Results of Proficiency Test
Fuel Oil
December 2019

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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CONTENTS

1 INTRODUCTION

Since 1994 the Institute for Interlaboratory Studies (iis) organizes a proficiency test for Fuel Oil every year and twice per year since 2016. During the annual proficiency testing program of 2019/2020, it was decided to continue twice per year with the round robin for the analysis of Fuel Oil in accordance with the latest applicable version of the specifications ISO8217 and ASTM D396.

In this interlaboratory study 137 laboratories in 59 countries registered for participation for the PT on Fuel Oil (iis19F03), 103 laboratories in 47 countries for Metals in Fuel Oil (iis19F03M), 48 laboratories in 24 countries for the Bromine and p-Value in proficiency test (iis19F03Br) and 53 laboratories in 28 countries registered for the Compatibility proficiency test (iis19F03C). In total 146 laboratories in 60 different countries registered for participation. See appendix 3 for the number of participants per country. In this report, the test results of the December 2019 interlaboratory study on Fuel Oil are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory. In this proficiency test, the participants received, depending on the registration, from one to four different samples of Fuel Oil, see table below.

Samples	Purpose
#19275: 1x 1L	Regular analyzes
#19276: 1x 100mL	Metals
#19277: 1x 1L	Bromine number & p-Value
#19278: 1x prepared filter	Compatibility

Table 1: Fuel Oil samples used in iis19F03

Participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

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

2.2 PROTOCOL

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

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

Preparation of samples for the regular Fuel Oil PT and the PT Bromine Number and p-Value
A batch of approximately 210 liters of Fuel Oil obtained from a third party was used for the preparation of the subsamples for the regular analyses and for Bromine Number/p-Value only. After homogenization about 210 amber glass bottles of 1L were filled of which 155 bottles were labelled #19275 for the regular Fuel Oil PT and 55 bottles were labelled #19277 for the PT Bromine Number and p-Value. The homogeneity of the subsamples #19275 and #19277 was checked by determination of Density at 15°C in accordance with ISO12185 on 8 stratified randomly selected samples.

	Density at 15°C in kg/m^3
Sample 1	958.5
Sample 2	958.7
Sample 3	958.6
Sample 4	958.6
Sample 5	958.7
Sample 6	958.7
Sample 7	958.6
Sample 8	958.5

Table 2: homogeneity test results of subsamples #19275 and #19277

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

	Density at 15°C in kg/m^3
r (observed)	0.23
reference test method	ISO12185:96
0.3 * R (ref. test method)	0.45

Table 3: evaluation of the repeatability of subsamples #19275 and #19277

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

Preparation of samples for the PT Metals in Fuel Oil

A batch of approximately 12 liters of Fuel Oil was spiked with Aluminum and Silicon Conostan standards and spiked with a lubricating oil which contains Calcium, Phosphorus and Zinc. After homogenization about 200 plastic PE bottles of 100mL were filled and labelled #19276. The homogeneity of the subsamples #19276 was checked by determination of Phosphorus in accordance with ISO12185 on 8 stratified randomly selected samples.

	Phosphorus in mg/kg
Sample #19276-1	21
Sample #19276-2	20
Sample #19276-3	20
Sample #19276-4	20
Sample #19276-5	19
Sample #19276-6	19
Sample #19276-7	21
Sample #19276-8	19

Table 4: homogeneity test results of subsamples #19276

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

	Phosphorus in mg/kg
r (observed)	2.34
reference test method	IP501:05
0.3 * R (ref. test method)	1.98

Table 5: evaluation of the repeatability of subsamples #19276

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

Preparation of samples for the PT Fuel Oil Compatibility

For the preparation of the samples #19278 two incompatible Fuel Oils were mixed according to ASTM D4740 and the mixture was applied to paper filters as per ASTM D4740. The paper filters with a spot were kept in a tin box, labelled #19278. The homogeneity was done visually and the homogeneity of the samples #19278 was assumed.

To each of the participating laboratories, depending on the registration, one bottle of 1L labelled #19275, one bottle of 100mL labelled #19276, one bottle of 1L labelled #19277 and/or a tin box with a paper filter labelled #19278 was sent to each of the participating laboratories on November 27, 2019. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

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

2.6 ANALYSES

The participants were requested to determine on sample #19275: Acid Number (Total), API Gravity, Ash Content, Asphaltenes, Calculated Carbon Aromaticity Index (CCAI), Carbon Residue – micro method, Conradson Carbon Residue, Density at 15°C, Flash Point PMcc, Heat of Combustion (Gross and Net), Kinematic Viscosity (at 50°C and 100°C), Viscosity Stabinger (at 50°C and 100°C), Nitrogen, Pour Point (Lower, Upper and Automated), Sediment by Extraction, Total Sediment (Existent, Accelerated and Potential), Total Sulfur, Water by Distillation, Water and Sediment, Distillation (IBP, 5% - 50% recovered and FBP) and Total Carbon, Hydrogen and Nitrogen (CHN-analyzer). Also, some extra questions regarding Acid Number Determination were asked.
The participants were requested to determine on sample #19276: Aluminum, Silicon, Sum of Aluminum and Silicon, Iron, Nickel, Sodium, Vanadium, Calcium, Phosphorus and Zinc content. On sample #19277 Bromine Number and p-Value and on sample 19278 rating of Compatibility.

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

To get comparable test results, a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the appropriate reference test methods that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis/. The participating laboratories are also requested to confirm the sample receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

3 RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis/. The reported test results are tabulated per determination in appendix 1 of this report. The laboratories are presented by their code numbers.

Directly after the deadline, a reminder was sent to those laboratories that had not reported test results at that moment. Shortly after the deadline, the available test results were screened for suspect data. A test result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the reported test results (no reanalyzes). Additional or corrected test results are used for data analysis and the original test results are placed under 'Remarks' in the test result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1 STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5).
For the statistical evaluation, the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as '<…' or '>…' were not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test, a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either 'unknown', 'OK', 'suspect' or 'not OK'. After removal of outliers, this check was repeated. If a data set does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.
According to ISO5725 the original test results per determination were submitted to Dixon's 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. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

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

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

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis, the reported test results are plotted. The corresponding laboratory numbers are on the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. The Kernel Density Graph is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve was projected over the Kernel Density Graph for reference.

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ASTM or ISO reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.
The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used, like Horwitz or an estimated reproducibility based on former iis proficiency tests.

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

The z-scores were calculated according to:

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

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

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 proficiency test some problems were encountered with the dispatch of the samples.
For the PT on Fuel Oil: sixteen participants reported test results after the final reporting date and eight participants did not report any test results at all.
For the PT on Metals in Fuel Oil: ten participants reported test results after the final reporting date and sixteen participants did not report any test results at all.
For the PT on Bromine Number and p-Value in Fuel Oil: five participants reported test results after the final reporting date and thirteen participants did not report any test results at all.
For the PT Fuel Oil Compatibility: seven participants reported test results after the final reporting date and ten participants did not report any test results at all.
Finally, over the four PTs 137 participants reported in total 2945 numerical test results. Observed were 115 statistically outlying test results, which is 3.9 %. In proficiency studies outlier percentages of 3% - 7.5% are quite normal.

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

4.1 EVALUATION PER SAMPLE AND PER TEST

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

In the iis PT reports, ASTM test methods are referred to with a number (e.g. D1298) or an added designation for the year that the test method was adopted or revised (e.g. D1298:12b). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D1298:12b(2017)). In the results tables of appendix 1 only the method number and year of adoption or revision (e.g. D1298:12b) will be used.

Sample #19275

Acid Number (Total): This determination was very problematic. Seven statistical outliers were observed. About 70% of the reporting participants reported to have used Inflection Point and about 50% of the reporting participants reported to have used Inflection Point and 125mL volume. The variation in the test results was very high. Therefore, no z-scores were calculated.

API Gravity: This determination was not problematic. Seven statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D1298:12b(2017).

Ash Content: This determination was very problematic at an Ash content of 0.02 %M/M. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not at all in agreement with requirements of ISO6245:01 and ASTM D482:13.

Asphaltenes: This determination was very problematic. Seven statistical outliers were observed. The variation in the test results was very high. Therefore, no z-scores were calculated.

Calculated Carbon Aromaticity Index: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO8217:17.

Carbon Residue - micro method: This determination was not problematic. Seven statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO10370:14.

Conradson Carbon Residue: 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 D189:06(2019).

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

Flash Point PMcc: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO2719-B:16.

Heat of Combustion (Gross): This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D240:17.

Heat of Combustion (Net): This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D240:17.

Kin. Visc. at 50°C: This determination was problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in not agreement with the requirements of ISO3104:94.

Kin. Visc. at 100°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO3104:94.

Vis. Stab.at 50°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D7042:16e3.

Vis. Stab.at 100°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D7042:16e3.

Nitrogen: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D5762:18a.
When the test results of ASTM D5762 volumetric and gravimetric test methods were evaluated separately both the calculated reproducibilities are not in agreement also.

Pour Point, Lower: This determination was not problematic. One statistical outlier was observed and one other test result was excluded. However, the calculated reproducibility after rejection of the suspect data is in agreement with the requirements of ISO3016:19.

Pour Point, Upper: This determination was not problematic. Four statistical outliers were observed and one other test result was excluded. However, the calculated reproducibility after rejection of the suspect data is in agreement with the requirements of ISO3016:19.

Pour Point, Automated: This determination was not problematic. No statistical outliers were observed but one test result was excluded. The calculated reproducibility after rejection of the suspect data is in full agreement with the requirements of ASTM D5950:14.

Sediment by Extraction: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D473:07e1(2017).

Total Sediment Existent (TSE): This determination was not problematic. Eight statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of IP375:11(2018).

Total Sediment Accelerated (TSA): This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of IP390:11(2017). IP390:11(2017) is identical to ISO10307-2:09 and technically equivalent to ASTM D4870.

Total Sediment Potential (TSP): This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of IP390:11(2017). IP390:11(2017) is identical to ISO10307-2:09 and technically equivalent to ASTM D4870.

Total Sulfur: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO8754:03 and ASTM D4294:16e1.

Water by Distillation: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO3733:99 or ASTM D95:13(2018).

Water and Sediment: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D1796:11(2016).

Vacuum Distillation: This determination may be problematic for 10%, 40% and 50% recovered. In total fifteen statistical outliers were observed over eight parameters. However, the calculated reproducibilities after rejection of the statistical outliers are for IBP, 5%, 20%, 30% recovered and FBP in agreement with the requirements of ASTM D1160:18, but not for 10%, 40% and 50% recovered.

CHN-Analyzer: This determination was not problematic for Carbon, Hydrogen and Nitrogen. In total one statistical outlier was observed over three parameters. The calculated reproducibilities for Carbon and Hydrogen are in agreement with the requirements of ASTM D5291-ABC:16. The calculated reproducibility for Nitrogen after rejection of the statistical outlier is in agreement with the requirements of ASTM D5291-D:16.

Sample #9276

Aluminum: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of IP470:05 and in agreement with the requirements of IP501:05.

Silicon: This determination may be problematic depending on the test method used. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of IP470:05 but not in agreement with the more strict requirements of IP501:05.

Total Al+Si: This determination may be problematic depending on the test method used. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of IP470:05 but not in agreement with the more strict requirements of IP501:05.

Iron: This determination may be problematic depending on the test method used. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of IP470:05 but not in agreement with the more strict requirements of IP501:05.

Nickel: This determination was not problematic. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of IP470:05 and IP501:05.

Sodium: This determination may be problematic depending on the test method used. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of IP470:05 but not in agreement with the more strict requirements of IP501:05.

Vanadium: This determination was not problematic. One statistical outlier was observed and one other test results was excluded. However, the calculated reproducibility after rejection of the suspect data is in agreement with the requirements of IP470:05 and IP501:05.

Calcium: 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 IP470:05 or IP501:05.

Zinc: This determination may be problematic depending on test method used. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of IP470:05 but is not in agreement with the more strict requirements of IP501:05.

Phosphorus: This determination may be problematic depending on test method used. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of IP501:05 but is not in agreement with the more strict requirements of IP500:03.

Finally, it should be noted that proper attention for homogenization is crucial for a material such as Fuel Oil. Due to the nature of the material it is very susceptible to problems when not handled correctly. Practically most test methods for the determination of metals in Fuel Oil have similar statements regarding homogenization. Recommended is the use of a quality control fuel oil with known amounts of metals like Al, Fe, Si and V. This control standard may be of use to detect deviations in metals with respect to the preparation steps.

Sample #19277

Bromine Number: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D1159:07 (2017).

P-Value: This determination was very problematic. One statistical outlier was observed. The calculated reproducibility is not at all in agreement with the requirements of target test method estimated from the repeatability of SMS1600.

Sample #19278

Compatibility: This determination may be problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D4740-M:19. No effect was observed between the type of reference used for spot determination.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant reference test method and the reproducibility as found for the group of participating laboratories. The number of significant test results, the average results, the calculated reproducibility (2.8 * standard deviation) and the target reproducibility derived from literature reference test methods (in casu ASTM and IP test methods) are presented in the next tables.

Parameters	unit	n	average	2.8 * sd	R (lit)
Acid Number (Total)	mg KOH/g	68	0.14	0.09	(0.03)
API Gravity		66	16.0	0.2	0.5
Ash Content	%M/M	93	0.025	0.011	0.005
Asphaltenes	%M/M	57	0.93	0.49	(0.19)
Calc. Carbon Aromaticity Index		64	821.2	1.4	2.2
Carbon Residue - micro method	%M/M	83	7.89	0.60	0.97
Conradson Carbon Residue	%M/M	29	8.15	1.45	1.33
Density at 15°C	kg/m^3	110	959.1	1.4	1.5
Flash Point PMcc	°C	110	125.2	5.2	6
Heat of Combustion (Gross)	MJ/kg	53	43.66	0.31	0.40
Heat of Combustion (Net)	MJ/kg	50	41.25	0.43	0.40
Kinematic Viscosity at 50°C	mm^2/s	100	333.0	28.4	24.6
Kinematic Viscosity at 100°C	mm^2/s	86	30.4	1.2	1.5
Viscosity Stabinger at 50°C	mm^2/s	17	323.6	29.6	33.3
Viscosity Stabinger at 100°C	mm^2/s	16	30.2	0.5	2.2
Nitrogen	mg/kg	37	3136	1343	834
Pour Point, Lower	°C	44	29.9	6.7	9
Pour Point, Upper	°C	79	31.0	5.2	9

Parameters	unit	n	average	2.8 * sd	R (lit)
Pour Point, Autom., 3°C interval	°C	22	30.4	6.0	6.1
Sediment by Extraction	%M/M	67	0.016	0.023	0.037
Total Sediment Existent (TSE)	%M/M	62	0.016	0.011	0.037
Total Sediment Accel. (TSA)	%M/M	60	0.018	0.013	0.039
Total Sediment Potential (TSP)	%M/M	65	0.016	0.017	0.037
Total Sulfur	%M/M	111	0.61	0.05	0.06
Water by Distillation	%V/V	67	0.04	0.08	0.2
Water and Sediment	%V/V	40	0.05	0.09	0.11
Distillation performed at 10 mmHg but reported as AET					
Initial Boiling Point	°C	32	219.5	26.5	49
5% recovered	°C	33	305.6	29.2	28.7
10% recovered	°C	34	376.7	24.7	21.1
20% recovered	°C	33	416.3	11.7	14.3
30% recovered	°C	33	433.9	12.5	12.5
40% recovered	°C	32	457.4	18.7	15.8
50% recovered	°C	29	507.2	26.0	18.0
Final Boiling Point	°C	26	519.1	26.9	27
Total Carbon	%M/M	22	87.1	1.8	2.4
Total Hydrogen	%M/M	20	11.5	0.6	0.8
Total Nitrogen	%M/M	13	0.37	0.08	0.10

Table 6: reproducibilities of tests on sample #19275

Elements	unit	n	average	2.8 * sd	R (lit)
Aluminum as Al	mg/kg	82	22.2	6.4	6.3
Silicon as Si	mg/kg	81	15.7	7.6	8.8
Total Aluminum + Silicon	mg/kg	79	37.6	11.6	10.8
Iron as Fe	mg/kg	77	37.0	8.9	16.5
Nickel as Ni	mg/kg	78	27.2	5.5	14.4
Sodium as Na	mg/kg	75	28.5	8.4	9.7
Vanadium as V	mg/kg	81	76.4	18.6	28.5
Calcium as Ca	mg/kg	76	30.7	8.5	7.3
Zinc as Zn	mg/kg	76	23.3	6.5	6.2
Phosphorus as P	mg/kg	64	20.1	5.4	6.6

Table 7: reproducibilities of elements on sample #19276

Parameters	unit	n	average	2.8 * sd	R (lit)
Bromine Number	g Br_2/100g	30	4.1	1.5	2.0
p-Value		24	3.58	1.28	0.6
Compatibility	rating	42	4.2	1.6	1

Table 8: reproducibilities of tests on sample #19277 and #19278

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

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

	December 2019	June 2019	December 2018	June 2018	December 2017
Number of reporting laboratories	137	147	134	149	143
Number of test results	2945	2713	2948	2631	3081
Number of statistical outliers	115	86	92	88	133
Percentage outliers	3.9%	3.2%	3.1%	3.3%	4.3%

Table 9: comparison with previous proficiency tests

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

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

Determination	December 2019	June 2019	December 2018	June 2018	December 2017
Acid Number (Total)	(--)	(--)	+	-	++
API Gravity	++	+	++	+	++
Ash Content	--	--	-	-	--
Asphaltenes	(--)	-	-	-	+/-
Calc. Carbon Aromaticity Index	+	+	+	++	+
Carbon Residue - micro method	+	+	+	+	+
Conradson Carbon Residue	+/-	+/-	+	+/-	+
Density at 15°C	+	-	+	+	+/-
Flash Point PMcc	+	+/-	+/-	-	-
Heat of Combustion (Gross)	+	+	+	+/-	+/-
Heat of Combustion (Net)	+/-	+	+	+/-	+/-
Kinematic Viscosity at 50°C	-	+	+/-	+	+
Kinematic Viscosity at 100°C	+	+/-	+	+	-
Viscosity Stabinger at 50°C	+	++	+	++	++
Viscosity Stabinger at 100°C	++	++	+	++	++
Nitrogen	-	+/-	-	-	-
Pour Point, Lower	+	-	-	+/-	-
Pour Point, Upper	+	-	-	-	-
Pour Point, Automated, 3°C interval	+/-	-	-	-	-
Sediment by Extraction	+	+	++	+	+
Total Sediment Existent (TSE)	++	++	++	++	++
Total Sediment Accelerated (TSA)	++	++	++	++	++
Total Sediment Potential (TSP)	++	++	++	++	++

Determination	December 2019	June 2019	December 2018	June 2018	December 2017
Total Sulfur	+	+	+/-	+/-	+/-
Water by Distillation	++	++	++	++	++
Water and Sediment	+	++	+	+	+
Distillation at 10 mmHg to AET	+/-	-	+	+/-	+
Total Carbon	+	+	+	+	+
Total Hydrogen	+	+	+	+	+
Total Nitrogen	+	-	-	++	-
Aluminum as Al	+/-	+/-	+/-	-	+
Silicon as Si	+	+	+/-	-	+
Total Aluminum + Silicon	+/-	+/-	+/-	-	+
Iron as Fe	+	+	++	+/-	++
Nickel as Ni	++	++	++	-	+
Sodium as Na	+	+	+	-	+
Vanadium as V	+	+	+	+	++
Calcium as Ca	-	-	+/-	-	+/-
Zinc as Zn	+/-	+/-	+	-	+/-
Phosphorus as P	+	+/-	+	+/-	-
Bromine Number	+	n.e.	+	n.e.	+
p-Value	--	n.e.	++	n.e.	+
Compatibility	-	n.e.	-	n.e.	(-)

Table 10: comparison determinations against the reference test methods

The following performance categories were used:

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

APPENDIX 1

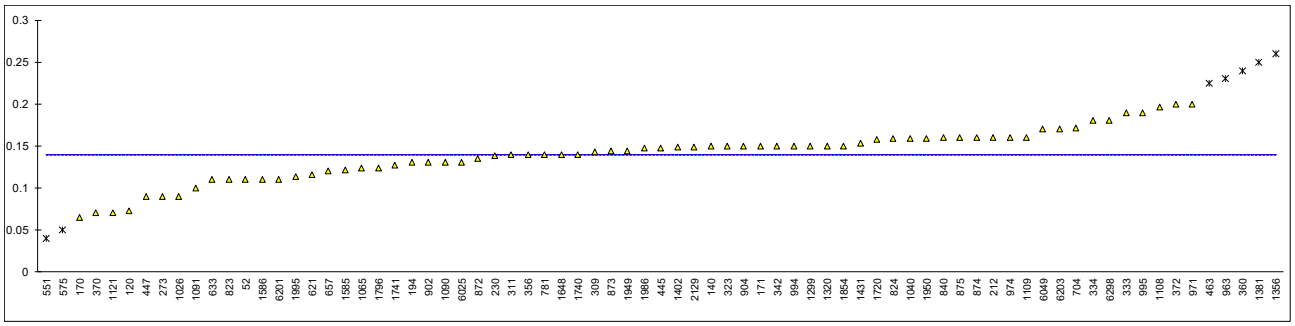
Determination of Acid Number (Total) on sample #19275; results in mg KOH/g

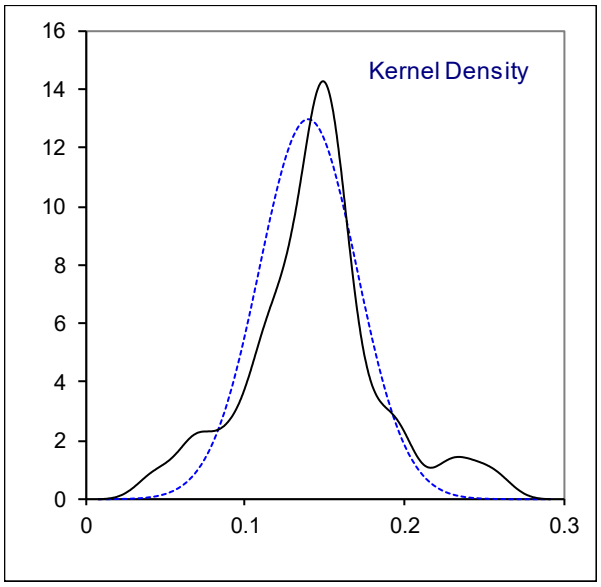
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D664-A	0.11		-----	962		-----		-----
120	D664-A	0.073		-----	963	D664-A	0.23	R(0.01)	-----
140	D664-B	0.15		-----	971	D664-A	0.20		-----
150	D664-A	<0.10		-----	974	D664-A	0.16		-----
159		-----		-----	994	D664-A	0.15		-----
168		-----		-----	995	D664-A	0.19		-----
169		-----		-----	996		-----		-----
170	D664-A	0.0645		-----	997		-----		-----
171	D664-A	0.15		-----	1026	D664-A	0.09		-----
175		-----		-----	1040	D664-A	0.159		-----
194	D664-A	0.13		-----	1065	D664-A	0.124		-----
212	D664-A	0.16		-----	1082		-----		-----
225		-----		-----	1090	D664-A	0.13		-----
230	D664-A	0.138		-----	1091	D664-A	0.10		-----
237		-----		-----	1108	D664-A	0.196		-----
238		-----		-----	1109	D664-A	0.16		-----
253		-----		-----	1121	D664-A	0.07		-----
256		-----		-----	1126		-----		-----
273	D664-A	0.09		-----	1134		-----		-----
309	D664-A	0.1433		-----	1161		-----		-----
311	D664-A	0.14		-----	1191		-----		-----
313		-----		-----	1205		-----		-----
323	D664-A	0.15		-----	1213	D664-A	<0.1		-----
333	D664-A	0.19		-----	1229		-----		-----
334	D664-A	0.18		-----	1299	D664-A	0.150		-----
336		-----		-----	1320	D664-A	0.15		-----
337		-----		-----	1356	D664-A	0.26	R(0.01)	-----
339		-----		-----	1367		-----		-----
342	D664-A	0.15		-----	1381	D664-A	0.250	R(0.01)	-----
349		-----		-----	1397		-----		-----
351		-----		-----	1402	IP177	0.149		-----
356	D664-A	0.14		-----	1431	D664-A	0.153		-----
360	D664-A	0.239	R(0.01)	-----	1554		-----		-----
370	D664-A	0.07		-----	1585	D664-A	0.122		-----
372	D664-A	0.20		-----	1586	D664-B	0.110		-----
381		-----		-----	1636		-----		-----
445	D664-A	0.148		-----	1648	D664-A	0.14		-----
447	D664-A	0.09		-----	1681		-----		-----
463	D664-A	0.225	R(0.01)	-----	1720	D664-A	0.158		-----
507		-----		-----	1724		-----	W	-----
541		-----		-----	1740	D664-A	0.14		-----
551	D664-A	0.04	R(0.01)	-----	1741	ISO6619	0.127		-----
558		-----		-----	1796	D664-A	0.1243		-----
575	D664-A	0.05	R(0.01)	-----	1810		-----		-----
610		-----		-----	1811		-----		-----
621	D664-A	0.116		-----	1854	D664-A	0.15		-----
631		-----		-----	1881		-----		-----
633	D664-A	0.11		-----	1949	D664-A	0.144		-----
634		-----		-----	1950	D664-A	0.159		-----
657	D664-A	0.12		-----	1986	D664-A	0.147		-----
704	D664-A	0.171		-----	1995	D664	0.113		-----
732		-----		-----	2129	D664-A	0.149		-----
753		-----		-----	6024		-----		-----
778		-----		-----	6025	D664-A	0.13		-----
781	D664-A	0.14		-----	6049	D664-A	0.17		-----
785		-----		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823	D664-A	0.11		-----	6075		-----		-----
824	D664-A	0.159		-----	6092		-----		-----
825		-----		-----	6112		-----		-----
840	D664-A	0.16		-----	6142		-----		-----
872	D664-A	0.135		-----	6201	D664-A	0.11		-----
873	D664-A	0.144		-----	6203	D664-A	0.17		-----
874	D664-A	0.16		-----	6223		-----		-----
875	D664-A	0.16		-----	6257		-----		-----
887		-----		-----	6262		-----		-----
902	D664-A	0.13		-----	6289		-----		-----
904	D664-A	0.15		-----	6298	D664-A	0.18		-----
913		-----		-----					

		IP only	BEP only
normality	OK	OK	OK
n	68	47	11
outliers	7	4	1
mean (n)	0.1398	0.1428	0.1304
st.dev. (n)	0.03071	0.03121	0.0362
R(calc.)	0.0860	0.0874	0.1014
st.dev.(D664-A:18e2 IP 125 mL)	(0.01004)	---	---
R(D664-A:18e2 IP 125 mL)	(0.0281)	(0.0287)	---
compare			
R(D664-A:18e2 IP 60 mL)	(0.0801)	(0.0815)	---
R(D664-A:18e2 BEP 125 mL)	(0.0399)	---	(0.0371)
R(D664-A:18e2 BEP 60 mL)	(0.0813)	---	(0.0757)

application range: 0.1 – 150 mg KOH/g

Lab 1724 first reported 0.47



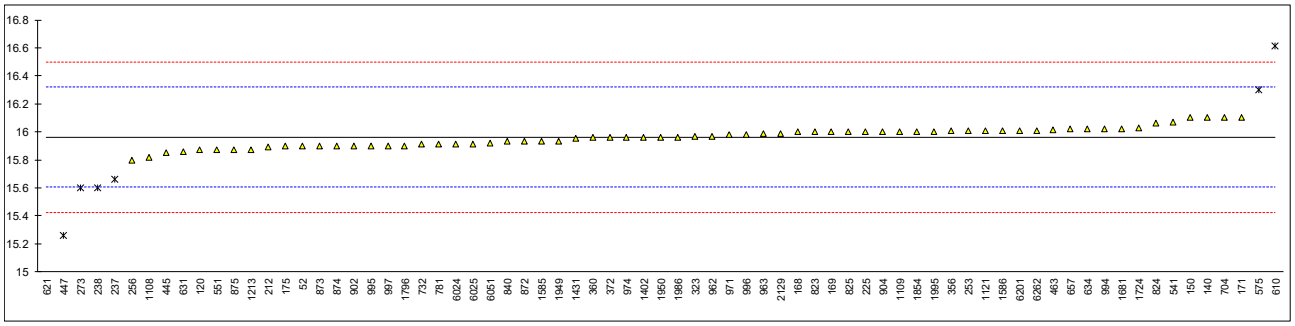


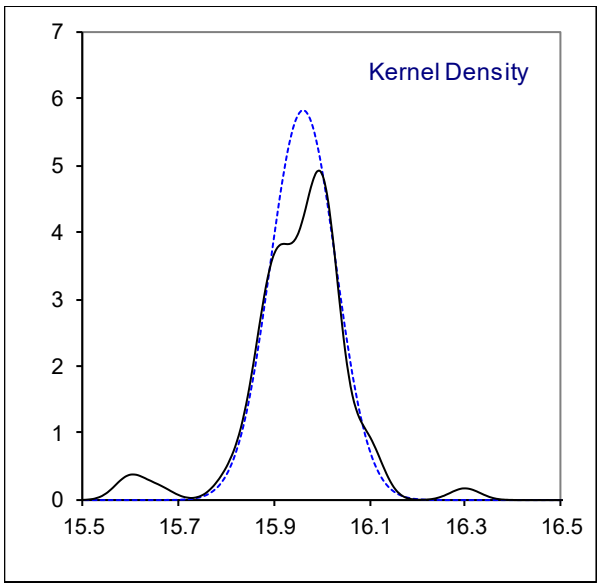
Determination of API Gravity on sample #19275

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4052	15.9		-0.35	962	D1298	15.97		0.05
120	D4052	15.87		-0.51	963	D1298	15.99		0.16
140	D4052	16.1		0.77	971	D1298	15.98		0.10
150	D287	16.1		0.77	974	D1298	15.96		-0.01
159		-----		-----	994	D1250	16.02		0.33
168	D287	16.0		0.21	995	D1298	15.9		-0.35
169	D287	16.0		0.21	996	D1298	15.98		0.10
170		-----		-----	997	D1298	15.9		-0.35
171	D4052	16.1		0.77	1026		-----		-----
175	D4052	15.9		-0.35	1040		-----		-----
194		-----		-----	1065		-----		-----
212	ISO12185	15.89		-0.40	1082		-----		-----
225	D4052	16.0		0.21	1090		-----		-----
230		-----		-----	1091		-----		-----
237	D4052	15.66	C,R(0.01)	-1.69	1108	ISO12185	15.82		-0.79
238	D4052	15.6	R(0.01)	-2.03	1109	D287	16.00		0.21
253	D4052	16.01		0.27	1121	ISO12185	16.01		0.27
256	D1298	15.8		-0.91	1126		-----		-----
273	D4052	15.6	R(0.01)	-2.03	1134		-----		-----
309		-----		-----	1161		-----		-----
311		-----		-----	1191		-----		-----
313		-----		-----	1205		-----		-----
323	D1298	15.97		0.05	1213	D4052	15.87		-0.51
333		-----		-----	1229		-----		-----
334		-----		-----	1299		-----		-----
336		-----		-----	1320		-----		-----
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381		-----		-----
349		-----		-----	1397		-----		-----
351		-----		-----	1402	D4052	15.96		-0.01
356	D4052	16.01		0.27	1431	ISO12185	15.95		-0.07
360	D4052	15.96		-0.01	1554		-----		-----
370		-----		-----	1585	ISO12185	15.93		-0.18
372	D1298	15.96		-0.01	1586	D4052	16.01		0.27
381		-----		-----	1636		-----		-----
445	D4052-mod	15.85		-0.63	1648		-----		-----
447	D1250	15.26	R(0.01)	-3.93	1681	ISO12185	16.02		0.33
463	D1298	16.015		0.30	1720		-----		-----
507		-----		-----	1724	D4052	16.03		0.38
541	D4052	16.07	C	0.61	1740		-----		-----
551	D4052	15.87		-0.51	1741		-----		-----
558		-----		-----	1796	D1250	15.90		-0.35
575	D1298	16.3	R(0.01)	1.89	1810		-----		-----
610	D1298	16.61	C,R(0.01)	3.63	1811		-----		-----
621	D4052	14.88	R(0.01)	-6.06	1854		16.0		0.21
631	D1298	15.855		-0.60	1881		-----		-----
633		-----		-----	1949	D1298	15.93		-0.18
634	D1298	16.02		0.33	1950	D1298	15.96		-0.01
657	ISO12185	16.02		0.33	1986	D1298	15.96		-0.01
704	D1298	16.1		0.77	1995	D1298	16.003		0.23
732	ISO12185	15.91		-0.29	2129	D4052Conversion	15.99		0.16
753		-----		-----	6024	D1250	15.91		-0.29
778		-----		-----	6025	D1298	15.91		-0.29
781	D1298	15.91		-0.29	6049		-----		-----
785		-----		-----	6051	D1250	15.92		-0.23
798		-----		-----	6054		-----		-----
823	D1298	16.0		0.21	6075		-----		-----
824	D4052	16.06		0.55	6092		-----		-----
825	D1298	16.0		0.21	6112		-----		-----
840	ISO12185	15.93		-0.18	6142		-----		-----
872	D1298	15.93		-0.18	6201	D1298	16.01		0.27
873	D1298	15.9		-0.35	6203		-----		-----
874	D4052	15.9		-0.35	6223		-----		-----
875	D1298	15.87		-0.51	6257		-----		-----
887		-----		-----	6262	ISO12185	16.01		0.27
902	D4052	15.9		-0.35	6289		-----		-----
904	D1298	16.0		0.21	6298		-----		-----
913		-----		-----					

normality	OK
n	66
outliers	7
mean (n)	15.962
st.dev. (n)	0.0685
R(calc.)	0.192
st.dev.(D1298:12b)	0.1786
R(D1298:12b)	0.5

Lab 237 first reported 15.25
Lab 541 first reported 15.23
Lab 610 first reported 17.26



