185	<1		-----	
1026		-----		-----	
1059		-----		-----	
1146	In house	0		-----	
1278	D5185	0.588		-----	
1316	D5185	0.02		-----	
1396		-----		-----	
1435	D5185	0		-----	
1456	D5185	0		-----	
1460	D5185	14		-----	possibly a false positive test result?
1495		-----		-----	
1569	D5185	<1		-----	
1648		-----		-----	
1740	D5185	0.3		-----	
1743	D5185	0.02		-----	
1748		-----		-----	
1807		<2,5		-----	
1850	In house	16		-----	possibly a false positive test result?
1854		-----		-----	
1900	D5185	0		-----	
1957	D5185	8		-----	possibly a false positive test result?
2133	D5185	0.141		-----	
6016		-----		-----	
6044	D5185	0		-----	
6059	D5185	0.10		-----	
6080	D5185	<1		-----	
6236	D5185	0		-----	
	n	46			
	mean (n)	<5			Application range : 0.5 – 50 mg/kg

Determination of Sodium as Na on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	3		0.68	
179	D5185	3		0.68	
212	D5185	7	R(0.05)	6.00	
225	D6595	3.2		0.94	
230	D5185	1.0		-1.99	
237		-----		-----	
254		-----		-----	
255	D6595	4.84		3.13	
257	D6595	3.41		1.22	
311		-----		-----	
325	D5185	3		0.68	
331	D5185Mod.	<2		-----	
333		-----		-----	
343	D5185	2.4		-0.12	
349	D5185	2		-0.65	
398		-----		-----	
421	D5185	2.0		-0.65	
451		-----		-----	
496	D5185	2.357		-0.18	
511	D5185	1.89		-0.80	
512	D5185	1.68		-1.08	
541	D5185	<7		-----	
562	D6595	5.2		3.61	
575	D6595	2.45		-0.06	
614	D5185	2.35		-0.19	
