Results of Proficiency Test
Crude Oil
November 2021

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 1998 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Crude Oil every year. During the annual proficiency testing program 2021/2022 it was decided to continue the round robin for the analysis of Crude Oil.

In this interlaboratory study 170 laboratories in 56 different countries registered for participation. See appendix 4 for the number of participants per country. In this report the results of the Crude Oil proficiency test are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in 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.
It was decided to send one sample Crude Oil in a 1 liter wide-neck bottle labelled #21220 for various analyzes and one sample Crude Oil in a 40mL vial labelled #21221 for determination of Mercury (Hg) only. A wide-neck bottle is used to enable the use of a large size diameter high speed shear mixer for homogenization.
The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

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

2.2 PROTOCOL

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

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

A batch of approximately 200 liters of Crude Oil was obtained from a local refinery. After homogenization 188 wide-neck transparent colorless glass bottles of 1L were filled and labelled #21220. The bottles were put into red plastic bags to protect it from light.
The homogeneity of the subsamples was checked by determination of Density at 15°C in accordance with ASTM D5002 on 8 stratified randomly selected subsamples.

	Density at 15°C in kg/m^3
sample #21220-1	885.34
sample #21220-2	885.35
sample #21220-3	885.30
sample #21220-4	885.52
sample #21220-5	885.34
sample #21220-6	885.52
sample #21220-7	885.24
sample #21220-8	885.31

Table 1: homogeneity test results of subsamples #21220

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)	0.285
reference test method	ASTM D5002:19
0.3 x R (reference test method)	1.094

Table 2: evaluation of the repeatability of subsamples #21220

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

A batch of approximately 10 liters of Crude Oil was obtained from a third local refinery and spiked with a Mercury Conostan standard and a $HgCl_2$ in Ethanol solution especially for Mercury determination. After homogenization 188 amber glass vials of 40mL were filled and labelled #21221.
The homogeneity of the subsamples was checked by determination of Mercury in accordance with UOP938 on 8 stratified randomly selected subsamples.

	Total Mercury in µg/kg
sample #21221-1	16.9
sample #21221-2	16.7
sample #21221-3	16.9
sample #21221-4	16.5
sample #21221-5	16.6
sample #21221-6	16.5
sample #21221-7	16.6
sample #21221-8	16.6

Table 3: homogeneity test results of subsamples #21221

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

	Total Mercury in µg/kg
r (observed)	0.4
reference method	Horwitz
0.3 x R (reference method)	4.1

Table 4: evaluation of the repeatability of subsamples #21221

The calculated repeatability is in agreement with 0.3 times the estimated reproducibility calculated with the Horwitz equation. Therefore, homogeneity of the subsamples was assumed.

To each of the participating laboratories one sample of Crude Oil labelled #21220 and one sample of Crude Oil for Hg analysis only labelled #21221 were sent on October 13, 2021. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of Crude Oil packed in the transparent colorless glass bottles and put into red plastic bags to protect it from light and in amber glass vials was checked. The material has been found sufficiently stable for the period of the proficiency test.

2.6 ANALYZES

The participants were requested to determine on sample #21220: Total Acid Number, API Gravity, BS&W, Density at 15°C, Kinematic Viscosity at 40°C, Light ends (Methane, Ethane, Propane, iso-Butane, n-Butane, iso-Pentane, n-Pentane, cyclo-Pentane, Total Hexanes and Total of all C1-C6), Average Molecular Mass, Pour Point Maximum, Salt as Chloride, Sediment (Extraction method and Membrane filtration), Total Sulfur, Water and Simulated Distillation. It was also requested to report some analytical details about Total Acid Number determination.
On sample #21221 it was requested to determine Total Mercury.

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

To get comparable test results a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the reference test methods (when applicable) that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis/. 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 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.
The assigned value is determined by consensus based on the test results of the group of participants after rejection of the statistical outliers and/or suspect data.

According to ISO13528 all (original received or corrected) results per determination were submitted to outlier tests. In the iis procedure for proficiency tests, outliers are detected prior to calculation of the mean, standard deviation and reproducibility. For small data sets, Dixon (up to 20 test results) or Grubbs (up to 40 test results) outlier tests can be used. For larger data sets (above 20 test results) Rosner's outlier test can be used. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

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

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

3.2 GRAPHICS

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

Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve (dotted line) was projected over the Kernel Density Graph (smooth line) for reference. The Gauss curve is calculated from the consensus value and the corresponding standard deviation.

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 (derived from e.g. ISO or ASTM test methods), 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 test result tables in appendix 1.

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

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

4 EVALUATION

In this proficiency test some problems were encountered with the dispatch of the samples due to COVID-19 pandemic. Therefore, the reporting time on the data entry portal was extended with another three weeks. When considering the test results of the two samples together 17 participants reported test results after the final reporting date and 15 participants did not report any test results. Not all participants were able to report all tests requested.
In total 155 participants reported 1281 numerical test results. Observed were 27 outlying test results, which is 2.1%. 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 in the tables together with the original data in appendix 1. The abbreviations, used in these tables, are explained in appendix 5.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D473) and an added designation for the year that the test method was adopted or revised (e.g. D473:07e1). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D473:07e1(2017)). In the test results tables of appendix 1 only the test method number and year of adoption or revision (e.g. D473:07e1) will be used.

For the evaluation of Total Mercury it was decided to use the Horwitz equation to calculate an estimated target reproducibility as ASTM D7623 and UOP938 give only a repeatability. Furthermore, UOP938 as used by most of the laboratories is not intended to use for crude oil. Also, the repeatability of UOP938 is only available for concentrations in µg/L and conversion to µg/kg will lead to extra uncertainty.

sample #21220

Total Acid Number: This determination may be problematic for a number of laboratories. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with all four requirements (titration volume and IP/BEP) of ASTM D664-A:18e2.

API Gravity: This determination was not problematic. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D287:12b(2019).

BS&W: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D4007:11e1(2016).

Density at 15°C: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5002:19.
Some participants reported to have used test method ASTM D4052. It must be noted that in the scope of this test method it is mentioned that ASTM D5002 is intended for crude oils (see e.g. §1.3 of ASTM D4052:18a).

Kin.Visc.at 40°C: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D445:21e1.

Light ends: This determination was very problematic. In total three statistical outliers were observed over ten parameters. None of the calculated reproducibilities after rejection of the statistical outliers are in agreement with the requirements of IP344:88(2010).
For the evaluation of Light ends test method IP344 is used. Although IP344 is an obsolete test method the reproducibilities are given per individual component. Alternative test methods i.e. ASTM D7900 and EN15199-4 only specify a reproducibility per complete boiling range.

Average Molecular Mass: This determination may be problematic, but only six test results were reported. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D2503:92(2016).

Pour Point Maximum: 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 D5853-A:17a. Some participants reported to have used test method ASTM D97. It must be noted that in the scope of ASTM D97 it is mentioned that ASTM D5853 is intended for crude oils (see e.g. §1.3 of ASTM D97:17b).

Salt as Chloride: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D3230:19.

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

Sediment (Membrane filtration): This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D4807:05(2020).

Total Sulfur: This determination may be problematic for a number of laboratories. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D4294:21.

Water: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D4377:00(2011).

Simulated Distillation: This determination was very problematic. Only 14 laboratories reported test results for this determination. In total over eight distillation parameters no statistical outliers were observed. The calculated reproducibilities are not at all in agreement with the requirements of ASTM D7169:20e1.

sample #21221

Total Mercury: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility calculated with the Horwitz equation.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

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

Parameter	unit	n	average	2.8 * sd	R(lit)
Total Acid Number	mg KOH/g	67	1.09	0.19	0.43
API Gravity		101	28.2	0.2	0.5
BS&W	%V/V	65	0.04	0.07	0.11
Density at 15°C	kg/m^3	145	885.6	1.5	3.6
Kinematic Viscosity at 40°C	mm^2/s	91	11.16	1.39	0.94
Methane	%M/M	16	<0.01	n.e.	n.e.
Ethane	%M/M	17	0.026	0.019	0.010
Propane	%M/M	18	0.29	0.11	0.06
iso-Butane	%M/M	17	0.18	0.04	0.03
n-Butane	%M/M	17	0.59	0.14	0.08
iso-Pentane	%M/M	18	0.46	0.09	0.04
n-Pentane	%M/M	18	0.67	0.13	0.07
cyclo-Pentane	%M/M	15	0.091	0.050	0.014
Total Hexanes	%M/M	13	2.01	1.67	0.45
Total of all C1 - C6	%M/M	12	4.38	1.72	0.47
Average Molecular Mass	g/mol	6	244	16	14
Pour Point Maximum	°C	70	-2.2	13.8	18.0
Salt as Chloride	mg/kg	82	16.1	18.1	22.3
Sediment (Extraction method)	%V/V	63	0.007	0.012	0.035
Sediment (Membrane filtration)	%M/M	46	0.012	0.019	0.013
Total Sulfur	%M/M	102	0.64	0.05	0.05
Water	%V/V	130	0.042	0.040	0.039
IBP	°C	14	<36	n.e.	n.e.
5% recovered	°C	14	85	40	20
10% recovered	°C	14	134	44	20
30% recovered	°C	14	270	29	13
50% recovered	°C	14	370	37	16
70% recovered	°C	14	478	52	21
90% recovered	°C	14	648	120	n.a.
FBP	°C	5	723	n.a.	n.a.
Total Mercury	µg/kg	29	17.6	9.4	14.5

Table 5: reproducibilities of tests on samples #21220 and #21221 (Hg only)

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF NOVEMBER 2021 WITH PREVIOUS PTS

	November 2021	November 2020	November 2019	November 2018	November 2017
Number of reporting laboratories	155	140	138	143	140
Number of test results	1281	1212	1189	1234	1234
Number of statistical outliers	27	44	32	60	60
Percentage of statistical outliers	2.1%	3.6%	2.7%	4.9%	4.9%

Table 6: 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 to the requirements of the reference test methods. The conclusions are given in the following table.

Determination	November 2021	November 2020	November 2019	November 2018	November 2017
Total Acid Number	++	+	-	+	+
API Gravity	++	++	+	+	+
BS&W	+	+	+	+/-	+
Density at 15°C	++	++	++	++	++
Kinematic Viscosity at 40°C	-	-	-	-	-
Light Ends (C1 - C6)	--	--	--	--	--
Average Molecular Mass	-	+	+	-	+/-
Pour Point Maximum	+	+	+	+	+
Salt as Chloride	+	+	+	+	+/-
Sediment (Extraction method)	++	++	++	++	++
Sediment (Membrane filtration)	-	+/-	-	-	+/-
Total Sulfur	+	-	-	-	-
Water	+/-	+	+	+	--
Simulated Distillation	--	--	-	--	--
Total Mercury	+	+	+	+	++

Table 7: 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

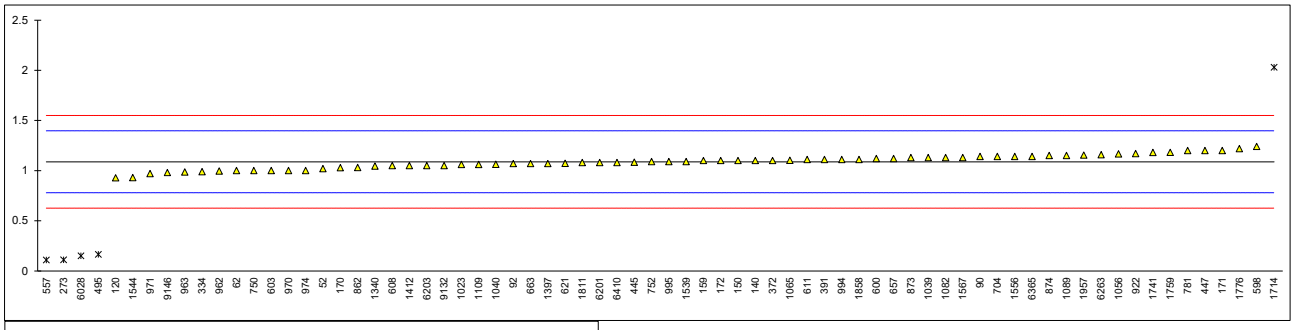
Determination of Total Acid Number on sample #21220; results in mg KOH/g

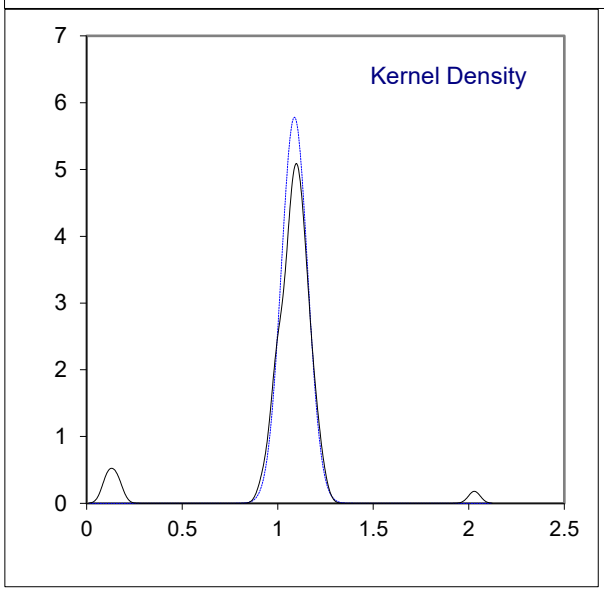
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D664-A	1.02		-0.44	781	D664-A	1.2		0.73
62	D664-A	1.0		-0.57	785		-----		-----
90	D664-A	1.14		0.34	798		-----		-----
92	D664-A	1.07		-0.12	840		-----		-----
120	D664-A	0.928		-1.04	862	D664-A	1.03		-0.38
140	D664-A	1.1		0.08	873	D664-A	1.13		0.27
141		-----		-----	874	D664-A	1.15		0.40
150	D664-A	1.1		0.08	875		-----		-----
154		-----		-----	904		-----		-----
158		-----		-----	914		-----		-----
159	D664-A	1.10		0.08	922	D664-A	1.17		0.53
167		-----		-----	962	D664-A	0.995		-0.60
168		-----		-----	963	D664-A	0.987		-0.66
170	D664-A	1.029		-0.38	970	D664-A	1.0		-0.57
171	D664-A	1.2		0.73	971	D664-A	0.97		-0.77
172	D664-A	1.1		0.08	974	D664-A	1.0		-0.57
175		-----		-----	988		-----		-----
203		-----		-----	991		-----		-----
225		-----		-----	992		-----		-----
237		-----		-----	994	D664-A	1.11		0.14
238		-----		-----	995	D664-A	1.09		0.01
273	D664-A	0.11	C,R(0.01)	-6.35	997		-----		-----
311		-----		-----	1011		-----		-----
314		-----		-----	1023	D8045	1.06		-0.18
328		-----		-----	1039	D664-A	1.13		0.27
333		-----		-----	1040	D664-A	1.0627		-0.16
334	D664-A	0.99		-0.64	1056	D664-A	1.167		0.51
335		-----		-----	1065	D664-A	1.103		0.10
355		-----		-----	1082	ISO6619	1.13		0.27
372	D664-A	1.10		0.08	1089	D664-A	1.15		0.40
391	D664-A	1.11		0.14	1109	D664-A	1.06		-0.18
398		-----		-----	1236		-----		-----
399		-----		-----	1259		-----		-----
442		-----		-----	1320		-----		-----
444		-----		-----	1340	D664-A	1.045		-0.28
445	D664-A	1.083		-0.03	1360		-----		-----
446		-----		-----	1397	D664-A	1.07		-0.12
447	D664-A	1.200		0.73	1412	D664-A	1.05		-0.25
480		-----		-----	1510		-----		-----
495	D664-A	0.165	R(0.01)	-6.00	1539	D664-A	1.09		0.01
511		-----		-----	1544	D664-A	0.93	C	-1.03
525		-----		-----	1556	D664-A	1.14		0.34
529		-----		-----	1567	D664-A	1.13		0.27
541		-----		-----	1613		-----	W	-----
542		-----		-----	1654		-----		-----
551		-----		-----	1695		-----		-----
553		-----		-----	1714	In house	2.03	R(0.01)	6.12
557	D664-A	0.10784752	R(0.01)	-6.37	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728		-----		-----
588		-----		-----	1741	ISO6619	1.180		0.60
589		-----		-----	1759	D664-A	1.181		0.60
590		-----		-----	1776	D664-A	1.22		0.86
593		-----		-----	1810		-----		-----
596		-----		-----	1811	D664-A	1.08		-0.05
597		-----		-----	1815		-----		-----
598	D664-A	1.24		0.99	1833		-----		-----
599		-----		-----	1842		-----		-----
600	D664-A	1.12		0.21	1849		-----		-----
603	D664-A	1.00		-0.57	1858	D664-A	1.11		0.14
608	D664-A	1.05		-0.25	1928		-----		-----
609		-----		-----	1929		-----		-----
610		-----		-----	1930		-----		-----
611	D664-A	1.11		0.14	1957	D664-A	1.154		0.43
612		-----		-----	6016		-----		-----
621	D664-A	1.0727		-0.10	6028	D664-A	0.15	R(0.01)	-6.09
657	D664-A	1.12		0.21	6054		-----		-----
663	D664-A	1.07		-0.12	6166		-----		-----
704	D664-A	1.14		0.34	6201	D664-A	1.08		-0.05
710		-----		-----	6203	D664-A	1.05		-0.25
734		-----		-----	6263	D664	1.1593	C	0.46
749		-----		-----	6290		-----		-----
750	D664-A	1.0		-0.57	6295		-----		-----
752	D664-A	1.090		0.01	6296		-----		-----
753		-----		-----	6362		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365	D664-A	1.14		0.34	9142		-----		-----
6410	D664-A	1.08		-0.05	9143		-----		-----
9051		-----		-----	9146	D664Mod.	0.98		-0.70
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060		-----		-----	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132	D664-A	1.05		-0.25	9164		-----		-----
9141		-----		-----	9165		-----		-----

	normality	OK	
	n	67	
	outliers	5	
	mean (n)	1.0880	
	st.dev. (n)	0.06900	
	R(calc.)	0.1932	
	st.dev.(D664-A:18e2)	0.15393	IP 60mL
	R(D664-A:18e2)	0.4310	IP 60mL
Compare			
	R(D664-A:18e2)	0.2389	IP 125mL
	R(D664-A:18e2)	0.6017	BEP 60mL
	R(D664-A:18e2)	0.3453	BEP 125mL

Lab 273 first reported 0.19
Lab 1544 first reported 0.13
Lab 1613 test result withdrawn, reported 0.23
Lab 6263 first reported 0.1784