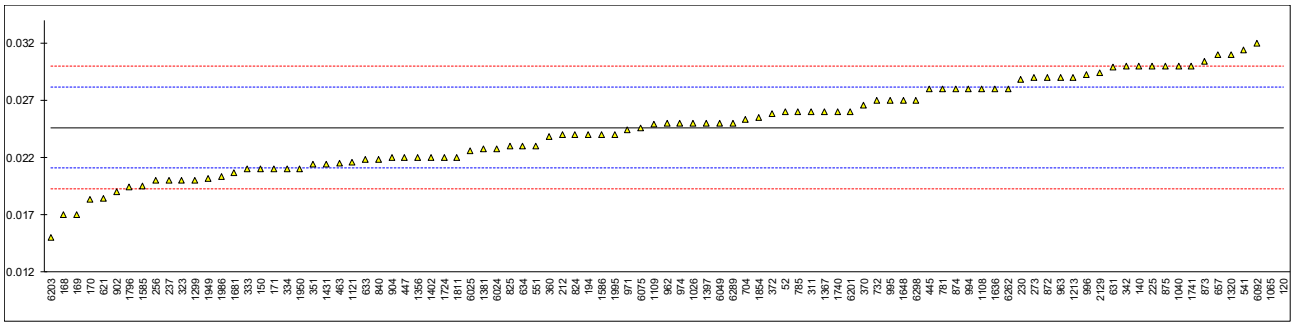


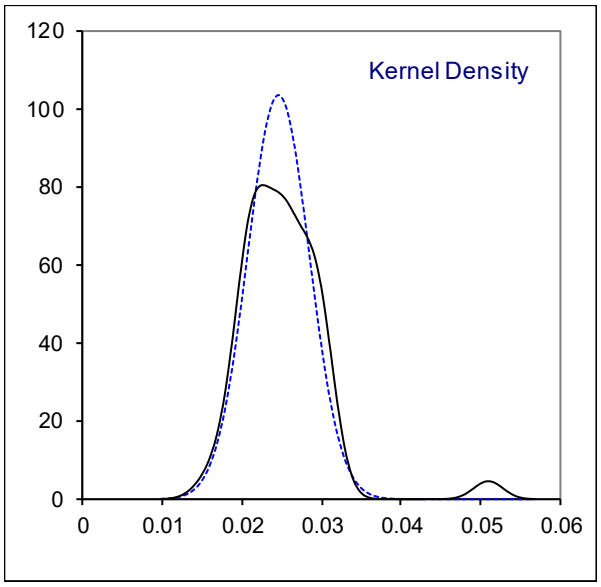
Determination of Ash Content on sample #19275; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D482	0.026		0.78	962	D482	0.025		0.22
120	D482	0.05146	C,R(0.01)	15.04	963	ISO6245	0.029		2.46
140	D482	0.030		3.02	971	ISO6245	0.0244		-0.12
150	D482	0.021		-2.02	974	D482	0.025		0.22
159		-----		-----	994	D482	0.028		1.90
168	D482	0.017		-4.26	995	ISO6245	0.027		1.34
169	D482	0.017		-4.26	996	D482	0.0292		2.57
170	D482	0.01835		-3.50	997		-----		-----
171	ISO6245	0.021		-2.02	1026	D482	0.025		0.22
175		-----		-----	1040	ISO6245	0.03		3.02
194	D482	0.024		-0.34	1065	D482	0.0503	R(0.01)	14.39
212	ISO6245	0.024		-0.34	1082		-----		-----
225	D482	0.030		3.02	1090		-----		-----
230	ISO6245	0.02883		2.37	1091		-----		-----
237	D482	0.02		-2.58	1108	ISO6245	0.028		1.90
238		-----		-----	1109	D482	0.0249		0.16
253		-----		-----	1121	ISO6245	0.0216		-1.68
256	D482	0.020		-2.58	1126		-----		-----
273	D482	0.029		2.46	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO6245	0.026		0.78	1191		-----		-----
313		-----		-----	1205		-----		-----
323	ISO6245	0.02		-2.58	1213	D482	0.029		2.46
333	ISO6245	0.021		-2.02	1229		-----		-----
334	ISO6245	0.021		-2.02	1299	D482	0.02		-2.58
336		-----		-----	1320	ISO6245	0.031		3.58
337		-----		-----	1356	ISO6245	0.022		-1.46
339		-----		-----	1367	IP4	0.026		0.78
342	ISO6245	0.030		3.02	1381	ISO6245	0.0227		-1.07
349		-----		-----	1397	ISO6245	0.025		0.22
351	ISO6245	0.0214		-1.80	1402	IP4	0.022		-1.46
356		-----		-----	1431	D482	0.0214		-1.80
360	D482	0.0238		-0.45	1554		-----		-----
370	ISO6245	0.0266		1.12	1585	D482	0.0195		-2.86
372	ISO6245	0.0258		0.67	1586	D482	0.024		-0.34
381		-----		-----	1636	ISO6245	0.0280		1.90
445	IP4	0.028		1.90	1648	ISO6245	0.027		1.34
447	IP4	0.022		-1.46	1681	ISO6245	0.0207		-2.19
463	ISO6245	0.0215		-1.74	1720		-----		-----
507		-----		-----	1724	ISO6245	0.0220		-1.46
541	D482	0.0314		3.80	1740	D482	0.026		0.78
551	D482	0.023		-0.90	1741	ISO6245	0.030		3.02
558		-----		-----	1796	D482	0.0194		-2.92
575		-----		-----	1810		-----		-----
610		-----		-----	1811	ISO6245	0.022		-1.46
621	D482	0.0184		-3.48	1854	ISO6245	0.0255		0.50
631	D482	0.0299		2.96	1881		-----		-----
633	D482	0.0218		-1.57	1949	ISO6245	0.0202		-2.47
634	D482	0.023		-0.90	1950	ISO6245	0.021		-2.02
657	D482	0.031		3.58	1986	ISO6245	0.0203		-2.41
704	D482	0.0253	C	0.39	1995	D482	0.024		-0.34
732	D482	0.027		1.34	2129	ISO6245	0.0294		2.68
753		-----		-----	6024	ISO6245	0.0227		-1.07
778		-----		-----	6025	D482	0.0226		-1.12
781	ISO6245	0.028		1.90	6049	ISO6245	0.025		0.22
785	ISO6245	0.026		0.78	6051		-----		-----
798		-----		-----	6054		-----		-----
823		-----		-----	6075	ISO6245	0.0246		0.00
824	ISO6245	0.024		-0.34	6092	ISO6245	0.032		4.14
825	ISO6245	0.023		-0.90	6112		-----		-----
840	D482	0.0218		-1.57	6142		-----		-----
872	D482	0.029		2.46	6201	D482	0.026		0.78
873	D482	0.0304		3.24	6203	ISO6245	0.015		-5.38
874	ISO6245	0.028		1.90	6223		-----		-----
875	ISO6245	0.030		3.02	6257		-----		-----
887		-----		-----	6262	D482	0.028		1.90
902	ISO6245	0.019		-3.14	6289	D482	0.025		0.22
904	D482	0.022		-1.46	6298	D482	0.027		1.34
913		-----		-----					

		ISO6245/IP4 only	D482 only
normality	OK	OK	OK
n	93	49	46
outliers	2	0	2
mean (n)	0.0246	0.0247	0.0246
st.dev. (n)	0.00386	0.00376	0.00397
R(calc.)	0.0108	0.0105	0.0111
st.dev.(ISO6245:01)	0.00179	0.00179	---
R(ISO6245:01)	0.005	0.005	---
compare			
R(D482:13)	0.005	---	0.005

Lab 120 first reported 0.038
Lab 704 first reported 0.253





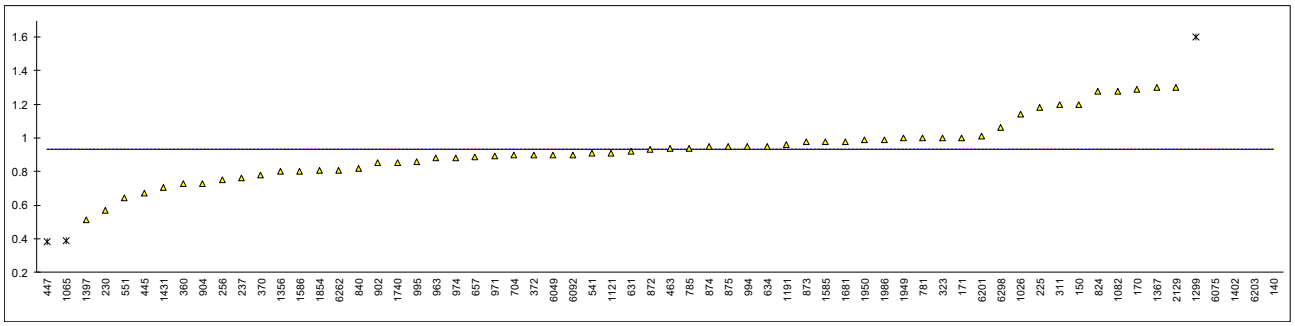
Determination of Asphaltenes on sample #19275; results in %M/M

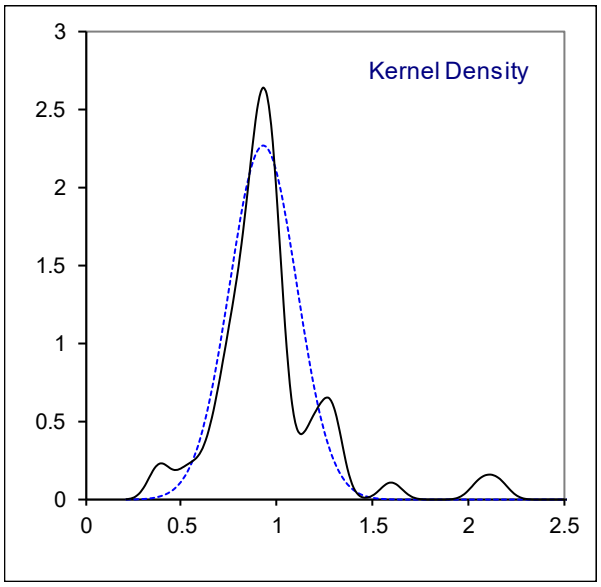
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	962		-----		-----
120		-----		-----	963	IP143	0.88		-----
140	IP143	4.2	R(0.01)	-----	971	IP143	0.89		-----
150	IP143	1.2		-----	974	IP143	0.88		-----
159		-----		-----	994	D6560	0.95		-----
168		-----		-----	995	IP143	0.86		-----
169		-----		-----	996		-----		-----
170	D6560	1.2871		-----	997		-----		-----
171	IP143	1.0		-----	1026	IP143	1.14		-----
175		-----		-----	1040		-----		-----
194		-----		-----	1065	D6560	0.39	R(0.05)	-----
212		-----		-----	1082	DIN51595	1.28		-----
225	D6560	1.18		-----	1090		-----		-----
230	IP143	0.567		-----	1091		-----		-----
237	D6560	0.76		-----	1108		-----		-----
238		-----		-----	1109		-----		-----
253		-----		-----	1121	IP143	0.912	C	-----
256	IP143	0.75		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311	IP143	1.2		-----	1191	DIN51595	0.962		-----
313		-----		-----	1205		-----		-----
323	IP143	1.0		-----	1213		-----		-----
333		-----		-----	1229		-----		-----
334		-----		-----	1299	IP143	1.6	R(0.05)	-----
336		-----		-----	1320		-----		-----
337		-----		-----	1356	D6560	0.8		-----
339		-----		-----	1367	IP143	1.3		-----
342		-----		-----	1381		-----		-----
349		-----		-----	1397	D6560	0.51		-----
351		-----		-----	1402	IP143	2.159973	C,R(0.01)	-----
356		-----		-----	1431	D6560	0.706		-----
360	D6560	0.73		-----	1554		-----		-----
370	IP143	0.78		-----	1585	IP143	0.98		-----
372	IP143	0.90		-----	1586	IP143	0.80		-----
381		-----		-----	1636		-----		-----
445	IP143	0.671		-----	1648		-----		-----
447	IP143	0.385	R(0.05)	-----	1681	IP143	0.98		-----
463	IP143	0.938		-----	1720		-----		-----
507		-----		-----	1724		-----		-----
541	IP143	0.91		-----	1740	D6560	0.85		-----
551	IP143	0.644		-----	1741		-----		-----
558		-----		-----	1796		-----		-----
575		-----		-----	1810		-----		-----
610		-----		-----	1811		-----		-----
621		-----		-----	1854		0.81		-----
631	D6560	0.919		-----	1881		-----		-----
633		-----		-----	1949	IP143	0.998		-----
634	D6560	0.9504		-----	1950	IP143	0.99		-----
657	IP143	0.885		-----	1986	IP143	0.99		-----
704	IP143	0.897		-----	1995		-----		-----
732		-----		-----	2129	IP143	1.30		-----
753		-----		-----	6024		-----		-----
778		-----		-----	6025		-----		-----
781	IP143	1.0		-----	6049	IP143	0.90		-----
785	IP143	0.94		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823		-----		-----	6075	IP143	2.07	R(0.01)	-----
824	IP143	1.28	C	-----	6092	IP143	0.90		-----
825		-----		-----	6112		-----		-----
840	IP143	0.819		-----	6142		-----		-----
872	IP143	0.93		-----	6201	IP143	1.01		-----
873	IP143	0.98		-----	6203	IP143	2.81	R(0.01)	-----
874	IP143	0.95		-----	6223		-----		-----
875	IP143	0.95		-----	6257		-----		-----
887		-----		-----	6262	IP143	0.81	C	-----
902	IP143	0.85		-----	6289		-----		-----
904	IP143	0.73		-----	6298	IP143	1.06		-----
913		-----		-----					

normality	OK
n	57
outliers	7
mean (n)	0.931
st.dev. (n)	0.1761
R(calc.)	0.493
st.dev.(IP143:04)	(0.0665)
R(IP143:04)	(0.186)

precision range: 0.50-30.0 %M/M

Lab 824 first reported 0.206
Lab 1121 first reported 1.68
Lab 1402 first reported 2.1
Lab 6262 first reported 1.47



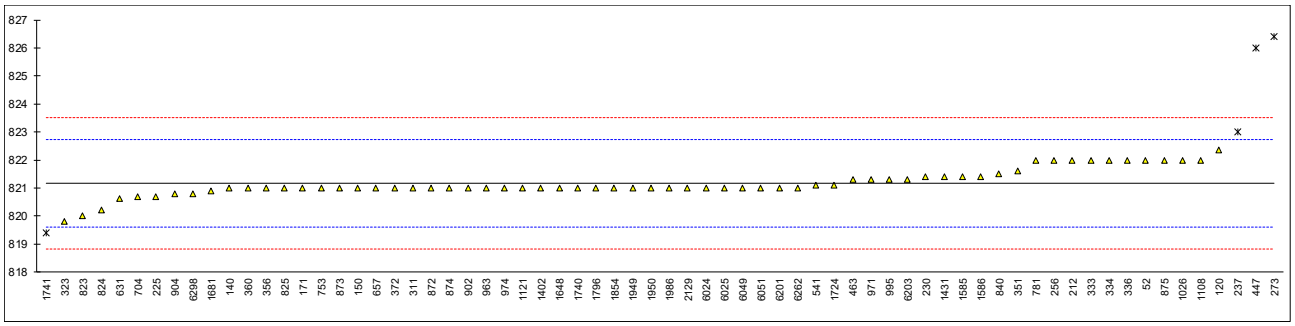


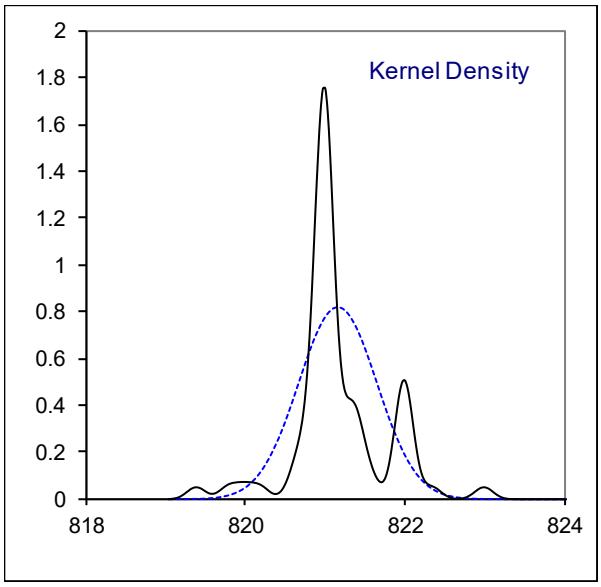
Determination of Calculated Carbon Aromaticity Index on sample #19275

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	ISO8217	822		1.05	962		-----		-----
120	ISO8217	822.348		1.50	963	ISO8217	821		-0.22
140	ISO8217	821		-0.22	971	ISO8217	821.3		0.16
150	ISO8217	821		-0.22	974	ISO8217	821		-0.22
159		-----		-----	994		-----		-----
168		-----		-----	995	ISO8217	821.3		0.16
169		-----		-----	996		-----		-----
170		-----		-----	997		-----		-----
171	ISO8217	821		-0.22	1026	ISO8217	822		1.05
175		-----		-----	1040		-----		-----
194		-----		-----	1065		-----		-----
212	ISO8217	822		1.05	1082		-----		-----
225	ISO8217	820.7		-0.60	1090		-----		-----
230	ISO8217	821.4		0.29	1091		-----		-----
237	ISO8217	823	C,R(0.05)	2.33	1108	ISO8217	822		1.05
238		-----		-----	1109		-----		-----
253		-----		-----	1121	ISO8217	821		-0.22
256	ISO8217	822		1.05	1126		-----		-----
273	ISO8217	826.4	C,R(0.01)	6.65	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO8217	821		-0.22	1191		-----		-----
313		-----		-----	1205		-----		-----
323	ISO8217	819.80		-1.75	1213		-----		-----
333	ISO8217	822		1.05	1229		-----		-----
334	ISO8217	822		1.05	1299		-----		-----
336	ISO8217	822		1.05	1320		-----		-----
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381		-----		-----
349		-----		-----	1397		-----		-----
351	ISO8217	821.61		0.56	1402	ISO8217	821		-0.22
356	ISO8217	821		-0.22	1431	ISO8217	821.4	C	0.29
360	ISO8217	821		-0.22	1554		-----		-----
370		-----		-----	1585	ISO8217	821.4		0.29
372	ISO8217	821		-0.22	1586	ISO8217	821.4		0.29
381		-----		-----	1636		-----		-----
445		-----		-----	1648	ISO8217	821		-0.22
447	ISO8217	826	R(0.01)	6.15	1681	ISO8217	820.9		-0.35
463	ISO8217	821.3		0.16	1720		-----		-----
507		-----		-----	1724	ISO8217	821.1		-0.09
541	ISO8217	821.1		-0.09	1740	ISO8217	821		-0.22
551		-----		-----	1741	ISO8217	819.4	R(0.05)	-2.25
558		-----		-----	1796	ISO8217	821		-0.22
575		-----		-----	1810		-----		-----
610		-----		-----	1811		-----		-----
621		-----		-----	1854		821		-0.22
631	ISO8217	820.63	E	-0.69	1881		-----		-----
633		-----		-----	1949	ISO8217	821		-0.22
634		-----		-----	1950	ISO8217	821		-0.22
657	ISO8217	821		-0.22	1986	ISO8217	821.0		-0.22
704	ISO8217	820.7		-0.60	1995		-----		-----
732		-----		-----	2129	ISO8217	821		-0.22
753	ISO8217	821		-0.22	6024	ISO8217	821		-0.22
778		-----		-----	6025	ISO8217	821		-0.22
781	ISO8217	822		1.05	6049	ISO8217	821		-0.22
785		-----		-----	6051	ISO8217	821		-0.22
798		-----		-----	6054		-----		-----
823	ISO8217	820		-1.49	6075		-----		-----
824	ISO8217	820.2	C	-1.24	6092		-----		-----
825	ISO8217	821		-0.22	6112		-----		-----
840	ISO8217	821.5		0.42	6142		-----		-----
872	ISO8217	821.0		-0.22	6201	ISO8217	821		-0.22
873	ISO8217	821		-0.22	6203	ISO8217	821.3		0.16
874	ISO8217	821		-0.22	6223		-----		-----
875	ISO8217	822		1.05	6257		-----		-----
887		-----		-----	6262	ISO8217	821		-0.22
902	ISO8217	821		-0.22	6289		-----		-----
904	ISO8217	820.8		-0.47	6298	ISO8217	820.8		-0.47
913		-----		-----					

normality	OK
n	64
outliers	4
mean (n)	821.172
st.dev. (n)	0.4889
R(calc.)	1.369
st.dev.(ISO8217:17)	0.7857
R(ISO8217:17)	2.2

Lab 237 first reported 826
Lab 273 first reported 824.8
Lab 631 possibly an error in calculations, iis calculated 821.79
Lab 824 first reported 852.8
Lab 1431 first reported 841.86



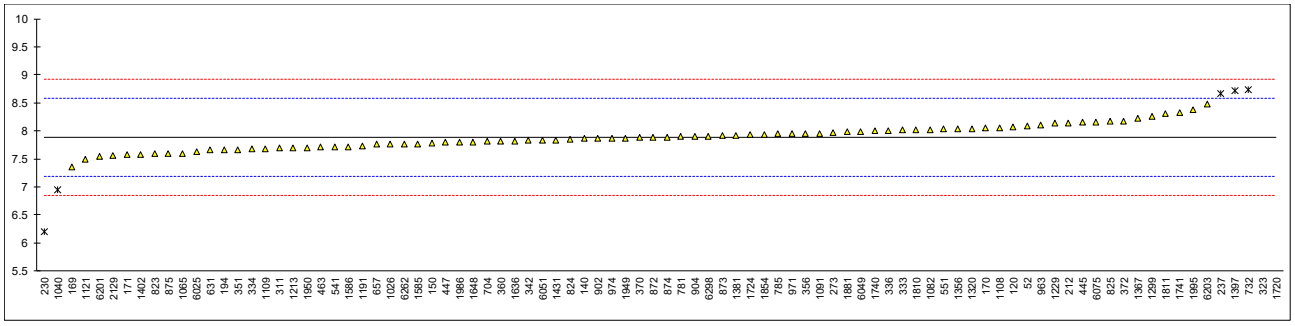


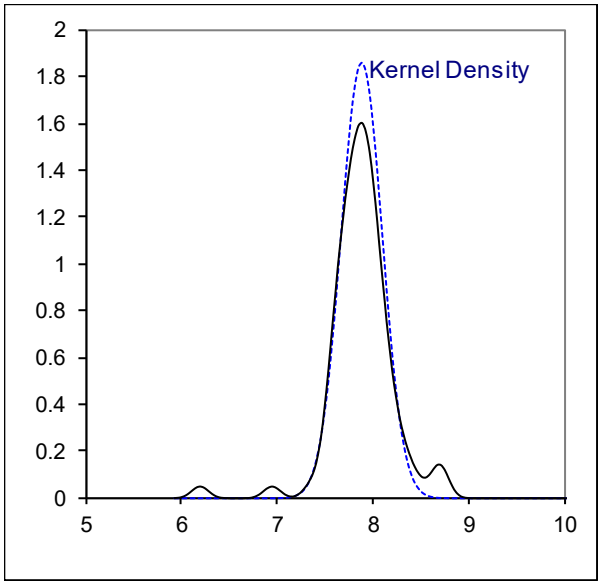
Determination of Carbon Residue - micro method on sample #19275; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4530	8.08		0.56	962		-----		-----
120	D4530	8.063		0.51	963	ISO10370	8.11		0.64
140	ISO10370	7.86		-0.08	971	ISO10370	7.95		0.18
150	D4530	7.78		-0.31	974	D4530	7.87		-0.05
159		-----		-----	994		-----		-----
168		-----		-----	995		-----		-----
169	D4530	7.36		-1.52	996		-----		-----
170	D4530	8.0587		0.50	997		-----		-----
171	ISO10370	7.57		-0.91	1026	D4530	7.76		-0.36
175		-----		-----	1040	ISO10370	6.95	R(0.05)	-2.70
194	D4530	7.66		-0.65	1065	D4530	7.6		-0.83
212	ISO10370	8.14		0.73	1082	ISO10370	8.021		0.39
225		-----		-----	1090		-----		-----
230	ISO10370	6.197	R(0.01)	-4.87	1091	D4530	7.95		0.18
237	D4530	8.66	R(0.05)	2.23	1108	ISO10370	8.06		0.50
238		-----		-----	1109	D4530	7.68		-0.60
253		-----		-----	1121	ISO10370	7.49		-1.14
256		-----		-----	1126		-----		-----
273	D4530	7.97		0.24	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO10370	7.70		-0.54	1191	ISO10370	7.724		-0.47
313		-----		-----	1205		-----		-----
323	ISO10370	12.5	C,R(0.01)	13.30	1213	D4530	7.70		-0.54
333	ISO10370	8.02		0.39	1229	ISO10370	8.134		0.71
334	ISO10370	7.68		-0.60	1299	D4530	8.25		1.05
336	ISO10370	8.01		0.36	1320	ISO10370	8.04		0.44
337		-----		-----	1356	ISO10370	8.03		0.41
339		-----		-----	1367	IP398	8.23		0.99
342	ISO10370	7.83		-0.16	1381	ISO10370	7.925		0.11
349		-----		-----	1397	ISO10370	8.71	R(0.05)	2.37
351	ISO10370	7.664		-0.64	1402	IP398	7.57		-0.91
356	ISO10370	7.95		0.18	1431	D4530	7.838		-0.14
360	D4530	7.811		-0.22	1554		-----		-----
370	ISO10370	7.886		0.00	1585	D4530	7.769		-0.34
372	ISO10370	8.17		0.82	1586	D4530	7.72		-0.48
381		-----		-----	1636	ISO10370	7.820		-0.19
445	IP398	8.161		0.79	1648	ISO10370	7.805		-0.23
447	IP398	7.793		-0.27	1681		-----		-----
463	ISO10370	7.707		-0.52	1720	D4530	15.67	R(0.01)	22.44
507		-----		-----	1724	D4530	7.94		0.15
541	D4530	7.715		-0.49	1740	D4530	8.0		0.33
551	D4530	8.03		0.41	1741	ISO10370	8.33		1.28
558		-----		-----	1796		-----		-----
575		-----		-----	1810	ISO10370	8.02		0.39
610		-----		-----	1811	ISO10370	8.30		1.19
621		-----		-----	1854		7.94		0.15
631	D4530	7.6599		-0.65	1881	ISO10370	7.98		0.27
633		-----		-----	1949	ISO10370	7.871		-0.04
634		-----		-----	1950	ISO10370	7.70		-0.54
657	ISO10370	7.76		-0.36	1986	ISO10370	7.80		-0.25
704	ISO10370	7.81		-0.22	1995	D4530	8.38		1.42
732	ISO10370	8.73	R(0.05)	2.43	2129	ISO10370	7.56		-0.94
753		-----		-----	6024		-----		-----
778		-----		-----	6025	D4530	7.63		-0.74
781	ISO10370	7.90		0.04	6049	ISO10370	7.99		0.30
785	ISO10370	7.95		0.18	6051	ISO10370	7.83		-0.16
798		-----		-----	6054		-----		-----
823	ISO10370	7.59		-0.85	6075	ISO10370	8.161		0.79
824	ISO10370	7.85		-0.11	6092		-----		-----
825	ISO10370	8.17		0.82	6112		-----		-----
840		-----		-----	6142		-----		-----
872	ISO10370	7.89		0.01	6201	D4530	7.54		-1.00
873	ISO10370	7.91		0.07	6203	ISO10370	8.48		1.71
874	ISO10370	7.89		0.01	6223		-----		-----
875	ISO10370	7.60		-0.83	6257		-----		-----
887		-----		-----	6262	D4530	7.76		-0.36
902	ISO10370	7.87		-0.05	6289		-----		-----
904	D4530	7.9		0.04	6298	D4530	7.90		0.04
913		-----		-----					

normality	OK
n	83
outliers	7
mean (n)	7.8865
st.dev. (n)	0.21489
R(calc.)	0.6017
st.dev.(ISO10370:14)	0.34682
R(ISO10370:14)	0.9711

Lab 323 first reported 9.0



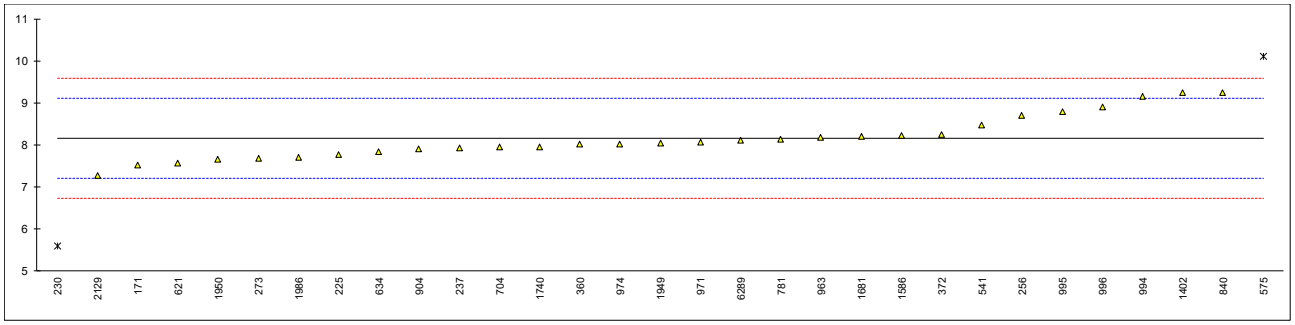


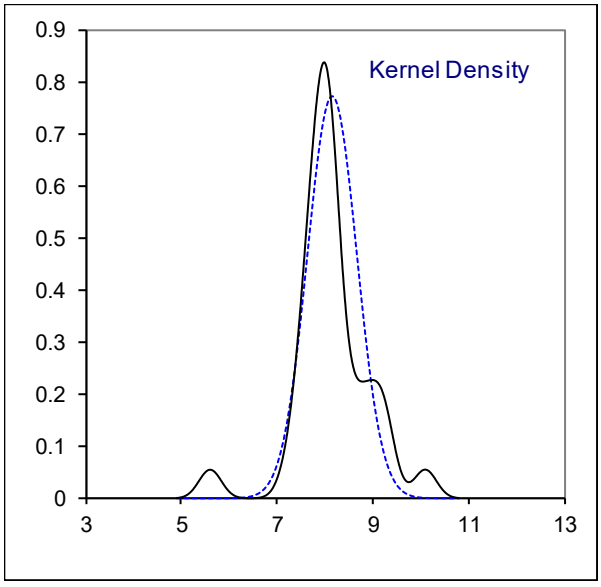
Determination of Conradson Carbon Residue on sample #19275; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	962		-----		-----
120		-----		-----	963	D189	8.17		0.04
140		-----		-----	971	D189	8.06		-0.20
150		-----		-----	974	D189	8.01		-0.30
159		-----		-----	994	D189	9.15		2.11
168		-----		-----	995	D189	8.8		1.37
169		-----		-----	996	D189	8.9089		1.60
170		-----		-----	997		-----		-----
171	D189	7.52		-1.34	1026		-----		-----
175		-----		-----	1040		-----		-----
194		-----		-----	1065		-----		-----
212		-----		-----	1082		-----		-----
225	D4530	7.78		-0.79	1090		-----		-----
230	D189	5.600	R(0.01)	-5.39	1091		-----		-----
237	D189	7.92		-0.49	1108		-----		-----
238		-----		-----	1109		-----		-----
253		-----		-----	1121		-----		-----
256	D189	8.70		1.16	1126		-----		-----
273	D189	7.68		-1.00	1134		-----		-----
309		-----		-----	1161		-----		-----
311		-----		-----	1191		-----		-----
313		-----		-----	1205		-----		-----
323		-----		-----	1213		-----		-----
333		-----		-----	1229		-----		-----
334		-----		-----	1299		-----		-----
336		-----		-----	1320		-----		-----
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381		-----		-----
349		-----		-----	1397		-----		-----
351		-----		-----	1402	IP13	9.24		2.30
356		-----		-----	1431		-----		-----
360	D189	8.01		-0.30	1554		-----		-----
370		-----		-----	1585		-----		-----
372	D189	8.25		0.21	1586	D189	8.23		0.16
381		-----		-----	1636		-----		-----
445		-----		-----	1648		-----		-----
447		-----		-----	1681	D189	8.19		0.08
463		-----		-----	1720		-----		-----
507		-----		-----	1724		-----		-----
541	D189	8.474		0.68	1740	D189	7.95		-0.43
551		-----		-----	1741		-----		-----
558		-----		-----	1796		-----		-----
575	D189	10.1	C,R(0.05)	4.12	1810		-----		-----
610		-----		-----	1811		-----		-----
621	D189	7.5596		-1.25	1854		-----		-----
631		-----		-----	1881		-----		-----
633		-----		-----	1949	D189	8.04		-0.24
634	D189	7.83		-0.68	1950	D189	7.65		-1.06
657		-----		-----	1986	D189	7.70		-0.96
704	D189	7.94		-0.45	1995		-----		-----
732		-----		-----	2129	D189	7.28		-1.84
753		-----		-----	6024		-----		-----
778		-----		-----	6025		-----		-----
781	D189	8.13		-0.05	6049		-----		-----
785		-----		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823		-----		-----	6075		-----		-----
824		-----		-----	6092		-----		-----
825		-----		-----	6112		-----		-----
840	D189	9.25		2.32	6142		-----		-----
872		-----		-----	6201		-----		-----
873		-----		-----	6203		-----		-----
874		-----		-----	6223		-----		-----
875		-----		-----	6257		-----		-----
887		-----		-----	6262		-----		-----
902		-----		-----	6289	D189	8.10		-0.11
904	D189	7.9		-0.53	6298		-----		-----
913		-----		-----					

normality	OK
n	29
outliers	2
mean (n)	8.1525
st.dev. (n)	0.51752
R(calc.)	1.4491
st.dev.(D189:06)	0.47323
R(D189:06)	1.3250

Lab 575 first reported 10.87



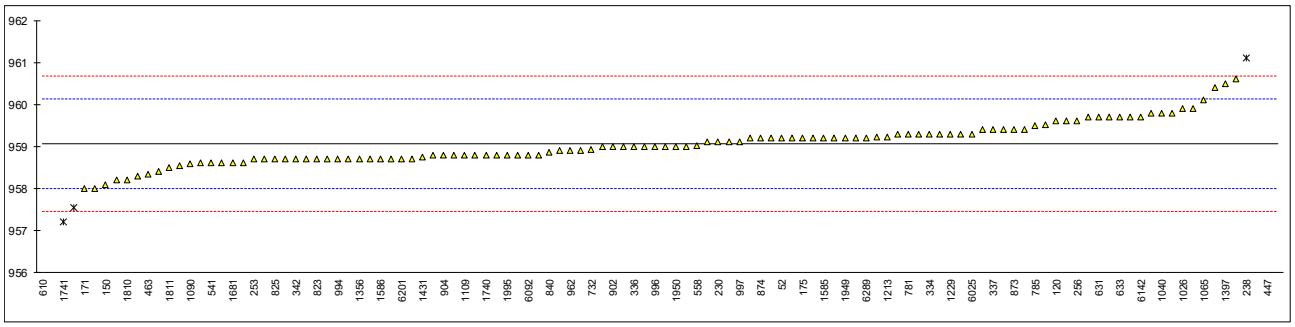


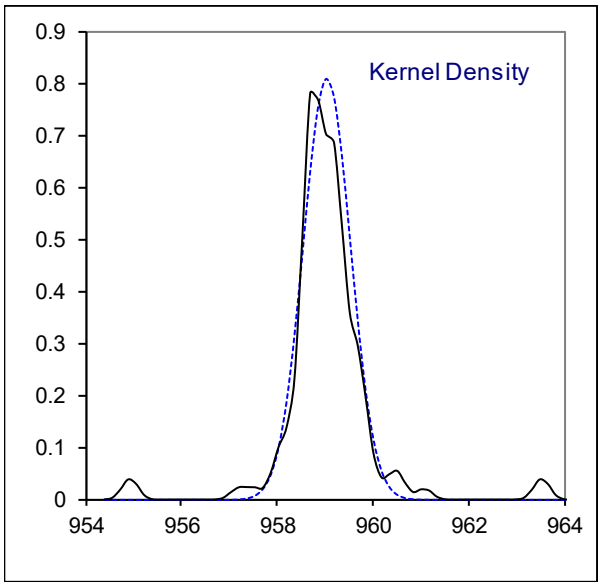
Determination of Density at 15°C on sample #19275; results in kg/m^3

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4052	959.2		0.26	962	D1298	958.9		-0.30
120	D4052	959.6		1.00	963	ISO12185	958.8		-0.49
140	D4052	958.0		-1.98	971	ISO12185	958.9		-0.30
150	D1298	958.1		-1.80	974	D1298	959.0		-0.12
159		-----		-----	994	ISO12185	958.7		-0.68
168		-----		-----	995	ISO12185	959.1		0.07
169	D1298	959.7		1.19	996	D1298	959.0		-0.12
170	D4052	959.4		0.63	997	D4052	959.1		0.07
171	ISO12185	958.0		-1.98	1026	D4052	959.9		1.56
175	D4052	959.2		0.26	1040	ISO12185	959.8	C	1.38
194	D4052	959.8		1.38	1065	D4052	960.1		1.94
212	ISO12185	959.4		0.63	1082	ISO12185	959.7		1.19
225	D4052	958.6		-0.86	1090	ISO12185	958.58		-0.90
230	ISO12185	959.1		0.07	1091	D4052	959.3		0.44
237	D4052	960.6	C	2.87	1108	ISO12185	959.9		1.56
238	D4052	961.1	R(0.01)	3.80	1109	D4052	958.8		-0.49
253	D4052	958.7		-0.68	1121	ISO12185	958.7		-0.68
256	D1298	959.6		1.00	1126		-----		-----
273	D4052	963.5	C,R(0.01)	8.28	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO12185	958.8		-0.49	1191	ISO12185	959.51		0.84
313	ISO12185	958.7		-0.68	1205		-----		-----
323	ISO12185	959.0		-0.12	1213	D4052	959.23		0.31
333	ISO12185	959.3		0.44	1229	ISO12185	959.3		0.44
334	ISO12185	959.3		0.44	1299	D4052	958.8		-0.49
336	ISO12185	959.0		-0.12	1320	ISO12185	959.8		1.38
337	ISO12185	959.4		0.63	1356	ISO12185	958.7		-0.68
339		-----		-----	1367	IP365	958.7		-0.68
342	ISO12185	958.7		-0.68	1381	ISO12185	959.22		0.29
349		-----		-----	1397	ISO12185	960.5		2.68
351	ISO3675	959.1		0.07	1402	IP365	959.0		-0.12
356	ISO12185	958.7		-0.68	1431	ISO12185	958.75		-0.58
360	ISO12185	958.9		-0.30	1554		-----		-----
370	ISO12185	959.2		0.26	1585	ISO12185	959.20		0.26
372	ISO12185	959.0		-0.12	1586	D4052	958.7		-0.68
381	ISO12185	958.3		-1.42	1636	ISO3675	958.2		-1.61
445	IP365	959.7		1.19	1648	ISO12185	958.54		-0.98
447	IP365	963.6	R(0.01)	8.47	1681	ISO12185	958.6		-0.86
463	ISO12185	958.35		-1.33	1720	D4052	955.0	R(0.01)	-7.58
507		-----		-----	1724	ISO12185	958.6		-0.86
541	ISO12185	958.60		-0.86	1740	D1298	958.8		-0.49
551	D4052	959.2		0.26	1741	ISO12185	957.2	R(0.01)	-3.48
558	D4052	959.02		-0.08	1796	ISO12185	959.4		0.63
575		-----		-----	1810	ISO12185	958.2		-1.61
610	D1298	954.9	C,R(0.01)	-7.77	1811	ISO12185	958.5		-1.05
621	D4052	996.1	R(0.01)	69.14	1854	ISO12185	958.8		-0.49
631	D1298	959.7		1.19	1881	ISO12185	959.2		0.26
633	D1298	959.70		1.19	1949	ISO12185	959.2		0.26
634	D1298	958.6		-0.86	1950	ISO12185	959.0		-0.12
657	ISO12185	958.7		-0.68	1986	ISO12185	959.0		-0.12
704	D1298	958.7		-0.68	1995	D4052	958.8		-0.49
732	ISO12185	958.93		-0.25	2129	D4052	958.8		-0.49
753	ISO12185	959.3		0.44	6024	ISO12185	959.3		0.44
778	ISO12185	959.2		0.26	6025	D1298	959.3		0.44
781	ISO12185	959.3		0.44	6049	ISO12185	958.7		-0.68
785	D1298	959.5		0.82	6051	ISO12185	959.2		0.26
798		-----		-----	6054		-----		-----
823	ISO12185	958.7		-0.68	6075	ISO12185	960.4		2.50
824	ISO12185	958.4		-1.24	6092	ISO12185	958.8		-0.49
825	ISO12185	958.7		-0.68	6112		-----		-----
840	ISO12185	958.86		-0.38	6142	ISO12185	959.7		1.19
872	ISO12185	959.2		0.26	6201	ISO12185	958.7		-0.68
873	ISO12185	959.4		0.63	6203	ISO3675	957.54	R(0.01)	-2.84
874	ISO12185	959.2		0.26	6223		-----		-----
875	ISO12185	959.6		1.00	6257		-----		-----
887		-----		-----	6262	ISO12185	958.7		-0.68
902	D4052	959.0		-0.12	6289	D1298	959.2		0.26
904	D1298	958.8		-0.49	6298	D4052	958.8		-0.49
913		-----		-----					

normality	OK
n	110
outliers	8
mean (n)	959.063
st.dev. (n)	0.4936
R(calc.)	1.382
st.dev.(ISO12185:96)	0.5357
R(ISO12185:96)	1.5