633	D6595	3.16		0.89	
634		-----		-----	
657	D5185	< 1		-----	
663	D5185	0.00		-3.32	
780	D5185	2.7		0.28	
823	D5185	0.1		-3.18	
840	D5185	3.5		1.34	
862	D5185	2		-0.65	
863	D5185	3		0.68	
864	D5185	2.3		-0.25	
875		-----		-----	
902	D5185	2.15		-0.45	
912		-----		-----	
913		-----		-----	
922	D5185	<7		-----	
962	D5185	2		-0.65	
963	D5185	2.64		0.20	
974	D5185	5		3.34	
994	D5185	<7		-----	
1026	D5185	2.66		0.22	
1059		-----		-----	
1146	In house	2.561		0.09	
1278	D5185	2.705		0.28	
1316	D5185	1.66		-1.11	
1396		-----		-----	
1435	D5185	1.499		-1.32	
1456	D5185	0.7		-2.39	
1460	D5185	14	R(0.01)	15.32	
1495		-----		-----	
1569	D5185	<1		-----	
1648		-----	W	-----	test result withdrawn. First reported 8.62
1740	D5185	1.8		-0.92	
1743	D5185	1.7		-1.05	
1748		-----		-----	
1807		4.0	C	2.01	first reported 12
1850		-----		-----	
1854	D5185	2.7		0.28	
1900	D5185	3		0.68	
1957	D5185	0		-3.32	
2133	D5185	1.725		-1.02	
6016		-----		-----	
6044	D5185	1.630		-1.15	
6059	D5185	3.94		1.93	
6080	D5185	5		3.34	
6236	D5185	2.512		0.03	

normality	OK
n	45
outliers	2
mean (n)	2.492
st.dev. (n)	1.2057
R(calc.)	3.376
st.dev.(D5185:18)	0.7511
R(D5185:18)	2.103

Application range : 7 – 70 mg/kg
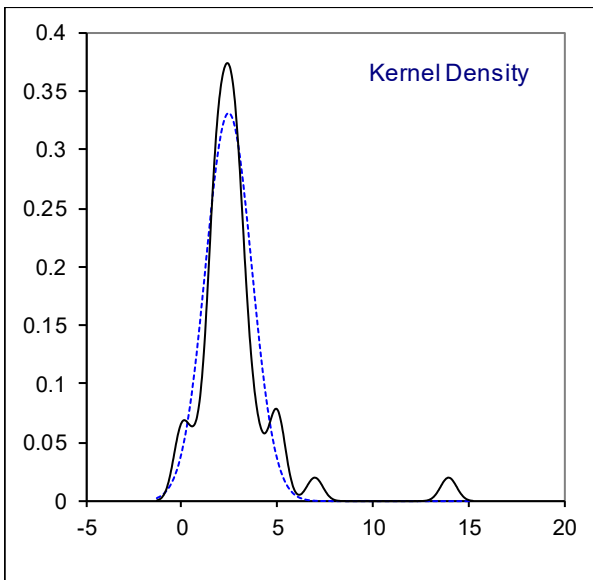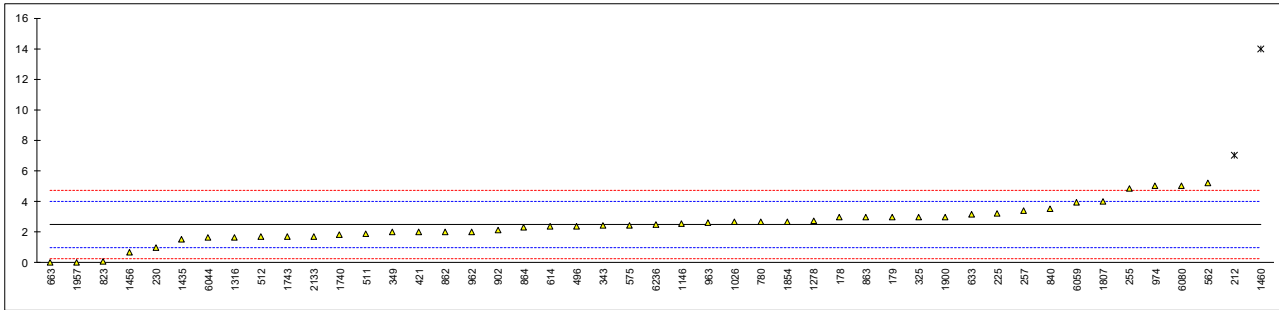
Determination of Tin as Sn on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	1		-----	