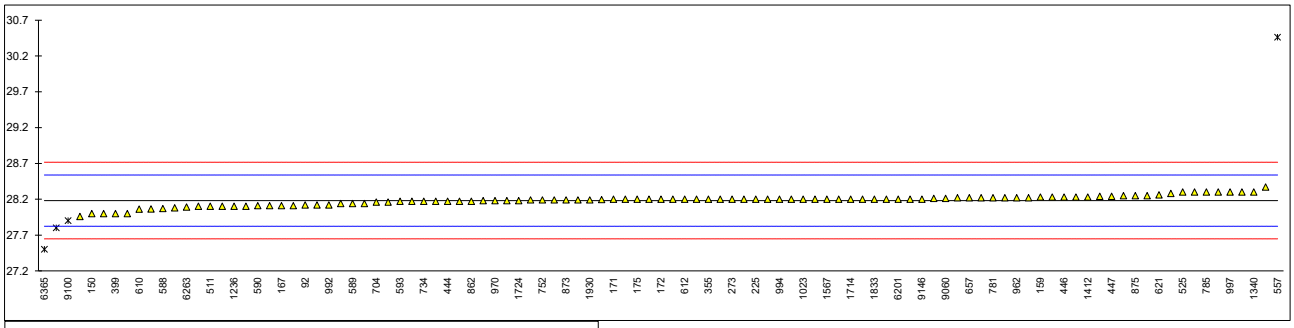


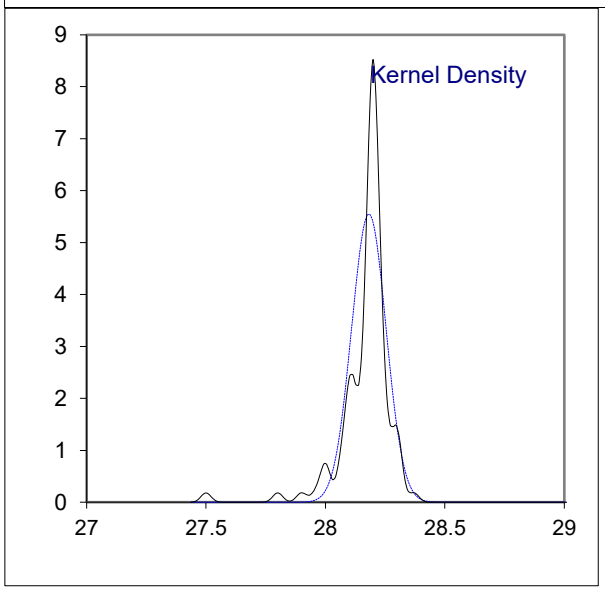
Determination of API Gravity on sample #21220;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5002	28.2		0.10	781	D5002	28.22		0.21
62	D5002	28.1		-0.46	785	D1298	28.3		0.66
90	D5002	28.18		-0.01	798		-----		-----
92	D5002	28.12		-0.35	840	D5002	28.08		-0.57
120		-----		-----	862	D287	28.17		-0.07
140		-----		-----	873	D1298	28.19		0.05
141	D5002	27.8	R(0.01)	-2.14	874		-----		-----
150	D287	28.0		-1.02	875	D1250	28.25		0.38
154	D287	28.3		0.66	904		-----		-----
158		-----		-----	914		-----		-----
159	D5002	28.23		0.27	922	D4052	28.22		0.21
167	D5002	28.11		-0.40	962	D5002	28.22		0.21
168	D287	28.0		-1.02	963	D5002	28.22		0.21
170		-----		-----	970	D1298	28.18		-0.01
171	D287	28.2		0.10	971	D5002	28.18		-0.01
172	D287	28.2		0.10	974	Calc.	28.19		0.05
175	D5002	28.2		0.10	988	D1298	28.3		0.66
203	Calc.	28.24		0.33	991	D1298	28.12		-0.35
225	Calc.	28.2		0.10	992	D1298	28.12		-0.35
237	D1298	28.2		0.10	994	Calc.	28.2		0.10
238	D5002	28.2		0.10	995	D4052	28.2		0.10
273	D4052	28.2		0.10	997	D287	28.3		0.66
311		-----		-----	1011		-----		-----
314		-----		-----	1023	Calc.	28.2		0.10
328		-----		-----	1039		-----		-----
333		-----		-----	1040	D287	28.2		0.10
334		-----		-----	1056	Calc.	28.3		0.66
335		-----		-----	1065		-----		-----
355	D4052	28.2		0.10	1082		-----		-----
372	D287	28.23		0.27	1089	D5002	28.1		-0.46
391		-----		-----	1109	D5002	28.23		0.27
398		-----		-----	1236	D287	28.1		-0.46
399	Calc.	28.0		-1.02	1259	Calc.	28.11		-0.40
442	D5002	28.0625		-0.67	1320		-----		-----
444	D5002	28.17		-0.07	1340	D1298	28.3		0.66
445	D5002	28.22		0.21	1360		-----		-----
446	Calc.	28.23		0.27	1397		-----		-----
447	D5002	28.24		0.33	1412	D5002	28.23		0.27
480		-----		-----	1510		-----		-----
495	D1298	28.19		0.05	1539		-----		-----
511	D1298	28.1		-0.46	1544		-----		-----
525	Calc.	28.3		0.66	1556		-----		-----
529	D1298	28.2		0.10	1567	Calc.	28.2		0.10
541	D5002	28.20		0.10	1613	D5002	28.28		0.55
542	D287	28		-1.02	1654	D4052	28.2		0.10
551	D287	28.14		-0.23	1695		-----		-----
553		-----		-----	1714	D5002	28.2		0.10
557	D287	30.46	R(0.01)	12.76	1720		-----		-----
562		-----		-----	1724	D5002	28.18		-0.01
575		-----		-----	1728	D5002	28.194		0.07
588	D1298	28.07		-0.63	1741	D1298	28.2		0.10
589	D1298	28.14		-0.23	1759		-----		-----
590	D1298	28.11		-0.40	1776		-----		-----
593	D1298	28.17		-0.07	1810		-----		-----
596		-----		-----	1811		-----		-----
597		-----		-----	1815		-----		-----
598	D5002	27.96		-1.24	1833	D5002	28.2		0.10
599	D1298	28.25		0.38	1842		-----		-----
600	D5002	28.17		-0.07	1849	ISO3675	28.2		0.10
603	D4052	28.2		0.10	1858	Calc.	28.10		-0.46
608	Calc.	28.17		-0.07	1928		-----		-----
609	D5002	28.11		-0.40	1929		-----		-----
610	D5002	28.06		-0.68	1930	Calc.	28.19		0.05
611	D5002	28.22		0.21	1957	D4052	28.14		-0.23
612	D5002	28.20		0.10	6016		-----		-----
621	D5002	28.26		0.44	6028	D1298	28.25		0.38
657	D5002	28.22		0.21	6054	D5002	28.16		-0.12
663	D5002	28.21		0.16	6166		-----		-----
704	D1298	28.16		-0.12	6201	D287	28.2		0.10
710	Calc.	28.17		-0.07	6203		-----		-----
734	Calc.	28.17		-0.07	6263	D1298	28.09		-0.51
749		-----		-----	6290		-----		-----
750	D1250	28.2		0.10	6295		-----		-----
752	D1298	28.19		0.05	6296		-----		-----
753	D5002	28.19		0.05	6362		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365	D5002	27.5	R(0.01)	-3.82	9142	D1298	28.2		0.10
6410		-----		-----	9143		-----		-----
9051		-----		-----	9146	In house	28.2		0.10
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060	D5002	28.21		0.16	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100	D1298	27.9	R(0.05)	-1.58	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141	D287	28.37		1.05	9165		-----		-----

normality	suspect
n	101
outliers	4
mean (n)	28.182
st.dev. (n)	0.0719
R(calc.)	0.201
st.dev.(D287:12b)	0.1786
R(D287:12b)	0.5



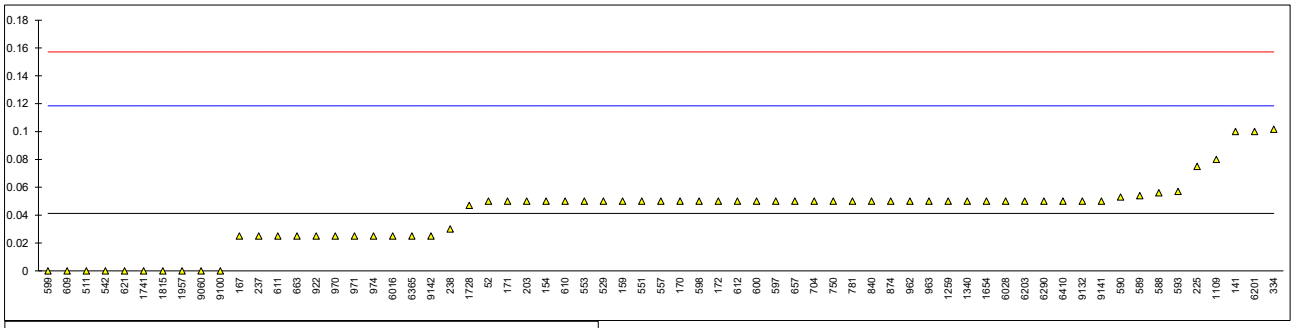


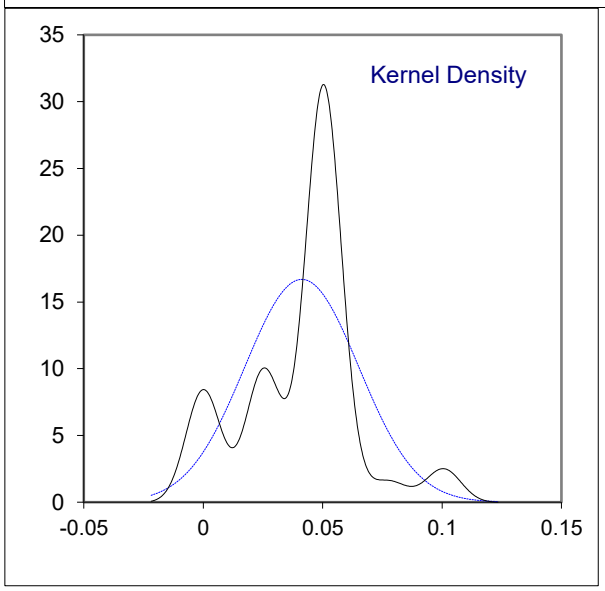
Determination of BS&W on sample #21220; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4007	0.05		0.23	781	D4007	0.05		0.23
62	D4007	<0.1		-----	785		-----		-----
90		-----		-----	798		-----		-----
92		-----		-----	840	D4007	0.05		0.23
120		-----		-----	862		-----		-----
140	D4007	<0.025		-----	873		-----		-----
141	D4007	0.10		1.52	874	D4007	0.05		0.23
150		-----		-----	875		-----		-----
154	D1796	0.05		0.23	904		-----		-----
158	D4007	<0.025		-----	914		-----		-----
159	D4007	0.05		0.23	922	D4007	0.025		-0.42
167	D4007	0.025		-0.42	962	D4007	0.05		0.23
168		-----		-----	963	D4007	0.05		0.23
170	D4007	0.05		0.23	970	D4007	0.025		-0.42
171	D4007	0.05		0.23	971	D4007	0.025		-0.42
172	D4007	0.05		0.23	974	D4007	0.025		-0.42
175		-----		-----	988		-----		-----
203	D4007	0.05		0.23	991		-----		-----
225	D4007	0.075		0.87	992		-----		-----
237	D4007	0.025		-0.42	994		-----		-----
238	D4007	0.03		-0.29	995		-----		-----
273		-----		-----	997		-----		-----
311		-----		-----	1011		-----		-----
314		-----		-----	1023	D4007	<0,025		-----
328		-----		-----	1039		-----		-----
333		-----		-----	1040		-----		-----
334	D4007	0.1016		1.56	1056		-----		-----
335		-----		-----	1065		-----		-----
355		-----		-----	1082		-----		-----
372		-----		-----	1089		-----		-----
391		-----		-----	1109	D4007	0.08		1.00
398		-----		-----	1236		-----		-----
399		-----		-----	1259	ISO9030	0.05		0.23
442		-----		-----	1320		-----		-----
444		-----		-----	1340	ISO9030	0.05		0.23
445		-----		-----	1360		-----		-----
446		-----		-----	1397		-----		-----
447		-----		-----	1412		-----		-----
480		-----		-----	1510		-----		-----
495		-----		-----	1539		-----		-----
511	D4007	0		-1.07	1544		-----		-----
525		-----		-----	1556		-----		-----
529	D4007	0.05		0.23	1567		-----		-----
541	D4007	<0.025		-----	1613	D4007	<0.05		-----
542	D4007	0		-1.07	1654	D4007	0.05		0.23
551	D4007	0.05		0.23	1695		-----		-----
553	D4007	0.05		0.23	1714		-----		-----
557	D4007	0.05		0.23	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728		0.047		0.15
588	D7829	0.056		0.38	1741	ISO9030	0.0		-1.07
589	D7829	0.054		0.33	1759		-----		-----
590	D7829	0.053		0.31	1776		-----		-----
593	D7829	0.057		0.41	1810		-----		-----
596	D4007	<0.05		-----	1811		-----		-----
597	D4007	0.05		0.23	1815	D4007	0		-1.07
598	D4007	0.05		0.23	1833		-----		-----
599	D4007	0.00		-1.07	1842		-----		-----
600	D4007	0.05		0.23	1849		-----		-----
603		-----		-----	1858		-----		-----
608	D4007	<0.05		-----	1928		-----		-----
609	D4007	0.00		-1.07	1929		-----		-----
610	D4007	0.05		0.23	1930		-----		-----
611	D4007	0.025		-0.42	1957	D4007	0		-1.07
612	D4007	0.05		0.23	6016	D4007	0.025		-0.42
621	D4007	0		-1.07	6028	D4007	0.05		0.23
657	D4007	0.05		0.23	6054		-----		-----
663	D4007	0.025		-0.42	6166		-----		-----
704	D4007	0.050		0.23	6201	D4007	0.10		1.52
710		-----		-----	6203	D4007	0.05		0.23
734		-----		-----	6263	D4007	<0.05		-----
749		-----		-----	6290	D4007	0.05		0.23
750	D4007	0.05		0.23	6295		-----		-----
752		-----		-----	6296		-----		-----
753		-----		-----	6362		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365	D4007	0.025		-0.42	9142	D4007	0.025		-0.42
6410	D4007	0.05		0.23	9143		-----		-----
9051		-----		-----	9146	D4007	<0.1		-----
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060	D4007	0		-1.07	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100	D4007	0.0		-1.07	9163		-----		-----
9132	D4007	0.05		0.23	9164		-----		-----
9141	D4007	0.05		0.23	9165		-----		-----

normality	OK
n	65
outliers	0
mean (n)	0.0412
st.dev. (n)	0.02390
R(calc.)	0.0669
st.dev.(D4007:11e1)	0.03866
R(D4007:11e1)	0.1082





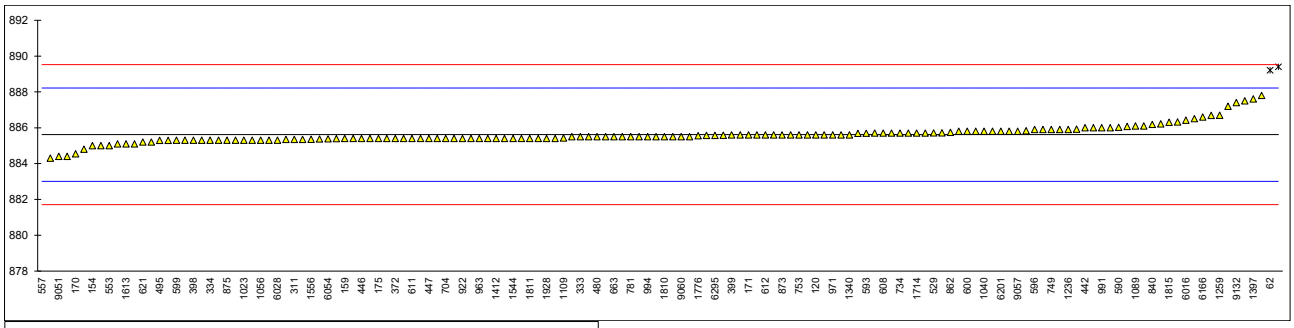
Determination of Density at 15°C on sample #21220; results in kg/m^3

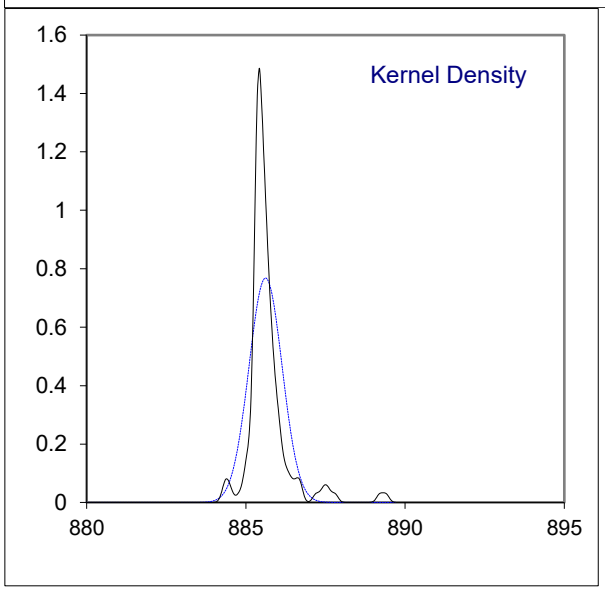
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5002	885.5		-0.09	781	D5002	885.5		-0.09
62	D5002	889.2	C,R(0.01)	2.75	785	D5002	885.5		-0.09
90	D5002	885.6		-0.01	798		-----		-----
92	D5002	885.5		-0.09	840	D5002	886.18		0.43
120	D5002	885.6		-0.01	862	D5002	885.74		0.09
140		-----		-----	873	D5002	885.6		-0.01
141	D5002	887.8		1.67	874	D5002	886.0		0.29
150	D5002	885.0		-0.47	875	D5002	885.3		-0.24
154	D4052	885.0		-0.47	904	D5002	885.4		-0.17
158		-----		-----	914		-----		-----
159	D5002	885.4		-0.17	922	D4052	885.4	C	-0.17
167	D5002	885.367	C	-0.19	962	D5002	885.4		-0.17
168		-----		-----	963	D5002	885.4		-0.17
170	D5002	884.54		-0.83	970	D4052	885.6		-0.01
171	D5002	885.6		-0.01	971	D5002	885.6	C	-0.01
172	D5002	885.8		0.14	974	D5002	885.6		-0.01
175	D5002	885.4		-0.17	988	D1298	885.5		-0.09
203	D5002	885.40		-0.17	991	D1298	886.0		0.29
225	D5002	885.4		-0.17	992	D1298	886.0		0.29
237	D1298	885.7		0.06	994	D5002	885.5		-0.09
238	D5002	885.6		-0.01	995	D5002	885.5		-0.09
273	D5002	885.3		-0.24	997	D5002	885.3		-0.24
311	D5002	885.34		-0.21	1011		-----		-----
314	D5002	885.34		-0.21	1023	D5002	885.30		-0.24
328	D5002	885.6		-0.01	1039	ISO12185	885.3		-0.24
333	D5002	885.5		-0.09	1040	ISO12185	885.8		0.14
334	D5002	885.3		-0.24	1056	D5002	885.3		-0.24
335	D5002	885.9		0.22	1065	D4052	885.7	C	0.06
355	D4052	885.6		-0.01	1082	D5002	885.34		-0.21
372	D5002	885.4		-0.17	1089	D5002	886.1		0.37
391	ISO12185	885.3		-0.24	1109	D5002	885.43		-0.14
398	D5002	885.3		-0.24	1236	D5002	885.9		0.22
399	D5002	885.6		-0.01	1259	ISO12185	886.7		0.83
442	IP365	886.0		0.29	1320		-----		-----
444	D5002	885.4		-0.17	1340	ISO3675	885.6		-0.01
445	D5002	885.4		-0.17	1360		885.4		-0.17
446	D5002	885.4		-0.17	1397	ISO12185	887.6		1.52
447	D5002	885.4		-0.17	1412	D5002	885.4		-0.17
480	D5002	885.50		-0.09	1510		-----		-----
495	ISO12185	885.29		-0.25	1539	D5002	885.4		-0.17
511		-----		-----	1544	D5002	885.4	C	-0.17
525	D7042	884.8	C	-0.63	1556	ISO12185	885.35		-0.21
529	D5002	885.71		0.07	1567	D4052	885.3		-0.24
541	D5002	885.40		-0.17	1613	D5002	885.1		-0.40
542	D5002	885.8		0.14	1654	D4052	885.393		-0.17
551	D5002	885.5		-0.09	1695	D5002	885.92		0.23
553	D5002	885.0		-0.47	1714	D5002	885.7		0.06
557	D5002	873.23	R(0.01)	-9.51	1720		-----		-----
562		-----		-----	1724	D5002	885.7		0.06
575		-----		-----	1728	D5002	885.57		-0.04
588	D1298	886.22		0.46	1741	D1298	885.4		-0.17
589	D1298	885.83		0.16	1759	D4052	886.1	C	0.37
590	D1298	886.02		0.31	1776	ISO12185	885.56		-0.04
593	D1298	885.69		0.06	1810	ISO12185	885.5		-0.09
596	D5002	885.9		0.22	1811	D5002	885.4		-0.17
597	D5002	885.3		-0.24	1815	ISO12185	886.30		0.52
598	D5002	886.5		0.68	1833	D5002	885.4		-0.17
599	D1298	885.3		-0.24	1842		-----		-----
600	D5002	885.8		0.14	1849	ISO3675	885.2		-0.32
603	D4052	885.1		-0.40	1858	D1298	886.07		0.35
608	D5002	885.7		0.06	1928		885.4		-0.17
609	D5002	885.7		0.06	1929		885.8		0.14
610	D5002	886.32		0.54	1930	ISO12185	885.29		-0.25
611	D5002	885.4		-0.17	1957	D4052	885.5		-0.09
612	D5002	885.6		-0.01	6016	In house	886.42		0.62
621	D5002	885.2		-0.32	6028	ISO3675	885.3		-0.24
657	D5002	885.4		-0.17	6054	D5002	885.38		-0.18
663	D5002	885.50		-0.09	6166	IP365	886.6		0.75
704	D5002	885.4		-0.17	6201	D5002	885.8		0.14
710	ISO12185	885.72		0.08	6203	D4052	885.4		-0.17
734	D4052	885.7		0.06	6263	D4052	885.8		0.14
749	GOST R51069	885.9		0.22	6290	D4052	886.69		0.82
750	D1298	885.9		0.22	6295	D5002	885.57		-0.04
752	ISO12185	885.6		-0.01	6296	D5002	885.68		0.05
753	D5002	885.6		-0.01	6362	D5002	885.58		-0.03