Lab 237 first reported 963.3
Lab 273 first reported 961.9
Lab 610 first reported 950.7
Lab 1040 first reported 922.0



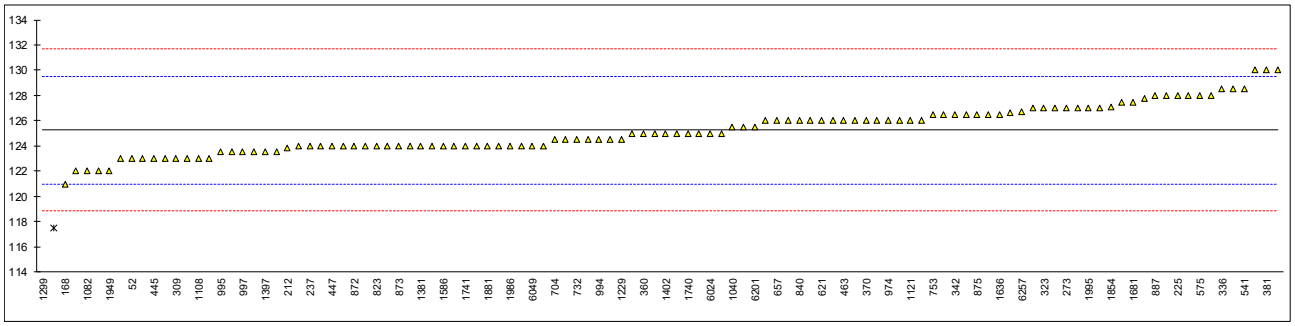


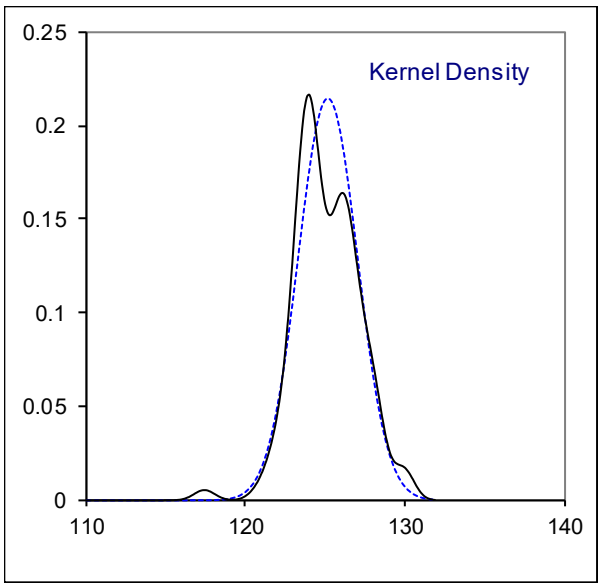
Determination of Flash Point PMcc on sample #19275; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D93-B	123.0		-1.05	962	D93-B	126.0		0.35
120	D93-B	127.8		1.19	963	ISO2719-B	127.0		0.82
140	D93-B	>230	f+?	>48.89	971	ISO2719-B	126.0		0.35
150	D93-B	124.0		-0.58	974	D93-B	126.0		0.35
159		-----		-----	994	D93-B	124.5		-0.35
168	D93-B	121.0		-1.98	995	D93-B	123.5		-0.81
169	D93-B	>110		-----	996	D93-B	123.5		-0.81
170	D93-B	126.5		0.59	997	D93-B	123.5		-0.81
171	ISO2719-A	128.5		1.52	1026	ISO2719-B	123.0		-1.05
175		-----		-----	1040	ISO2719-A	125.5		0.12
194		-----		-----	1065	D93-A	126		0.35
212	ISO2719-B	123.8		-0.67	1082	ISO2719-A	122		-1.51
225	D93-B	128.0		1.29	1090		-----		-----
230	ISO2719-B	124		-0.58	1091	D93-B	126.5		0.59
237	D93-B	124		-0.58	1108	ISO2719-B	123.0		-1.05
238	D93-B	124		-0.58	1109	D93-B	>100		-----
253	D93-B	123		-1.05	1121	ISO2719-B	126.0	C	0.35
256	D93-B	128.0		1.29	1126	ISO2719-A	127.5		1.05
273	D93-B	127		0.82	1134		-----		-----
309	D93-A	123.0		-1.05	1161		-----		-----
311	D93-B	127.0		0.82	1191	ISO2719-A	124.5		-0.35
313	D93-B	126.0		0.35	1205		-----		-----
323	ISO2719-A	127.0		0.82	1213	D93-A	125		-0.11
333	ISO2719-B	127.0		0.82	1229	ISO2719-A	124.5		-0.35
334	D93-B	126.5		0.59	1299	D93-B	102.0	R(0.01)	-10.85
336	ISO2719-B	128.5		1.52	1320		-----		-----
337		-----		-----	1356	D93-B	130		2.22
339		-----		-----	1367	D93-B	123.5		-0.81
342	ISO2719	126.5		0.59	1381	ISO2719-B	124.00		-0.58
349		-----		-----	1397	ISO2719-A	123.5		-0.81
351	ISO2719-B	124.50		-0.35	1402	IP34-B	125.0		-0.11
356	ISO2719-B	130.0		2.22	1431	D93-B	126.6		0.63
360	D93-B	125.0		-0.11	1554	ISO2719-A	125.0		-0.11
370	ISO2719-B	126.0		0.35	1585	D93-B	124.0		-0.58
372	ISO2719-B	124.5		-0.35	1586	D93-B	124.0		-0.58
381	ISO2719-A	130		2.22	1636	ISO2719-B	126.5		0.59
445	D93-B	123.0		-1.05	1648	ISO2719-A	124.0		-0.58
447	D93-B	124.0		-0.58	1681	ISO2719-B	127.5		1.05
463	ISO2719-B	126.0	C	0.35	1720		-----		-----
507		-----		-----	1724	D93-B	125.5		0.12
541	D93-B	128.50		1.52	1740	D93-B	125		-0.11
551		-----		-----	1741	ISO2719-B	124		-0.58
558		-----		-----	1796	ISO2719-B	122.0		-1.51
575	D93-B	128		1.29	1810	ISO2719-A	125.0		-0.11
610		-----		-----	1811	ISO2719-A	124.0		-0.58
621	D93-B	126.0		0.35	1854	D93-A	127.1		0.87
631	D93-B	123.0		-1.05	1881	ISO2719-B	124.0		-0.58
633	D93-B	124		-0.58	1949	ISO2719-A	122.0		-1.51
634	D93-B	128.0		1.29	1950	D93-B	124.0		-0.58
657	D93-B	126		0.35	1986	ISO2719-B	124.0		-0.58
704	D93-B	124.5		-0.35	1995	D93-B	127		0.82
732	ISO2719-B	124.5		-0.35	2129	D93-A	128.0		1.29
753	ISO2719-B	126.5		0.59	6024	ISO2719-B	125.0		-0.11
778	ISO2719-B	126.0		0.35	6025	D93-B	124.0		-0.58
781	ISO2719-B	124.0		-0.58	6049	ISO2719-B	124		-0.58
785	ISO2719-B	123.0		-1.05	6051	ISO2719-B	124.0		-0.58
798		-----		-----	6054		-----		-----
823	ISO2719-B	124.0		-0.58	6075	ISO2719-A	126.0		0.35
824	ISO2719-B	125.0		-0.11	6092	D93-B	125		-0.11
825	ISO2719-B	126.0		0.35	6112		-----		-----
840	D93-B	126.0		0.35	6142		-----		-----
872	ISO2719-B	124.0		-0.58	6201	D93-A	125.5		0.12
873	ISO2719-B	124.0		-0.58	6203	ISO2719-A	117.5	R(0.01)	-3.61
874	ISO2719-B	126.0		0.35	6223		-----		-----
875	ISO2719-B	126.5		0.59	6257	ISO2719-A	126.7		0.68
887	D93-B	128.0		1.29	6262	D93-A	123.5		-0.81
902	ISO2719-B	124		-0.58	6289	D93-B	123.0		-1.05
904	D93-A	122		-1.51	6298	D93-B	127		0.82
913		-----		-----					

normality	OK
n	110
outliers	2
mean (n)	125.245
st.dev. (n)	1.8586
R(calc.)	5.204
st.dev.(ISO2719-B:16)	2.1429
R(ISO2719-B:16)	6

Lab 140 f+? = possibly a false positive test result, reported possibly in a different unit?
Lab 463 first reported 133.0
Lab 1121 first reported 112.5



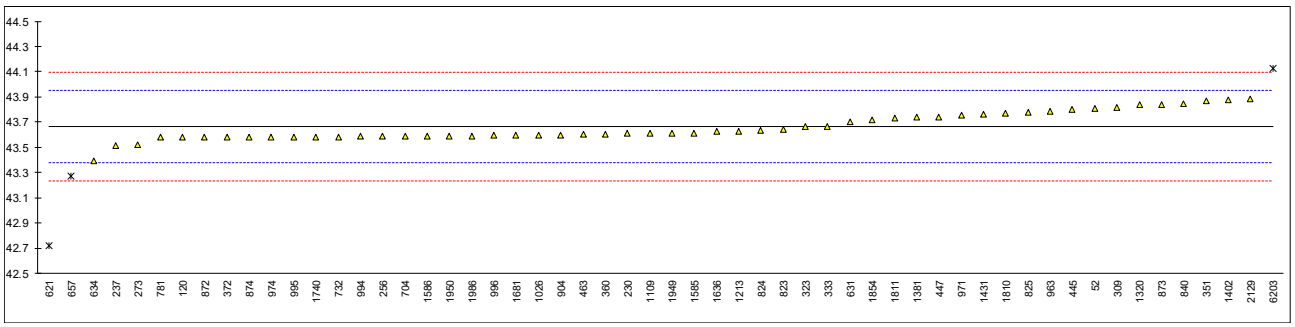


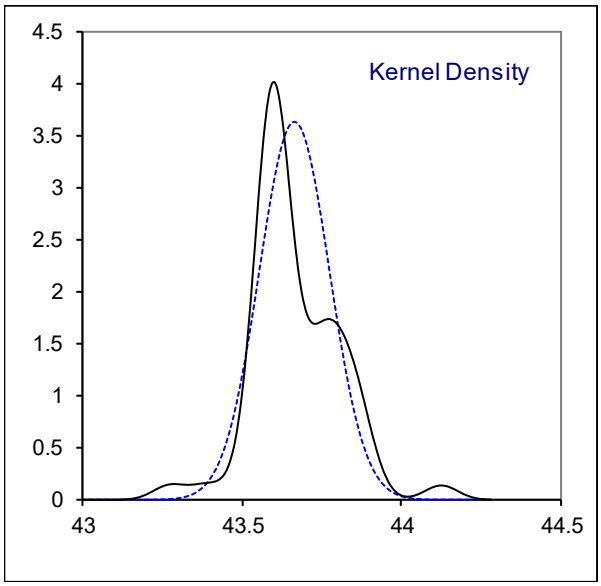
Determination of Heat of Combustion (Gross) on sample #19275; results in MJ/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D240	43.810		1.03	962		-----		-----
120	D4868	43.58		-0.58	963	D240	43.7894		0.88
140		-----		-----	971	D240	43.754		0.63
150		-----		-----	974	D4868	43.58		-0.58
159		-----		-----	994	D4868	43.588		-0.53
168		-----		-----	995	D4868	43.58		-0.58
169		-----		-----	996	D4868	43.595		-0.48
170		-----		-----	997		-----		-----
171		-----		-----	1026	D4868	43.597		-0.47
175		-----		-----	1040		-----		-----
194		-----		-----	1065		-----		-----
212		-----		-----	1082		-----		-----
225		-----		-----	1090		-----		-----
230	D4868	43.61		-0.37	1091		-----		-----
237	D4868	43.516		-1.03	1108		-----		-----
238		-----		-----	1109	D4868	43.610		-0.37
253		-----		-----	1121		-----		-----
256	D4868	43.59		-0.51	1126		-----		-----
273	D4868	43.52		-1.00	1134		-----		-----
309	D240	43.815		1.06	1161		-----		-----
311		-----		-----	1191		-----		-----
313		-----		-----	1205		-----		-----
323	D240	43.665		0.01	1213	D240	43.63		-0.23
333	D240	43.665		0.01	1229		-----		-----
334		-----		-----	1299		-----		-----
336		-----		-----	1320		43.837		1.21
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381	D240	43.7384		0.52
349		-----		-----	1397		-----		-----
351	D4868	43.87		1.45	1402	D240	43.88		1.52
356		-----		-----	1431	D240	43.760		0.68
360	D4868	43.603		-0.42	1554		-----		-----
370		-----		-----	1585		43.611		-0.37
372	D4868	43.58		-0.58	1586	D4868	43.59		-0.51
381		-----		-----	1636	D4868	43.625		-0.27
445	D240	43.7997895		0.95	1648		-----		-----
447	D240	43.7397		0.53	1681	D4868	43.596		-0.47
463	D4868	43.603		-0.42	1720		-----		-----
507		-----		-----	1724		-----		-----
541		-----		-----	1740	D240	43.580		-0.58
551		-----		-----	1741		-----		-----
558		-----		-----	1796		-----		-----
575		-----		-----	1810	D240	43.770		0.75
610		-----		-----	1811		43.732		0.48
621	D240	42.72	R(0.01)	-6.60	1854	D240	43.72		0.40
631	D240	43.7064		0.30	1881		-----		-----
633		-----		-----	1949		43.610		-0.37
634	D240	43.39	C	-1.91	1950	D4868	43.59		-0.51
657	DIN51900-1	43.2718	C,R(0.05)	-2.74	1986	D4868	43.590		-0.51
704	D4868	43.59		-0.51	1995		-----		-----
732	D240	43.585		-0.55	2129	D240	43.887		1.56
753		-----		-----	6024		-----		-----
778		-----		-----	6025		-----		-----
781	D4868	43.58		-0.58	6049		-----		-----
785		-----		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823	D240	43.641		-0.16	6075		-----		-----
824	D240	43.6386		-0.17	6092		-----		-----
825	D240	43.777		0.79	6112		-----		-----
840	D240	43.8500		1.31	6142		-----		-----
872	D4868	43.58		-0.58	6201		-----		-----
873	ISO8217(H)	43.84		1.24	6203		44.1246	R(0.05)	3.23
874	D4868	43.58		-0.58	6223		-----		-----
875		-----		-----	6257		-----		-----
887		-----		-----	6262		-----		-----
902		-----		-----	6289		-----		-----
904	D4868	43.6		-0.44	6298		-----		-----
913		-----		-----					

normality	OK
n	53
outliers	3
mean (n)	43.6635
st.dev. (n)	0.10999
R(calc.)	0.3080
st.dev.(D240:17)	0.14286
R(D240:17)	0.40

Lab 634 first reported 42.81
Lab 657 first reported 44.2159



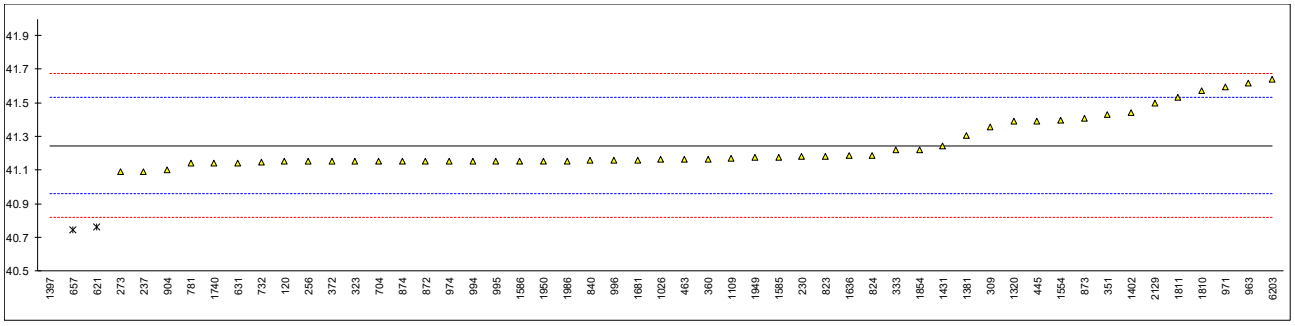


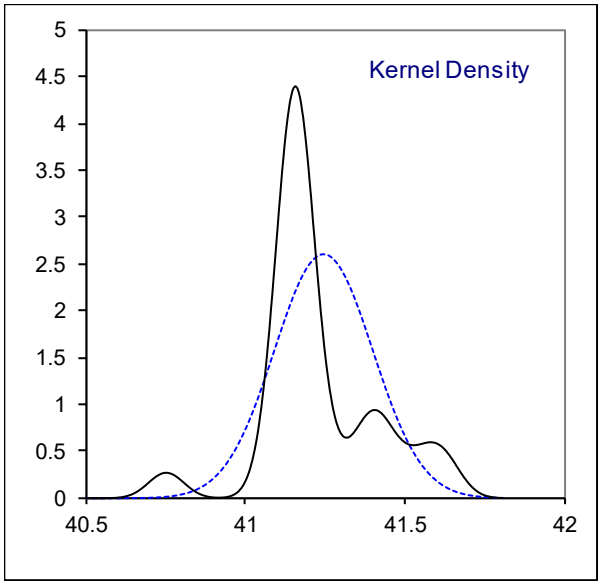
Determination of Heat of Combustion (Net) on sample #19275; results in MJ/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	962		-----		-----
120	D4868	41.15		-0.67	963	D240	41.6170		2.60
140		-----		-----	971	D240	41.597		2.46
150		-----		-----	974	D4868	41.15		-0.67
159		-----		-----	994	D4868	41.150		-0.67
168		-----		-----	995	D4868	41.15		-0.67
169		-----		-----	996	D4868	41.157		-0.62
170		-----		-----	997		-----		-----
171		-----		-----	1026	D4868	41.163		-0.58
175		-----		-----	1040		-----		-----
194		-----		-----	1065		-----		-----
212		-----		-----	1082		-----		-----
225		-----		-----	1090		-----		-----
230	D4868	41.18		-0.46	1091		-----		-----
237	D4868	41.092		-1.08	1108		-----		-----
238		-----		-----	1109	D4868	41.171		-0.52
253		-----		-----	1121		-----		-----
256	D4868	41.15		-0.67	1126		-----		-----
273	D4868	41.09		-1.09	1134		-----		-----
309	D240	41.355		0.77	1161		-----		-----
311		-----		-----	1191		-----		-----
313		-----		-----	1205		-----		-----
323	D240	41.150		-0.67	1213		-----		-----
333	D240	41.220		-0.18	1229		-----		-----
334		-----		-----	1299		-----		-----
336		-----		-----	1320		41.392		1.02
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381	D240	41.3072		0.43
349		-----		-----	1397	D240	40.211	R(0.01)	-7.24
351	D4868	41.43		1.29	1402	D240	41.44		1.36
356		-----		-----	1431	D240	41.242		-0.03
360	D4868	41.165		-0.56	1554		41.398		1.07
370		-----		-----	1585		41.174		-0.50
372	D4868	41.15		-0.67	1586	D4868	41.15		-0.67
381		-----		-----	1636	D4868	41.185		-0.42
445	D240	41.393		1.03	1648		-----		-----
447		-----		-----	1681	D4868	41.157		-0.62
463	D4868	41.164		-0.57	1720		-----		-----
507		-----		-----	1724		-----		-----
541		-----		-----	1740	D240	41.140		-0.74
551		-----		-----	1741		-----		-----
558		-----		-----	1796		-----		-----
575		-----		-----	1810	D240	41.574		2.30
610		-----		-----	1811		41.533		2.01
621	D240	40.76	R(0.05)	-3.40	1854	D240	41.22		-0.18
631	D4868	41.1426		-0.72	1881		-----		-----
633		-----		-----	1949		41.173		-0.51
634		-----		-----	1950	D4868	41.15		-0.67
657	DIN51900-1	40.7465	C,R(0.05)	-3.49	1986	D4868	41.150		-0.67
704	D4868	41.15		-0.67	1995		-----		-----
732	D240	41.147		-0.69	2129	D240	41.496		1.75
753		-----		-----	6024		-----		-----
778		-----		-----	6025		-----		-----
781	D4868	41.14		-0.74	6049		-----		-----
785		-----		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823	D240	41.180		-0.46	6075		-----		-----
824	D240	41.1877		-0.41	6092		-----		-----
825		-----		-----	6112		-----		-----
840	D4868	41.157		-0.62	6142		-----		-----
872	D4868	41.15		-0.67	6201		-----		-----
873	ISO8217(H)	41.41		1.15	6203		41.6419		2.77
874	D4868	41.15		-0.67	6223		-----		-----
875		-----		-----	6257		-----		-----
887		-----		-----	6262		-----		-----
902		-----		-----	6289		-----		-----
904	D4868	41.1		-1.02	6298		-----		-----
913		-----		-----					

normality	suspect
n	50
outliers	3
mean (n)	41.2456
st.dev. (n)	0.15383
R(calc.)	0.4307
st.dev.(D240:17)	0.14286
R(D240:17)	0.40

Lab 657 first reported 41.748



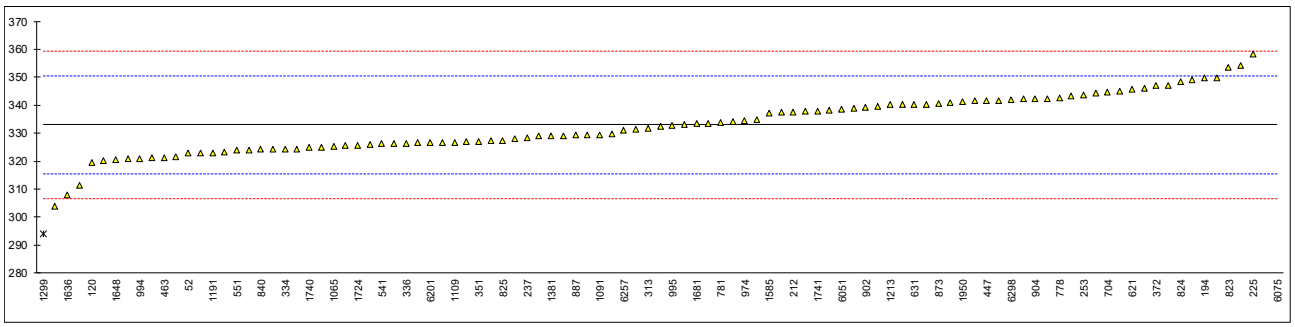


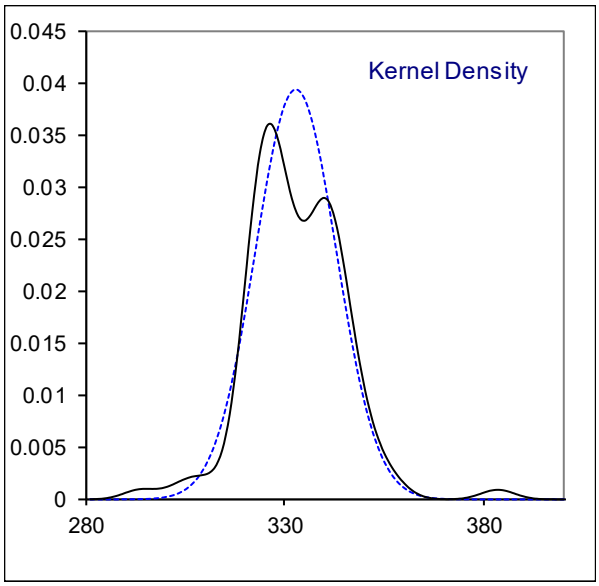
Determination of Kinematic Viscosity at 50°C on sample #19275; results in mm^2/s

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D445	322.8		-1.16	962		-----		-----
120	D445	319.647		-1.52	963	ISO3104	341.7		0.99
140	D445	321.1		-1.35	971	ISO3104	329.8		-0.36
150	D445	324.2		-1.00	974	D445	334.4		0.16
159		-----		-----	994	D445	320.8		-1.39
168	D445	320.3		-1.44	995	ISO3104	332.9		-0.01
169	D445	333.6		0.07	996	D445	326.85		-0.70
170		-----		-----	997		-----		-----
171	ISO3104	303.7		-3.33	1026	ISO3104	327.2		-0.66
175	D445	346.1		1.49	1040	ISO3104	323.9		-1.04
194	D445	349.6		1.89	1065	D445	325.3		-0.88
212	ISO3104	337.5		0.51	1082	ISO3104	327.95		-0.57
225	D445	358.1		2.85	1090		-----		-----
230	ISO3104	332.40		-0.07	1091	ISO3104	329.5		-0.40
237	D445	328.5		-0.51	1108	ISO3104	325.1		-0.90
238		-----		-----	1109	D445	326.69		-0.72
253	D445	343.6		1.20	1121	ISO3104	346.9		1.58
256	D445	321.7		-1.28	1126		-----		-----
273	D445	311.2		-2.48	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO3104	329.5		-0.40	1191	ISO3104	323.07		-1.13
313	D445	331.9		-0.13	1205		-----		-----
323	ISO3104	383.7	R(0.01)	5.76	1213	D445	340.2		0.82
333	ISO3104	324.2		-1.00	1229	ISO3104	325.7		-0.83
334	ISO3104	324.2		-1.00	1299	D445	294.0	R(0.05)	-4.43
336	ISO3104	326.4		-0.75	1320		-----		-----
337		-----		-----	1356	ISO3104	326.5		-0.74
339		-----		-----	1367	IP71	323.2		-1.11
342	ISO3104	354.2		2.41	1381	ISO3104	328.95		-0.46
349		-----		-----	1397		-----		-----
351	ISO3104	326.95		-0.69	1402	IP71	342.2		1.04
356	ISO3104	331.5		-0.17	1431		-----		-----
360	D445	348.97		1.81	1554		-----		-----
370	ISO3104	326.52		-0.74	1585	D445	337.05		0.46
372	D445	346.9		1.58	1586	D445	320.7		-1.40
381	D445	329.0		-0.46	1636	ISO3104	308.062		-2.83
445	IP71	326.3		-0.76	1648	ISO3104	320.6		-1.41
447	D445	341.66		0.98	1681	ISO3104	333.31		0.03
463	ISO3104	321.28		-1.33	1720		-----		-----
507		-----		-----	1724	ISO3104	325.7		-0.83
541	D445	326.23		-0.77	1740	D445	324.8		-0.93
551	D445	323.8		-1.05	1741	ISO3104	337.97		0.56
558		-----		-----	1796	D445	349.7		1.90
575	D445	337.4	C	0.50	1810		-----		-----
610		-----		-----	1811		-----		-----
621	D445	345.85		1.46	1854	ISO3104	322.8		-1.16
631	D445	340.32	C	0.83	1881		-----		-----
633		-----		-----	1949	ISO3104	334.28		0.14
634	D445	333.15		0.02	1950	ISO3104	341.1		0.92
657	ISO3104	339.0		0.68	1986	ISO3104	340.3		0.83
704	D445	344.5		1.31	1995		-----		-----
732	D445	328.9		-0.47	2129	ISO3104	340.35		0.83
753	ISO3104	338.26		0.60	6024	ISO3104	340.9		0.90
778	ISO3104	342.6		1.09	6025	D445	343.2		1.16
781	ISO3104	333.9		0.10	6049	ISO3104	325.9		-0.81
785	ISO3104	337.7		0.53	6051	ISO3104	338.6		0.64
798		-----		-----	6054		-----		-----
823	ISO3104	353.5		2.33	6075	ISO3104	509.99	R(0.01)	20.11
824	ISO3104	348.24		1.73	6092	D445	344.3		1.28
825	ISO3104	327.3		-0.65	6112		-----		-----
840	D445	324.14		-1.01	6142		-----		-----
872	D445	341.5		0.96	6201	D445	326.5		-0.74
873	D445	340.5		0.85	6203		-----		-----
874	ISO3104	339.7		0.76	6223		-----		-----
875	ISO3104	345.1		1.37	6257	ISO3104	330.967		-0.23
887	D445	329.3		-0.42	6262	D445	342.40		1.07
902	ISO3104	339.3		0.71	6289	D445	334.7		0.19
904	D445	342.3		1.06	6298	D445	341.9		1.01
913		-----		-----					

normality	OK
n	100
outliers	3
mean (n)	333.0092
st.dev. (n)	10.15214
R(calc.)	28.4260
st.dev.(ISO3104:94)	8.80096
R(ISO3104:94)	24.6427

Lab 575 first reported 389.5
Lab 631 first reported 380.44

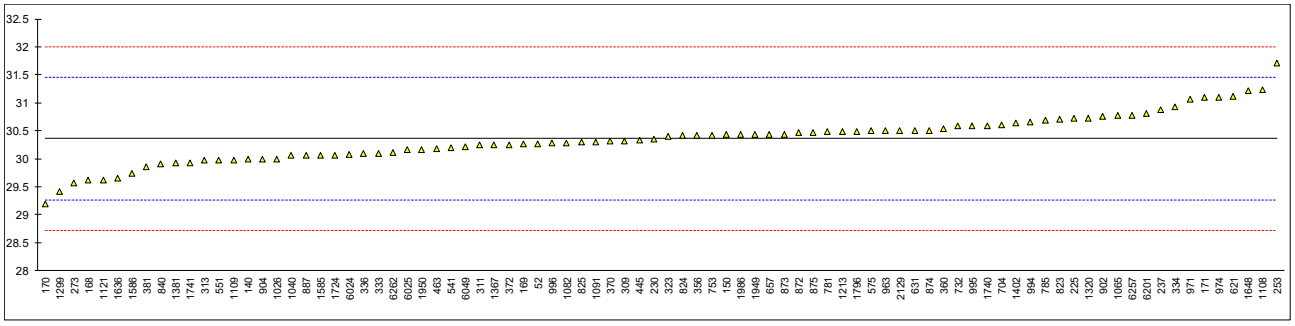


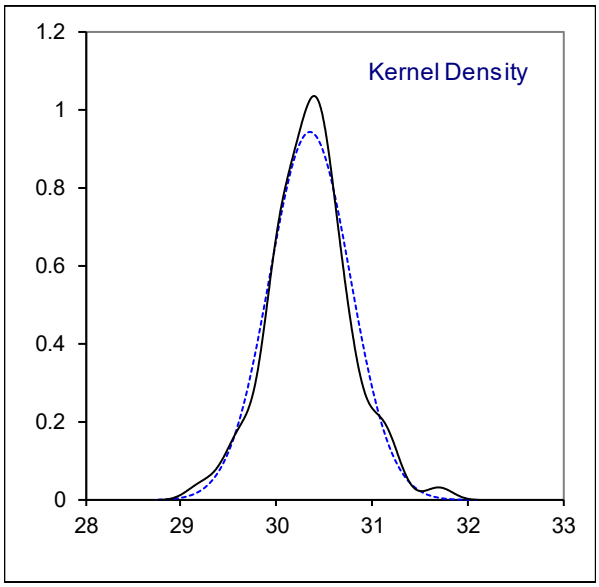


Determination of Kinematic Viscosity at 100°C on sample #19275; results in mm^2/s

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D445	30.27		-0.16	962		-----		-----
120		-----		-----	963	ISO3104	30.50		0.26
140	D445	29.99		-0.67	971	ISO3104	31.06		1.28
150	D445	30.43		0.13	974	D445	31.09		1.34
159		-----		-----	994	D445	30.66		0.55
168	D445	29.62		-1.35	995	ISO3104	30.59		0.42
169	D445	30.26		-0.18	996	D445	30.275		-0.15
170	D445	29.1959		-2.12	997		-----		-----
171	ISO3104	31.09		1.34	1026	D445	30.00		-0.65
175		-----		-----	1040	ISO3104	30.058		-0.55
194		-----		-----	1065	D445	30.77		0.75
212		-----		-----	1082	ISO3104	30.288		-0.13
225	D445	30.72		0.66	1090		-----		-----
230	ISO3104	30.356		0.00	1091	ISO3104	30.29		-0.12
237	D445	30.88		0.95	1108	ISO3104	31.23		1.59
238		-----		-----	1109	D445	29.98		-0.69
253	D445	31.71		2.47	1121	ISO3104	29.62		-1.35
256		-----		-----	1126		-----		-----
273	D445	29.57		-1.44	1134		-----		-----
309	D445	30.320		-0.07	1161		-----		-----
311	ISO3104	30.24		-0.22	1191		-----		-----
313	D445	29.97		-0.71	1205		-----		-----
323	ISO3104	30.4		0.08	1213	D445	30.49		0.24
333	ISO3104	30.10		-0.47	1229		-----		-----
334	ISO3104	30.92		1.03	1299	D445	29.41		-1.73
336	ISO3104	30.09		-0.49	1320	ISO3104	30.73		0.68
337		-----		-----	1356		-----		-----
339		-----		-----	1367	IP71	30.24		-0.22
342		-----		-----	1381	ISO3104	29.930		-0.78
349		-----		-----	1397		-----		-----
351		-----		-----	1402	IP71	30.64		0.51
356	ISO3104	30.41		0.09	1431		-----		-----
360	D445	30.541		0.33	1554		-----		-----
370	ISO3104	30.318		-0.07	1585	D445	30.064		-0.54
372	D445	30.25		-0.20	1586	D445	29.74		-1.13
381	D445	29.86		-0.91	1636	ISO3104	29.6606		-1.27
445	IP71	30.33		-0.05	1648	ISO3104	31.22		1.57
447		-----		-----	1681		-----		-----
463	ISO3104	30.178		-0.33	1720		-----		-----
507		-----		-----	1724	ISO3104	30.066		-0.53
541	D445	30.192		-0.30	1740	D445	30.59		0.42
551	D445	29.9717		-0.71	1741	ISO3104	29.93		-0.78
558		-----		-----	1796	ISO3104	30.49		0.24
575	D445	30.50		0.26	1810		-----		-----
610		-----		-----	1811		-----		-----
621	D445	31.12		1.39	1854		-----		-----
631	D445	30.510		0.28	1881		-----		-----
633		-----		-----	1949	ISO3104	30.431		0.13
634		-----		-----	1950	ISO3104	30.17		-0.34
657	ISO3104	30.44		0.15	1986	ISO3104	30.43		0.13
704	D445	30.599		0.44	1995		-----		-----
732	D445	30.59		0.42	2129	ISO3104	30.501		0.26
753	ISO3104	30.419		0.11	6024	ISO3104	30.07		-0.53
778		-----		-----	6025	D445	30.16		-0.36
781	ISO3104	30.48		0.22	6049	ISO3104	30.21		-0.27
785	ISO3104	30.69		0.61	6051		-----		-----
798		-----		-----	6054		-----		-----
823	ISO3104	30.70		0.62	6075		-----		-----
824	ISO3104	30.41		0.09	6092		-----		-----
825	ISO3104	30.29		-0.12	6112		-----		-----
840	D445	29.913		-0.81	6142		-----		-----
872	D445	30.46		0.19	6201	D445	30.81		0.82
873	D445	30.44		0.15	6203		-----		-----
874	ISO3104	30.51		0.28	6223		-----		-----
875	ISO3104	30.46		0.19	6257	ISO3104	30.780		0.77
887	D445	30.06		-0.54	6262	D445	30.116		-0.44
902	ISO3104	30.76		0.73	6289		-----		-----
904	D445	29.99		-0.67	6298		-----		-----
913		-----		-----					

normality	OK
n	86
outliers	0
mean (n)	30.3583
st.dev. (n)	0.42380
R(calc.)	1.1866
st.dev.(ISO3104:94)	0.54798
R(ISO3104:94)	1.5343