179	D5185	1		-----	
212	D5185	2		-----	
225	D6595	0		-----	
230	D5185	3.3	C	-----	first reported 20.8
237		-----		-----	
254		-----		-----	
255		-----		-----	
257		-----		-----	
311		-----		-----	
325	D5185	1		-----	
331	D5185Mod.	<1		-----	
333		-----		-----	
343	D5185	<1		-----	
349	D5185	4		-----	
398		-----		-----	
421	D5185	3.4		-----	
451		-----		-----	
496	D5185	3.138		-----	
511	D5185	0		-----	
512	D5185	0		-----	
541	D5185	<10		-----	
562	D6595	<30		-----	
575	D6595	0.00		-----	
614	D5185	0.20		-----	
633	D6595	0		-----	
634	D5185	0.000		-----	
657	D5185	< 1		-----	
663	D5185	0.66		-----	
780	D5185	<1		-----	
823	D5185	2.4		-----	
840	D5185	3.0		-----	
862	D5185	<1		-----	
863	D5185	<1		-----	
864	D5185	<1.0		-----	
875		-----		-----	
902		-----		-----	
912		<1		-----	
913	D5185	4.57		-----	
922	D5185	<10		-----	
962		-----		-----	
963	D5185	<1		-----	
974	D5185	1		-----	
994	D5185	<10		-----	
1026	D5185	0.425		-----	
1059	In house	<8		-----	
1146	In house	3.109		-----	
1278	D5185	3.74		-----	
1316	D5185	2.37		-----	
1396		-----		-----	
1435	D5185	0.5792		-----	
1456	D5185	2.8		-----	
1460	D5185	15		-----	possibly a false positive test result?
1495	IP PM-ED/09	3.2		-----	
1569	D5185	2		-----	
1648	D5185	1.17		-----	
1740	D5185	0.8		-----	
1743	D5185	0.38		-----	
1748		-----		-----	
1807		<2,5		-----	
1850	In house	15		-----	possibly a false positive test result?
1854	D5185	<1		-----	
1900	D5185	0		-----	
1957	D5185	0		-----	
2133	D5185	0.344		-----	
6016		-----		-----	
6044	D5185	0		-----	
6059	D5185	0.60		-----	
6080	D5185	0.7		-----	
6236	D5185	0.640		-----	
	n	53			
	mean (n)	<10			Application range : 10 – 40 mg/kg

Determination of Titanium as Ti on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D5185	<1		-----	
212	D5185	6		-----	possibly a false positive test result?
225	D6595	0.4		-----	
230	D5185	1.6		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
257	D6595	0.0		-----	
311		-----		-----	
325	D5185	0		-----	
331	D5185Mod.	<1		-----	
333		-----		-----	
343	D5185	<1		-----	
349	D5185	<2		-----	
398		-----		-----	
421	D5185	<1,0		-----	
451		-----		-----	
496	D5185	0.182		-----	
511	D5185	0		-----	
512	D5185	0		-----	
541	D5185	<5		-----	
562	D6595	<6.8		-----	
575	D6595	0.15		-----	
614	D5185	0.1		-----	
633	D6595	0		-----	
634	D5185	0.375		-----	
657	D5185	< 1		-----	
663	D5185	0.00		-----	
780	D5185	<1		-----	
823	D5185	0.1		-----	
840	D5185	<5		-----	
862	D5185	<1		-----	
863	D5185	<1		-----	
864	D5185	<1.0		-----	
875		-----		-----	
902		-----		-----	
912		<1		-----	
913		-----		-----	
922	D5185	<5		-----	
962		-----		-----	
963	D5185	0.15		-----	
974		-----		-----	
994	D5185	<5		-----	
1026	D5185	0.152		-----	
1059		-----		-----	
1146	In house	0.0805		-----	
1278	D5185	0.04		-----	
1316	D5185	0.12		-----	
1396		-----		-----	
1435	D5185	0.2131		-----	
1456	D5185	0.1		-----	
1460	D5185	14		-----	possibly a false positive test result?
1495		-----		-----	
1569		-----		-----	
1648		-----		-----	
1740	D5185	0.5		-----	
1743	D5185	0.15		-----	
1748		-----		-----	
1807		<2,5		-----	
1850		-----		-----	
1854	D5185	<1		-----	
1900	D5185	0		-----	
1957	D5185	0		-----	
2133	D5185	0.352		-----	
6016		-----		-----	
6044	D5185	0.239		-----	
6059	D5185	0.20		-----	
6080	D5185	<1		-----	
6236	D5185	0.057		-----	
	n	46			
	mean (n)	<5			

Determination of Vanadium as V on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	<1		-----	