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365	D5002	889.4	C,R(0.01)	2.90	9142	D1298	885.5		-0.09
6410	D5002	885.1		-0.40	9143		-----		-----
9051	In house	884.4		-0.93	9146		-----		-----
9052	In house	887.5		1.44	9151		-----		-----
9057	D5002	885.8		0.14	9160		-----		-----
9060	D5002	885.5		-0.09	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100	D1298	887.2		1.21	9163		-----		-----
9132	D5002	887.4		1.37	9164		-----		-----
9141	D1298	884.3		-1.01	9165	D1298	884.4		-0.93

normality	not OK
n	145
outliers	3
mean (n)	885.617
st.dev. (n)	0.5197
R(calc.)	1.455
st.dev.(D5002:19)	1.3031
R(D5002:19)	3.649

Lab 62 first reported 882.2
Lab 167 first reported 0.885367 kg/m³
Lab 525 first reported 0.8848 kg/m³
Lab 922 first reported 0.8854 kg/m³
Lab 971 first reported 0.8856 kg/m³
Lab 1065 first reported 0.8857 kg/m³
Lab 1544 first reported 0.88540 kg/m³
Lab 1759 first reported 0.8861 kg/m³
Lab 6365 first reported 0.8894 kg/m³





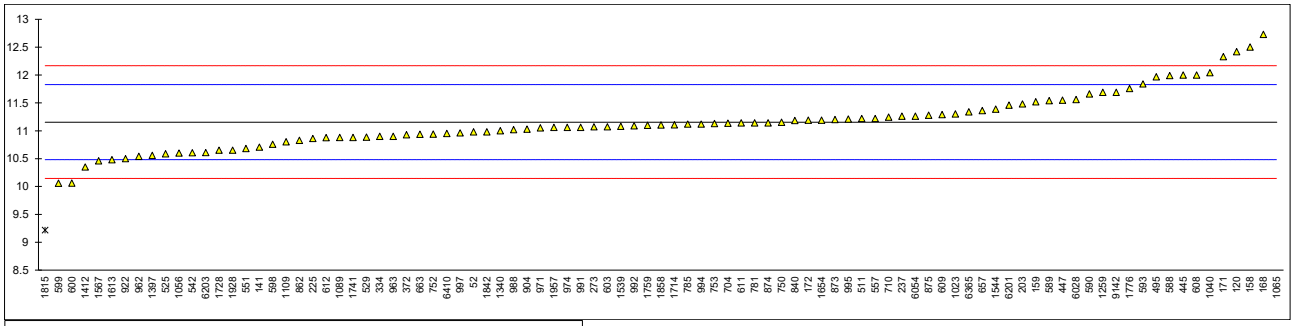
Determination of Kinematic Viscosity at 40°C on sample #21220; results in mm²/s

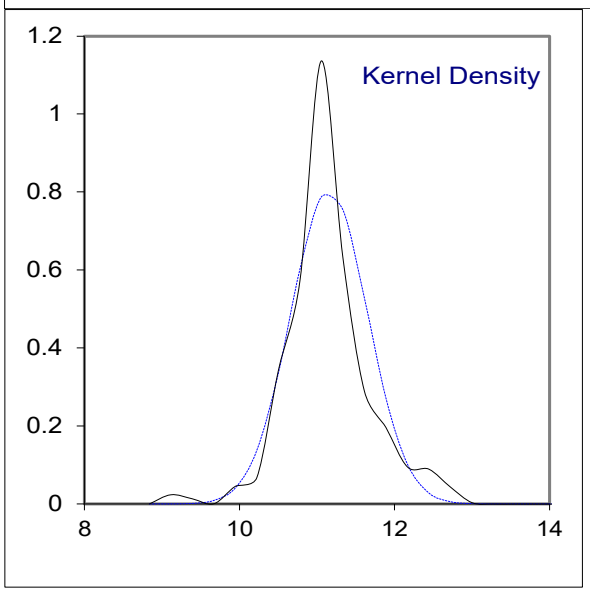
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D445	10.98		-0.52	781	D445	11.14		-0.05
62		-----		-----	785	D445	11.12		-0.11
90		-----		-----	798		-----		-----
92		-----		-----	840	D7042	11.184		0.08
120	D445	12.42		3.75	862	D445	10.828		-0.97
140		-----		-----	873	D445	11.20		0.13
141	D7042	10.706		-1.33	874	D445	11.14		-0.05
150		-----		-----	875	D445	11.28		0.37
154		-----		-----	904	D445	11.03		-0.37
158	D445	12.50	C	3.99	914		-----		-----
159	D445	11.52		1.08	922	D7042	10.50		-1.95
167		-----		-----	962	D445	10.54		-1.83
168	D445	12.73		4.67	963	D445	10.90		-0.76
170		-----		-----	970		-----		-----
171	D445	12.33		3.48	971	D445	11.05		-0.31
172	D445	11.19		0.10	974	D445	11.06		-0.28
175		-----		-----	988	D445	11.02		-0.40
203	D445	11.4804		0.96	991	D445	11.06		-0.28
225	D445	10.86		-0.88	992	D445	11.09		-0.19
237	D445	11.26		0.31	994	D445	11.12		-0.11
238		-----		-----	995	D445	11.21		0.16
273	D445	11.07		-0.25	997	D445	10.96		-0.58
311		-----		-----	1011		-----		-----
314		-----		-----	1023	D445	11.3		0.43
328		-----		-----	1039		-----		-----
333		-----		-----	1040	D445	12.04		2.62
334	D445	10.90		-0.76	1056	D7042	10.6		-1.65
335		-----		-----	1065	D445	79.23	R(0.01)	201.94
355		-----		-----	1082		-----		-----
372	D445	10.93		-0.67	1089	D445	10.88	C	-0.82
391		-----		-----	1109	D445	10.801		-1.05
398		-----		-----	1236		-----		-----
399		-----		-----	1259	D7042	11.69		1.58
442		-----		-----	1320		-----		-----
444		-----		-----	1340	ISO3104	10.999		-0.46
445	D445	12.00		2.50	1360		-----		-----
446		-----		-----	1397	D7042	10.56		-1.77
447	D445	11.549		1.17	1412	D445	10.35		-2.39
480		-----		-----	1510		-----		-----
495	D445	11.9682		2.41	1539	ISO3104	11.08		-0.22
511	D445	11.22	C	0.19	1544	D445	11.3885		0.69
525	D7042	10.586	C	-1.69	1556		-----		-----
529	D445	10.885		-0.80	1567	D7042	10.46		-2.06
541		-----		-----	1613	D445	10.48		-2.00
542	D7042	10.604		-1.64	1654	D445	11.19		0.10
551	D445	10.68		-1.41	1695		-----		-----
553		-----		-----	1714	D7042	11.1060		-0.15
557	D445	11.220051		0.19	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728	D445	10.65		-1.50
588	D445	11.99		2.47	1741	ISO3104	10.88		-0.82
589	D445	11.54		1.14	1759	ISO3219-2	11.098		-0.17
590	D445	11.66		1.50	1776	ISO3104	11.757		1.78
593	D445	11.84		2.03	1810		-----		-----
596		-----		-----	1811		-----		-----
597		-----		-----	1815	ISO3104	9.2172	R(0.05)	-5.75
598	D7042	10.756		-1.19	1833		-----		-----
599	D7042	10.057		-3.26	1842	D445	10.98		-0.52
600	D445	10.06		-3.25	1849		-----		-----
603	D445	11.07		-0.25	1858	D445	11.103		-0.16
608	D445	12.001		2.51	1928	D7042	10.652		-1.49
609	D445	11.29		0.40	1929		-----		-----
610		-----		-----	1930		-----		-----
611	D445	11.14		-0.05	1957	D2270	11.058	C	-0.29
612	D7042	10.8775		-0.83	6016		-----		-----
621		-----		-----	6028	ISO3104	11.56		1.20
657	D445	11.36		0.61	6054		11.2614		0.31
663	D445	10.937		-0.65	6166		-----		-----
704	D445	11.135		-0.06	6201	D445	11.46		0.90
710	D445	11.245		0.26	6203	D7042	10.608		-1.62
734		-----		-----	6263		-----		-----
749		-----		-----	6290		-----		-----
750	D445	11.1507		-0.01	6295		-----		-----
752	GOSt33	10.94		-0.64	6296		-----		-----
753	D445	11.13		-0.08	6362		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365	D445	11.34		0.55	9142	D445	11.69		1.58
6410	D445	10.95		-0.61	9143		-----		-----
9051		-----		-----	9146		-----		-----
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060		-----		-----	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141		-----		-----	9165		-----		-----

normality	suspect
n	91
outliers	2
mean (n)	11.1557
st.dev. (n)	0.49649
R(calc.)	1.3902
st.dev.(D445:21e1)	0.33710
R(D445:21e1)	0.9439

Lab 158 first reported 14.06
Lab 511 first reported 9.674
Lab 525 first reported 26.111
Lab 1089 first reported 18.839
Lab 1957 first reported 22.527





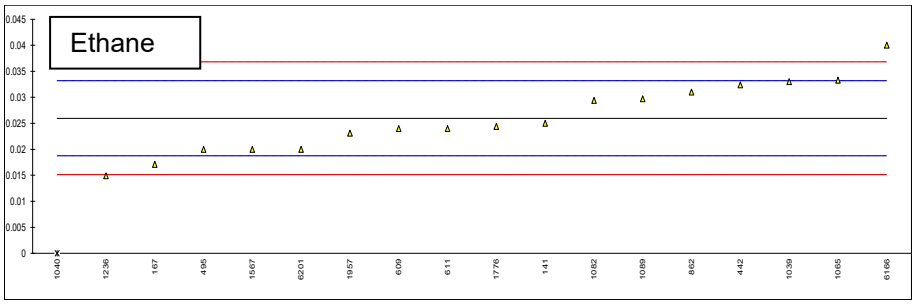
Determination of individual Light ends on sample #21220; results in %M/M

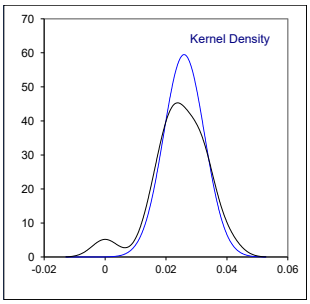
lab	method	Methane	Ethane	Propane	i-Butane	n-Butane	i-Pentane	n-Pentane	cyc-Pentane	Hexanes
52		-----	-----	-----	-----	-----	-----	-----	-----	-----
62		-----	-----	-----	-----	-----	-----	-----	-----	-----
90		-----	-----	-----	-----	-----	-----	-----	-----	-----
92		-----	-----	-----	-----	-----	-----	-----	-----	-----
120		-----	-----	-----	-----	-----	-----	-----	-----	-----
140		-----	-----	-----	-----	-----	-----	-----	-----	-----
141	GPA2186	0.001	0.025	0.250	0.161	0.521	0.423	0.602	0.114	1.203
150		-----	-----	-----	-----	-----	-----	-----	-----	-----
154		-----	-----	-----	-----	-----	-----	-----	-----	-----
158		-----	-----	-----	-----	-----	-----	-----	-----	-----
159		-----	-----	-----	-----	-----	-----	-----	-----	-----
167	GPA2186	0.000	0.0171	0.2199	0.1494	0.5270	0.4307	0.6282	0.1291	2.3913
168		-----	-----	-----	-----	-----	-----	-----	-----	-----
170		-----	-----	-----	-----	-----	-----	-----	-----	-----
171		-----	-----	-----	-----	-----	-----	-----	-----	-----
172		-----	-----	-----	-----	-----	-----	-----	-----	-----
175		-----	-----	-----	-----	-----	-----	-----	-----	-----
203		-----	-----	-----	-----	-----	-----	-----	-----	-----
225		-----	-----	-----	-----	-----	-----	-----	-----	-----
237		-----	-----	-----	-----	-----	-----	-----	-----	-----
238		-----	-----	-----	-----	-----	-----	-----	-----	-----
273		-----	-----	-----	-----	-----	-----	-----	-----	-----
311		-----	-----	-----	-----	-----	-----	-----	-----	-----
314		-----	-----	-----	-----	-----	-----	-----	-----	-----
328		-----	-----	-----	-----	-----	-----	-----	-----	-----
333		-----	-----	-----	-----	-----	-----	-----	-----	-----
334		-----	-----	-----	-----	-----	-----	-----	-----	-----
335		-----	-----	-----	-----	-----	-----	-----	-----	-----
355		-----	-----	-----	-----	-----	-----	-----	-----	-----
372		-----	-----	-----	-----	-----	-----	-----	-----	-----
391		-----	-----	-----	-----	-----	-----	-----	-----	-----
398		-----	-----	-----	-----	-----	-----	-----	-----	-----
399		-----	-----	-----	-----	-----	-----	-----	-----	-----
442	IP344	0.0009	0.0324	0.3223	0.1927	0.6330	0.4852	0.7069	0.0969	1.9376
444		-----	-----	-----	-----	-----	-----	-----	-----	-----
445		-----	-----	-----	-----	-----	-----	-----	-----	-----
446		-----	-----	-----	-----	-----	-----	-----	-----	-----
447		-----	-----	-----	-----	-----	-----	-----	-----	-----
480		-----	-----	-----	-----	-----	-----	-----	-----	-----
495	IP344	<0.01	0.02	0.2794	0.1746	0.5929	0.4555	0.6646	0.0797	2.7652
511		-----	-----	-----	-----	-----	-----	-----	-----	-----
525		-----	-----	-----	-----	-----	-----	-----	-----	-----
529		-----	-----	-----	-----	-----	-----	-----	-----	-----
541		-----	-----	-----	-----	-----	-----	-----	-----	-----
542		-----	-----	-----	-----	-----	-----	-----	-----	-----
551		-----	-----	-----	-----	-----	-----	-----	-----	-----
553		-----	-----	-----	-----	-----	-----	-----	-----	-----
557		-----	-----	-----	-----	-----	-----	-----	-----	-----
562		-----	-----	-----	-----	-----	-----	-----	-----	-----
575		-----	-----	-----	-----	-----	-----	-----	-----	-----
588		-----	-----	-----	-----	-----	-----	-----	-----	-----
589		-----	-----	-----	-----	-----	-----	-----	-----	-----
590		-----	-----	-----	-----	-----	-----	-----	-----	-----
593		-----	-----	-----	-----	-----	-----	-----	-----	-----
596		-----	-----	-----	-----	-----	-----	-----	-----	-----
597		-----	-----	-----	-----	-----	-----	-----	-----	-----
598		-----	-----	-----	-----	-----	-----	-----	-----	-----
599		-----	-----	-----	-----	-----	-----	-----	-----	-----
600		-----	-----	-----	-----	-----	-----	-----	-----	-----
603		-----	-----	-----	-----	-----	-----	-----	-----	-----
608		-----	-----	-----	-----	-----	-----	-----	-----	-----
609	IP344	<0.01	0.024	0.296	0.186	0.624	0.478	0.712	-----	-----
610		-----	-----	-----	-----	-----	-----	-----	-----	-----
611	GPA2186	<0.01	0.024	0.282	0.182	0.605	0.483	0.694	-----	-----
612		-----	-----	-----	-----	-----	-----	-----	-----	-----
621		-----	-----	-----	-----	-----	-----	-----	-----	-----
657		-----	-----	-----	-----	-----	-----	-----	-----	-----
663		-----	-----	-----	-----	-----	-----	-----	-----	-----
704		-----	-----	-----	-----	-----	-----	-----	-----	-----
710		-----	-----	-----	-----	-----	-----	-----	-----	-----
734		-----	-----	-----	-----	-----	-----	-----	-----	-----
749		-----	-----	-----	-----	-----	-----	-----	-----	-----
750		-----	-----	-----	-----	-----	-----	-----	-----	-----
752		-----	-----	-----	-----	-----	-----	-----	-----	-----
753		-----	-----	-----	-----	-----	-----	-----	-----	-----

