Results of Proficiency Test
Used Lubricating Oil
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Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 1997, a proficiency test for used Lubricating Oil is organized every year by the Institute for Interlaboratory Studies. During the annual proficiency testing program 2013/2014, it was decided to continue the round robin for the analyses of used Lubricating Oil. In this interlaboratory study, 97 laboratories in 52 different countries have participated. See appendix 2 for the number of participants per country. In this report, the results of the 2014 used Lubricating Oil proficiency test are presented and discussed. This report is also electronically available through the iis internet site www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test. It was decided to send three different samples of used Lubricating Oil, one bottle of 0.5L (labelled #14081), one bottle of 100 mL, 25% filled (labelled #14082) and one bottle of 0.5L (labelled #14083), all donated by one of the participating laboratories. The analyses for fit-for-use and homogeneity were subcontracted. Participants were requested to report rounded and unrounded results. The unrounded 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/IEC 17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentially of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organisation was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of April 2014 (iis-protocol, version 3.3). This protocol can be downloaded from the iis website http://www.iisnl.com.

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

In this proficiency test three different samples were used. The necessary bulk material for the first sample, used Lubricating Oil, was donated by a third party laboratory. This sample from the field contained a high amount of water. Because this water content could interfere with some of the tests, it was decided to limit the amount of testing on this sample and add another sample to this PT.

The necessary 60 litre bulk material was homogenised in a precleaned 60L drum. After homogenisation, 112 subsamples were transferred to 0.5 L brown glass bottles and labelled #14081. The homogeneity of the subsamples #14081 was checked by determination of Density @ 15 °C in accordance with ISO12185:96, Kinematic Viscosity @ 40°C in accordance with ASTM D445:12 and Water in accordance with ASTM D6304:07-C on 8 stratified randomly selected samples.

	Density @ 15 °C in kg/L	Viscosity @ 40°C in mm^2/s	Water in mg/kg
Sample #14081-1	0.89653	105.3	16700
Sample #14081-2	0.89648	105.3	16900
Sample #14081-3	0.89680	105.3	16900
Sample #14081-4	0.89660	105.4	16600
Sample #14081-5	0.89650	105.2	16600
Sample #14081-6	0.89648	105.3	16300
Sample #14081-7	0.89681	105.3	16800
Sample #14081-8	0.89676	105.4	16400

Table 1: homogeneity test results of subsamples #14081

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

	Density @ 15 °C in kg/L	Viscosity @ 40°C in mm^2/s	Water in mg/kg
r (sample #14081)	0.00041	0.18	620
reference test	ASTM ISO12185:96	iis MEMO (ref 14)	ASTM D6304:07 proc.C
0.3 * R (reference test)	0.00045	0.57	1730

Table 2: evaluation of repeatabilities of the subsamples #14081

The second bulk material, used Lubricating Oil, enriched with several wear metals, was also obtained from a third party laboratory. The approximately 3 L bulk material was homogenised in a precleaned can. After homogenisation, 110 subsamples were transferred to 100 mL PE bottles, each filled with approximately 25 mL material and labelled #14082. The homogeneity of the subsamples #14082 was checked by determination of Copper and Nickel both in accordance with ASTM D5185:13 on 8 stratified randomly selected samples.

	Copper in mg/kg	Nickel in mg/kg
Sample #14082-1	11.2	7.5
Sample #14082-2	11.0	7.3
Sample #14082-3	11.0	7.5
Sample #14082-4	10.7	7.1
Sample #14082-5	11.1	7.0
Sample #14082-6	10.7	7.0
Sample #14082-7	10.5	7.0
Sample #14082-8	11.0	6.7

Table 3: homogeneity test results of subsamples #14082

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

	Copper in mg/kg	Nickel in mg/kg
r (sample #13064)	0.67	0.78
reference test	ASTM D5185:09	ASTM D5185:09
0.3 * R (reference test)	0.78	1.20

Table 4: evaluation of repeatabilities of the subsamples #14082

For the third sample, 60 litre bulk material was homogenised in a precleaned 60L drum. After homogenisation, 107 subsamples were transferred to 0.5 L brown glass bottles and labelled #14083. The homogeneity of the subsamples #14083 was checked by determination of Density @ 15 °C in accordance with ISO12185:96 and Water in accordance with ASTM D6304:07-C on 4 stratified randomly selected samples.

	Density @ 15 ^{o}C in kg/L	Water in mg/kg.
Sample #14083-1	0.89698	1515
Sample #14083-2	0.89707	1386
Sample #14083-3	0.89698	1438
Sample #14083-4	0.89697	1446

Table 5: homogeneity test results of subsamples #14083

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

	Density @ 15 ^{o}C in kg/L	Water in mg/kg
r (sample #14081)	0.00013	148
reference test	ISO12185:96	ASTM D6304:07 proc.C
0.3 * R (reference test)	0.00045	399

Table 6: evaluation of repeatabilities of the subsamples #14081

The calculated repeatabilities are all less than 0.3 times the corresponding reproducibilities of the reference methods. Therefore, homogeneity of the subsamples #14081, #14082 and #14083 was assumed.

To each of the participating laboratories three samples of used Lubricating Oil (1*0.5 L brown glass bottle labelled #14081, 1*100 mL PE bottle labelled #14082 and 1*0.5 L brown glass bottle labelled #14083) were sent on May 21, 2014.

2.5 STABILITY OF THE SAMPLES

The stability of Lubricating Oil, packed in the brown 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 #14081: Acid Number (Total), Base Number (Total and Strong), Density @ 15°C, Flash Point PMcc, Analysis run time, Fuel Dilution, Kinematic Viscosity @ 40°C, Kinematic Viscosity by Houillon @ 40°C and Water. The participants were requested to determine 20 elements (Wear metals: Ag, Al, Ba, Cr, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni,

Na, Si, Sn, Ti and V and the additives Ca, P and Zn) on sample #14082. The participants were requested to determine on sample #14083: Acid Number (Total), Base Number (Total and Strong), Density @ 15°C, Flash Point PMcc, Analysis run time, Fuel Dilution, Kinematic Viscosity @ 40°C and @100°C, Viscosity Index, Kinematic Viscosity by Houillon @ 40°C and @ 100°C and Water.

To get comparable results a detailed report form, on which the units were prescribed as well as some of the required standards and a letter of instructions were prepared and made available for download on the iis website www.iisnl.com. A SDS and a form to confirm receipt of the samples were added to the sample package

3 RESULTS

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

Directly after the deadline, a reminder fax was sent to those laboratories that had not reported results at that moment.
Shortly after the deadline, the available results were screened for suspect data. A result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the results. Additional or corrected results are used for data analysis and original results are placed under 'Remarks' in the result tables in appendix 1.

3.1 STATISTICS

Statistical calculations were performed as described in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ of April 2014 (iis-protocol, version 3.3). For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded results. 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. Not all data sets proved to have a normal distribution, in which cases the statistical evaluation of the results should be used with due care.
According to ISO 5725 the original results per determination were submitted to Dixon’s and/or 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 (ref. 15). Stragglers are marked by D(0.05) for the Dixon’s test, by G(0.05) or DG(0.05) for the Grubbs’ test and by R(0.05) for the Rosner’s test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.
For each assigned value the uncertainty was determined in accordance with ISO13528.
Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. When the uncertainty passed the evaluation no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.

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

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data per determination (see appendix 1). On the Y-axis the reported analysis results are plotted. The corresponding laboratory numbers are under the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected standard. Outliers and other data, which were excluded from the calculations, are represented as a “x”. Accepted data are represented as a triangle. Furthermore, Kernel Density Graphs were made. The Kernel Density is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms (see appendix 3; nos.12 and 13). 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 target standard deviation was calculated from the literature reproducibility by division with 2.8.

The z-scores were calculated according to:

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

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

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

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

	$\lvert z \rvert < 1$	good
$1 <$	$\lvert z \rvert < 2$	satisfactory
$2 <$	$\lvert z \rvert < 3$	questionable
$3 <$	$\lvert z \rvert$	unsatisfactory

4 EVALUATION

In this interlaboratory study, several problems with sample despatch were encountered. Laboratories in Azerbaijan, Chile, Jordan, Malaysia, Nigeria, Norway, Saudi Arabia, Sudan, Thailand and Turkey received the samples late. Twenty participants reported after the final reporting date and nine

participants did not report any results at all due to several reasons. Not all laboratories were able to report all analyses requested. In total 88 participants reported 2150 results. Observed were 61 outlying results, which is 2.8% of the numerical results. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

In the iis PT reports, ASTM methods are referred to with a number (e.g. D2086) and an added designation for the year that the method was adopted or revised (e.g. D2086:08). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D2086:08(2013)). In the results tables of Appendix 1 only the method number and year of adoption or revision e.g. D2086:08 will be used.

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 4.4

4.1 EVALUATION PER TEST

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

As used Lubricating Oil is a very difficult matrix to analyze, 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 standard. 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.

Sample #14081:

Acid Number (Total): This determination was problematic. No statistical outliers were observed. Two test results were excluded from the statistical calculations as the reported test method is not equivalent with ASTM D664. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTM D664:11a. Differences in sample intake may (partly) explain the large spread (see also proficiency test iis13L02).

Base Number (Total): This determination was very problematic. No statistical outliers were observed. One test result was excluded from the statistical calculations as the reported test method is not equivalent with ASTM D2896:11. The calculated reproducibility after rejection of the suspect data is not at all in agreement with the requirements of ASTM D2896:11.

Base Number (Strong): This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of ASTM D4739:11.

Density @ 15°C: This determination was not problematic. Two statistical outliers were observed.

The calculated reproducibility, after rejection of the statistical outliers is in good agreement with the requirements of ISO12185:96.

Flash Point PMcc: This determination was very problematic. The observed spread is extremely large. In sample #14081 a large amount of water was present and possibly a number of laboratories did not remove the water prior to the flash point determination (paragraph 8.7 of ASTM D93), thus resulting in deviating flash points.
As it is not clear which sub method of ASTM D93 should be followed, it was decided to evaluate both procedures (A for in-use oils and B for used oils) separately. For both procedures no suitable consensus value could be determined, therefore, no significant conclusions were drawn.

Fuel dilution: This determination was very problematic. No statistical outliers were observed, but one test result was excluded from statistical calculations as the laboratory reported to have used ASTM E2412, a test method that is not equivalent with ASTM D3524. The calculated reproducibility after rejection of the suspect data is not at all in agreement with the requirements of ASTM D3524:14.

Kin.Visco.@ 40°C: This determination was not problematic. No statistical outliers were observed. The reproducibility for used oils is not present in ASTM D445:12 (see §17.3). Therefore the target reproducibility is calculated from the reproducibilities found in iis PT's on used oils (see appendix 3, ref. 14). The calculated reproducibility is in good agreement with the average reproducibility found for used oils in previous iis PTs.

Kin.Visco.@ 40°C: (Houillon) This determination was not problematic. One statistical outlier was observed and one test result was excluded from the statistical calculations as the laboratory reported probably a value for Viscosity @100ºC. However, the calculated reproducibility after rejection of the suspect data is in good agreement with the requirements of ASTM D7279:08.

Water: This determination was problematic for a number of laboratories. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D6304:07.

Sample #14082: Wear metals

Nine laboratories reported to have used ASTM D6595. This test method is used for the quantification of elements from dissolved materials to particles approximately 10 µm in size, while test method ASTM D5185 does not purport to quantitatively determine insoluble particles larger than a few micrometers. When the ASTM D6595 data for the elements Aluminium, Chromium, Nickel, Manganese and Sodium were evaluated separately, the D6595 averages were significantly higher than the averages of all data for these elements. This suggests the presence of particles larger than a few micrometers.

Aluminium: This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in good agreement with the requirements of ASTM D5185:13e1.

Barium: This determination may not be problematic. Two statistical outliers were observed. Although all reported results are above the application range (0.5 - 4 mg/kg), the calculated reproducibility after rejection of the statistical outliers is in good agreement with the estimated extrapolated requirements of ASTM D5185:13e1.

Chromium: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D5185:13e1. However, when the ASTM D5185 data is evaluated separately, the calculated reproducibility is in full agreement with the requirements the standard.

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 D5185:13e1. When the ASTM D5185 data is evaluated separately, the calculated reproducibility is not in agreement with the requirements the standard.

Iron: This determination was problematic for a number of laboratories. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D5185:13e1. When the ASTM D5185 data is evaluated separately, the calculated reproducibility is smaller and in agreement with the requirements the standard.

Lead: This determination may not be problematic. Three statistical outliers were observed. Although almost all reported results are below the application range (10 - 160 mg/kg), the calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated extrapolated requirements of ASTM D5185:13e1.

Lithium: Regretfully, for this element no test method with precision data was available, therefore, the Horwitz equation was used to estimate the reproducibility limits. This determination may not be problematic. Two statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers is in full agreement with the strict estimated requirements, calculated using the Horwitz equation.

Magnesium: This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in full agreement with the requirements of ASTM D5185:13e1.

Manganese: This determination was very problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D5185:13e1. When the ASTM D5185 data is evaluated separately, the calculated reproducibility is smaller but again not in agreement with the requirements the standard.

Molybdenum: This determination was problematic for a number of laboratories. Three statistical outliers were observed. However, the calculated reproducibility after the rejection of the statistical outliers is in full agreement with the requirements of ASTM D5185:13e1.

Nickel: This determination was not problematic. No statistical outliers and one false negative test result were observed. The calculated reproducibility is in good agreement with the requirements of ASTM D5185:13e1.

Sodium: This determination was very problematic. One false negative test result and one statistical outlier were observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D5185:13e1. When the ASTM D5185 data is evaluated separately, the calculated reproducibility is smaller but again not in agreement with the requirements the standard.

Silicon: This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier is in good agreement with the requirements of ASTM D5185:13e1.

Silver: This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of ASTM D5185:13e1.

Tin: This determination may not be problematic. Three statistical outliers were observed. Although almost all reported results are below the application range (10 - 40 mg/kg), the calculated reproducibility after rejection of the statistical outliers is in good agreement with the estimated extrapolated requirements of ASTM D5185:13e1.

Titanium: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D5185:13e1.

Vanadium: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D5185:13e1.

Calcium: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D5185:13e1. When the ASTM D5185 data is evaluated separately, the calculated reproducibility is smaller but again not in agreement with the requirements the standard.

Phosphorus: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers is in good agreement with the requirements of D5185:13e1.

Zinc: 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 D5185:13e1. When the ASTM D5185 data is evaluated separately, the calculated reproducibility is again not in agreement with the requirements the standard.

Sample #14083:

Acid Number (Total): This determination was problematic. No statistical outliers were observed. Three test results were excluded from the statistical calculations as the three laboratories reported to have used ASTM D974/IP139, a test method that is not equivalent with ASTM D664. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTMD664:11a Differences in sample intake may (partly) explain the large spread (see also proficiency test iis13L02).

Base Number (Total): This determination was problematic. Two statistical outliers were observed and one test result was excluded from the statistical evaluation as the reported test method is not equivalent with ASTM D2896:11. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTM D2896:11.

Base Number (Strong): This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of ASTM D4739:11.

Density @ 15°C: This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96.

Flash Point PMcc: As it is not clear which sub method of ASTM D93 should be followed, it was decided to evaluate both procedures (A for in-use oils and B for used oils) separately.
For procedure A the determination was problematic. Two statistical outliers were observed. Three laboratories reported to have used ASTM D3828, a test method that is not equivalent to ASTM D93 and one laboratory probably mixed up the results for both determinations (test result for procedure A > procedure B, which is unlikely). The calculated reproducibility after rejection of the suspect data is not at all in agreement with the requirements of ASTM D93:13e1.
For procedure B: This determination was very problematic. Two statistical outliers were observed and one result was excluded as the test result was probably mixed up (see above). The calculated reproducibility after rejection of the statistical outlier is not at all in agreement with the requirements of ASTM D93:13e1.

Fuel dilution: This determination was not problematic. No statistical outliers were observed, but two test results were excluded from statistical calculations. One of the laboratories reported to have used ASTM E2412, a test method that is not equivalent with ASTM D3524. The calculated reproducibility after rejection of the suspect data is in good agreement with the requirements of ASTM D3524:14.

Kin.Visco.@ 40°C: This determination was not problematic. Only one statistical outlier was observed. The reproducibility for used oils is not present in ASTM D445:12 (see §17.3). Therefore the target reproducibility is calculated from the reproducibilities found in iis PTs on used oils (see appendix 3, ref. 14). The calculated reproducibility after rejection of the statistical outlier is in full agreement with the average reproducibility found for used oils in previous iis PTs.

Kin.Visco.@ 100°C: This determination was problematic for a number of laboratories. Seven statistical outliers were observed. The reproducibility for used oils is not present in ASTM D445:12 (see §17.3). Therefore the target reproducibility is calculated from the reproducibilities found in iis PT's on used oils (see appendix 3, ref. 14). The calculated reproducibility after rejection of the statistical outliers is in full agreement with the average reproducibility found for used oils in previous iis PTs.

Viscosity Index: This determination was problematic. Two statistical outliers were observed and five results were excluded for statistical evaluation for several reasons (see pag. 94-95). The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTM D2270:10e1.

Kin.Visco.@ 40°C: (Houillon) This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection statistical outlier is in good agreement with the requirements of ASTM D7279:08.

Kin.Visco.@ 100°C: (Houillon) This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection statistical outlier is in good agreement with the requirements of ASTM D7279:08.

Water: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D6304:07.
The preferred method to use for a product containing interfering components may be ASTM D6304 method C. This method is applicable for oils with difficult matrix interferences. When the ASTM D6304 method C data was evaluated separately, the calculated reproducibility is much smaller and in agreement with the requirements of ASTM D6304:07.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant standard and the reproducibility as found for the group of participating laboratories. The average results, calculated reproducibilities and reproducibilities derived from literature standards (in casu ASTM and IP standards), are compared in the next table.

Parameter	unit	n	average	2.8 * sd	R (lit)
Acid Number (Total)	mg KOH/g	55	2.72	1.65	1.20
Base Number (Total)	mg KOH/g	53	10.20	1.18	0.71
Base Number (Strong)	mg KOH/g	16	8.92	2.25	4.28
Density @ 15°C	kg/L	65	0.8965	0.0009	0.0015
Flash Point PMcc – method A	^{o}C	31	165.2	75.0	(11.7)
Flash Point PMcc – method B	^{o}C	15	162.0	75.3	(10.0)
Fuel dilution	%M/M	14	4.5	4.5	1.6
Kinematic Viscosity @ 40°C	mm^2/s	70	105.72	1.68	1.90
Kinematic Viscosity (Houillon) @ 40°C	mm^2/s	14	105.90	0.88	3.18
Water	mg/kg	47	17271	4313	5889

Table 7: reproducibilities of test results of sample #14081

Parameter	Unit	n	Average	2.8 * sd	R (lit)
Aluminium as Al	mg/kg	63	7.6	3.6	6.4
Barium as Ba	mg/kg	58	17.0	4.9	8.0
Chromium as Cr	mg/kg	70	7.4	3.8	2.7
Copper as Cu	mg/kg	68	11.3	4.0	2.7
Iron as Fe	mg/kg	66	19.0	5.7	5.5
Lead as Pb	mg/kg	60	6.9	3.7	6.0
Lithium as Li	mg/kg	16	6.7	2.5	2.3
Magnesium as Mg	mg/kg	59	18.4	5.9	6.8
Manganese as Mn	mg/kg	60	7.6	2.8	1.5
Molybdenum as Mo	mg/kg	59	6.7	2.3	2.5
Nickel as Ni	mg/kg	67	7.0	3.1	4.0
Sodium as Na	mg/kg	56	11.7	12.0	6.3
Silicon as Si	mg/kg	60	14.2	5.0	8.2
Silver as Ag	mg/kg	55	6.8	1.7	2.4
Tin as Sn	mg/kg	51	6.2	4.2	6.5
Titanium as Ti	mg/kg	52	7.0	2.0	6.3
Vanadium as V	mg/kg	60	6.7	2.0	2.3
Calcium as Ca	mg/kg	68	3710	937	655
Phosphorus as P	mg/kg	62	715	98	115
Zinc as Zn	mg/kg	68	826	158	134

Table 8: reproducibilities of test results of sample #14082

Parameter	unit	n	average	2.8 * sd	R (lit)
Acid Number (Total)	mg KOH/g	53	2.72	2.24	1.20
Base Number (Total)	mg KOH/g	50	9.68	0.92	0.68
Base Number (Strong)	mg KOH/g	16	8.53	2.00	4.19
Density @ 15°C	kg/L	65	0.8969	0.0012	0.0015
Flash Point PMcc – method A	^{o}C	37	204.8	16.2	14.5
Flash Point PMcc – method B	^{o}C	15	197.4	23.0	10.0
Fuel dilution	%M/M	11	1.2	1.1	1.6
Kinematic Viscosity @ 40°C	mm^2/s	71	120.64	1.53	2.17
Kinematic Viscosity @ 100°C	mm^2/s	58	13.151	0.210	0.289
Viscosity Index		50	103.0	3.1	2.0
Kinematic Viscosity (Houillon) @ 40°C	mm^2/s	16	121.13	1.62	3.63
Kinematic Viscosity (Houillon) @ 100°C	mm^2/s	15	13.214	0.253	0.740
Water	mg/kg	50	922	1125	1015

Table 9: reproducibilities of test results of sample #14083

Without further statistical calculations it can be concluded that for several tests there is a good compliance of the group of participants with the relevant standards. The tests, which are problematic, have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE PROFICIENCY TEST OF JUNE 2014 WITH PREVIOUS PTS

	June 2014	May 2013	May 2012	May 2011
Number of reporting participants	88	83	77	75
Number of results reported	2150	1476	1216	1257
Statistical outliers	61	90	53	52
Percentage outliers	2.8%	6.1%	4.4%	4.1%

Table 10: 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 standards. The conclusions are given the following table:

Determination	June 2014 *)	May 2013	May 2012	May 2011
Total Acid Number	--	-	-	--
Total Base Number	--	--	-	--
Base Number Strong	++	++	++	n.e.
Density @ 15 °C	+	--	-	--
Flash Point PMcc	-	--	--	--
Fuel Dilution	++	n.e.	n.e.	n.e.
Kinematic Viscosity @ 40 °C	++	++	++	++
Kinematic Viscosity @ 100 °C	++	++	-	++
Viscosity Index	--	-	n.e.	n.e.
Kinematic Viscosity (Houillon) @ 40 °C	++	++	n.e.	n.e.
Kinematic Viscosity (Houillon) @ 100 °C	++	++	n.e.	n.e.
Water	-	+	-	++
Metals (20 elements) #14082	+	+	+	+/-

Table 11: comparison determinations against the reference standards

*) only for sample #14083

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

++: group performed much better than the standard
+ : group performed better than the standard
+/-: group performance equals the standard
- : group performed worse than the standard
-- : group performed much worse than the standard
n.e.: not evaluated

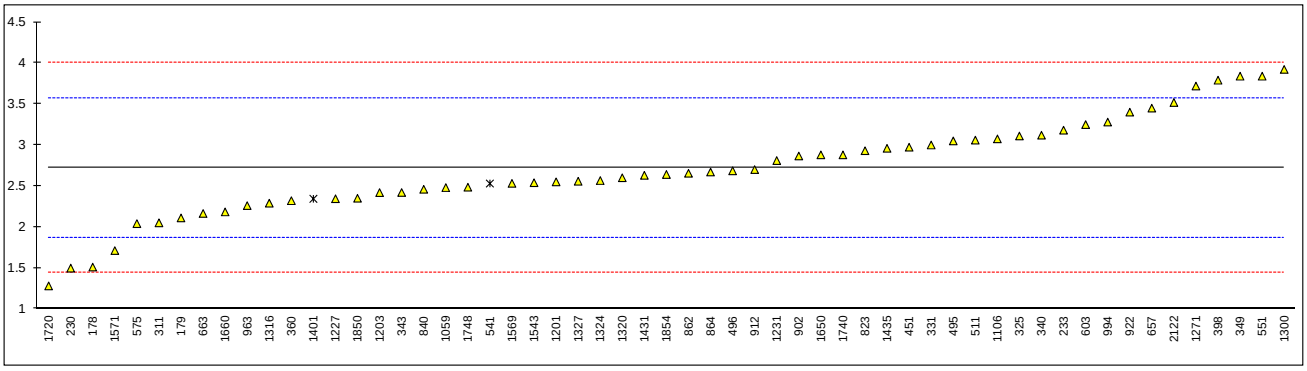
APPENDIX 1

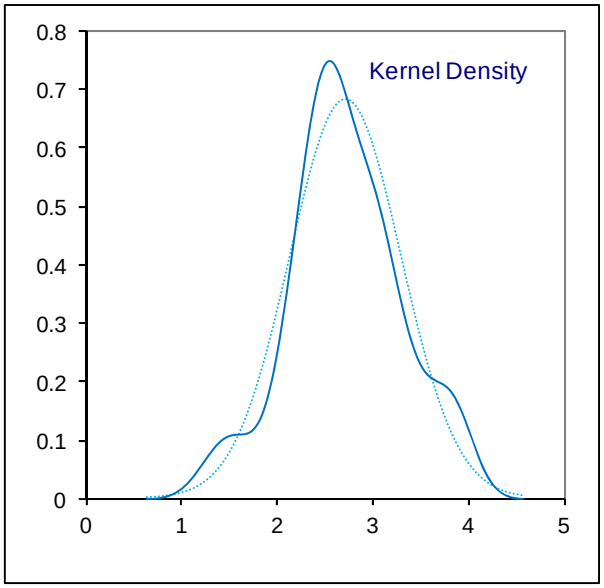
Determination of Acid Number (Total) on sample #14081; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
178	D664	1.51		-2.83	
179	D664	2.11		-1.43	
230	D664	1.497		-2.86	
233	D664	3.181		1.08	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271		-----		-----	
311	D664	2.05		-1.57	
315		-----		-----	
325	D664	3.11		0.91	
331	D664	3		0.65	
340	D664	3.12		0.94	
343	D664	2.42		-0.70	
349	D664	3.84		2.62	
360	D664	2.32		-0.94	
398	D664	3.791		2.51	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451	D664	2.973		0.59	
473		-----		-----	
495	D664	3.05		0.77	
496	D664	2.685		-0.08	
511	D664	3.06		0.80	
541	D974	2.53	ex	-0.44	Result excluded, see §4.1
551	D664	3.84	C	2.62	First reported: 1.139
562		-----		-----	
575	D664	2.04		-1.59	
603	D664	3.2493		1.24	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D664	3.45		1.71	
663	D664	2.164		-1.30	
823	D664	2.93		0.49	
840	D664	2.459		-0.61	
862	D664	2.6545		-0.15	
864	D664	2.67		-0.12	
875		-----		-----	
902	D664	2.866		0.34	
912	D664	2.7		-0.05	
922	D664	3.401	C	1.59	First reported: 4.881
963	D664	2.26		-1.08	
966		-----		-----	
993		-----		-----	
994	D664	3.28		1.31	
1023	in house	<0.07		<-6.20	False negative?
1059	ISO6619	2.48		-0.56	
1106	D664	3.0746		0.83	
1146		-----		-----	
1161		-----		-----	
1173		-----		-----	
1201	D664	2.55		-0.40	
1203	D664	2.419		-0.70	
1227	D664	2.3437		-0.88	
1231	D664	2.81		0.21	
1271	D664	3.720		2.34	
1278		-----		-----	
1300	D664	3.9224		2.81	
1316	D664	2.29		-1.01	
1318		-----		-----	
1320	D664	2.6	C	-0.28	First reported: 5.2
1324	D664	2.566		-0.36	
1327	D664	2.5578		-0.38	
1396		-----		-----	
1401	D974	2.343	ex	-0.88	Result excluded, see §4.1
1403		-----		-----	
1423		-----		-----	
1431	D664	2.63		-0.21	
1435	D664	2.96		0.56	
1460		-----		-----	

1543	D664	2.54	-0.42
1569	D664	2.5321	-0.44
1571	D664	1.7109	-2.36
1622		-----	-----
1650	D664	2.88	0.37
1660	D664	2.183	-1.26
1720	D664	1.28	-3.37
1722		-----	-----
1740	D664	2.88	0.37
1748	D664	2.485	-0.55
1752		-----	-----
1791		-----	-----
1800		-----	-----
1842		-----	-----
1850	ISO6619	2.35	-0.87
1854	D664	2.64	-0.19
1874		-----	-----
1900		-----	-----
1915		-----	-----
2122	IP177	3.519	1.87
9101		-----	-----
9129		-----	-----

normality	OK
n	55
outliers	0 (+2 ex)
mean (n)	2.720
st.dev. (n)	0.5907
R(calc.)	1.654
R(D664:11a)	1.197



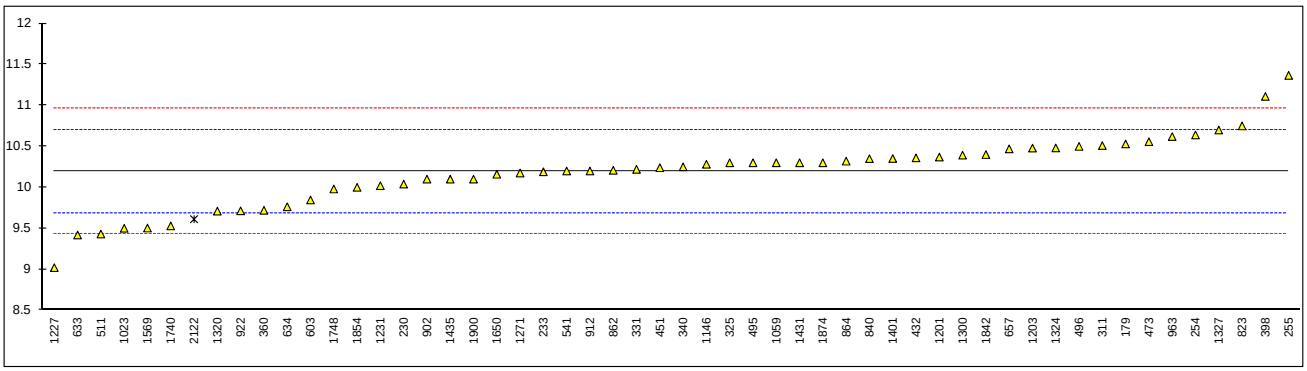


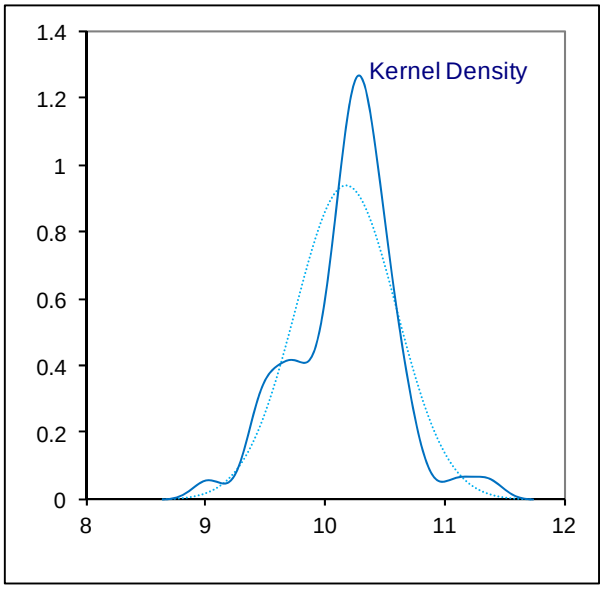
Determination of Base Number (Total) on sample #14081; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D2896	10.53		1.31	
230	D2896	10.04		-0.61	
233	D2896	10.19		-0.02	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	D2896	10.64		1.74	
255	D2896	11.367		4.59	
271		-----		-----	
311	D2896	10.51		1.23	
315		-----		-----	
325	D2896	10.30		0.41	
331	D2896	10.22		0.09	
340	D2896	10.25		0.21	
343		-----		-----	
349		-----		-----	
360	D2896	9.72		-1.87	
398	D2896	11.11		3.59	
420		-----		-----	
432	D2896	10.36		0.64	
450		-----		-----	
451	D2896Mod.	10.24		0.17	
473	D2896	10.5571		1.42	
495	D2896	10.3		0.41	
496	D2896	10.5	C	1.19	First reported: 8.45
511	D2896	9.43		-3.00	
541	D2896	10.2		0.02	
551		-----		-----	
562		-----		-----	
575		-----		-----	
603	D2898	9.8463		-1.37	
614		-----		-----	
621		-----		-----	
633	D2896	9.4185		-3.05	
634	D2896	9.7627		-1.70	
657	D2896	10.47		1.08	
663		-----		-----	
823	D2896	10.75		2.17	
840	D2896	10.35		0.60	
862	D2896	10.2083		0.05	
864	D2896	10.32		0.49	
875		-----		-----	
902	D2896	10.10		-0.38	
912	D2896	10.2		0.02	
922	D2896	9.713		-1.89	
963	D2896	10.62		1.66	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023	D2896	9.50		-2.73	
1059	ISO3771	10.3		0.41	
1106		-----		-----	
1146	D2896	10.282		0.34	
1161		-----		-----	
1173		-----		-----	
1201	D2896	10.37		0.68	
1203	ISO3771	10.479		1.11	
1227	D2896	9.02		-4.61	
1231	D2896	10.02		-0.69	
1271	ISO3771	10.175		-0.08	
1278		-----		-----	
1300	D2896	10.393		0.77	
1316		-----		-----	
1318		-----		-----	
1320	D2896	9.71		-1.91	
1324	D2896	10.481		1.12	
1327	D2896	10.700		1.98	
1396		-----		-----	
1401	D2896	10.352		0.61	
1403		-----		-----	
1423		-----		-----	
1431	D2896	10.3		0.41	
1435	D2896	10.10		-0.38	
1460		-----		-----	

1543		-----		-----	
1569	D2896	9.5032		-2.72	
1571		-----		-----	
1622		-----		-----	
1650	D2896	10.16		-0.14	
1660		-----		-----	
1720		-----		-----	
1722		-----		-----	
1740	D2896	9.53		-2.61	
1748	D2896	9.98	C	-0.85	First reported: 11.34
1752		-----		-----	
1791		-----		-----	
1800		-----		-----	
1842	IP276	10.4		0.80	
1850		-----		-----	
1854	D2896	10.0		-0.77	
1874	E2412	10.3		0.41	
1900	D2896	10.1		-0.38	
1915		-----		-----	
2122	IP400	9.61136	ex	-2.29	Result excluded, see §4.1
9101		-----		-----	
9129		-----		-----	

normality	suspect
n	53
outliers	0 (+1ex)
mean (n)	10.196
st.dev. (n)	0.4215
R(calc.)	1.180
R(D2896:11)	0.714