179	D5185	<1		-----	
212	D5185	0		-----	
225	D6595	0		-----	
230	D5185	0.0		-----	
237		-----		-----	
254		-----		-----	
255	D6595	0.55		-----	
257	D6595	0.18		-----	
311		-----		-----	
325	D5185	0		-----	
331	D5185Mod.	<1		-----	
333		-----		-----	
343	D5185	<1		-----	
349	D5185	<2		-----	
398		-----		-----	
421	D5185	<1,0		-----	
451		-----		-----	
496	D5185	0.022		-----	
511	D5185	0		-----	
512	D5185	0		-----	
541	D5185	<1.0		-----	
562	D6595	<2.1		-----	
575	D6595	0.52		-----	
614	D5185	0.0		-----	
633	D6595	0.37		-----	
634	D5185	0.419		-----	
657	D5185	< 1		-----	
663	D5185	0.02		-----	
780	D5185	<1		-----	
823	D5185	<0.1		-----	
840	D5185	<1		-----	
862	D5185	<1		-----	
863	D5185	<1		-----	
864	D5185	<1.0		-----	
875		-----		-----	
902	D5185	<1		-----	
912		<1		-----	
913		-----		-----	
922	D5185	<1		-----	
962		-----		-----	
963	D5185	0.02		-----	
974	D5185	1		-----	
994	D5185	<1		-----	
1026	D5185	0.019		-----	
1059	In house	<4		-----	
1146	In house	0.0430		-----	
1278	D5185	0.04		-----	
1316	D5185	0.02		-----	
1396	In house	<1		-----	
1435	D5185	0.0227		-----	
1456	D5185	0		-----	
1460	D5185	13		-----	possibly a false positive test result?
1495	IP PM-ED/09	3.3		-----	possibly a false positive test result?
1569	D5185	<1		-----	
1648	D5185	0.55		-----	
1740	D5185	0.8		-----	
1743	D5185	0.01		-----	
1748		-----		-----	
1807		<2,5		-----	
1850	In house	3		-----	possibly a false positive test result?
1854	D5185	<1		-----	
1900	D5185	0		-----	
1957	D5185	0		-----	
2133	D5185	0.010		-----	
6016		-----		-----	
6044	D5185	0		-----	
6059	D5185	0.10		-----	
6080	D5185	0.48		-----	
6236	D5185	0.027		-----	
	n	52			
	mean (n)	<1			Application range : 1 - 50 mg/kg