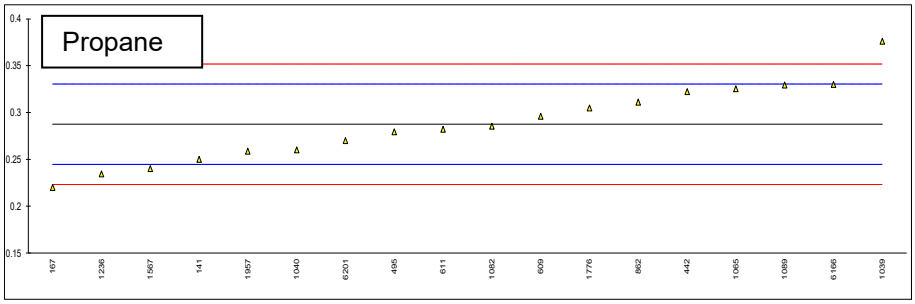
lab	method	Methane	Ethane	Propane	i-Butane	n-Butane	i-Pentane	n-Pentane	cyc-Pentane	Hexanes
781		-----	-----	-----	-----	-----	-----	-----	-----	-----
785		-----	-----	-----	-----	-----	-----	-----	-----	-----
798		-----	-----	-----	-----	-----	-----	-----	-----	-----
840		-----	-----	-----	-----	-----	-----	-----	-----	-----
862	IP344	0.00	0.031	0.311	0.180	0.615	0.472	0.668	0.083	2.229
873		-----	-----	-----	-----	-----	-----	-----	-----	-----
874		-----	-----	-----	-----	-----	-----	-----	-----	-----
875		-----	-----	-----	-----	-----	-----	-----	-----	-----
904		-----	-----	-----	-----	-----	-----	-----	-----	-----
914		-----	-----	-----	-----	-----	-----	-----	-----	-----
922		-----	-----	-----	-----	-----	-----	-----	-----	-----
962		-----	-----	-----	-----	-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----	-----	-----	-----	-----
970		-----	-----	-----	-----	-----	-----	-----	-----	-----
971		-----	-----	-----	-----	-----	-----	-----	-----	-----
974		-----	-----	-----	-----	-----	-----	-----	-----	-----
988		-----	-----	-----	-----	-----	-----	-----	-----	-----
991		-----	-----	-----	-----	-----	-----	-----	-----	-----
992		-----	-----	-----	-----	-----	-----	-----	-----	-----
994		-----	-----	-----	-----	-----	-----	-----	-----	-----
995		-----	-----	-----	-----	-----	-----	-----	-----	-----
997		-----	-----	-----	-----	-----	-----	-----	-----	-----
1011		-----	-----	-----	-----	-----	-----	-----	-----	-----
1023		-----	-----	-----	-----	-----	-----	-----	-----	-----
1039	D6729	<0.01	0.033	0.376	**0.231**	**0.843**	0.530	0.749	0.121	2.699
1040		0	**0**	0.26	0.17	0.55	0.42	0.62	0.07	1.11
1056		-----	-----	-----	-----	-----	-----	-----	-----	-----
1065		0.0009	0.0333	0.3253	0.1904	0.6198	0.4650	0.6536	0.0862	2.339
1082	D5134	-----	0.0294	0.2854	0.1638	0.5523	0.4080	0.5883	0.0772	1.5299
1089	D5134	0.0006	0.0297	0.3293	0.1987	0.6550	0.5001	0.7087	0.0969	1.3081
1109		-----	-----	-----	-----	-----	-----	-----	-----	-----
1236	IP344	0.00016	0.0149	0.2344	0.1629	0.5449	0.4488	0.6414	0.0891	2.3134
1259		-----	-----	-----	-----	-----	-----	-----	-----	-----
1320		-----	-----	-----	-----	-----	-----	-----	-----	-----
1340		-----	-----	-----	-----	-----	-----	-----	-----	-----
1360		-----	-----	-----	-----	-----	-----	-----	-----	-----
1397		-----	-----	-----	-----	-----	-----	-----	-----	-----
1412		-----	-----	-----	-----	-----	-----	-----	-----	-----
1510		-----	-----	-----	-----	-----	-----	-----	-----	-----
1539		-----	-----	-----	-----	-----	-----	-----	-----	-----
1544		-----	-----	-----	-----	-----	-----	-----	-----	-----
1556		-----	-----	-----	-----	-----	-----	-----	-----	-----
1567	IP601	<0.01	0.02	0.24	0.15	0.54	0.42	0.60	0.08	1.58
1613		-----	-----	-----	-----	-----	-----	-----	-----	-----
1654		-----	-----	-----	-----	-----	-----	-----	-----	-----
1695		-----	-----	-----	-----	-----	-----	-----	-----	-----
1714		-----	-----	-----	-----	-----	-----	-----	-----	-----
1720		-----	-----	-----	-----	-----	-----	-----	-----	-----
1724		-----	-----	-----	-----	-----	-----	-----	-----	-----
1728		-----	-----	-----	-----	-----	-----	-----	-----	-----
1741		-----	-----	-----	-----	-----	-----	-----	-----	-----
1759		-----	-----	-----	-----	-----	-----	-----	-----	-----
1776		<0,01	0.0244	0.3048	0.1939	0.6930	0.4809	0.7308	-----	-----
1810		-----	-----	-----	-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----	-----	-----	-----
1815		-----	-----	-----	-----	-----	-----	-----	-----	-----
1833		-----	-----	-----	-----	-----	-----	-----	-----	-----
1842		-----	-----	-----	-----	-----	-----	-----	-----	-----
1849		-----	-----	-----	-----	-----	-----	-----	-----	-----
1858		-----	-----	-----	-----	-----	-----	-----	-----	-----
1928		-----	-----	-----	-----	-----	-----	-----	-----	-----
1929		-----	-----	-----	-----	-----	-----	-----	-----	-----
1930		-----	-----	-----	-----	-----	-----	-----	-----	-----
1957		0.0006	0.0231	0.2586	0.1651	0.5541	0.4177	0.6411	0.0681	2.6746
6016		-----	-----	-----	-----	-----	-----	-----	-----	-----
6028		-----	-----	-----	-----	-----	-----	-----	-----	-----
6054		-----	-----	-----	-----	-----	-----	-----	-----	-----
6166		0.00	0.04	0.33	0.19	0.64	0.48	0.71	0.09	-----
6201	IP344	ND	0.02	0.27	0.17	0.59	0.47	0.68	0.09	-----
6203		-----	-----	-----	-----	-----	-----	-----	-----	-----
6263		-----	-----	-----	-----	-----	-----	-----	-----	-----
6290		-----	-----	-----	-----	-----	-----	-----	-----	-----
6295		-----	-----	-----	-----	-----	-----	-----	-----	-----
6296		-----	-----	-----	-----	-----	-----	-----	-----	-----
6362		-----	-----	-----	-----	-----	-----	-----	-----	-----
6365		-----	-----	-----	-----	-----	-----	-----	-----	-----
6410		-----	-----	-----	-----	-----	-----	-----	-----	-----
9051		-----	-----	-----	-----	-----	-----	-----	-----	-----

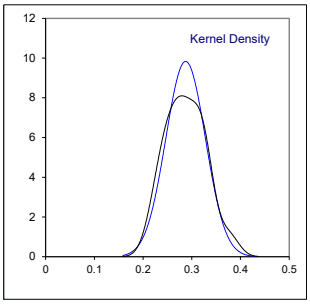
lab	method	Methane	Ethane	Propane	i-Butane	n-Butane	i-Pentane	n-Pentane	cyc-Pentane	Hexanes
9052		-----	-----	-----	-----	-----	-----	-----	-----	-----
9057		-----	-----	-----	-----	-----	-----	-----	-----	-----
9060		-----	-----	-----	-----	-----	-----	-----	-----	-----
9063		-----	-----	-----	-----	-----	-----	-----	-----	-----
9100		-----	-----	-----	-----	-----	-----	-----	-----	-----
9132		-----	-----	-----	-----	-----	-----	-----	-----	-----
9141		-----	-----	-----	-----	-----	-----	-----	-----	-----
9142		-----	-----	-----	-----	-----	-----	-----	-----	-----
9143		-----	-----	-----	-----	-----	-----	-----	-----	-----
9146		-----	-----	-----	-----	-----	-----	-----	-----	-----
9151		-----	-----	-----	-----	-----	-----	-----	-----	-----
9160		-----	-----	-----	-----	-----	-----	-----	-----	-----
9161		-----	-----	-----	-----	-----	-----	-----	-----	-----
9162		-----	-----	-----	-----	-----	-----	-----	-----	-----
9163		-----	-----	-----	-----	-----	-----	-----	-----	-----
9164		-----	-----	-----	-----	-----	-----	-----	-----	-----
9165		-----	-----	-----	-----	-----	-----	-----	-----	-----
	normality	n.a.	OK	OK	OK	OK	OK	OK	OK	OK
	n	16	17	18	17	17	18	18	15	13
	outliers	0	1	0	1	1	0	0	0	0
	mean (n)	<0.01	0.0260	0.2875	0.1753	0.5916	0.4593	0.6666	0.0914	2.0062
	st.dev. (n)	n.e.	0.00671	0.04058	0.01538	0.04976	0.03357	0.04791	0.01782	0.59545
	R(calc.)	n.e.	0.0188	0.1136	0.0431	0.1393	0.0940	0.1342	0.0499	1.6673
	st.dev.(IP344:88)	n.e.	0.00362	0.02146	0.00927	0.02789	0.01476	0.02452	0.00513	0.16071
	R(IP344:88)	n.e.	0.0101	0.0601	0.0259	0.0781	0.0413	0.0687	0.0144	0.45

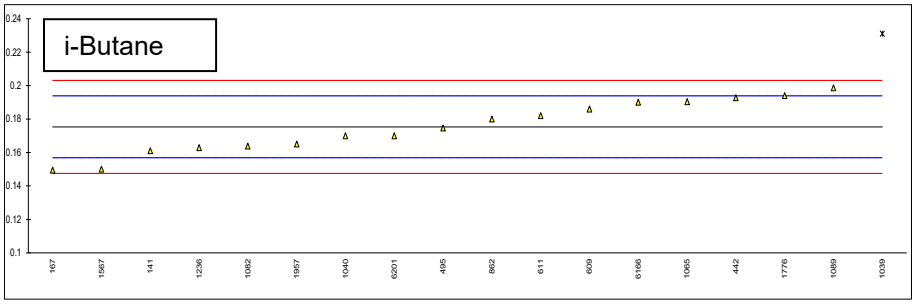
Test results in bold are identified as statistical outliers
Underlined test results are corrected by the participants after notification by iis of suspect test result
Lab 495 first reported ,0.01 Ethane
Lab 1714 test result withdrawn, first reported 0.0415 Propane, 0.0960 i-Butane, 0.2669 n-Butane, 0.0092 i-Pentane, 0.505 n-Pentane, 0.118 cyclo-Pentane, 1.9194 Total Hexanes
Lab 1957 first reported 0.0031 cyclo-Pentane

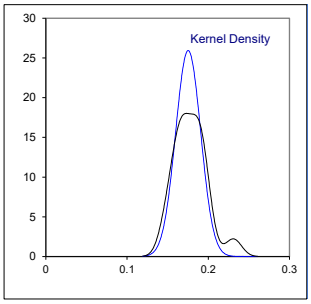


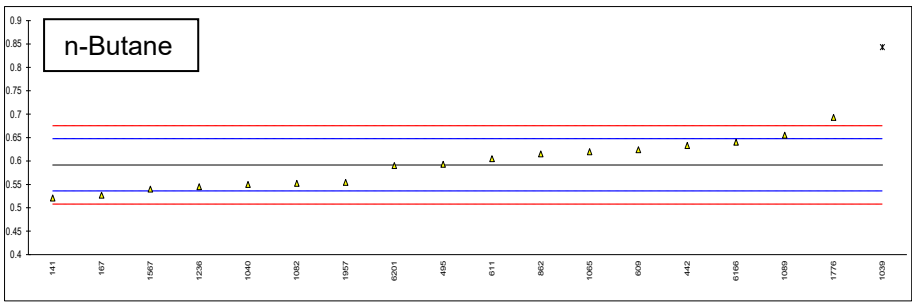


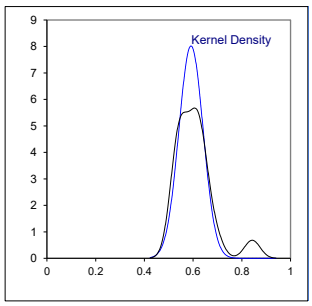


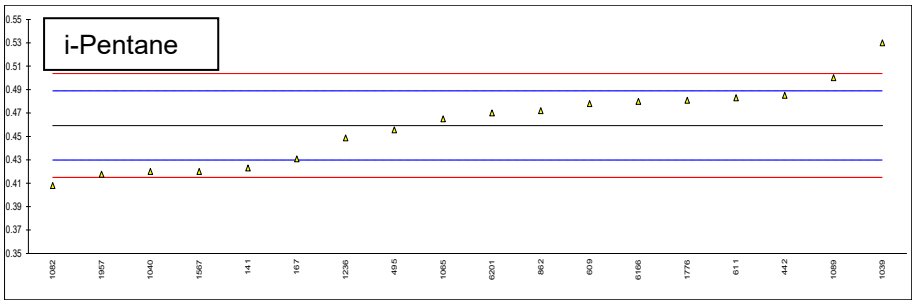


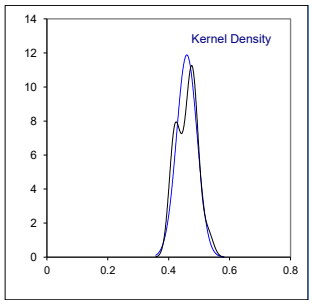


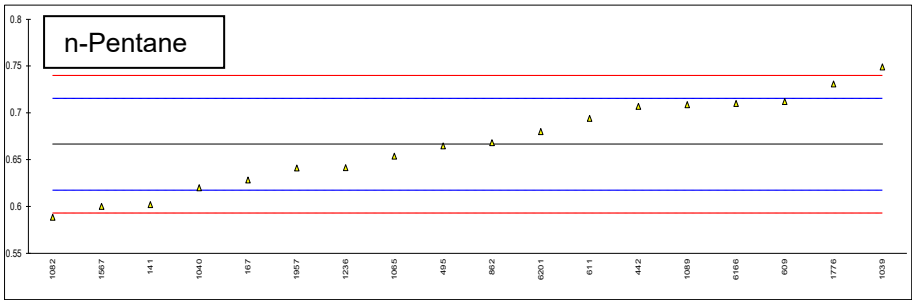


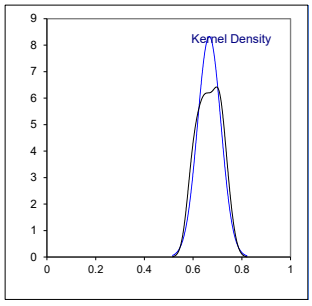

n-Butane

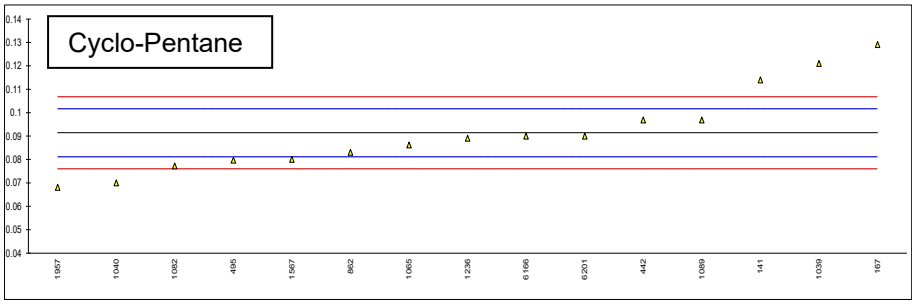

Kernel Density

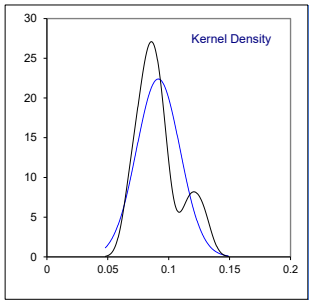

i-Pentane

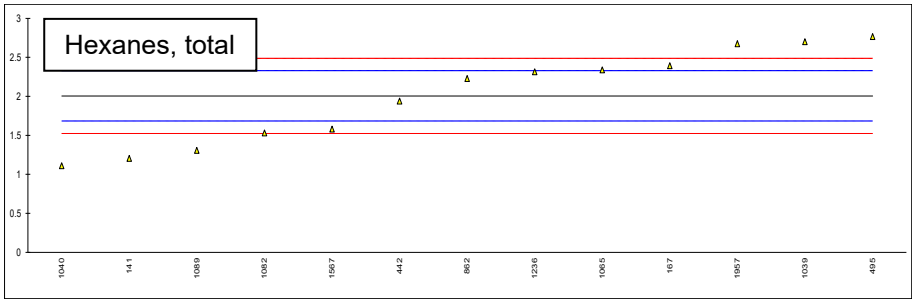

Kernel Density

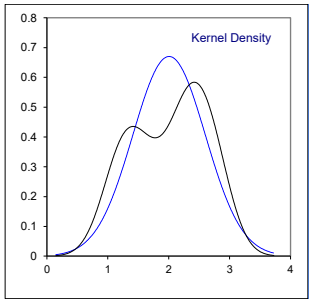

n-Pentane


Kernel Density


Cyclo-Pentane


Kernel Density


Hexanes, total


Kernel Density

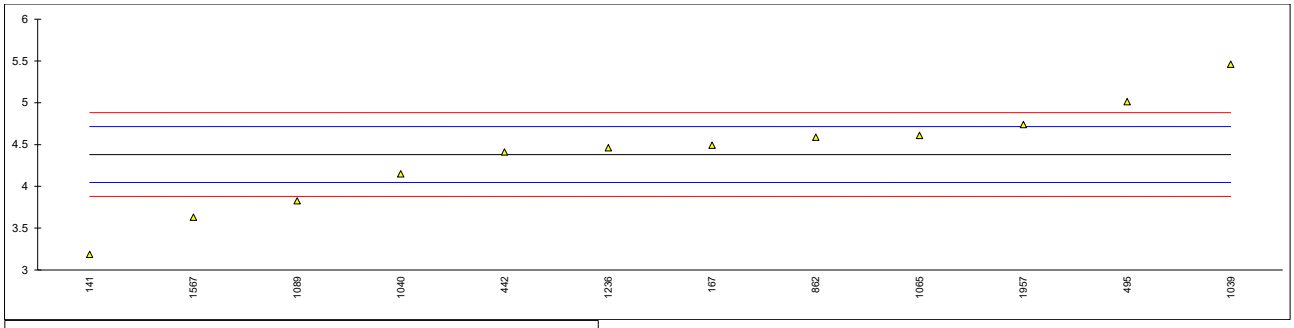
Determination of Total of all C1 – C6 on sample #21220; results in %M/M