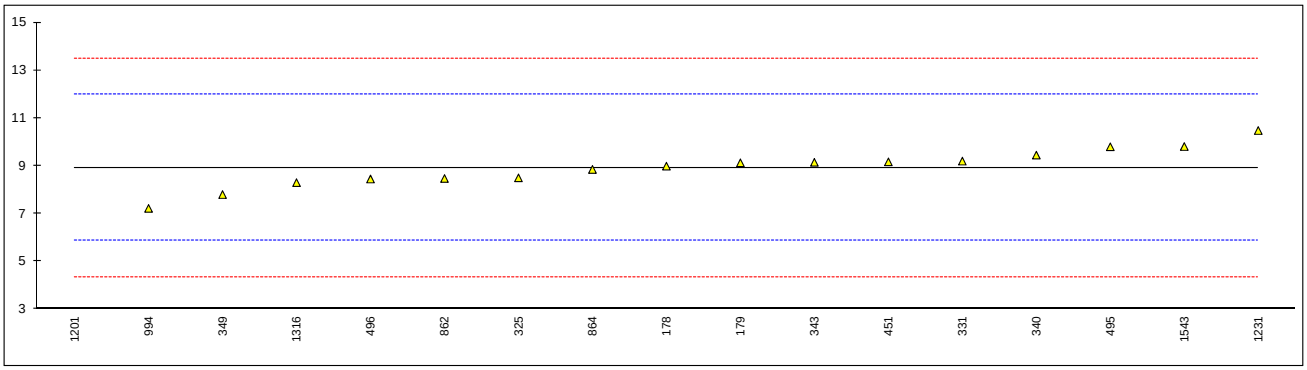


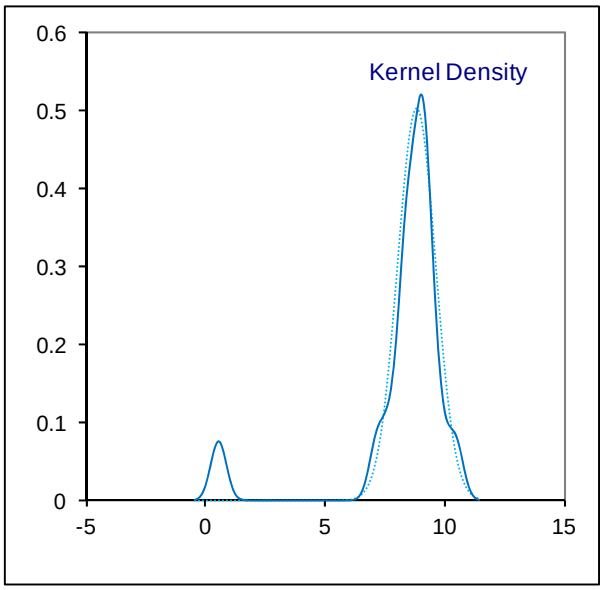
Determination of Base Number (Strong) on sample #14081; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
178	D4739	8.99		0.04	
179	D4739	9.13		0.14	
230		-----		-----	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271		-----		-----	
311		-----		-----	
315		-----		-----	
325	D4739	8.50		-0.28	
331	D4739	9.2		0.18	
340	D4739	9.45		0.34	
343	D4739	9.15		0.15	
349	D4739	7.8		-0.73	
360		-----		-----	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451	D4739	9.17		0.16	
473		-----		-----	
495	D4739	9.8		0.57	
496	D4739	8.45	C	-0.31	First reported: 10.5
511		-----		-----	
541		-----		-----	
551		-----		-----	
562		-----		-----	
575		-----		-----	
603		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823		-----		-----	
840		-----		-----	
862	D4739	8.4731		-0.29	
864	D4739	8.85		-0.05	
875		-----		-----	
902		-----		-----	
912		-----		-----	
922		-----		-----	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994	D4739	7.22		-1.11	
1023		-----		-----	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1161		-----		-----	
1173		-----		-----	
1201	D4739	0.59	D(0.01)	-5.45	
1203		-----		-----	
1227		-----		-----	
1231	D4739	10.48		1.02	
1271		-----		-----	
1278		-----		-----	
1300		-----		-----	
1316	D4739	8.3		-0.41	
1318		-----		-----	
1320		-----		-----	
1324		-----		-----	
1327		-----		-----	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431		-----		-----	
1435		-----		-----	
1460		-----		-----	

1543	D4739	9.81	0.58
1569		-----	-----
1571		-----	-----
1622		-----	-----
1650		-----	-----
1660		-----	-----
1720		-----	-----
1722		-----	-----
1740		-----	-----
1748		-----	-----
1752		-----	-----
1791		-----	-----
1800		-----	-----
1842		-----	-----
1850		-----	-----
1854		-----	-----
1874		-----	-----
1900		-----	-----
1915		-----	-----
2122		-----	-----
9101		-----	-----
9129		-----	-----

normality	OK
n	16
outliers	1
mean (n)	8.923
st.dev. (n)	0.8023
R(calc.)	2.246
R(D4739:11)	4.280





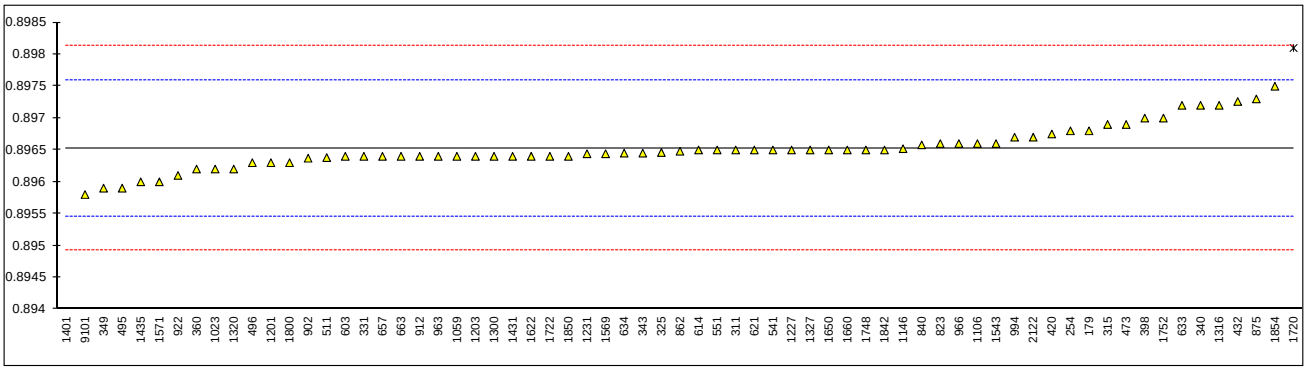
Determination of Density @ 15°C on sample #14081; results in kg/L

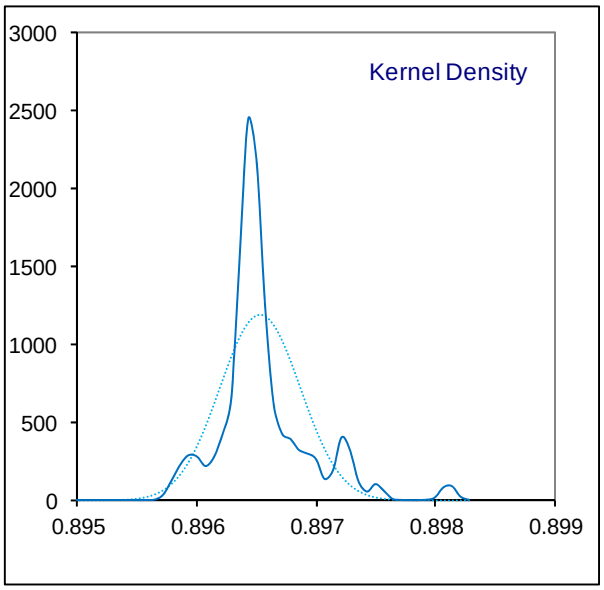
lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D4052	0.8968		0.51	
230		-----		-----	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	D4052	0.8968		0.51	
255		-----		-----	
271		-----		-----	
311	D4052	0.8965		-0.05	
315	D4052	0.8969		0.70	
325	D4052	0.89646		-0.12	
331	ISO12185	0.8964		-0.23	
340	D4052	0.8972		1.26	
343	D4052	0.89645		-0.14	
349	D4052	0.8959	C	-1.17	First reported: 0.8981
360	D4052	0.8962		-0.61	
398	D4052	0.8970		0.89	
420	ISO12185	0.89675		0.42	
432	D4052	0.89726		1.37	
450		-----		-----	
451		-----		-----	
473	D4052	0.8969		0.70	
495	D4052	0.8959		-1.17	
496	D4052	0.89630		-0.42	
511	D4052	0.89638		-0.27	
541	D4052	0.8965		-0.05	
551	D4052	0.8965		-0.05	
562		-----		-----	
575		-----		-----	
603	D4052	0.8964		-0.23	
614	D4052	0.8965		-0.05	
621	D1298	0.8965		-0.05	
633	D4052	0.8972		1.26	
634	D4052	0.89645		-0.14	
657	D4052	0.8964		-0.23	
663	D4052	0.8964		-0.23	
823	D4052	0.89660		0.14	
840	D4052	0.89658		0.10	
862	D4052	0.89648		-0.08	
864		-----		-----	
875	D4052	0.8973		1.45	
902	D4052	0.89637		-0.29	
912	D4052	0.8964		-0.23	
922	D4052	0.8961		-0.79	
963	D4052	0.8964		-0.23	
966	D4052	0.8966		0.14	
993		-----		-----	
994	D4052	0.8967		0.33	
1023	D4052	0.8962		-0.61	
1059	ISO12185	0.8964		-0.23	
1106	D5002	0.8966	C	0.14	First reported: 896.6
1146	D4052	0.89652		-0.01	
1161		-----		-----	
1173		-----		-----	
1201	D4052	0.8963		-0.42	
1203	ISO12185	0.8964	C	-0.23	First reported: 896.4
1227	D4052	0.8965		-0.05	
1231	D4052	0.89644		-0.16	
1271		-----		-----	
1278		-----		-----	
1300	D4052	0.8964		-0.23	
1316	D4052	0.8972	C	1.26	First reported: 897.2
1318		-----		-----	
1320	D4052	0.8962		-0.61	
1324		-----		-----	
1327	D4052	0.8965	C	-0.05	First reported: 896.5
1396		-----		-----	
1401	D4052	0.8803	R(0.01)	-30.29	
1403		-----		-----	
1423		-----		-----	
1431	D4052	0.8964		-0.23	
1435	D4052	0.896		-0.98	
1460		-----		-----	

1543	D4052	0.8966		0.14	
1569	D4052	0.89644		-0.16	
1571	D7042	0.896		-0.98	
1622	D4052	0.8964		-0.23	
1650	D4052	0.8965		-0.05	
1660	D7042	0.8965		-0.05	
1720	D4052	0.8981	C,R(0.01)	2.94	Reported: 898.1 (probably a unit error)
1722	D4052	0.8964		-0.23	
1740		-----		-----	
1748	D4052	0.8965		-0.05	
1752	D4052	0.89700	C	0.89	First reported: 897.00
1791		-----		-----	
1800	D4052	0.8963		-0.42	
1842	IP365	0.8965		-0.05	
1850	D4052	0.8964		-0.23	
1854	D4052	0.8975		1.82	
1874		-----		-----	
1900		-----		-----	
1915		-----		-----	
2122	in house	0.8967		0.33	
9101	D1298	0.8958		-1.35	
9129		-----		-----	

	normality	suspect
	n	65
	outliers	2
	mean (n)	0.89652
	st.dev. (n)	0.000337
	R(calc.)	0.00094
	R(ISO12185:96)	0.00150

Compare R(D4052): 0.00050



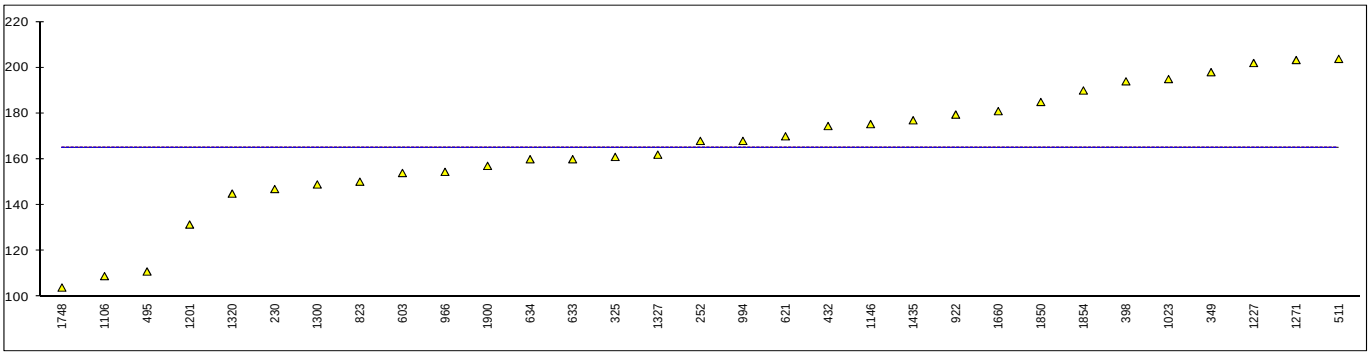


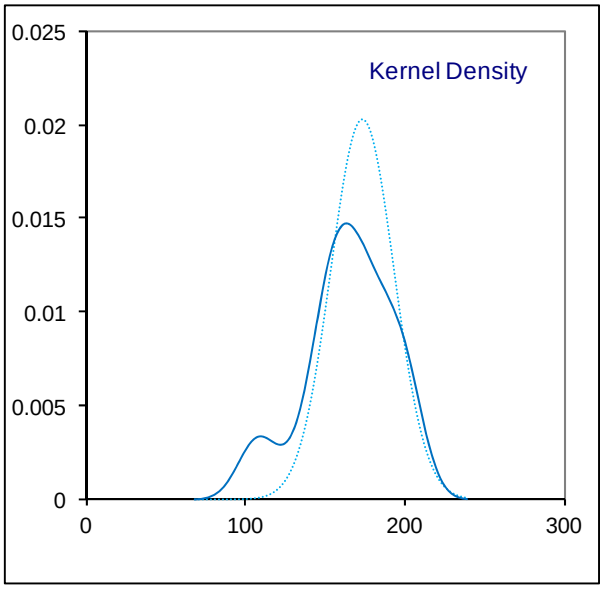
Determination of Flash Point PMcc method A on sample #14081; results in °C

lab	method	value	mark	z(targ)	Run time	remarks
178		-----		-----	-----	
179		-----		-----	-----	
230	D3828Mod.	147		-----	-----	
233		-----		-----	-----	
237		-----		-----	-----	
238		-----		-----	-----	
252	D93A	168		-----	23	
254		-----		-----	-----	
255		-----		-----	-----	
271	D93C	>180.0		-----	5.5	Method C not applicable (for biodiesel only)
311		-----		-----	-----	
315		-----		-----	-----	
325	D93	161.0		-----	24m25s	
331		-----		-----	-----	
340		-----		-----	-----	
343		-----		-----	-----	
349	D93	198	C	-----	-----	First reported: 254
360		-----		-----	-----	
398	D93A	194.0		-----	36	
420		-----		-----	-----	
432	D93	174.5		-----	34	
450		-----		-----	-----	
451		-----		-----	-----	
473		-----		-----	-----	
495	D93	111.0		-----	-----	
496		-----		-----	-----	
511	D93	203.8		-----	36.02	
541		-----		-----	-----	
551		-----		-----	-----	
562		-----		-----	-----	
575		-----		-----	-----	
603	D3828	154.0		-----	-----	Result excluded, see §4.1
614		-----		-----	-----	
621	D93	170.0		-----	23	
633	D93	160.0		-----	40	
634	D93A	160.0		-----	22.5	
657		-----		-----	-----	
663		-----		-----	-----	
823	D93A	150.2		-----	48	
840		-----		-----	-----	
862		-----		-----	-----	
864		-----		-----	-----	
875		-----		-----	-----	
902		-----		-----	-----	
912		-----		-----	-----	
922	D93A	179.5		-----	31	
963		-----		-----	-----	
966	D3828	154.5		-----	-----	
993		-----		-----	-----	
994	D93A	168.0		-----	-----	
1023	D93A	195		-----	-----	
1059		-----		-----	-----	
1106	D93A	109.0		-----	-----	
1146	in house	175.33		-----	33m33s	
1161		-----		-----	-----	
1173		-----		-----	-----	
1201	D93A	131.5		-----	-----	
1203		-----		-----	-----	
1227	D93A	202		-----	-----	
1231		-----		-----	-----	
1271	ISO2719	203.3		-----	30	
1278		-----		-----	-----	
1300	D93	149		-----	28	
1316		-----		-----	-----	
1318		-----		-----	-----	
1320	D93	145		-----	-----	
1324		-----		-----	-----	
1327	D93	162.0		-----	-----	
1396		-----		-----	-----	
1401		-----		-----	-----	
1403		-----		-----	-----	
1423		-----		-----	-----	
1431		-----		-----	-----	
1435	D93A	177		-----	-----	
1460		-----		-----	-----	

1543		-----	-----	-----
1569		-----	-----	-----
1571		-----	-----	-----
1622		-----	-----	-----
1650		-----	-----	-----
1660	D93A	181.0	-----	-----
1720		-----	-----	-----
1722		-----	-----	-----
1740		-----	-----	-----
1748	D93A	104	-----	-----
1752		-----	-----	-----
1791	ISO2719	n.d.	-----	-----
1800		-----	-----	-----
1842		-----	-----	-----
1850	ISO2719	185	-----	-----
1854	D93A	190	-----	-----
1874		-----	-----	-----
1900	in house	157.1	-----	10
1915		-----	-----	-----
2122		-----	-----	-----
9101		-----	-----	-----
9129	D93A	no flash	-----	-----

normality	OK
n	31
outliers	0
mean (n)	165.15
st.dev. (n)	26.776
R(calc.)	74.97
R(D93:13e1)	(11.73)



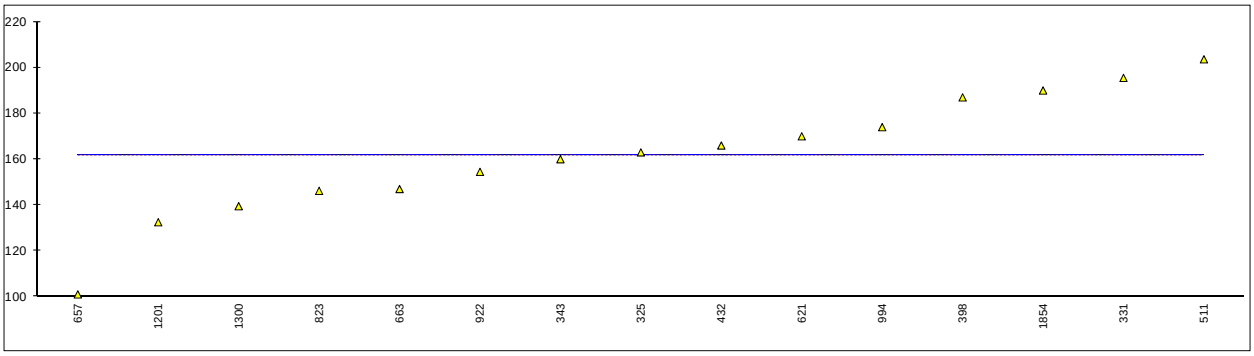


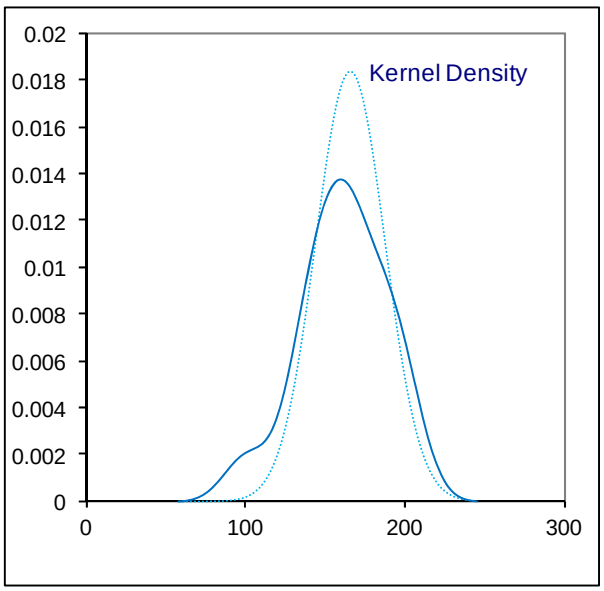
Determination of Flash Point PMcc method B on sample #14081; results in °C

lab	method	value	mark	z(targ)	Run time	remarks
178		-----		-----	-----	
179		-----		-----	-----	
230		-----		-----	-----	
233		-----		-----	-----	
237		-----		-----	-----	
238		-----		-----	-----	
252		-----		-----	-----	
254		-----		-----	-----	
255		-----		-----	-----	
271		-----		-----	-----	
311		-----		-----	-----	
315		-----		-----	-----	
325	D93	163.0		-----	1h49m53s	
331	D93	195.5		-----	35	
340		-----		-----	-----	
343	D93B	160.0		-----	-----	
349		-----		-----	-----	
360		-----		-----	-----	
398	D93B	187.0		-----	115	
420		-----		-----	-----	
432	D93	166		-----	119	
450		-----		-----	-----	
451		-----		-----	-----	
473		-----		-----	-----	
495		-----		-----	-----	
496		-----		-----	-----	
511	D93	203.6		-----	151.14	
541		-----		-----	-----	
551		-----		-----	-----	
562		-----		-----	-----	
575		-----		-----	-----	
603		-----		-----	-----	
614		-----		-----	-----	
621	D93	170.0		-----	23	
633		-----		-----	-----	
634		-----		-----	-----	
657	D93	101		-----	-----	
663	D93B	147.0		-----	-----	
823	D93B	146.2		-----	75	
840		-----		-----	-----	
862		-----		-----	-----	
864		-----		-----	-----	
875		-----		-----	-----	
902		-----		-----	-----	
912		-----		-----	-----	
922	D93B	154.5		-----	129	
963		-----		-----	-----	
966		-----		-----	-----	
993		-----		-----	-----	
994	D93B	174.0		-----	-----	
1023		-----		-----	-----	
1059		-----		-----	-----	
1106		-----		-----	-----	
1146		-----		-----	-----	
1161		-----		-----	-----	
1173		-----		-----	-----	
1201	D93B	132.5		-----	-----	
1203		-----		-----	-----	
1227		-----		-----	-----	
1231		-----		-----	-----	
1271		-----		-----	-----	
1278		-----		-----	-----	
1300	D93	139.5		-----	68	
1316		-----		-----	-----	
1318		-----		-----	-----	
1320		-----		-----	-----	
1324		-----		-----	-----	
1327		-----		-----	-----	
1396		-----		-----	-----	
1401		-----		-----	-----	
1403		-----		-----	-----	
1423		-----		-----	-----	
1431		-----		-----	-----	
1435		-----		-----	-----	
1460		-----		-----	-----	

1543		-----	-----	-----
1569		-----	-----	-----
1571		-----	-----	-----
1622		-----	-----	-----
1650		-----	-----	-----
1660		-----	-----	-----
1720		-----	-----	-----
1722		-----	-----	-----
1740		-----	-----	-----
1748		-----	-----	-----
1752		-----	-----	-----
1791		-----	-----	-----
1800		-----	-----	-----
1842		-----	-----	-----
1850		-----	-----	-----
1854	D93B	190	-----	-----
1874		-----	-----	-----
1900		-----	-----	-----
1915		-----	-----	-----
2122		-----	-----	-----
9101		-----	-----	-----
9129	D93A	no flash	-----	-----

normality	OK
n	15
outliers	0
mean (n)	161.99
st.dev. (n)	26.885
R(calc.)	75.28
R(D93:13e1)	(10.00)



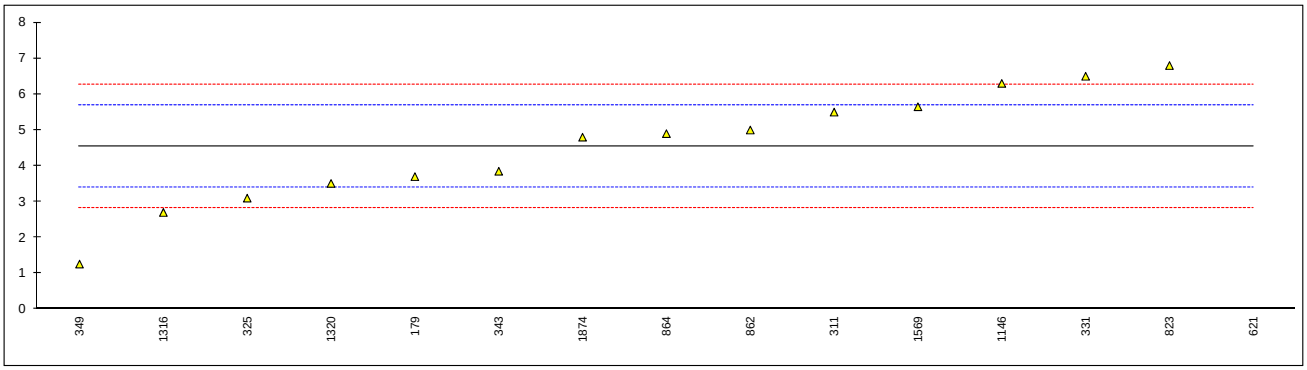


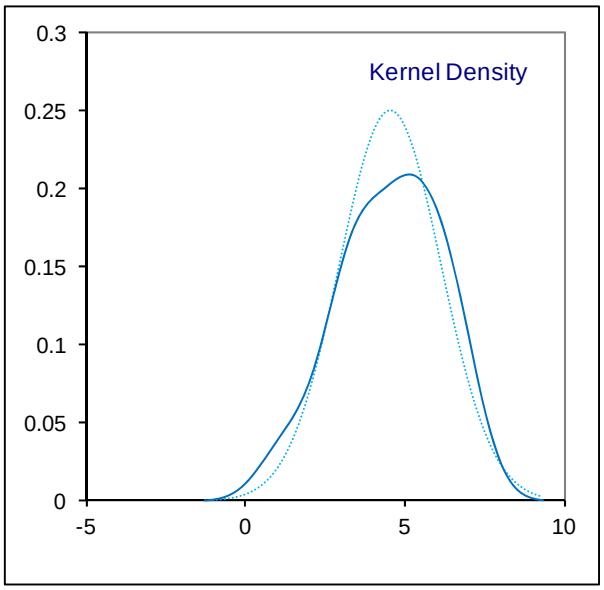
Determination of Fuel dilution on sample #14081; results in %M/M

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D3542Mod.	3.7		-1.47	
230		-----		-----	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271		-----		-----	
311	D3524	5.5		1.68	
315		-----		-----	
325	INH-GC	3.10		-2.52	
331	in house	6.5		3.43	
340		-----		-----	
343	D3524	3.85		-1.21	
349	D3524	1.26		-5.74	
360		-----		-----	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551		-----		-----	
562		-----		-----	
575		-----		-----	
603		-----		-----	
614		-----		-----	
621	E2412	26039.9	ex	45561	See §4.1, method not equivalent, reported in: Abs/0.1mm
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823	D3524	6.80		3.95	
840		-----		-----	
862	D3524	5		0.80	
864	D3524	4.9		0.63	
875		-----		-----	
902		-----		-----	
912		-----		-----	
922		-----		-----	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023		-----		-----	
1059		-----		-----	
1106		-----		-----	
1146	D3524	6.3		3.08	
1161		-----		-----	
1173		-----		-----	
1201		-----		-----	
1203		-----		-----	
1227		-----		-----	
1231		-----		-----	
1271		-----		-----	
1278		-----		-----	
1300		-----		-----	
1316	D3524	2.7		-3.22	
1318		-----		-----	
1320	D3524	3.51		-1.80	
1324		-----		-----	
1327		-----		-----	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431		-----		-----	
1435		-----		-----	
1460		-----		-----	

1543		-----	-----
1569	D3524	5.65	1.94
1571		-----	-----
1622		-----	-----
1650		-----	-----
1660		-----	-----
1720		-----	-----
1722		-----	-----
1740		-----	-----
1748		-----	-----
1752		-----	-----
1791		-----	-----
1800		-----	-----
1842		-----	-----
1850		-----	-----
1854		-----	-----
1874	in house	4.8	0.45
1900		-----	-----
1915		-----	-----
2122		-----	-----
9101		-----	-----
9129		-----	-----

normality	OK
n	14
outliers	0 (+1ex)
mean (n)	4.54
st.dev. (n)	1.595
R(calc.)	4.47
R(D3524:14)	1.60





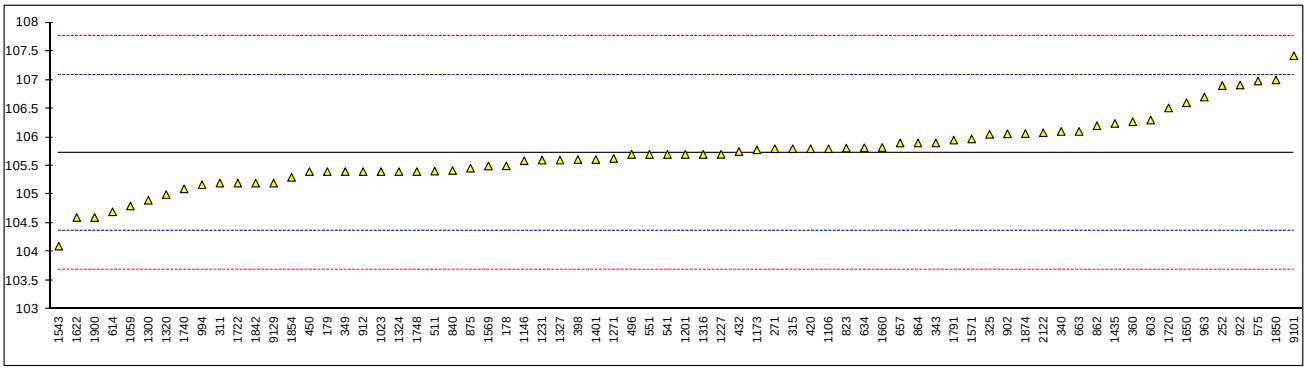
Determination of Kinematic Viscosity @ 40°C (D445) on sample #14081; results in mm^2/s

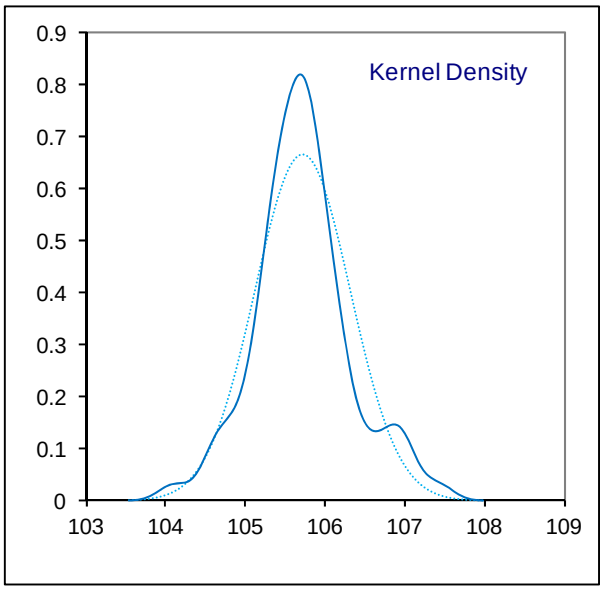
lab	method	value	mark	z(targ)	remarks
178	D445	105.5		-0.32	
179	D445	105.4		-0.47	
230		-----		-----	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252	D445	106.9		1.74	
254		-----		-----	
255		-----		-----	
271	D445	105.8		0.12	
311	D445	105.2		-0.76	
315	D445	105.8		0.12	
325	D445	106.05		0.49	
331		-----		-----	
340	D445	106.1		0.56	
343	D445	105.9		0.27	
349	D445	105.4	C	-0.47	First reported: 120.0
360	D445	106.27		0.81	
398	D445	105.61		-0.16	
420	ISO3104	105.8		0.12	
432	D445	105.75	C	0.05	First reported: 107.75
450	D445	105.4		-0.47	
451		-----		-----	
473		-----		-----	
495		-----		-----	
496	D445	105.70		-0.03	
511	D445	105.409		-0.46	
541	D445	105.7		-0.03	
551	D445	105.7		-0.03	
562		-----		-----	
575	D445	106.98		1.86	
603	D445	106.3		0.86	Also reported: D7042 103.75, z-score: -2.90
614	D445	104.7		-1.50	
621		-----		-----	
633		-----		-----	
634	D445	105.8155		0.14	
657	D445	105.9		0.27	
663	D445	106.10		0.56	
823	D445	105.81		0.14	
840	D445	105.42		-0.44	
862	D445	106.2		0.71	
864	D445	105.9		0.27	
875	D445	105.46		-0.38	
902	D445	106.06	C	0.50	First reported: 107.15
912	D445	105.4		-0.47	
922	D445	106.91		1.75	
963	D445	106.7		1.44	
966		-----		-----	
993		-----		-----	
994	D445	105.17		-0.81	
1023	D445	105.4		-0.47	
1059	ISO3104	104.8		-1.35	
1106	D445	105.8		0.12	
1146	D445	105.59		-0.19	
1161		-----		-----	
1173	IP71	105.78		0.09	
1201	D445	105.7		-0.03	
1203		-----		-----	
1227	D445	105.702		-0.02	
1231	D445	105.6		-0.17	
1271	D445	105.629		-0.13	
1278		-----		-----	
1300	D445	104.9		-1.20	
1316	D445	105.7		-0.03	
1318		-----		-----	
1320	D445	105		-1.06	
1324	D445	105.4		-0.47	
1327	D445	105.6		-0.17	
1396		-----		-----	
1401	D445	105.61		-0.16	Also reported: D7042 104.99, z-score: -1.07
1403		-----		-----	
1423		-----		-----	
1431		-----		-----	
1435	D7042	106.24		0.77	
1460		-----		-----	

1543	D445	104.1		-2.38	
1569	D445	105.498		-0.32	
1571	D7042	105.97		0.37	
1622	D445	104.6		-1.65	
1650	D445	106.60	C	1.30	First reported: 107.248
1660	D7042	105.82		0.15	
1720	D445	106.51		1.17	
1722	D445	105.2		-0.76	
1740	D445	105.1		-0.91	
1748	D445	105.4		-0.47	
1752		-----		-----	
1791	ISO3104	105.95		0.34	
1800		-----		-----	
1842	IP71	105.2		-0.76	
1850	ISO3104	107.0		1.89	
1854	D445	105.3		-0.62	
1874	D445	106.063		0.51	
1900	D445	104.6		-1.65	
1915		-----		-----	
2122	in house	106.079		0.53	
9101	D445	107.42		2.50	
9129	D445	105.2		-0.76	

normality	OK
n	70
outliers	0
mean (n)	105.718
st.dev. (n)	0.5990
R(calc.)	1.677
R(iis)	1.903