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Determination of Calcium as Ca on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	2936		-0.78	
179	D5185	3119		0.21	
212	D5185	2924		-0.85	
225	D6595	2772		-1.68	
230	D5185	2992.7		-0.47	
237		-----		-----	
254		-----		-----	
255	D6595	4223	R(0.01)	6.23	
257	D6595	2233	R(0.01)	-4.61	
311		-----		-----	
325	D5185	2989		-0.49	
331	D5185Mod.	2952.7		-0.69	
333		-----		-----	
343	D5185	3088		0.05	
349	D5185	3206		0.69	
398		-----		-----	
421	D5185	3056		-0.13	
451		-----		-----	
496	D5185	3084		0.02	
511	D5185	3089		0.05	
512	D5185	3094		0.08	
541	D5185	3097.1		0.09	
562	D6595	2750		-1.80	
575	D6595	3186		0.58	
614	D5185	2934		-0.79	
633	D6595	3135		0.30	
634		-----		-----	
657	D5185	3260		0.98	
663	D5185	2971.2		-0.59	
780	D5185	3065		-0.08	
823	D5185	3302		1.21	
840	D5185	3235		0.85	
862	D5185	3105		0.14	
863	D5185	3114		0.19	
864	D5185	3121		0.22	
875		-----		-----	
902	D5185	3270		1.04	
912		2994		-0.47	
913	D5185	3054		-0.14	
922	D5185	3038		-0.23	
962	D5185	3156		0.42	
963	D5185	3106.3		0.14	
974	D5185	3119		0.21	
994	D5185	3031		-0.27	
1026	D5185	3410		1.80	
1059	In house	2958		-0.66	
1146	In house	3091		0.06	
1278	D5185	3110.4		0.17	
1316	D5185	2758		-1.75	
1396		-----		-----	
1435	D5185	2874		-1.12	
1456	D5185	3494		2.26	
1460	D5185	3172		0.50	
1495	IP PM-ED/09	1276.6	R(0.01)	-9.82	
1569	D5185	2605		-2.58	
1648	D5185	3012.0		-0.37	
1740	D5185	3082		0.01	
1743	D5185	3280		1.09	
1748		-----		-----	
1807		3130		0.27	
1850	In house	2930		-0.82	
1854	D5185	3250		0.93	
1900	D5185	2995		-0.46	
1957	D5185	2918		-0.88	
2133	D5185	3112.356		0.18	
6016		-----		-----	
6044	D5185	3125.03		0.25	
6059	D5185	3426.0		1.89	
6080	D5185	3120		0.22	
6236	D5185	3264.590		1.01	

normality	suspect
n	56
outliers	3
mean (n)	3079.7
st.dev. (n)	164.02
R(calc.)	459.2