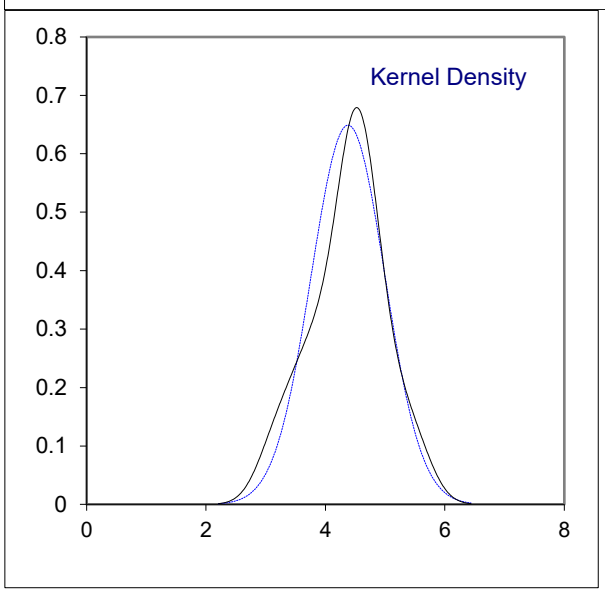
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	781		-----		-----
62		-----		-----	785		-----		-----
90		-----		-----	798		-----		-----
92		-----		-----	840		-----		-----
120		-----		-----	862	IP344	4.589		1.25
140		-----		-----	873		-----		-----
141	GPA2186	3.186		-7.14	874		-----		-----
150		-----		-----	875		-----		-----
154		-----		-----	904		-----		-----
158		-----		-----	914		-----		-----
159		-----		-----	922		-----		-----
167	GPA2186	4.4927		0.67	962		-----		-----
168		-----		-----	963		-----		-----
170		-----		-----	970		-----		-----
171		-----		-----	971		-----		-----
172		-----		-----	974		-----		-----
175		-----		-----	988		-----		-----
203		-----		-----	991		-----		-----
225		-----		-----	992		-----		-----
237		-----		-----	994		-----		-----
238		-----		-----	995		-----		-----
273		-----		-----	997		-----		-----
311		-----		-----	1011		-----		-----
314		-----		-----	1023		-----		-----
328		-----		-----	1039	D6729	5.461		6.46
333		-----		-----	1040		4.15		-1.38
334		-----		-----	1056		-----		-----
335		-----		-----	1065		4.6083		1.36
355		-----		-----	1082	D5134	-----		-----
372		-----		-----	1089	D5134	3.8271		-3.31
391		-----		-----	1109		-----		-----
398		-----		-----	1236	IP344	4.4606		0.48
399		-----		-----	1259		-----		-----
442	IP344	4.4108		0.18	1320		-----		-----
444		-----		-----	1340		-----		-----
445		-----		-----	1360		-----		-----
446		-----		-----	1397		-----		-----
447		-----		-----	1412		-----		-----
480		-----		-----	1510		-----		-----
495	IP344	5.0119		3.77	1539		-----		-----
511		-----		-----	1544		-----		-----
525		-----		-----	1556		-----		-----
529		-----		-----	1567	IP601	3.63		-4.48
541		-----		-----	1613		-----		-----
542		-----		-----	1654		-----		-----
551		-----		-----	1695		-----		-----
553		-----		-----	1714		-----	W	-----
557		-----		-----	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728		-----		-----
588		-----		-----	1741		-----		-----
589		-----		-----	1759		-----		-----
590		-----		-----	1776		-----		-----
593		-----		-----	1810		-----		-----
596		-----		-----	1811		-----		-----
597		-----		-----	1815		-----		-----
598		-----		-----	1833		-----		-----
599		-----		-----	1842		-----		-----
600		-----		-----	1849		-----		-----
603		-----		-----	1858		-----		-----
608		-----		-----	1928		-----		-----
609		-----		-----	1929		-----		-----
610		-----		-----	1930		-----		-----
611		-----		-----	1957		4.738		2.14
612		-----		-----	6016		-----		-----
621		-----		-----	6028		-----		-----
657		-----		-----	6054		-----		-----
663		-----		-----	6166		-----		-----
704		-----		-----	6201		-----		-----
710		-----		-----	6203		-----		-----
734		-----		-----	6263		-----		-----
749		-----		-----	6290		-----		-----
750		-----		-----	6295		-----		-----
752		-----		-----	6296		-----		-----
753		-----		-----	6362		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365		-----		-----	9142		-----		-----
6410		-----		-----	9143		-----		-----
9051		-----		-----	9146		-----		-----
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060		-----		-----	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141		-----		-----	9165		-----		-----

normality	OK
n	12
outliers	0
mean (n)	4.3805
st.dev. (n)	0.61487
R(calc.)	1.7216
st.dev.(IP344:88)	0.16737
R(IP344:88)	0.4686

Lab 1714 test result withdrawn, reported 3.4231



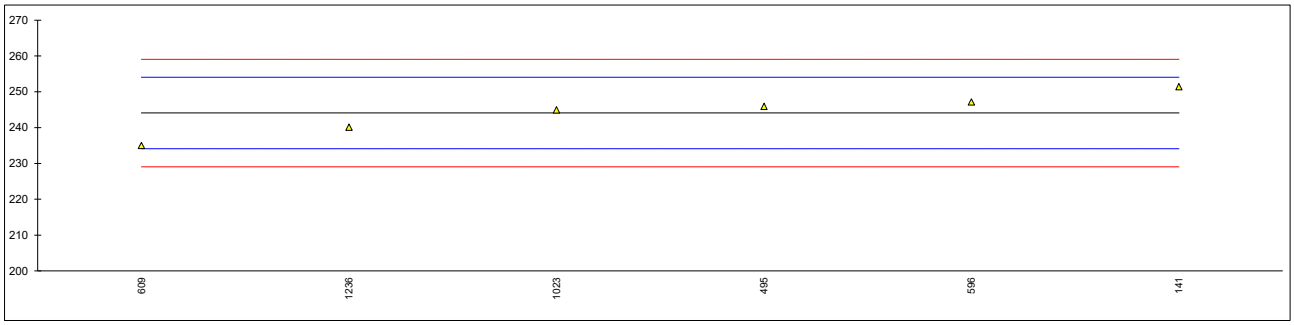


Determination of Average Molecular Mass on sample #21220; results in g/mol

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	781		-----		-----
62		-----		-----	785		-----		-----
90		-----		-----	798		-----		-----
92		-----		-----	840		-----		-----
120		-----		-----	862		-----		-----
140		-----		-----	873		-----		-----
141	INH-5008	251.4		1.46	874		-----		-----
150		-----		-----	875		-----		-----
154		-----		-----	904		-----		-----
158		-----		-----	914		-----		-----
159		-----		-----	922		-----		-----
167		-----		-----	962		-----		-----
168		-----		-----	963		-----		-----
170		-----		-----	970		-----		-----
171		-----		-----	971		-----		-----
172		-----		-----	974		-----		-----
175		-----		-----	988		-----		-----
203		-----		-----	991		-----		-----
225		-----		-----	992		-----		-----
237		-----		-----	994		-----		-----
238		-----		-----	995		-----		-----
273		-----		-----	997		-----		-----
311		-----		-----	1011		-----		-----
314		-----		-----	1023		244.94		0.17
328		-----		-----	1039		-----		-----
333		-----		-----	1040		-----		-----
334		-----		-----	1056		-----		-----
335		-----		-----	1065		-----		-----
355		-----		-----	1082		-----		-----
372		-----		-----	1089		-----		-----
391		-----		-----	1109		-----		-----
398		-----		-----	1236	In house	240.09		-0.80
399		-----		-----	1259		-----		-----
442		-----		-----	1320		-----		-----
444		-----		-----	1340		-----		-----
445		-----		-----	1360		-----		-----
446		-----		-----	1397		-----		-----
447		-----		-----	1412		-----		-----
480		-----		-----	1510		-----		-----
495	D2503	245.91		0.37	1539		-----		-----
511		-----		-----	1544		-----		-----
525		-----		-----	1556		-----		-----
529		-----		-----	1567		-----		-----
541		-----		-----	1613		-----		-----
542		-----		-----	1654		-----		-----
551		-----		-----	1695		-----		-----
553		-----		-----	1714		-----		-----
557		-----		-----	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728		-----		-----
588		-----		-----	1741		-----		-----
589		-----		-----	1759		-----		-----
590		-----		-----	1776		-----		-----
593		-----		-----	1810		-----		-----
596	INH-2001	247.12		0.61	1811		-----		-----
597		-----		-----	1815		-----		-----
598		-----		-----	1833		-----		-----
599		-----		-----	1842		-----		-----
600		-----		-----	1849		-----		-----
603		-----		-----	1858		-----		-----
608		-----		-----	1928		-----		-----
609	INH-006	235		-1.82	1929		-----		-----
610		-----		-----	1930		-----		-----
611		-----		-----	1957		-----		-----
612		-----		-----	6016		-----		-----
621		-----		-----	6028		-----		-----
657		-----		-----	6054		-----		-----
663		-----		-----	6166		-----		-----
704		-----		-----	6201		-----		-----
710		-----		-----	6203		-----		-----
734		-----		-----	6263		-----		-----
749		-----		-----	6290		-----		-----
750		-----		-----	6295		-----		-----
752		-----		-----	6296		-----		-----
753		-----		-----	6362		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365		-----		-----	9142		-----		-----
6410		-----		-----	9143		-----		-----
9051		-----		-----	9146		-----		-----
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060		-----		-----	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141		-----		-----	9165		-----		-----

normality	unknown
n	6
outliers	0
mean (n)	244.08
st.dev. (n)	5.749
R(calc.)	16.10
st.dev.(D2503:92)	5
R(D2503:92)	14



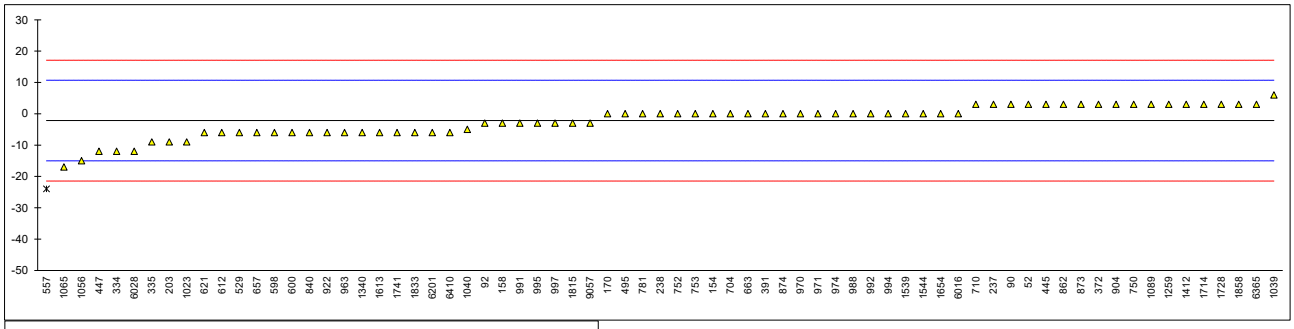
Determination of Pour Point Maximum on sample #21220; results in °C

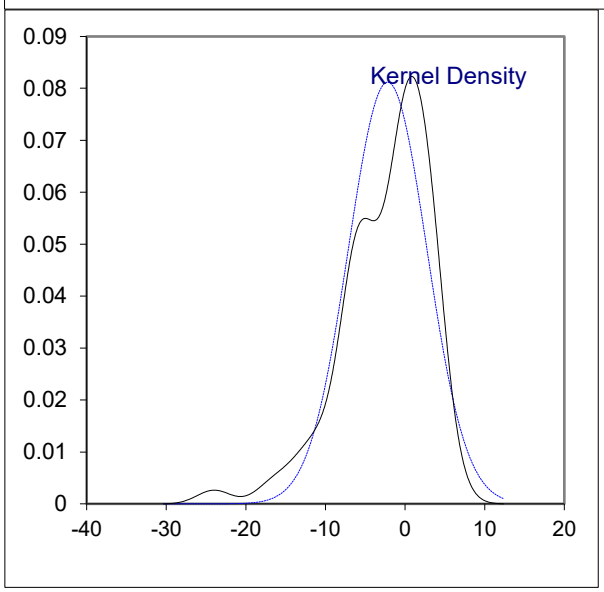
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D5853-A	3		0.81	781	D5853-A	0		0.34
62		-----		-----	785		-----		-----
90	D5853-A	3		0.81	798		-----		-----
92	D5853-A	-3		-0.12	840	D5853-A	-6		-0.59
120		-----		-----	862	D5853-A	3		0.81
140		-----		-----	873	D5853-A	3		0.81
141		-----		-----	874	D5853-A	0		0.34
150		-----		-----	875		-----		-----
154	D97	0		0.34	904	D5853-A	3		0.81
158	D97	-3	C	-0.12	914		-----		-----
159		-----		-----	922	D97	-6		-0.59
167		-----		-----	962		-----		-----
168		-----		-----	963	D5853-A	-6		-0.59
170	D5853-A	0		0.34	970	D5853-A	0		0.34
171		-----		-----	971	D5853-A	0		0.34
172		-----		-----	974	D5853-A	0		0.34
175		-----		-----	988	D5853-A	0		0.34
203	D5853-A	-9		-1.06	991	D5853-A	-3		-0.12
225		-----		-----	992	D5853-A	0		0.34
237	D5853-A	3		0.81	994	D5853-A	0		0.34
238	D5853-A	0		0.34	995	D5853-A	-3		-0.12
273		-----		-----	997	D5853-A	-3		-0.12
311		-----		-----	1011		-----		-----
314		-----		-----	1023	D5853-A	-9		-1.06
328		-----		-----	1039	D5853-A	6		1.28
333		-----		-----	1040	D5853-A	-5.0		-0.44
334	D97	-12		-1.52	1056	D5853-A	-15		-1.99
335	NF60105	-9		-1.06	1065	D5853-A	-17		-2.30
355		-----		-----	1082		-----		-----
372	D5853-A	3		0.81	1089	D5853-A	3		0.81
391	D5853-A	0		0.34	1109		-----		-----
398		-----		-----	1236		-----		-----
399		-----		-----	1259	D5853-A	3		0.81
442		-----		-----	1320		-----		-----
444		-----		-----	1340	D5853-A	-6		-0.59
445	IP441	3		0.81	1360		-----		-----
446		-----		-----	1397		-----		-----
447	D5853-A	-12		-1.52	1412	D5853-A	3		0.81
480		-----		-----	1510		-----		-----
495	D5853-A	0		0.34	1539	D5853-A	0		0.34
511		-----		-----	1544	D5853-A	0		0.34
525		-----		-----	1556		-----	W	-----
529	D97	-6		-0.59	1567		-----		-----
541		-----		-----	1613	D5853-A	-6		-0.59
542		-----		-----	1654	D5853-A	0.0		0.34
551		-----		-----	1695		-----		-----
553		-----		-----	1714	D5853-A	3		0.81
557	D5853-A	-24	R(0.01)	-3.39	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728	D5853-A	3		0.81
588		-----		-----	1741	D5853-A	-6		-0.59
589		-----		-----	1759		-----		-----
590		-----		-----	1776		-----		-----
593		-----		-----	1810		-----		-----
596		-----		-----	1811		-----		-----
597		-----		-----	1815	D5853-A	-3.0		-0.12
598	D5853-A	-6		-0.59	1833	D5853-A	-6		-0.59
599		-----		-----	1842		-----		-----
600	D5853-A	-6		-0.59	1849		-----		-----
603		-----		-----	1858	D5853-A	3		0.81
608		-----		-----	1928		-----		-----
609		-----		-----	1929		-----		-----
610		-----		-----	1930		-----		-----
611		-----		-----	1957		-----		-----
612	D5853-A	-6.0		-0.59	6016	D5853-A	0		0.34
621	D5853-A	-6.0		-0.59	6028	D97	-12		-1.52
657	D5853-A	-6		-0.59	6054		-----		-----
663	D5853-A	0		0.34	6166		-----		-----
704	D5853-A	0		0.34	6201	D5853-A	-6		-0.59
710	D5853-A	3		0.81	6203		-----		-----
734		-----		-----	6263		-----		-----
749		-----		-----	6290		-----		-----
750	D5853-A	3		0.81	6295		-----		-----
752	D5853-A	0		0.34	6296		-----		-----
753	D5853-A	0		0.34	6362		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365	D5853-A	3		0.81	9142		-----		-----
6410	D5853-A	-6		-0.59	9143		-----		-----
9051		-----		-----	9146		-----		-----
9052		-----		-----	9151		-----		-----
9057		-3		-0.12	9160		-----		-----
9060		-----		-----	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141		-----		-----	9165		-----		-----

normality	OK
n	70
outliers	1
mean (n)	-2.20
st.dev. (n)	4.916
R(calc.)	13.76
st.dev.(D5853-A:17a)	6.429
R(D5853-A:17a)	18.0