R calculated from iis reports on used oils for ASTM D445: 1.8% of mean



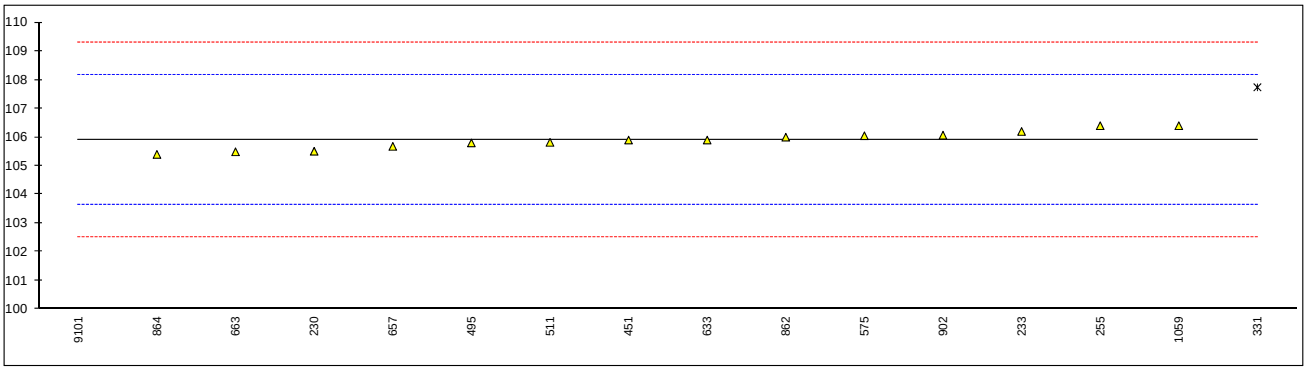


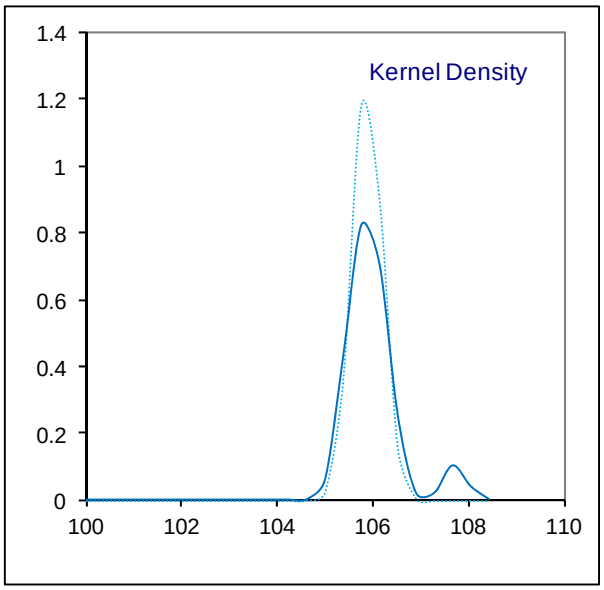
Determination of Kinematic Viscosity @ 40°C (Houillon) on sample #14081; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
230	in house	105.51		-0.34	
233	D7279	106.2		0.26	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255	D7279	106.4		0.44	
271		-----		-----	
311		-----		-----	
315		-----		-----	
325		-----		-----	
331	D7279	107.74	G(0.01)	1.62	
340		-----		-----	
343		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451	D7279	105.9		0.00	
473		-----		-----	
495	D7279	105.8		-0.09	
496		-----		-----	
511	D7279	105.82		-0.07	
541		-----		-----	
551		-----		-----	
562		-----		-----	
575	D7279	106.05		0.13	
603		-----		-----	
614		-----		-----	
621		-----		-----	
633	D7279	105.9		0.00	
634		-----		-----	
657	D7279	105.68		-0.20	
663	D7279	105.49		-0.36	
823		-----		-----	
840		-----		-----	
862	D7279	106		0.09	
864	D7279	105.4		-0.44	
875		-----		-----	
902	D7279	106.07		0.15	
912		-----		-----	
922		-----		-----	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023		-----		-----	
1059	D7279	106.4		0.44	
1106		-----		-----	
1146		-----		-----	
1161		-----		-----	
1173		-----		-----	
1201		-----		-----	
1203		-----		-----	
1227		-----		-----	
1231		-----		-----	
1271		-----		-----	
1278		-----		-----	
1300		-----		-----	
1316		-----		-----	
1318		-----		-----	
1320		-----		-----	
1324		-----		-----	
1327		-----		-----	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431		-----		-----	
1435		-----		-----	
1460		-----		-----	

1543		-----		-----	
1569		-----		-----	
1571		-----		-----	
1622		-----		-----	
1650		-----		-----	
1660		-----		-----	
1720		-----		-----	
1722		-----		-----	
1740		-----		-----	
1748		-----		-----	
1752		-----		-----	
1791		-----		-----	
1800		-----		-----	
1842		-----		-----	
1850		-----		-----	
1854		-----		-----	
1874		-----		-----	
1900		-----		-----	
1915		-----		-----	
2122		-----		-----	
9101	D445	11.88	ex	-82.86	See §4.1, maybe D445 viscosity at 100°C?
9129		-----		-----	

normality	OK
n	14
outliers	1 (+1ex)
mean (n)	105.901
st.dev. (n)	0.3146
R(calc.)	0.881
R(D7279:08)	3.177



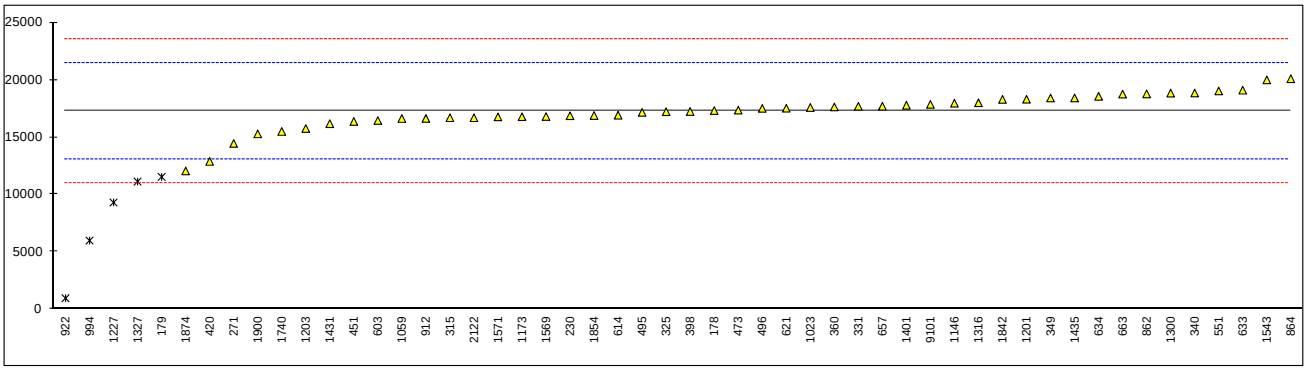


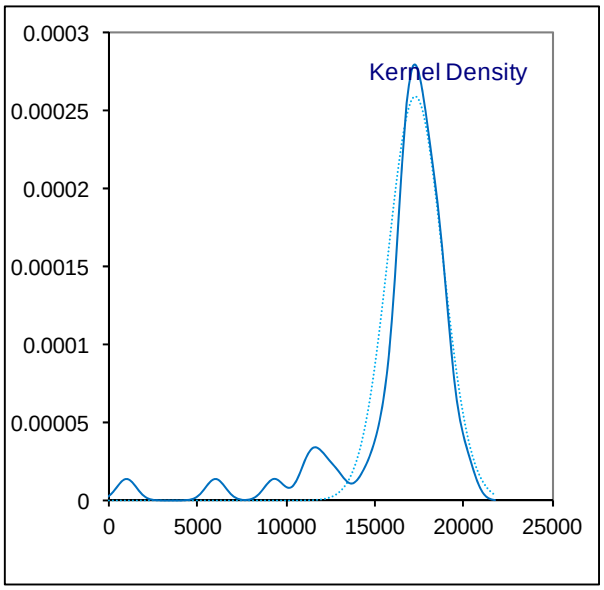
Determination of Water on sample #14081; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D6304	17323		0.02	
179	D6304	11534	R(0.05)	-2.73	
230	D6304	16870		-0.19	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252	D95	<500		<-7.97	False negative?
254		-----		-----	
255		-----		-----	
271	D6304	14454.1		-1.34	
311		-----		-----	
315	D6304C	16700		-0.27	
325	D6304A	17222.5		-0.02	
331	D6304	17693.8		0.20	
340	D6304	18854		0.75	
343		-----		-----	
349	D6304C	18420	C	0.55	First reported: 9420
360	D6304C	17642		0.18	
398	D6304C	17241		-0.01	
420	D6304C	12890		-2.08	
432		-----		-----	
450		-----		-----	
451	D6304C	16374	C	-0.43	First reported: 1.64
473	D6304C	17357.1		0.04	
495	D6304C	17165		-0.05	
496	D6304C	17515		0.12	
511		-----		-----	
541		-----		-----	
551	D6304A	19038.4		0.84	
562		-----		-----	
575		-----		-----	
603	D6304C	16450		-0.39	
614	D6304C	16920		-0.17	
621	D6304A	17529.21		0.12	
633	D6304A	19100		0.87	
634	D6304A	18564.26		0.61	
657	D6304C	17702.4		0.20	
663	D6304C	18759.3		0.71	
823		-----		-----	
840		-----		-----	
862	D6304C	18774.8		0.71	
864	D6304	20100		1.34	
875		-----		-----	
902		-----		-----	
912	D6304C	16637		-0.30	
922	D6304A	960.3	R(0.01)	-7.75	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994	D6304A	5987	R(0.01)	-5.36	
1023	D6304A	17590		0.15	
1059	D6304AMod.	16630		-0.30	
1106		-----		-----	
1146	D6304C	17967		0.33	
1161		-----		-----	
1173	in house	16790		-0.23	
1201	E203	18310		0.49	
1203	D6304C	15758		-0.72	
1227	D6304A	9310	R(0.05)	-3.79	
1231		-----		-----	
1271		-----		-----	
1278		-----		-----	
1300	D6304A	18846		0.75	
1316	D6304	18000		0.35	
1318		-----		-----	
1320		-----		-----	
1324		-----		-----	
1327	D6304C	11128.3	R(0.05)	-2.92	
1396		-----		-----	
1401	D6304	17785		0.24	
1403		-----		-----	
1423		-----		-----	
1431	D6304	16180		-0.52	
1435	D1744	18426		0.55	
1460		-----		-----	

1543	D95	20000	1.30	Reported 2.0 % vol
1569	D6304C	16802	-0.22	
1571	D6304C	16773	-0.24	
1622		-----	-----	
1650		-----	-----	
1660		-----	-----	
1720		-----	-----	
1722		-----	-----	
1740	D6304A	15500	-0.84	
1748		-----	-----	
1752		-----	-----	
1791		-----	-----	
1800		-----	-----	
1842	D6304A	18300	0.49	
1850		-----	-----	
1854	D6304	16892	-0.18	
1874	E2412	12060	-2.48	
1900	D6304C	15289	-0.94	
1915		-----	-----	
2122	INH-KF	16700	-0.27	
9101	D95	17861	0.28	
9129		-----	-----	

normality	not OK
n	47
outliers	5
mean (n)	17271.40
st.dev. (n)	1540.245
R(calc.)	4312.69
R(D6304:07)	5889.38





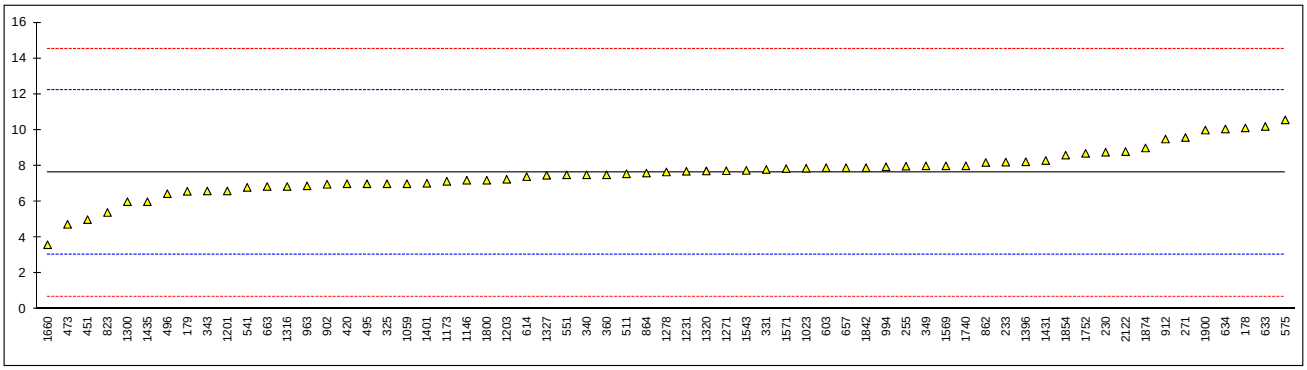
Determination of Aluminium (Al) on sample #14082; results in mg/kg

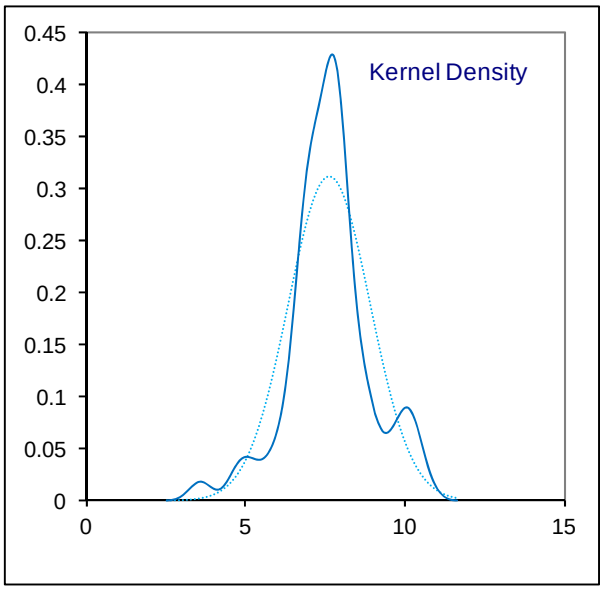
lab	method	value	mark	z(targ)	remarks
178	INH-5185	10.12		1.09	
179	D5185	6.58		-0.45	
230	D6595	8.76		0.49	
233	D6595	8.211		0.26	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255	INH-OL1	7.983		0.16	
271	D5185	9.584		0.85	
311		-----		-----	
315		-----		-----	
325	INH-5185	7		-0.27	
331	D5185	7.8		0.08	
340	D5185	7.5		-0.05	
343	D5185	6.6		-0.44	
349	D5185	8	C	0.16	First reported: 0
360	D5185	7.50		-0.05	
398		-----		-----	
420	D5185	7		-0.27	
432		-----		-----	
450		-----		-----	
451	D5185	5		-1.14	
473	D5185	4.739		-1.25	
495	D5185	7		-0.27	
496	D5185	6.45		-0.51	
511	D5185	7.56		-0.03	
541	D5185	6.8		-0.36	
551	D5185	7.5		-0.05	
562		-----		-----	
575	D6595	10.565		1.28	
603	D5185	7.9		0.12	
614	D5185	7.4		-0.10	
621		-----		-----	
633	D6595	10.202		1.12	
634	D6595	10.06	C	1.06	First reported: 10.946
657	D5185	7.90		0.12	
663	D5185	6.85		-0.34	
823	D5185	5.4		-0.97	
840		-----		-----	
862	D5185	8.19		0.25	
864	D5185	7.6		-0.01	
875		-----		-----	
902	D5185	6.972		-0.28	
912	D5185	9.5		0.82	
922		-----		-----	
963	D5185	6.887		-0.32	
966		-----		-----	
993		-----		-----	
994	D5185	7.95		0.14	
1023	D5185	7.87		0.11	
1059	in house	7		-0.27	
1106		-----		-----	
1146	in house	7.2		-0.18	
1161		-----		-----	
1173	in house	7.14		-0.21	
1201	D5185	6.6		-0.44	
1203	D5185	7.25		-0.16	
1227		-----		-----	
1231	D5185	7.7		0.03	
1271	D5185	7.73		0.05	
1278	D5185	7.66		0.02	
1300	D5185	6		-0.71	
1316	D5185	6.85		-0.34	
1318		-----		-----	
1320	D5185Mod.	7.72		0.04	
1324		-----		-----	
1327	D5185	7.474		-0.06	
1396	D5185	8.23		0.26	
1401	D6443	7.03		-0.26	
1403		-----		-----	
1423		-----		-----	
1431	in house	8.3		0.29	
1435	D5185	6		-0.71	
1460		-----		-----	

1543	in house	7.748		0.05	
1569	D5185	8		0.16	
1571	D5185	7.8503		0.10	
1622		-----	W	-----	First reported: 4.45
1650		-----		-----	
1660	D5185	3.6		-1.75	
1720		-----		-----	
1722		-----		-----	
1740	D5185	8		0.16	
1748		-----		-----	
1752	D6595	8.7		0.47	OK
1791		-----		-----	8
1800	INH-301	7.2		-0.18	55
1842	in house	7.9		0.12	9.43725014
1850		-----		-----	0.86670536
1854	D5185	8.6		0.42	2.426775
1874	D6595	9		0.60	
1900	D6595	10		1.03	
1915		-----		-----	
2122	D5185	8.8		0.51	
9101		-----		-----	
9129		-----		-----	

			Only ASTM D6595 data:
	normality	suspect	OK
	n	63	8
	outliers	0	0
	mean (n)	7.622	9.437
	st.dev. (n)	1.2795	0.8667
	R(calc.)	3.583	2.427
	R(D5185:13e1)	6.444	4.108

Application range: 6 – 40 mg/kg





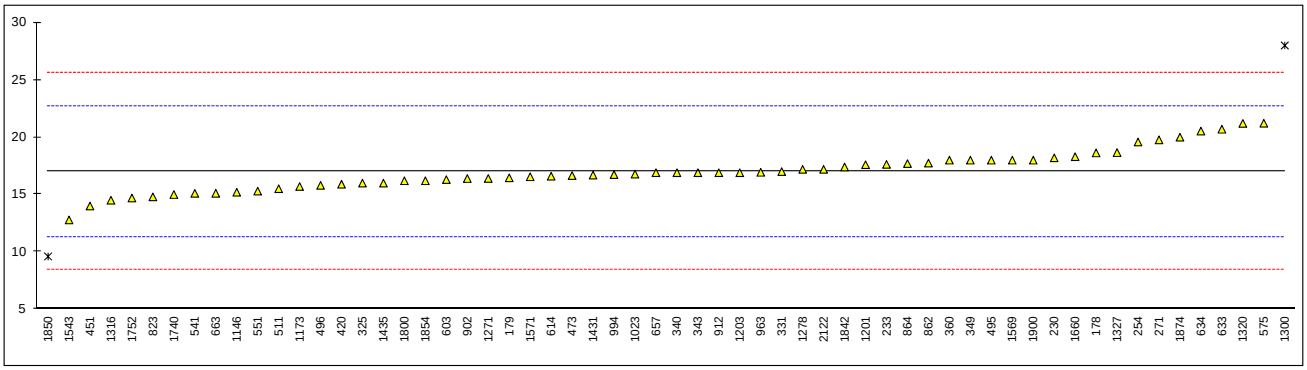
Determination of Barium (Ba) on sample #14082; results in mg/kg

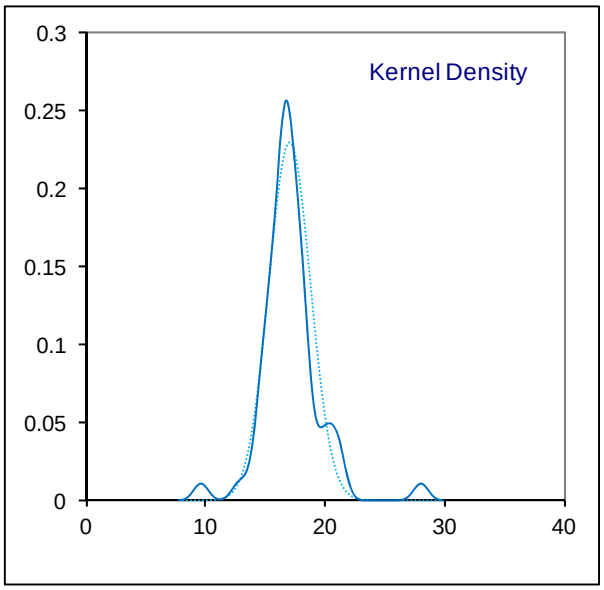
lab	method	value	mark	z(targ)	remarks
178	INH-5185	18.63		0.56	
179	D5185	16.46		-0.20	
230	D6595	18.2		0.41	
233	D6595	17.63		0.21	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	19.585		0.90	
255		-----		-----	
271	D5185	19.771		0.96	
311		-----		-----	
315		-----		-----	
325	INH-5185	16		-0.36	
331	D5185	17		-0.01	
340	D5185	16.9		-0.04	
343	D5185	16.9		-0.04	
349	D5185	18	C	0.34	First reported: 0
360	D5185	18.0		0.34	
398		-----		-----	
420	D5185	15.9		-0.39	
432		-----		-----	
450		-----		-----	
451	D5185	14		-1.06	
473	D5185	16.65		-0.13	
495	D5185	18		0.34	
496	D5185	15.80		-0.43	
511	D5185	15.51		-0.53	
541	D5185	15.1		-0.67	
551	D5185	15.3		-0.60	
562		-----		-----	
575	D6595	21.219		1.47	
603	D5185	16.3		-0.25	
614	D5185	16.6		-0.15	
621		-----		-----	
633	D6595	20.695		1.29	
634	D6595	20.53	C	1.23	First reported: 23.889
657	D5185	16.9		-0.04	
663	D5185	15.11		-0.67	
823	D5185	14.8		-0.78	
840		-----		-----	
862	D5185	17.74		0.25	
864	D5185	17.7		0.24	
875		-----		-----	
902	D5185	16.395		-0.22	
912	D5185	16.9		-0.04	
922		-----		-----	
963	D5185	16.940		-0.03	
966		-----		-----	
993		-----		-----	
994	D5185	16.74		-0.10	
1023	D5185	16.78		-0.08	
1059		-----		-----	
1106		-----		-----	
1146	in house	15.2		-0.64	
1161		-----		-----	
1173	in house	15.70		-0.46	
1201	D5185	17.6		0.20	
1203	D5185	16.9	C	-0.04	First reported: 5.77
1227		-----		-----	
1231		-----		-----	
1271	D5185	16.40		-0.22	
1278	D5185	17.20		0.06	
1300	D5185	28.0	C,R(0.01)	3.84	First reported: 30.3
1316	D5185	14.5		-0.88	
1318		-----		-----	
1320	D5185Mod.	21.2	C	1.46	First reported 26.2
1324		-----		-----	
1327	D5185	18.658		0.57	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431	in house	16.7		-0.11	
1435	D5185	16		-0.36	
1460		-----		-----	

1543	in house	12.79		-1.48
1569	D5185	18		0.34
1571	D5185	16.5484		-0.16
1622		-----		-----
1650		-----		-----
1660	D5185	18.3		0.45
1720		-----		-----
1722		-----		-----
1740	D5185	15		-0.71
1748		-----		-----
1752	D6595	14.7		-0.81
1791		-----		-----
1800	INH-301	16.2		-0.29
1842	in house	17.4		0.13
1850	in house	9.6	R(0.01)	-2.60
1854	D5185	16.2		-0.29
1874	D6595	20		1.04
1900	D6595	18		0.34
1915		-----		-----
2122	D5185	17.2		0.06
9101		-----		-----
9129		-----		-----

normality	OK
n	58
outliers	2
mean (n)	17.019
st.dev. (n)	1.7420
R(calc.)	4.878
R(D5185:13e1)	8.004

Application range: 0.5 – 4 mg/kg



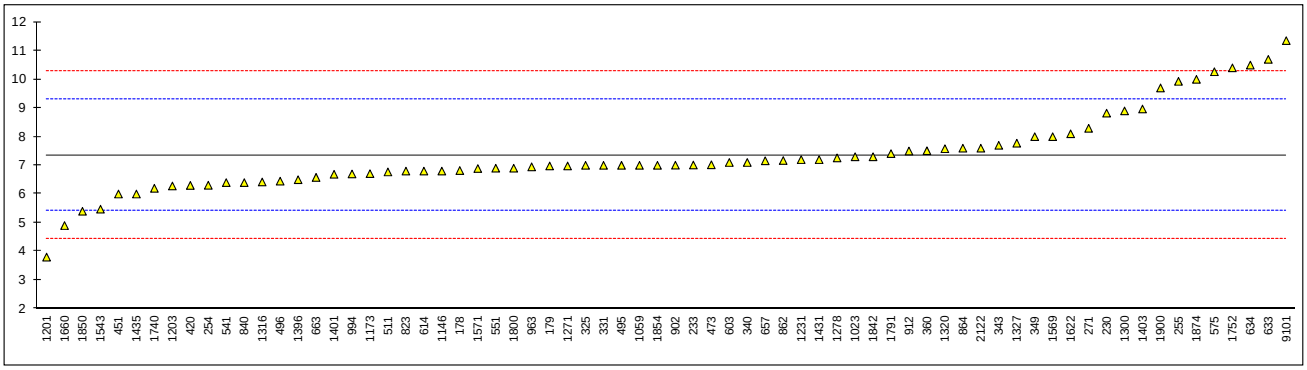


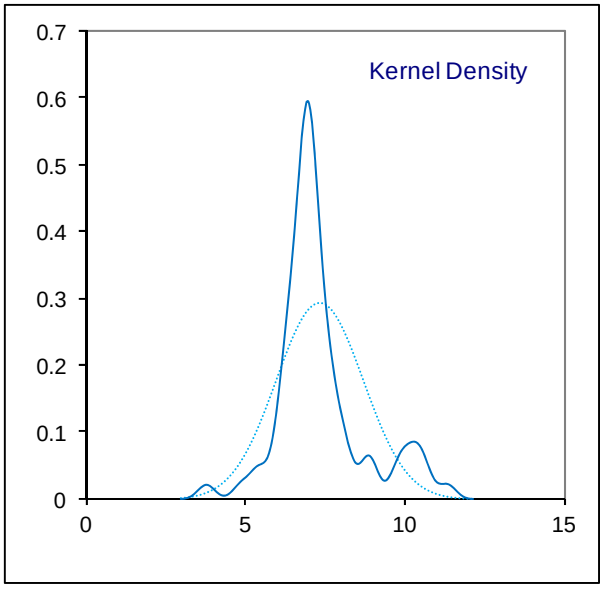
Determination of Chromium (Cr) on sample #14082; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	INH-5185	6.82		-0.54	
179	D5185	6.98		-0.38	
230	D6595	8.82		1.50	
233	D6595	7.012		-0.35	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	6.306		-1.07	
255	INH-OL1	9.930		2.64	
271	D5185	8.293		0.97	
311		-----		-----	
315		-----		-----	
325	INH-5185	7		-0.36	
331	D5185	7		-0.36	
340	D5185	7.1		-0.26	
343	D5185	7.7		0.36	
349	D5185	8	C	0.67	First reported: 0
360	D5185	7.51		0.16	
398		-----		-----	
420	D5185	6.3		-1.08	
432		-----		-----	
450		-----		-----	
451	D5185	6		-1.38	
473	D5185	7.020		-0.34	
495	D5185	7		-0.36	
496	D5185	6.45		-0.92	
511	D5185	6.77		-0.59	
541	D5185	6.4		-0.97	
551	D5185	6.9		-0.46	
562		-----		-----	
575	D6595	10.265		2.98	
603	D5185	7.1		-0.26	
614	D5185	6.8		-0.56	
621		-----		-----	
633	D6595	10.696		3.43	
634	D6595	10.498		3.22	
657	D5185	7.16		-0.19	
663	D5185	6.58		-0.79	
823	D5185	6.8		-0.56	
840	UOP391	6.4		-0.97	
862	D5185	7.17		-0.18	
864	D5185	7.6		0.26	
875		-----		-----	
902	D5185	7.006		-0.35	
912	D5185	7.5		0.15	
922		-----		-----	
963	D5185	6.948		-0.41	
966		-----		-----	
993		-----		-----	
994	D5185	6.7		-0.67	
1023	D5185	7.30		-0.05	
1059	in house	7		-0.36	
1106		-----		-----	
1146	in house	6.8		-0.56	
1161		-----		-----	
1173	in house	6.71		-0.66	
1201	D5185	3.8		-3.63	
1203	D5185	6.28		-1.10	
1227		-----		-----	
1231	D5185	7.2		-0.15	
1271	D5185	6.98		-0.38	
1278	D5185	7.26		-0.09	
1300	D5185	8.9	C	1.59	First reported: 11.9
1316	D5185	6.42		-0.95	
1318		-----		-----	
1320	D5185Mod.	7.58		0.24	
1324		-----		-----	
1327	D5185	7.774		0.43	
1396	D5185	6.50		-0.87	
1401	D6443	6.69		-0.68	
1403	ISO11885	8.965		1.65	
1423		-----		-----	
1431	in house	7.2		-0.15	
1435	D5185	6		-1.38	
1460		-----		-----	

1543	in house	5.473	-1.92
1569	D5185	8	0.67
1571	D5185	6.8904	-0.47
1622	D5185	8.10	0.77
1650		-----	-----
1660	D5185	4.9	-2.51
1720		-----	-----
1722		-----	-----
1740	D5185	6.2	-1.18
1748		-----	-----
1752	D6595	10.4	3.12
1791	in house	7.41	0.06
1800	INH-301	6.9	-0.46
1842	in house	7.3	-0.05
1850	in house	5.4	-2.00
1854	D5185	7.0	-0.36
1874	D6595	10	2.71
1900	D6595	9.7	2.41
1915		-----	-----
2122	D5185	7.6	0.26
9101	EPA3005	11.35	4.10
9129		-----	-----

		Only ASTM D5185		Only ASTM D6595
normality	suspect	not OK		not OK
n	70	46		8
outliers	0	0		0
mean (n)	7.350	6.959		9.674
st.dev. (n)	1.3630	0.8341		1.2260
R(calc.)	3.816	2.335		3.433
R(D5185:13e1)	2.735	2.645	Appl range: 1- 40 mg/kg	3.131





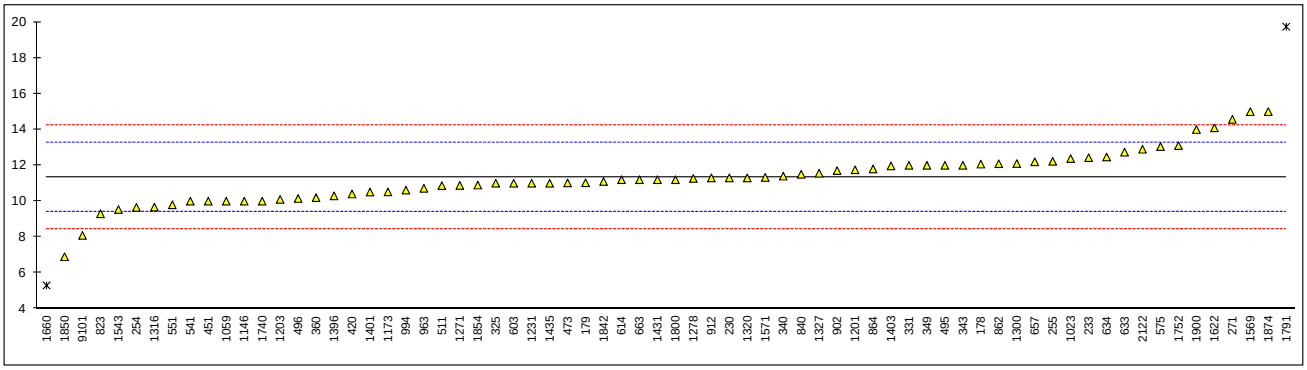
Determination of Copper (Cu) on sample #14082; results in mg/kg

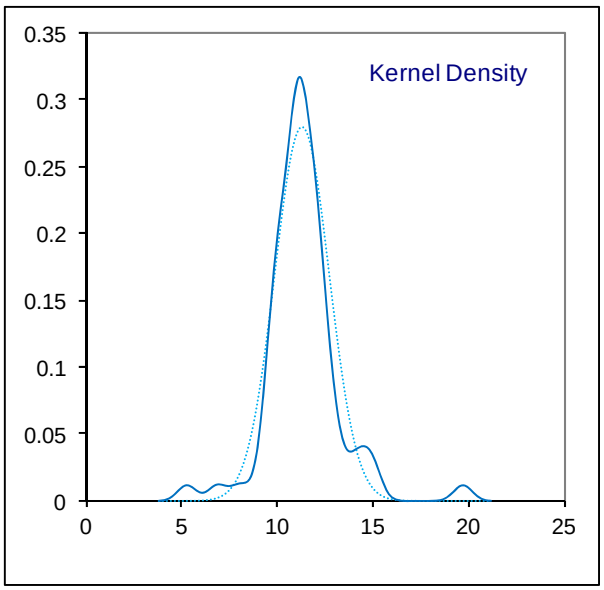
lab	method	value	mark	z(targ)	remarks
178	INH-5185	12.07		0.77	
179	D5185	11.03	C	-0.30	First reported: 6.80
230	D6595	11.3		-0.02	
233	D6595	12.432		1.15	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	9.653		-1.72	
255	INH-OL1	12.227		0.94	
271	D5185	14.569		3.35	
311		-----		-----	
315		-----		-----	
325	INH-5185	11		-0.33	
331	D5185	12		0.70	
340	D5185	11.4		0.08	
343	D5185	12		0.70	
349	D5185	12	C	0.70	First reported: 1.6
360	D5185	10.2		-1.15	
398		-----		-----	
420	D5185	10.4		-0.95	
432		-----		-----	
450		-----		-----	
451	D5185	10		-1.36	
473	D5185	11.02		-0.31	
495	D5185	12		0.70	
496	D5185	10.15		-1.20	
511	D5185	10.87		-0.46	
541	D5185	10		-1.36	
551	D5185	9.8		-1.57	
562		-----		-----	
575	D6595	13.050		1.78	
603	D5185	11.0		-0.33	
614	D5185	11.2		-0.12	
621		-----		-----	
633	D6595	12.738		1.46	
634	D6595	12.465		1.18	
657	D5185	12.2		0.91	
663	D5185	11.2		-0.12	
823	D5185	9.3		-2.08	
840	UOP391	11.5		0.19	
862	D5185	12.09		0.80	
864	D5185	11.8		0.50	
875		-----		-----	
902	D5185	11.71		0.40	
912	D5185	11.3		-0.02	
922		-----		-----	
963	D5185	10.720		-0.62	
966		-----		-----	
993		-----		-----	
994	D5185	10.62		-0.72	
1023	D5185	12.38		1.09	
1059	in house	10		-1.36	
1106		-----		-----	
1146	in house	10.0		-1.36	
1161		-----		-----	
1173	in house	10.52		-0.82	
1201	D5185	11.75		0.44	
1203	D5185	10.1		-1.26	
1227		-----		-----	
1231	D5185	11		-0.33	
1271	D5185	10.88		-0.45	
1278	D5185	11.27		-0.05	
1300	D5185	12.1		0.81	
1316	D5185	9.67		-1.70	
1318		-----		-----	
1320	D5185Mod.	11.3		-0.02	
1324		-----		-----	
1327	D5185	11.561		0.25	
1396	D5185	10.30		-1.05	
1401	D6443	10.51		-0.83	
1403	ISO11885	11.967		0.67	
1423		-----		-----	
1431	in house	11.2		-0.12	
1435	D5185	11		-0.33	
1460		-----		-----	

1543	in house	9.537		-1.84
1569	D5185	15		3.79
1571	D5185	11.3271		0.01
1622	D5185	14.09		2.86
1650		-----		-----
1660	D5185	5.3	R(0.01)	-6.20
1720		-----		-----
1722		-----		-----
1740	D5185	10		-1.36
1748		-----		-----
1752	D6595	13.1		1.84
1791	in house	19.74	R(0.01)	8.68
1800	INH-301	11.2		-0.12
1842	in house	11.1		-0.23
1850	in house	6.9		-4.55
1854	D5185	10.9		-0.43
1874	D6595	15		3.79
1900	D6595	14		2.76
1915		-----		-----
2122	D5185	12.9		1.63
9101	EPA3005	8.09		-3.33
9129		-----		-----

		Only ASTM D5185
normality	suspect	not OK
n	68	46
outliers	2	1
mean (n)	11.319	11.330
st.dev. (n)	1.4263	1.1812
R(calc.)	3.994	3.307
R(D5185:13e1)	2.716	2.719