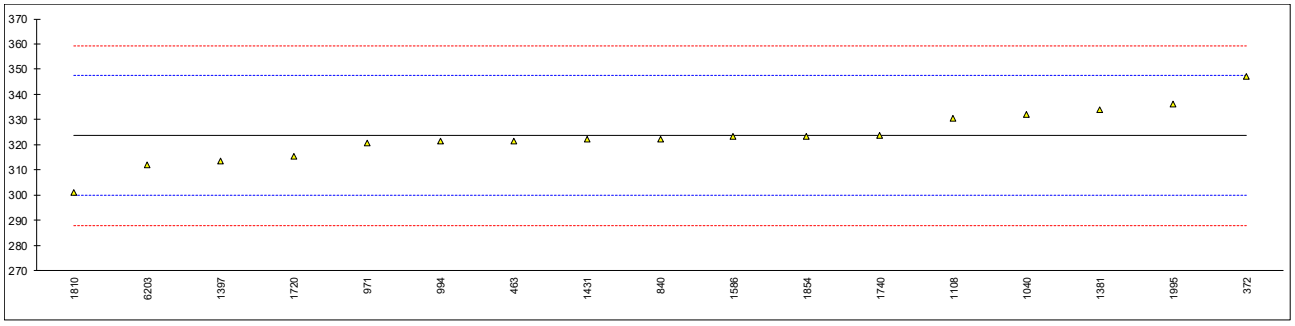


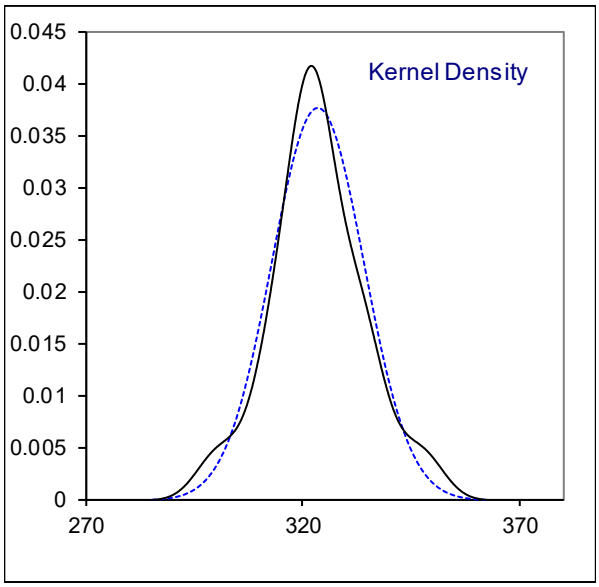


Determination of Viscosity Stabinger at 50°C on sample #19275; results in mm^2/s

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	962		-----		-----
120		-----		-----	963		-----		-----
140		-----		-----	971	D7042	320.6		-0.25
150		-----		-----	974		-----		-----
159		-----		-----	994	D7042	321.3		-0.19
168		-----		-----	995		-----		-----
169		-----		-----	996		-----		-----
170		-----		-----	997		-----		-----
171		-----		-----	1026		-----		-----
175		-----		-----	1040	D7042	332.2		0.73
194		-----		-----	1065		-----		-----
212		-----		-----	1082		-----		-----
225		-----		-----	1090		-----		-----
230		-----		-----	1091		-----		-----
237		-----		-----	1108	D7042	330.7		0.60
238		-----		-----	1109		-----		-----
253		-----		-----	1121		-----		-----
256		-----		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311		-----		-----	1191		-----		-----
313		-----		-----	1205		-----		-----
323		-----		-----	1213		-----		-----
333		-----		-----	1229		-----		-----
334		-----		-----	1299		-----		-----
336		-----		-----	1320		-----		-----
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381	D7042	333.79		0.86
349		-----		-----	1397	D7042	313.4		-0.85
351		-----		-----	1402		-----		-----
356		-----		-----	1431	D7042	322.13		-0.12
360		-----		-----	1554		-----		-----
370		-----		-----	1585		-----		-----
372	D7042	347.2		1.99	1586	D7042	323.4		-0.01
381		-----		-----	1636		-----		-----
445		-----		-----	1648		-----		-----
447		-----		-----	1681		-----		-----
463	D7042	321.61		-0.16	1720	D7042	315.4		-0.69
507		-----		-----	1724		-----		-----
541		-----		-----	1740	D7042	323.6		0.00
551		-----		-----	1741		-----		-----
558		-----		-----	1796		-----		-----
575		-----		-----	1810	D7042	300.9		-1.91
610		-----		-----	1811		-----		-----
621		-----		-----	1854	D7042	323.5		0.00
631		-----		-----	1881		-----		-----
633		-----		-----	1949		-----		-----
634		-----		-----	1950		-----		-----
657		-----		-----	1986		-----		-----
704		-----		-----	1995	D7042	336.31		1.07
732		-----		-----	2129		-----		-----
753		-----		-----	6024		-----		-----
778		-----		-----	6025		-----		-----
781		-----		-----	6049		-----		-----
785		-----		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823		-----		-----	6075		-----		-----
824		-----		-----	6092		-----		-----
825		-----		-----	6112		-----		-----
840	D7042	322.28		-0.11	6142		-----		-----
872		-----		-----	6201		-----		-----
873		-----		-----	6203	D7042	312.1		-0.96
874		-----		-----	6223		-----		-----
875		-----		-----	6257		-----		-----
887		-----		-----	6262		-----		-----
902		-----		-----	6289		-----		-----
904		-----		-----	6298		-----		-----
913		-----		-----					

normality	suspect
n	17
outliers	0
mean (n)	323.5541
st.dev. (n)	10.57030
R(calc.)	29.5968
st.dev.(D7042:16e3)	11.89061
R(D7042:16e3)	33.2937



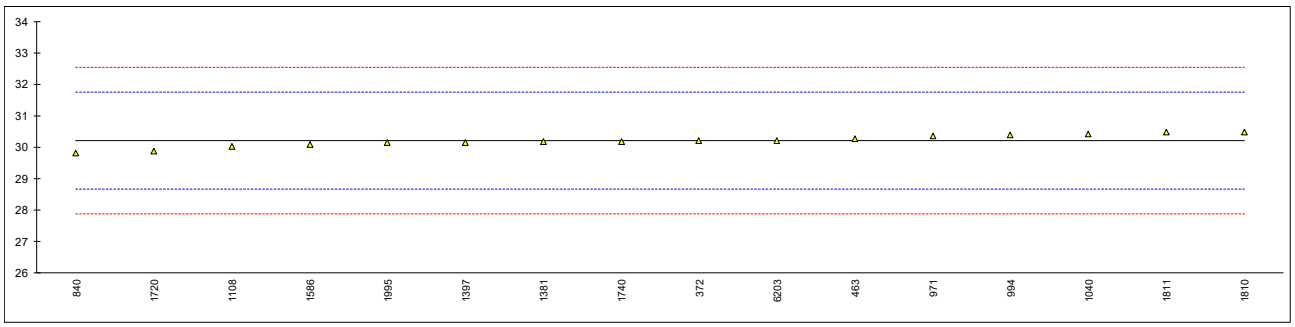


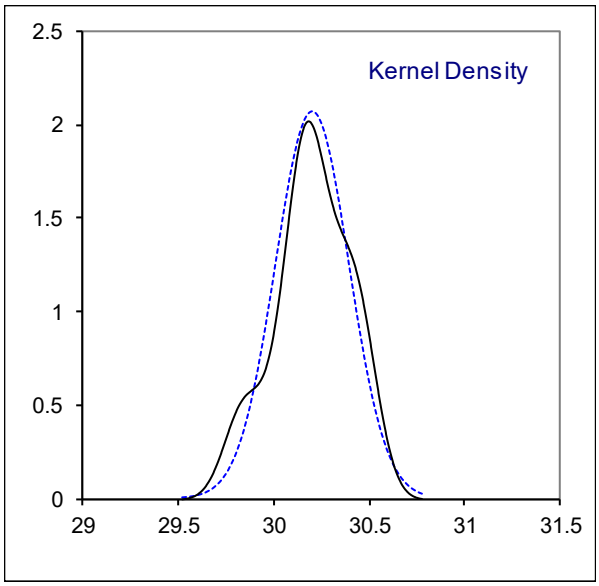
Determination of Viscosity Stabinger at 100°C on sample #19275; results in mm^2/s

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	962		-----		-----
120		-----		-----	963		-----		-----
140		-----		-----	971	D7042	30.36		0.20
150		-----		-----	974		-----		-----
159		-----		-----	994	D7042	30.38		0.23
168		-----		-----	995		-----		-----
169		-----		-----	996		-----		-----
170		-----		-----	997		-----		-----
171		-----		-----	1026		-----		-----
175		-----		-----	1040	D7042	30.41		0.27
194		-----		-----	1065		-----		-----
212		-----		-----	1082		-----		-----
225		-----		-----	1090		-----		-----
230		-----		-----	1091		-----		-----
237		-----		-----	1108	D7042	30.03		-0.22
238		-----		-----	1109		-----		-----
253		-----		-----	1121		-----		-----
256		-----		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311		-----		-----	1191		-----		-----
313		-----		-----	1205		-----		-----
323		-----		-----	1213		-----		-----
333		-----		-----	1229		-----		-----
334		-----		-----	1299		-----		-----
336		-----		-----	1320		-----		-----
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381	D7042	30.170		-0.04
349		-----		-----	1397	D7042	30.16		-0.05
351		-----		-----	1402		-----		-----
356		-----		-----	1431		-----		-----
360		-----		-----	1554		-----		-----
370		-----		-----	1585		-----		-----
372	D7042	30.20		0.00	1586	D7042	30.10		-0.13
381		-----		-----	1636		-----		-----
445		-----		-----	1648		-----		-----
447		-----		-----	1681		-----		-----
463	D7042	30.260		0.07	1720	D7042	29.87		-0.43
507		-----		-----	1724		-----		-----
541		-----		-----	1740	D7042	30.19		-0.02
551		-----		-----	1741		-----		-----
558		-----		-----	1796		-----		-----
575		-----		-----	1810	D7042	30.48	C	0.36
610		-----		-----	1811	D7042	30.472	C	0.35
621		-----		-----	1854		-----		-----
631		-----		-----	1881		-----		-----
633		-----		-----	1949		-----		-----
634		-----		-----	1950		-----		-----
657		-----		-----	1986		-----		-----
704		-----		-----	1995	D7042	30.14		-0.08
732		-----		-----	2129		-----		-----
753		-----		-----	6024		-----		-----
778		-----		-----	6025		-----		-----
781		-----		-----	6049		-----		-----
785		-----		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823		-----		-----	6075		-----		-----
824		-----		-----	6092		-----		-----
825		-----		-----	6112		-----		-----
840	D7042	29.818		-0.50	6142		-----		-----
872		-----		-----	6201		-----		-----
873		-----		-----	6203	D7042	30.20		0.00
874		-----		-----	6223		-----		-----
875		-----		-----	6257		-----		-----
887		-----		-----	6262		-----		-----
902		-----		-----	6289		-----		-----
904		-----		-----	6298		-----		-----
913		-----		-----					

normality	OK
n	16
outliers	0
mean (n)	30.2025
st.dev. (n)	0.19286
R(calc.)	0.5400
st.dev.(D7042:16e3)	0.77513
R(D7042:16e3)	2.1704

Lab 1810 first reported 27.51
Lab 1811 first reported 27.47

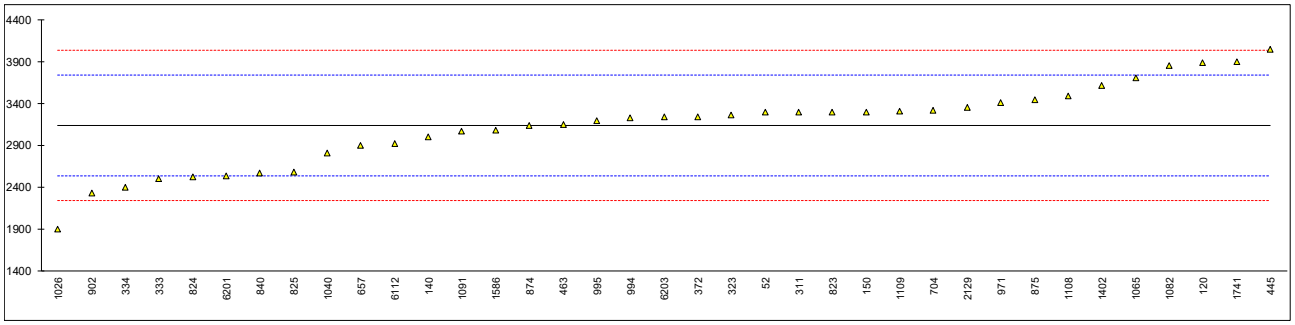


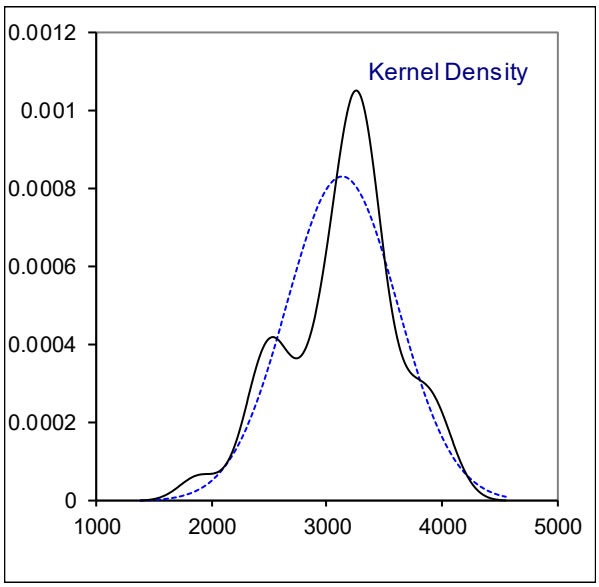


Determination of Nitrogen on sample #19275; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4629	3300		0.55	962		-----		-----
120	D4629	3883.587		2.51	963		-----		-----
140	D5762 Volumetric	3000		-0.46	971	D5762 Gravimetric	3409		0.92
150	D5762 Volumetric	3300		0.55	974		-----		-----
159		-----		-----	994	D5762 Volumetric	3225		0.30
168		-----		-----	995	D3228	3188		0.18
169		-----		-----	996		-----		-----
170		-----		-----	997		-----		-----
171		-----		-----	1026	D5762 Volumetric	1900		-4.15
175		-----		-----	1040	D4629	2811		-1.09
194		-----		-----	1065	D4629	3700		1.89
212		-----		-----	1082	D5762 Volumetric	3853		2.41
225		-----		-----	1090		-----		-----
230		-----		-----	1091	D5762 Volumetric	3063		-0.24
237		-----		-----	1108	D5762 Gravimetric	3482		1.16
238		-----		-----	1109	D4629	3304		0.56
253		-----		-----	1121		-----		-----
256		-----		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311	D5762 Volumetric	3300		0.55	1191		-----		-----
313		-----		-----	1205		-----		-----
323	D5762 Gravimetric	3264		0.43	1213		-----		-----
333	D5762 Gravimetric	2500		-2.13	1229		-----		-----
334	D5762 Gravimetric	2400		-2.47	1299		-----		-----
336		-----		-----	1320		-----		-----
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381		-----		-----
349		-----		-----	1397		-----		-----
351		-----		-----	1402	D5762 Volumetric	3606.92		1.58
356		-----		-----	1431		-----		-----
360		-----		-----	1554		-----		-----
370		-----		-----	1585		-----		-----
372	D5762 Volumetric	3240		0.35	1586	D5762 Volumetric	3075		-0.20
381		-----		-----	1636		-----		-----
445	D5762 Gravimetric	4040		3.04	1648		-----		-----
447		-----		-----	1681		-----		-----
463	D5762 Gravimetric	3153		0.06	1720		-----		-----
507		-----		-----	1724		-----		-----
541		-----		-----	1740		-----		-----
551		-----		-----	1741	D5762 Gravimetric	3898.0		2.56
558		-----		-----	1796		-----		-----
575		-----		-----	1810		-----		-----
610		-----		-----	1811		-----		-----
621		-----		-----	1854		-----		-----
631		-----		-----	1881		-----		-----
633		-----		-----	1949		-----		-----
634		-----		-----	1950		-----		-----
657	D5762 Gravimetric	2900		-0.79	1986		-----		-----
704	D5762 Volumetric	3315		0.60	1995		-----		-----
732		-----		-----	2129	D3228	3350		0.72
753		-----		-----	6024		-----		-----
778		-----		-----	6025		-----		-----
781		-----		-----	6049		-----		-----
785		-----		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823	D5762 Volumetric	3300		0.55	6075		-----		-----
824	D5762 Gravimetric	2520		-2.07	6092		-----		-----
825	D5762 Gravimetric	2580		-1.87	6112	D5762 Volumetric	2916		-0.74
840	D3228	2572		-1.89	6142		-----		-----
872		-----		-----	6201	D5762 Gravimetric	2538		-2.01
873		-----		-----	6203	D5762 Gravimetric	3233		0.33
874	D5762 Volumetric	3136		0.00	6223		-----		-----
875	D5762 Gravimetric	3438		1.01	6257		-----		-----
887		-----		-----	6262		-----		-----
902	D5762 Gravimetric	2333		-2.69	6289		-----		-----
904		-----		-----	6298		-----		-----
913		-----		-----					

		Volumetric only	Gravimetric only
normality	OK	not OK	OK
n	37	14	15
outliers	0	0	0
mean (n)	3135.85	3159.28	3045.87
st.dev. (n)	479.513	435.305	552.942
R(calc.)	1342.64	1218.85	1548.24
st.dev.(D5762:18a)	297.906	300.132	289.357
R(D5762:18a)	834.14	840.37	810.20



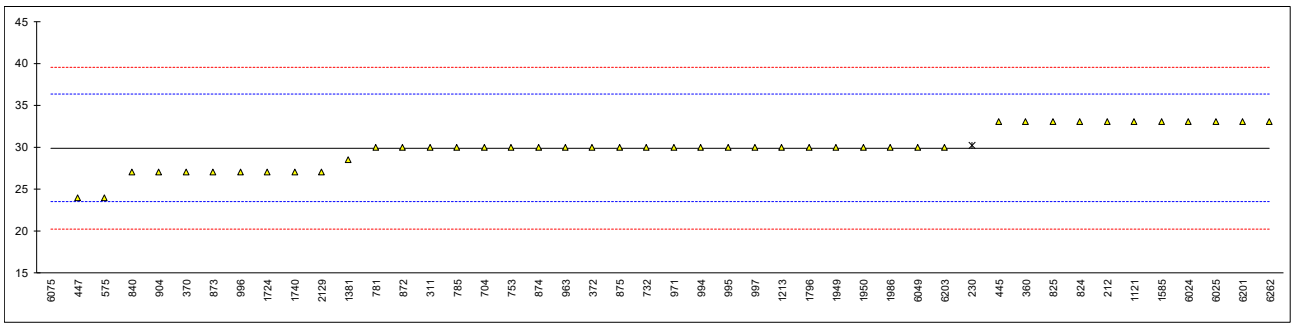


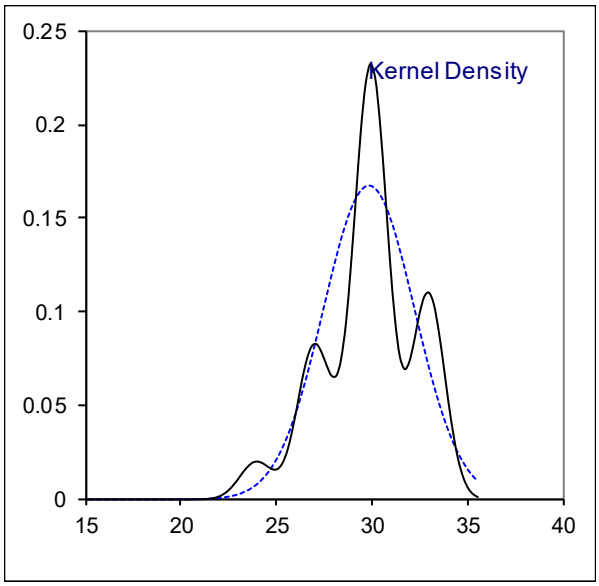
Determination of Pour Point, Lower on sample #19275; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	962		-----		-----
120		-----		-----	963	ISO3016	30		0.03
140		-----		-----	971	ISO3016	30		0.03
150		-----		-----	974		-----		-----
159		-----		-----	994	D97	30		0.03
168		-----		-----	995	ISO3016	30		0.03
169		-----		-----	996	D97	27		-0.90
170		-----		-----	997	D97	30		0.03
171		-----		-----	1026		-----		-----
175		-----		-----	1040		-----		-----
194		-----		-----	1065		-----		-----
212	ISO3016	33		0.97	1082		-----		-----
225		-----		-----	1090		-----		-----
230	ISO3016	30.2	ex	0.09	1091		-----		-----
237		-----		-----	1108		-----		-----
238		-----		-----	1109		-----		-----
253		-----		-----	1121	ISO3016	33		0.97
256		-----		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO3016	30		0.03	1191		-----		-----
313		-----		-----	1205		-----		-----
323		-----		-----	1213	D97	30		0.03
333		-----		-----	1229		-----		-----
334		-----		-----	1299		-----		-----
336		-----		-----	1320		-----		-----
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381	ISO3016	28.5		-0.43
349		-----		-----	1397		-----		-----
351		-----		-----	1402		-----		-----
356		-----		-----	1431		-----		-----
360	ISO3016	33		0.97	1554		-----		-----
370	ISO3016	27		-0.90	1585	D97	33		0.97
372	ISO3016	30		0.03	1586		-----		-----
381		-----		-----	1636		-----		-----
445	D97	33		0.97	1648		-----		-----
447	D97	24		-1.83	1681		-----		-----
463		-----		-----	1720		-----		-----
507		-----		-----	1724	ISO3016	27		-0.90
541		-----		-----	1740	D97	27		-0.90
551		-----		-----	1741		-----		-----
558		-----		-----	1796	D97	30		0.03
575	D97	24	C	-1.83	1810		-----		-----
610		-----		-----	1811		-----		-----
621		-----		-----	1854		-----		-----
631		-----		-----	1881		-----		-----
633		-----		-----	1949	ISO3016	30		0.03
634		-----		-----	1950	ISO3016	30		0.03
657		-----		-----	1986	ISO3016	30		0.03
704	D97	30		0.03	1995		-----		-----
732	D97	30		0.03	2129	ISO3016	27		-0.90
753	ISO3016	30		0.03	6024	ISO3016	33		0.97
778		-----		-----	6025	D97	33.0		0.97
781	ISO3016	30		0.03	6049	ISO3016	30		0.03
785	ISO3016	30		0.03	6051		-----		-----
798		-----		-----	6054		-----		-----
823		-----		-----	6075	ISO3016	-27	R(0.01)	-17.70
824	ISO3016	33		0.97	6092		-----		-----
825	ISO3016	33		0.97	6112		-----		-----
840	D97	27		-0.90	6142		-----		-----
872	ISO3016	30		0.03	6201	ISO3016	33		0.97
873	ISO3016	27		-0.90	6203	ISO3016	30		0.03
874	ISO3016	30		0.03	6223		-----		-----
875	D97	30		0.03	6257		-----		-----
887		-----		-----	6262	D97	33		0.97
902		-----		-----	6289		-----		-----
904	ISO3016	27		-0.90	6298		-----		-----
913		-----		-----					

normality	OK
n	44
outliers	1 (+1 ex)
mean (n)	29.90
st.dev. (n)	2.386
R(calc.)	6.68
st.dev.(ISO3016:19)	3.214
R(ISO3016:19)	9

Lab 230 test result excluded as PP lower > PP upper, which is in principle not possible
Lab 575 first reported 12



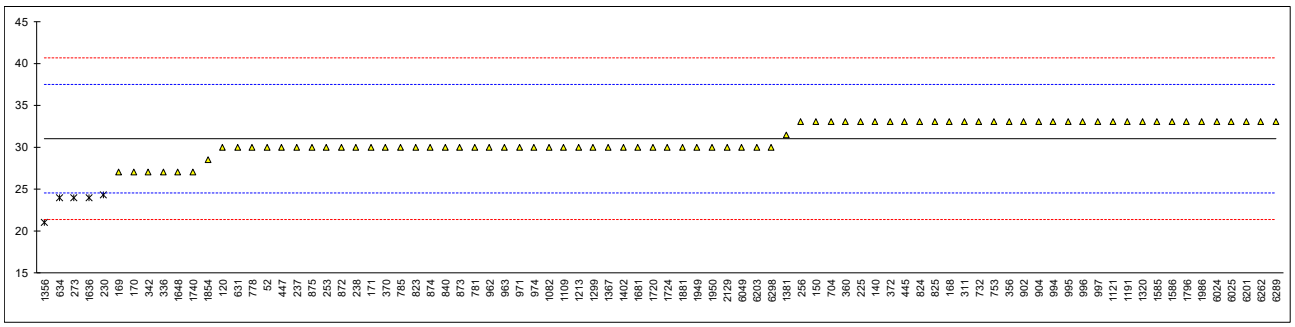


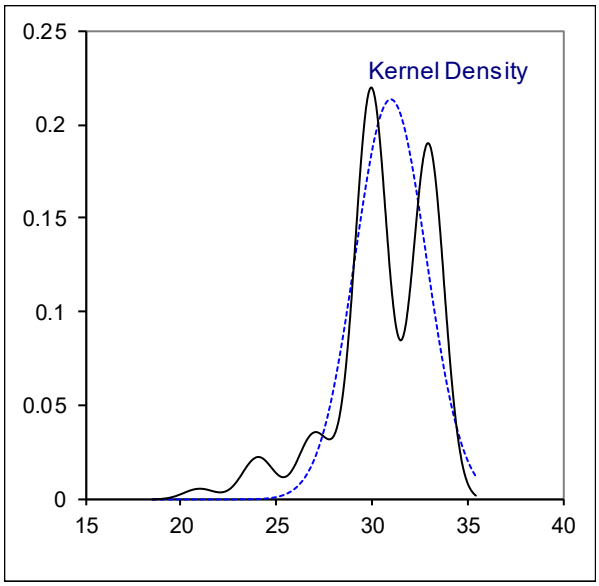
Determination of Pour Point, Upper on sample #19275; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D97	30		-0.32	962	D97	30		-0.32
120	D97	30		-0.32	963	ISO3016	30		-0.32
140	D97	33		0.61	971	ISO3016	30		-0.32
150	D97	33		0.61	974	D97	30		-0.32
159		-----		-----	994	D97	33		0.61
168	D97	33		0.61	995	ISO3016	33		0.61
169	D97	27		-1.25	996	D97	33		0.61
170	D97	27		-1.25	997	D97	33		0.61
171	ISO3016	30		-0.32	1026		-----		-----
175		-----		-----	1040		-----		-----
194		-----		-----	1065		-----		-----
212		-----		-----	1082	ISO3016	30		-0.32
225	D97	33		0.61	1090		-----		-----
230	ISO3016	24.3	ex	-2.09	1091		-----		-----
237	D97	30		-0.32	1108		-----		-----
238	D97	30		-0.32	1109	D97	30		-0.32
253	D97	30		-0.32	1121	ISO3016	33		0.61
256	D97	33		0.61	1126		-----		-----
273	D97	24	C,R(0.05)	-2.19	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO3016	33		0.61	1191	ISO3016	33		0.61
313		-----		-----	1205		-----		-----
323		-----		-----	1213	D97	30		-0.32
333		-----		-----	1229		-----		-----
334		-----		-----	1299	D97	30		-0.32
336	ISO3016	27		-1.25	1320	ISO3016	33		0.61
337		-----		-----	1356	ISO3016	21	R(0.01)	-3.12
339		-----		-----	1367	D97	30		-0.32
342	ISO3016	27		-1.25	1381	ISO3016	31.5		0.15
349		-----		-----	1397		-----		-----
351		-----		-----	1402	D97	30		-0.32
356	ISO3016	33		0.61	1431		-----		-----
360	ISO3016	33		0.61	1554		-----		-----
370	ISO3016	30		-0.32	1585	D97	33		0.61
372	ISO3016	33		0.61	1586	D97	33		0.61
381		-----		-----	1636	ISO3016	24	R(0.05)	-2.19
445	D97	33		0.61	1648	ISO3016	27		-1.25
447	D97	30		-0.32	1681	ISO3016	30		-0.32
463		-----		-----	1720	D97	30		-0.32
507		-----		-----	1724	ISO3016	30		-0.32
541		-----		-----	1740	D97	27		-1.25
551		-----		-----	1741		-----		-----
558		-----		-----	1796	D97	33		0.61
575		-----		-----	1810		-----		-----
610		-----		-----	1811		-----		-----
621		-----		-----	1854		28.5		-0.79
631	D97	30		-0.32	1881	ISO3016	30		-0.32
633		-----		-----	1949	ISO3016	30		-0.32
634	D97	24	R(0.05)	-2.19	1950	ISO3016	30		-0.32
657		-----		-----	1986	ISO3016	33		0.61
704	D97	33		0.61	1995		-----		-----
732	D97	33		0.61	2129	ISO3016	30		-0.32
753	ISO3016	33		0.61	6024	ISO3016	33		0.61
778	ISO3016	30		-0.32	6025	D97	33.0		0.61
781	ISO3016	30		-0.32	6049	ISO3016	30		-0.32
785	ISO3016	30		-0.32	6051		-----		-----
798		-----		-----	6054		-----		-----
823	ISO3016	30		-0.32	6075		-----		-----
824	ISO3016	33		0.61	6092		-----		-----
825	ISO3016	33		0.61	6112		-----		-----
840	D97	30		-0.32	6142		-----		-----
872	ISO3016	30		-0.32	6201	ISO3016	33		0.61
873	ISO3016	30		-0.32	6203	ISO3016	30		-0.32
874	ISO3016	30		-0.32	6223		-----		-----
875	D97	30		-0.32	6257		-----		-----
887		-----		-----	6262	D97	33		0.61
902	ISO3016	33		0.61	6289	D97	33		0.61
904	ISO3016	33		0.61	6298	D97	30		-0.32
913		-----		-----					

normality	OK
n	79
outliers	4 (+1 ex)
mean (n)	31.03
st.dev. (n)	1.869
R(calc.)	5.23
st.dev.(ISO3016:19)	3.214
R(ISO3016:19)	9

Lab 230 test result excluded as PP lower > PP upper, which is in principle not possible
Lab 273 first reported 12



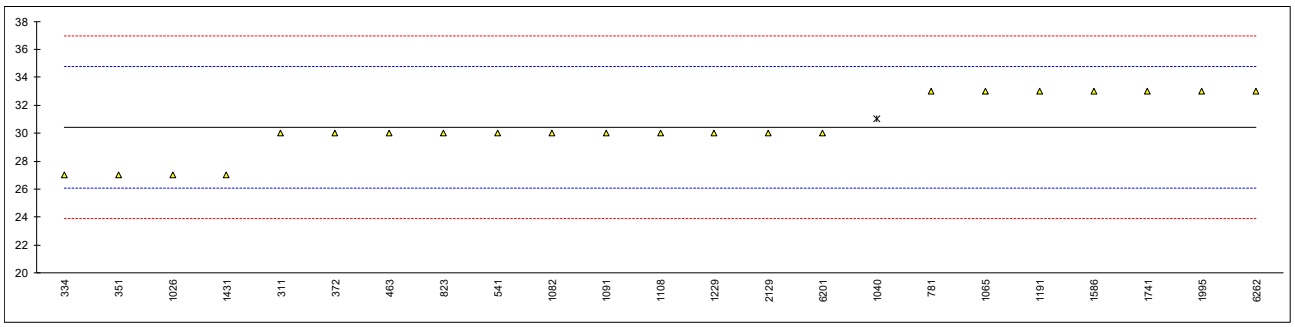


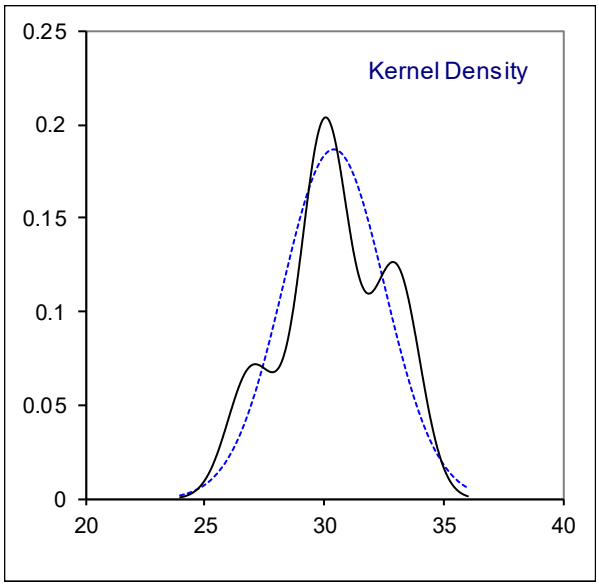
Determination of Pour Point, Automated, 3°C interval on sample #19275; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	962		-----		-----
120		-----		-----	963		-----		-----
140		-----		-----	971		-----		-----
150		-----		-----	974		-----		-----
159		-----		-----	994		-----		-----
168		-----		-----	995		-----		-----
169		-----		-----	996		-----		-----
170		-----		-----	997		-----		-----
171		-----		-----	1026	D5950	27		-1.56
175		-----		-----	1040	ISO3016	31.0	ex	0.27
194		-----		-----	1065	D5950	33		1.19
212		-----		-----	1082	D5950	30		-0.19
225		-----		-----	1090		-----		-----
230		-----		-----	1091	D5950	30		-0.19
237		-----		-----	1108	D5950	30		-0.19
238		-----		-----	1109		-----		-----
253		-----		-----	1121		-----		-----
256		-----		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311	D5950	30		-0.19	1191	D5950	33		1.19
313		-----		-----	1205		-----		-----
323		-----		-----	1213		-----		-----
333		-----		-----	1229	D5950	30		-0.19
334	D5950	27		-1.56	1299		-----		-----
336		-----		-----	1320		-----		-----
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381		-----		-----
349		-----		-----	1397		-----		-----
351	D6749	27.0		-1.56	1402		-----		-----
356		-----		-----	1431	D5950	27		-1.56
360		-----		-----	1554		-----		-----
370		-----		-----	1585		-----		-----
372	D5950	30		-0.19	1586	D5950	33		1.19
381		-----		-----	1636		-----		-----
445		-----		-----	1648		-----		-----
447		-----		-----	1681		-----		-----
463	D6892	30		-0.19	1720		-----		-----
507		-----		-----	1724		-----		-----
541	D5950	30		-0.19	1740		-----		-----
551		-----		-----	1741	D5950	33		1.19
558		-----		-----	1796		-----		-----
575		-----		-----	1810		-----		-----
610		-----		-----	1811		-----		-----
621		-----		-----	1854		-----		-----
631		-----		-----	1881		-----		-----
633		-----		-----	1949		-----		-----
634		-----		-----	1950		-----		-----
657		-----		-----	1986		-----		-----
704		-----		-----	1995	D5950	33		1.19
732		-----		-----	2129	D5950	30		-0.19
753		-----		-----	6024		-----		-----
778		-----		-----	6025		-----		-----
781	D5950	33		1.19	6049		-----		-----
785		-----		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823	D5950	30		-0.19	6075		-----		-----
824		-----		-----	6092		-----		-----
825		-----		-----	6112		-----		-----
840		-----		-----	6142		-----		-----
872		-----		-----	6201	D5950	30		-0.19
873		-----		-----	6203		-----		-----
874		-----		-----	6223		-----		-----
875		-----		-----	6257		-----		-----
887		-----		-----	6262	D5950	33		1.19
902		-----		-----	6289		-----		-----
904		-----		-----	6298		-----		-----
913		-----		-----					

normality	OK
n	22
	0 (+1
outliers	ex)
mean (n)	30.41
st.dev. (n)	2.130
R(calc.)	5.97
st.dev.(D5950:14)	2.179
R(D5950:14)	6.1