Lab 158 first reported <-21
Lab 1556 test result withdrawn, reported -18



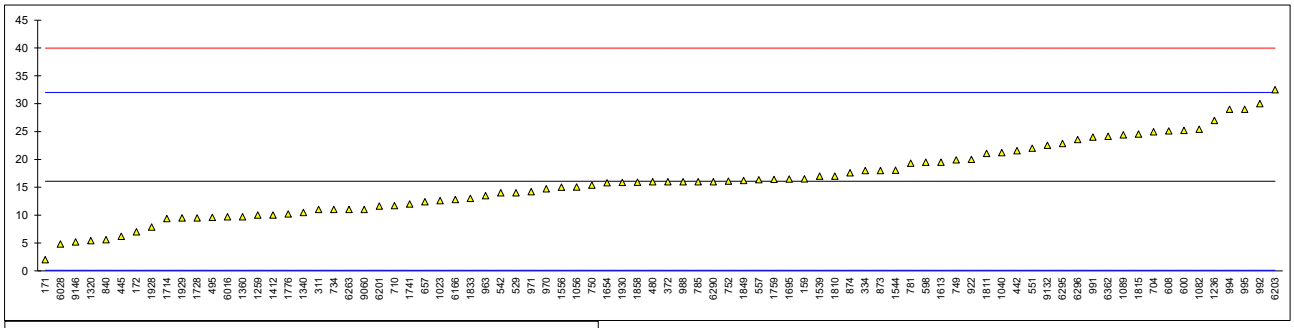


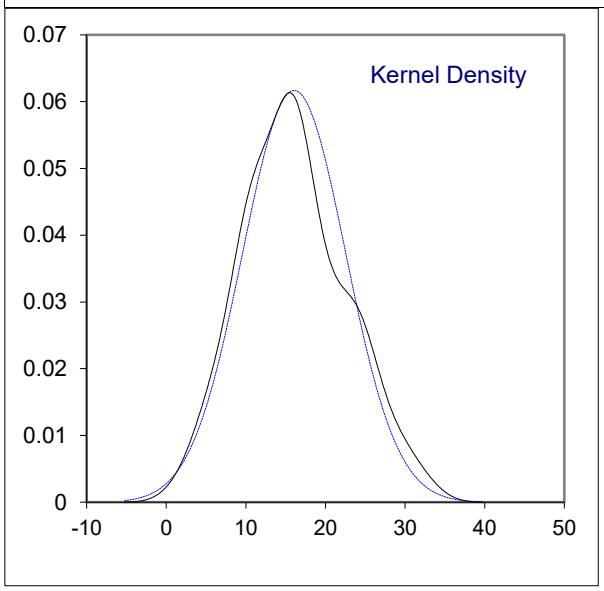
Determination of Salt as Chloride on sample #21220; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	781	D3230	19.3		0.41
62		-----		-----	785	D3230	16		-0.01
90		-----		-----	798		-----		-----
92		-----		-----	840	D6470	5.60		-1.31
120		-----		-----	862		-----		-----
140		-----		-----	873	D3230	18		0.24
141		-----		-----	874	D3230	17.6		0.19
150		-----		-----	875		-----		-----
154		-----		-----	904		-----		-----
158		-----		-----	914		-----		-----
159	D3230	16.5		0.05	922	D3230	20		0.49
167		-----		-----	962		-----		-----
168		-----		-----	963	D3230	13.5		-0.32
170		-----		-----	970	D3230	14.7		-0.17
171	D3230	2		-1.77	971	D3230	14.2		-0.23
172	D3230	7		-1.14	974		-----		-----
175		-----		-----	988	D3230	16		-0.01
203		-----		-----	991	D3230	24		1.00
225		-----		-----	992	D3230	30		1.75
237		-----		-----	994	D3230	29.0		1.62
238		-----		-----	995	D3230	29		1.62
273		-----		-----	997		-----		-----
311	D3230	11		-0.64	1011		-----		-----
314		-----		-----	1023	D3230	12.6		-0.44
328		-----		-----	1039		-----		-----
333		-----		-----	1040	D3230	21.2		0.64
334	D3230	18		0.24	1056	D3230	15.05		-0.13
335		-----		-----	1065		-----		-----
355		-----		-----	1082	D3230	25.4		1.17
372	D3230	16		-0.01	1089	D3230	24.4		1.05
391		-----		-----	1109		-----		-----
398		-----		-----	1236	D3230	26.966		1.37
399		-----		-----	1259	D3230	10		-0.76
442	IP265	21.57		0.69	1320	In house	5.4		-1.34
444		-----		-----	1340	UOP22	10.455		-0.70
445	IP265	6.2		-1.24	1360		9.72		-0.80
446		-----		-----	1397		-----		-----
447		-----		-----	1412	D3230	10.0		-0.76
480	D3230	15.99		-0.01	1510		-----		-----
495	D3230	9.6		-0.81	1539	D3230	17		0.12
511		-----		-----	1544	D3230	18.07		0.25
525		-----		-----	1556	D3230	15		-0.13
529	D3230	14		-0.26	1567		-----		-----
541		-----		-----	1613	D3230	19.5		0.43
542	D3230	14		-0.26	1654	D3230	15.79		-0.03
551	D3230	22		0.74	1695	D3230	16.48		0.05
553		-----		-----	1714	D6470	9.38		-0.84
557	D3230	16.33469		0.03	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728		9.5		-0.82
588		-----		-----	1741	D3230	12		-0.51
589		-----		-----	1759	D3230	16.4		0.04
590		-----		-----	1776	D3230	10.2		-0.74
593		-----		-----	1810	D3230	17		0.12
596		-----		-----	1811	D3230	21.08		0.63
597		-----		-----	1815	D3230	24.53		1.06
598	D3230	19.5		0.43	1833	D3230	13		-0.38
599		-----		-----	1842		-----		-----
600	D3230	25.2		1.15	1849	D3230	16.2		0.02
603		-----		-----	1858	D3230	15.9		-0.02
608	D3230	25.1		1.13	1928		7.85		-1.03
609		-----		-----	1929		9.48		-0.83
610		-----		-----	1930	DIN51576	15.86		-0.03
611		-----		-----	1957		-----		-----
612		-----		-----	6016	In house	9.7		-0.80
621		-----		-----	6028	D3230	4.8		-1.41
657	D3230	12.4		-0.46	6054		-----		-----
663		-----		-----	6166	D3230	12.8		-0.41
704	D3230	24.95		1.11	6201	D3230	11.6		-0.56
710	GOST21534	11.7		-0.55	6203	D3230	32.5		2.06
734	GOST21534	11.0		-0.64	6263	D3230	11.0		-0.64
749	GOST21534	19.9		0.48	6290	D3230	16.0		-0.01
750	D3230	15.4		-0.08	6295	D3230	22.85		0.85
752	D3230	16.11		0.01	6296	D3230	23.56		0.94
753		-----		-----	6362	D3230	24.16		1.02

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365		-----		-----	9142		-----		-----
6410		-----		-----	9143		-----		-----
9051		-----		-----	9146	In house	5.19		-1.36
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060	D3230	11		-0.64	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132	D3230	22.51		0.81	9164		-----		-----
9141		-----		-----	9165		-----		-----

normality	OK
n	82
outliers	0
mean (n)	16.066
st.dev. (n)	6.4722
R(calc.)	18.122
st.dev.(D3230:19)	7.9684
R(D3230:19)	22.311





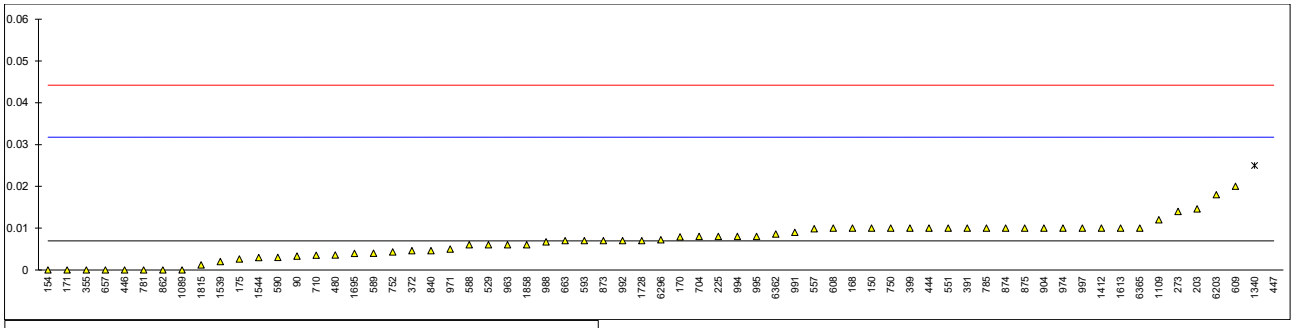
Determination of Sediment (Extraction method) on sample #21220; results in %V/V

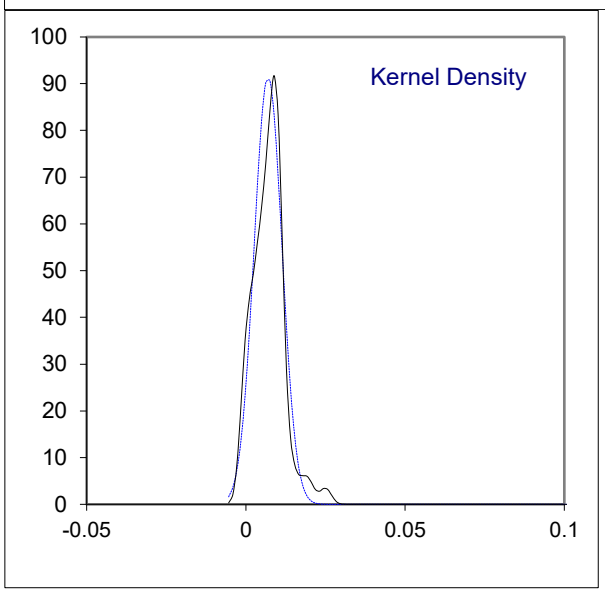
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D473	<0.01		-----	781	D473	0.00		-0.56
62		-----		-----	785	D473	0.01		0.25
90	D473	0.0033		-0.29	798		-----		-----
92		-----		-----	840	D473	0.0046		-0.19
120		-----		-----	862	D473	0.000		-0.56
140		-----		-----	873	D473	0.007		0.00
141		-----		-----	874	D473	0.01		0.25
150	D473	0.01		0.25	875	D473	0.01		0.25
154	D473	0		-0.56	904	D473	0.01		0.25
158		-----		-----	914		-----		-----
159		-----		-----	922	D473	<0.01		-----
167		-----		-----	962		-----		-----
168	D473	0.01		0.25	963	D473	0.006	C	-0.08
170	D473	0.0079		0.08	970		-----		-----
171	D473	0		-0.56	971	D473	0.005		-0.16
172	D473	<0.01		-----	974	D473	0.01		0.25
175	D473	0.0026		-0.35	988	D473	0.0067		-0.02
203	D473	0.0146		0.62	991	D473	0.009		0.17
225	D473	0.008		0.09	992	D473	0.007		0.00
237	D473	<0.01		-----	994	D473	0.008		0.09
238		-----		-----	995	D473	0.008		0.09
273	D473	0.014		0.57	997	D473	0.010		0.25
311	D473	<0.01		-----	1011		-----		-----
314		-----		-----	1023		-----		-----
328	D473	<0.01		-----	1039		-----		-----
333	D473	<0.01		-----	1040		-----		-----
334	D473	<0.01		-----	1056		-----		-----
335	D473	< 0.01		-----	1065		-----		-----
355	D473	0		-0.56	1082		-----		-----
372	D473	0.0046		-0.19	1089	D473	0.00		-0.56
391	D473	0.01		0.25	1109	D473	0.012		0.41
398		-----		-----	1236		-----		-----
399	D473	0.01		0.25	1259		-----		-----
442		-----		-----	1320		-----		-----
444	D473	0.01		0.25	1340	ISO9030	0.025	R(0.01)	1.45
445	D473	<0.01		-----	1360		-----		-----
446	D473	0		-0.56	1397		-----		-----
447	D473	0.32	R(0.01)	25.21	1412	D473	0.010		0.25
480	D473	0.00359		-0.27	1510		-----		-----
495		-----		-----	1539	D473	0.002		-0.40
511		-----		-----	1544	D473	0.00297		-0.32
525		-----		-----	1556		-----		-----
529	D473	0.006		-0.08	1567		-----		-----
541	D473	<0.01		-----	1613	D473	0.01		0.25
542		-----		-----	1654		-----		-----
551	D473	0.01		0.25	1695	D473	0.00394		-0.24
553		-----		-----	1714		-----		-----
557	D473	0.00986790		0.24	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728	D473	0.007		0.00
588	D473	0.006		-0.08	1741		-----		-----
589	D473	0.004		-0.24	1759		-----		-----
590	D473	0.003		-0.32	1776		-----		-----
593	D473	0.007		0.00	1810		-----		-----
596		-----		-----	1811		-----		-----
597		-----		-----	1815	ISO3735	0.0012		-0.46
598		-----		-----	1833		-----		-----
599		-----		-----	1842		-----		-----
600		-----		-----	1849		-----		-----
603	D473	< 0.01		-----	1858	D473	0.006		-0.08
608	D473	0.01		0.25	1928		-----		-----
609	D473	0.02		1.05	1929		-----		-----
610		-----		-----	1930		-----		-----
611		-----		-----	1957		-----		-----
612		-----		-----	6016		-----		-----
621	D473	<0.01		-----	6028		-----		-----
657	D473	0		-0.56	6054		-----		-----
663	D473	0.007		0.00	6166		-----		-----
704	D473	0.008		0.09	6201	D473	<0,01		-----
710	D473	0.0035		-0.28	6203	D473	0.018		0.89
734		-----		-----	6263		-----		-----
749		-----		-----	6290		-----		-----
750	D473	0.01		0.25	6295		-----		-----
752	D473	0.0043		-0.21	6296	D473	0.0072		0.02
753		-----		-----	6362	D473	0.0086		0.13

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365	D473	0.01		0.25	9142		-----		-----
6410		-----		-----	9143		-----		-----
9051		-----		-----	9146		-----		-----
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060		-----		-----	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141		-----		-----	9165		-----		-----

normality	OK
n	63
outliers	2
mean (n)	0.00694
st.dev. (n)	0.004361
R(calc.)	0.01221
st.dev.(D473:07e1)	0.012418
R(D473:07e1)	0.03477

Lab 963 first reported 0.06





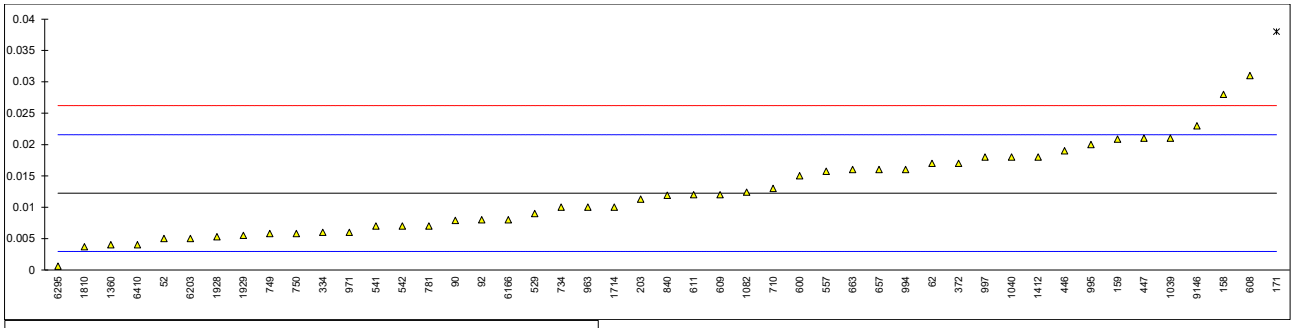
Determination of Sediment (Membrane filtration) on sample #21220; results in %M/M

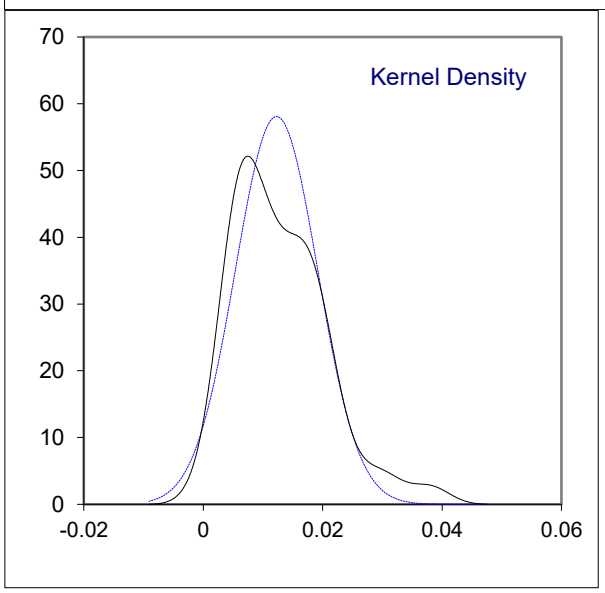
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4807	0.005		-1.56	781	D4807	0.007		-1.13
62	D4807	0.017		1.02	785		-----		-----
90	D4807	0.0079		-0.94	798		-----		-----
92	D4807	0.008		-0.92	840	D4807	0.0119		-0.08
120		-----		-----	862		-----		-----
140		-----		-----	873		-----		-----
141		-----		-----	874		-----		-----
150		-----		-----	875		-----		-----
154		-----		-----	904		-----		-----
158	D4807	0.028	C	3.39	914		-----		-----
159	D4807	0.02086		1.85	922		-----		-----
167		-----		-----	962		-----		-----
168		-----		-----	963	D4807	0.01		-0.49
170		-----		-----	970		-----		-----
171	D4807	0.038	R(0.05)	5.54	971	D4807	0.006		-1.35
172		-----		-----	974		-----		-----
175		-----		-----	988		-----		-----
203	D4807	0.0113		-0.21	991		-----		-----
225		-----		-----	992		-----		-----
237		-----		-----	994	D4807	0.016		0.81
238		-----		-----	995	D4807	0.020		1.67
273		-----		-----	997	D4807	0.018		1.24
311		-----		-----	1011		-----		-----
314		-----		-----	1023		-----		-----
328		-----		-----	1039	D4807	0.021		1.88
333		-----		-----	1040	D4807	0.018		1.24
334	D4807	0.006		-1.35	1056		-----		-----
335		-----		-----	1065		-----		-----
355		-----		-----	1082	D4807	0.0124		0.03
372	D4807	0.017		1.02	1089		-----		-----
391		-----		-----	1109		-----		-----
398		-----		-----	1236		-----		-----
399		-----		-----	1259		-----		-----
442		-----		-----	1320		-----		-----
444		-----		-----	1340		-----		-----
445		-----		-----	1360		0.0040		-1.78
446	D4807	0.019		1.45	1397		-----		-----
447	D4807	0.021		1.88	1412	D4807	0.018		1.24
480		-----		-----	1510		-----		-----
495		-----		-----	1539		-----		-----
511		-----		-----	1544		-----		-----
525		-----		-----	1556		-----		-----
529	D4807	0.009		-0.70	1567		-----		-----
541	D4807	0.0070		-1.13	1613	D4807	--		-----
542	D4807	0.007		-1.13	1654		-----		-----
551		-----		-----	1695		-----		-----
553		-----		-----	1714	D4807	0.010		-0.49
557	D4807	0.01574007		0.75	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728		-----		-----
588		-----		-----	1741		-----		-----
589		-----		-----	1759		-----		-----
590		-----		-----	1776		-----		-----
593		-----		-----	1810	D4807	0.0037		-1.84
596		-----		-----	1811		-----		-----
597		-----		-----	1815		-----		-----
598		-----		-----	1833		-----		-----
599		-----		-----	1842		-----		-----
600	D4807	0.015		0.59	1849		-----		-----
603		-----		-----	1858		-----		-----
608	D4807	0.031		4.03	1928		0.0053		-1.50
609	D4807	0.012		-0.06	1929		0.0055		-1.45
610		-----		-----	1930		-----		-----
611	D4807	0.012		-0.06	1957		-----		-----
612		-----		-----	6016		-----		-----
621		-----		-----	6028		-----		-----
657	D4807	0.016		0.81	6054		-----		-----
663	D4807	0.016		0.81	6166	D4807	0.008		-0.92
704		-----		-----	6201	D4807	<0,005		-----
710	D4807	0.013		0.16	6203	D4807	0.005		-1.56
734	GOST6370	0.010		-0.49	6263		-----		-----
749	GOST6370	0.0058		-1.39	6290		-----		-----
750	GOST6370	0.0058		-1.39	6295	GOST6370	0.0006		-2.51
752		-----		-----	6296		-----		-----
753		-----		-----	6362		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365		-----		-----	9142		-----		-----
6410	D4807	0.004		-1.78	9143		-----		-----
9051		-----		-----	9146	D4807	0.023		2.31
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060		-----		-----	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141		-----		-----	9165		-----		-----

normality	OK
n	46
outliers	1
mean (n)	0.01226
st.dev. (n)	0.006872
R(calc.)	0.01924
st.dev.(D4807:05)	0.004650
R(D4807:05)	0.01302

Lab 158 first reported 0.052





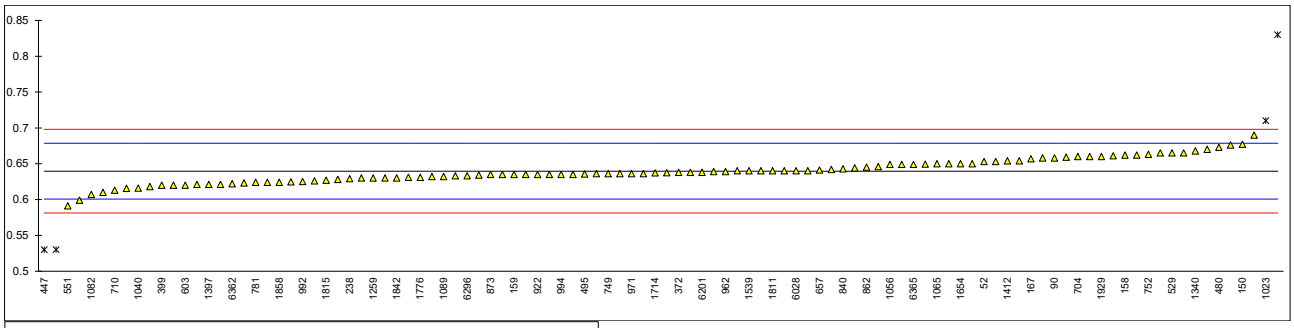
Determination of Total Sulfur on sample #21220; results in %M/M