Application range: 2 – 160 mg/kg





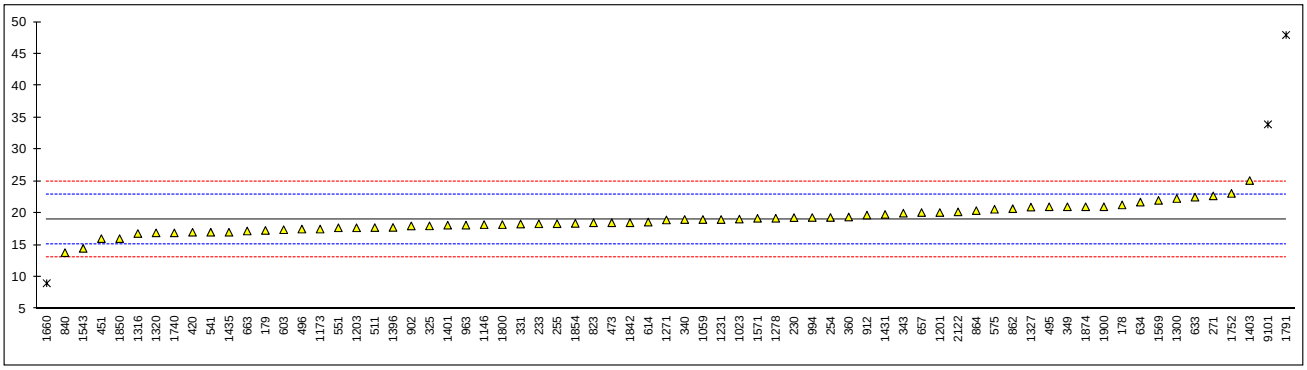
Determination of Iron (Fe) on sample #14082; results in mg/kg

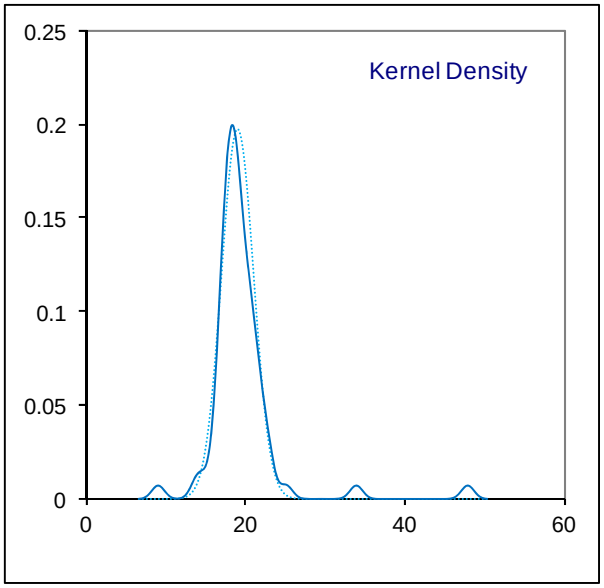
lab	method	value	mark	z(targ)	remarks
178	INH-5185	21.29		1.17	
179	D5185	17.29		-0.87	
230	D6595	19.3		0.15	
233	D6595	18.326		-0.34	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	19.321		0.17	
255	INH-OL1	18.342		-0.33	
271	D5185	22.710		1.90	
311		-----		-----	
315		-----		-----	
325	INH-5185	18		-0.51	
331	D5185	18.3		-0.36	
340	D5185	19		0.00	
343	D5185	20		0.51	
349	D5185	21	C	1.02	First reported: 0
360	D5185	19.4		0.21	
398		-----		-----	
420	D5185	17		-1.02	
432		-----		-----	
450		-----		-----	
451	D5185	16		-1.53	
473	D5185	18.5		-0.25	
495	D5185	21		1.02	
496	D5185	17.5		-0.76	
511	D5185	17.73		-0.65	
541	D5185	17		-1.02	
551	D5185	17.7		-0.66	
562		-----		-----	
575	D6595	20.612		0.82	
603	D5185	17.4		-0.82	
614	D5185	18.6		-0.20	
621		-----		-----	
633	D6595	22.515		1.80	
634	D6595	21.736		1.40	
657	D5185	20.1		0.56	
663	D5185	17.2		-0.92	
823	D5185	18.5		-0.25	
840	UOP391	13.8		-2.65	
862	D5185	20.7		0.87	
864	D5185	20.4		0.72	
875		-----		-----	
902	D5185	17.995		-0.51	
912	D5185	19.7		0.36	
922		-----		-----	
963	D5185	18.120		-0.45	
966		-----		-----	
993		-----		-----	
994	D5185	19.32		0.16	
1023	D5185	19.07		0.04	
1059	in house	19		0.00	
1106		-----		-----	
1146	in house	18.2		-0.41	
1161		-----		-----	
1173	in house	17.50		-0.76	
1201	D5185	20.1		0.56	
1203	D5185	17.7		-0.66	
1227		-----		-----	
1231	D5185	19		0.00	
1271	D5185	18.93		-0.03	
1278	D5185	19.2		0.10	
1300	D5185	22.3		1.69	
1316	D5185	16.8		-1.12	
1318		-----		-----	
1320	D5185Mod.	16.9		-1.07	
1324		-----		-----	
1327	D5185	20.950		1.00	
1396	D5185	17.76		-0.63	
1401	D6443	18.11		-0.45	
1403	ISO11885	25.118		3.13	
1423		-----		-----	
1431	in house	19.8		0.41	
1435	D5185	17		-1.02	
1460		-----		-----	

1543	in house	14.47		-2.31
1569	D5185	22		1.53
1571	D5185	19.1911		0.10
1622		-----		-----
1650		-----		-----
1660	D5185	9.0	R(0.01)	-5.11
1720		-----		-----
1722		-----		-----
1740	D5185	16.9		-1.07
1748		-----		-----
1752	D6595	23.1		2.10
1791	in house	47.96	R(0.01)	14.79
1800	INH-301	18.2		-0.41
1842	in house	18.5		-0.25
1850	in house	16.0		-1.53
1854	D5185	18.4		-0.30
1874	D6595	21		1.02
1900	D6595	21		1.02
1915		-----		-----
2122	D5185	20.2		0.61
9101	EPA3005	33.94	R(0.01)	7.63
9129		-----		-----

		Only ASTM D5185
normality	OK	OK
n	66	45
outliers	3	1
mean (n)	18.997	18.886
st.dev. (n)	2.0201	1.6315
R(calc.)	5.656	4.568
R(D5185:13e1)	5.482	5.456

Application range: 2 – 140 mg/kg





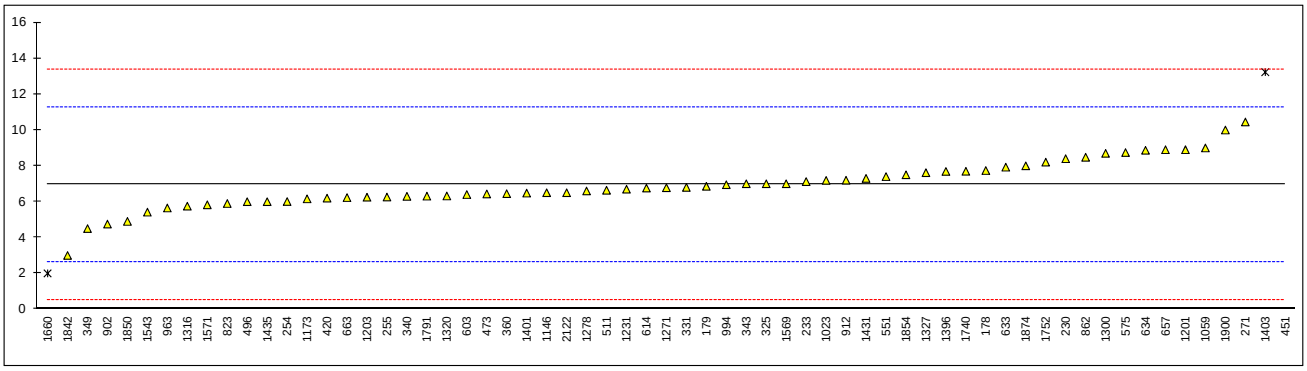
Determination of Lead (Pb) on sample #14082; results in mg/kg

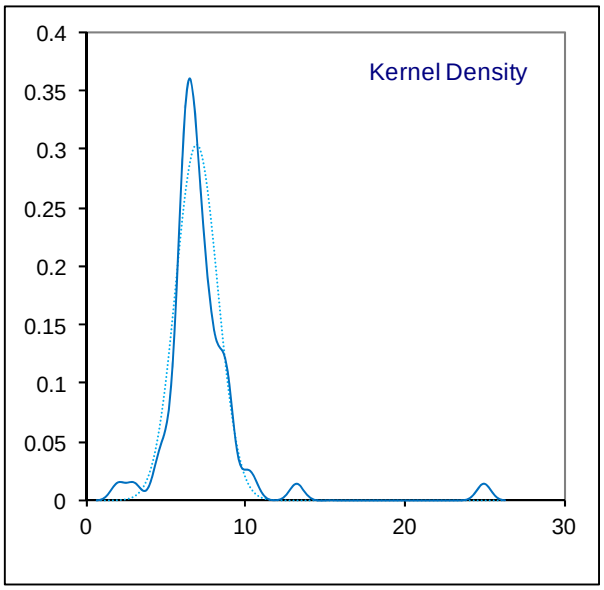
lab	method	value	mark	z(targ)	remarks
178	INH-5185	7.74		0.37	
179	D5185	6.86		-0.04	
230	D6595	8.4		0.68	
233	D6595	7.122		0.08	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	6.011		-0.43	
255	INH-OL1	6.262		-0.32	
271	D5185	10.451		1.63	
311		-----		-----	
315		-----		-----	
325	INH-5185	7		0.03	
331	D5185	6.8		-0.07	
340	D5185	6.3		-0.30	
343	D5185	7.0		0.03	
349	D5185	4.5		-1.14	
360	D5185	6.45		-0.23	
398		-----		-----	
420	D5185	6.2		-0.35	
432		-----		-----	
450		-----		-----	
451	D5185	25	R(0.01)	8.39	
473	D5185	6.434		-0.24	
495	D5185	<10		-----	
496	D5185	6.0		-0.44	
511	D5185	6.64		-0.14	
541	D5185	<10		-----	
551	D5185	7.4		0.21	
562		-----		-----	
575	D6595	8.746		0.84	
603	D5185	6.4		-0.25	
614	D5185	6.76		-0.09	
621		-----		-----	
633	D6595	7.927		0.46	
634	D6595	8.87	C	0.89	First reported: 12.661
657	D5185	8.90		0.91	
663	D5185	6.23		-0.33	
823	D5185	5.9		-0.49	
840		-----		-----	
862	D5185	8.48		0.71	
864		-----		-----	
875		-----		-----	
902	D5185	4.753		-1.02	
912	D5185	7.2		0.12	
922		-----		-----	
963	D5185	5.649		-0.60	
966		-----		-----	
993		-----		-----	
994	D5185	6.95		0.00	
1023	D5185	7.19		0.11	
1059	in house	9		0.96	
1106		-----		-----	
1146	in house	6.5		-0.21	
1161		-----		-----	
1173	in house	6.16		-0.36	
1201	D5185	8.9		0.91	
1203	D5185	6.25		-0.32	
1227		-----		-----	
1231	D5185	6.7		-0.11	
1271	D5185	6.78		-0.08	
1278	D5185	6.60		-0.16	
1300	D5185	8.7	C	0.82	First reported: 12.6
1316	D5185	5.75		-0.55	
1318		-----		-----	
1320	D5185Mod.	6.32		-0.29	
1324		-----		-----	
1327	D5185	7.621		0.31	
1396	D5185	7.69		0.35	
1401	D6443	6.48		-0.22	
1403	ISO11885	13.231	R(0.01)	2.92	
1423		-----		-----	
1431	in house	7.3		0.17	
1435	D5185	6		-0.44	
1460		-----		-----	

1543	in house	5.417		-0.71	
1569	D5185	7		0.03	
1571	D5185	5.8275		-0.52	
1622		-----	W	-----	First reported: 10.83
1650		-----		-----	
1660	D5185	2.0	R(0.05)	-2.30	
1720		-----		-----	
1722		-----		-----	
1740	D5185	7.7		0.35	
1748		-----		-----	
1752	D6595	8.21		0.59	
1791	in house	6.31		-0.29	
1800		-----		-----	
1842	in house	3.0		-1.83	
1850	in house	4.9		-0.95	
1854	D5185	7.5		0.26	
1874	D6595	8		0.49	
1900	D6595	10		1.42	
1915		-----		-----	
2122	D5185	6.5		-0.21	
9101		-----		-----	
9129		-----		-----	

normality	suspect
n	60
outliers	3
mean (n)	6.944
st.dev. (n)	1.3102
R(calc.)	3.669
R(D5185:13e1)	6.027

Application range: 10 – 160



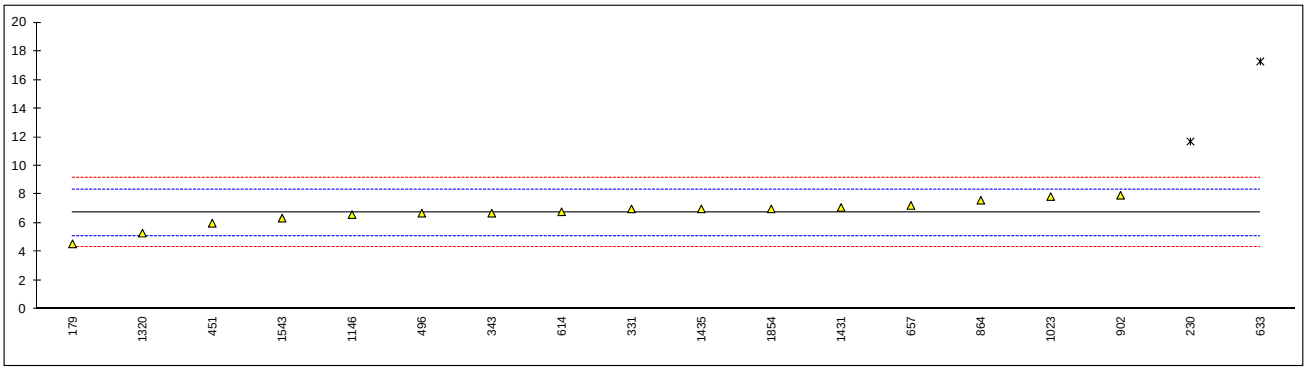


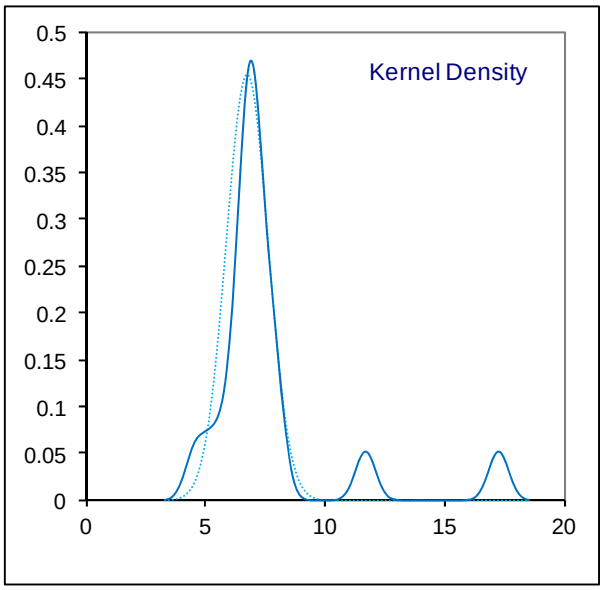
Determination of Lithium (Li) on sample #14082; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D5185	4.56	C	-2.69	First reported 3.6
230	D6595	11.7	G(0.01)	6.14	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271		-----		-----	
311		-----		-----	
315		-----		-----	
325		-----		-----	
331	D5185	7		0.33	
340		-----		-----	
343		6.7		-0.04	
349		-----		-----	
360		-----		-----	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		6		-0.91	
473		-----		-----	
495		-----		-----	
496		6.7		-0.04	
511		-----		-----	
541		-----		-----	
551		-----		-----	
562		-----		-----	
575		-----		-----	
603		-----		-----	
614	D5185	6.8		0.08	
621		-----		-----	
633	D6595	17.280	C,G(0.01)	13.04	First reported: 23.848
634		-----		-----	
657	D5185	7.24		0.62	
663		-----		-----	
823		-----		-----	
840		-----		-----	
862		-----		-----	
864	D5185	7.6		1.07	
875		-----		-----	
902	D5185	7.948		1.50	
912		-----		-----	
922		-----		-----	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023	D5185	7.86		1.39	
1059		-----		-----	
1106		-----		-----	
1146	in house	6.6		-0.17	
1161		-----		-----	
1173		-----		-----	
1201		-----		-----	
1203		-----		-----	
1227		-----		-----	
1231		-----		-----	
1271		-----		-----	
1278		-----		-----	
1300		-----		-----	
1316		-----		-----	
1318		-----		-----	
1320	D5185Mod.	5.31		-1.76	
1324		-----		-----	
1327		-----		-----	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431	in house	7.1		0.45	
1435		7		0.33	
1460		-----		-----	

1543	in house	6.354	-0.47
1569		-----	-----
1571		-----	-----
1622		-----	-----
1650		-----	-----
1660		-----	-----
1720		-----	-----
1722		-----	-----
1740		-----	-----
1748		-----	-----
1752		-----	-----
1791		-----	-----
1800		-----	-----
1842		-----	-----
1850		-----	-----
1854		7.0	0.33
1874		-----	-----
1900		-----	-----
1915		-----	-----
2122		-----	-----
9101		-----	-----
9129		-----	-----

normality	suspect
n	16
outliers	2
mean (n)	6.736
st.dev. (n)	0.8777
R(calc.)	2.458
R(Horwitz)	2.265





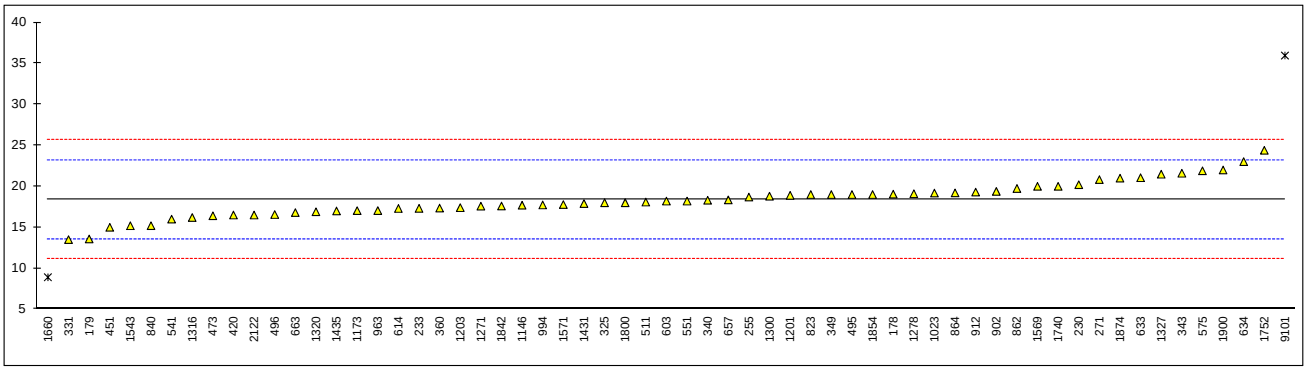
Determination of Magnesium (Mg) on sample #14082; results in mg/kg

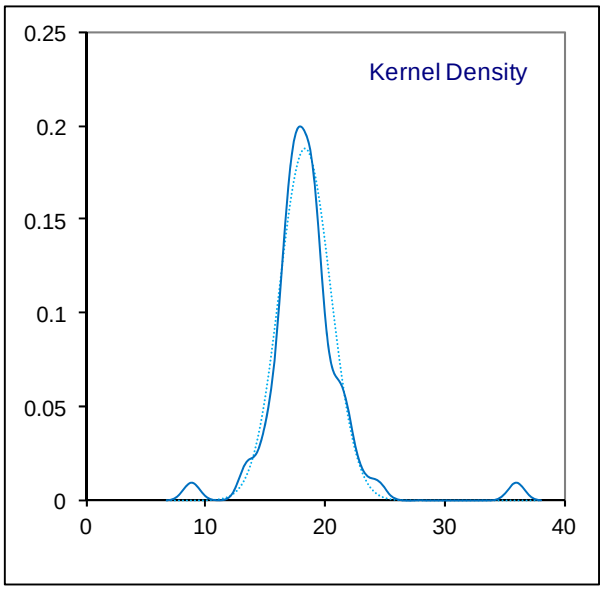
lab	method	value	mark	z(targ)	remarks
178	INH-5185	19.05		0.29	
179	D5185	13.58		-1.98	
230	D6595	20.2		0.76	
233	D6595	17.317		-0.43	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255	INH-OL1	18.692		0.14	
271	D5185	20.829		1.02	
311		-----		-----	
315		-----		-----	
325	INH-5185	18		-0.15	
331	D5185	13.5		-2.01	
340	D5185	18.3		-0.02	
343	D5185	21.6		1.34	
349	D5185	19	C	0.27	First reported: 36.8
360	D5185	17.35		-0.42	
398		-----		-----	
420	D5185	16.5		-0.77	
432		-----		-----	
450		-----		-----	
451	D5185	15		-1.39	
473	D5185	16.41		-0.81	
495	D5185	19		0.27	
496	D5185	16.56		-0.74	
511	D5185	18.08		-0.11	
541	D5185	16.0		-0.97	
551	D5185	18.2		-0.06	
562		-----		-----	
575	D6595	21.896		1.46	
603	D5185	18.2		-0.06	
614	D5185	17.3		-0.44	
621		-----		-----	
633	D6595	21.052		1.12	
634	D6595	23.020		1.93	
657	D5185	18.34		-0.01	
663	D5185	16.80		-0.64	
823	D5185	19.0		0.27	
840	UOP391	15.2		-1.31	
862	D5185	19.74		0.57	
864	D5185	19.2		0.35	
875		-----		-----	
902	D5185	19.385		0.43	
912	D5185	19.3		0.39	
922		-----		-----	
963	D5185	17.040		-0.54	
966		-----		-----	
993		-----		-----	
994	D5185	17.73		-0.26	
1023	D5185	19.18		0.34	
1059		-----		-----	
1106		-----		-----	
1146	in house	17.7		-0.27	
1161		-----		-----	
1173	in house	17.03		-0.55	
1201	D5185	18.9		0.23	
1203	D5185	17.4		-0.40	
1227		-----		-----	
1231		-----		-----	
1271	D5185	17.58		-0.32	
1278	D5185	19.1		0.31	
1300	D5185	18.8		0.18	
1316	D5185	16.2		-0.89	
1318		-----		-----	
1320	D5185Mod.	16.9		-0.60	
1324		-----		-----	
1327	D5185	21.481		1.29	
1396	D5185	<0.5		<-7.39	False negative result?
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431	in house	17.9		-0.19	
1435	D5185	17		-0.56	
1460		-----		-----	

1543	in house	15.19		-1.31
1569	D5185	20		0.68
1571	D5185	17.7743		-0.24
1622		-----		-----
1650		-----		-----
1660	D5185	8.9	R(0.01)	-3.91
1720		-----		-----
1722		-----		-----
1740	D5185	20		0.68
1748		-----		-----
1752	D6595	24.4		2.50
1791		-----		-----
1800	INH-301	18.0		-0.15
1842	in house	17.6		-0.31
1850		-----		-----
1854	D5185	19.0		0.27
1874	D6595	21		1.09
1900	D6595	22		1.51
1915		-----		-----
2122	D5185	16.5		-0.77
9101	EPA3005	35.97	R(0.01)	7.29
9129		-----		-----

normality	OK
n	59
outliers	2
mean (n)	18.356
st.dev. (n)	2.1204
R(calc.)	5.937
R(D5185:13e1)	6.768

Application range: 5 – 1700 mg/kg



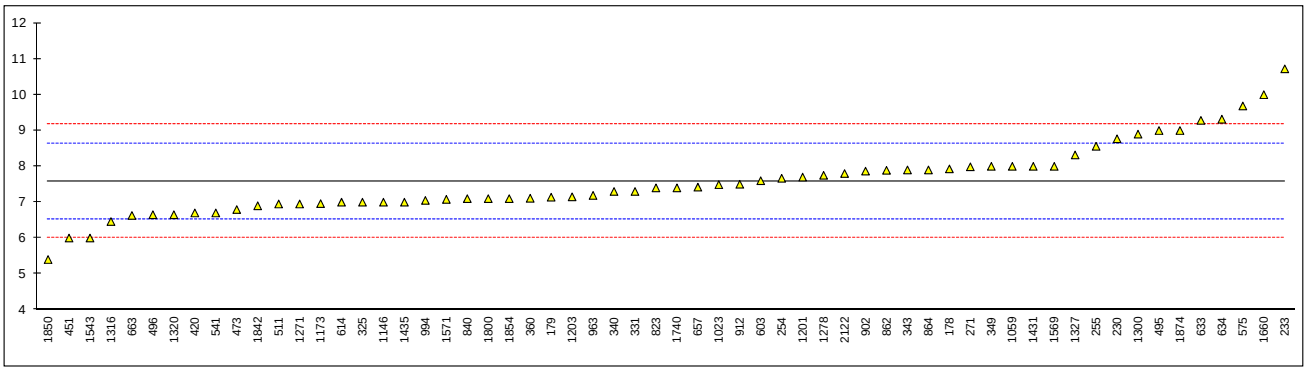


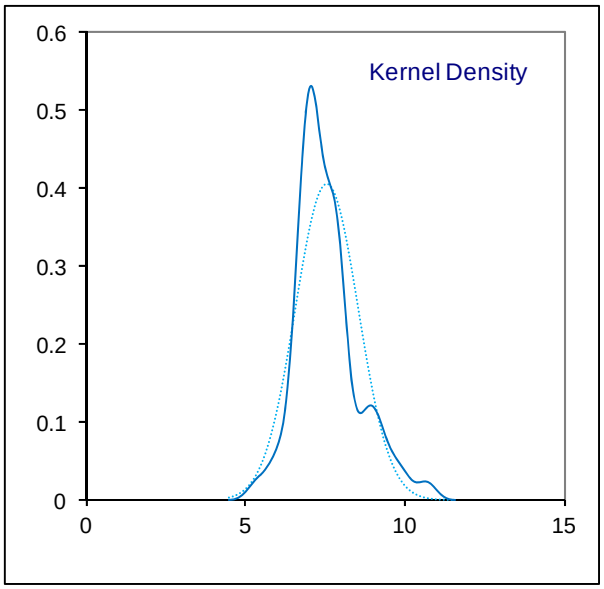
Determination of Manganese (Mn) on sample #14082; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	INH-5185	7.93		0.65	
179	D5185	7.14	C	-0.84	First reported: 1.66
230	D6595	8.77		2.24	
233	D6595	10.72		5.94	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	7.668		0.16	
255	INH-OL1	8.561		1.85	
271	D5185	7.987		0.76	
311		-----		-----	
315		-----		-----	
325	INH-5185	7		-1.11	
331	D5185	7.3		-0.54	
340	D5185	7.3		-0.54	
343	D5185	7.9		0.60	
349	D5185	8	C	0.79	First reported: 0.3
360	D5185	7.11		-0.90	
398		-----		-----	
420	D5185	6.7		-1.68	
432		-----		-----	
450		-----		-----	
451	D5185	6		-3.00	
473	D5185	6.795		-1.50	
495	D5185	9		2.68	
496	D5185	6.65		-1.77	
511	D5185	6.95		-1.20	
541	D5185	6.7		-1.68	
551		-----		-----	
562		-----		-----	
575	D6595	9.686		3.98	
603	D5185	7.6		0.03	
614	D5185	7		-1.11	
621		-----		-----	
633	D6595	9.284	C	3.22	First reported: 11.022
634	D6595	9.316		3.28	
657	D5185	7.42		-0.31	
663	D5185	6.63		-1.81	
823	D5185	7.4		-0.35	
840	UOP391	7.1		-0.92	
862	D5185	7.89		0.58	
864	D5185	7.9		0.60	
875		-----		-----	
902	D5185	7.867		0.53	
912	D5185	7.5		-0.16	
922		-----		-----	
963	D5185	7.190		-0.75	
966		-----		-----	
993		-----		-----	
994	D5185	7.05		-1.01	
1023	D5185	7.49		-0.18	
1059	in house	8		0.79	
1106		-----		-----	
1146	in house	7.0		-1.11	
1161		-----		-----	
1173	in house	6.96		-1.18	
1201	D5185	7.7		0.22	
1203	D5185	7.15		-0.82	
1227		-----		-----	
1231		-----		-----	
1271	D5185	6.95		-1.20	
1278	D5185	7.75		0.31	
1300	D5185	8.9	C	2.49	First reported: 10.4
1316	D5185	6.46		-2.13	
1318		-----		-----	
1320	D5185Mod.	6.65		-1.77	
1324		-----		-----	
1327	D5185	8.319		1.39	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431	in house	8.0		0.79	
1435	D5185	7		-1.11	
1460		-----		-----	

1543	in house	6.000		-3.00	
1569	D5185	8		0.79	
1571	D5185	7.0788		-0.96	
1622		-----		-----	
1650		-----		-----	
1660	D5185	10.0		4.57	
1720		-----		-----	
1722		-----		-----	
1740	D5185	7.4		-0.35	
1748		-----		-----	
1752		-----		-----	
1791		-----		-----	
1800	INH-301	7.1		-0.92	
1842	in house	6.9		-1.30	
1850	in house	5.4		-4.14	
1854	D5185	7.1		-0.92	
1874	D6595	9	C	2.68	First reported: 10
1900		-----		-----	
1915		-----		-----	
2122	D5185	7.8		0.41	
9101		-----		-----	
9129		-----		-----	

		Only ASTM D5185		Only ASTM D6595
normality	suspect	not OK		not OK
n	60	43		6
outliers	0	0		0
mean (n)	7.585	7.434		9.463
st.dev. (n)	0.9852	0.7317		0.6896
R(calc.)	2.758	2.049		1.931
R(D5185:13e1)	1.479	1.443	Appl range: 5 – 700 mg/kg	4.939





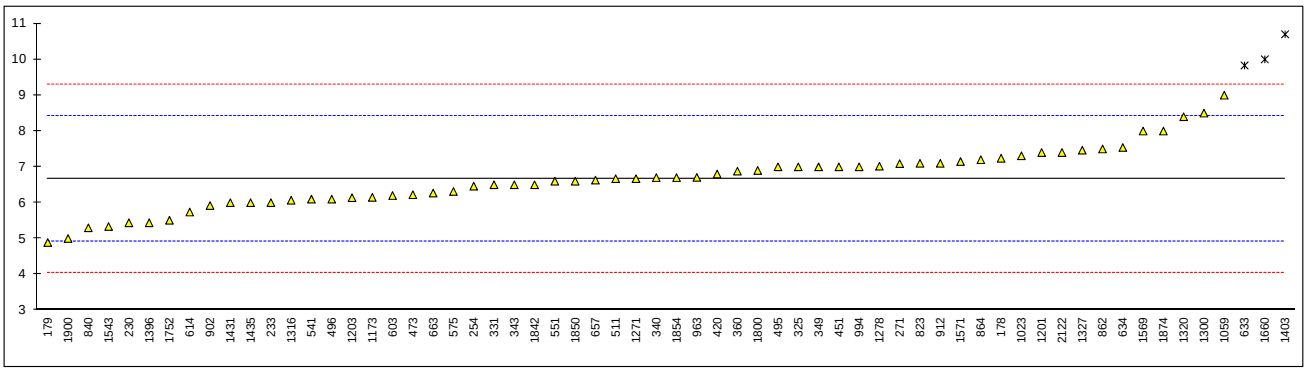
Determination of Molybdenum (Mo) on sample #14082; results in mg/kg

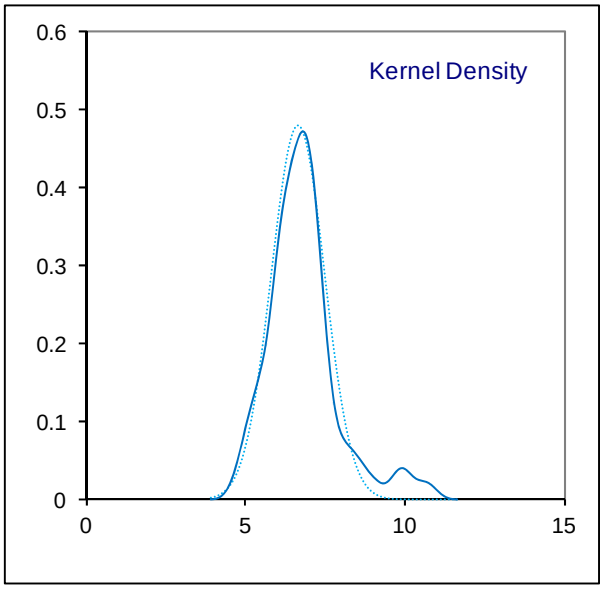
lab	method	value	mark	z(targ)	remarks
178	INH-5185	7.24		0.65	
179	D5185	4.89		-2.02	
230	D6595	5.44		-1.40	
233	D6595	6.002		-0.76	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	6.463		-0.23	
255		-----		-----	
271	D5185	7.091		0.48	
311		-----		-----	
315		-----		-----	
325	INH-5185	7		0.38	
331	D5185	6.5		-0.19	
340	D5185	6.7		0.04	
343	D5185	6.5		-0.19	
349	D5185	7	C	0.38	First reported: 0
360	D5185	6.88		0.24	
398		-----		-----	
420	D5185	6.8		0.15	
432		-----		-----	
450		-----		-----	
451	D5185	7		0.38	
473	D5185	6.222		-0.51	
495	D5185	7		0.38	
496	D5185	6.1		-0.65	
511	D5185	6.67		0.00	
541	D5185	6.1		-0.65	
551	D5185	6.6		-0.08	
562		-----		-----	
575	D6595	6.313		-0.40	
603	D5185	6.2		-0.53	
614	D5185	5.74		-1.06	
621		-----		-----	
633	D6595	9.83	C,R(0.05)	3.60	First reported: 12.228
634	D6595	7.541		0.99	
657	D5185	6.63		-0.04	
663	D5185	6.27		-0.45	
823	D5185	7.1		0.49	
840	UOP391	5.3		-1.56	
862	D5185	7.5		0.95	
864	D5185	7.2		0.61	
875		-----		-----	
902	D5185	5.921		-0.85	
912	D5185	7.1		0.49	
922		-----		-----	
963	D5185	6.707		0.04	
966		-----		-----	
993		-----		-----	
994	D5185	7.00		0.38	
1023	D5185	7.31		0.73	
1059	in house	9		2.65	
1106		-----		-----	
1146		-----		-----	
1161		-----		-----	
1173	in house	6.15		-0.59	
1201	D5185	7.4		0.83	
1203	D5185	6.14		-0.60	
1227		-----		-----	
1231		-----		-----	
1271	D5185	6.67		0.00	
1278	D5185	7.02		0.40	
1300	D5185	8.5	C	2.08	First reported: 12.4
1316	D5185	6.07		-0.68	
1318		-----		-----	
1320	D5185Mod.	8.4	C	1.97	First reported 9.66
1324		-----		-----	
1327	D5185	7.466		0.91	
1396	D5185	5.44		-1.40	
1401		-----		-----	
1403	ISO11885	10.70	R(0.05)	4.59	
1423		-----		-----	
1431	in house	6.0		-0.76	
1435	D5185	6		-0.76	
1460		-----		-----	

1543	in house	5.335		-1.52
1569	D5185	8		1.52
1571	D5185	7.1484		0.55
1622		-----		-----
1650		-----		-----
1660	D5185	10.0	R(0.05)	3.79
1720		-----		-----
1722		-----		-----
1740		-----		-----
1748		-----		-----
1752	D6595	5.51		-1.32
1791		-----		-----
1800	INH-301	6.9		0.26
1842	in house	6.5		-0.19
1850	in house	6.6		-0.08
1854	D5185	6.7		0.04
1874	D6595	8		1.52
1900	D6595	5		-1.90
1915		-----		-----
2122	D5185	7.4		0.83
9101		-----		-----
9129		-----		-----

normality	OK
n	59
outliers	3
mean (n)	6.667
st.dev. (n)	0.8325
R(calc.)	2.331
R(D5185:13e1)	2.461