st.dev.(D5185:18)	183.65
R(D5185:18)	514.2
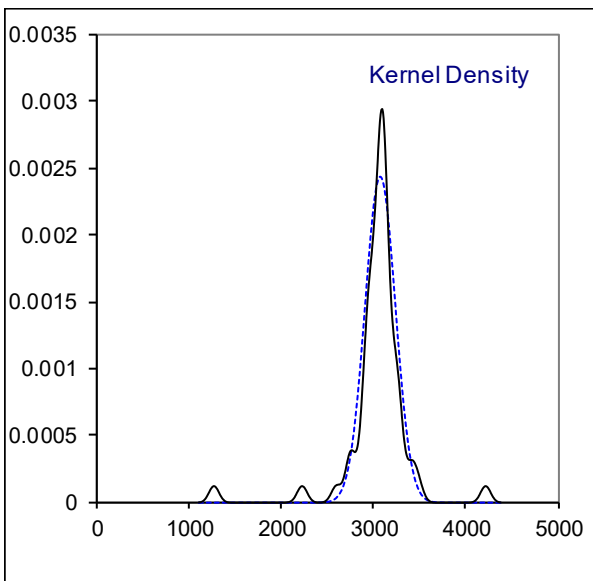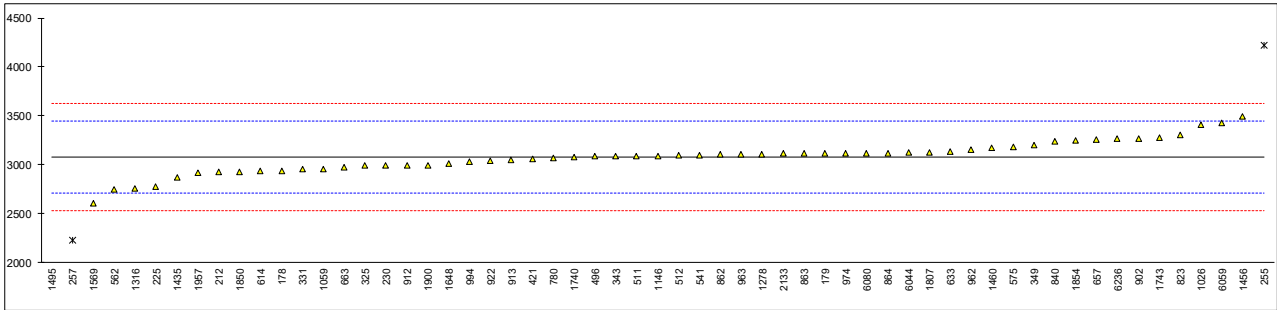
Determination of Phosphorus as P on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	1003		-1.12	
179	D5185	1060		0.02	
212	D5185	2023	R(0.01)	19.29	
225	D6595	1150		1.82	
230	D5185	675	C,R(0.01)	-7.68	first reported 1683.6
237		-----		-----	
254		-----		-----	
255	D6595	1122		1.26	
257	D6595	1113		1.08	
311		-----		-----	
325	D5185	1126		1.34	
331	D5185Mod.	1036.3		-0.45	
333		-----		-----	
343	D5185	1045		-0.28	
349	D5185	1075		0.32	
398		-----		-----	
421	D5185	1011		-0.96	
451		-----		-----	
496	D5185	1046		-0.26	
511	D5185	1024		-0.70	
512	D5185	1060		0.02	
541	D5185	1046.2		-0.26	
562	D6595	1132		1.46	
575	D6595	1184		2.50	
614	D5185	1009		-1.00	
633	D6595	1169		2.20	
634		-----		-----	
657	D5185	1060		0.02	
663	D5185	967.1		-1.84	
780	D5185	1100		0.82	
823	D5185	1151		1.84	
840	D5185	1064		0.10	
862	D5185	1047		-0.24	
863	D5185	1013		-0.92	
864	D5185	1038		-0.42	
875		-----		-----	
902	D5185	1034		-0.50	
912		1037		-0.44	
913	D5185	1047		-0.24	
922	D5185	1020		-0.78	
962	D5185	1058		-0.02	
963	D5185	1064.6		0.11	
974	D5185	1040		-0.38	
994	D5185	1057		-0.04	
1026	D5185	1133		1.48	
1059	In house	980		-1.58	
1146	In house	1025		-0.68	
1278	D5185	999.47		-1.19	
1316	D5185	885		-3.48	
1396		-----		-----	
1435	D5185	966.9		-1.84	
1456	D5185	1120		1.22	
1460	D5185	1202		2.86	
1495		-----		-----	
1569	D5185	861		-3.96	
1648	D5185	1006.6		-1.05	
1740	D5185	1012		-0.94	
1743	D5185	1070		0.22	
1748		-----		-----	
1807		1075		0.32	
1850	In house	1430	R(0.01)	7.42	
1854	D5185	1026		-0.66	
1900	D5185	944		-2.30	
1957	D5185	989		-1.40	
2133	D5185	1115.578		1.13	
6016		-----		-----	
6044	D5185	1265.10		4.12	