Lab 1040 test results excluded, manual method

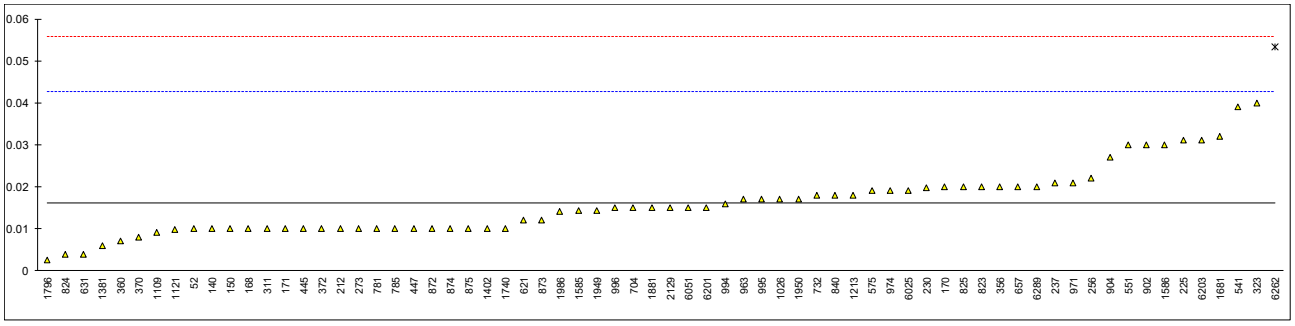


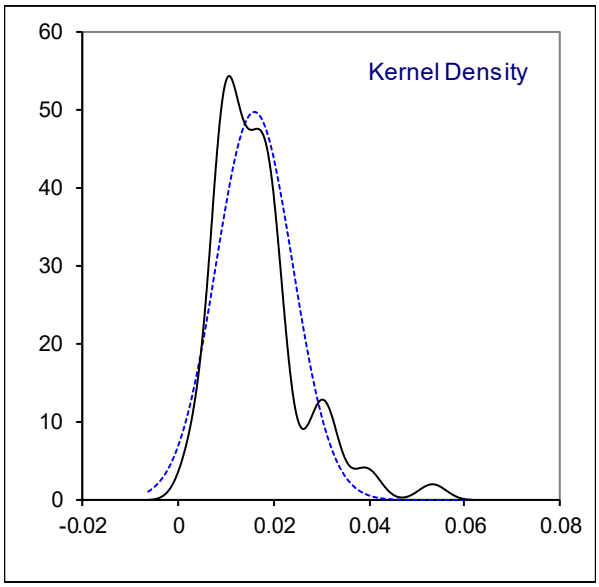


Determination of Sediment by Extraction on sample #19275; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D473	0.01		-0.46	962		-----		-----
120		-----		-----	963	D473	0.017		0.07
140	D473	0.01		-0.46	971	D473	0.021		0.37
150	D473	0.01		-0.46	974	D473	0.019		0.22
159		-----		-----	994	D473	0.016		0.00
168	D473	0.01		-0.46	995	D473	0.017		0.07
169		-----		-----	996	D473	0.01499		-0.08
170	D473	0.0199		0.29	997		-----		-----
171	D473	0.01		-0.46	1026		0.017		0.07
175		-----		-----	1040		-----		-----
194		-----		-----	1065		-----		-----
212	D473	0.01		-0.46	1082		-----		-----
225	D473	0.031		1.13	1090		-----		-----
230	D473	0.0197		0.28	1091		-----		-----
237	D473	0.021		0.37	1108		-----		-----
238		-----		-----	1109	D473	0.009		-0.53
253		-----		-----	1121	D473	0.0099		-0.46
256	D473	0.022		0.45	1126		-----		-----
273	D473	0.01		-0.46	1134		-----		-----
309		-----		-----	1161		-----		-----
311	D473	0.01		-0.46	1191		-----		-----
313		-----		-----	1205		-----		-----
323	D473	0.04		1.81	1213	D473	0.018		0.15
333		-----		-----	1229		-----		-----
334		-----		-----	1299		-----		-----
336		-----		-----	1320		-----		-----
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381	ISO3735	0.006		-0.76
349		-----		-----	1397		-----		-----
351		-----		-----	1402		0.01		-0.46
356	D473	0.02		0.30	1431		-----		-----
360	D473	0.007		-0.68	1554		-----		-----
370	D473	0.008		-0.61	1585	D473	0.0144		-0.13
372	D473	0.01		-0.46	1586	D473	0.03		1.05
381		-----		-----	1636		-----		-----
445	D473	0.01		-0.46	1648		-----		-----
447	D473	0.01		-0.46	1681	D473	0.032		1.20
463		-----		-----	1720		-----		-----
507		-----		-----	1724		-----		-----
541	D473	0.039		1.73	1740	D473	0.01		-0.46
551	D473	0.03		1.05	1741		-----		-----
558		-----		-----	1796	D473	0.0025		-1.02
575	D473	0.019		0.22	1810		-----		-----
610		-----		-----	1811		-----		-----
621	D473	0.012		-0.31	1854		-----		-----
631	D473	0.004		-0.91	1881	D473	0.015		-0.08
633		-----		-----	1949	D473	0.0144		-0.13
634		-----		-----	1950	D473	0.017		0.07
657	D473	0.02		0.30	1986	D473	0.014		-0.16
704	D473	0.015		-0.08	1995		-----		-----
732	ISO3735	0.018		0.15	2129	D473	0.015		-0.08
753		-----		-----	6024		-----		-----
778		-----		-----	6025	D473	0.019		0.22
781	D473	0.01		-0.46	6049		-----		-----
785	D473	0.01		-0.46	6051	D473	0.015		-0.08
798		-----		-----	6054		-----		-----
823	D473	0.02		0.30	6075		-----		-----
824	D473	0.004		-0.91	6092		-----		-----
825	D473	0.02		0.30	6112		-----		-----
840	D473	0.018		0.15	6142		-----		-----
872	D473	0.010		-0.46	6201	D473	0.015		-0.08
873	D473	0.012		-0.31	6203	D473	0.031		1.13
874	D473	0.01		-0.46	6223		-----		-----
875	D473	0.01		-0.46	6257		-----		-----
887		-----		-----	6262	D473	0.0533	R(0.01)	2.81
902	D473	0.03		1.05	6289	D473	0.02		0.30
904	D473	0.027		0.83	6298		-----		-----
913		-----		-----					

normality	suspect
n	67
outliers	1
mean (n)	0.0161
st.dev. (n)	0.00803
R(calc.)	0.0225
st.dev.(D473:07e1)	0.01325
R(D473:07e1)	0.0371

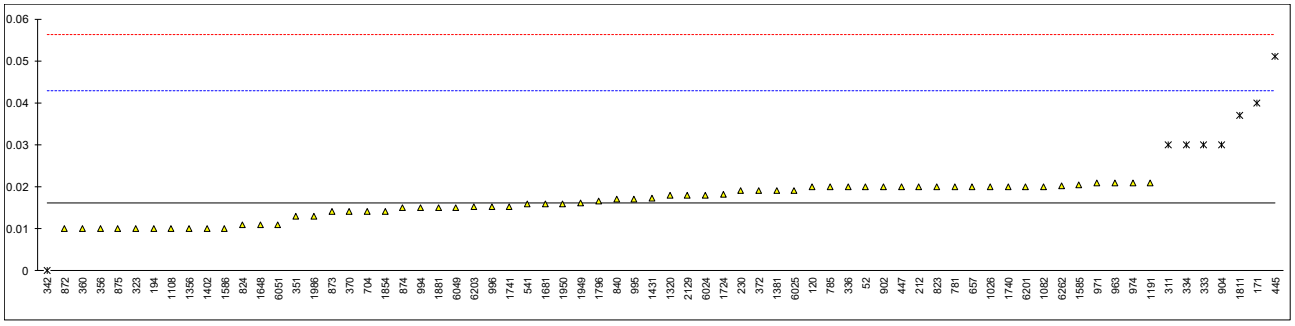


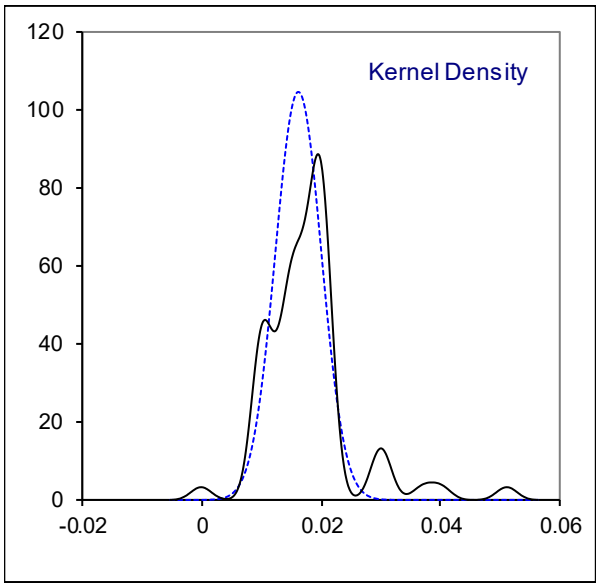


Determination of Total Sediment Existent (TSE) of sample #19275; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4870	0.02		0.28	962		-----		-----
120	D4870	0.02		0.28	963	IP375	0.021		0.36
140		-----		-----	971	IP375	0.021		0.36
150		-----		-----	974	IP375	0.021		0.36
159		-----		-----	994	IP375	0.015		-0.09
168		-----		-----	995	IP375	0.017		0.06
169		-----		-----	996	D4870	0.01517		-0.08
170		-----		-----	997		-----		-----
171	IP375	0.04	R(0.01)	1.78	1026		0.02		0.28
175		-----		-----	1040	ISO10307-1	<0,01		-----
194	ISO10307-1	0.01		-0.47	1065		-----		-----
212	ISO10307-1	0.02		0.28	1082	ISO10307-1	0.0201		0.29
225		-----		-----	1090		-----		-----
230	ISO10307-1	0.019		0.21	1091		-----		-----
237		-----		-----	1108	ISO10307-1	0.01		-0.47
238		-----		-----	1109		-----		-----
253		-----		-----	1121	IP375	<0.01		-----
256		-----		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO10307-1	0.03	R(0.05)	1.03	1191	ISO10307-1	0.021		0.36
313		-----		-----	1205		-----		-----
323	IP375	0.01		-0.47	1213		-----		-----
333	ISO10307-1	0.03	R(0.05)	1.03	1229		-----		-----
334	ISO10307-1	0.03	R(0.05)	1.03	1299		-----		-----
336	IP375	0.02		0.28	1320	D4870	0.018		0.13
337		-----		-----	1356	ISO10307-1	0.01		-0.47
339		-----		-----	1367	IP375	<0.01		-----
342	IP375	0.00	R(0.01)	-1.21	1381	ISO10307-1	0.019		0.21
349		-----		-----	1397		-----		-----
351	ISO10307-1	0.0130		-0.24	1402	IP375	0.01		-0.47
356	IP375	0.01		-0.47	1431	D4870	0.01737		0.09
360	ISO10307-1	0.010		-0.47	1554		-----		-----
370	ISO10307-1	0.014		-0.17	1585	IP375	0.0205		0.32
372	IP375	0.019		0.21	1586	IP375	0.01		-0.47
381		-----		-----	1636		-----		-----
445	IP375	0.051	R(0.01)	2.60	1648	ISO10307-1	0.011		-0.39
447	IP375	0.02		0.28	1681	ISO10307-1	0.016		-0.02
463		-----		-----	1720		-----		-----
507		-----		-----	1724	IP375	0.0182		0.15
541	D4870	0.016		-0.02	1740	D4870	0.02		0.28
551		-----		-----	1741	ISO10307-1	0.0153		-0.07
558		-----		-----	1796	ISO10307-1	0.0167		0.04
575		-----		-----	1810		-----		-----
610		-----		-----	1811	IP375	0.037	R(0.05)	1.55
621		-----		-----	1854		0.014		-0.17
631		-----		-----	1881	ISO10307-1	0.015		-0.09
633		-----		-----	1949	ISO10307-1	0.0161		-0.01
634		-----		-----	1950	IP375	0.016		-0.02
657	IP375	0.02		0.28	1986	IP375	0.013		-0.24
704	IP375	0.014		-0.17	1995		-----		-----
732		-----		-----	2129	IP375	0.018		0.13
753		-----		-----	6024	IP375	0.018		0.13
778		-----		-----	6025	IP375	0.019		0.21
781	IP375	0.02		0.28	6049	ISO10307-1	0.015		-0.09
785	IP375	0.02		0.28	6051	IP375	0.011		-0.39
798		-----		-----	6054		-----		-----
823	ISO10307-1	0.02		0.28	6075		-----		-----
824	ISO10307-1	0.011		-0.39	6092		-----		-----
825		-----		-----	6112		-----		-----
840	ISO10307-1	0.017		0.06	6142		-----		-----
872	IP375	0.010		-0.47	6201	ISO10307-1	0.02		0.28
873	IP375	0.014		-0.17	6203	ISO10307-1	0.01515		-0.08
874	IP375	0.015		-0.09	6223		-----		-----
875	IP375	0.01		-0.47	6257		-----		-----
887		-----		-----	6262	ISO10307-1	0.02033		0.31
902	ISO10307-1	0.02		0.28	6289		-----		-----
904	IP375	0.03	R(0.05)	1.03	6298		-----		-----
913		-----		-----					

normality	OK
n	62
outliers	8
mean (n)	0.0162
st.dev. (n)	0.00383
R(calc.)	0.0107
st.dev.(IP375:11)	0.01337
R(IP375:11)	0.0374

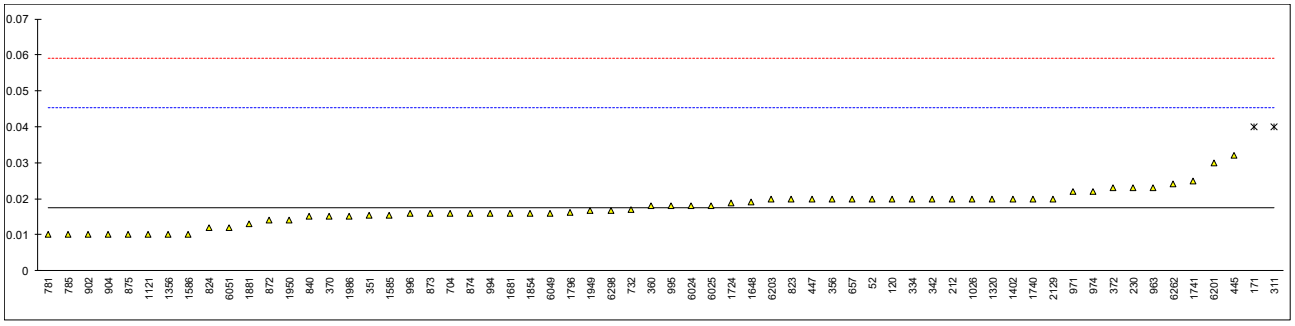


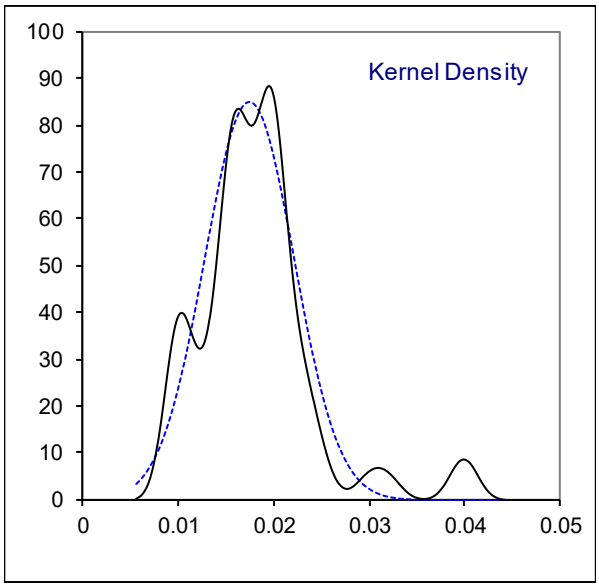


Determination of Total Sediment Accelerated (TSA) of sample #19275; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4870	0.02		0.18	962		-----		-----
120	D4870	0.02		0.18	963	IP390	0.023		0.40
140		-----		-----	971	IP390	0.022		0.33
150		-----		-----	974	IP390	0.022		0.33
159		-----		-----	994	IP390	0.016		-0.11
168		-----		-----	995	IP390	0.018		0.04
169		-----		-----	996	D4870	0.01595		-0.11
170		-----		-----	997		-----		-----
171	IP390	0.04	R(0.01)	1.62	1026		0.02		0.18
175		-----		-----	1040	ISO10307-2	<0,01		-----
194		-----		-----	1065		-----		-----
212	ISO10307-2	0.02		0.18	1082		-----		-----
225		-----		-----	1090		-----		-----
230	ISO10307-2	0.023		0.40	1091		-----		-----
237		-----		-----	1108		-----		-----
238		-----		-----	1109		-----		-----
253		-----		-----	1121	IP390	0.01		-0.54
256		-----		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO10307-2	0.04	R(0.01)	1.62	1191		-----		-----
313		-----		-----	1205		-----		-----
323		-----		-----	1213		-----		-----
333		-----		-----	1229		-----		-----
334	ISO10307-2	0.02		0.18	1299		-----		-----
336		-----		-----	1320	ISO10307-2	0.020		0.18
337		-----		-----	1356	ISO10307-2	0.01		-0.54
339		-----		-----	1367	IP390	<0.01		-----
342	IP390	0.02		0.18	1381		-----		-----
349		-----		-----	1397		-----		-----
351	ISO10307-2	0.0154		-0.15	1402	IP390	0.02		0.18
356	IP390	0.02		0.18	1431		-----		-----
360	ISO10307-2	0.018		0.04	1554		-----		-----
370	ISO10307-2	0.015		-0.18	1585	IP390	0.0154		-0.15
372	IP390	0.023		0.40	1586	IP390	0.01		-0.54
381		-----		-----	1636		-----		-----
445	IP390	0.032		1.05	1648	ISO10307-2	0.019		0.11
447	IP390	0.02		0.18	1681	ISO10307-2	0.016		-0.11
463		-----		-----	1720		-----		-----
507		-----		-----	1724	IP390	0.0187		0.09
541		-----		-----	1740	D4870	0.02		0.18
551		-----		-----	1741	ISO10307-2	0.025		0.54
558		-----		-----	1796	ISO10307-2	0.0161		-0.10
575		-----		-----	1810		-----		-----
610		-----		-----	1811		-----		-----
621		-----		-----	1854		0.016		-0.11
631		-----		-----	1881	ISO10307-2	0.013		-0.32
633		-----		-----	1949	ISO10307-2	0.0168		-0.05
634		-----		-----	1950	IP390	0.014		-0.25
657	IP390	0.02		0.18	1986	IP390	0.015		-0.18
704	IP390	0.016		-0.11	1995		-----		-----
732	D4870	0.017		-0.03	2129	IP390	0.020		0.18
753		-----		-----	6024	IP390	0.018		0.04
778		-----		-----	6025	IP390	0.018		0.04
781	IP390	0.01		-0.54	6049	ISO10307-2	0.016		-0.11
785	IP390	0.01		-0.54	6051	IP390	0.012		-0.40
798		-----		-----	6054		-----		-----
823	ISO10307-2	0.02		0.18	6075		-----		-----
824	ISO10307-2	0.012		-0.40	6092		-----		-----
825		-----		-----	6112		-----		-----
840	IP390	0.015		-0.18	6142		-----		-----
872	IP390	0.014		-0.25	6201	ISO10307-2	0.03		0.90
873	IP390	0.016		-0.11	6203	ISO10307-2	0.01986		0.17
874	IP390	0.016		-0.11	6223		-----		-----
875	IP390	0.01		-0.54	6257		-----		-----
887		-----		-----	6262	ISO10307-2	0.02409		0.48
902	ISO10307-2	0.01		-0.54	6289		-----		-----
904	IP390	0.01		-0.54	6298	ISO10307-2	0.0168		-0.05
913		-----		-----					

normality	OK
n	60
outliers	2
mean (n)	0.0175
st.dev. (n)	0.00469
R(calc.)	0.0131
st.dev.(IP390:11)	0.01388
R(IP390:11)	0.0389

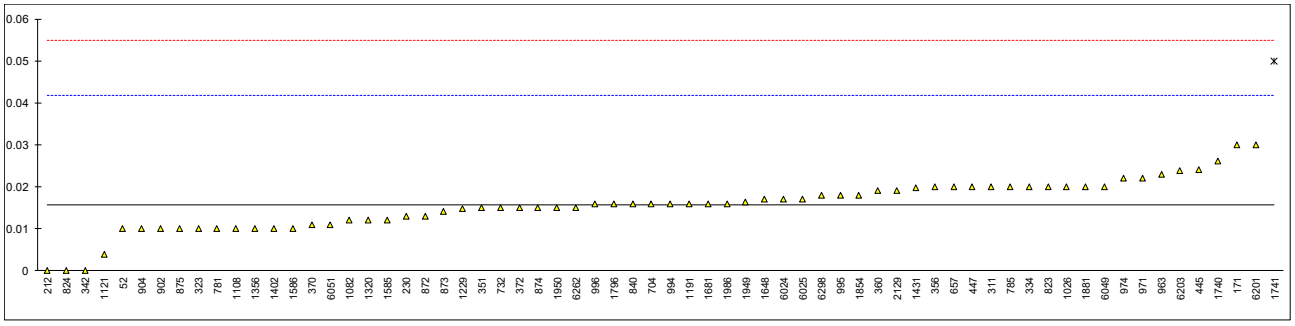


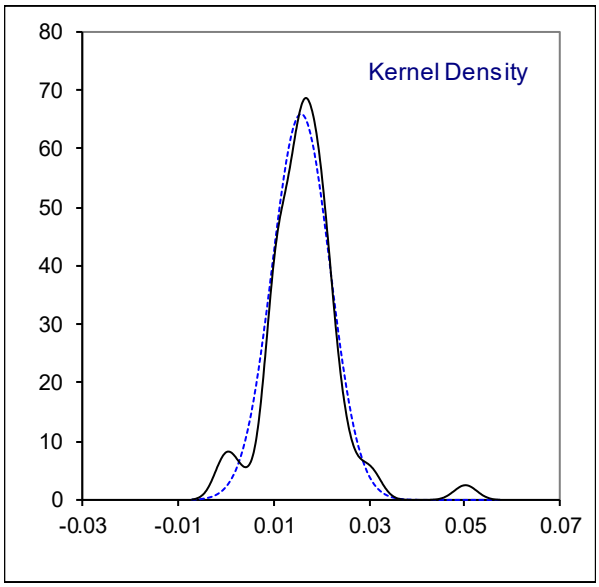


Determination of Total Sediment Potential (TSP) of sample #19275; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4870	0.01		-0.43	962		-----		-----
120		-----		-----	963	IP390	0.023		0.56
140		-----		-----	971	IP390	0.022		0.49
150		-----		-----	974	IP390	0.022		0.49
159		-----		-----	994	IP390	0.016		0.03
168		-----		-----	995	IP390	0.018		0.18
169		-----		-----	996	D4870	0.01585		0.02
170		-----		-----	997		-----		-----
171	IP390	0.03		1.10	1026		0.02		0.33
175		-----		-----	1040		-----		-----
194		-----		-----	1065		-----		-----
212	ISO10307-2	0.00		-1.19	1082	ISO10307-2	0.012		-0.27
225		-----		-----	1090		-----		-----
230	ISO10307-2	0.013		-0.20	1091		-----		-----
237		-----		-----	1108	ISO10307-2	0.01		-0.43
238		-----		-----	1109		-----		-----
253		-----		-----	1121	IP390	0.004		-0.88
256		-----		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311	ISO10307-2	0.02		0.33	1191	ISO10307-2	0.016		0.03
313		-----		-----	1205		-----		-----
323	IP390	0.01		-0.43	1213		-----		-----
333		-----		-----	1229	ISO10307-2	0.0148		-0.06
334	ISO10307-2	0.02		0.33	1299		-----		-----
336		-----		-----	1320	ISO10307-2	0.012		-0.27
337		-----		-----	1356	ISO10307-2	0.010		-0.43
339		-----		-----	1367	IP390	<0.01		-----
342	IP390	0.00		-1.19	1381		-----		-----
349		-----		-----	1397		-----		-----
351	ISO10307-2	0.0149		-0.05	1402	IP390	0.01		-0.43
356	IP390	0.02		0.33	1431	D4870	0.01984		0.32
360	ISO10307-2	0.019		0.26	1554		-----		-----
370	ISO10307-2	0.011		-0.35	1585	IP390	0.012		-0.27
372	IP390	0.015		-0.05	1586	IP390	0.01		-0.43
381		-----		-----	1636		-----		-----
445	IP390	0.024		0.64	1648	ISO10307-2	0.017		0.11
447	IP390	0.02		0.33	1681	ISO10307-2	0.016		0.03
463		-----		-----	1720		-----		-----
507		-----		-----	1724		-----		-----
541		-----		-----	1740	D4870	0.026		0.79
551		-----		-----	1741	ISO10307-2	0.050	R(0.01)	2.62
558		-----		-----	1796	ISO10307-2	0.0159		0.02
575		-----		-----	1810		-----		-----
610		-----		-----	1811		-----		-----
621		-----		-----	1854		0.018		0.18
631		-----		-----	1881	ISO10307-2	0.020		0.33
633		-----		-----	1949	ISO10307-2	0.0164		0.06
634		-----		-----	1950	IP390	0.015		-0.05
657	IP390	0.02		0.33	1986	IP390	0.016		0.03
704	IP390	0.016		0.03	1995		-----		-----
732	D4870	0.015		-0.05	2129	IP390	0.019		0.26
753		-----		-----	6024	IP390	0.017		0.11
778		-----		-----	6025	IP390	0.017		0.11
781	IP390	0.01		-0.43	6049	ISO10307-2	0.020		0.33
785	IP390	0.02		0.33	6051	IP390	0.011		-0.35
798		-----		-----	6054		-----		-----
823	ISO10307-2	0.02		0.33	6075		-----		-----
824	ISO10307-2	0		-1.19	6092		-----		-----
825		-----		-----	6112		-----		-----
840	IP390	0.016		0.03	6142		-----		-----
872	IP390	0.013		-0.20	6201	ISO10307-2	0.03		1.10
873	IP390	0.014		-0.12	6203	ISO10307-2	0.0238		0.62
874	IP390	0.015		-0.05	6223		-----		-----
875	IP390	0.01		-0.43	6257		-----		-----
887		-----		-----	6262	ISO10307-2	0.01501		-0.05
902	ISO10307-2	0.01		-0.43	6289		-----		-----
904	IP390	0.01		-0.43	6298	ISO10307-2	0.0179		0.17
913		-----		-----					

normality	suspect
n	65
outliers	1
mean (n)	0.0156
st.dev. (n)	0.00604
R(calc.)	0.0169
st.dev.(IP390:11)	0.01312
R(IP390:11)	0.0367

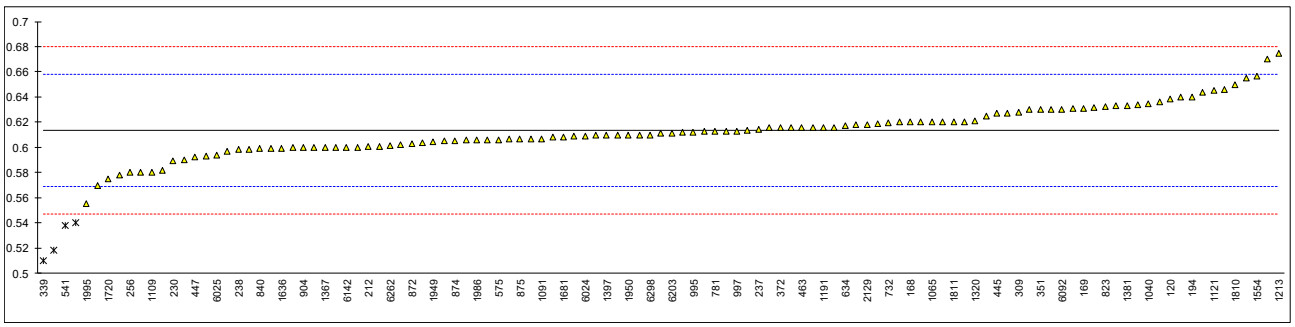


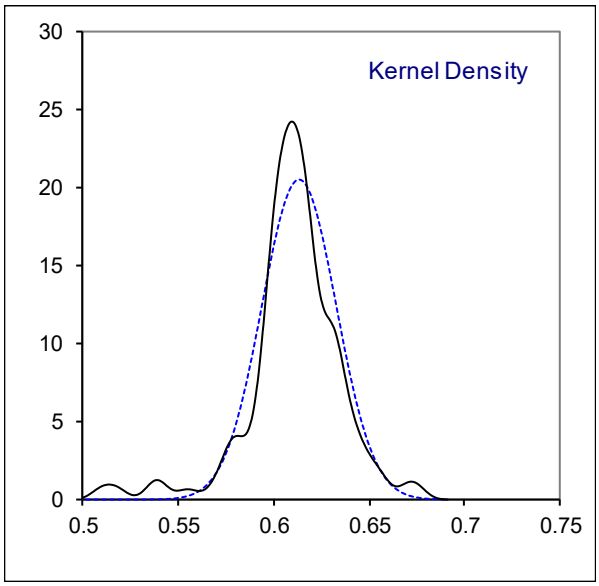


Determination of Total Sulfur on sample #19275; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4294	0.616		0.11	962		-----		-----
120	D4294	0.63828		1.12	963	ISO8754	0.602		-0.52
140		-----		-----	971	ISO8754	0.613		-0.02
150	D4294	0.644		1.38	974	D4294	0.619		0.25
159		-----		-----	994	D4294	0.620		0.29
168	D4294	0.620		0.29	995	ISO8754	0.612		-0.07
169	D4294	0.631		0.79	996	D4294	0.6157		0.10
170	D4294	0.6365		1.04	997	D4294	0.613		-0.02
171	D4294	0.634		0.93	1026	D2622	0.60		-0.61
175		-----		-----	1040	ISO8754	0.635		0.97
194	D4294	0.64		1.20	1065	D4294	0.62		0.29
212	ISO8754	0.601		-0.56	1082	ISO8754	0.598		-0.70
225		-----		-----	1090		-----		-----
230	ISO8754	0.589		-1.11	1091	D2622	0.607		-0.29
237	D4294	0.614		0.02	1108	ISO8754	0.646		1.47
238	D4294	0.598		-0.70	1109	D4294	0.58		-1.51
253	D4294	0.655		1.88	1121	ISO8754	0.645		1.42
256	D5453	0.58		-1.51	1126	ISO8754	0.54	R(0.05)	-3.32
273	D4294	0.67		2.55	1134		-----		-----
309	ISO8754	0.628		0.66	1161		-----		-----
311	ISO8754	0.62		0.29	1191	ISO8754	0.616		0.11
313	ISO8754	0.60		-0.61	1205	ISO14596	0.627		0.61
323	ISO8754	0.58		-1.51	1213	D4294	0.675		2.78
333	D4294	0.597		-0.74	1229	ISO8754	0.593		-0.92
334	ISO8754	0.582		-1.42	1299	ISO8754	0.618		0.20
336	D4294	0.61		-0.16	1320	ISO8754	0.621		0.34
337	D2622	0.599		-0.65	1356		-----		-----
339	INH-048	0.51	R(0.01)	-4.67	1367	IP336	0.6		-0.61
342	ISO8754	0.633		0.88	1381	ISO8754	0.633		0.88
349		-----		-----	1397	D2622	0.610		-0.16
351	ISO8754	0.630		0.75	1402	IP336	0.6314		0.81
356	ISO8754	0.57		-1.96	1431	D4294	0.518	R(0.01)	-4.31
360	D4294	0.609		-0.20	1554	ISO8754	0.6564		1.94
370	ISO8754	0.64		1.20	1585	D4294	0.601		-0.56
372	ISO8754	0.616		0.11	1586	D4294	0.630		0.75
381		-----		-----	1636	ISO8754	0.599		-0.65
445	IP336	0.627		0.61	1648	ISO8754	0.608		-0.25
447	IP336	0.592		-0.97	1681	ISO8754	0.608		-0.25
463	ISO8754	0.616		0.11	1720	D4294	0.575		-1.74
507		-----		-----	1724	ISO8754	0.610		-0.16
541	D4294	0.5380	R(0.05)	-3.41	1740	D4294	0.62		0.29
551		-----		-----	1741	ISO8754	0.606		-0.34
558		-----		-----	1796	ISO8754	0.60		-0.61
575	D4294	0.6063		-0.32	1810	D4294	0.65		1.65
610		-----		-----	1811	ISO8754	0.62		0.29
621	D4294	0.611		-0.11	1854		0.62		0.29
631	D4294	0.6049		-0.39	1881	ISO8754	0.590		-1.06
633		-----		-----	1949	D4294	0.6046		-0.40
634	D4294	0.617		0.16	1950	ISO8754	0.610		-0.16
657	D4294	0.613		-0.02	1986	ISO8754	0.606		-0.34
704	D4294	0.6161		0.12	1995	D4294	0.5552		-2.63
732	D4294	0.6195		0.27	2129	ISO8754	0.618		0.20
753	ISO8754	0.612		-0.07	6024	D4294	0.609		-0.20
778	ISO8754	0.616		0.11	6025	D4294	0.594		-0.88
781	ISO8754	0.613		-0.02	6049	ISO8754	0.61		-0.16
785	ISO8754	0.631		0.79	6051	D4294	0.606		-0.34
798		-----		-----	6054		-----		-----
823	ISO8754	0.632		0.84	6075	ISO8754	0.604		-0.43
824	ISO8754	0.61372		0.01	6092	D4294	0.63		0.75
825	ISO8754	0.63		0.75	6112		-----		-----
840	D4294	0.5989		-0.66	6142	ISO8754	0.60		-0.61
872	D4294	0.603		-0.47	6201	ISO8754	0.60		-0.61
873	D4294	0.607		-0.29	6203	ISO8754	0.611		-0.11
874	D4294	0.605		-0.38	6223		-----		-----
875	ISO8754	0.607		-0.29	6257	ISO8754	0.5783		-1.59
887		-----		-----	6262	ISO8754	0.6017		-0.53
902	ISO8754	0.607		-0.29	6289	D4294	0.625		0.52
904	D4294	0.60		-0.61	6298	D4294	0.61		-0.16
913		-----		-----					

		D4294 only	ISO8754/IP336 only
normality	suspect	suspect	OK
n	111	48	57
outliers	4	1	2
mean (n)	0.6135	0.6156	0.6120
st.dev. (n)	0.01946	0.02231	0.01756
R(calc.)	0.0545	0.0625	0.0492
st.dev.(ISO8754:03)	0.02214	---	0.02210
R(ISO8754:03)	0.0620	---	0.0619
compare			
R(D4294:16e1)	0.0530	0.0622	---

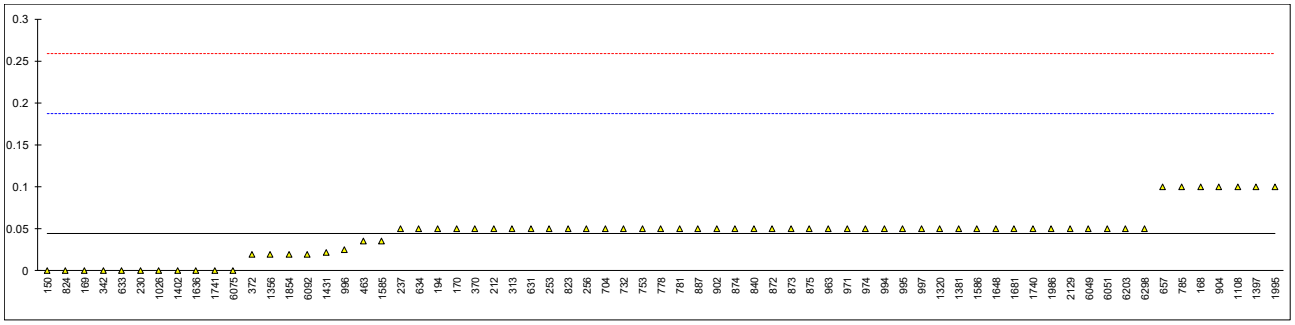


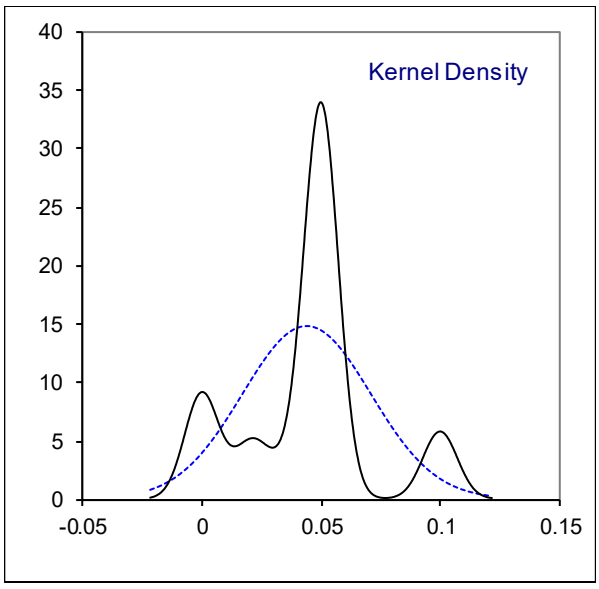


Determination of Water by Distillation on sample #19275; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D95	<0.05		-----	962		-----		-----
120	D95	<0.05		-----	963	ISO3733	0.05		0.08
140		-----		-----	971	D95	0.05		0.08
150	D95	0.00		-0.62	974	D95	0.05		0.08
159		-----		-----	994	D95	0.05		0.08
168	D95	0.10		0.78	995	ISO3733	0.05		0.08
169	D95	0.00		-0.62	996	D95	0.025		-0.27
170	D95	0.05		0.08	997	D95	0.05		0.08
171		-----		-----	1026	D95	0.00		-0.62
175		-----		-----	1040		-----		-----
194	D95	0.05		0.08	1065		-----		-----
212	ISO3733	0.05		0.08	1082		-----		-----
225	D95	<0.05		-----	1090		-----		-----
230	ISO3733	0.00		-0.62	1091		-----		-----
237	D95	0.05		0.08	1108	ISO3733	0.10		0.78
238		-----		-----	1109	D95	<0.05		-----
253	D95	0.05		0.08	1121	ISO3733	<0.05		-----
256	D95	0.05		0.08	1126		-----		-----
273	D95	<0.05		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311		-----		-----	1191		-----		-----
313	D95	0.05		0.08	1205		-----		-----
323	ISO3733	<0.05		-----	1213	D95	<0.1		-----
333	D95	<0.05		-----	1229		-----		-----
334		-----		-----	1299	D95	<0.1		-----
336		-----		-----	1320		0.05		0.08
337	D95	< 0.1		-----	1356	D6304-A	0.02		-0.34
339		-----		-----	1367	D95	<0.05		-----
342	ISO3733	0.00		-0.62	1381	ISO3733	0.05		0.08
349	D95	<0,1		-----	1397	ISO3733	0.1		0.78
351	ISO3733	<0.05		-----	1402	IP74	0.00		-0.62
356	ISO3733	< 0.05		-----	1431	D95	0.0216		-0.31
360	D95	< 0.05		-----	1554	ISO3733	absence		-----
370	D95	0.05		0.08	1585	D95	0.035		-0.13
372	ISO3733	0.02		-0.34	1586	D95	0.05		0.08
381		-----		-----	1636	ISO3733	0.0		-0.62
445	D95	<0.05		-----	1648	ISO3733	0.05		0.08
447	D95	<0.1		-----	1681	ISO3733	0.05		0.08
463	ISO3733	0.035		-0.13	1720		-----		-----
507		-----		-----	1724	D95	<0,05		-----
541	D95	<0.05		-----	1740	D95	0.05		0.08
551		-----		-----	1741	ISO3733	0		-0.62
558		-----		-----	1796	D95	< 0.05		-----
575	D95	<0.05		-----	1810		-----		-----
610		-----		-----	1811		-----		-----
621	D95	<0.05		-----	1854		0.02		-0.34
631	D95	0.05		0.08	1881	ISO3733	<0.05		-----
633	D95	0		-0.62	1949	ISO3733	<0.05		-----
634	D95	0.05		0.08	1950	ISO3733	<0.05		-----
657	D95	0.10		0.78	1986	ISO3733	0.05		0.08
704	D95	0.05		0.08	1995	D95	0.1		0.78
732	ISO3733	0.05		0.08	2129	ISO3733	0.05		0.08
753	ISO3733	0.05		0.08	6024	D95	< 0.05		-----
778	ISO3733	0.05		0.08	6025	D95	<0.05		-----
781	ISO3733	0.05		0.08	6049	ISO3733	0.05		0.08
785	ISO3733	0.10		0.78	6051	D95	0.05		0.08
798		-----		-----	6054		-----		-----
823	ISO3733	0.05		0.08	6075	ISO3733	0.0		-0.62
824	ISO3733	0		-0.62	6092	D95	0.02		-0.34
825	ISO3733	L0.05		-----	6112		-----		-----
840	D95	0.05		0.08	6142		-----		-----
872	D95	0.05		0.08	6201	ISO3733	<0.1		-----
873	D95	0.05		0.08	6203	D95	0.05		0.08
874	D95	0.05		0.08	6223		-----		-----
875	ISO3733	0.05		0.08	6257		-----		-----
887	D95	0.05		0.08	6262	ISO3733	<0.1		-----
902	ISO3733	0.05		0.08	6289		-----		-----
904	ISO3733	0.10		0.78	6298	D95	0.05		0.08
913		-----		-----					

normality	OK
n	67
outliers	0
mean (n)	0.0440
st.dev. (n)	0.02698
R(calc.)	0.0756
st.dev.(ISO3733:99)	0.07143
R(ISO3733:99)	0.2
compare	
R(D95:13)	0.2