Application range: 5 – 200 mg/kg





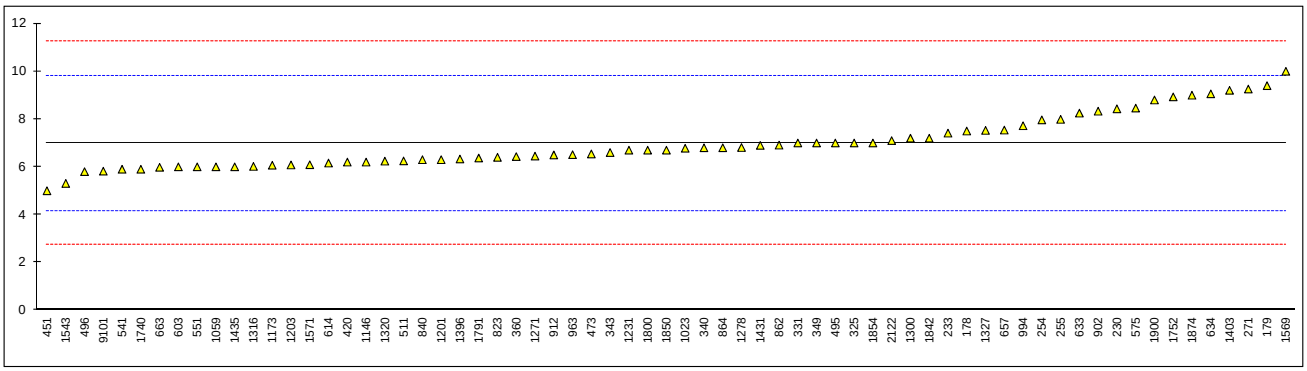
Determination of Nickel (Ni) on sample #14082; results in mg/kg

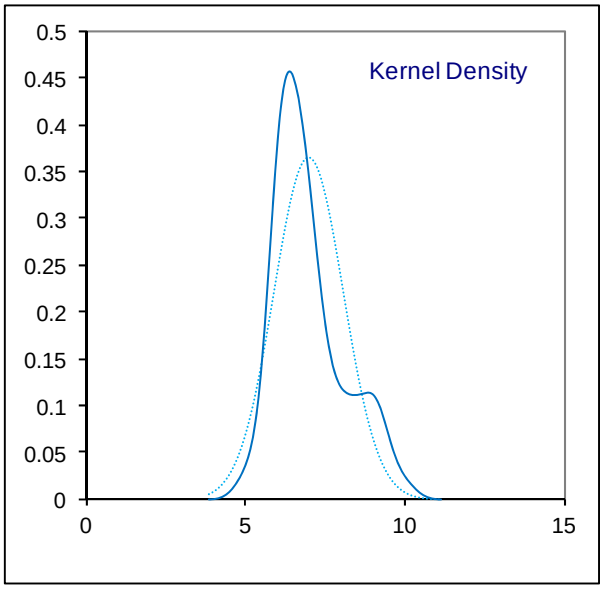
lab	method	value	mark	z(targ)	remarks
178	INH-5185	7.5		0.36	
179	D5185	9.4		1.70	
230	D6595	8.43		1.02	
233	D6595	7.412		0.30	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	7.967		0.69	
255	INH-OL1	7.989		0.71	
271	D5185	9.259		1.60	
311		-----		-----	
315		-----		-----	
325	INH-5185	7		0.01	
331	D5185	7		0.01	
340	D5185	6.8		-0.13	
343	D5185	6.6		-0.27	
349	D5185	7	C	0.01	First reported: 0
360	D5185	6.43		-0.39	
398		-----		-----	
420	D5185	6.2		-0.56	
432		-----		-----	
450		-----		-----	
451	D5185	5		-1.40	
473	D5185	6.541		-0.31	
495	D5185	7		0.01	
496	D5185	5.8		-0.84	
511	D5185	6.25		-0.52	
541	D5185	5.9		-0.77	
551	D5185	6.0		-0.70	
562		-----		-----	
575	D6595	8.460		1.04	
603	D5185	6.0		-0.70	
614	D5185	6.16		-0.58	
621		-----		-----	
633	D6595	8.250	C	0.89	First reported: 10.325
634	D6595	9.056		1.46	
657	D5185	7.54		0.39	
663	D5185	5.98		-0.71	
823	D5185	6.4		-0.41	
840	UOP391	6.3		-0.49	
862	D5185	6.91		-0.05	
864	D5185	6.8		-0.13	
875		-----		-----	
902	D5185	8.330		0.95	
912	D5185	6.5		-0.34	
922		-----		-----	
963	D5185	6.510		-0.34	
966		-----		-----	
993		-----		-----	
994	D5185	7.72		0.52	
1023	D5185	6.78		-0.15	
1059	in house	6		-0.70	
1106		-----		-----	
1146	in house	6.2		-0.56	
1161		-----		-----	
1173	in house	6.07		-0.65	
1201	D5185	6.3		-0.49	
1203	D5185	6.08		-0.64	
1227		-----		-----	
1231	D5185	6.7		-0.20	
1271	D5185	6.45		-0.38	
1278	D5185	6.81		-0.12	
1300	D5185	7.2		0.15	
1316	D5185	6.02		-0.68	
1318		-----		-----	
1320	EN13131	6.24		-0.53	
1324		-----		-----	
1327	D5185	7.527		0.38	
1396	D5185	6.33		-0.46	
1401		-----		-----	
1403	ISO11885	9.202		1.56	
1423		-----		-----	
1431	in house	6.9		-0.06	
1435	D5185	6		-0.70	
1460		-----		-----	

1543	in house	5.308	-1.19	
1569	D5185	10	2.13	
1571	D5185	6.0892	-0.63	
1622		-----	-----	
1650		-----	-----	
1660	D5185	<0.1	<-4.86	False negative test result?
1720		-----	-----	
1722		-----	-----	
1740	D5185	5.9	-0.77	
1748		-----	-----	
1752	D6595	8.93	1.37	
1791	in house	6.37	-0.44	
1800	INH-301	6.7	-0.20	
1842	in house	7.2	0.15	
1850	in house	6.7	-0.20	
1854	D5185	7.0	0.01	
1874	D6595	9	1.42	
1900	D6595	8.8	1.28	
1915		-----	-----	
2122	D5185	7.1	0.08	
9101	EPA3005	5.82	-0.82	
9129		-----	-----	

			Only ASTM D6595
	normality	OK	OK
	n	67	9
	outliers	0	0
	mean (n)	6.987	8.349
	st.dev. (n)	1.0928	0.7722
	R(calc.)	3.060	2.162
	R(D5185:13e1)	3.965	2.992

Application range: 5 – 40 mg/kg



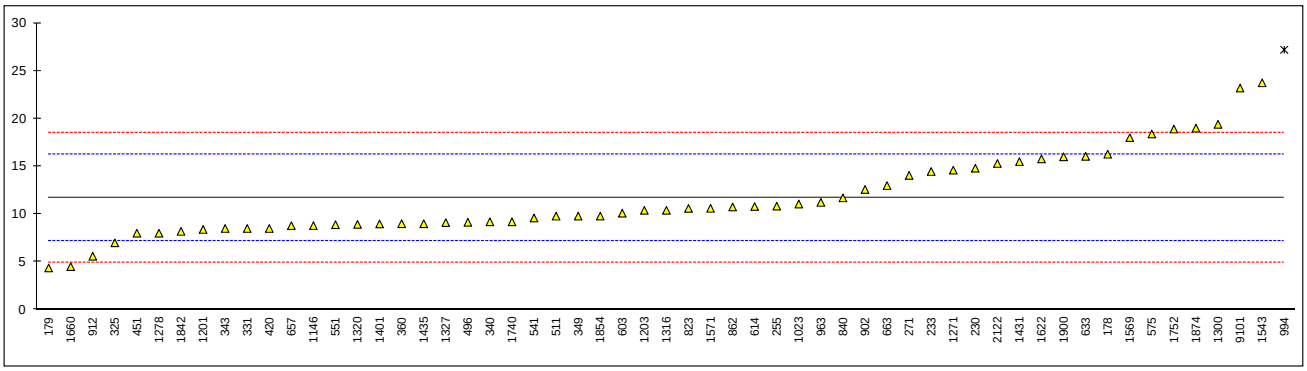


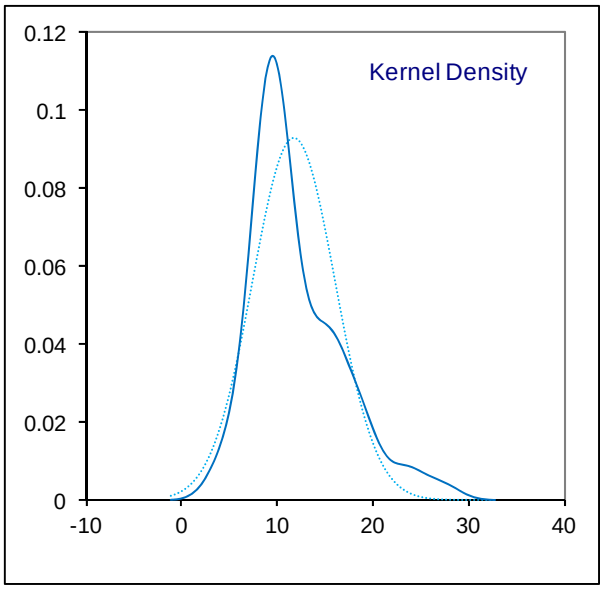
Determination of Sodium (Na) on sample #14082; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	INH-5185	16.27		2.03	
179	D5185	4.37		-3.25	
230	D6595	14.8		1.38	
233	D6595	14.462		1.23	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255	INH-OL1	10.833		-0.38	
271	D5185	14.058		1.05	
311		-----		-----	
315		-----		-----	
325	INH-5185	7		-2.09	
331	D5185	8.5		-1.42	
340	D5185	9.2		-1.11	
343	D5185	8.5		-1.42	
349	D5185	9.8		-0.84	
360	D5185	9.00		-1.20	
398		-----		-----	
420	D5185	8.5		-1.42	
432		-----		-----	
450		-----		-----	
451	D5185	8		-1.64	
473		-----		-----	
495	D5185	<7		<-2.09	
496	D5185	9.15		-1.13	
511	D5185	9.79		-0.85	
541	D5185	9.6		-0.93	
551	D5185	8.9		-1.24	
562		-----		-----	
575	D6595	18.390		2.97	
603	D5185	10.1		-0.71	
614	D5185	10.8		-0.40	
621		-----		-----	
633	D6595	16.051		1.93	
634	D6595	<1		<-4.75	False negative test result?
657	D5185	8.79		-1.29	
663	D5185	12.99		0.57	
823	D5185	10.6		-0.49	
840	UOP391	11.7		0.00	
862	D5185	10.75		-0.42	
864		-----		-----	
875		-----		-----	
902	D5185	12.583		0.39	
912	D5185	5.6		-2.71	
922		-----		-----	
963	D5185	11.230		-0.21	
966		-----		-----	
993		-----		-----	
994	D5185	27.2	R(0.05)	6.88	
1023	D5185	11.06		-0.28	
1059		-----		-----	
1106		-----		-----	
1146	in house	8.8		-1.29	
1161		-----		-----	
1173		-----		-----	
1201	D5185	8.4		-1.46	
1203	D5185	10.4		-0.58	
1227		-----		-----	
1231		-----		-----	
1271	D5185	14.60		1.29	
1278	D5185	8.0		-1.64	
1300	D5185	19.4		3.42	
1316	D5185	10.4		-0.58	
1318		-----		-----	
1320	D5185Mod.	8.93		-1.23	
1324		-----		-----	
1327	D5185	9.108		-1.15	
1396		-----		-----	
1401	D6443	8.98		-1.21	
1403		-----		-----	
1423		-----		-----	
1431	in house	15.5		1.69	
1435	D5185	9		-1.20	
1460		-----		-----	

1543	in house	23.74	5.35
1569	D5185	18	2.80
1571	D5185	10.6095	-0.48
1622	D5185	15.78	1.81
1650		-----	-----
1660	D5185	4.5	-3.20
1720		-----	-----
1722		-----	-----
1740	D5185	9.2	-1.11
1748		-----	-----
1752	D6595	18.9	3.20
1791		-----	-----
1800		-----	-----
1842	in house	8.2	-1.55
1850		-----	-----
1854	D5185	9.8	-0.84
1874	D6595	19	3.24
1900	D6595	16	1.91
1915		-----	-----
2122	D5185	15.3	1.60
9101	EPA3005	23.19	5.10
9129		-----	-----

		Only D5185		Only D6595
normality	OK	suspect		OK
n	56	41		7
outliers	1	1		0
mean (n)	11.698	10.404		16.800
st.dev. (n)	4.2954	3.2447		1.9341
R(calc.)	12.027	9.085		5.416
R(D5185:13e1)	6.306	5.802	Application.range: 7 – 70 mg/kg	4.640





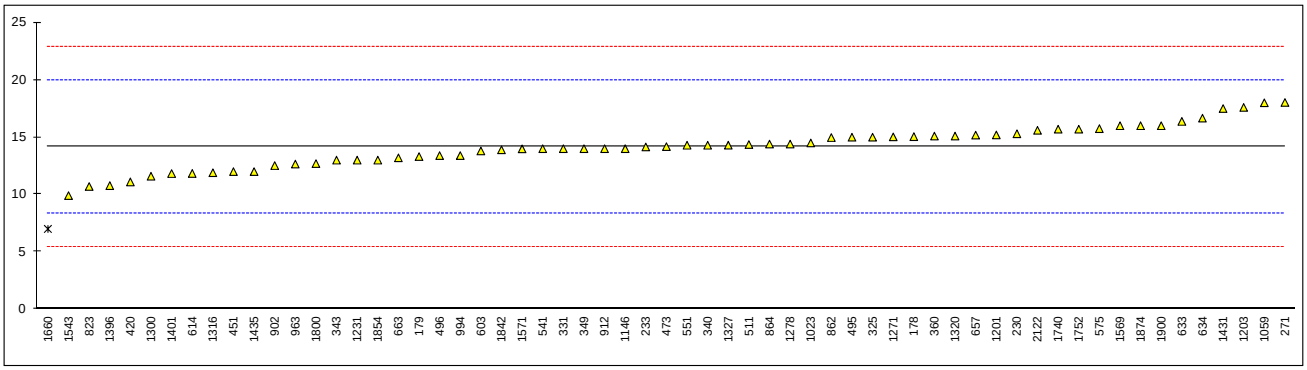
Determination of Silicon (Si) on sample #14082; results in mg/kg

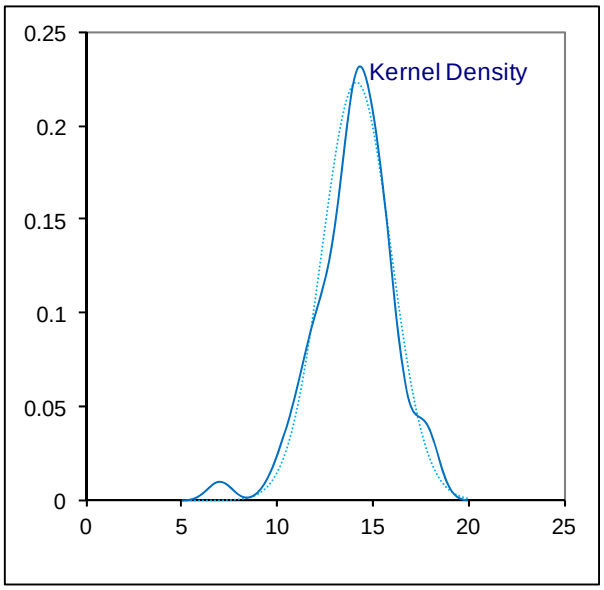
lab	method	value	mark	z(targ)	remarks
178	INH-5185	15.05		0.30	
179	D5185	13.31		-0.30	
230	D6595	15.3		0.39	
233	D6595	14.152		-0.01	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271	D5185	18.027		1.32	
311		-----		-----	
315		-----		-----	
325	INH-5185	15		0.28	
331	D5185	14		-0.06	
340	D5185	14.3		0.04	
343	D5185	13		-0.40	
349	D5185	14	C	-0.06	First reported: 2
360	D5185	15.1		0.32	
398		-----		-----	
420	D5185	11.1		-1.05	
432		-----		-----	
450		-----		-----	
451	D5185	12		-0.75	
473	D5185	14.18		0.00	
495	D5185	15		0.28	
496	D5185	13.4		-0.26	
511	D5185	14.36		0.06	
541	D5185	14		-0.06	
551	D5185	14.3		0.04	
562		-----		-----	
575	D6595	15.748		0.54	
603	D5185	13.8		-0.13	
614	D5185	11.84		-0.80	
621		-----		-----	
633	D6595	16.378		0.76	
634	D6595	16.662		0.86	
657	D5185	15.18		0.35	
663	D5185	13.2		-0.33	
823	D5185	10.7		-1.19	
840		-----		-----	
862	D5185	14.97		0.27	
864	D5185	14.4		0.08	
875		-----		-----	
902	D5185	12.525		-0.57	
912	D5185	14		-0.06	
922		-----		-----	
963	D5185	12.660		-0.52	
966		-----		-----	
993		-----		-----	
994	D5185	13.4		-0.26	
1023	D5185	14.50		0.11	
1059	in house	18		1.31	
1106		-----		-----	
1146	in house	14.0		-0.06	
1161		-----		-----	
1173		-----		-----	
1201	D5185	15.2		0.35	
1203	D5185	17.6		1.18	
1227		-----		-----	
1231	D5185	13		-0.40	
1271	D5185	15.03		0.29	
1278	D5185	14.4		0.08	
1300	D5185	11.6		-0.88	
1316	D5185	11.9		-0.78	
1318		-----		-----	
1320	D5185Mod.	15.1		0.32	
1324		-----		-----	
1327	D5185	14.306		0.05	
1396	D5185	10.78		-1.16	
1401	D6443	11.83		-0.80	
1403		-----		-----	
1423		-----		-----	
1431	in house	17.5		1.14	
1435	D5185	12		-0.75	
1460		-----		-----	

1543	in house	9.906		-1.46
1569	D5185	16		0.63
1571	D5185	13.9796		-0.07
1622		-----		-----
1650		-----		-----
1660	D5185	7.0	R(0.05)	-2.46
1720		-----		-----
1722		-----		-----
1740	D5185	15.7		0.52
1748		-----		-----
1752	D6595	15.7		0.52
1791		-----		-----
1800	INH-301	12.7		-0.51
1842	in house	13.9		-0.09
1850		-----		-----
1854	D5185	13.0		-0.40
1874	D6595	16		0.63
1900	D6595	16		0.63
1915		-----		-----
2122	D5185	15.6		0.49
9101		-----		-----
9129		-----		-----

normality	OK
n	60
outliers	1
mean (n)	14.171
st.dev. (n)	1.7917
R(calc.)	5.017
R(D5185:13e1)	8.155

Application range: 7 – 70 mg/kg





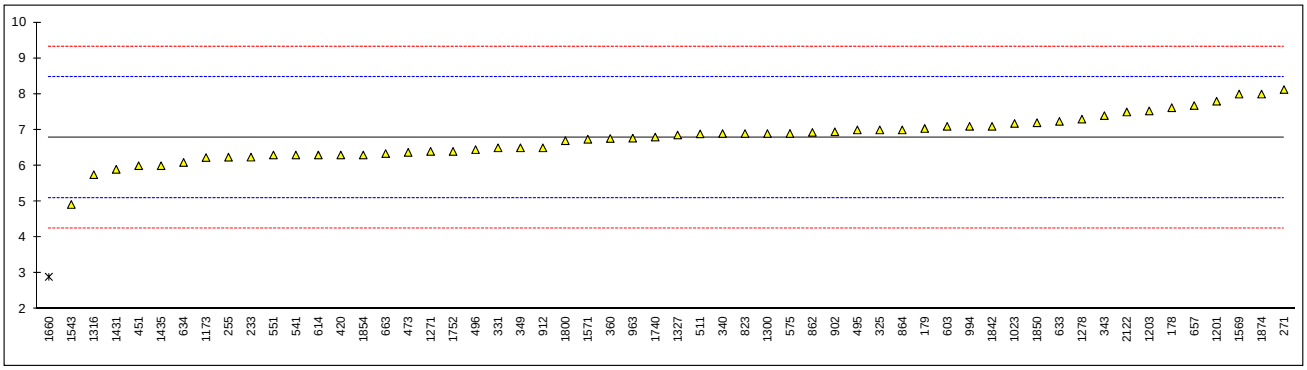
Determination of Silver (Ag) on sample #14082; results in mg/kg

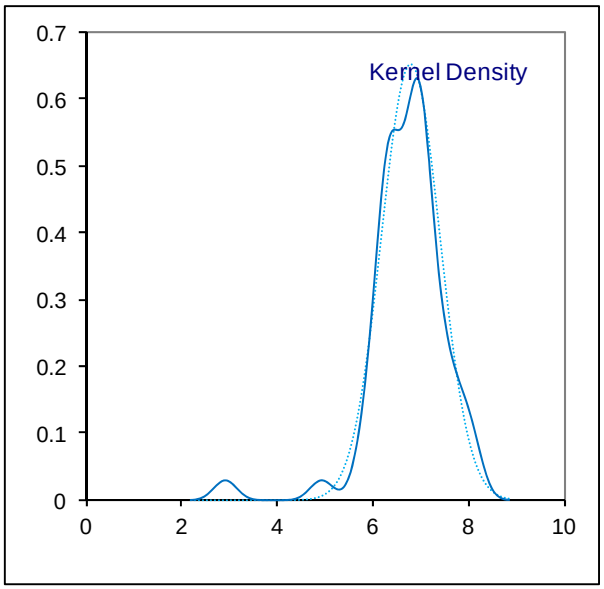
lab	method	value	mark	z(targ)	remarks
178	INH-5185	7.62		0.98	
179	D5185	7.04		0.30	
230		-----		-----	
233	D6595	6.241		-0.64	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255	INH-OL1	6.24		-0.64	
271	D5185	8.127		1.58	
311		-----		-----	
315		-----		-----	
325	INH-5185	7		0.25	
331	D5185	6.5		-0.34	
340	D5185	6.9		0.13	
343	D5185	7.4		0.72	
349	D5185	6.5		-0.34	
360	D5185	6.76		-0.03	
398		-----		-----	
420	D5185	6.3		-0.57	
432		-----		-----	
450		-----		-----	
451	D5185	6		-0.93	
473	D5185	6.374		-0.49	
495	D5185	7		0.25	
496	D5185	6.45		-0.40	
511	D5185	6.89		0.12	
541	D5185	6.3		-0.57	
551	D5185	6.3		-0.57	
562		-----		-----	
575	D6595	6.901		0.14	
603	D5185	7.1		0.37	
614	D5185	6.3		-0.57	
621		-----		-----	
633	D6595	7.238		0.53	
634	D6595	6.092		-0.82	
657	D5185	7.68		1.05	
663	D5185	6.34		-0.53	
823	D5185	6.9		0.13	
840		-----		-----	
862	D5185	6.93		0.17	
864	D5185	7		0.25	
875		-----		-----	
902	D5185	6.949		0.19	
912	D5185	6.5		-0.34	
922		-----		-----	
963	D5185	6.771		-0.02	
966		-----		-----	
993		-----		-----	
994	D5185	7.10		0.37	
1023	D5185	7.18		0.46	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1161		-----		-----	
1173	in house	6.23		-0.66	
1201	D5185	7.8		1.19	
1203	D5185	7.53		0.88	
1227		-----		-----	
1231		-----		-----	
1271	D5185	6.40		-0.46	
1278	D5185	7.3		0.61	
1300	D5185	6.9	C	0.13	First reported: 9.2
1316	D5185	5.75		-1.22	
1318		-----		-----	
1320		-----		-----	
1324		-----		-----	
1327	D5185	6.858		0.08	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431	in house	5.9		-1.04	
1435	D5185	6		-0.93	
1460		-----		-----	

1543	in house	4.919		-2.20
1569	D5185	8		1.43
1571	D5185	6.7402		-0.05
1622		-----		-----
1650		-----		-----
1660	D5185	2.9	R(0.01)	-4.58
1720		-----		-----
1722		-----		-----
1740	D5185	6.8		0.02
1748		-----		-----
1752	D6595	6.4		-0.46
1791		-----		-----
1800	INH-301	6.7		-0.10
1842	in house	7.1		0.37
1850	in house	7.2		0.49
1854	D5185	6.3		-0.57
1874	D6595	8		1.43
1900		-----		-----
1915		-----		-----
2122	D5185	7.5		0.84
9101		-----		-----
9129		-----		-----

normality	OK
n	55
outliers	1
mean (n)	6.786
st.dev. (n)	0.6131
R(calc.)	1.717
R(D5185:13e1)	2.375

Application range: 0.5 – 50 mg/kg





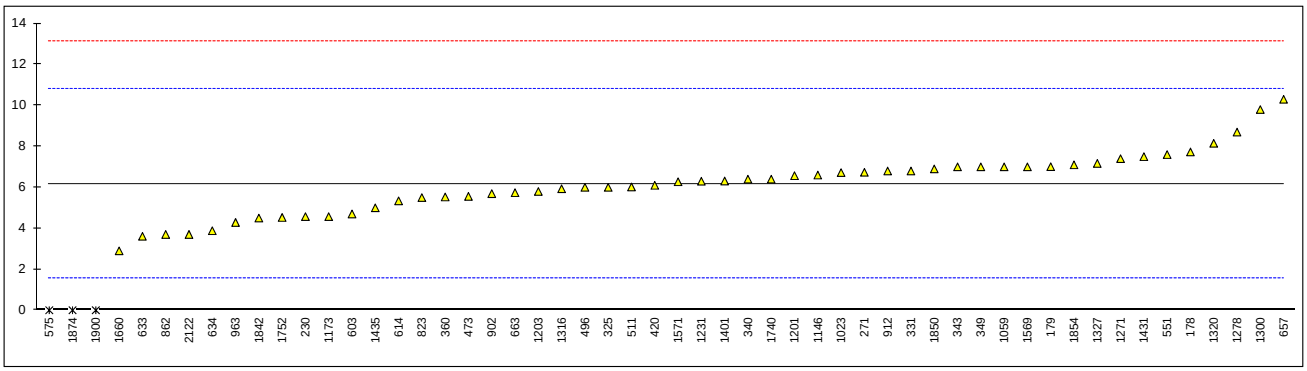
Determination of Tin (Sn) on sample #14082; results in mg/kg

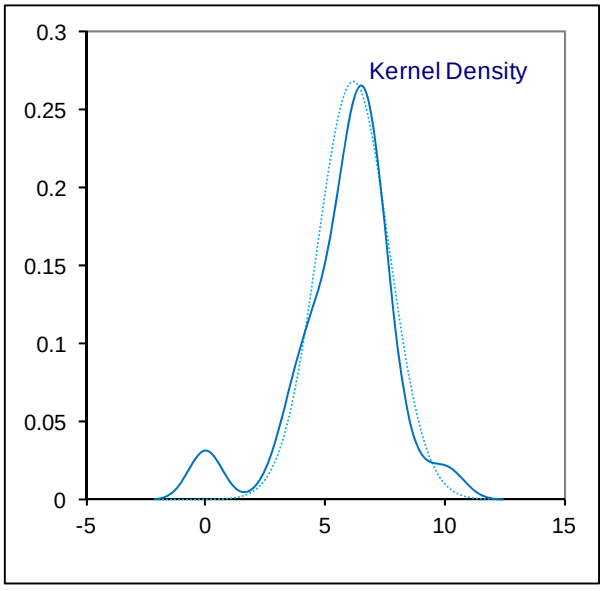
lab	method	value	mark	z(targ)	remarks
178	INH-5185	7.73		0.68	
179	D5185	7.01		0.36	
230	D6595	4.57		-0.69	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271	D5185	6.735		0.25	
311		-----		-----	
315		-----		-----	
325	INH-5185	6		-0.07	
331	D5185	6.8		0.27	
340	D5185	6.4		0.10	
343	D5185	7.0		0.36	
349	D5185	7	C	0.36	First reported: 0
360	D5185	5.53		-0.27	
398		-----		-----	
420	D5185	6.1		-0.03	
432		-----		-----	
450		-----		-----	
451	D5185	n.d.		-----	
473	D5185	5.560		-0.26	
495	D5185	<10		-----	
496	D5185	6.0		-0.07	
511	D5185	6.02		-0.06	
541	D5185	<10		-----	
551	D5185	7.6		0.62	
562		-----		-----	
575	D6595	0.0	C,R(0.01)	-2.66	First reported: 0.520
603	D5185	4.7		-0.63	
614	D5185	5.34		-0.36	
621		-----		-----	
633	D6595	3.61	C	-1.10	First reported: 0.536
634	D6595	3.88	C	-0.99	First reported: 1.223
657	D5185	10.3	C	1.78	First reported: 11.63
663	D5185	5.74		-0.18	
823	D5185	5.5		-0.29	
840		-----		-----	
862	D5185	3.7	C	-1.06	First reported: 1.06
864		-----		-----	
875		-----		-----	
902	D5185	5.693		-0.20	
912	D5185	6.8		0.27	
922		-----		-----	
963	D5185	4.285		-0.81	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023	D5185	6.72		0.24	
1059	in house	7		0.36	
1106		-----		-----	
1146	in house	6.6		0.19	
1161		-----		-----	
1173	in house	4.57		-0.69	
1201	D5185	6.57		0.17	
1203	D5185	5.80		-0.16	
1227		-----		-----	
1231	D5185	6.3		0.06	
1271	D5185	7.40		0.53	
1278	D5185	8.7		1.09	
1300	D5185	9.8		1.57	
1316	D5185	5.93		-0.10	
1318		-----		-----	
1320	D5185Mod.	8.15		0.86	
1324		-----		-----	
1327	D5185	7.169		0.43	
1396	D5185	<0.5		-----	
1401	D6443	6.31		0.06	
1403		-----		-----	
1423		-----		-----	
1431	in house	7.5		0.58	
1435	D5185	5		-0.50	
1460		-----		-----	

1543		-----		-----	
1569	D5185	7		0.36	
1571	D5185	6.2715		0.05	
1622		-----		-----	
1650		-----		-----	
1660	D5185	2.9		-1.41	
1720		-----		-----	
1722		-----		-----	
1740	D5185	6.4		0.10	
1748		-----		-----	
1752	D6595	4.53		-0.71	
1791		-----		-----	
1800		-----		-----	
1842	in house	4.5		-0.72	
1850	in house	6.9		0.32	
1854	D5185	7.1		0.40	
1874	D6595	0	C,R(0.01)	-2.66	First reported: 1
1900	D6595	0	R(0.01)	-2.66	
1915		-----		-----	
2122	D5185	3.7		-1.06	
9101		-----		-----	
9129		-----		-----	

normality	OK
n	51
outliers	3
mean (n)	6.165
st.dev. (n)	1.4904
R(calc.)	4.173
R(D5185:13e1)	6.486

Application range: 10 – 40 mg/kg





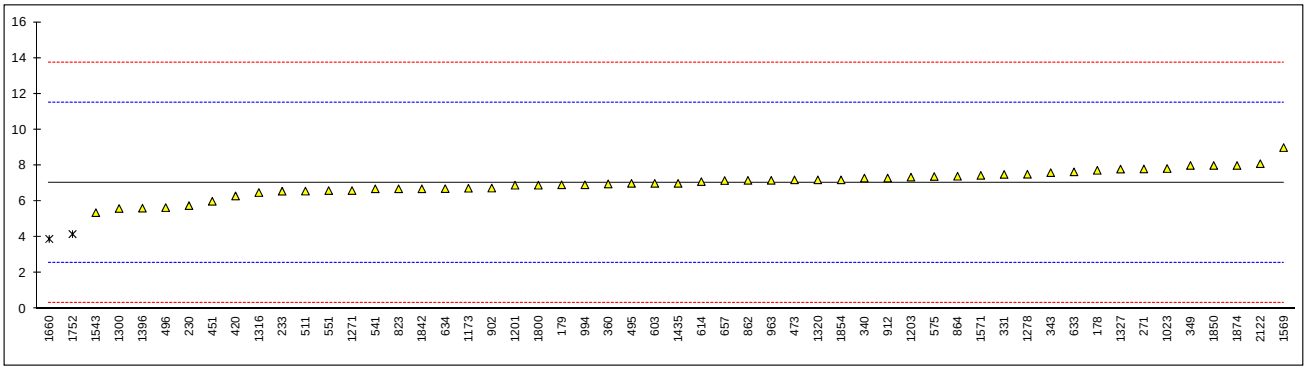
Determination of Titanium (Ti) on sample #14082; results in mg/kg

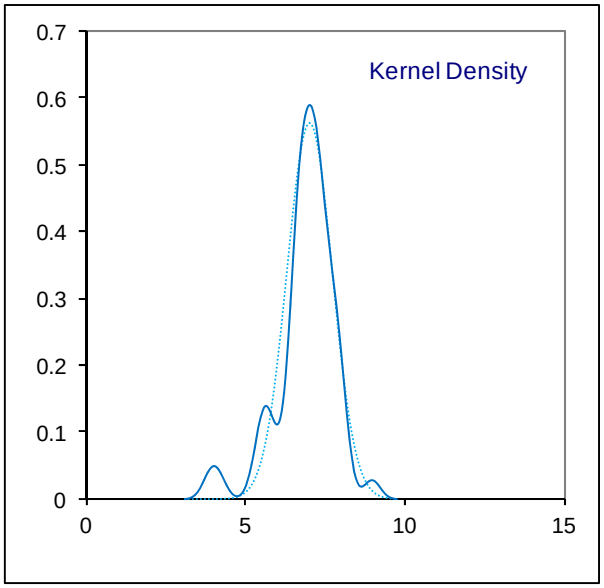
lab	method	value	mark	z(targ)	remarks
178	INH-5185	7.73		0.31	
179	D5185	6.92		-0.05	
230	D6595	5.76		-0.57	
233	D6595	6.562		-0.21	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271	D5185	7.806		0.34	
311		-----		-----	
315		-----		-----	
325		-----		-----	
331	D5185	7.5		0.21	
340	D5185	7.3		0.12	
343	D5185	7.6		0.25	
349	D5185	8	C	0.43	First reported: 0
360	D5185	6.97		-0.03	
398		-----		-----	
420	D5185	6.3		-0.33	
432		-----		-----	
450		-----		-----	
451	D5185	6		-0.46	
473	D5185	7.199		0.07	
495	D5185	7		-0.02	
496	D5185	5.65		-0.62	
511	D5185	6.57		-0.21	
541	D5185	6.7		-0.15	
551	D5185	6.6		-0.20	
562		-----		-----	
575	D6595	7.386		0.16	
603	D5185	7.0		-0.02	
614	D5185	7.1		0.03	
621		-----		-----	
633	D6595	7.643		0.27	
634	D6595	6.706		-0.15	
657	D5185	7.16		0.06	
663		-----		-----	
823	D5185	6.7		-0.15	
840		-----		-----	
862	D5185	7.17		0.06	
864	D5185	7.4		0.16	
875		-----		-----	
902	D5185	6.739		-0.13	
912	D5185	7.3		0.12	
922		-----		-----	
963	D5185	7.172		0.06	
966		-----		-----	
993		-----		-----	
994	D5185	6.92		-0.05	
1023	D5185	7.83		0.36	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1161		-----		-----	
1173	in house	6.73		-0.14	
1201	D5185	6.90		-0.06	
1203	D5185	7.35		0.14	
1227		-----		-----	
1231		-----		-----	
1271	D5185	6.60		-0.20	
1278	D5185	7.51		0.21	
1300	D5185	5.6		-0.64	
1316	D5185	6.49		-0.24	
1318		-----		-----	
1320	D5185Mod.	7.2		0.07	
1324		-----		-----	
1327	D5185	7.799		0.34	
1396	D5185	5.62		-0.63	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431		-----		-----	
1435	D5185	7		-0.02	
1460		-----		-----	