6059	D5185	1151.0		1.84	
6080	D5185	1053		-0.12	
6236	D5185	1155.810		1.94	

normality	OK
n	55
outliers	3
mean (n)	1059.0
st.dev. (n)	73.83
R(calc.)	206.7
st.dev.(D5185:18)	49.98
R(D5185:18)	139.9

Kernel Density
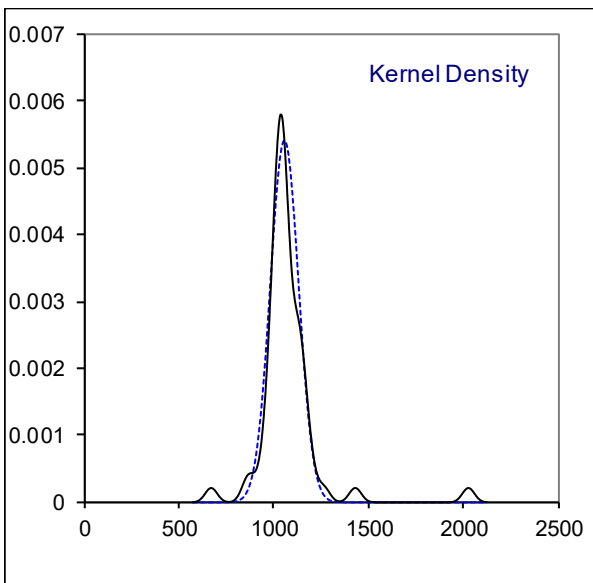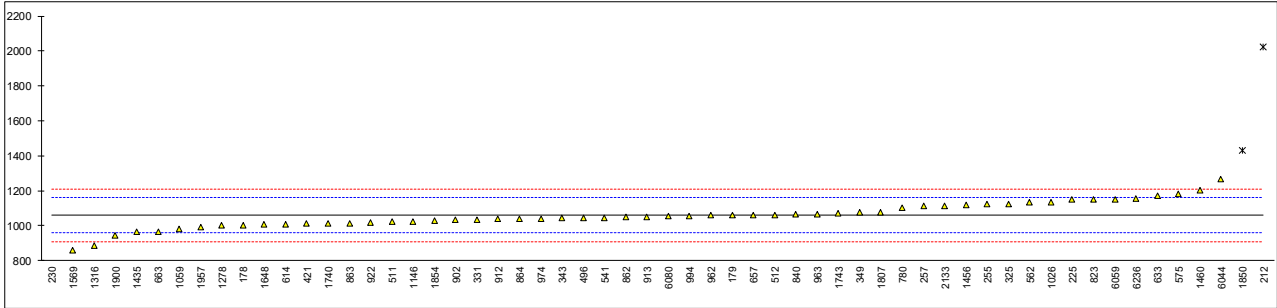
Determination of Zinc as Zn on sample #19097; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D5185	1247		0.04	
179	D5185	1184		-0.80	
212	D5185	1262		0.24	
225	D6595	1200		-0.58	
230	D5185	27	C,R(0.01)	-16.18	first reported 2218.3
237		-----		-----	
254		-----		-----	
255	D6595	1104		-1.86	
257	D6595	1231		-0.17	
311		-----		-----	
325	D5185	1314		0.93	
331	D5185Mod.	1275.0		0.41	
333		-----		-----	
343	D5185	1285		0.55	
349	D5185	1271		0.36	
398		-----		-----	
421	D5185	1300		0.75	
451		-----		-----	
496	D5185	1336		1.23	
511	D5185	1260		0.21	
512	D5185	1280		0.48	
541	D5185	1256.1		0.16	
562	D6595	1280		0.48	
575	D6595	1183		-0.81	
614	D5185	1213		-0.41	
633	D6595	1221		-0.30	
634		-----		-----	
657	D5185	1336		1.23	
663	D5185	1273.4		0.39	
780	D5185	1325		1.08	
823	D5185	1232		-0.16	
840	D5185	1276		0.43	
862	D5185	1233		-0.14	
863	D5185	1223		-0.28	
864	D5185	1289		0.60	
875		-----		-----	
902	D5185	1263		0.25	
912		1226		-0.24	
913	D5185	1200		-0.58	
922	D5185	1243		-0.01	
962	D5185	1296		0.69	
963	D5185	1262.7		0.25	
974	D5185	1263		0.25	
994	D5185	1285		0.55	
1026	D5185	1312		0.91	
1059	In house	1233		-0.14	
1146	In house	1269		0.33	
1278	D5185	1239.8		-0.05	
1316	D5185	1035		-2.78	
1396	In house	1086.7		-2.09	
1435	D5185	1080		-2.18	
1456	D5185	1290		0.61	
1460	D5185	1266		0.29	
1495	IP PM-ED/09	604.4	R(0.01)	-8.50	
1569	D5185	1082		-2.15	
1648	D5185	1151.8		-1.22	
1740	D5185	1235		-0.12	
1743	D5185	1295		0.68	
1748		-----		-----	