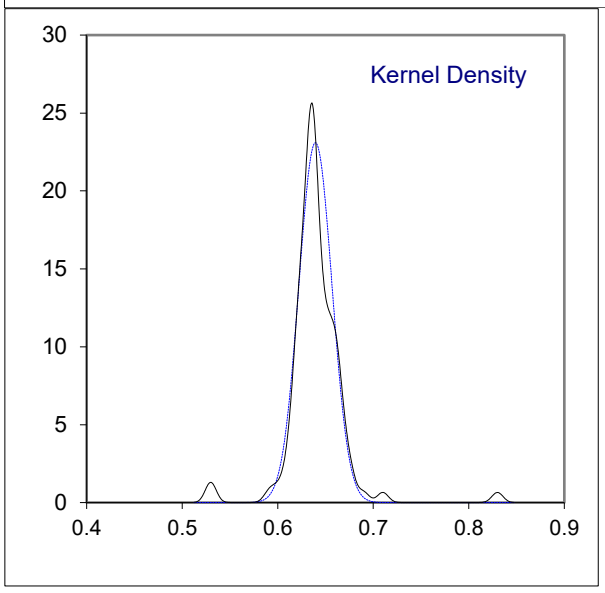
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4294	0.653		0.69	781	D4294	0.624		-0.80
62	D4294	0.661		1.10	785	D4294	0.621		-0.95
90	D4294	0.6580		0.95	798		-----		-----
92	D4294	0.658		0.95	840	D4294	0.6428		0.17
120	D4294	0.66508		1.31	862	D2622	0.645		0.28
140	D4294	0.646		0.33	873	D4294	0.635		-0.24
141		-----		-----	874	D4294	0.636		-0.18
150	D4294	0.677		1.92	875	D4294	0.633		-0.34
154	D4294	0.653		0.69	904	D4294	0.62		-1.01
158	D4294	0.662		1.15	914		-----		-----
159	D4294	0.635		-0.24	922	D4294	0.635		-0.24
167	D4294	0.65668		0.88	962	D4294	0.639		-0.03
168	D4294	0.676		1.87	963	D4294	0.632		-0.39
170	D4294	0.64940		0.51	970	D4294	0.636		-0.18
171	D4294	0.690		2.59	971	D4294	0.636		-0.18
172	D4294	0.665		1.31	974	D4294	0.636		-0.18
175		-----		-----	988	D4294	0.635		-0.24
203		-----		-----	991	D4294	0.618		-1.11
225	D4294	0.6154		-1.24	992	D4294	0.625		-0.75
237	D4294	0.623		-0.85	994	D4294	0.635		-0.24
238	D4294	0.629		-0.54	995	D4294	0.635		-0.24
273	D4294	0.64	C	0.02	997		-----		-----
311	D4294	0.639		-0.03	1011		-----		-----
314		-----		-----	1023	IP336	0.71	R(0.05)	3.62
328		-----		-----	1039	D2622	0.6310		-0.44
333		-----		-----	1040	ISO8754	0.616		-1.21
334	D4294	0.599		-2.09	1056	D4294	0.649		0.48
335	D4294	0.624		-0.80	1065	D4294	0.65		0.54
355	D2622	0.830	R(0.01)	9.79	1082	ISO8754	0.607		-1.67
372	D4294	0.638		-0.08	1089	D4294	0.632		-0.39
391	D4294	0.635		-0.24	1109	D2622	0.6372		-0.12
398		-----		-----	1236		-----		-----
399	D4294	0.62	C	-1.01	1259	D4294	0.63		-0.49
442	IP336	0.642		0.12	1320		-----		-----
444		-----		-----	1340	ISO8754	0.66775		1.45
445	D4294	0.659		1.00	1360	ISO8754	0.65		0.54
446		-----		-----	1397	D2622	0.621		-0.95
447	IP336	0.53	R(0.01)	-5.63	1412	D4294	0.654		0.74
480	D4294	0.6729		1.71	1510		-----		-----
495	D4294	0.6356		-0.20	1539	D4294	0.64		0.02
511		-----		-----	1544	D4294	0.6245		-0.77
525		-----		-----	1556	ISO8754	0.662		1.15
529	D4294	0.665		1.31	1567	D4294	0.670		1.56
541		-----		-----	1613		-----	W	-----
542		-----		-----	1654	ISO8754	0.65		0.54
551	D4294	0.5911		-2.49	1695	D4294	0.626		-0.70
553		-----		-----	1714	D2622	0.637		-0.13
557		-----		-----	1720		-----		-----
562		-----		-----	1724	D4294	0.649		0.48
575		-----		-----	1728	D4294	0.638		-0.08
588		-----		-----	1741	ISO8754	0.630		-0.49
589		-----		-----	1759		-----		-----
590		-----		-----	1776	ISO8754	0.631		-0.44
593	D4294	0.635		-0.24	1810	D4294	0.64		0.02
596		-----		-----	1811	D4294	0.64		0.02
597		-----		-----	1815	D7039	0.627		-0.65
598		-----		-----	1833	IP336	0.64		0.02
599		-----		-----	1842	D2622	0.630		-0.49
600		-----		-----	1849		-----		-----
603	D4294	0.620		-1.01	1858	D4294	0.624		-0.80
608		-----		-----	1928	ISO8754	0.66		1.05
609		-----		-----	1929	ISO8754	0.66		1.05
610		-----		-----	1930		-----		-----
611		-----		-----	1957		-----		-----
612		-----		-----	6016	D4294	0.654		0.74
621	D4294	0.6441		0.23	6028	ISO8754	0.64		0.02
657	D4294	0.641		0.07	6054	D4294	0.53	C,R(0.01)	-5.63
663		-----		-----	6166	IP336	0.64		0.02
704	D4294	0.660		1.05	6201	D4294	0.638	C	-0.08
710	D4294	0.613		-1.37	6203	D2622	0.628		-0.59
734		-----		-----	6263		-----		-----
749	D4294	0.636		-0.18	6290		-----		-----
750	D4294	0.634		-0.29	6295	D4294	0.621		-0.95
752	ISO8754	0.663		1.20	6296	D4294	0.633		-0.34
753	D4294	0.630		-0.49	6362	D4294	0.622		-0.90

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365	D4294	0.649		0.48	9142		-----		-----
6410	D4294	0.61		-1.52	9143		-----		-----
9051		-----		-----	9146	In house	0.65		0.54
9052		-----		-----	9151		-----		-----
9057		-----		-----	9160		-----		-----
9060		-----		-----	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141		-----		-----	9165		-----		-----

normality	OK
n	102
outliers	4
mean (n)	0.6396
st.dev. (n)	0.01727
R(calc.)	0.0484
st.dev.(D4294:21)	0.01945
R(D4294:21)	0.0545

Lab 273 first reported 0.58
Lab 399 first reported 0.72
Lab 1613 test result withdrawn, reported 0.572
Lab 6054 first reported 0.51
Lab 6201 first reported 6.4





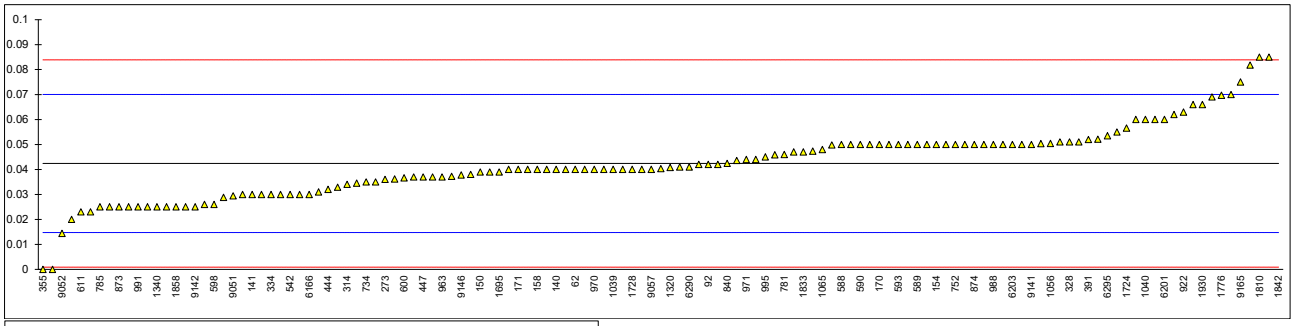
Determination of Water on sample #21220; results in %V/V

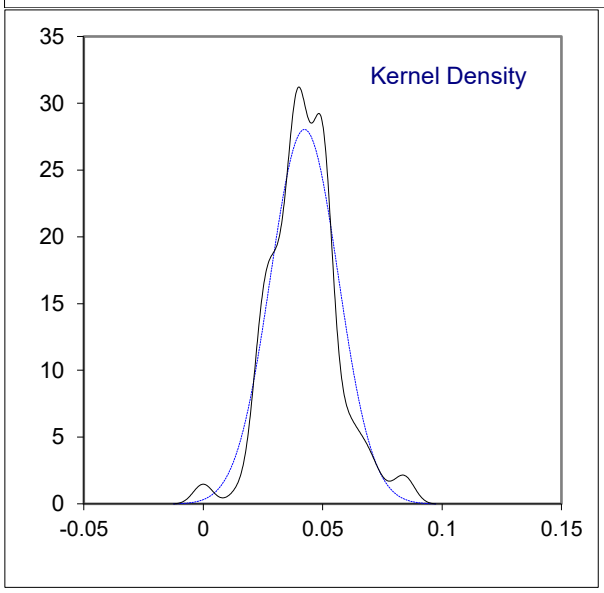
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52	D4928	0.05		0.55	781	D4928	0.046		0.26
62	D4928	0.04		-0.17	785	D4006	0.025		-1.26
90	D4928	0.038		-0.32	798		-----		-----
92	D4377	0.042		-0.03	840	D4928	0.0424		0.00
120	D4006	<0.025		-----	862	D4006	<0.025		-----
140	D4928	0.04		-0.17	873	D4006	0.025		-1.26
141	D4928	0.03		-0.90	874	D4006	0.05		0.55
150	D4928	0.039		-0.25	875	D95	0.050		0.55
154	D4928	0.05	C	0.55	904	D4928	0.039		-0.25
158	D4928	0.04		-0.17	914		-----		-----
159	D4928	0.0345		-0.57	922	D4928	0.063		1.49
167		-----		-----	962	D4377	0.05		0.55
168		-----		-----	963	D4377	0.0370		-0.39
170	D4006	0.05		0.55	970	D4928	0.040		-0.17
171	D4377	0.04		-0.17	971	D4928	0.044		0.12
172	D4928	0.05		0.55	974	D4928	0.04		-0.17
175	D4006	<0.025		-----	988	D4006	0.050		0.55
203	D4377	0.0403		-0.15	991	D4006	0.025		-1.26
225	D4006	0.05		0.55	992	D4006	0.025		-1.26
237	D4006	0.025		-1.26	994	D4928	0.035		-0.53
238	D4006	0.03		-0.90	995	D4928	0.045		0.19
273	D4928	0.036		-0.46	997	D4928	0.047		0.33
311	D4928	0.037		-0.39	1011		-----		-----
314	D4377	0.034		-0.61	1023	D4928	0.0473		0.35
328	ISO10337	0.051		0.62	1039	D4928	0.04		-0.17
333	D4377	0.06		1.27	1040	D4377	0.06		1.27
334	D4377	0.03	C	-0.90	1056	D4928	0.0504		0.58
335	D4377	0.04		-0.17	1065	D4928	0.048		0.41
355	D4006	0		-3.07	1082	ISO10336	0.069		1.92
372	D4377	0.0436		0.09	1089	D4377	0.062		1.42
391	D4377	0.052		0.69	1109	D4377	0.07		2.00
398	D4928	0.051		0.62	1236	D4928	0.0818		2.85
399	D4006	0.05		0.55	1259	D4006	<0,05		-----
442	IP386	0.03287		-0.69	1320	E203	0.0408		-0.12
444	D4928	0.032		-0.75	1340	ISO9029	0.025		-1.26
445	D4928	0.0459		0.25	1360	D4377	0.06		1.27
446	D4928	0.04		-0.17	1397		-----		-----
447	IP386	0.037		-0.39	1412	D4928	0.040		-0.17
480	D4377	0.0372		-0.38	1510		-----		-----
495	D6304	0.02		-1.62	1539	D4928	0.044		0.12
511		-----		-----	1544	D4006	0.0250		-1.26
525		-----		-----	1556	D6304	0.03		-0.90
529	D4928	0.037		-0.39	1567		-----		-----
541	D4928	0.030		-0.90	1613	D4006	<0.05		-----
542	D4928	0.030		-0.90	1654		-----		-----
551	D4377	0.066		1.71	1695	D4928	0.039		-0.25
553	E203	0.04		-0.17	1714	D6304	0.055		0.91
557		-----		-----	1720		-----		-----
562		-----		-----	1724	D4377	0.05657		1.03
575		-----		-----	1728	D4006	0.04		-0.17
588	D4006	0.05		0.55	1741	ISO9029	0		-3.07
589	D4006	0.05		0.55	1759		-----		-----
590	D4006	0.05		0.55	1776	D6304	0.0697		1.98
593	D4006	0.05		0.55	1810	D4377	0.0850		3.08
596	D4928	0.03		-0.90	1811	D4377	0.085		3.08
597		-----		-----	1815	D4377	0.0498		0.54
598	D4928	0.026		-1.19	1833	D4377	0.047		0.33
599		-----		-----	1842	D6304	1460	R(0.01)	105618
600	D4928	0.0366		-0.42	1849	D4928	0.051		0.62
603		-----		-----	1858	D4006	0.025		-1.26
608	D4928	0.04		-0.17	1928	D4377	0.041		-0.10
609		-----		-----	1929	D4377	0.042		-0.03
610	D4928	0.0362		-0.45	1930	DIN51777	0.066		1.71
611	D4928	0.023		-1.40	1957	D4377	0.050		0.55
612		-----		-----	6016	ISO10337	0.031		-0.82
621	D4006	<0.05		-----	6028		-----		-----
657	D4377	0.05		0.55	6054	D4006	0.025		-1.26
663	D4928	0.023		-1.40	6166	IP386	0.03		-0.90
704	D4377	0.042		-0.03	6201	D4377	0.06		1.27
710	D4377	0.026		-1.19	6203	ISO9029	0.05		0.55
734	D4377	0.035		-0.53	6263	D6304	0.050373		0.58
749	GOST2477	0.04		-0.17	6290	D4377	0.041		-0.10
750	D4006	0.05		0.55	6295	D4928	0.0535		0.80
752	D4006	0.050		0.55	6296	D4928	0.0521		0.70
753	D4006	0.025		-1.26	6362	GOST2477	0.05		0.55

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365		-----		-----	9142	D4006	0.025		-1.26
6410	D6304	0.04		-0.17	9143		-----		-----
9051	In house	0.0294		-0.94	9146	In house	0.0378		-0.33
9052	In house	0.0144		-2.03	9151		-----		-----
9057		0.04		-0.17	9160		-----		-----
9060	D4928	0.0288		-0.98	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141	D4006	0.05		0.55	9165	D4006	0.075		2.36

normality	suspect
n	130
outliers	1
mean (n)	0.04240
st.dev. (n)	0.014234
R(calc.)	0.03986
st.dev.(D4377:00)	0.013823
R(D4377:00)	0.03870

Lab 154 first reported 0.49
Lab 334 first reported 0.10





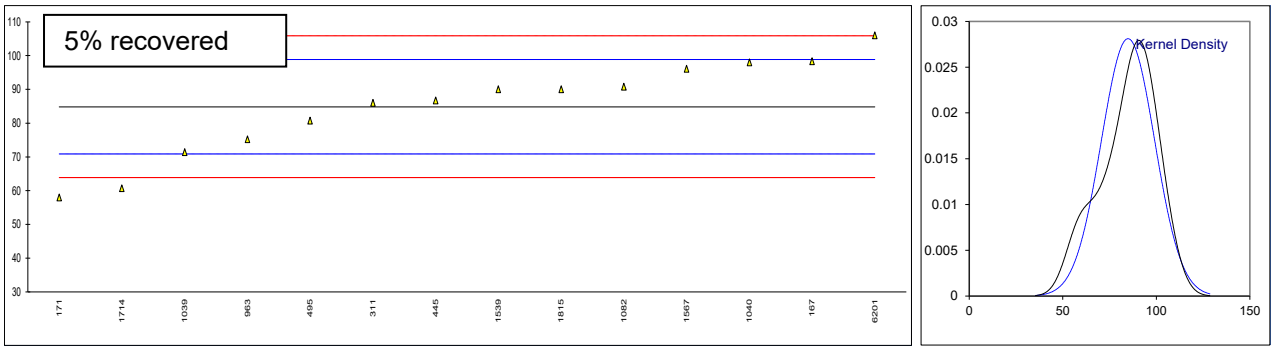
Determination of Simulated Distillation on sample #21220; results in °C