1543	in house	5.366		-0.75
1569	D5185	9		0.88
1571	D5185	7.44878		0.18
1622		-----		-----
1650		-----		-----
1660	D5185	3.9	R(0.05)	-1.40
1720		-----		-----
1722		-----		-----
1740		-----		-----
1748		-----		-----
1752	D6595	4.17	R(0.05)	-1.28
1791		-----		-----
1800	INH-301	6.9		-0.06
1842	in house	6.7		-0.15
1850	in house	8.0		0.43
1854	D5185	7.2		0.07
1874	D6595	8		0.43
1900		-----		-----
1915		-----		-----
2122	D5185	8.1		0.48
9101		-----		-----
9129		-----		-----

normality	OK
n	52
outliers	2
mean (n)	7.037
st.dev. (n)	0.7117
R(calc.)	1.993
R(D5185:13e1)	6.252

Application range: 5 – 40 mg/kg





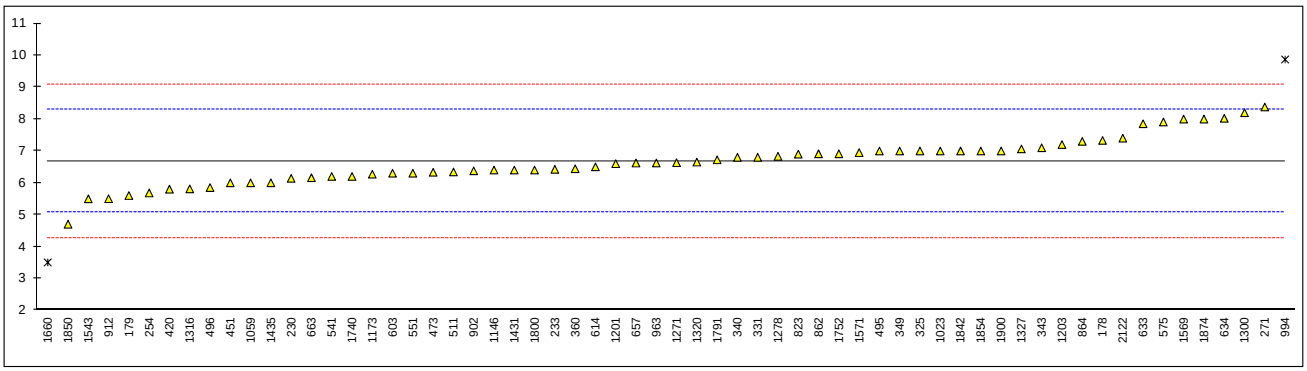
Determination of Vanadium (V) on sample #14082; results in mg/kg

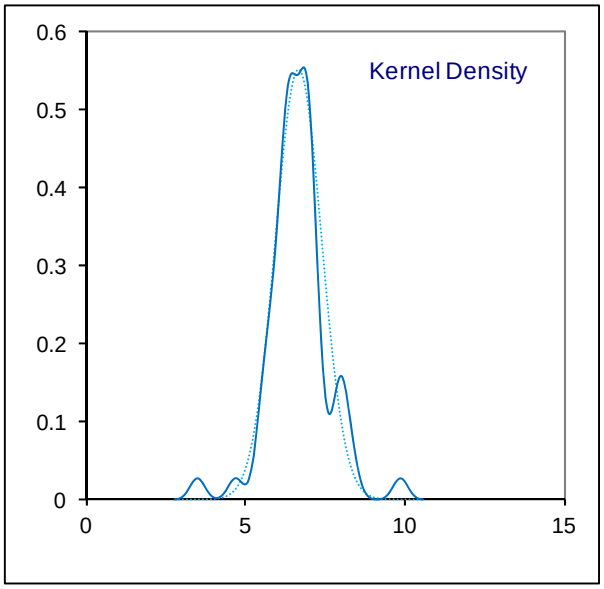
lab	method	value	mark	z(targ)	remarks
178	INH-5185	7.33		0.82	
179	D5185	5.6		-1.33	
230	D6595	6.14		-0.66	
233	D6595	6.423		-0.31	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	5.681		-1.23	
255		-----		-----	
271	D5185	8.379		2.12	
311		-----		-----	
315		-----		-----	
325	INH-5185	7		0.41	
331	D5185	6.8		0.16	
340	D5185	6.8		0.16	
343	D5185	7.1		0.53	
349	D5185	7	C	0.41	First reported: 0
360	D5185	6.44		-0.29	
398		-----		-----	
420	D5185	5.8		-1.08	
432		-----		-----	
450		-----		-----	
451	D5185	6		-0.83	
473	D5185	6.331		-0.42	
495	D5185	7		0.41	
496	D5185	5.85		-1.02	
511	D5185	6.34		-0.41	
541	D5185	6.2		-0.59	
551	D5185	6.3		-0.46	
562		-----		-----	
575	D6595	7.910		1.53	
603	D5185	6.3		-0.46	
614	D5185	6.5		-0.21	
621		-----		-----	
633	D6595	7.854		1.47	
634	D6595	8.025		1.68	
657	D5185	6.62		-0.06	
663	D5185	6.16		-0.63	
823	D5185	6.9		0.28	
840		-----		-----	
862	D5185	6.91		0.30	
864	D5185	7.3		0.78	
875		-----		-----	
902	D5185	6.377		-0.37	
912	D5185	5.5		-1.45	
922		-----		-----	
963	D5185	6.622		-0.06	
966		-----		-----	
993		-----		-----	
994	D5185	9.87	R(0.01)	3.96	
1023	D5185	7.00		0.41	
1059	in house	6		-0.83	
1106		-----		-----	
1146	0	6.4		-0.34	
1161		-----		-----	
1173	in house	6.27		-0.50	
1201	D5185	6.6		-0.09	
1203	D5185	7.20		0.65	
1227		-----		-----	
1231		-----		-----	
1271	D5185	6.63		-0.05	
1278	D5185	6.83		0.20	
1300	D5185	8.2		1.89	
1316	D5185	5.81		-1.07	
1318		-----		-----	
1320	EN13131	6.65		-0.03	
1324		-----		-----	
1327	D5185	7.063		0.48	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431	in house	6.4		-0.34	
1435	D5185	6		-0.83	
1460		-----		-----	

1543	in house	5.498		-1.46
1569	D5185	8		1.65
1571	D5185	6.9471		0.34
1622		-----		-----
1650		-----		-----
1660	D5185	3.5	R(0.01)	-3.93
1720		-----		-----
1722		-----		-----
1740	D5185	6.2		-0.59
1748		-----		-----
1752	D6595	6.91		0.30
1791	in house	6.72		0.06
1800	INH-301	6.4		-0.34
1842	in house	7.0		0.41
1850	in house	4.7		-2.44
1854	D5185	7.0		0.41
1874	D6595	8		1.65
1900	D6595	7		0.41
1915		-----		-----
2122	D5185	7.4		0.90
9101		-----		-----
9129		-----		-----

normality	OK
n	60
outliers	2
mean (n)	6.672
st.dev. (n)	0.7248
R(calc.)	2.029
R(D5185:13e1)	2.259

Application range: 1 – 50 mg/kg



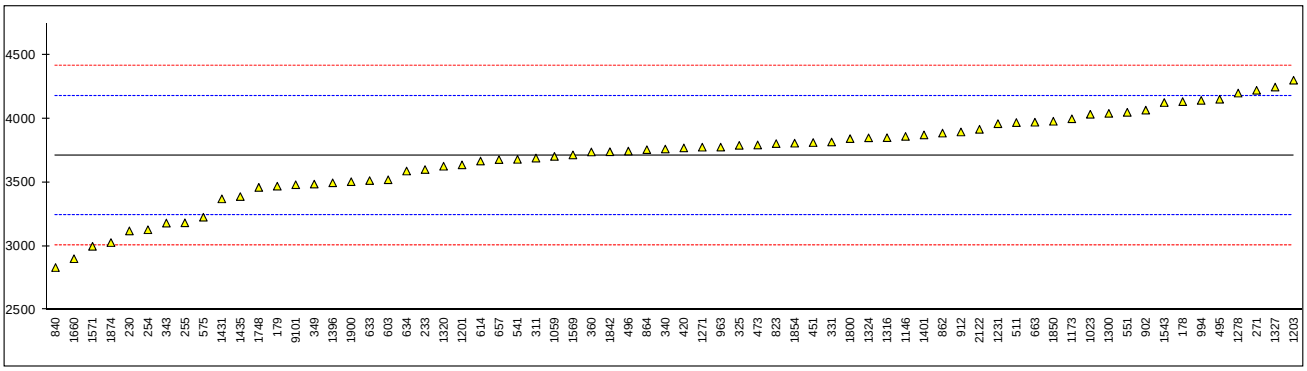


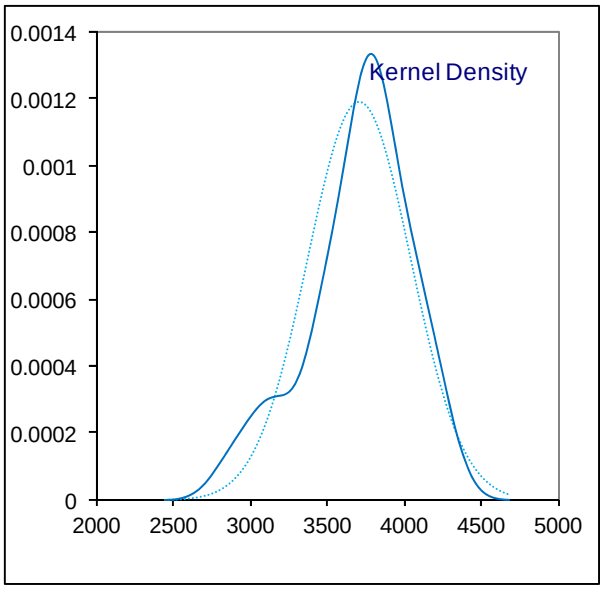
Determination of Calcium (Ca) on sample #14082; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	INH-5185	4133.35		1.81	
179	D5185	3469.4		-1.03	
230	D6595	3118.5		-2.53	
233	D6595	3600		-0.47	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	3127.405		-2.49	
255	INH-OL1	3182.2		-2.26	
271	D5185	4222.17		2.19	
311	D5185	3690		-0.09	
315		-----		-----	
325	INH-5185	3790		0.34	
331	D5185	3816.3		0.45	
340	D5185	3761		0.22	
343	D5185	3180		-2.27	
349	D5185	3486		-0.96	
360	D5186	3738		0.12	
398		-----		-----	
420	D5185	3770		0.25	
432		-----		-----	
450		-----		-----	
451	D5185	3812		0.43	
473	D5185	3793		0.35	
495	D5185	4152		1.89	
496	D5185	3745		0.15	
511	D5185	3968.74		1.10	
541	D5185	3680		-0.13	
551	D5185	4049		1.45	
562		-----		-----	
575	D6595	3226		-2.07	
603	D5185	3520		-0.81	
614	D5185	3667		-0.19	
621		-----		-----	
633	D6595	3513.5		-0.84	
634	D6595	3588.4		-0.52	
657	D5185	3678		-0.14	
663	D5185	3971.6		1.12	
823	D5185	3804		0.40	
840	D4628	2831		-3.76	
862	D5185	3886		0.75	
864	D5185	3756		0.19	
875		-----		-----	
902	D5185	4066.5		1.52	
912	D5185	3895		0.79	
922		-----		-----	
963	D5185	3776		0.28	
966		-----		-----	
993		-----		-----	
994	D5185	4143.0		1.85	
1023	D5185	4034		1.38	
1059	in house	3703		-0.03	
1106		-----		-----	
1146	in house	3860		0.64	
1161		-----		-----	
1173	in house	3998.1		1.23	
1201	D5185	3636.9		-0.31	
1203	D5185	4301		2.52	
1227		-----		-----	
1231	D4951	3960		1.07	
1271	D5185	3775.48		0.28	
1278	D5185	4200		2.09	
1300	D5185	4041		1.41	
1316	D5185	3850		0.60	
1318		-----		-----	
1320	D4628	3626		-0.36	
1324	D5185	3848.9		0.59	
1327	D5185	4247.38		2.29	
1396	D5185	3496.12		-0.92	
1401	D6443	3872	C	0.69	Reported 0.3872, probably unit error
1403		-----		-----	
1423		-----		-----	
1431	in house	3370		-1.45	
1435	D5185	3388		-1.38	
1460		-----		-----	

1543	in house	4126		1.78	
1569	D5185	3715		0.02	
1571	D5185	2997.68		-3.05	
1622		-----	W	-----	First reported: 3507.15
1650		-----		-----	
1660	D5185	2900		-3.46	
1720		-----		-----	
1722		-----		-----	
1740		-----		-----	
1748	D6481	3460		-1.07	
1752		-----		-----	
1791		-----		-----	
1800	INH-301	3842.5		0.56	
1842	in house	3740		0.13	
1850	in house	3979		1.15	
1854	D5185	3807		0.41	
1874	D6595	3027		-2.92	
1900	D6595	3505		-0.88	
1915		-----		-----	
2122	D5185	3916		0.88	
9101	EPA3005	3480.70		-0.98	
9129		-----		-----	

		Only ASTM D5185	
normality	OK	suspect	
n	68	45	
outliers	0	0	
mean (n)	3710.44	3790.52	
st.dev. (n)	334.696	300.340	
R(calc.)	937.15	840.95	
R(D5185:13e1)	655.16	673.60	Application range: 40 – 9000 mg/kg





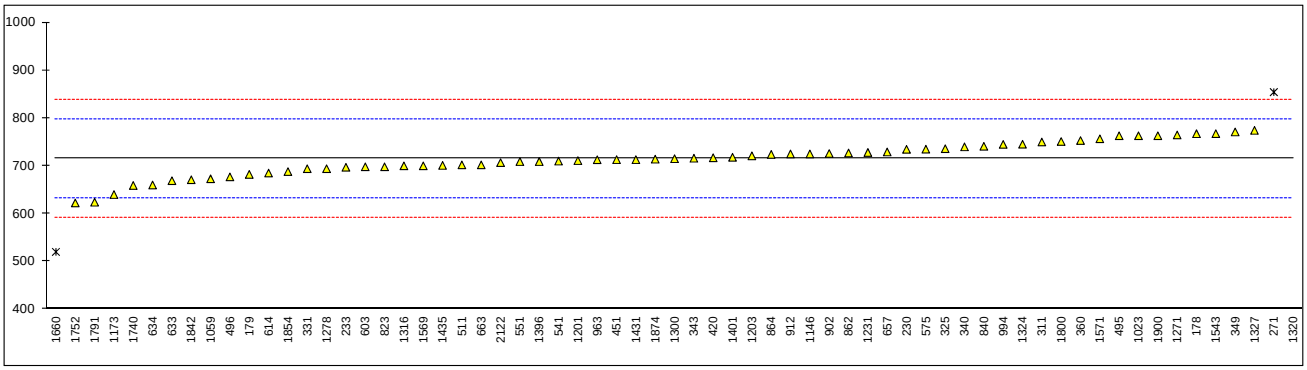
Determination of Phosphorus (P) on sample #14082; results in mg/kg

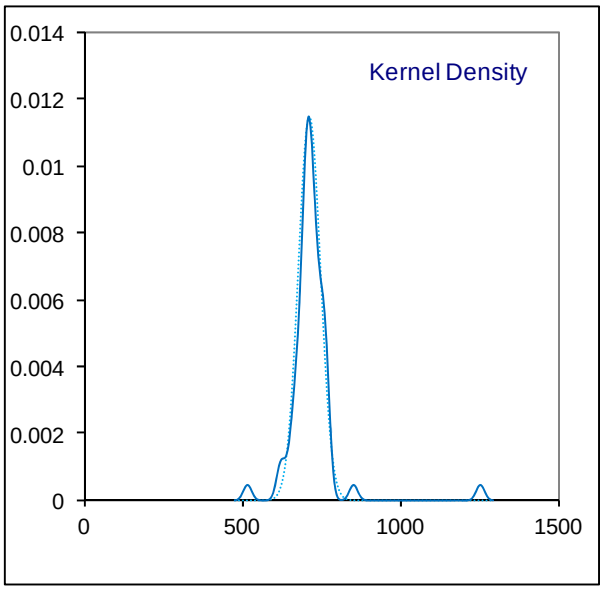
lab	method	value	mark	z(targ)	remarks
178	INH-5185	767.29		1.27	
179	D5185	682.11		-0.80	
230	D6595	734.5		0.48	
233	D6595	697		-0.44	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271	D5185	854.32	R(0.05)	3.39	
311	D5185	750		0.85	
315		-----		-----	
325	INH-5185	736		0.51	
331	D5185	694		-0.51	
340	D5185	739.8		0.61	
343	D5185	716		0.03	
349	D5185	771	C	1.36	First reported: 1085
360	D5186	753		0.93	
398		-----		-----	
420	D5185	717		0.05	
432		-----		-----	
450		-----		-----	
451	D5185	713		-0.05	
473		-----		-----	
495	D5185	763		1.17	
496	D5185	676.9		-0.93	
511	D5185	702.10		-0.31	
541	D5185	710		-0.12	
551	D5185	709		-0.15	
562		-----		-----	
575	D6595	735		0.49	
603	D5185	698		-0.41	
614	D5185	685		-0.73	
621		-----		-----	
633	D6595	669	C	-1.12	First reported: 553.01
634	D6595	660		-1.34	
657	D5185	729.1		0.34	
663	D5185	702.1		-0.31	
823	D5185	698		-0.41	
840	IP500	741		0.63	
862	D5185	727		0.29	
864	D5185	724		0.22	
875		-----		-----	
902	D5185	725.9		0.27	
912	D5185	725		0.24	
922		-----		-----	
963	D5185	712.9		-0.05	
966		-----		-----	
993		-----		-----	
994	D5185	745.0		0.73	
1023	D5185	763		1.17	
1059	in house	673		-1.02	
1106		-----		-----	
1146	in house	725		0.24	
1161		-----		-----	
1173	in house	640.0		-1.83	
1201	D5185	711.0		-0.10	
1203	D5185	721		0.15	
1227		-----		-----	
1231	D4951	728		0.32	
1271	D5185	764.67		1.21	
1278	D5185	694		-0.51	
1300	D5185	715		0.00	
1316	D5185	700		-0.36	
1318		-----		-----	
1320	D1091	1254	C,R(0.01)	13.13	First reported: 579.7
1324	D5185	745.3		0.74	
1327	D5185	774.292		1.45	
1396	D5185	709.03		-0.14	
1401	D6443	718	C	0.07	Reported: 0.0718, probably unit error
1403		-----		-----	
1423		-----		-----	
1431	in house	713		-0.05	
1435	D5185	701		-0.34	
1460		-----		-----	

1543	in house	767.5		1.28
1569	D5185	700		-0.36
1571	D5185	756.673		1.02
1622		-----		-----
1650		-----		-----
1660	D5185	520	R(0.01)	-4.75
1720		-----		-----
1722		-----		-----
1740	D5185	659		-1.36
1748		-----		-----
1752	D6595	622.4		-2.25
1791	in house	623.94		-2.22
1800	INH-301	751.0		0.88
1842	in house	671		-1.07
1850		-----		-----
1854	D5185	688		-0.66
1874	D6595	714		-0.02
1900	D6595	763		1.17
1915		-----		-----
2122	D5185	706.7		-0.20
9101		-----		-----
9129		-----		-----

normality	OK
n	62
outliers	3
mean (n)	714.95
st.dev. (n)	34.854
R(calc.)	97.59
R(D5185:13e1)	114.98

Application range: 10 – 1000 mg/kg





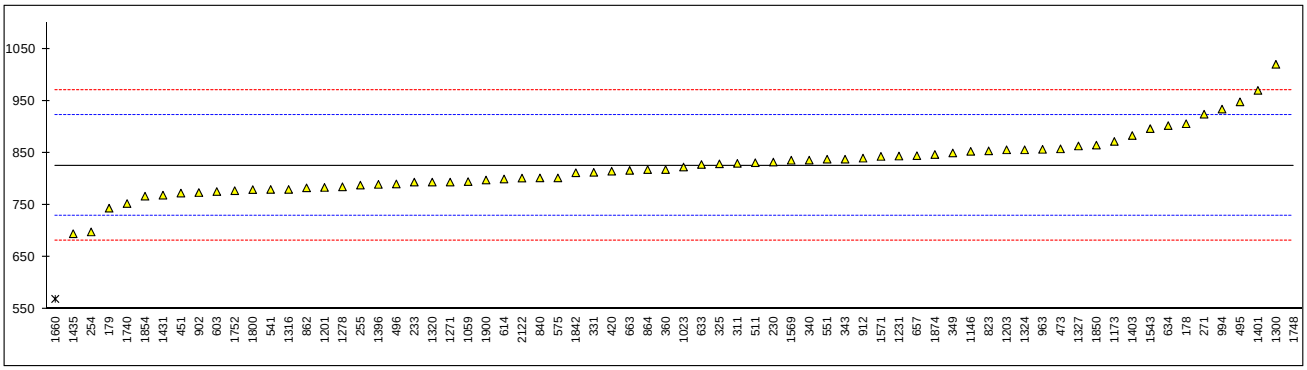
Determination of Zinc (Zn) on sample #14082; results in mg/kg

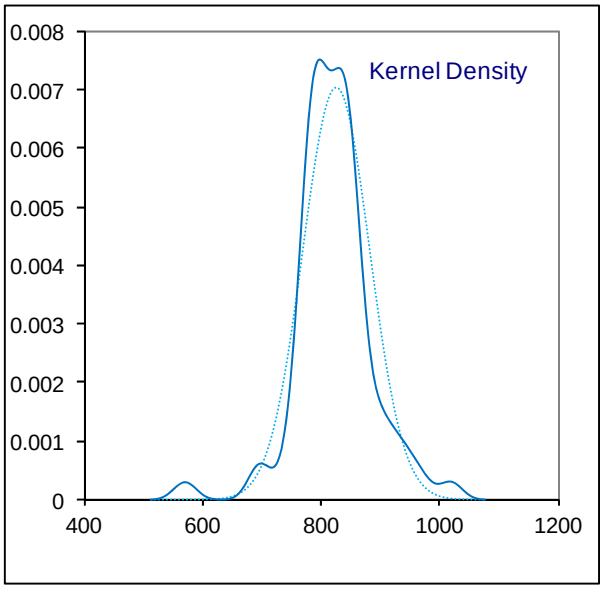
lab	method	value	mark	z(targ)	remarks
178	INH-5185	906.03		1.67	
179	D5185	743.96		-1.71	
230	D6595	832.5		0.14	
233	D6595	794		-0.67	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	in house	698.458		-2.66	
255	INH-OL1	788.245		-0.79	
271	D5185	924.30		2.05	
311	D5185	830		0.08	
315		-----		-----	
325	INH-5185	829		0.06	
331	D5185	812.8		-0.28	
340	D5185	836.2		0.21	
343	D5185	838		0.25	
349	D5185	850	C	0.50	First reported: 1188
360	D5186	818		-0.17	
398		-----		-----	
420	D5185	815		-0.23	
432		-----		-----	
450		-----		-----	
451	D5185	773		-1.11	
473	D5185	857.8		0.66	
495	D5185	948		2.54	
496	D5185	790.5		-0.74	
511	D5185	831.29		0.11	
541	D5185	780		-0.96	
551	D5185	838		0.25	
562		-----		-----	
575	D6595	802		-0.50	
603	D5185	776		-1.04	
614	D5185	800		-0.54	
621		-----		-----	
633	D6595	827.80		0.04	
634	D6595	902.51		1.60	
657	D5185	844.7		0.39	
663	D5185	816.5		-0.20	
823	D5185	854		0.58	
840	D4628	802		-0.50	
862	D5185	783		-0.90	
864	D5185	818		-0.17	
875		-----		-----	
902	D5185	774.0		-1.09	
912	D5185	840		0.29	
922		-----		-----	
963	D5185	856.9		0.64	
966		-----		-----	
993		-----		-----	
994	D5185	934.0		2.25	
1023	D5185	823		-0.06	
1059	in house	795		-0.65	
1106		-----		-----	
1146	in house	853		0.56	
1161		-----		-----	
1173	in house	872.1		0.96	
1201	D5185	783.8		-0.88	
1203	D5185	856		0.63	
1227		-----		-----	
1231	D4951	844		0.37	
1271	D5185	794.10		-0.67	
1278	D5185	785		-0.86	
1300	D5185	1020	C	4.05	First reported: 991
1316	D5185	780		-0.96	
1318		-----		-----	
1320	D4628	794		-0.67	
1324	D5185	856		0.63	
1327	D5185	863.351		0.78	
1396	D5185	789.66		-0.76	
1401	D6443	970	C	3.00	Reported: 0.0970, probably a unit error
1403	ISO11885	883.49		1.20	
1423		-----		-----	
1431	in house	769		-1.19	
1435	D5185	695		-2.73	
1460		-----		-----	

1543	in house	896.6		1.47
1569	D5185	836		0.21
1571	D5185	843.370		0.36
1622		-----		-----
1650		-----		-----
1660	D5185	570	R(0.01)	-5.34
1720		-----		-----
1722		-----		-----
1740	D5185	753		-1.52
1748	D6481	8520	R(0.01)	160.52
1752	D6595	777.6		-1.01
1791		-----		-----
1800	INH-301	779.7		-0.97
1842	in house	812		-0.29
1850	in house	865		0.81
1854	D5185	767		-1.23
1874	D6595	847		0.44
1900	D6595	798		-0.58
1915		-----		-----
2122	D5185	801.7		-0.51
9101		-----		-----
9129		-----		-----

		Only ASTM D5185
normality	suspect	not OK
n	68	45
outliers	2	1
mean (n)	826.03	825.91
st.dev. (n)	56.574	57.170
R(calc.)	158.41	160.08
R(D5185:13e1)	134.21	134.19

Application range: 60 -1600 mg/kg



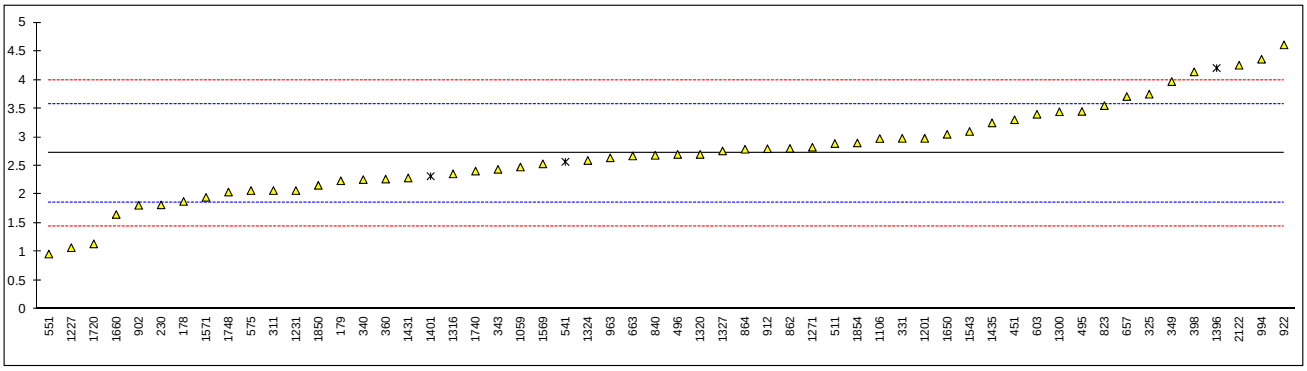


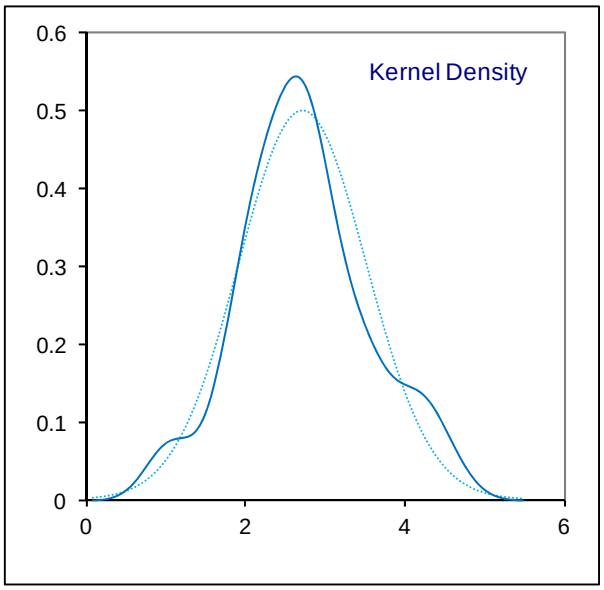
Determination of Acid Number (Total) on sample #14083; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
178	D664	1.88		-1.96	
179	D664	2.24		-1.12	
230	D664	1.82		-2.10	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271		-----		-----	
311	D664	2.07		-1.52	
315		-----		-----	
325	D664	3.75		2.42	
331	D664	2.98		0.61	
340	D664	2.26	C	-1.07	First reported: 5.2
343	D664	2.44		-0.65	
349	D664	3.97		2.93	
360	D664	2.27		-1.05	
398	D664	4.140		3.33	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451	D664	3.305		1.38	
473		-----		-----	
495	D664	3.45		1.71	
496	D664	2.70		-0.04	
511	D664	2.89		0.40	
541	D974	2.57	ex	-0.35	Result excluded, see §4.1
551	D664	0.962		-4.11	
562		-----		-----	
575	D664	2.07		-1.52	
603	D664	3.4		1.60	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657	D664	3.71		2.32	
663	D664	2.673		-0.10	
823	D664	3.55		1.95	
840	D664	2.684		-0.08	
862	D664	2.8056		0.21	
864	D664	2.79		0.17	
875		-----		-----	
902	D664	1.813		-2.12	
912	D664	2.8		0.19	
922	D664	4.610		4.43	
963	D664	2.64		-0.18	
966		-----		-----	
993		-----		-----	
994	D664	4.36		3.85	
1023	in house	<0.07		<-3.31	False negative test result?
1059	ISO6619	2.48		-0.56	
1106	D664	2.9771		0.61	
1146		-----		-----	
1161		-----		-----	
1173		-----		-----	
1201	D664	2.98		0.61	
1203		-----	W	-----	First reported: 0.2189
1227	D664	1.0736		-3.85	
1231	D664	2.07		-1.52	
1271	D664	2.825		0.25	
1278		-----		-----	
1300	D664	3.443		1.70	
1316	D664	2.36		-0.84	
1318		-----		-----	
1320	D664	2.7	C	-0.04	First reported: 6.5
1324	D664	2.594		-0.29	
1327	D664	2.7610		0.10	
1396	IP139	4.205397	ex	3.48	Result excluded, see §4.1
1401	D974	2.32	ex	-0.93	Result excluded, see §4.1
1403		-----		-----	
1423		-----		-----	
1431	D664	2.29		-1.00	
1435	D664	3.25		1.25	
1460		-----		-----	

1543	D664	3.10	0.90
1569	D664	2.5351	-0.43
1571	D664	1.9510	-1.80
1622		-----	-----
1650	D664	3.05	0.78
1660	D664	1.652	-2.50
1720	D664	1.14	-3.69
1722		-----	-----
1740	D664	2.41	-0.72
1748	D664	2.044	-1.58
1752		-----	-----
1791		-----	-----
1800		-----	-----
1842		-----	-----
1850	ISO6619	2.16	-1.31
1854	D664	2.90	0.43
1874		-----	-----
1900		-----	-----
1915		-----	-----
2122	IP177	4.255	3.60
9101		-----	-----
9129		-----	-----

normality	OK
n	53
outliers	0 (+3ex)
mean (n)	2.718
st.dev. (n)	0.7999
R(calc.)	2.240
R(D664:11a)	1.196



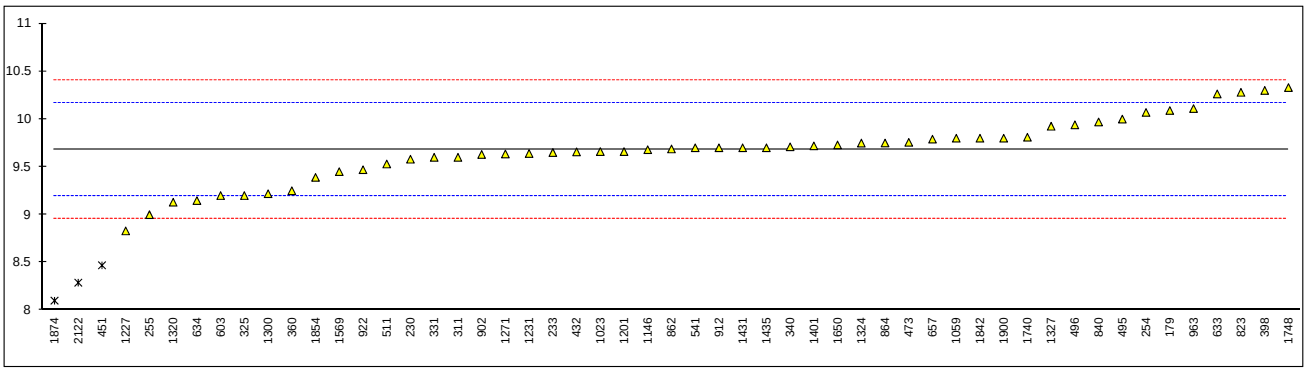


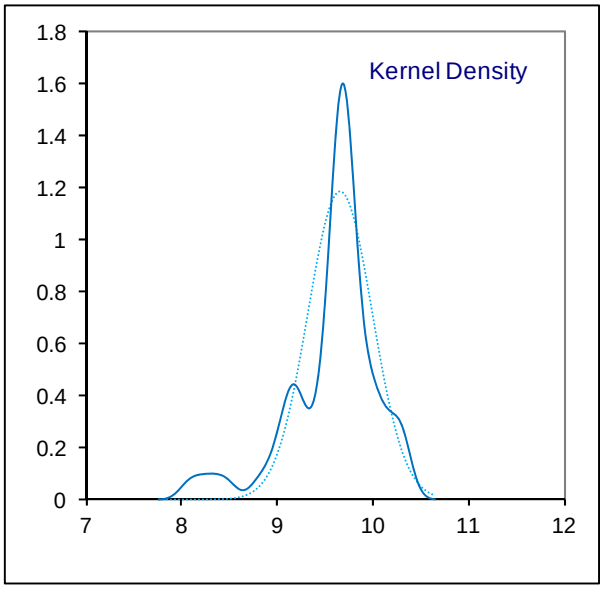
Determination of Base Number (Total) on sample #14083; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D2896	10.09		1.70	
230	in house	9.58		-0.41	
233	D2896	9.65		-0.12	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	D2896	10.07		1.61	
255	D2896	9.0		-2.81	
271		-----		-----	
311	D2896	9.6		-0.33	
315		-----		-----	
325	D2896	9.20		-1.98	
331	D2896	9.6		-0.33	
340	D2896	9.71		0.12	
343		-----		-----	
349		-----		-----	
360	D2896	9.25		-1.78	
398	D2896	10.30		2.56	
420		-----		-----	
432	D2896	9.657		-0.09	
450		-----		-----	
451	D2896Mod.	8.47	R(0.05)	-5.00	
473	D2896	9.7571		0.32	
495	D2896	10.0		1.32	
496	D2896	9.94	C	1.08	First reported: 8.20
511	D2896	9.53	C	-0.62	First reported: 8.53
541	D2896	9.7		0.08	
551		-----		-----	
562		-----		-----	
575		-----		-----	
603	D2896	9.2		-1.98	
614		-----		-----	
621		-----		-----	
633	D2896	10.2632		2.41	
634	D2896	9.1475		-2.20	
657	D2896	9.79		0.46	
663		-----		-----	
823	D2896	10.28		2.48	
840	D2896	9.970		1.20	
862	D2896	9.6874		0.03	
864	D2896	9.75		0.29	
875		-----		-----	
902	D2896	9.630		-0.21	
912	D2896	9.7		0.08	
922	D2896	9.47		-0.87	
963	D2896	10.11		1.78	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023	D2896	9.66		-0.08	
1059	ISO3771	9.8		0.50	
1106		-----		-----	
1146	D2896	9.68		0.00	
1161		-----		-----	
1173		-----		-----	
1201	D2896	9.66		-0.08	
1203		-----	W	-----	First reported: 10.948 (ISO 3771)
1227	D2896	8.83		-3.51	
1231	D2896	9.64		-0.16	
1271	ISO3771	9.635		-0.19	
1278		-----		-----	
1300	D2896	9.2189		-1.90	
1316		-----		-----	
1318		-----		-----	
1320	D2896	9.13		-2.27	
1324	D2896	9.749		0.29	
1327	D2896	9.925		1.01	
1396		-----		-----	
1401	D2896	9.72		0.17	
1403		-----		-----	
1423		-----		-----	
1431	D2896	9.7		0.08	
1435	D2896	9.70		0.08	
1460		-----		-----	