1807		1240		-0.05	
1850	In house	1220		-0.32	
1854	D5185	1250		0.08	
1900	D5185	1248		0.05	
1957	D5185	1081		-2.17	
2133	D5185	1279.665		0.48	
6016		-----		-----	
6044	D5185	1710.51	R(0.01)	6.21	
6059	D5185	1392.0		1.97	
6080	D5185	1371		1.69	
6236	D5185	1315.980		0.96	

normality	suspect
n	57
outliers	3
mean (n)	1243.9
st.dev. (n)	72.40
R(calc.)	202.7
st.dev.(D5185:18)	75.19
R(D5185:18)	210.5
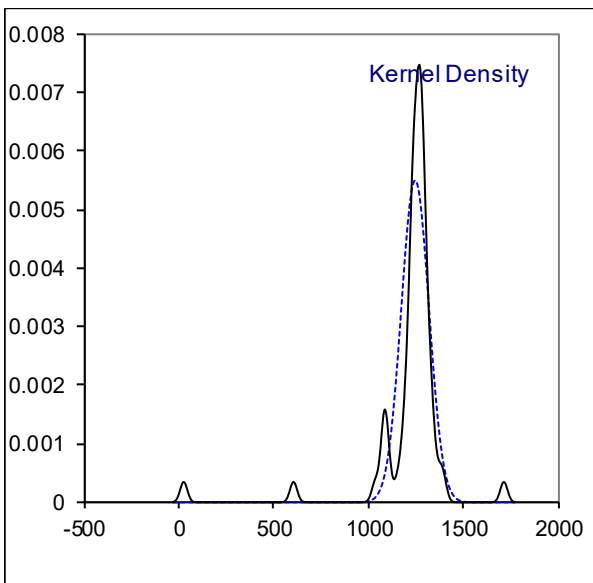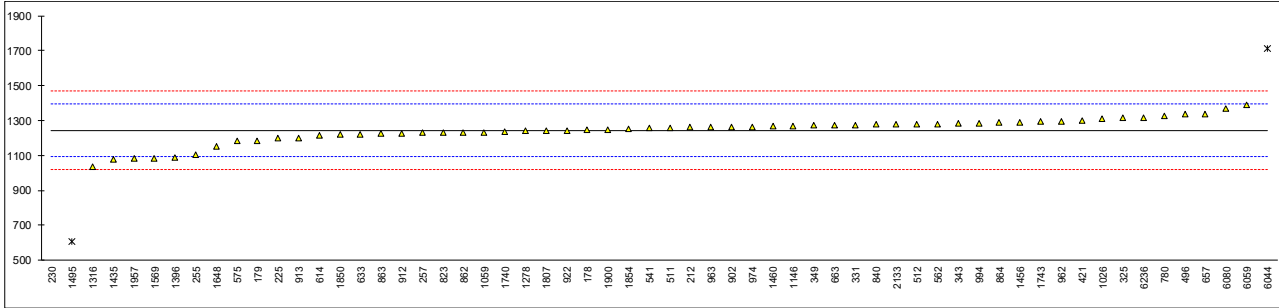
APPENDIX 2

Number of participants per country

1 lab in ARGENTINA
2 labs in AUSTRALIA
1 lab in AZERBAIJAN
3 labs in BELGIUM
1 lab in BRUNEI
1 lab in CHILE
3 labs in CHINA, People's Republic
1 lab in COLOMBIA
1 lab in COTE D'IVOIRE
1 lab in CROATIA
1 lab in CZECH REPUBLIC
1 lab in DENMARK
3 labs in FRANCE
1 lab in GERMANY
4 labs in GREECE
2 labs in INDIA
1 lab in INDONESIA
1 lab in ITALY
1 lab in JORDAN
1 lab in KAZAKHSTAN
1 lab in KENYA
4 labs in MALAYSIA
1 lab in MAURITIUS
3 labs in MOROCCO
3 labs in NETHERLANDS
4 labs in NIGERIA
2 labs in NORWAY
1 lab in PAKISTAN
2 labs in PERU
2 labs in PHILIPPINES
2 labs in RUSSIAN FEDERATION
3 labs in SAUDI ARABIA
1 lab in SINGAPORE
1 lab in SLOVENIA
1 lab in SOUTH KOREA
7 labs in SPAIN
1 lab in SWEDEN
2 labs in TANZANIA
1 lab in THAILAND
1 lab in TURKEY
2 labs in UNITED ARAB EMIRATES
2 labs in UNITED KINGDOM
2 labs in UNITED STATES OF AMERICA
2 labs 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
ex   = test result excluded from the statistical evaluation
W   = test result withdrawn on request of the participants
fr.   = first reported test result
n.a.   = not applicable
n.e.   = not evaluated
n.d.   = not detected
SDS   = Material Safety Data Sheet

Literature:

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