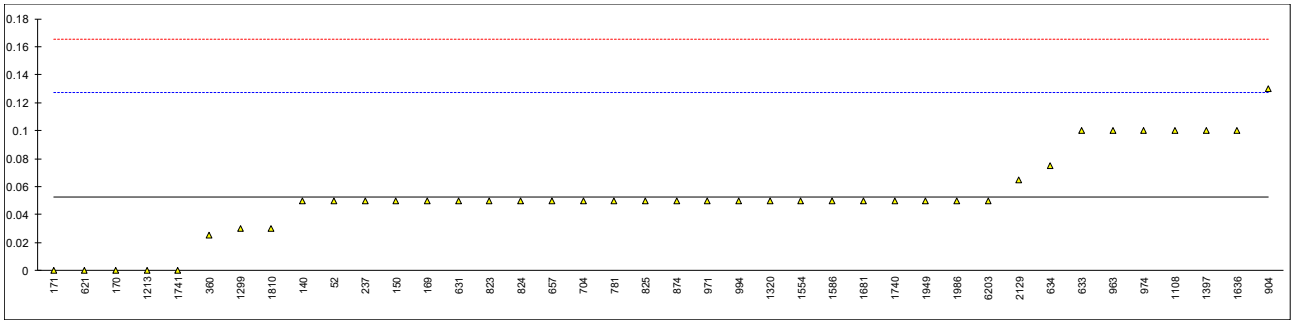


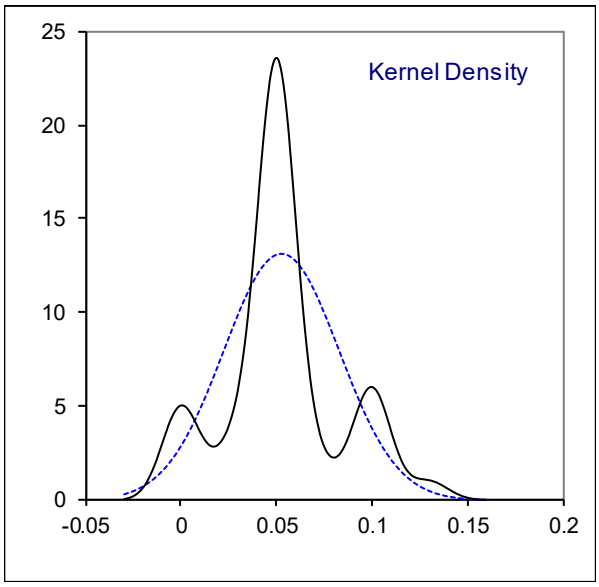
Determination of Water and Sediment on sample #19275; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D1796	0.05		-0.07	962		-----		-----
120	D1796	<0.05		-----	963	D1796	0.10		1.26
140	D1796	0.05		-0.07	971	D1796	0.05		-0.07
150	D1796	0.05		-0.07	974	D1796	0.10		1.26
159		-----		-----	994	D1796	0.05		-0.07
168		-----		-----	995		-----		-----
169	D1796	0.05		-0.07	996		-----		-----
170	D1796	0.00		-1.40	997		-----		-----
171	D1796	0.00		-1.40	1026		-----		-----
175		-----		-----	1040		-----		-----
194		-----		-----	1065		-----		-----
212		-----		-----	1082		-----		-----
225		-----		-----	1090		-----		-----
230		-----		-----	1091		-----		-----
237	D1796	0.05		-0.07	1108	D1796	0.10		1.26
238		-----		-----	1109		-----	W	-----
253		-----		-----	1121		-----		-----
256		-----		-----	1126		-----		-----
273		-----		-----	1134		-----		-----
309		-----		-----	1161		-----		-----
311		-----		-----	1191		-----		-----
313		-----		-----	1205		-----		-----
323		-----		-----	1213	D1796	0		-1.40
333		-----		-----	1229		-----		-----
334		-----		-----	1299	D1796	0.03		-0.60
336		-----		-----	1320	D1796	0.05		-0.07
337		-----		-----	1356		-----		-----
339		-----		-----	1367		-----		-----
342		-----		-----	1381		-----		-----
349		-----		-----	1397	ISO3734	0.1		1.26
351		-----		-----	1402		-----		-----
356		-----		-----	1431		-----		-----
360	D1796	0.025		-0.74	1554		0.05		-0.07
370		-----		-----	1585		-----		-----
372		-----		-----	1586	D1796	0.05		-0.07
381		-----		-----	1636	ISO3734	0.1		1.26
445	D1796	<0.025		-----	1648		-----		-----
447		-----		-----	1681	D1796	0.05		-0.07
463		-----		-----	1720		-----		-----
507		-----		-----	1724		-----		-----
541	D1796	<0.1		-----	1740	D1796	0.05		-0.07
551		-----		-----	1741	ISO3734	0		-1.40
558		-----		-----	1796		-----		-----
575		-----		-----	1810	ISO760	0.03		-0.60
610		-----		-----	1811		-----		-----
621	D1796	0.00		-1.40	1854		-----		-----
631	D1796	0.05		-0.07	1881		-----		-----
633	D1796	0.10		1.26	1949	D1796	0.050		-0.07
634	D1796	0.075		0.60	1950		-----		-----
657	D1796	0.05		-0.07	1986	D1796	0.05		-0.07
704	D1796	0.05		-0.07	1995		-----		-----
732		-----		-----	2129	Calculation	0.065		0.33
753		-----		-----	6024		-----		-----
778		-----		-----	6025		-----		-----
781	D1796	0.05		-0.07	6049		-----		-----
785		-----		-----	6051		-----		-----
798		-----		-----	6054		-----		-----
823	D1796	0.05		-0.07	6075		-----		-----
824	D1796	0.05		-0.07	6092		-----		-----
825	D1796	0.05		-0.07	6112		-----		-----
840		-----		-----	6142		-----		-----
872		-----		-----	6201		-----		-----
873		-----		-----	6203	D1796	0.05		-0.07
874	D1796	0.05		-0.07	6223		-----		-----
875		-----		-----	6257		-----		-----
887		-----		-----	6262		-----		-----
902		-----		-----	6289		-----		-----
904	D1796	0.13		2.06	6298		-----		-----
913		-----		-----					

normality	OK
n	40
outliers	0
mean (n)	0.0526
st.dev. (n)	0.03034
R(calc.)	0.0850
st.dev.(D1796:11)	0.03750
R(D1796:11)	0.1050

Lab 1109 first reported 0.3





Vacuum Distillation according to ASTM D1160 (as AET) on sample #19275, results in °C

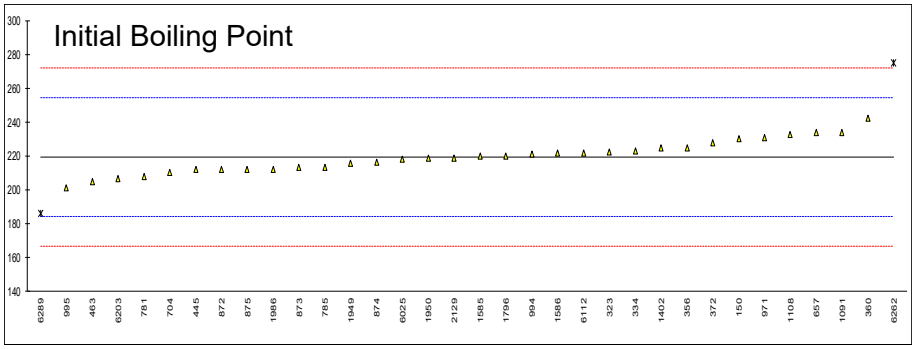
lab	method	IBP	5%rec	10%rec	20%rec	30%rec	40%rec	50%rec	FBP
52		-----	-----	-----	-----	-----	-----	-----	-----
120		-----	-----	-----	-----	-----	-----	-----	-----
140		-----	-----	-----	-----	-----	-----	-----	-----
150	D1160	230	319	388	422	438	461	504	524
159		-----	-----	-----	-----	-----	-----	-----	-----
168		-----	-----	-----	-----	-----	-----	-----	-----
169		-----	-----	-----	-----	-----	-----	-----	-----
170		-----	-----	-----	-----	-----	-----	-----	-----
171		-----	-----	-----	-----	-----	-----	-----	-----
175		-----	-----	-----	-----	-----	-----	-----	-----
194		-----	-----	-----	-----	-----	-----	-----	-----
212		-----	-----	-----	-----	-----	-----	-----	-----
225		-----	-----	-----	-----	-----	-----	-----	-----
230		-----	-----	-----	-----	-----	-----	-----	-----
237		-----	-----	-----	-----	-----	-----	-----	-----
238		-----	-----	-----	-----	-----	-----	-----	-----
253		-----	-----	-----	-----	-----	-----	-----	-----
256		-----	-----	-----	-----	-----	-----	-----	-----
273		-----	-----	-----	-----	-----	-----	-----	-----
309		-----	-----	-----	-----	-----	-----	-----	-----
311		-----	-----	-----	-----	-----	-----	-----	-----
313		-----	-----	-----	-----	-----	-----	-----	-----
323	D1160	222.5	309.5	375.0	410.0	430.0	454.5	505.0	519.5
333		-----	-----	-----	-----	-----	-----	-----	-----
334	D1160	223	322	395	426	446	-----	-----	458 (R1)
336		-----	-----	-----	-----	-----	-----	-----	-----
337		-----	-----	-----	-----	-----	-----	-----	-----
339		-----	-----	-----	-----	-----	-----	-----	-----
342		-----	-----	-----	-----	-----	-----	-----	-----
349		-----	-----	-----	-----	-----	-----	-----	-----
351		-----	-----	-----	-----	-----	-----	-----	-----
356	D1160	225	307	380	422	440	460	509	510
360	D1160	242	328	388	422	440	465	-----	520
370		-----	-----	-----	-----	-----	-----	-----	-----
372	D1160	228	306	383	413	430	454	-----	530
381		-----	-----	-----	-----	-----	-----	-----	-----
445	D1160	211.8	284.9	353.8	410.0	427.9	450.8	489.5	499.3
447		-----	-----	-----	-----	-----	-----	-----	-----
463	D1160	205.0	288.0	364.0	411.0	429.0	451.0	498.0	511.0
507		-----	-----	-----	-----	-----	-----	-----	-----
541		-----	-----	-----	-----	-----	-----	-----	-----
551		-----	-----	-----	-----	-----	-----	-----	-----
558		-----	-----	-----	-----	-----	-----	-----	-----
575		-----	-----	-----	-----	-----	-----	-----	-----
610		-----	-----	-----	-----	-----	-----	-----	-----
621		-----	-----	-----	-----	-----	-----	-----	-----
631		-----	-----	-----	-----	-----	-----	-----	-----
633		-----	-----	-----	-----	-----	-----	-----	-----
634		-----	-----	-----	-----	-----	-----	-----	-----
657	D1160	233.9	307.6	373.0	413.4	431.8	454.2	506.4	531.8
704	D1160	210.0	295.0	372.0	415.0	433.0	458.0	512.0	520.0
732		-----	-----	-----	-----	-----	-----	-----	-----
753		-----	-----	-----	-----	-----	-----	-----	-----
778		-----	-----	-----	-----	-----	-----	-----	-----
781	D1160	208	297	377	420	438	471	520	572 (R1)
785	D1160	213.2	299.1	383.0	415.9	430.9	453.7	515.1	565 (R1)
798		-----	-----	-----	-----	-----	-----	-----	-----
823		-----	-----	-----	-----	-----	-----	-----	-----
824		-----	-----	-----	-----	-----	-----	-----	-----
825		-----	-----	-----	-----	-----	-----	-----	-----
840		-----	-----	-----	-----	-----	-----	-----	-----
872	D1160	212	300	380	418	436	469	518	573 (R1)
873	D1160	213	301	382	420	437	468	518	575 (R1)
874	D1160	216	302	377	415	435	463	519	573 (R1)
875	D1160	212	303	381	419	437	469	519	572 (R1)
887		-----	-----	-----	-----	-----	-----	-----	-----
902		-----	-----	-----	-----	-----	-----	-----	-----
904		-----	-----	-----	-----	-----	-----	-----	-----
913		-----	-----	-----	-----	-----	-----	-----	-----

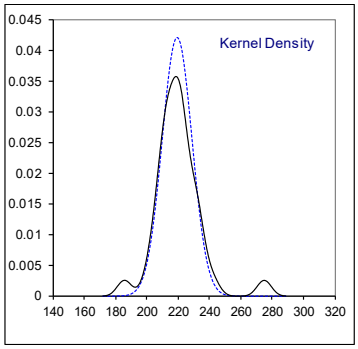
lab	method	IBP	5%rec	10%rec	20%rec	30%rec	40%rec	50%rec	FBP
962		-----	-----	-----	-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----	-----	-----	-----
971	D1160	231	318	379	419	436	459	510	513
974		-----	-----	-----	-----	-----	-----	-----	-----
994	D1160	221.0	301.0	379.0	415.0	439.0	460.0	514.0	520.0
995	D1160	201.0	303.0	370.5	413.0	437.0	455.0	511.0	522.0
996		-----	-----	-----	-----	-----	-----	-----	-----
997		-----	-----	-----	-----	-----	-----	-----	-----
1026		-----	-----	-----	-----	-----	-----	-----	-----
1040		-----	-----	-----	-----	-----	-----	-----	-----
1065		-----	-----	-----	-----	-----	-----	-----	-----
1082		-----	-----	-----	-----	-----	-----	-----	-----
1090		-----	-----	-----	-----	-----	-----	-----	-----
1091		234	325	380	417	434	456	510	540
1108	D1160	232.5	310.0	375.6	415.8	432.1	455.1	502.5	519.3
1109		-----	-----	-----	-----	-----	-----	-----	-----
1121		-----	-----	-----	-----	-----	-----	-----	-----
1126		-----	-----	-----	-----	-----	-----	-----	-----
1134		-----	-----	-----	-----	-----	-----	-----	-----
1161		-----	-----	-----	-----	-----	-----	-----	-----
1191		-----	-----	-----	-----	-----	-----	-----	-----
1205		-----	-----	-----	-----	-----	-----	-----	-----
1213		-----	-----	-----	-----	-----	-----	-----	-----
1229		-----	-----	-----	-----	-----	-----	-----	-----
1299		-----	-----	-----	-----	-----	-----	-----	-----
1320		-----	-----	-----	-----	-----	-----	-----	-----
1356		-----	-----	-----	-----	-----	-----	-----	-----
1367		-----	-----	-----	-----	-----	-----	-----	-----
1381		-----	-----	-----	-----	-----	-----	-----	-----
1397		-----	-----	-----	-----	-----	-----	-----	-----
1402	D1160	224.8	312.5	368.8	411.2	428.7	452.1	506.6	527.5
1431		-----	-----	-----	-----	-----	-----	-----	-----
1554		-----	-----	-----	-----	-----	-----	-----	-----
1585		220.0	307.5	374.0	419.0	437.0	459.0	505.0	513.0
1586	D1160	221.6	315.3	382.1	415.2	432.0	455.5	503.1	503.1
1636		-----	-----	-----	-----	-----	-----	-----	-----
1648		-----	-----	-----	-----	-----	-----	-----	-----
1681		-----	-----	-----	-----	-----	-----	-----	-----
1720		-----	-----	-----	-----	-----	-----	-----	-----
1724		-----	-----	-----	-----	-----	-----	-----	-----
1740		-----	-----	-----	-----	-----	-----	-----	-----
1741		-----	-----	-----	-----	-----	-----	-----	-----
1796	D1160	220	289	364	414	432	450	492 C	519
1810		-----	-----	-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----	-----	-----
1854		-----	-----	-----	-----	-----	-----	-----	-----
1881		-----	-----	-----	-----	-----	-----	-----	-----
1949	D1160	215.4	306.5	374.0	414.7	432.8	455.6	505.4	516.7
1950	D1160	219	300	374	419	435	454	500	512
1986	D1160	212	311	375	414	431	456	507	515
1995		-----	-----	-----	-----	-----	-----	-----	-----
2129	D1160	219	314	392	443 (C,R1)	469 (C,R1)	486 (C,R1)	522	530
6024		-----	-----	-----	-----	-----	-----	-----	-----
6025	D1160	218.0	310.0	372.0	419.0	430.0	460.0	499.0	520.0
6049		-----	-----	-----	-----	-----	-----	-----	-----
6051		-----	-----	-----	-----	-----	-----	-----	-----
6054		-----	-----	-----	-----	-----	-----	-----	-----
6075		-----	-----	-----	-----	-----	-----	-----	-----
6092		-----	-----	-----	-----	-----	-----	-----	-----
6112		221.8	305.5	376.8	418.0	435.1	458.5	505.0	512.8
6142		-----	-----	-----	-----	-----	-----	-----	-----
6201		-----	-----	-----	-----	-----	-----	-----	-----
6203	D1160	206.7	291.9	363.7	407.1	423.7	444.0	471.0 (R5)	473.5 (R1)
6223		-----	-----	-----	-----	-----	-----	-----	-----
6257		-----	-----	-----	-----	-----	-----	-----	-----
6262	D1160	274.8 (R1)	342.8 (R5)	390.7	420.8	436.0	462.5	-----	511
6289		186 (R5)	294	365	413	428	442	484	537
6298		-----	-----	-----	-----	-----	-----	-----	-----

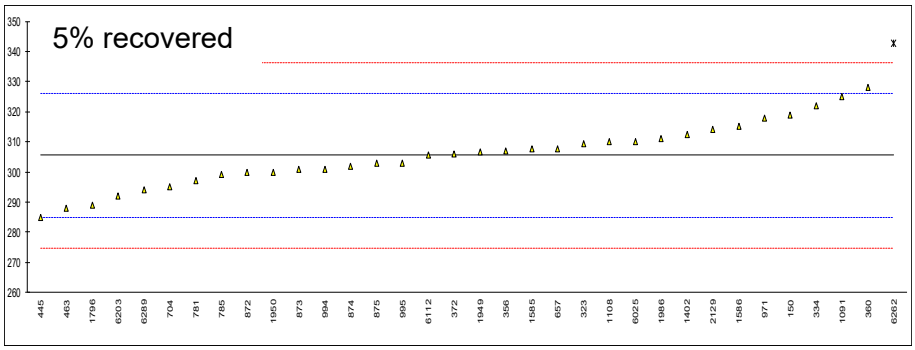
	IBP	5%rec	10%rec	20%rec	30%rec	40%rec	50%rec	FBP
normality	OK	OK	OK	OK	OK	OK	OK	OK
n	32	33	34	33	33	32	29	26
outliers	2	1	0	1	1	1	1	8
mean (n)	219.47	305.55	376.71	416.28	433.91	457.39	507.23	519.12
st.dev. (n)	9.470	10.432	8.807	4.187	4.479	6.679	9.285	9.616
R(calc.)	26.52	29.21	24.66	11.72	12.54	18.70	26.00	26.92
st.dev.(D1160:18)	17.500	10.257	7.529	5.109	4.463	5.655	6.411	9.643
R(D1160:18)	49	28.72	21.08	14.30	12.50	15.83	17.95	27

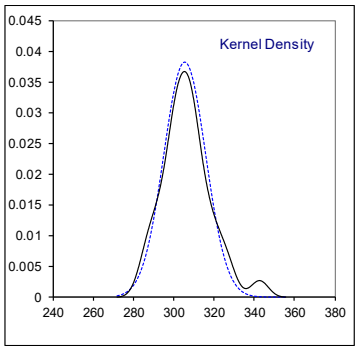
R1 and R5: respectively outlier and straggler in Rosner's outlier test

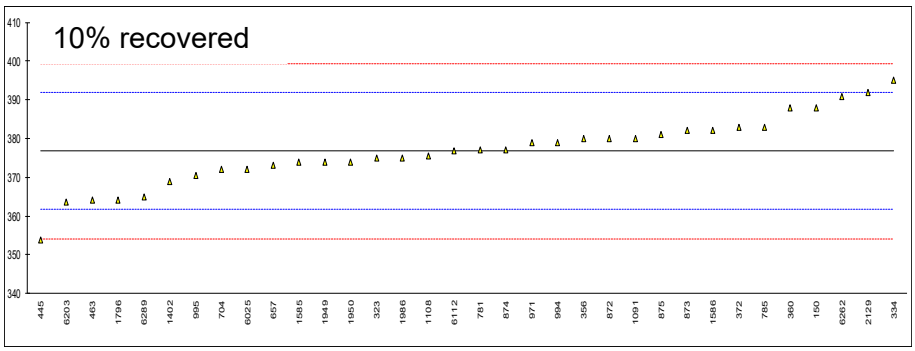
Lab 1796 first reported 482
Lab 2129 first reported 433, 460, 482 respectively

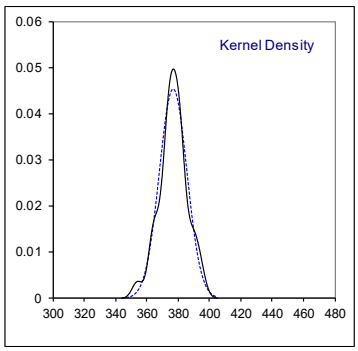


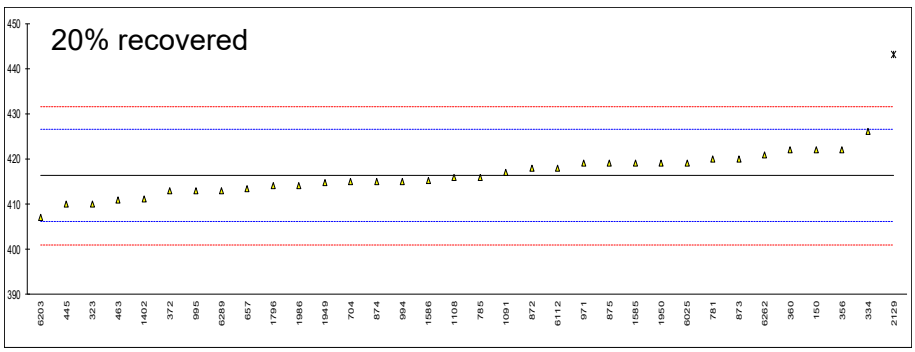


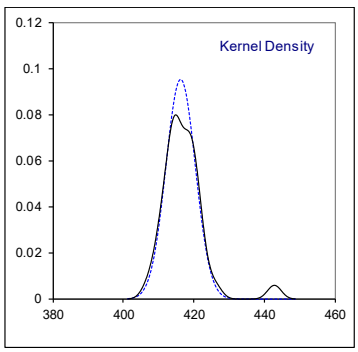


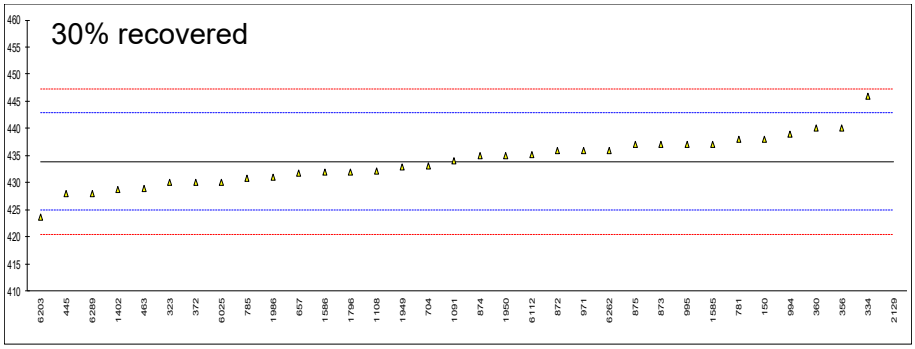


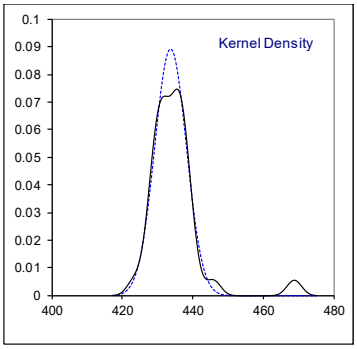


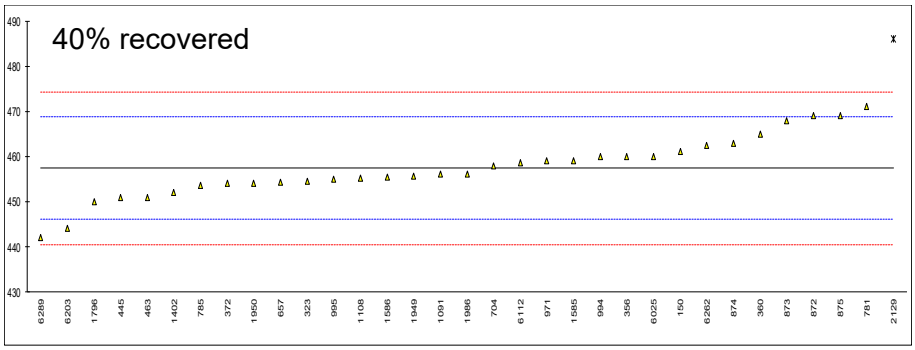


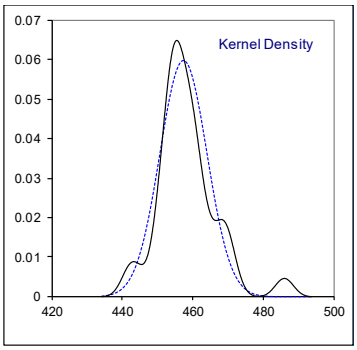


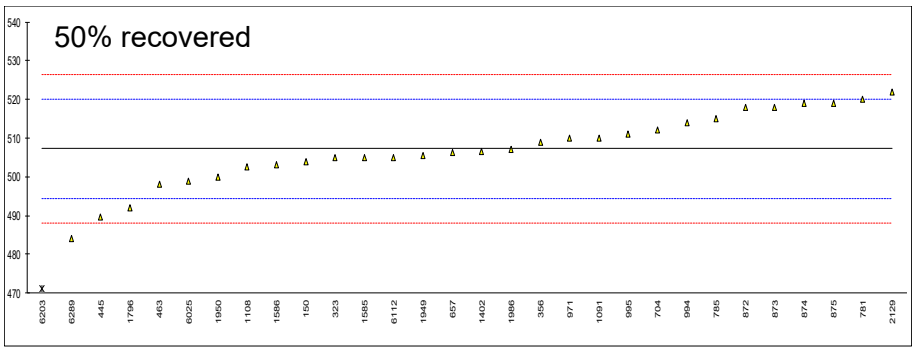


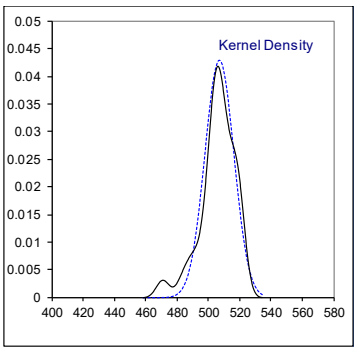

30% recovered

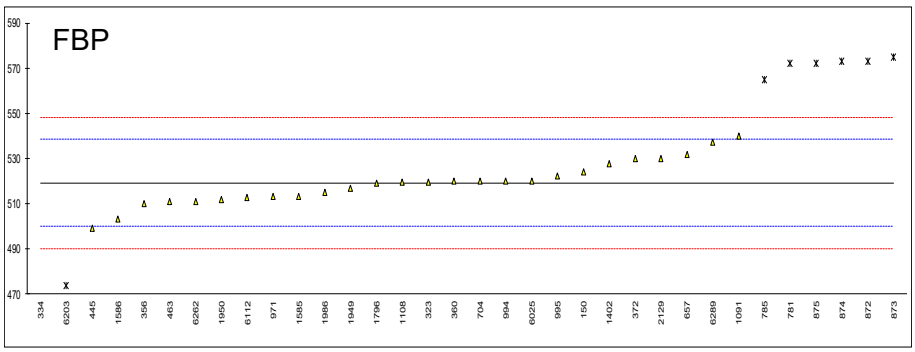

Kernel Density

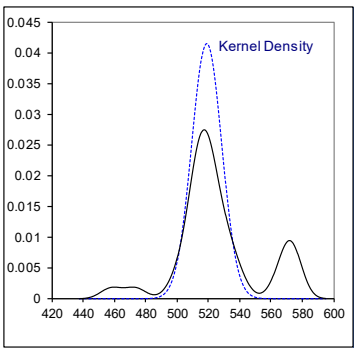

40% recovered


Kernel Density


50% recovered


Kernel Density


FBP


Kernel Density

z-scores of Vacuum Distillation according to ASTM D1160 on sample #19275

lab	method	IBP	5%rec	10%rec	20%rec	30%rec	40%rec	50%rec	FBP
52		-----	-----	-----	-----	-----	-----	-----	-----
120		-----	-----	-----	-----	-----	-----	-----	-----
140		-----	-----	-----	-----	-----	-----	-----	-----
150	D1160	0.60	1.31	1.50	1.12	0.92	0.64	-0.50	0.51
159		-----	-----	-----	-----	-----	-----	-----	-----
168		-----	-----	-----	-----	-----	-----	-----	-----
169		-----	-----	-----	-----	-----	-----	-----	-----
170		-----	-----	-----	-----	-----	-----	-----	-----
171		-----	-----	-----	-----	-----	-----	-----	-----
175		-----	-----	-----	-----	-----	-----	-----	-----
194		-----	-----	-----	-----	-----	-----	-----	-----
212		-----	-----	-----	-----	-----	-----	-----	-----
225		-----	-----	-----	-----	-----	-----	-----	-----
230		-----	-----	-----	-----	-----	-----	-----	-----
237		-----	-----	-----	-----	-----	-----	-----	-----
238		-----	-----	-----	-----	-----	-----	-----	-----
253		-----	-----	-----	-----	-----	-----	-----	-----
256		-----	-----	-----	-----	-----	-----	-----	-----
273		-----	-----	-----	-----	-----	-----	-----	-----
309		-----	-----	-----	-----	-----	-----	-----	-----
311		-----	-----	-----	-----	-----	-----	-----	-----
313		-----	-----	-----	-----	-----	-----	-----	-----
323	D1160	0.17	0.38	-0.23	-1.23	-0.88	-0.51	-0.35	0.04
333		-----	-----	-----	-----	-----	-----	-----	-----
334	D1160	0.20	1.60	2.43	1.90	2.71	-----	-----	-6.34
336		-----	-----	-----	-----	-----	-----	-----	-----
337		-----	-----	-----	-----	-----	-----	-----	-----
339		-----	-----	-----	-----	-----	-----	-----	-----
342		-----	-----	-----	-----	-----	-----	-----	-----
349		-----	-----	-----	-----	-----	-----	-----	-----
351		-----	-----	-----	-----	-----	-----	-----	-----
356	D1160	0.32	0.14	0.44	1.12	1.36	0.46	0.28	-0.95
360	D1160	1.29	2.19	1.50	1.12	1.36	1.35	-----	0.09
370		-----	-----	-----	-----	-----	-----	-----	-----
372	D1160	0.49	0.04	0.84	-0.64	-0.88	-0.60	-----	1.13
381		-----	-----	-----	-----	-----	-----	-----	-----
445	D1160	-0.44	-2.01	-3.04	-1.23	-1.35	-1.17	-2.77	-2.05
447		-----	-----	-----	-----	-----	-----	-----	-----
463	D1160	-0.83	-1.71	-1.69	-1.03	-1.10	-1.13	-1.44	-0.84
507		-----	-----	-----	-----	-----	-----	-----	-----
541		-----	-----	-----	-----	-----	-----	-----	-----
551		-----	-----	-----	-----	-----	-----	-----	-----
558		-----	-----	-----	-----	-----	-----	-----	-----
575		-----	-----	-----	-----	-----	-----	-----	-----
610		-----	-----	-----	-----	-----	-----	-----	-----
621		-----	-----	-----	-----	-----	-----	-----	-----
631		-----	-----	-----	-----	-----	-----	-----	-----
633		-----	-----	-----	-----	-----	-----	-----	-----
634		-----	-----	-----	-----	-----	-----	-----	-----
657	D1160	0.82	0.20	-0.49	-0.56	-0.47	-0.56	-0.13	1.32
704	D1160	-0.54	-1.03	-0.63	-0.25	-0.20	0.11	0.74	0.09
732		-----	-----	-----	-----	-----	-----	-----	-----
753		-----	-----	-----	-----	-----	-----	-----	-----
778		-----	-----	-----	-----	-----	-----	-----	-----
781	D1160	-0.66	-0.83	0.04	0.73	0.92	2.41	1.99	5.48
785	D1160	-0.36	-0.63	0.84	-0.07	-0.67	-0.65	1.23	4.76
798		-----	-----	-----	-----	-----	-----	-----	-----
823		-----	-----	-----	-----	-----	-----	-----	-----
824		-----	-----	-----	-----	-----	-----	-----	-----
825		-----	-----	-----	-----	-----	-----	-----	-----
840		-----	-----	-----	-----	-----	-----	-----	-----
872	D1160	-0.43	-0.54	0.44	0.34	0.47	2.05	1.68	5.59
873	D1160	-0.37	-0.44	0.70	0.73	0.69	1.88	1.68	5.80
874	D1160	-0.20	-0.35	0.04	-0.25	0.24	0.99	1.84	5.59
875	D1160	-0.43	-0.25	0.57	0.53	0.69	2.05	1.84	5.48
887		-----	-----	-----	-----	-----	-----	-----	-----
902		-----	-----	-----	-----	-----	-----	-----	-----
904		-----	-----	-----	-----	-----	-----	-----	-----
913		-----	-----	-----	-----	-----	-----	-----	-----

lab	method	IBP	5%rec	10%rec	20%rec	30%rec	40%rec	50%rec	FBP
962		-----	-----	-----	-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----	-----	-----	-----
971	D1160	0.66	1.21	0.30	0.53	0.47	0.28	0.43	-0.63
974		-----	-----	-----	-----	-----	-----	-----	-----
994	D1160	0.09	-0.44	0.30	-0.25	1.14	0.46	1.06	0.09
995	D1160	-1.06	-0.25	-0.82	-0.64	0.69	-0.42	0.59	0.30
996		-----	-----	-----	-----	-----	-----	-----	-----
997		-----	-----	-----	-----	-----	-----	-----	-----
1026		-----	-----	-----	-----	-----	-----	-----	-----
1040		-----	-----	-----	-----	-----	-----	-----	-----
1065		-----	-----	-----	-----	-----	-----	-----	-----
1082		-----	-----	-----	-----	-----	-----	-----	-----
1090		-----	-----	-----	-----	-----	-----	-----	-----
1091		0.83	1.90	0.44	0.14	0.02	-0.25	0.43	2.17
1108	D1160	0.74	0.43	-0.15	-0.09	-0.41	-0.41	-0.74	0.02
1109		-----	-----	-----	-----	-----	-----	-----	-----
1121		-----	-----	-----	-----	-----	-----	-----	-----
1126		-----	-----	-----	-----	-----	-----	-----	-----
1134		-----	-----	-----	-----	-----	-----	-----	-----
1161		-----	-----	-----	-----	-----	-----	-----	-----
1191		-----	-----	-----	-----	-----	-----	-----	-----
1205		-----	-----	-----	-----	-----	-----	-----	-----
1213		-----	-----	-----	-----	-----	-----	-----	-----
1229		-----	-----	-----	-----	-----	-----	-----	-----
1299		-----	-----	-----	-----	-----	-----	-----	-----
1320		-----	-----	-----	-----	-----	-----	-----	-----
1356		-----	-----	-----	-----	-----	-----	-----	-----
1367		-----	-----	-----	-----	-----	-----	-----	-----
1381		-----	-----	-----	-----	-----	-----	-----	-----
1397		-----	-----	-----	-----	-----	-----	-----	-----
1402	D1160	0.30	0.68	-1.05	-0.99	-1.17	-0.94	-0.10	0.87
1431		-----	-----	-----	-----	-----	-----	-----	-----
1554		-----	-----	-----	-----	-----	-----	-----	-----
1585		0.03	0.19	-0.36	0.53	0.69	0.28	-0.35	-0.63
1586	D1160	0.12	0.95	0.72	-0.21	-0.43	-0.33	-0.64	-1.66
1636		-----	-----	-----	-----	-----	-----	-----	-----
1648		-----	-----	-----	-----	-----	-----	-----	-----
1681		-----	-----	-----	-----	-----	-----	-----	-----
1720		-----	-----	-----	-----	-----	-----	-----	-----
1724		-----	-----	-----	-----	-----	-----	-----	-----
1740		-----	-----	-----	-----	-----	-----	-----	-----
1741		-----	-----	-----	-----	-----	-----	-----	-----
1796	D1160	0.03	-1.61	-1.69	-0.45	-0.43	-1.31	-2.38	-0.01
1810		-----	-----	-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----	-----	-----
1854		-----	-----	-----	-----	-----	-----	-----	-----
1881		-----	-----	-----	-----	-----	-----	-----	-----
1949	D1160	-0.23	0.09	-0.36	-0.31	-0.25	-0.32	-0.29	-0.25
1950	D1160	-0.03	-0.54	-0.36	0.53	0.24	-0.60	-1.13	-0.74
1986	D1160	-0.43	0.53	-0.23	-0.45	-0.65	-0.25	-0.04	-0.43
1995		-----	-----	-----	-----	-----	-----	-----	-----
2129	D1160	-0.03	0.82	2.03	5.23	7.86	5.06	2.30	1.13
6024		-----	-----	-----	-----	-----	-----	-----	-----
6025	D1160	-0.08	0.43	-0.63	0.53	-0.88	0.46	-1.28	0.09
6049		-----	-----	-----	-----	-----	-----	-----	-----
6051		-----	-----	-----	-----	-----	-----	-----	-----
6054		-----	-----	-----	-----	-----	-----	-----	-----
6075		-----	-----	-----	-----	-----	-----	-----	-----
6092		-----	-----	-----	-----	-----	-----	-----	-----
6112		0.13	-0.01	0.01	0.34	0.27	0.20	-0.35	-0.65
6142		-----	-----	-----	-----	-----	-----	-----	-----
6201		-----	-----	-----	-----	-----	-----	-----	-----
6203	D1160	-0.73	-1.33	-1.73	-1.80	-2.29	-2.37	-5.65	-4.73
6223		-----	-----	-----	-----	-----	-----	-----	-----
6257		-----	-----	-----	-----	-----	-----	-----	-----
6262	D1160	3.16	3.63	1.86	0.89	0.47	0.90	-----	-0.84
6289		-1.91	-1.13	-1.55	-0.64	-1.32	-2.72	-3.62	1.85
6298		-----	-----	-----	-----	-----	-----	-----	-----