1543		-----		-----	
1569	D2896	9.4502		-0.95	
1571		-----		-----	
1622		-----		-----	
1650	D2896	9.73		0.21	
1660		-----		-----	
1720		-----		-----	
1722		-----		-----	
1740	D2896	9.81		0.54	
1748	D2896	10.33		2.69	
1752		-----		-----	
1791		-----		-----	
1800		-----		-----	
1842	IP276	9.8		0.50	
1850		-----		-----	
1854	D2896	9.39		-1.20	
1874	E2412	8.1	R(0.01)	-6.53	
1900	D2896	9.8		0.50	
1915		-----		-----	
2122	IP400	8.2884	ex	-5.75	Result excluded, see §4.1
9101		-----		-----	
9129		-----		-----	

normality	OK
n	50
outliers	2 (+ 1 ex)
mean (n)	9.680
st.dev. (n)	0.3284
R(calc.)	0.920
R(D2896:11)	0.678



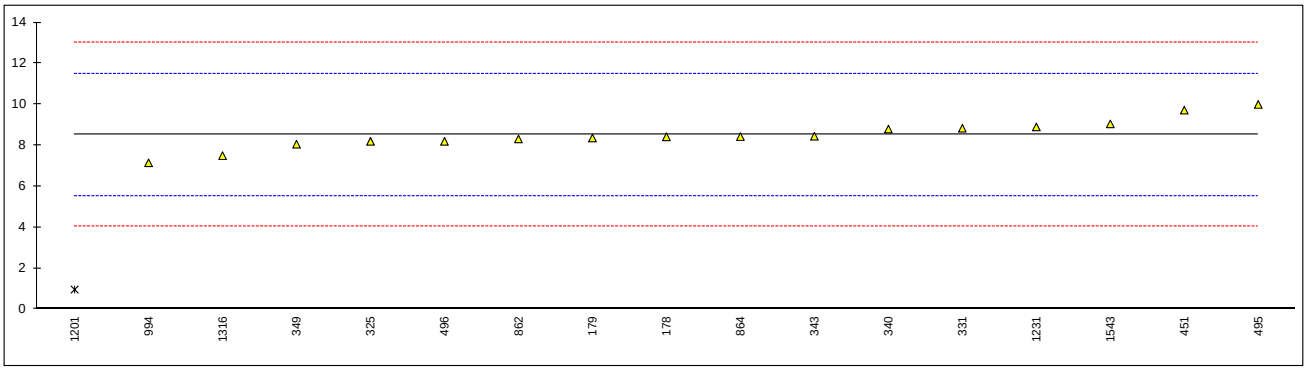


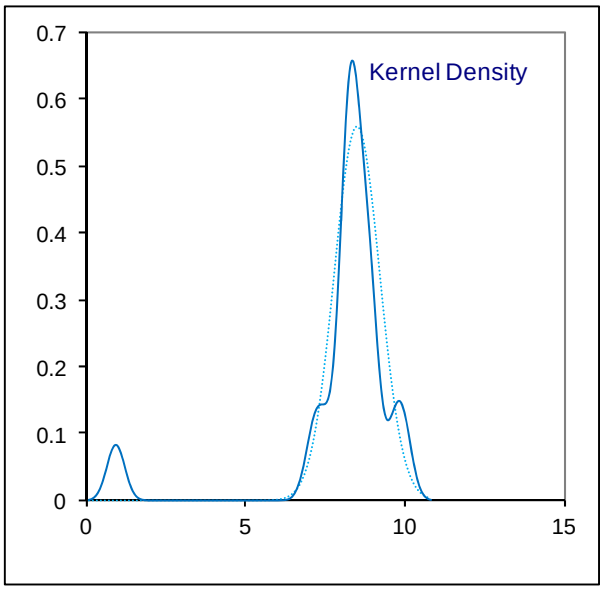
Determination of Base Number (Strong) on sample #14083; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
178	D4739	8.42		-0.07	
179	D4739	8.36		-0.11	
230		-----		-----	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271		-----		-----	
311		-----		-----	
315		-----		-----	
325	D4739	8.20		-0.22	
331	D4739	8.84		0.21	
340	D4739	8.8		0.18	
343	D4739	8.45		-0.05	
349	D4739	8.06		-0.31	
360		-----		-----	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451	D4739	9.72		0.80	
473		-----		-----	
495	D4739	10.0		0.99	
496	D4739	8.20	C	-0.22	First reported: 9.94
511		-----		-----	
541		-----		-----	
551		-----		-----	
562		-----		-----	
575		-----		-----	
603		-----		-----	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823		-----		-----	
840		-----		-----	
862	D4739	8.3147		-0.14	
864	D4739	8.43		-0.06	
875		-----		-----	
902		-----		-----	
912		-----		-----	
922		-----		-----	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994	D4739	7.15		-0.92	
1023		-----		-----	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1161		-----		-----	
1173		-----		-----	
1201	D4739	0.96	G(0.01)	-5.06	
1203		-----		-----	
1227		-----		-----	
1231	D4739	8.90	C	0.25	First reported: 10.94
1271		-----		-----	
1278		-----		-----	
1300		-----		-----	
1316	D4739	7.5	C	-0.68	First reported: 6.1
1318		-----		-----	
1320		-----		-----	
1324		-----		-----	
1327		-----		-----	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431		-----		-----	
1435		-----		-----	
1460		-----		-----	

1543	D4739	9.05	C	0.35	First reported: 8.97
1569		-----		-----	
1571		-----		-----	
1622		-----		-----	
1650		-----		-----	
1660		-----		-----	
1720		-----		-----	
1722		-----		-----	
1740		-----		-----	
1748		-----		-----	
1752		-----		-----	
1791		-----		-----	
1800		-----		-----	
1842		-----		-----	
1850		-----		-----	
1854		-----		-----	
1874		-----		-----	
1900		-----		-----	
1915		-----		-----	
2122		-----		-----	
9101		-----		-----	
9129		-----		-----	

normality	OK
n	16
outliers	1
mean (n)	8.525
st.dev. (n)	0.7146
R(calc.)	2.001
R(D4739:11)	4.189





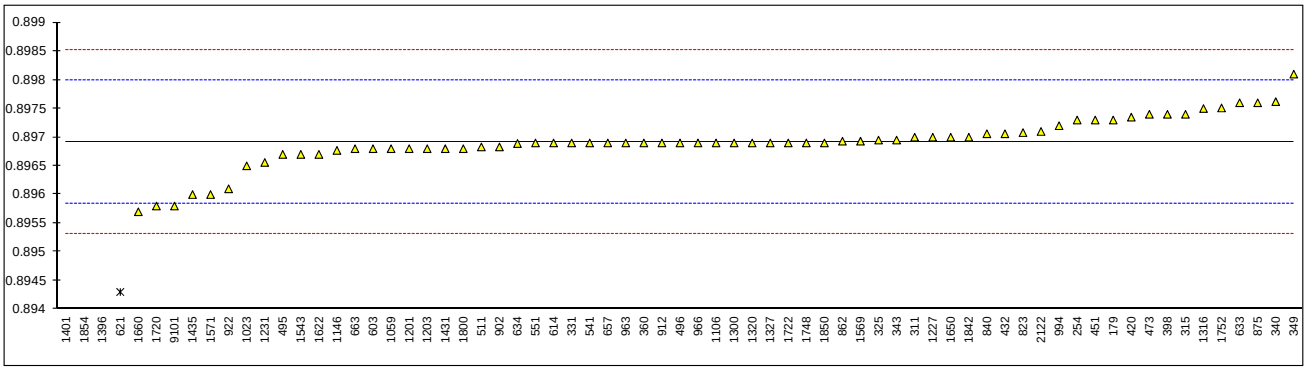
Determination of Density @ 15°C on sample #14083; results in kg/L

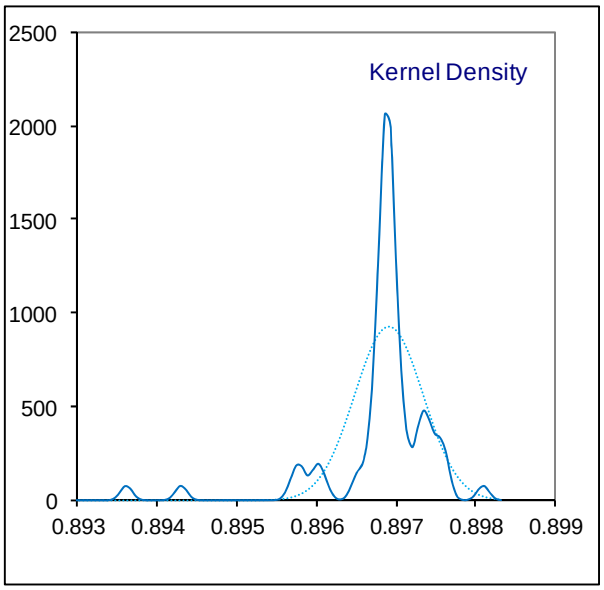
lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D4052	0.8973		0.72	
230		-----		-----	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254	D4052	0.8973		0.72	
255		-----		-----	
271		-----		-----	
311	D4052	0.8970		0.16	
315	D4052	0.8974		0.91	
325	D4052	0.89695		0.07	
331	ISO12185	0.8969		-0.03	
340	D4052	0.89762		1.32	
343	D4052	0.89695		0.07	
349	D4052	0.8981		2.21	
360	D4052	0.8969		-0.03	
398	D4052	0.8974		0.91	
420	ISO12185	0.89735		0.81	
432	D4052	0.89706		0.27	
450		-----		-----	
451	D4052	0.8973		0.72	
473	D4052	0.8974		0.91	
495	D4052	0.8967		-0.40	
496	D4052	0.89690		-0.03	
511	D4052	0.89683		-0.16	
541	D4052	0.8969		-0.03	
551	D4052	0.8969		-0.03	
562		-----		-----	
575		-----		-----	
603	D4052	0.8968		-0.21	
614	D4052	0.8969		-0.03	
621	D1298	0.8943	R(0.01)	-4.88	
633	D4052	0.8976		1.28	
634	D4052	0.89689		-0.05	
657	D4052	0.8969		-0.03	
663	D4052	0.8968		-0.21	
823	D4052	0.89708		0.31	
840	D4052	0.89706		0.27	
862	D4052	0.89693		0.03	
864		-----		-----	
875	D4052	0.8976		1.28	
902	D4052	0.89683		-0.16	
912	D4052	0.8969		-0.03	
922	D4052	0.8961		-1.52	
963	D4052	0.8969		-0.03	
966	D4052	0.8969		-0.03	
993		-----		-----	
994	D4052	0.8972		0.53	
1023	D4052	0.8965		-0.77	
1059	ISO12185	0.8968		-0.21	
1106	D5002	0.8969	C	-0.03	First reported: 896.9
1146	D4052	0.89677		-0.27	
1161		-----		-----	
1173		-----		-----	
1201	D4052	0.8968		-0.21	
1203	D4052	0.8968	C	-0.21	First reported: 896.8
1227	D4052	0.8970		0.16	
1231	D4052	0.89656		-0.66	
1271		-----		-----	
1278		-----		-----	
1300	D4052	0.8969		-0.03	
1316	D4052	0.8975	C	1.09	First reported: 8.975
1318		-----		-----	
1320	D4052	0.8969		-0.03	
1324		-----		-----	
1327	D4052	0.8969	C	-0.03	First reported: 896.9
1396	IP365	0.89361	R(0.01)	-6.17	
1401	D4052	0.8808	R(0.01)	-30.08	
1403		-----		-----	
1423		-----		-----	
1431	D4052	0.8968		-0.21	
1435	D4052	0.896		-1.71	
1460		-----		-----	

1543	D4052	0.8967	C	-0.40	First reported: 0.8971
1569	D4052	0.89693		0.03	
1571	D7042	0.896		-1.71	
1622	D4052	0.8967		-0.40	
1650	D4052	0.8970		0.16	
1660	D7042	0.8957		-2.27	
1720	D4052	0.8958	C	-2.08	Reported: 895.8, probably a unit error
1722	D4052	0.8969		-0.03	
1740		-----		-----	
1748	D4052	0.8969		-0.03	
1752	D4052	0.89751	C	1.11	First reported: 897.51
1791		-----		-----	
1800	D4052	0.8968		-0.21	
1842	IP365	0.8970		0.16	
1850	D4052	0.8969		-0.03	
1854	D4052	0.89	R(0.01)	-12.91	
1874		-----		-----	
1900		-----		-----	
1915		-----		-----	
2122	in house	0.8971		0.35	
9101	D1298	0.8958		-2.08	
9129		-----		-----	

normality	suspect
n	65
outliers	4
mean (n)	0.89691
st.dev. (n)	0.000432
R(calc.)	0.00121
R(ISO12185:96)	0.00150

Compare R(D4052): 0.00050



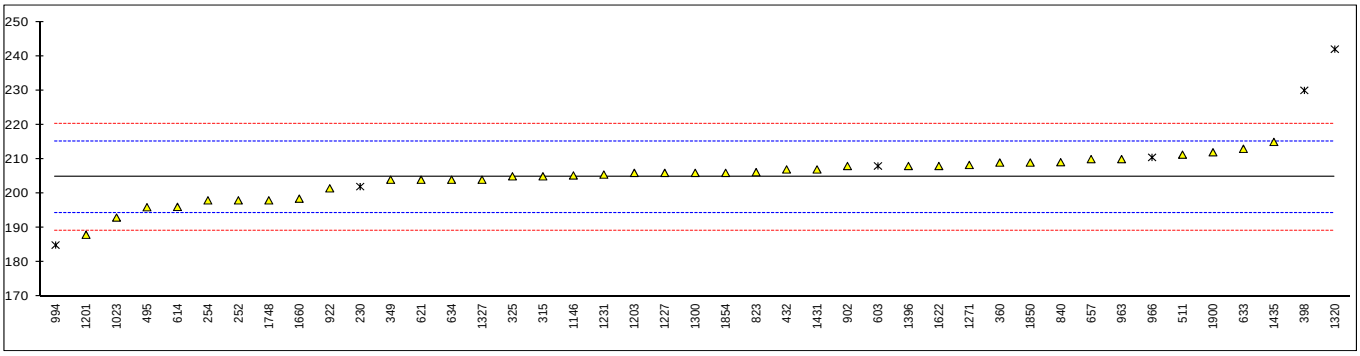


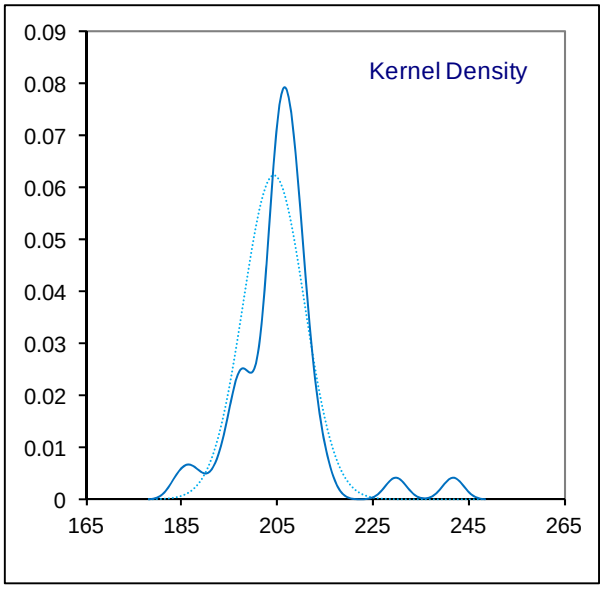
Determination of Flash Point PMcc method A on sample #14083; results in °C

lab	method	value	mark	z(targ)	Run time	remarks
178		-----		-----	-----	
179		-----		-----	-----	
230	D3828A	202	ex	-0.55	-----	Result excluded, see §4.1
233		-----		-----	-----	
237		-----		-----	-----	
238		-----		-----	-----	
252	D93A	198		-1.32	26	
254	D93A	198		-1.32	-----	
255		-----		-----	-----	
271	D93C	>180.0		-----	5.5	Method C not applicable (for biodiesel only)
311		-----		-----	-----	
315	D93	205		0.03	39.24	
325	D93	205		0.03	27m50s	
331		-----		-----	-----	
340		-----		-----	-----	
343		-----		-----	-----	
349	D93A	204		-0.16	-----	
360	D93A	209.0		0.80	36	
398	D93A	230.0	R(0.05)	4.85	43	
420		-----		-----	-----	
432	D93	207		0.42	37	
450		-----		-----	-----	
451		-----		-----	-----	
473		-----		-----	-----	
495	D93A	196.0		-1.70	-----	
496		-----		-----	-----	
511	D93A	211.3		1.25	38.36	
541		-----		-----	-----	
551		-----		-----	-----	
562		-----		-----	-----	
575		-----		-----	-----	
603	D3828	208.0	ex	0.61	-----	Result excluded, see §4.1
614	D93A	196.1		-1.68	35	
621	D93	204		-0.16	27	
633	D93A	213		1.57	40	
634	D93A	204.0		-0.16	29.5	
657	D93A	210		1.00	-----	
663		-----		-----	-----	
823	D93A	206.2		0.26	65	
840	D93A	209.1		0.82	32	
862		-----		-----	-----	
864		-----		-----	-----	
875		-----		-----	-----	
902	D93A	208.0		0.61	39m10s	
912		-----		-----	-----	
922	D93A	201.5		-0.64	35	
963	D93A	210		1.00	-----	
966	D3828	210.5	ex	1.09	-----	Result excluded, see §4.1
993		-----		-----	-----	
994	D93A	185.0	ex	-3.82	-----	Probably results mixed up. (proc. B > proc. A)
1023	D93A	193		-2.28	-----	
1059		-----		-----	-----	
1106		-----		-----	-----	
1146	in house	205.25		0.08	38m41s	
1161		-----		-----	-----	
1173		-----		-----	-----	
1201	D93A	188.0		-3.24	-----	
1203	ISO2719	206		0.23	-----	
1227	D93A	206	C	0.23	-----	First reported: 223
1231	D93	205.5		0.13	-----	
1271	ISO2719	208.3		0.67	25	
1278		-----		-----	-----	
1300	D93	206		0.23	38	
1316		-----		-----	-----	
1318		-----		-----	-----	
1320	D93	242	C,R(0.01)	7.16	-----	First reported: 190
1324		-----		-----	-----	
1327	D93	204.0		-0.16	-----	
1396	IP523	208		0.61	1	
1401		-----		-----	-----	
1403		-----		-----	-----	
1423		-----		-----	-----	
1431	D93A	207		0.42	-----	
1435	D93A	215		1.96	-----	
1460		-----		-----	-----	

1543		-----		-----	-----	
1569		-----		-----	-----	
1571		-----		-----	-----	
1622	D93A	208.0		0.61	-----	
1650		-----		-----	-----	
1660	D93A	198.5		-1.22	-----	
1720		-----		-----	-----	
1722		-----		-----	-----	
1740		-----		-----	-----	
1748	D93A	198	C	-1.32	-----	First reported: 138
1752		-----		-----	-----	
1791	ISO2719	n.d.		-----	-----	
1800		-----		-----	-----	
1842		-----		-----	-----	
1850	ISO2719	209		0.80	-----	
1854	D93A	206		0.23	-----	
1874		-----		-----	-----	
1900	in house	212.0		1.38	6	
1915		-----		-----	-----	
2122		-----		-----	-----	
9101		-----		-----	-----	
9129	D93A	no flash		-----	-----	

normality	OK
n	37
outliers	2 + 4 excl.
mean (n)	204.83
st.dev. (n)	5.775
R(calc.)	16.17
R(D93:13e1)	14.54



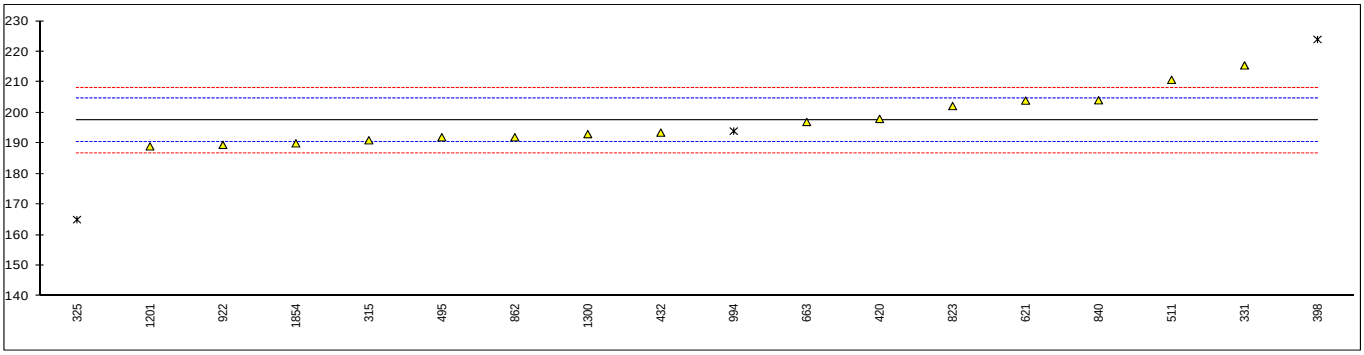


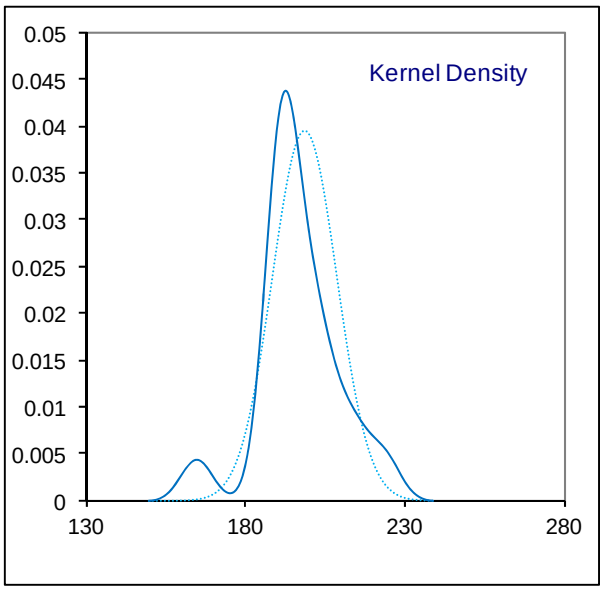
Determination of Flash Point PMcc method B on sample #14083; results in °C

lab	method	value	mark	z(targ)	runtime	remarks
178		-----		-----	-----	
179		-----		-----	-----	
230		-----		-----	-----	
233		-----		-----	-----	
237		-----		-----	-----	
238		-----		-----	-----	
252		-----		-----	-----	
254		-----		-----	-----	
255		-----		-----	-----	
271		-----		-----	-----	
311		-----		-----	-----	
315	D93	191		-1.80	132.08	
325	D93	165	D(0.05)	-9.08	1h54m14s	
331	D93	215.5		5.06	36	
340		-----		-----	-----	
343		-----		-----	-----	
349		-----		-----	-----	
360		-----		-----	-----	
398	D93B	224.0	G(0.05)	7.44	147	
420	ISO2719	198		0.16	-----	
432	D93	193.5		-1.10	144	
450		-----		-----	-----	
451		-----		-----	-----	
473		-----		-----	-----	
495	D93B	192.0		-1.52	-----	
496		-----		-----	-----	
511	D93B	210.8		3.74	153.16	
541		-----		-----	-----	
551		-----		-----	-----	
562		-----		-----	-----	
575		-----		-----	-----	
603		-----		-----	-----	
614		-----		-----	-----	
621	D93	204		1.84	27	
633		-----		-----	-----	
634		-----		-----	-----	
657		-----		-----	-----	
663	D93B	197.0		-0.12	-----	
823	D93B	202.2		1.33	90	
840	D93B	204.1		1.86	112	
862	D93	192		-1.52	-----	
864		-----		-----	-----	
875		-----		-----	-----	
902		-----		-----	-----	
912		-----		-----	-----	
922	D93B	189.5		-2.22	160	
963		-----		-----	-----	
966		-----		-----	-----	
993		-----		-----	-----	
994	D93B	194.0	ex	-0.96	-----	Probably results mixed up (proc B > proc A)
1023		-----		-----	-----	
1059		-----		-----	-----	
1106		-----		-----	-----	
1146		-----		-----	-----	
1161		-----		-----	-----	
1173		-----		-----	-----	
1201	D93B	189.0		-2.36	-----	
1203		-----		-----	-----	
1227		-----		-----	-----	
1231		-----		-----	-----	
1271		-----		-----	-----	
1278		-----		-----	-----	
1300	D93	193		-1.24	121	
1316		-----		-----	-----	
1318		-----		-----	-----	
1320		-----		-----	-----	
1324		-----		-----	-----	
1327		-----		-----	-----	
1396		-----		-----	-----	
1401		-----		-----	-----	
1403		-----		-----	-----	
1423		-----		-----	-----	
1431		-----		-----	-----	
1435		-----		-----	-----	
1460		-----		-----	-----	

1543		-----	-----	-----
1569		-----	-----	-----
1571		-----	-----	-----
1622		-----	-----	-----
1650		-----	-----	-----
1660		-----	-----	-----
1720		-----	-----	-----
1722		-----	-----	-----
1740		-----	-----	-----
1748		-----	-----	-----
1752		-----	-----	-----
1791		-----	-----	-----
1800		-----	-----	-----
1842		-----	-----	-----
1850		-----	-----	-----
1854	D93B	190	-2.08	-----
1874		-----	-----	-----
1900		-----	-----	-----
1915		-----	-----	-----
2122		-----	-----	-----
9101		-----	-----	-----
9129	D93B	no flash	-----	-----

normality	suspect
n	15
outliers	2 + 1 excl.
mean (n)	197.44
st.dev. (n)	8.197
R(calc.)	22.95
R(D93:13e1)	10.00



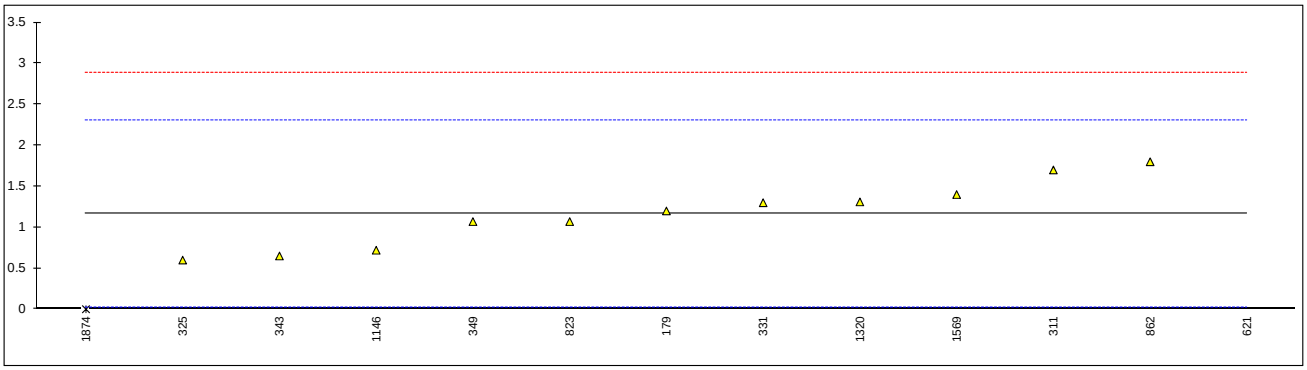


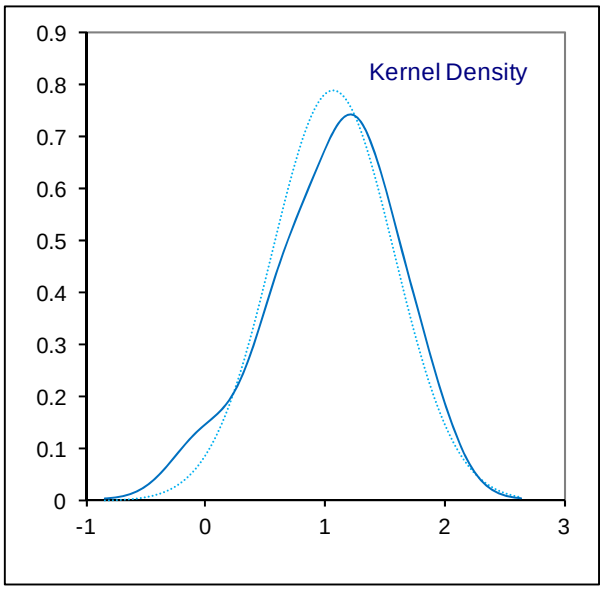
Determination of Fuel Dilution on sample #14083; results in %M/M

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179	D3524Mod.	1.2		0.06	
230		-----		-----	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
271		-----		-----	
311	D3524	1.7		0.94	
315		-----		-----	
325	INH-GC	0.60		-0.99	
331	in house	1.3		0.24	
340		-----		-----	
343	D3524	0.65		-0.90	
349	D3524	1.07	C	-0.17	First reported: 4.53
360		-----		-----	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473		-----		-----	
495		-----		-----	
496		-----		-----	
511		-----		-----	
541		-----		-----	
551		-----		-----	
562		-----		-----	
575		-----		-----	
603		-----		-----	
614		-----		-----	
621	E2412	25148.9	ex	44009	See §4.1, method not equivalent, reported in: Abs/0.1mm
633		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
823	D3524	1.07		-0.17	
840		-----		-----	
862	D3524	1.8		1.11	
864		-----		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
922		-----		-----	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023		-----		-----	
1059		-----		-----	
1106		-----		-----	
1146	D3524	0.72		-0.78	
1161		-----		-----	
1173		-----		-----	
1201		-----		-----	
1203		-----		-----	
1227		-----		-----	
1231		-----		-----	
1271		-----		-----	
1278		-----		-----	
1300		-----		-----	
1316	D3524	<0.5		-----	
1318		-----		-----	
1320	D3524	1.31		0.25	
1324		-----		-----	
1327		-----		-----	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431		-----		-----	
1435		-----		-----	
1460		-----		-----	

1543		-----		-----	
1569	D3524	1.4		0.41	
1571		-----		-----	
1622		-----		-----	
1650		-----		-----	
1660		-----		-----	
1720		-----		-----	
1722		-----		-----	
1740		-----		-----	
1748		-----		-----	
1752		-----		-----	
1791		-----		-----	
1800		-----		-----	
1842		-----		-----	
1850		-----		-----	
1854		-----		-----	
1874	in house	0	ex	-2.04	Result excluded; zero is not a real value
1900		-----		-----	
1915		-----		-----	
2122		-----		-----	
9101		-----		-----	
9129		-----		-----	

normality	OK
n	11
outliers	0 + 2 excl.
mean (n)	1.17
st.dev. (n)	0.398
R(calc.)	1.11
R(D3524:14)	1.60





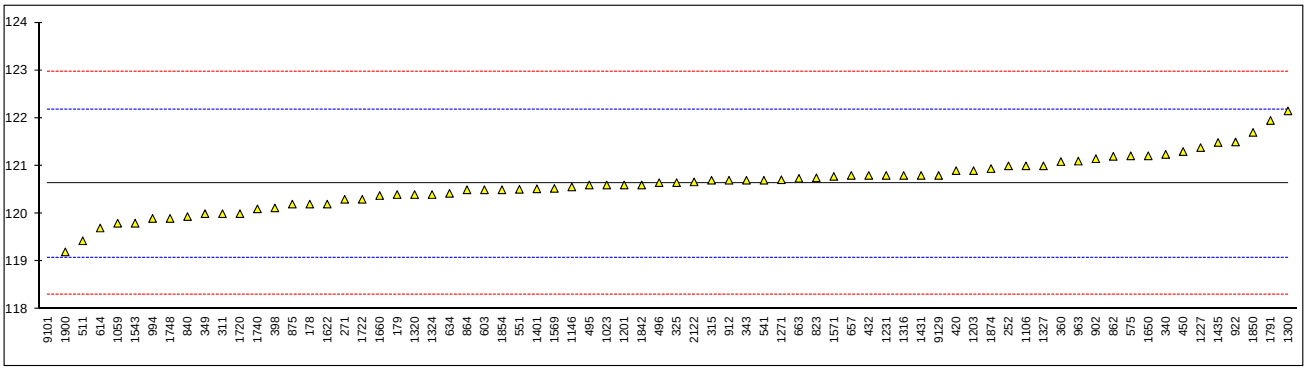
Determination of Kinematic Viscosity @ 40°C (D445) on sample #14083; results in mm^2/s

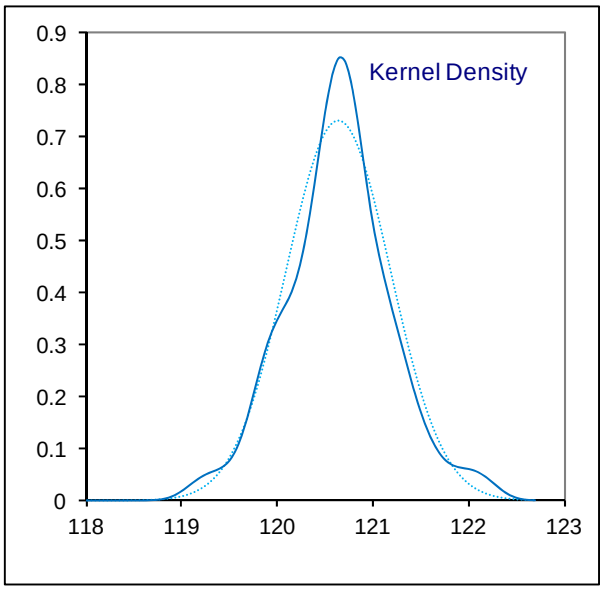
lab	method	value	mark	z(targ)	remarks
178	D445	120.2		-0.56	
179	D445	120.4		-0.30	
230		-----		-----	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252	D445	121.0		0.47	
254		-----		-----	
255		-----		-----	
271	D445	120.3		-0.43	
311	D445	120.0		-0.82	
315	D445	120.7		0.08	
325	D445	120.65		0.02	
331		-----		-----	
340	D445	121.24		0.78	
343	D445	120.7		0.08	
349	D445	120.0	C	-0.82	First reported: 105.4
360	D445	121.09		0.59	
398	D445	120.12		-0.66	
420	ISO3104	120.9		0.34	
432	D445	120.8		0.21	
450	D445	121.3		0.86	
451		-----		-----	
473		-----		-----	
495	D445	120.6		-0.04	
496	D445	120.65		0.02	
511	D445	119.432		-1.55	
541	D445	120.7		0.08	
551	D445	120.51		-0.16	
562		-----		-----	
575	D445	121.21		0.74	
603	D445	120.5		-0.17	Also reported: D7042 118.3, z-score: -3.79
614	D445	119.7		-1.21	
621		-----		-----	
633		-----		-----	
634	D445	120.4257		-0.27	
657	D445	120.8		0.21	
663	D445	120.74		0.14	
823	D445	120.75		0.15	
840	D445	119.94		-0.90	
862	D445	121.2		0.73	
864	D445	120.5		-0.17	
875	D445	120.2		-0.56	
902	D445	121.15		0.66	
912	D445	120.7		0.08	
922	D445	121.5		1.12	Also reported: D7042 121.41, z-score: 1.92
963	D445	121.1		0.60	
966		-----		-----	
993		-----		-----	
994	D445	119.9		-0.95	
1023	D445	120.6		-0.04	
1059	ISO3104	119.8		-1.08	
1106	D445	121.0		0.47	
1146	D445	120.56		-0.10	
1161		-----		-----	
1173		-----		-----	
1201	D445	120.6		-0.04	
1203	D445	120.9		0.34	
1227	D445	121.3822		0.96	
1231	D445	120.8		0.21	
1271	D445	120.71		0.10	
1278		-----		-----	
1300	D445	122.1497		1.95	
1316	D445	120.8		0.21	
1318		-----		-----	
1320	D445	120.4		-0.30	
1324	D445	120.4		-0.30	
1327	D445	121.0		0.47	
1396		-----		-----	
1401	D445	120.52		-0.15	Also reported: D7042 119.82, z-score: -1.00
1403		-----		-----	
1423		-----		-----	
1431	D7042	120.8	C	0.21	First reported: 105.6
1435	D7042	121.49		1.10	
1460		-----		-----	

1543	D445	119.8		-1.08
1569	D445	120.528		-0.14
1571	D7042	120.78		0.19
1622	D445	120.2		-0.56
1650	D445	121.21		0.74
1660	D7042	120.38		-0.33
1720	D445	120.0		-0.82
1722	D445	120.3		-0.43
1740	D445	120.1		-0.69
1748	D445	119.9		-0.95
1752		-----		-----
1791	ISO3104	121.95		1.70
1800		-----		-----
1842	IP71	120.6		-0.04
1850	ISO3104	121.7		1.37
1854	D445	120.5		-0.17
1874	D445	120.943		0.40
1900	D445	119.2		-1.85
1915		-----		-----
2122	in house	120.665		0.04
9101	D445	107.42	R(0.01)	-17.04
9129	D445	120.8		0.21

normality	OK
n	71
outliers	1
mean (n)	120.635
st.dev. (n)	0.5453
R(calc.)	1.527
R(iis)	2.171

R calculated from iis reports on used oils for ASTM D445: 1.8% of mean





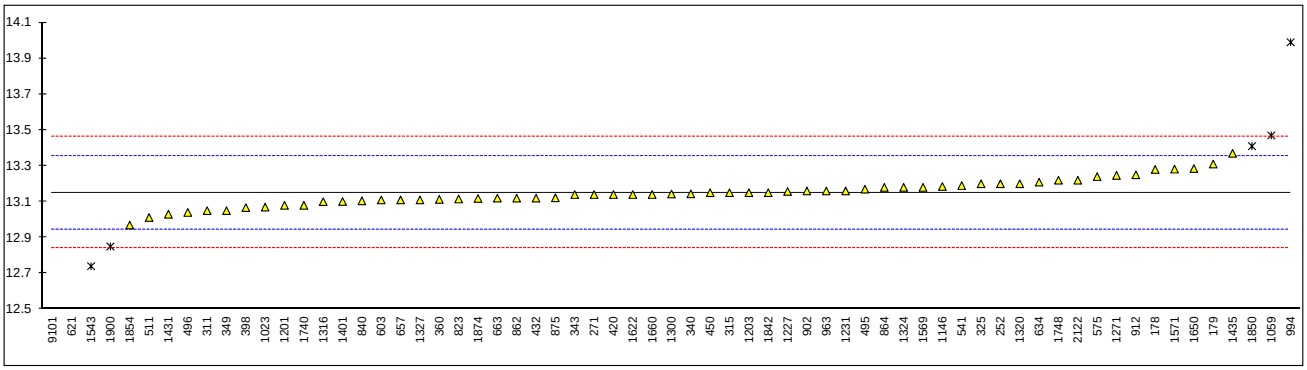
Determination of Kinematic Viscosity @ 100°C on sample #14083; results in mm^2/s

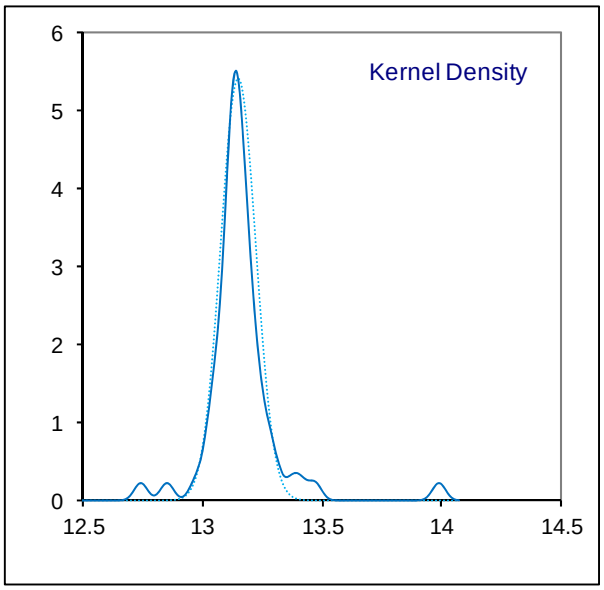
lab	method	value	mark	z(targ)	remarks
178	D445	13.28		1.25	
179	D445	13.31		1.54	
230		-----		-----	
233		-----		-----	
237		-----		-----	
238		-----		-----	
252	D445	13.20		0.48	
254		-----		-----	
255		-----		-----	
271	D445	13.14		-0.10	
311	D445	13.05		-0.97	
315	D445	13.15		-0.01	
325	D445	13.20		0.48	
331		-----		-----	
340	D445	13.144		-0.06	
343	D445	13.14		-0.10	
349	D445	13.05		-0.97	
360	D445	13.113		-0.36	
398	D445	13.067		-0.81	
420	ISO3104	13.14		-0.10	
432	D445	13.12		-0.30	
450	D445	13.15		-0.01	
451		-----		-----	
473		-----		-----	
495	D445	13.17		0.19	
496	D445	13.040		-1.07	
511	D445	13.012		-1.34	
541	D445	13.19		0.38	
551		-----		-----	
562		-----		-----	
575	D445	13.24		0.87	
603	D445	13.11		-0.39	Also reported: D7042 13.61, z-score: 6.12
614		-----		-----	
621	D445	12.1947	R(0.01)	-9.25	
633		-----		-----	
634	D445	13.2093		0.57	
657	D445	13.11		-0.39	
663	D445	13.120		-0.30	
823	D445	13.115		-0.34	
840	D445	13.105		-0.44	
862	D445	13.12		-0.30	
864	D445	13.18		0.28	
875	D445	13.122	C	-0.28	First reported: 3.122
902	D445	13.16		0.09	
912	D445	13.25		0.96	
922		-----		-----	
963	D445	13.16		0.09	
966		-----		-----	
993		-----		-----	
994	D445	13.99	R(0.01)	8.12	
1023	D445	13.07		-0.78	
1059	ISO3104	13.47	C,R(0.05)	3.09	First reported: 12.44
1106		-----		-----	
1146	D445	13.185		0.33	
1161		-----		-----	
1173		-----		-----	
1201	D445	13.08		-0.68	
1203	D445	13.15		-0.01	
1227	D445	13.1572		0.06	
1231	D445	13.16		0.09	
1271	D445	13.247		0.93	
1278		-----		-----	
1300	D445	13.143		-0.07	
1316	D445	13.1		-0.49	
1318		-----		-----	
1320	D445	13.2		0.48	
1324	D445	13.18		0.28	
1327	D445	13.11		-0.39	
1396		-----		-----	
1401	D445	13.101		-0.48	Also reported: D7042 13.174, z-score: 0.31
1403		-----		-----	
1423		-----		-----	
1431	D7042	13.03	C	-1.17	First reported: 13.22
1435	D7042	13.37		2.12	
1460		-----		-----	

1543	D445	12.74	R(0.01)	-3.97
1569	D445	13.18		0.28
1571	D7042	13.282		1.27
1622	D445	13.14		-0.10
1650	D445	13.285		1.30
1660	D7042	13.14		-0.10
1720		-----		-----
1722		-----		-----
1740	D445	13.08		-0.68
1748	D445	13.22		0.67
1752		-----		-----
1791		-----		-----
1800		-----		-----
1842	IP71	13.15		-0.01
1850	ISO3104	13.41	R(0.05)	2.51
1854	D445	12.97		-1.75
1874	D445	13.118		-0.32
1900	D445	12.85	R(0.05)	-2.91
1915		-----		-----
2122	in house	13.22		0.67
9101	D445	11.91	R(0.01)	-12.01
9129		-----		-----

normality	OK
n	58
outliers	7
mean (n)	13.151
st.dev. (n)	0.0751
R(calc.)	0.210
R(iis)	0.289

R calculated from iis reports on used oils for ASTM D445: 2.2% of mean



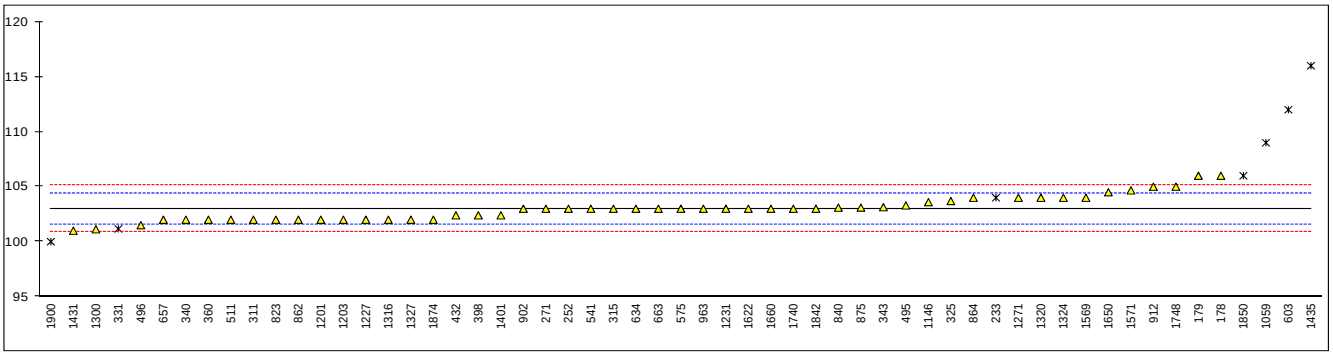


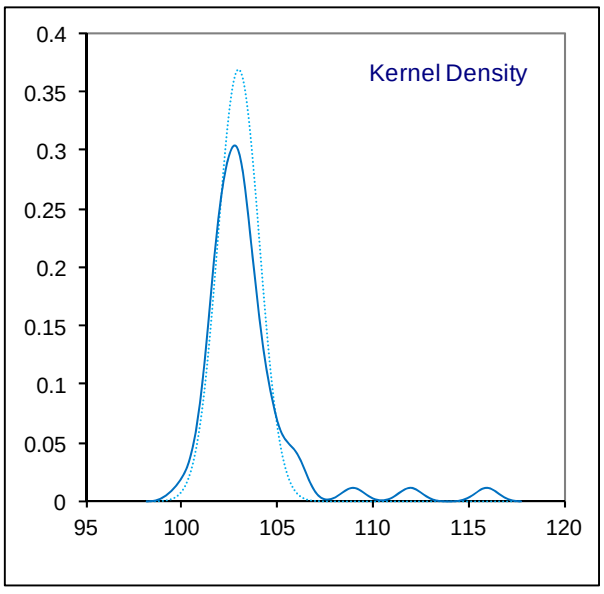
Determination of Viscosity index on sample #14083

lab	method	value	mark	z(targ)	remarks
178	D2270	106	C	4.20	First reported: 758
179	D2270	106		4.20	
230		-----		-----	
233	D2270	104	ex	1.40	Result excluded, based on Houillon viscosity
237		-----		-----	
238		-----		-----	
252	D2270	103		0.00	
254		-----		-----	
255		-----		-----	
271	D2270	103		0.00	
311	D2270	102		-1.40	
315	D2270	103		0.00	
325	D2270	103.7		0.98	
331	in house	101.17	ex	-2.56	Result excluded, based on Houillon viscosity
340	D2270	102		-1.40	
343	D2270	103.14		0.20	
349		-----		-----	
360	D2270	102		-1.40	
398	D2270	102.4		-0.84	
420		-----		-----	
432	D2270	102.4		-0.84	
450		-----		-----	
451		-----		-----	
473		-----		-----	
495	D2270	103.3		0.42	
496	D2270	101.5		-2.10	
511	D2270	102		-1.40	
541	D2270	103		0.00	
551		-----		-----	
562		-----		-----	
575	D2270	103		0.00	
603	D2270	112	R(0.01)	12.60	
614		-----		-----	
621		-----		-----	
633		-----		-----	
634	D2270	103		0.00	
657	D2270	102		-1.40	
663	D2270	103		0.00	
823	D2270	102		-1.40	
840	D2270	103.1		0.14	
862	D2270	102		-1.40	
864	D2270	104		1.40	
875	D2270	103.1036		0.15	
902	D2270	103		0.00	
912	D2270	105		2.80	
922		-----		-----	
963	D2270	103		0.00	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023		-----		-----	
1059	ISO2909	109	ex,C	8.40	First reported: 94, iis calc. 107.4, result excluded, outlier in D445 100°C
1106		-----		-----	
1146	D2270	103.6		0.84	
1161		-----		-----	
1173		-----		-----	
1201	D2270	102		-1.40	
1203	D2270	102		-1.40	
1227	D2270	102		-1.40	
1231	D2270	103		0.00	
1271	ISO2270	104		1.40	
1278		-----		-----	
1300	D2270	101.13		-2.62	
1316	D2270	102		-1.40	
1318		-----		-----	
1320	ISO3104	104		1.40	
1324	D2270	104		1.40	
1327	D2270	102		-1.40	
1396		-----		-----	
1401	D2270	102.4		-0.84	
1403		-----		-----	
1423		-----		-----	
1431	D2270	101	C	-2.80	First reported: 122
1435	D2270	116	E,R(0.01)	18.20	iis calc. 105.2
1460		-----		-----	

1543		-----		-----	
1569	D2270	104		1.40	
1571	D2270	104.671		2.34	
1622	D2270	103		0.00	
1650	D2270	104.5		2.10	
1660	D2270	103		0.00	
1720		-----		-----	
1722		-----		-----	
1740	D2270	103		0.00	
1748	D2270	105		2.80	
1752		-----		-----	
1791		-----		-----	
1800		-----		-----	
1842	IP226	103		0.00	
1850	ISO2909	106	ex	4.20	Result excluded, outlier in D445 100°C
1854		-----		-----	
1874	D2270	102		-1.40	
1900	D2270	100	ex	-4.20	Result excluded, outlier in D445 100°C
1915		-----		-----	
2122		-----		-----	
9101		-----		-----	
9129		-----		-----	

normality	OK
n	50
outliers	2 (+ 5 excl)
mean (n)	103.00
st.dev. (n)	1.114
R(calc.)	3.12
R(D2270:10e1)	2.00



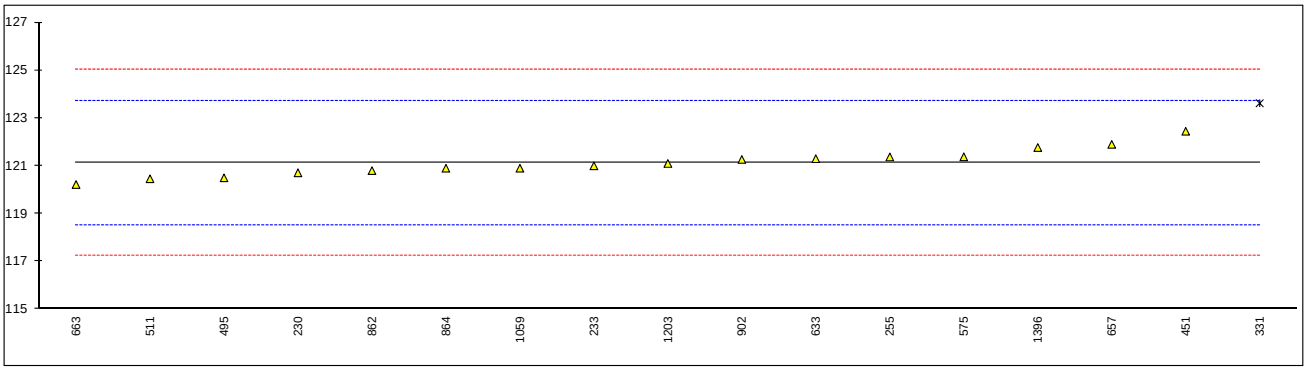


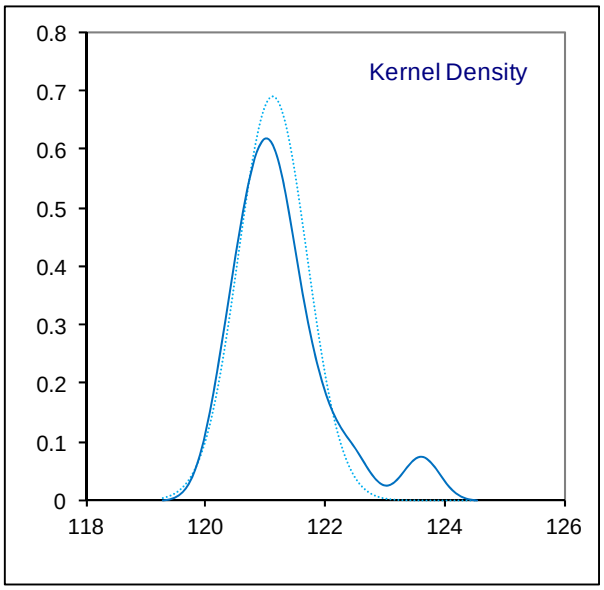
Determination of Kinematic Viscosity @ 40°C (Houillon) on sample #14083; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
230	in house	120.71		-0.32	
233	D7279	121		-0.10	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255	D7279	121.375		0.19	
271		-----		-----	
311		-----		-----	
315		-----		-----	
325		-----		-----	
331	D7279	123.62	G(0.05)	1.92	
340		-----		-----	
343		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451	D7279	122.45		1.02	
473		-----		-----	
495	D7279	120.5		-0.48	
496		-----		-----	
511	D7279	120.46		-0.51	
541		-----		-----	
551		-----		-----	
562		-----		-----	
575	D7279	121.38		0.19	
603		-----		-----	
614		-----		-----	
621		-----		-----	
633	D7279	121.3		0.13	
634		-----		-----	
657	D7279	121.9		0.60	
663	D7279	120.22		-0.70	
823		-----		-----	
840		-----		-----	
862	D7279	120.8		-0.25	
864	D7279	120.9		-0.17	
875		-----		-----	
902	D7279	121.27		0.11	
912		-----		-----	
922		-----		-----	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023		-----		-----	
1059	D7279	120.9		-0.17	
1106		-----		-----	
1146		-----		-----	
1161		-----		-----	
1173		-----		-----	
1201		-----		-----	
1203	D7279	121.1		-0.02	
1227		-----		-----	
1231		-----		-----	
1271		-----		-----	
1278		-----		-----	
1300		-----		-----	
1316		-----		-----	
1318		-----		-----	
1320		-----		-----	
1324		-----		-----	
1327		-----		-----	
1396	IP71	121.768		0.49	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431		-----		-----	
1435		-----		-----	
1460		-----		-----	

1543	-----	-----
1569	-----	-----
1571	-----	-----
1622	-----	-----
1650	-----	-----
1660	-----	-----
1720	-----	-----
1722	-----	-----
1740	-----	-----
1748	-----	-----
1752	-----	-----
1791	-----	-----
1800	-----	-----
1842	-----	-----
1850	-----	-----
1854	-----	-----
1874	-----	-----
1900	-----	-----
1915	-----	-----
2122	-----	-----
9101	-----	-----
9129	-----	-----

normality	OK
n	16
outliers	1
mean (n)	121.127
st.dev. (n)	0.5771
R(calc.)	1.616
R(D7279:08)	3.634



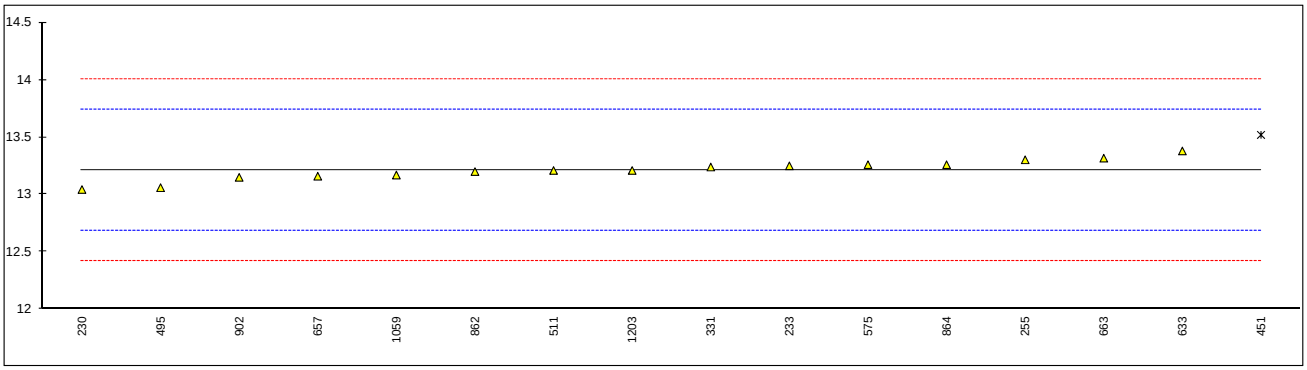


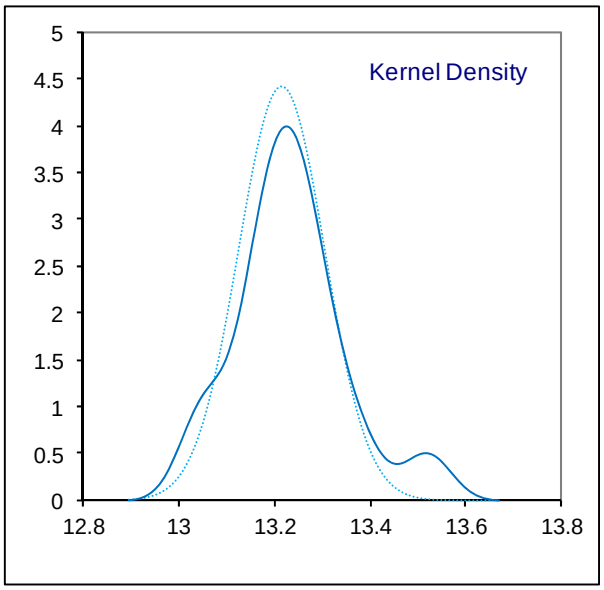
Determination of Kinematic Viscosity @ 100°C (Houillon) on sample #14083; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
178		-----		-----	
179		-----		-----	
230	in house	13.044		-0.64	
233	D7279	13.25		0.14	
237		-----		-----	
238		-----		-----	
252		-----		-----	
254		-----		-----	
255	D7279	13.303		0.34	
271		-----		-----	
311		-----		-----	
315		-----		-----	
325		-----		-----	
331	D7279	13.24		0.10	
340		-----		-----	
343		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451	D7279	13.52	D(0.05)	1.16	
473		-----		-----	
495	D7279	13.06		-0.58	
496		-----		-----	
511	D7279	13.21		-0.02	
541		-----		-----	
551		-----		-----	
562		-----		-----	
575	D7279	13.26		0.17	
603		-----		-----	
614		-----		-----	
621		-----		-----	
633	D7279	13.38		0.63	
634		-----		-----	
657	D7279	13.16		-0.21	
663	D7279	13.317		0.39	
823		-----		-----	
840		-----		-----	
862	D7279	13.2		-0.05	
864	D7279	13.26		0.17	
875		-----		-----	
902	D7279	13.15		-0.24	
912		-----		-----	
922		-----		-----	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994		-----		-----	
1023		-----		-----	
1059	D7279	13.17		-0.17	
1106		-----		-----	
1146		-----		-----	
1161		-----		-----	
1173		-----		-----	
1201		-----		-----	
1203	D7279	13.21		-0.02	
1227		-----		-----	
1231		-----		-----	
1271		-----		-----	
1278		-----		-----	
1300		-----		-----	
1316		-----		-----	
1318		-----		-----	
1320		-----		-----	
1324		-----		-----	
1327		-----		-----	
1396		-----		-----	
1401		-----		-----	
1403		-----		-----	
1423		-----		-----	
1431		-----		-----	
1435		-----		-----	
1460		-----		-----	

1543	-----	-----
1569	-----	-----
1571	-----	-----
1622	-----	-----
1650	-----	-----
1660	-----	-----
1720	-----	-----
1722	-----	-----
1740	-----	-----
1748	-----	-----
1752	-----	-----
1791	-----	-----
1800	-----	-----
1842	-----	-----
1850	-----	-----
1854	-----	-----
1874	-----	-----
1900	-----	-----
1915	-----	-----
2122	-----	-----
9101	-----	-----
9129	-----	-----

normality	OK
n	15
outliers	1
mean (n)	13.214
st.dev. (n)	0.0903
R(calc.)	0.253
R(D7279:08)	0.740

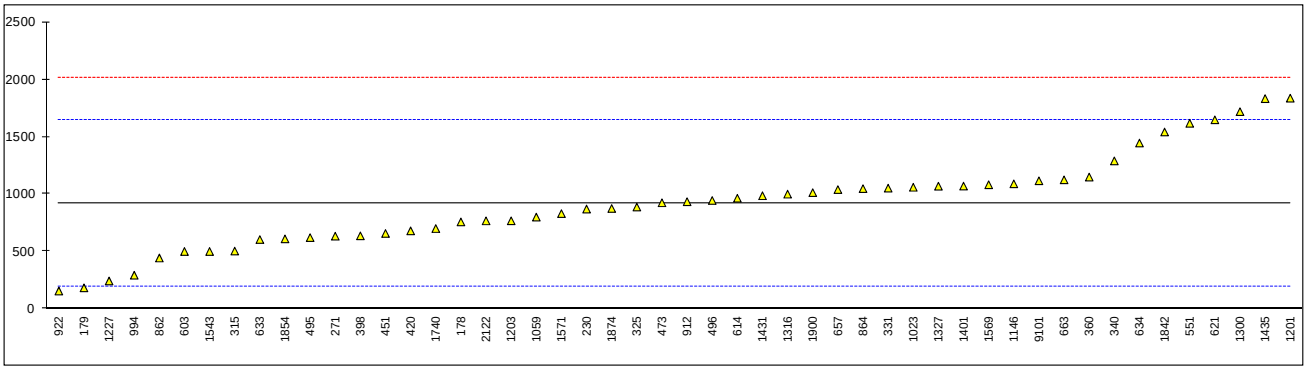


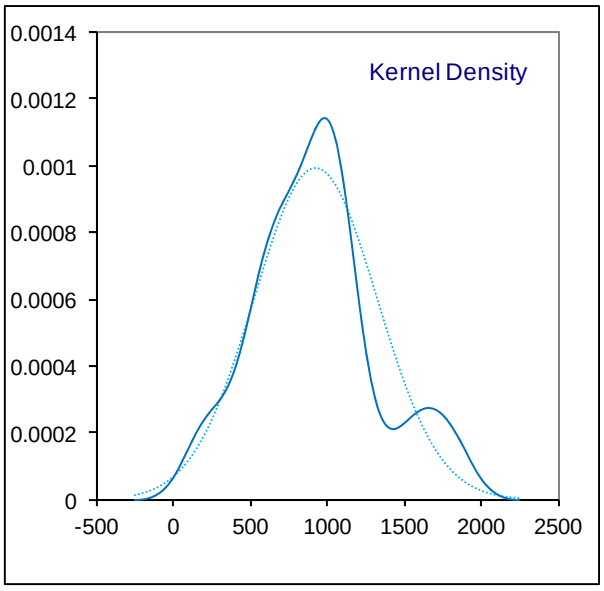


Determination of Water on sample #14083; results in mg/kg

lab	method	value	mark	z(targ)	remarks
178	D6304	758		-0.45	
179	D6304	183		-2.04	
230	D6304	870	C	-0.14	Reported 0.087, probably a unit error
233		-----		-----	
237		-----		-----	
238		-----		-----	
252	D95	<500		-----	
254		-----		-----	
255		-----		-----	
271	D6304	633.3		-0.80	
311		-----		-----	
315	D6304C	503.9		-1.15	
325	D6304A	887.5		-0.10	
331	D6304	1052.5		0.36	
340	D6304	1290		1.01	
343		-----		-----	
349		-----		-----	
360	D6304C	1149		0.62	
398	D6304C	636.5		-0.79	
420	D6304C	680		-0.67	
432		-----		-----	
450		-----		-----	
451	D6304	657	C	-0.73	First reported: 0.07
473	D6304C	924.6		0.01	
495	D6304C	621		-0.83	
496	D6304C	945		0.06	
511		-----		-----	
541		-----		-----	
551	D6304A	1618	C	1.92	First reported: 2094.7
562		-----		-----	
575		-----		-----	
603	D6304C	500		-1.16	
614	D6304C	964		0.11	
621	D6304A	1648.18		2.00	
633	D6304A	604		-0.88	
634	D6304A	1445.617		1.44	
657	D6304C	1039.5		0.32	
663	D6304C	1124.4		0.56	
823		-----		-----	
840		-----		-----	
862	D6304C	443.1		-1.32	
864	D6304	1048		0.35	
875		-----		-----	
902		-----		-----	
912	D6304C	934		0.03	
922	D6304A	155.5		-2.11	
963		-----		-----	
966		-----		-----	
993		-----		-----	
994	D6304A	293.2		-1.74	
1023	D6304A	1060		0.38	
1059	D6304AMod.	800		-0.34	
1106		-----		-----	
1146	D6304C	1090		0.46	
1161		-----		-----	
1173		-----		-----	
1201	E203	1837		2.52	
1203	D6304C	767.6		-0.43	
1227	D6304A	243		-1.87	
1231		-----		-----	
1271		-----		-----	
1278		-----		-----	
1300	D6304A	1719		2.20	
1316	D6304	1000		0.21	
1318		-----		-----	
1320		-----		-----	
1324		-----		-----	
1327	D6304C	1069.4		0.41	
1396		-----		-----	
1401	D6304	1070.3		0.41	
1403		-----		-----	
1423		-----		-----	
1431	D6304	986		0.18	
1435	D1744	1833		2.51	
1460		-----		-----	

1543	D95	500	C	-1.16	Reported: 0.05% vol
1569	D6304C	1082		0.44	
1571	D6304C	830		-0.25	
1622		-----		-----	
1650		-----		-----	
1660		-----		-----	
1720		-----		-----	
1722		-----		-----	
1740	D6304A	700		-0.61	
1748		-----		-----	
1752		-----		-----	
1791		-----		-----	
1800		-----		-----	
1842	D6304A	1542		1.71	
1850		-----		-----	
1854	D6304	610		-0.86	
1874	E2412	875		-0.13	
1900	D6304C	1013		0.25	
1915		-----		-----	
2122	INH-KF	767	C	-0.43	First reported: 7666
9101	D95	1116.3		0.53	
9129		-----		-----	
					Only ASTM D6304-C data:
	normality	OK			OK
	n	50			19
	outliers	0			0
	mean (n)	922.39			858.79
	st.dev. (n)	401.760			231.166
	R(calc.)	1124.93			647.26
	R(D6304:07)	1015.36			972.76





APPENDIX 2

Number of participants per country

1 lab in ARGENTINA
1 lab in AUSTRALIA
1 lab in AUSTRIA
2 labs in AZERBAIJAN
2 labs in BELGIUM
1 lab in BOSNIA and HERZEGOVINA
1 lab in BRAZIL
1 lab in BRUNEI
1 lab in BULGARIA
1 lab in CHILE
4 labs in CHINA, People's Republic
1 lab in COLOMBIA
1 lab in CROATIA
1 lab in CYPRUS
1 lab in CZECH REPUBLIC
1 lab in ESTONIA
2 labs in FRANCE
2 labs in GERMANY
1 lab in GHANA
4 labs in GREECE
1 lab in HUNGARY
1 lab in INDIA
2 labs in INDONESIA
2 labs in ITALY
1 lab in JORDAN
2 labs in KENYA
1 lab in MACEDONIA
2 labs in MALAYSIA
1 lab in MAURITIUS
5 labs in NETHERLANDS
4 labs in NIGERIA
4 labs in NORWAY
1 lab in PAKISTAN
1 lab in PERU
2 labs in PHILIPPINES
1 lab in POLAND
1 lab in RUSSIAN FEDERATION
4 labs in SAUDI ARABIA
1 lab in SINGAPORE
1 lab in SLOVAKIA
1 lab in SLOVENIA
1 lab in SOUTH AFRICA
1 lab in SOUTH KOREA
5 labs in SPAIN
2 labs in SUDAN
3 labs in SWEDEN
1 lab in TANZANIA
3 labs in THAILAND
2 labs in TURKEY
7 labs in UNITED KINGDOM
3 labs in UNITED STATES OF AMERICA
1 lab in VIETNAM

APPENDIX 3

Abbreviations:

C	= final result after checking of first reported suspect result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner outlier test
R(0.05)	= straggler in Rosner outlier test
ex	= excluded from calculations
W	= results withdrawn on request of the participants
fr.	= first reported
S	= scope of the reported method is not applicable
n.a.	= not applicable
SDS	= Safety Data Sheet
R(iis)	= reproducibility based on the reproducibilities found in previous iis PT's for this test

Literature:

1 iis Interlaboratory Studies, Protocol for the Organization, Statistics and Evaluation, April 2014

2 ASTM E178-89

3 ASTM E1301-89

4 ISO 5725-86

5 ISO 5725, parts 1-6, 1994

6 M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)

7 W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)

8 IP 367/84

9 DIN 38402 T41/42

10 P.L. Davies, First reported Z. Anal. Chem, 331, 513, (1988)

11 J.N. Miller, Analyst, 118, 455, (1993)

12 Analytical Methods Committee Technical brief, No4 January 2001.

13 The Royal Society of Chemistry 2002, Analyst 2002, 127 pages 1359-1364, P.J. Lowthian and M. Thompson (see http://www.rsc.org/suppdata/an/b2/b205600n/).

14 MEMO iis: Precision data of used oils for Kinematic Viscosity (ASTM D445)

15 Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, *Technometrics*, 25(2), pp. 165-172, (1983)