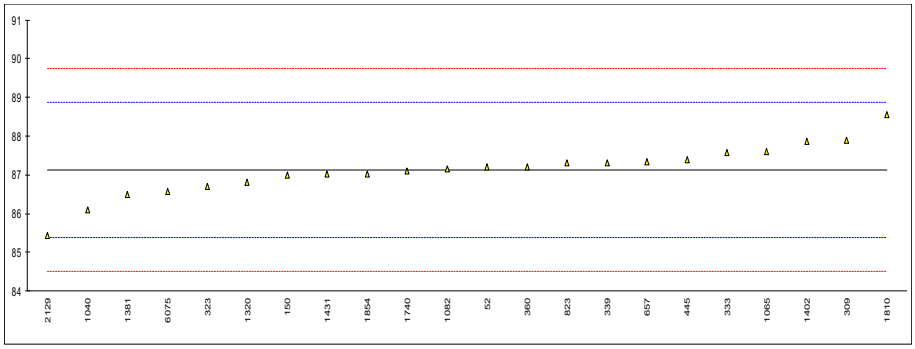
Determination of Total Carbon, Hydrogen and Nitrogen on sample #19275; results in %M/M

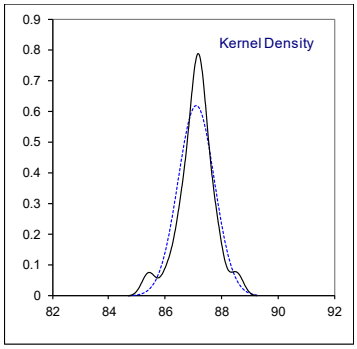
lab	method	Total C	mark	z(targ)	Total H	mark	z(targ)	Total N	mark	z(targ)
52	D5291-B	87.2		0.09	11.5		-0.15	-----		-----
120		-----		-----	-----		-----	-----		-----
140		-----		-----	-----		-----	-----		-----
150	D5291-C	87.0		-0.14	11.5		-0.15	-----		-----
159		-----		-----	-----		-----	-----		-----
168		-----		-----	-----		-----	-----		-----
169		-----		-----	-----		-----	-----		-----
170		-----		-----	-----		-----	-----		-----
171		-----		-----	-----		-----	-----		-----
175		-----		-----	-----		-----	-----		-----
194		-----		-----	-----		-----	-----		-----
212		-----		-----	-----		-----	-----		-----
225		-----		-----	-----		-----	-----		-----
230		-----		-----	-----		-----	-----		-----
237		-----		-----	-----		-----	-----		-----
238		-----		-----	-----		-----	-----		-----
253		-----		-----	-----		-----	-----		-----
256		-----		-----	-----		-----	-----		-----
273		-----		-----	-----		-----	-----		-----
309		87.9		0.90	11.6		0.21	0.40		0.74
311		-----		-----	-----		-----	-----		-----
313		-----		-----	-----		-----	-----		-----
323	D5291-A	86.7		-0.48	11.9		1.28	0.6	G(0.01)	6.34
333	D5291-A	87.58		0.53	11.60		0.21	0.37		-0.10
334		-----		-----	-----		-----	-----		-----
336		-----		-----	-----		-----	-----		-----
337		-----		-----	-----		-----	-----		-----
339		87.3		0.21	11.42		-0.43	0.36		-0.38
342		-----		-----	-----		-----	-----		-----
349		-----		-----	-----		-----	-----		-----
351		-----		-----	-----		-----	-----		-----
356		-----		-----	-----		-----	-----		-----
360	D5291-A	87.20		0.09	11.70		0.56	0.38		0.18
370		-----		-----	-----		-----	-----		-----
372		-----		-----	-----		-----	-----		-----
381		-----		-----	-----		-----	-----		-----
445	D5291	87.40		0.32	11.34		-0.72	0.38		0.18
447		-----		-----	-----		-----	-----		-----
463		-----		-----	-----		-----	-----		-----
507		-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----
551		-----		-----	-----		-----	-----		-----
558		-----		-----	-----		-----	-----		-----
575		-----		-----	-----		-----	-----		-----
610		-----		-----	-----		-----	-----		-----
621		-----		-----	-----		-----	-----		-----
631		-----		-----	-----		-----	-----		-----
633		-----		-----	-----		-----	-----		-----
634		-----		-----	-----		-----	-----		-----
657	D5291-D	87.34		0.25	11.64		0.35	0.36	C	-0.38
704		-----		-----	-----		-----	-----		-----
732		-----		-----	-----		-----	-----		-----
753		-----		-----	-----		-----	-----		-----
778		-----		-----	-----		-----	-----		-----
781		-----		-----	-----		-----	-----		-----
785		-----		-----	-----		-----	-----		-----
798		-----		-----	-----		-----	-----		-----
823		87.3		0.21	11.6		0.21	0.3		-2.06
824		-----		-----	-----		-----	-----		-----
825		-----		-----	-----		-----	-----		-----
840		-----		-----	-----		-----	-----		-----
872		-----		-----	-----		-----	-----		-----
873		-----		-----	-----		-----	-----		-----
874		-----		-----	-----		-----	-----		-----
875		-----		-----	-----		-----	-----		-----
887		-----		-----	-----		-----	-----		-----
902		-----		-----	-----		-----	-----		-----
904		-----		-----	-----		-----	-----		-----
913		-----		-----	-----		-----	-----		-----

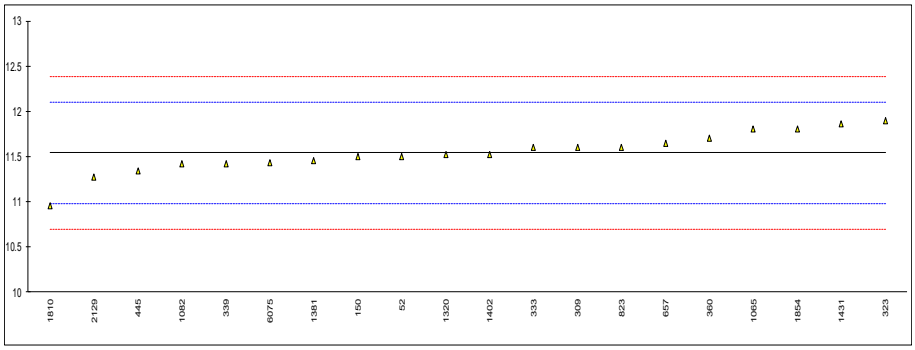
lab	method	Total C	mark	z(targ)	Total H	mark	z(targ)	Total N	mark	z(targ)
962		-----		-----	-----		-----	-----		-----
963		-----		-----	-----		-----	-----		-----
971		-----		-----	-----		-----	-----		-----
974		-----		-----	-----		-----	-----		-----
994		-----		-----	-----		-----	-----		-----
995		-----		-----	-----		-----	-----		-----
996		-----		-----	-----		-----	-----		-----
997		-----		-----	-----		-----	-----		-----
1026		-----		-----	-----		-----	-----		-----
1040	D7662	86.10		-1.17	-----		-----	-----		-----
1065	D5291-D	87.6		0.55	11.8		0.92	0.37		-0.10
1082	D5291-A	87.16		0.05	11.416		-0.45	0.34		-0.94
1090		-----		-----	-----		-----	-----		-----
1091		-----		-----	-----		-----	-----		-----
1108		-----		-----	-----		-----	-----		-----
1109		-----		-----	-----		-----	-----		-----
1121		-----		-----	-----		-----	-----		-----
1126		-----		-----	-----		-----	-----		-----
1134		-----		-----	-----		-----	-----		-----
1161		-----		-----	-----		-----	-----		-----
1191		-----		-----	-----		-----	-----		-----
1205		-----		-----	-----		-----	-----		-----
1213		-----		-----	-----		-----	-----		-----
1229		-----		-----	-----		-----	-----		-----
1299		-----		-----	-----		-----	-----		-----
1320	D5291-A	86.80		-0.37	11.52		-0.08	0.40		0.74
1356		-----		-----	-----		-----	-----		-----
1367		-----		-----	-----		-----	-----		-----
1381		86.50		-0.71	11.457		-0.30	-----		-----
1397		-----		-----	-----		-----	-----		-----
1402	D5291-C	87.86		0.85	11.52		-0.08	-----		-----
1431	D5291-C	87.014		-0.12	11.865		1.15	0.386		0.35
1554		-----		-----	-----		-----	-----		-----
1585		-----		-----	-----		-----	-----		-----
1586		-----		-----	-----		-----	-----		-----
1636		-----		-----	-----		-----	-----		-----
1648		-----		-----	-----		-----	-----		-----
1681		-----		-----	-----		-----	-----		-----
1720		-----		-----	-----		-----	-----		-----
1724		-----		-----	-----		-----	-----		-----
1740	D5291-A	87.1		-0.02	-----		-----	-----		-----
1741		-----		-----	-----		-----	-----		-----
1796		-----		-----	-----		-----	-----		-----
1810	D5291-A	88.55	C	1.64	10.95	C	-2.11	-----		-----
1811		-----		-----	-----		-----	-----		-----
1854		87.03		-0.10	11.8		0.92	-----		-----
1881		-----		-----	-----		-----	-----		-----
1949		-----		-----	-----		-----	-----		-----
1950		-----		-----	-----		-----	-----		-----
1986		-----		-----	-----		-----	-----		-----
1995		-----		-----	-----		-----	-----		-----
2129	D5291-A	85.43		-1.94	11.27		-0.97	0.41	C	1.02
6024		-----		-----	-----		-----	-----		-----
6025		-----		-----	-----		-----	-----		-----
6049		-----		-----	-----		-----	-----		-----
6051		-----		-----	-----		-----	-----		-----
6054		-----		-----	-----		-----	-----		-----
6075	D5291-D	86.56		-0.64	11.43		-0.40	0.40		0.74
6092		-----		-----	-----		-----	-----		-----
6112		-----		-----	-----		-----	-----		-----
6142		-----		-----	-----		-----	-----		-----
6201		-----		-----	-----		-----	-----		-----
6203		-----		-----	-----		-----	-----		-----
6223		-----		-----	-----		-----	-----		-----
6257		-----		-----	-----		-----	-----		-----
6262		-----		-----	-----		-----	-----		-----
6289		-----		-----	-----		-----	-----		-----
6298		-----		-----	-----		-----	-----		-----

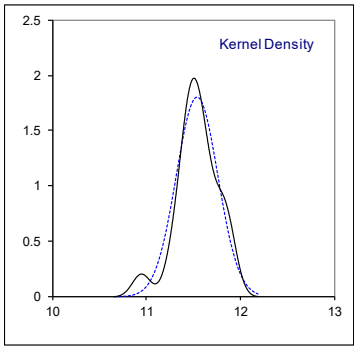
	Total C	Total H	Total N
normality	suspect	suspect	not OK
n	22	20	13
outliers	0	0	1
mean (n)	87.1193	11.5414	0.3735
st.dev. (n)	0.64573	0.22131	0.02971
R(calc.)	1.8080	0.6197	0.0832
st.dev.(D5291-ABC:16)	0.87171	0.28076	---
R(D5291-ABC:16)	2.4408	0.7861	---
st.dev.(D5291-D:16)	---	---	0.03575
R(D5291-D:16)	---	---	0.1001

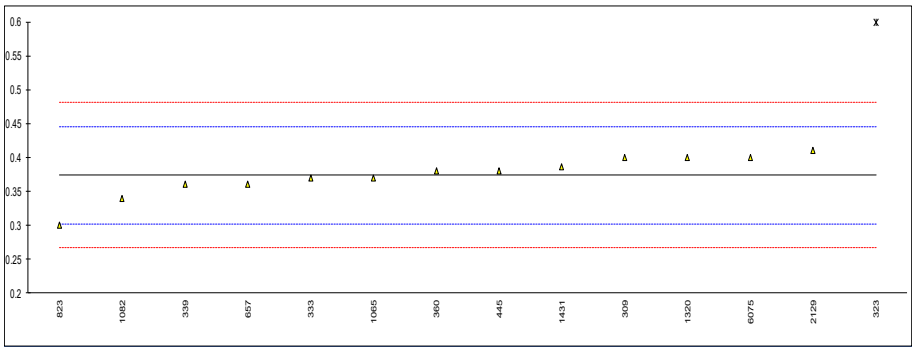
Lab 657 first reported 0.52
Lab 1810 first reported 89.77 and 10.86 respectively
Lab 2129 first reported 0.49

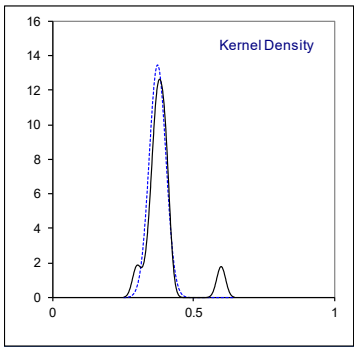












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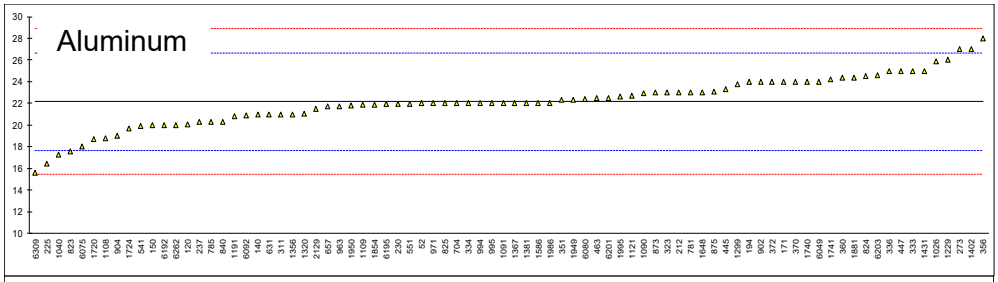
Determination of Aluminum as Al, Silicon as Si and total Al+Si on sample #19276; results in mg/kg

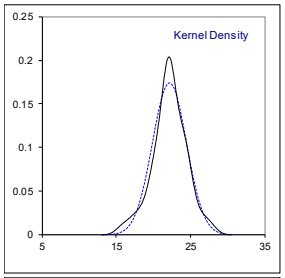
lab	method	Al	mark	z(targ)	Si	mark	z(targ)	Sum Al+Si	mark	z(targ)
52	IP501	22		-0.08	15		-0.23	37		-0.16
120	IP501	20.04		-0.95	16.895		0.38	36.935		-0.17
140	IP501	21		-0.52	14		-0.55	35		-0.68
150	IP501	20		-0.97	8		-2.46	28		-2.49
159		-----		-----	-----		-----	-----		-----
169		-----		-----	-----		-----	-----		-----
170		-----		-----	-----		-----	-----		-----
171	IP501	24		0.81	19		1.05	44		1.66
175		-----		-----	-----		-----	-----		-----
194	IP501	24		0.81	14		-0.55	38		0.10
212	IP470	23		0.37	18		0.73	41		0.88
225	IP501	16.41		-2.57	12.66		-0.97	29.07		-2.21
230	IP470	21.96		-0.10	14.2		-0.48	36.2		-0.37
237	IP501	20.28		-0.84	11.27		-1.42	31.55		-1.57
273	IP470	27	C	2.15	12		-1.18	39	C	0.36
311	IP501	21		-0.52	15		-0.23	36		-0.42
323	IP501	23		0.37	16		0.09	39		0.36
333	IP501	25		1.26	16		0.09	41		0.88
334	IP501	22		-0.08	17		0.41	39		0.36
336	IP501	25		1.26	18		0.73	43		1.40
342		-----		-----	-----		-----	-----		-----
351	IP501	22.33		0.07	12.77		-0.94	35.10		-0.65
356	IP501	28		2.59	16		0.09	44		1.66
360	IP501	24.4		0.99	15.4		-0.10	39.8		0.57
370	IP470	24		0.81	21		1.68	45		1.91
372	IP470	24		0.81	17		0.41	41		0.88
381		-----		-----	-----		-----	-----		-----
445	IP501	23.3		0.50	14.0		-0.55	37.3		-0.08
447	IP470	25		1.26	18.3		0.82	43.3		1.47
463	IP470	22.5		0.14	12.4		-1.06	34.9		-0.70
507		-----		-----	-----		-----	-----		-----
541	IP501	19.9		-1.01	12.3		-1.09	32.2		-1.40
551	IP501	21.9882		-0.08	15.20115		-0.16	27.18935	E	-2.70
631	IP470	21	C	-0.52	11.48		-1.35	32	C	-1.45
657	IP501	21.7		-0.21	15.0		-0.23	36.7		-0.24
704	IP470	22		-0.08	19		1.05	41		0.88
732		-----		-----	-----		-----	-----		-----
750		-----		-----	-----		-----	-----		-----
781	IP501	23		0.37	15		-0.23	38		0.10
785	IP470	20.3		-0.84	12.4		-1.06	32.7		-1.27
798		-----		-----	-----		-----	-----		-----
823	IP501	17.6		-2.04	11.8		-1.25	29.4		-2.13
824	IP501	24.55		1.06	18.12		0.77	42.67		1.31
825	IP501	22		-0.08	13		-0.87	35		-0.68
840	IP501	20.3		-0.84	15.7		0.00	36.0		-0.42
872		-----		-----	-----		-----	-----		-----
873	IP470	23		0.37	17		0.41	30	E	-1.97
874		-----		-----	-----		-----	-----		-----
875	IP501	23.1		0.41	16.3		0.19	39		0.36
902	IP501	24		0.81	17		0.41	41		0.88
904	IP470	19		-1.41	18		0.73	37		-0.16
913		-----		-----	-----		-----	-----		-----
963	IP501	21.73		-0.20	17.0		0.41	38.73		0.29
971	IP501	22		-0.08	18		0.73	40		0.62
974		-----		-----	-----		-----	-----		-----
994	IP501	22.0		-0.08	16.6		0.28	38.6		0.26
995	IP470	22		-0.08	18		0.73	40		0.62
1026	IP501	25.9		1.66	14.8		-0.29	40.7		0.80
1040	IP501	17.25		-2.19	17.64		0.61	34.89		-0.70
1082		-----		-----	-----		-----	-----		-----
1090	IP501	22.9		0.32	15.5		-0.07	38.4		0.20
1091	IP501	22		-0.08	16		0.09	38		0.10
1108	IP470	18.8		-1.50	13.3		-0.77	32.1		-1.43
1109	IP470	21.9		-0.12	15.6		-0.04	37.5		-0.03
1121	IP501	22.70		0.23	17.57		0.59	40.27		0.69
1134		-----		-----	-----		-----	-----		-----
1191	ISO10478	20.82		-0.60	16.15		0.14	36.97		-0.17
1229	ISO10478	26		1.70	21		1.68	47		2.43
1299	IP501	23.8		0.72	10.5		-1.66	34.3		-0.86
1320	IP501	21.03		-0.51	22.81		2.26	-----		-----
1356	IP501	21		-0.52	12		-1.18	33		-1.19
1367	IP501	22		-0.08	17		0.41	39		0.36
1381	ISO10478	22.00		-0.08	17.44		0.55	39.44		0.47
1402	IP501	27		2.15	12		-1.18	39		0.36

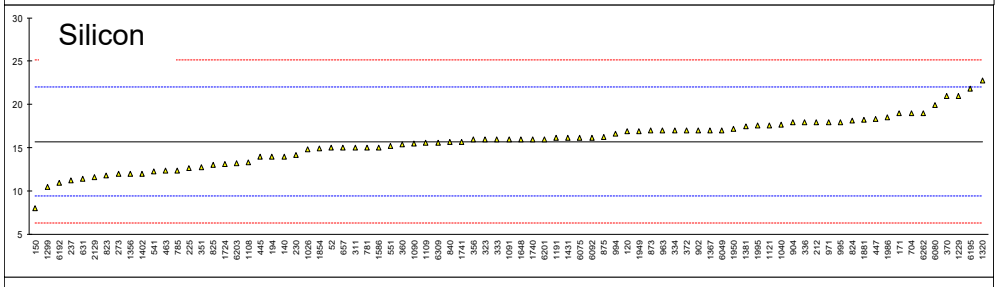
lab	method	Al	mark	z(targ)	Si	mark	z(targ)	Sum Al+Si	mark	z(targ)
1431	IP501	25.0		1.26	16.2		0.15	41.2		0.93
1586	IP470	22		-0.08	15		-0.23	36		-0.42
1648	IP501	23		0.37	16		0.09	39		0.36
1720		18.698		-1.55	-----		-----	-----		-----
1724	IP501	19.71		-1.10	13.10		-0.83	32.81		-1.24
1740	IP501	24		0.81	16		0.09	40		0.62
1741	IP501/D5184	24.2		0.90	15.7		0.00	39.9		0.59
1810		-----		-----	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
1854	IP501	21.9		-0.12	14.9		-0.26	36.8		-0.21
1881	IP470	24.4		0.99	18.2		0.79	42.6		1.29
1949	IP501	22.35		0.08	16.92		0.38	39.27		0.43
1950	IP470	21.8		-0.17	17.2		0.47	39.0		0.36
1986	IP470	22.0		-0.08	18.5		0.89	40.5		0.75
1995	IP501	22.63		0.20	17.56		0.59	40.19		0.67
2129	IP470	21.5		-0.30	11.6		-1.31	33.1		-1.17
6049	IP501	24		0.81	17		0.41	41		0.88
6054		-----		-----	-----		-----	-----		-----
6075	In house	18.0		-1.86	16.2		0.15	34.2		-0.88
6080	IP501	22.4		0.10	19.9		1.33	42.3		1.22
6092	IP501	20.9	C	-0.57	16.2	C	0.15	-----		-----
6192	IP501	20		-0.97	11		-1.50	31		-1.71
6195	IP501	21.95		-0.10	21.87		1.96	43.82		1.61
6201	IP501	22.5		0.14	16.0		0.09	38.5		0.23
6203	IP501	24.6		1.08	13.2		-0.80	37.8		0.05
6223		-----		-----	-----		-----	-----		-----
6262	IP501	20		-0.97	19		1.05	39		0.36
6289		-----		-----	-----		-----	-----		-----
6309	In house	15.62		-2.92	15.61		-0.03	31.23		-1.65
	normality	OK			OK			OK		
	n	82			81			79		
	outliers	0			0			0		
	mean (n)	22.18			15.72			37.61		
	st.dev. (n)	2.289			2.723			4.138		
	R(calc.)	6.41			7.62			11.59		
	st.dev.(IP470:05)	2.247			3.139			3.861		
	R(IP470:05)	6.29			8.79			10.81		
	compare									
	R(IP501:05)	7.47			5.22			9.12		

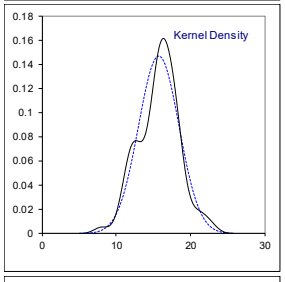
Lab 273 first reported 15 and 27 respectively
Lab 551 possibly an error in calculations, iis calc. 37.18935
Lab 631 first reported 13.47 and 24 respectively

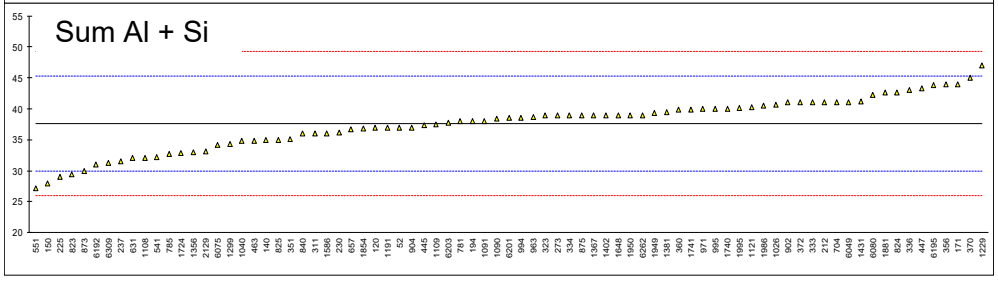
Lab 873 possibly an error in calculations, iis calculated 40
Lab 6092 first reported 9 and 7 respectively

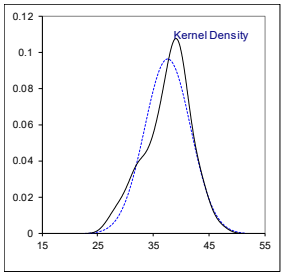










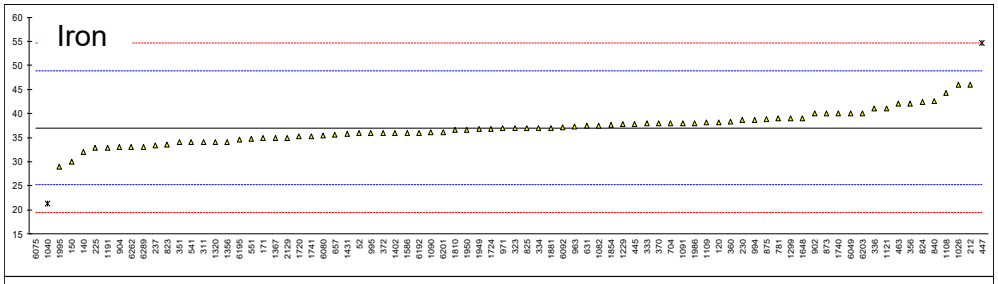


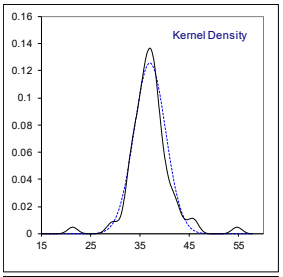
Determination of Iron as Fe, Nickel as Ni, Sodium as Na on sample #19276; results in mg/kg

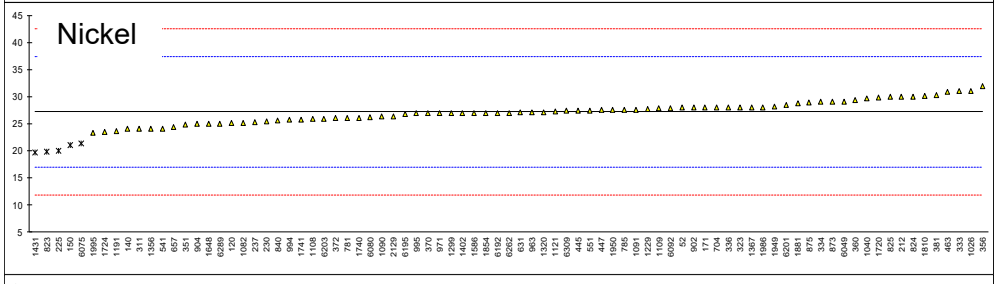
lab	method	Fe	mark	z(targ)	Ni	mark	z(targ)	Na	mark	z(targ)
52	IP501	36		-0.18	28		0.16	28		-0.15
120	IP501	38.22		0.20	25.165		-0.40	23.815		-1.36
140	IP501	32		-0.86	24		-0.62	25		-1.02
150	IP501	30		-1.20	21	R(0.05)	-1.21	22		-1.88
159		-----		-----	-----		-----	-----		-----
169		-----		-----	-----		-----	-----		-----
170		-----		-----	-----		-----	-----		-----
171	IP501	35		-0.35	28		0.16	30		0.42
175		-----		-----	-----		-----	-----		-----
194		-----		-----	-----		-----	28		-0.15
212	IP470	46		1.52	30		0.55	32		1.00
225	IP501	32.80		-0.72	19.94	R(0.05)	-1.41	20.84		-2.21
230	IP470	38.7		0.28	25.4		-0.35	36.0020		2.15
237	IP501	33.44		-0.61	25.35		-0.36	29.10		0.16
273		-----		-----	-----		-----	-----		-----
311	IP501	34		-0.52	24		-0.62	26		-0.73
323	IP501	37		-0.01	28		0.16	28		-0.15
333	IP501	38		0.16	31		0.74	31		0.71
334	IP501	37		-0.01	29		0.35	27		-0.44
336	IP501	41		0.67	28		0.16	31		0.71
342		-----		-----	-----		-----	-----		-----
351	IP501	33.99		-0.52	24.77		-0.47	35.49		2.00
356	IP501	42		0.84	32		0.94	32		1.00
360	IP501	38.3		0.21	29.3		0.41	29.4		0.25
370	IP470	38		0.16	27		-0.04	30		0.42
372	IP470	36		-0.18	26		-0.23	28		-0.15
381		-----		-----	30.3		0.61	-----		-----
445	IP501	37.8		0.13	27.4		0.04	30.2		0.48
447	IP470	54.7	R(0.01)	3.00	27.5		0.06	28.5		-0.01
463	IP470	42.0		0.84	30.9		0.72	36.1		2.18
507		-----		-----	-----		-----	-----		-----
541	IP501	34.0		-0.52	24.1		-0.60	25.0		-1.02
551	IP501	34.7916		-0.38	27.44035		0.05	29.87745		0.39
631	IP470	37.43		0.07	27.07		-0.02	27.16		-0.39
657	IP501	35.6		-0.24	24.3		-0.56	31.5		0.85
704	IP470	38		0.16	28		0.16	29		0.14
732		-----		-----	-----		-----	-----		-----
750		-----		-----	-----		-----	-----		-----
781	IP501	39		0.33	26		-0.23	29		0.14
785		-----		-----	27.6		0.08	34.1		1.60
798		-----		-----	-----		-----	-----		-----
823	IP501	33.6		-0.58	19.9	R(0.05)	-1.42	25.5	C	-0.87
824	IP501	42.37		0.91	30.03		0.55	29.94		0.41
825	IP501	37		-0.01	30		0.55	25		-1.02
840	IP501	42.6		0.94	25.6		-0.31	30.0		0.42
872		-----		-----	-----		-----	-----		-----
873	IP470	40		0.50	29		0.35	28		-0.15
874		-----		-----	-----		-----	-----		-----
875	IP501	38.9		0.32	28.9		0.33	28.7		0.05
902	IP501	40		0.50	28		0.16	29		0.14
904	IP470	33		-0.69	25		-0.43	30		0.42
913		-----		-----	-----		-----	-----		-----
963	IP501	37.30		0.04	27.1		-0.02	31		0.71
971	IP501	37		-0.01	27		-0.04	28		-0.15
974		-----		-----	-----		-----	-----		-----
994	IP501	38.7		0.28	25.7		-0.29	28.6		0.02
995	IP470	36		-0.18	27		-0.04	27		-0.44
1026	IP501	45.9		1.51	31.0		0.74	36.5		2.29
1040	IP501	21.40	R(0.01)	-2.66	29.62		0.47	8.39	R(0.01)	-5.80
1082	In house	37.52		0.08	25.18		-0.39	27.08		-0.42
1090	IP501	36.1		-0.16	26.3		-0.17	28.9		0.11
1091	IP501	38		0.16	27.6		0.08	27		-0.44
1108	IP470/D5863-B	44.3		1.23	25.9		-0.25	24.4		-1.19
1109	IP470	38.1		0.18	27.8		0.12	29.6		0.31
1121	IP501	41.08		0.69	27.28		0.02	30.03		0.43
1134		-----		-----	-----		-----	-----		-----
1191	ISO10478M	32.81		-0.72	23.64		-0.69	26.54		-0.57
1229	In house	37.79		0.13	27.76		0.11	27.66		-0.25
1299	IP501	39.0		0.33	27.0		-0.04	27.5		-0.30
1320	IP501	34.00		-0.52	27.11		-0.02	-----		-----
1356	IP501	34		-0.52	24		-0.62	16	R(0.01)	-3.61
1367	IP501	35		-0.35	28		0.16	34		1.57
1381		-----		-----	-----		-----	-----		-----
1402	IP501	36		-0.18	27		-0.04	27		-0.44

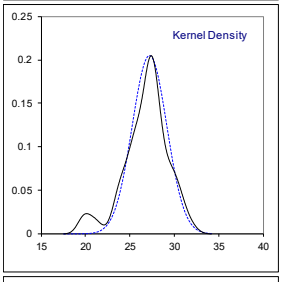
lab	method	Fe	mark	z(targ)	Ni	mark	z(targ)	Na	mark	z(targ)
1431	IP501	35.7		-0.23	19.7	R(0.05)	-1.46	48.4	R(0.01)	5.72
1586	IP470/IP501	36		-0.18	27		-0.04	27		-0.44
1648	IP501	39		0.33	25		-0.43	29		0.14
1720		35.2095		-0.31	29.781		0.51	30.075		0.44
1724	IP501	36.82		-0.04	23.42		-0.74	26.6		-0.56
1740	IP501	40		0.50	26		-0.23	30		0.42
1741	IP501	35.3		-0.30	25.8		-0.27	26.4		-0.61
1810	D8252	36.7		-0.06	30.1		0.57	-----		-----
1811		-----		-----	-----		-----	-----		-----
1854	IP501	37.6		0.10	27.0		-0.04	26.8		-0.50
1881	IP470	37.0		-0.01	28.8		0.31	28.1		-0.12
1949	IP501	36.71		-0.06	28.08		0.17	29.42		0.26
1950	IP470	36.7		-0.06	27.5		0.06	27.9		-0.18
1986	IP470	38.0		0.16	28.0		0.16	28.5		-0.01
1995	IP501	29.00		-1.37	23.28		-0.76	22.48		-1.74
2129	IP470	35.0		-0.35	26.4		-0.15	27.7		-0.24
6049	IP501	40		0.50	29		0.35	30		0.42
6054		-----		-----	-----		-----	-----		-----
6075	In house/D5863-B	9.9	R(0.01)	-4.61	21.3	R(0.05)	-1.15	15.9	R(0.01)	-3.63
6080	IP501	35.4		-0.28	26.2		-0.19	25.3		-0.93
6092	IP501	37.1	C	0.01	27.8	C	0.12	27.8	C	-0.21
6192	IP501	36		-0.18	27		-0.04	10	R(0.01)	-5.33
6195	IP501	34.60		-0.41	26.8		-0.08	25.4		-0.90
6201	IP501	36.1		-0.16	28.5		0.26	29.2		0.19
6203	IP501	40.0		0.50	25.9		-0.25	29.0		0.14
6223		-----		-----	-----		-----	-----		-----
6262	IP501	33		-0.69	27		-0.04	26		-0.73
6289	IP470	33		-0.69	25		-0.43	27		-0.44
6309		-----		-----	27.36		0.03	12.57	R(0.01)	-4.59
	normality	OK			OK			suspect		
	n	77			78			75		
	outliers	3			5			6		
	mean (n)	37.04			27.19			28.53		
	st.dev. (n)	3.178			1.949			2.991		
	R(calc.)	8.90			5.46			8.37		
	st.dev.(IP470:05)	5.886			5.125			3.475		
	R(IP470:05)	16.48			14.35			9.73		
	compare R(IP501:05)	6.84			10.34			6.74		

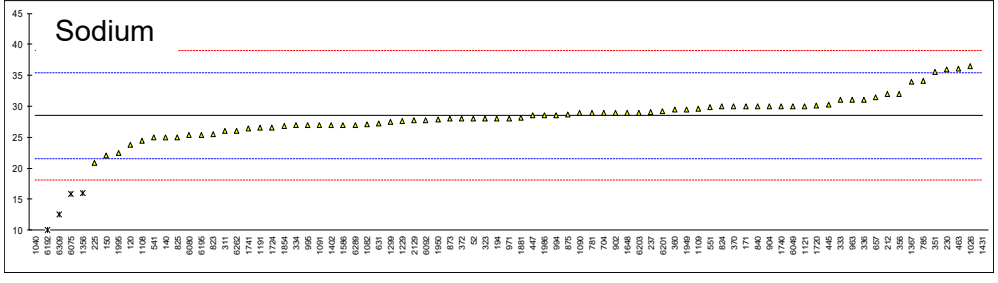
Lab 823 first reported 15.8
Lab 6092 first reported 16, 12 and 12 respectively

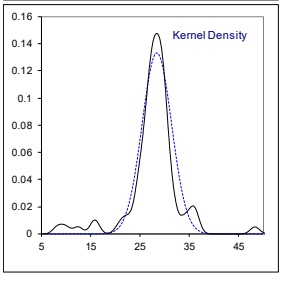












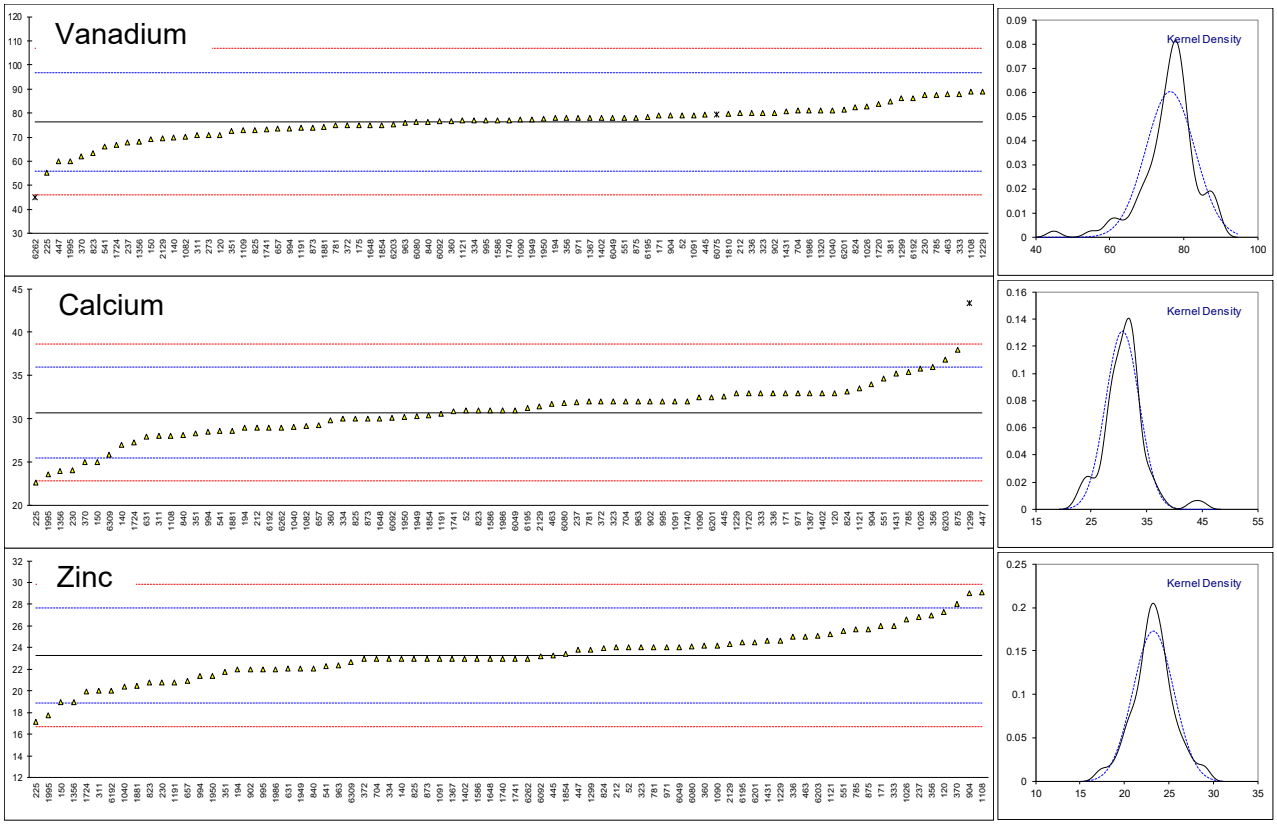
Determination of Vanadium as V, Calcium as Ca and Zinc as Zn on sample #19276; results in mg/kg

lab	method	V	mark	z(targ)	Ca	mark	z(targ)	Zn	mark	z(targ)
52	IP501	79		0.25	31		0.11	24		0.33
120	IP501	71.005		-0.53	33.005	C	0.87	27.265		1.82
140	IP501	70		-0.63	27		-1.42	23		-0.12
150	IP501	69		-0.73	25		-2.18	19		-1.95
159		-----		-----	-----		-----	-----		-----
169		-----		-----	-----		-----	-----		-----
170		-----		-----	-----		-----	-----		-----
171	IP501	79		0.25	33		0.87	26		1.24
175	D5863B	75		-0.14	-----		-----	-----		-----
194	IP501	78		0.15	29		-0.66	22		-0.58
212	IP470	80		0.35	29		-0.66	24		0.33
225	IP501	55.14		-2.09	22.67		-3.07	17.17		-2.78
230	IP470	87.4		1.08	24.1		-2.53	20.8		-1.13
237	IP501	67.8		-0.85	31.89		0.45	26.81		1.61
273	IP470	71	C	-0.53	-----		-----	-----		-----
311	IP501	71		-0.53	28		-1.04	20		-1.49
323	IP501	80		0.35	32		0.49	24		0.33
333	IP501	88		1.14	33		0.87	26		1.24
334	IP501	77		0.06	30		-0.27	23		-0.12
336	IP501	80		0.35	33		0.87	25		0.79
342		-----		-----	-----		-----	-----		-----
351	IP501	72.73		-0.36	28.34		-0.91	21.76		-0.69
356	IP501	78	C	0.15	36		2.01	27		1.70
360	IP501	76.8		0.04	29.8		-0.35	24.2		0.42
370	IP470	62		-1.42	25		-2.18	28		2.15
372	IP470	75		-0.14	32		0.49	23		-0.12
381	INH-407M	84.8		0.82	-----		-----	-----		-----
445	IP501	79.3		0.28	32.6		0.72	23.3		0.01
447	IP470	60.1		-1.60	45.1	R(0.01)	5.49	23.8		0.24
463	IP470	87.8		1.12	31.7		0.37	25.0		0.79
507		-----		-----	-----		-----	-----		-----
541	IP501	66.2		-1.00	28.6		-0.81	22.3		-0.44
551	IP501	78.03885		0.16	34.6976		1.52	25.5320		1.03
631		-----		-----	27.98		-1.04	22.06		-0.55
657	IP501	73.5		-0.29	29.3		-0.54	20.9		-1.08
704	IP470	81		0.45	32		0.49	23		-0.12
732		-----		-----	-----		-----	-----		-----
750		-----		-----	-----		-----	-----		-----
781	IP501	75		-0.14	32		0.49	24		0.33
785	IP470	87.5		1.09	35.4		1.79	25.7		1.11
798		-----		-----	-----		-----	-----		-----
823	IP501	63.5		-1.27	31.0		0.11	20.8		-1.13
824	IP501	82.41		0.59	33.12		0.92	23.96		0.31
825	IP501	73		-0.34	30		-0.27	23		-0.12
840	IP501	76.4		0.00	28.1		-1.00	22.1		-0.53
872		-----		-----	-----		-----	-----		-----
873	IP470	74		-0.24	30		-0.27	23		-0.12
874		-----		-----	-----		-----	-----		-----
875	IP501	78.1		0.16	38		2.78	25.7		1.11
902	IP501	80		0.35	32		0.49	22		-0.58
904	IP470	79		0.25	34		1.25	29		2.61
913		-----		-----	-----		-----	-----		-----
963	IP501	76		-0.04	32		0.49	22.4		-0.40
971	IP501	78		0.15	33		0.87	24		0.33
974		-----		-----	-----		-----	-----		-----
994	IP501	73.7		-0.27	28.5		-0.85	21.4		-0.85
995	IP470	77		0.06	32		0.49	22		-0.58
1026	IP501	82.6		0.61	35.8		1.94	26.6		1.52
1040	IP501	81.23		0.47	29.06		-0.63	20.41		-1.30
1082	In house	70.34		-0.60	29.2		-0.58	-----		-----
1090	IP501	77.2		0.08	32.5		0.68	24.2		0.42
1091	IP501	79		0.25	32		0.49	23		-0.12
1108	D5863-B/IP470	89	C	1.24	28.0		-1.04	29.1		2.65
1109	IP470	72.9		-0.35	-----		-----	-----		-----
1121	IP501	76.90		0.05	33.49		1.06	25.21		0.88
1134		-----		-----	-----		-----	-----		-----
1191	ISO10478M/IP501	73.87		-0.25	30.64		-0.03	20.81		-1.12
1229	In house	89.02		1.24	32.93		0.84	24.62		0.61
1299	IP501	86.0		0.94	43.3	R(0.01)	4.80	23.8		0.24
1320	IP501	81.20		0.47	-----		-----	-----		-----
1356	IP501	68		-0.83	24		-2.56	19		-1.95
1367	IP501	78		0.15	33		0.87	23		-0.12
1381		-----		-----	-----		-----	-----		-----
1402	IP501	78		0.15	33		0.87	23		-0.12

lab	method	V	mark	z(targ)	Ca	mark	z(targ)	Zn	mark	z(targ)
1431	IP501	80.7		0.42	35.2		1.71	24.6		0.60
1586	IP501/IP470	77		0.06	31		0.11	23		-0.12
1648	IP501	75		-0.14	30		-0.27	23		-0.12
1720	D5708	83.6485		0.71	32.936		0.85	-----		-----
1724	IP501	66.85		-0.94	27.32		-1.30	19.92		-1.53
1740	IP501	77		0.06	32		0.49	23		-0.12
1741	IP501	73.3		-0.31	30.9		0.07	23.0		-0.12
1810	D8252	79.6		0.31	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
1854	IP501	75		-0.14	30.4		-0.12	23.4		0.06
1881	IP470	74.2		-0.22	28.6		-0.81	20.5		-1.26
1949	IP501	77.40		0.10	30.28		-0.17	22.07		-0.55
1950	IP470	77.8		0.13	30.2		-0.20	21.4		-0.85
1986	IP470	81.0		0.45	31.0		0.11	22.0		-0.58
1995	IP501	60.13		-1.60	23.65		-2.70	17.75		-2.52
2129	IP470	69.6		-0.67	31.4		0.26	24.3		0.47
6049	IP501	78		0.15	31		0.11	24		0.33
6054		-----		-----	-----		-----	-----		-----
6075	D5863-B	79.5	ex	0.30	-----		-----	-----		-----
6080	IP501	76.2		-0.02	31.8		0.41	24.1		0.38
6092	IP501	76.6	C	0.02	30.1	C	-0.24	23.2	C	-0.03
6192	IP501	86		0.94	29		-0.66	20		-1.49
6195	IP501	78.4		0.19	31.3		0.22	24.5		0.56
6201	IP501	81.3		0.48	32.5		0.68	24.5		0.56
6203	IP501	75.4		-0.10	36.8		2.32	25.1		0.83
6223		-----		-----	-----		-----	-----		-----
6262	IP501	45	R(0.01)	-3.09	29		-0.66	23		-0.12
6289		-----		-----	-----		-----	-----		-----
6309		-----		-----	25.84		-1.86	22.70		-0.26
	normality	suspect			OK			OK		
	n	81			76			76		
	outliers	1 (+1 ex)			2			0		
	mean (n)	76.43			30.72			23.27		
	st.dev. (n)	6.634			3.036			2.314		
	R(calc.)	18.57			8.50			6.48		
	st.dev.(IP470:05)	10.179			2.621			2.195		
	R(IP470:05)	28.50			7.34			6.15		
	compare									
	R(IP501:05)	22.66			5.97			4.60		

Lab 120 first reported 41.205
Lab 273 first reported 53
Lab 356 first reported 98

Lab 1108 first reported 97.2
Lab 6075 excluded as outliers in Nickel and Sodium (method D5836-B)
Lab 6092 first reported 33, 13 and 10 respectively

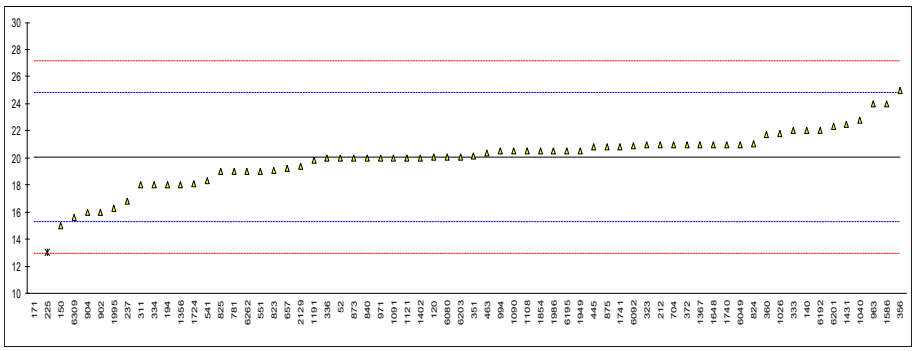


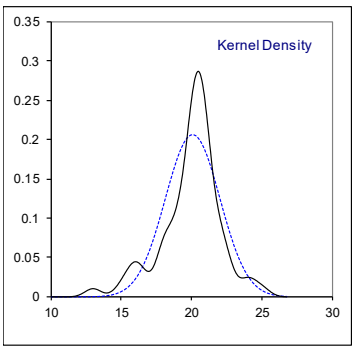
Determination of Phosphorus as P on sample #19276; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	IP501	20		-0.03	
120	IP501	20.07		0.00	
140	IP501	22		0.81	
150	IP501	15	C	-2.14	first reported 13
159		-----		-----	
169		-----		-----	
170		-----		-----	
171	IP501	0.342	C,R(0.01)	-8.31	first reported 0
175		-----		-----	
194	IP501	18		-0.87	
212	IP500	21		0.39	
225	IP501	13.0	R(0.05)	-2.98	
230		-----		-----	
237	IP501	16.82		-1.37	
273		-----		-----	
311	IP501	18		-0.87	
323	IP501	21		0.39	
333	IP501	22		0.81	
334	IP501	18		-0.87	
336	IP501	20		-0.03	
342		-----		-----	
351	IP501	20.13		0.03	
356	IP501	25		2.08	
360	IP501	21.7		0.69	
370		-----		-----	
372	IP500	21.0		0.39	
381		-----		-----	
445	IP501	20.8		0.31	
447		-----		-----	
463	IP500	20.40		0.14	
507		-----		-----	
541	IP501	18.3		-0.75	
551	IP501	19.0241		-0.44	
631		-----		-----	
657	IP501	19.2		-0.37	
704	IP500	21		0.39	
732		-----		-----	
750		-----		-----	
781	IP501	19		-0.45	
785		-----		-----	
798		-----		-----	
823	IP501	19.1		-0.41	
824	IP501	21.07		0.42	
825	IP501	19		-0.45	
840	IP501	20.0		-0.03	
872		-----		-----	
873	IP500	20		-0.03	
874		-----		-----	
875	IP501	20.8		0.31	
902	IP501	16		-1.71	
904	IP500	16		-1.71	
913		-----		-----	
963	IP501	24		1.66	
971	IP501	20		-0.03	
974		-----		-----	
994	IP501	20.5		0.18	
995		-----		-----	
1026	IP501	21.8		0.73	
1040	IP501	22.76		1.13	
1082		-----		-----	
1090	IP501	20.5		0.18	
1091	IP501	20		-0.03	
1108	IP501	20.5	C	0.18	first reported 42.2
1109		-----		-----	
1121	IP501	20.00		-0.03	
1134		-----		-----	
1191	IP501	19.85		-0.09	
1229		-----		-----	
1299		-----		-----	
1320		-----		-----	
1356	IP501	18		-0.87	
1367	IP501	21		0.39	
1381		-----		-----	
1402	IP501	20		-0.03	

lab	method	value	mark	z(targ)	remarks
1431	IP501	22.5		1.02	
1586	IP501	24		1.66	
1648	IP501	21		0.39	
1720		-----		-----	
1724	IP501	18.07		-0.84	
1740	IP501	21		0.39	
1741	IP501	20.8		0.31	
1810		-----		-----	
1811		-----		-----	
1854	IP501	20.5		0.18	
1881		-----		-----	
1949	IP501	20.53		0.19	
1950		-----		-----	
1986	IP500	20.5		0.18	
1995	IP501	16.29		-1.59	
2129	IP500	19.4		-0.28	
6049	IP501	21		0.39	
6054		-----		-----	
6075		-----		-----	
6080	IP501	20.1		0.01	
6092	IP501	20.9	C	0.35	first reported 9
6192	IP501	22		0.81	
6195	IP501	20.5		0.18	
6201	IP501	22.3		0.94	
6203	IP501	20.1		0.01	
6223		-----		-----	
6262	IP501	19		-0.45	
6289		-----		-----	
6309	In house	15.61		-1.88	

normality	OK
n	64
outliers	2
mean (n)	20.07
st.dev. (n)	1.937
R(calc.)	5.42
st.dev.(IP501:05)	2.373
R(IP501:05)	6.64
compare	
R(IP500:03)	4.02

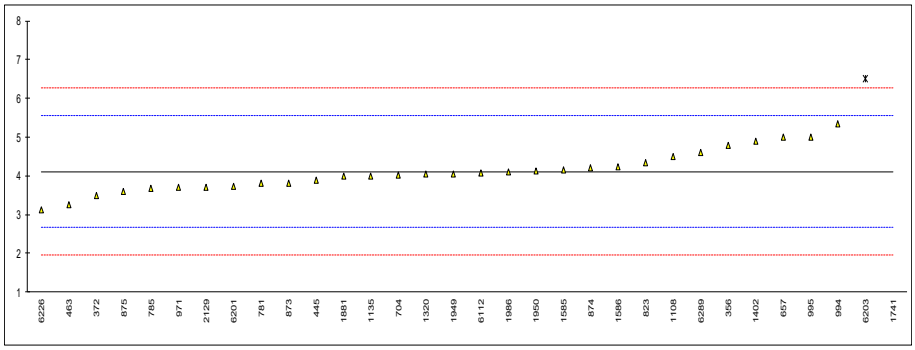


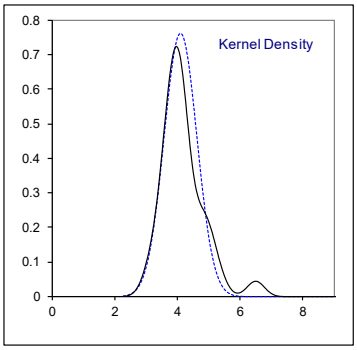


Determination of Bromine Number on distillate <360°C AET on sample #19277; results in g Br_2/100g

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
140		-----		-----	
150		-----		-----	
170		-----		-----	
171		-----		-----	
311		-----		-----	
323		-----		-----	
356	D1159	4.8		0.96	
372	D1159	3.5		-0.85	
445	D1159	3.89		-0.30	
463	D1159	3.26		-1.18	
551		-----		-----	
657	D1159	5.0		1.24	
704	D1159	4.03		-0.11	
732		-----		-----	
750		-----		-----	
781	D1159	3.8		-0.43	
785	D1159	3.67		-0.61	
798		-----		-----	
823	D1159	4.34		0.32	
873	D1159	3.8		-0.43	
874	D1159	4.2		0.13	
875	D1159	3.6		-0.71	
963		-----		-----	
971	D1159	3.70		-0.57	
994	D1159	5.33		1.70	
995	D1159	5.01		1.26	
1026		-----		-----	
1065		-----		-----	
1108	D1159	4.5		0.55	
1135	D1159	4.0		-0.15	
1320	D1159	4.04	C	-0.09	first reported 8.08
1402	D1159	4.9		1.10	
1585	D1159	4.15		0.06	
1586	D1159	4.24		0.18	
1741	UOP304	18.73	R(0.01)	20.37	
1881	D1159	3.99		-0.16	
1949	D1159	4.045		-0.09	
1950	D1159	4.12		0.02	
1986	D1159	4.10		-0.01	
2129	D1159	3.7		-0.57	
6112	D1159	4.08		-0.04	
6201	D1159	3.72		-0.54	
6203	D1159	6.51	R(0.01)	3.35	
6223		-----		-----	
6226	D1159	3.116		-1.38	
6262		-----		-----	
6289	D1159	4.6		0.69	

normality	OK
n	30
outliers	2
mean (n)	4.108
st.dev. (n)	0.5243
R(calc.)	1.468
st.dev.(D1159:07)	0.7179
R(D1159:07)	2.010

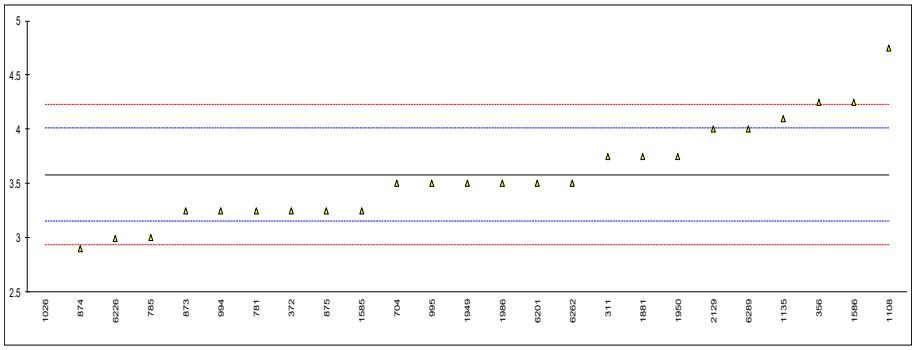


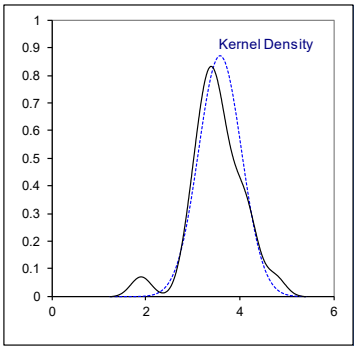


Determination of p-Value on sample #19277;

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
140		-----		-----	
150		-----		-----	
170		-----		-----	
171		-----		-----	
311	SMS1600	3.75		0.78	
323		-----		-----	
356	SMS1600	4.25		3.11	
372	SMS1600	3.25		-1.55	
445		-----		-----	
463		-----		-----	
551		-----		-----	
657	SMS1600	>5.00		>6.61	possibly a false positive test result?
704	SMS1600	3.50		-0.39	
732		-----		-----	
750		-----		-----	
781	SMS1600	3.25		-1.55	
785	SMS1600	3.0		-2.72	
798		-----		-----	
823		-----		-----	
873	SMS1600	3.25		-1.55	
874	SMS1600	2.90		-3.19	
875	SMS1600	3.25		-1.55	
963		-----		-----	
971		-----		-----	
994	INH-20837.5	3.25		-1.55	
995	SMS1600	3.50		-0.39	
1026	D7060	1.90	R(0.05)	-7.85	
1065		-----		-----	
1108	SMS1600	4.75		5.45	
1135	SMS1600	4.1		2.41	
1320		-----		-----	
1402		-----		-----	
1585	SMS1600	3.25		-1.55	
1586	SMS1600	4.25		3.11	
1741		-----		-----	
1881	SMS1600	3.75		0.78	
1949	SMS1600	3.50		-0.39	
1950	SMS1600	3.75		0.78	
1986	SMS1600	3.50		-0.39	
2129	SMS1600	4.0	C	1.95	first reported 4.8
6112		-----		-----	
6201	SMS1600	3.5		-0.39	
6203		-----		-----	
6223		-----		-----	
6226	D7060	2.99		-2.77	
6262	SMS1600	3.5		-0.39	
6289	SMS1600	4		1.95	

normality	OK
n	24
outliers	1
mean (n)	3.583
st.dev. (n)	0.4575
R(calc.)	1.281
st.dev.(SMS1600)	0.2143
R(SMS1600)	0.6

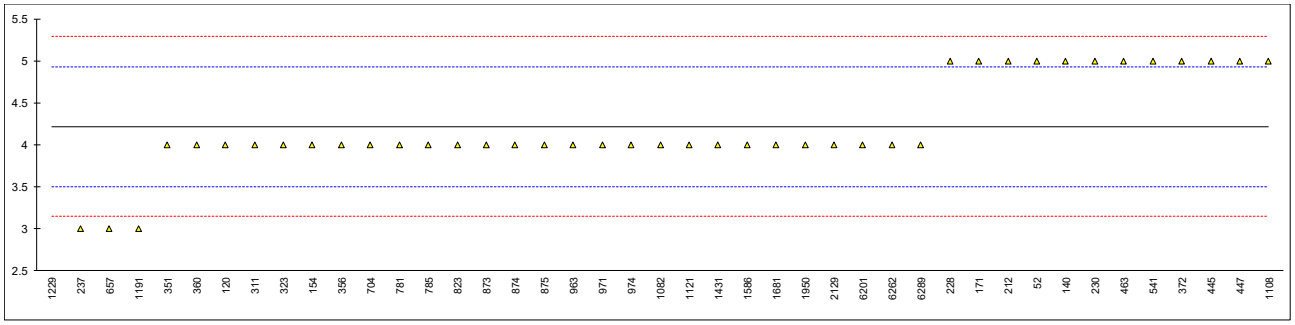


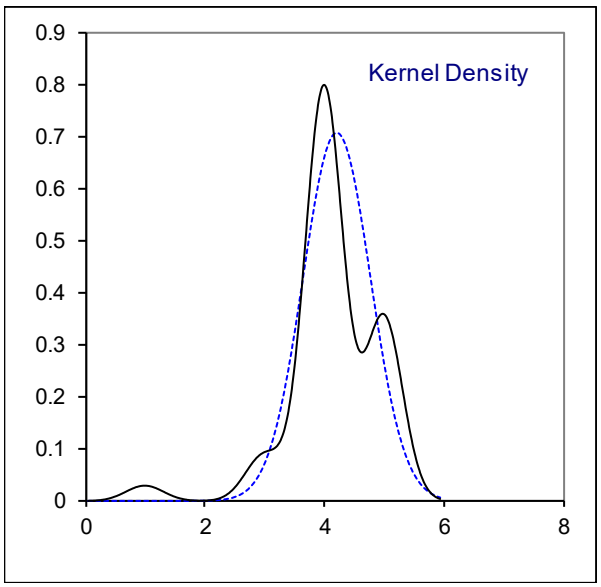


Determination of Compatibility rating on sample #19278;

lab	method	value	mark	z(targ)	used for spot determination	remarks
52	D4740	5		2.20	Acc. to Ref. Spot Description (D4740 8.8)	
120	D4740	4	C	-0.60	---	first reported 1
140	D4740	5		2.20	---	
154	D4740	4		-0.60	Original card	
170		-----		-----	---	
171	D4740	5		2.20	---	
212	D4740	5		2.20	Acc. to Ref. Spot Description (D4740 8.8)	
225		-----		-----	---	
228	D4740	5		2.20	---	
230	D4740	5		2.20	Acc. to Ref. Spot Description (D4740 8.8)	
237	D4740	3		-3.40	Copy of the original card	
311	D4740	4		-0.60	---	
323	D4740	4		-0.60	---	
342		-----		-----	---	
351	D4740	4		-0.60	Acc. to Ref. Spot Description (D4740 8.8)	
356	D4740	4		-0.60	Original card	
360	D4740	4		-0.60	Acc. to Ref. Spot Description (D4740 8.8)	
372	D4740	5		2.20	Original card	
445	D4740	5		2.20	Acc. to Ref. Spot Description (D4740 8.8)	
447	D4740	5		2.20	Acc. to Ref. Spot Description (D4740 8.8)	
463	D4740	5		2.20	Acc. to Ref. Spot Description (D4740 8.8)	
507		-----		-----	---	
541	D4740	5		2.20	Original card	
551		-----		-----	---	
657	D4740	3		-3.40	Original card	
704	D4740	4		-0.60	Original card	
750		-----		-----	---	
781	D4740	4		-0.60	Original card	
785	D4740	4		-0.60	Original card	
798		-----		-----	---	
823	D4740	4		-0.60	Original card	
873	D4740	4		-0.60	Copy of the original card	
874	D4740	4		-0.60	Copy of the original card	
875	D4740	4		-0.60	---	
963	D4740	4		-0.60	Acc. to Ref. Spot Description (D4740 8.8)	
971	D4740	4		-0.60	Original card	
974	D4740	4		-0.60	Original card	
1082	D4740	4		-0.60	---	
1108	D4740	5		2.20	---	
1121	D4740	4		-0.60	Original card	
1134		-----		-----	---	
1191	D4740	3		-3.40	Acc. to Ref. Spot Description (D4740 8.8)	
1229	D4740	1	R(0.01)	-9.00	---	
1431	D4740	4.0		-0.60	Original card	
1586	D4740	4		-0.60	Acc. to Ref. Spot Description (D4740 8.8)	
1681	D4740	4		-0.60	Acc. to Ref. Spot Description (D4740 8.8)	
1796		-----		-----	---	
1950	D4740	4		-0.60	---	
2129	D4740	4		-0.60	Original card	
6201	D4740	4		-0.60	Acc. to Ref. Spot Description (D4740 8.8)	
6223		-----		-----	---	
6262	D4740	4		-0.60	---	
6289	D4740	4		-0.60	---	

normality	OK
n	42
outliers	1
mean (n)	4.2
st.dev. (n)	0.56
R(calc.)	1.6
st.dev.(D4740-M:19)	0.36
R(D4740-M:19)	1


5.5
5
4.5
4
3.5
3
2.5
1229 237 657 1191 351 360 120 311 323 154 356 704 781 785 823 873 874 875 963 971 974 1082 1121 1431 1586 1681 1950 2129 6201 6262 6289 228 171 212 52 140 230 463 541 372 445 447 1108


Kernel Density
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
2
4
6
8

APPENDIX 2 Analytical details of the determination: Acid Number

lab	End point determination	Volume of the titration solvent
52	Inflection Point	125mL
120	Buffer End Point pH 10	125mL
140	Inflection Point	125mL
150	Inflection Point	60mL
159	---	---
168	---	---
169	---	---
170	Inflection Point	60mL
171	Inflection Point	125mL
175	---	---
194	---	---
212	Inflection Point	125mL
225	---	---
230	Inflection Point	125mL
237	---	---
238	---	---
253	---	---
256	---	---
273	Inflection Point	125mL
309	Buffer End Point pH 10	60mL
311	---	---
313	---	---
323	Inflection Point	125mL
333	Inflection Point	125mL
334	Buffer End Point pH 11	125mL
336	---	---
337	---	---
339	---	---
342	Buffer End Point pH 11	125mL
349	---	---
351	---	---
356	Inflection Point	125mL
360	Inflection Point	60mL
370	Inflection Point	125mL
372	Inflection Point	60mL
381	---	---
445	Inflection Point	60mL
447	Inflection Point	125mL
463	Buffer End Point pH 11	125mL
507	---	---
541	---	---
551	Inflection Point	125mL
558	---	---
575	---	---
610	---	---
621	---	---
631	---	---
633	Inflection Point	125mL
634	---	---
657	Inflection Point	125mL
704	Inflection Point	125mL
732	---	---
753	---	---
778	---	---
781	Inflection Point	60mL
785	---	---
798	---	---
823	Inflection Point	125mL
824	---	---
825	---	---
840	Inflection Point	60mL
872	Buffer End Point pH 10	125mL
873	Buffer End Point pH 10	125mL
874	Buffer End Point pH 10	125mL
875	Inflection Point	60mL
887	---	---
902	Inflection Point	125mL
904	Inflection Point	125mL
913	---	---

lab	End point determination	Volume of the titration solvent
962	---	---
963	Inflection Point	60mL
971	Inflection Point	125mL
974	Inflection Point	125mL
994	Inflection Point	60mL
995	Inflection Point	125mL
996	---	---
997	---	---
1026	Buffer End Point pH 10	125mL
1040	Inflection Point	60mL
1065	Inflection Point	125mL
1082	---	---
1090	Inflection Point	125mL
1091	---	---
1108	Inflection Point	125mL
1109	Inflection Point	125mL
1121	Buffer End Point pH 11	125mL
1126	---	---
1134	---	---
1161	---	---
1191	---	---
1205	---	---
1213	Buffer End Point pH 11	60mL
1229	---	---
1299	---	---
1320	Inflection Point	125mL
1356	---	---
1367	---	---
1381	Inflection Point	125mL
1397	---	---
1402	Buffer End Point pH 11	60mL
1431	Inflection Point	60mL
1554	---	---
1585	Inflection Point	125mL
1586	Inflection Point	125mL
1636	---	---
1648	Buffer End Point pH 10	60mL
1681	---	---
1720	---	---
1724	Inflection Point	125mL
1740	Inflection Point	60mL
1741	Inflection Point	100mL
1796	Inflection Point	125mL
1810	---	---
1811	---	---
1854	---	---
1881	---	---
1949	---	---
1950	Inflection Point	125mL
1986	Inflection Point	60mL
1995	---	---
2129	Inflection Point	125mL
6024	---	---
6025	Inflection Point	125mL
6049	Inflection Point	125mL
6051	---	---
6054	---	---
6075	---	---
6092	---	---
6112	---	---
6142	---	---
6201	Inflection Point	125mL
6203	Inflection Point	125mL
6223	---	---
6257	---	---
6262	---	---
6289	---	---
6298	Inflection Point	60mL

APPENDIX 3

Number of participants per country

1 lab in ARGENTINA
1 lab in AUSTRALIA
1 lab in AZERBAIJAN
5 labs in BELGIUM
2 labs in BRAZIL
2 labs in BULGARIA
1 lab in CANADA
1 lab in COLOMBIA
2 labs in COTE D'IVOIRE
1 lab in CROATIA
1 lab in CYPRUS
2 labs in CZECH REPUBLIC
1 lab in DJIBOUTI
1 lab in EGYPT
2 labs in ESTONIA
3 labs in FINLAND
5 labs in FRANCE
3 labs in GEORGIA
1 lab in GERMANY
7 labs in GREECE
1 lab in INDIA
1 lab in INDONESIA
1 lab in IRELAND
1 lab in ISRAEL
1 lab in KAZAKHSTAN
2 labs in LITHUANIA
1 lab in MALAYSIA
2 labs in MALTA
1 lab in MARTINIQUE
1 lab in MAURITIUS
1 lab in MOROCCO
6 labs in NETHERLANDS
2 labs in NIGERIA
1 lab in NORTH MACEDONIA, Republic of
1 lab in NORWAY
1 lab in PANAMA
3 labs in PHILIPPINES
1 lab in POLAND
2 labs in PORTUGAL
1 lab in ROMANIA
18 labs in RUSSIAN FEDERATION
2 labs in SAUDI ARABIA
2 labs in SERBIA
1 lab in SINGAPORE
1 lab in SLOVAKIA
1 lab in SOUTH AFRICA
3 labs in SOUTH KOREA
6 labs in SPAIN
1 lab in SUDAN
1 lab in SWEDEN
1 lab in TAIWAN
1 lab in TANZANIA
1 lab in TOGO
4 labs in TURKEY
1 lab in TURKMENISTAN
2 labs in UKRAINE
5 labs in UNITED ARAB EMIRATES
8 labs in UNITED KINGDOM
11 labs in UNITED STATES OF AMERICA
2 labs in VIETNAM

APPENDIX 4

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's outlier test
R1	= outlier in Rosner's outlier test
R5	= straggler in Rosner's outlier test
E	= possibly an error in calculations
W	= test result withdrawn on request of participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported
SDS	= Safety Data Sheet

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