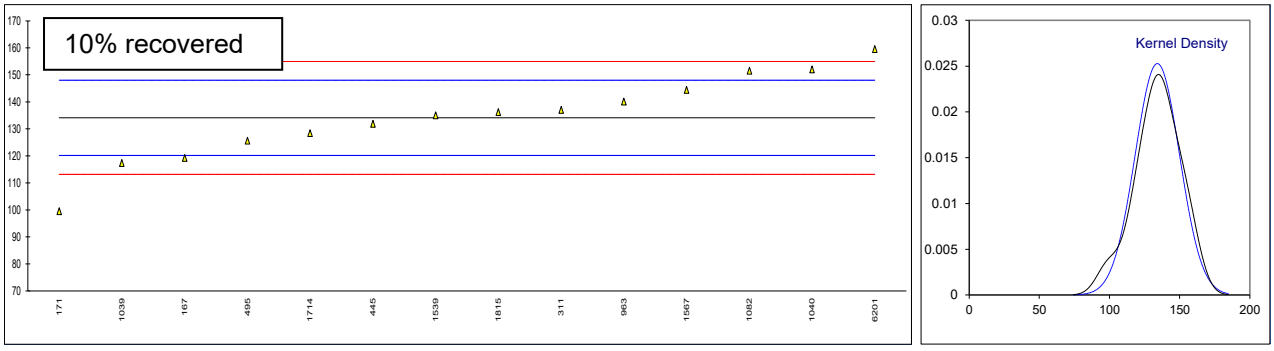
lab	method	IBP	5% rec	10% rec	30% rec	50% rec	70% rec	90% rec	FBP	tot rec.
52		-----	-----	-----	-----	-----	-----	-----	-----	-----
62		-----	-----	-----	-----	-----	-----	-----	-----	-----
90		-----	-----	-----	-----	-----	-----	-----	-----	-----
92		-----	-----	-----	-----	-----	-----	-----	-----	-----
120		-----	-----	-----	-----	-----	-----	-----	-----	-----
140		-----	-----	-----	-----	-----	-----	-----	-----	-----
141		-----	-----	-----	-----	-----	-----	-----	-----	-----
150		-----	-----	-----	-----	-----	-----	-----	-----	-----
154		-----	-----	-----	-----	-----	-----	-----	-----	-----
158		-----	-----	-----	-----	-----	-----	-----	-----	-----
159		-----	-----	-----	-----	-----	-----	-----	-----	-----
167	D7169	<69	98.333	119.167	251.063	345.156	446.829	596.351	712.352	100.000
168		-----	-----	-----	-----	-----	-----	-----	-----	-----
170		-----	-----	-----	-----	-----	-----	-----	-----	-----
171	D7169	31.5	58.0	99.5	252.5	355.5	464.0	612.0	714.5	-----
172		-----	-----	-----	-----	-----	-----	-----	-----	-----
175		-----	-----	-----	-----	-----	-----	-----	-----	-----
203		-----	-----	-----	-----	-----	-----	-----	-----	-----
225		-----	-----	-----	-----	-----	-----	-----	-----	-----
237		-----	-----	-----	-----	-----	-----	-----	-----	-----
238		-----	-----	-----	-----	-----	-----	-----	-----	-----
273		-----	-----	-----	-----	-----	-----	-----	-----	-----
311	D7169	<36	86.0	137.0	274.5	378.5	491.5	660.5	>720	-----
314		-----	-----	-----	-----	-----	-----	-----	-----	-----
328		-----	-----	-----	-----	-----	-----	-----	-----	-----
333		-----	-----	-----	-----	-----	-----	-----	-----	-----
334		-----	-----	-----	-----	-----	-----	-----	-----	-----
335		-----	-----	-----	-----	-----	-----	-----	-----	-----
355		-----	-----	-----	-----	-----	-----	-----	-----	-----
372		-----	-----	-----	-----	-----	-----	-----	-----	-----
391		-----	-----	-----	-----	-----	-----	-----	-----	-----
398		-----	-----	-----	-----	-----	-----	-----	-----	-----
399		-----	-----	-----	-----	-----	-----	-----	-----	-----
442		-----	-----	-----	-----	-----	-----	-----	-----	-----
444		-----	-----	-----	-----	-----	-----	-----	-----	-----
445	D7169	-0.5	86.7	131.8	268.6	365.8	469.1	618.1	735.1	76.3
446		-----	-----	-----	-----	-----	-----	-----	-----	-----
447		-----	-----	-----	-----	-----	-----	-----	-----	-----
480		-----	-----	-----	-----	-----	-----	-----	-----	-----
495	D7169	-0.5	80.7	125.6	273.8	376.5	486.9	663.5	738.7	94.55
511		-----	-----	-----	-----	-----	-----	-----	-----	-----
525		-----	-----	-----	-----	-----	-----	-----	-----	-----
529		-----	-----	-----	-----	-----	-----	-----	-----	-----
541		-----	-----	-----	-----	-----	-----	-----	-----	-----
542		-----	-----	-----	-----	-----	-----	-----	-----	-----
551		-----	-----	-----	-----	-----	-----	-----	-----	-----
553		-----	-----	-----	-----	-----	-----	-----	-----	-----
557		-----	-----	-----	-----	-----	-----	-----	-----	-----
562		-----	-----	-----	-----	-----	-----	-----	-----	-----
575		-----	-----	-----	-----	-----	-----	-----	-----	-----
588		-----	-----	-----	-----	-----	-----	-----	-----	-----
589		-----	-----	-----	-----	-----	-----	-----	-----	-----
590		-----	-----	-----	-----	-----	-----	-----	-----	-----
593		-----	-----	-----	-----	-----	-----	-----	-----	-----
596		-----	-----	-----	-----	-----	-----	-----	-----	-----
597		-----	-----	-----	-----	-----	-----	-----	-----	-----
598		-----	-----	-----	-----	-----	-----	-----	-----	-----
599		-----	-----	-----	-----	-----	-----	-----	-----	-----
600		-----	-----	-----	-----	-----	-----	-----	-----	-----
603		-----	-----	-----	-----	-----	-----	-----	-----	-----
608		-----	-----	-----	-----	-----	-----	-----	-----	-----
609		-----	-----	-----	-----	-----	-----	-----	-----	-----
610		-----	-----	-----	-----	-----	-----	-----	-----	-----
611		-----	-----	-----	-----	-----	-----	-----	-----	-----
612		-----	-----	-----	-----	-----	-----	-----	-----	-----
621		-----	-----	-----	-----	-----	-----	-----	-----	-----
657		-----	-----	-----	-----	-----	-----	-----	-----	-----
663		-----	-----	-----	-----	-----	-----	-----	-----	-----
704		-----	-----	-----	-----	-----	-----	-----	-----	-----
710		-----	-----	-----	-----	-----	-----	-----	-----	-----
734		-----	-----	-----	-----	-----	-----	-----	-----	-----
749		-----	-----	-----	-----	-----	-----	-----	-----	-----
750		-----	-----	-----	-----	-----	-----	-----	-----	-----
752		-----	-----	-----	-----	-----	-----	-----	-----	-----
753		-----	-----	-----	-----	-----	-----	-----	-----	-----

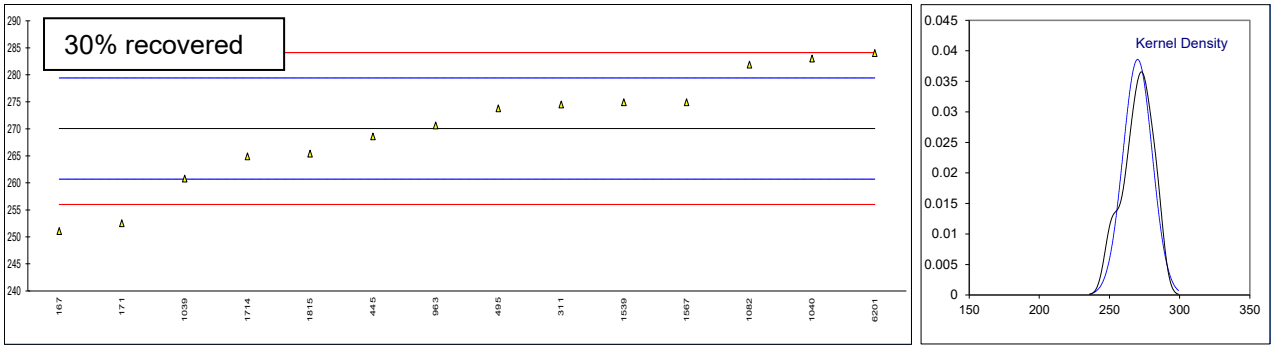
lab	method	IBP	5% rec	10% rec	30% rec	50% rec	70% rec	90% rec	FBP	tot rec.
781		-----	-----	-----	-----	-----	-----	-----	-----	-----
785		-----	-----	-----	-----	-----	-----	-----	-----	-----
798		-----	-----	-----	-----	-----	-----	-----	-----	-----
840		-----	-----	-----	-----	-----	-----	-----	-----	-----
862		-----	-----	-----	-----	-----	-----	-----	-----	-----
873		-----	-----	-----	-----	-----	-----	-----	-----	-----
874		-----	-----	-----	-----	-----	-----	-----	-----	-----
875		-----	-----	-----	-----	-----	-----	-----	-----	-----
904		-----	-----	-----	-----	-----	-----	-----	-----	-----
914		-----	-----	-----	-----	-----	-----	-----	-----	-----
922		-----	-----	-----	-----	-----	-----	-----	-----	-----
962		-----	-----	-----	-----	-----	-----	-----	-----	-----
963	D7169	<37	75.2	140.1	270.6	369.7	472.6	614.8	>700	-----
970		-----	-----	-----	-----	-----	-----	-----	-----	-----
971		-----	-----	-----	-----	-----	-----	-----	-----	-----
974		-----	-----	-----	-----	-----	-----	-----	-----	-----
988		-----	-----	-----	-----	-----	-----	-----	-----	-----
991		-----	-----	-----	-----	-----	-----	-----	-----	-----
992		-----	-----	-----	-----	-----	-----	-----	-----	-----
994		-----	-----	-----	-----	-----	-----	-----	-----	-----
995		-----	-----	-----	-----	-----	-----	-----	-----	-----
997		-----	-----	-----	-----	-----	-----	-----	-----	-----
1011		-----	-----	-----	-----	-----	-----	-----	-----	-----
1023		-----	-----	-----	-----	-----	-----	-----	-----	-----
1039	ISO15199-3	-30.0	71.4	117.3	260.8	358.1	463.2	623.5	-----	98.4
1040	D7169	-0.5	98	152	283	388	506	731	-----	91.3
1056		-----	-----	-----	-----	-----	-----	-----	-----	-----
1065		-----	-----	-----	-----	-----	-----	-----	-----	-----
1082	EN15199-3	-0.4900	90.7700	151.5291	281.8936	385.8889	504.6190	698.6054	-----	-----
1089		-----	-----	-----	-----	-----	-----	-----	-----	-----
1109		-----	-----	-----	-----	-----	-----	-----	-----	-----
1236		-----	-----	-----	-----	-----	-----	-----	-----	-----
1259		-----	-----	-----	-----	-----	-----	-----	-----	-----
1320		-----	-----	-----	-----	-----	-----	-----	-----	-----
1340		-----	-----	-----	-----	-----	-----	-----	-----	-----
1360		-----	-----	-----	-----	-----	-----	-----	-----	-----
1397		-----	-----	-----	-----	-----	-----	-----	-----	-----
1412		-----	-----	-----	-----	-----	-----	-----	-----	-----
1510		-----	-----	-----	-----	-----	-----	-----	-----	-----
1539	D7169	-11.7	90.0	135.0	274.9	379.2	492.8	684.8	-----	93.6
1544		-----	-----	-----	-----	-----	-----	-----	-----	-----
1556		-----	-----	-----	-----	-----	-----	-----	-----	-----
1567	IP545	-9.9	96.1	144.4	274.9	371.3	476.1	638.2	-----	97.2
1613		-----	-----	-----	-----	-----	-----	-----	-----	-----
1654		-----	-----	-----	-----	-----	-----	-----	-----	-----
1695		-----	-----	-----	-----	-----	-----	-----	-----	-----
1714	In house	21.0	60.7	128.4	264.9	358.7	465.1	623.5	>750	99.49
1720		-----	-----	-----	-----	-----	-----	-----	-----	-----
1724		-----	-----	-----	-----	-----	-----	-----	-----	-----
1728		-----	-----	-----	-----	-----	-----	-----	-----	-----
1741		-----	-----	-----	-----	-----	-----	-----	-----	-----
1759		-----	-----	-----	-----	-----	-----	-----	-----	-----
1776		-----	-----	-----	-----	-----	-----	-----	-----	-----
1810		-----	-----	-----	-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----	-----	-----	-----
1815	D7169	-0.5	90.0	136.2	265.4	358.6	457.1	598.9	714.6	100.0
1833		-----	-----	-----	-----	-----	-----	-----	-----	-----
1842		-----	-----	-----	-----	-----	-----	-----	-----	-----
1849		-----	-----	-----	-----	-----	-----	-----	-----	-----
1858		-----	-----	-----	-----	-----	-----	-----	-----	-----
1928		-----	-----	-----	-----	-----	-----	-----	-----	-----
1929		-----	-----	-----	-----	-----	-----	-----	-----	-----
1930		-----	-----	-----	-----	-----	-----	-----	-----	-----
1957		-----	-----	-----	-----	-----	-----	-----	-----	-----
6016		-----	-----	-----	-----	-----	-----	-----	-----	-----
6028		-----	-----	-----	-----	-----	-----	-----	-----	-----
6054		-----	-----	-----	-----	-----	-----	-----	-----	-----
6166		-----	-----	-----	-----	-----	-----	-----	-----	-----
6201	D7169	48.5	106.0	159.5	284.0	384.5	500.0	703.0	>720	91.3
6203		-----	-----	-----	-----	-----	-----	-----	-----	-----
6263		-----	-----	-----	-----	-----	-----	-----	-----	-----
6290		-----	-----	-----	-----	-----	-----	-----	-----	-----
6295		-----	-----	-----	-----	-----	-----	-----	-----	-----
6296		-----	-----	-----	-----	-----	-----	-----	-----	-----
6362		-----	-----	-----	-----	-----	-----	-----	-----	-----
6365		-----	-----	-----	-----	-----	-----	-----	-----	-----
6410		-----	-----	-----	-----	-----	-----	-----	-----	-----
9051		-----	-----	-----	-----	-----	-----	-----	-----	-----

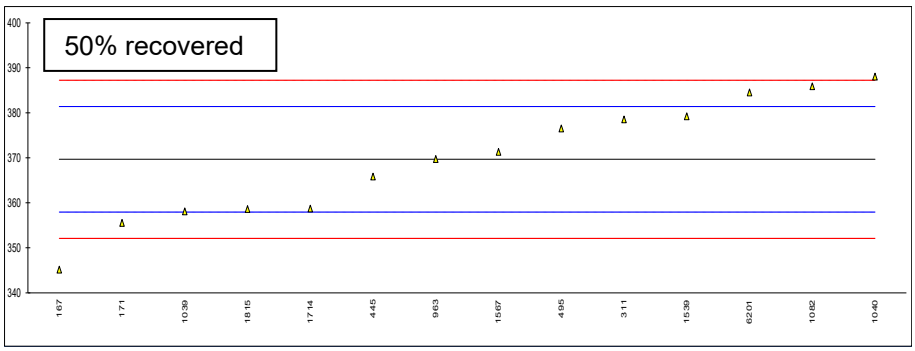
lab	method	IBP	5% rec	10% rec	30% rec	50% rec	70% rec	90% rec	FBP	tot rec.
9052		-----	-----	-----	-----	-----	-----	-----	-----	-----
9057		-----	-----	-----	-----	-----	-----	-----	-----	-----
9060		-----	-----	-----	-----	-----	-----	-----	-----	-----
9063		-----	-----	-----	-----	-----	-----	-----	-----	-----
9100		-----	-----	-----	-----	-----	-----	-----	-----	-----
9132		-----	-----	-----	-----	-----	-----	-----	-----	-----
9141		-----	-----	-----	-----	-----	-----	-----	-----	-----
9142		-----	-----	-----	-----	-----	-----	-----	-----	-----
9143		-----	-----	-----	-----	-----	-----	-----	-----	-----
9146		-----	-----	-----	-----	-----	-----	-----	-----	-----
9151		-----	-----	-----	-----	-----	-----	-----	-----	-----
9160		-----	-----	-----	-----	-----	-----	-----	-----	-----
9161		-----	-----	-----	-----	-----	-----	-----	-----	-----
9162		-----	-----	-----	-----	-----	-----	-----	-----	-----
9163		-----	-----	-----	-----	-----	-----	-----	-----	-----
9164		-----	-----	-----	-----	-----	-----	-----	-----	-----
9165		-----	-----	-----	-----	-----	-----	-----	-----	-----
normality		OK	OK	OK	OK	OK	OK	OK	unknown	
n		14	14	14	14	14	14	14	5	
outliers		0	0	0	0	0	0	0	0	
mean (n)		<36	84.85	134.11	270.06	369.67	478.27	647.63	723.05	
st.dev. (n)		n.e.	14.188	15.781	10.333	13.099	18.724	42.869	n.a.	
R(calc.)		n.e.	39.73	44.19	28.93	36.68	52.43	120.03	n.a.	
st.dev.(D7169:20e1)		n.e.	7	6.964	4.679	5.857	7.571	n.a.	n.a.	
R(D7169:20e1)		n.e.	19.6	19.5	13.1	16.4	21.2	n.a.	n.a.	

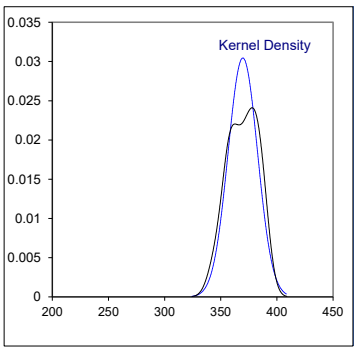
Underlined test results are corrected by the participants after notification by iis of suspect test result
Lab 167 first reported 69 (IBP)
Lab 963 first reported 90.5 (IBP), 128.1 (5%rec)

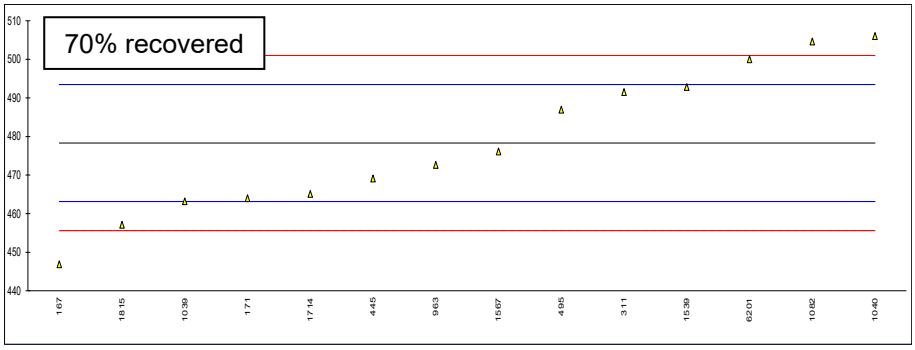


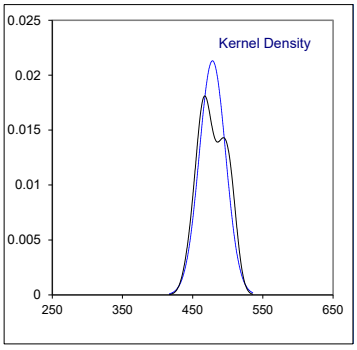


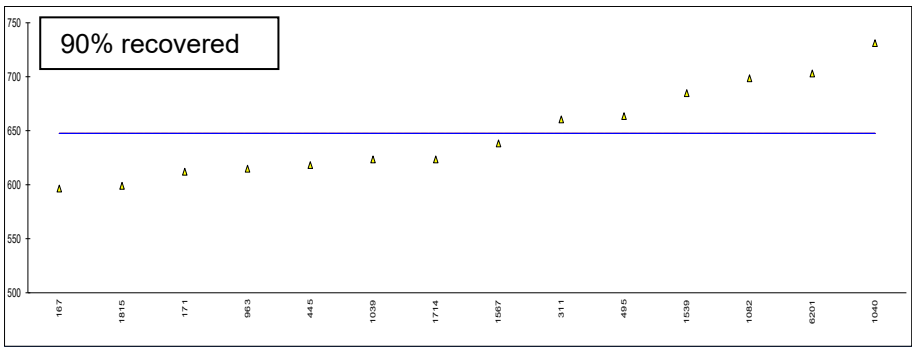


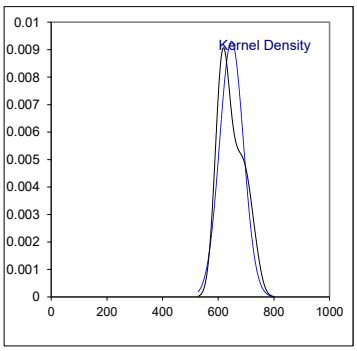

50% recovered
400
390
380
370
360
350
340
167
171
1039
1815
1714
445
963
1567
495
311
1539
6201
1082
1040


Kernel Density
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
200
250
300
350
400
450


70% recovered
510
500
490
480
470
460
450
440
167
1815
1039
171
1714
445
963
1567
495
311
1539
6201
1082
1040


Kernel Density
0.025
0.02
0.015
0.01
0.005
0
250
350
450
550
650


90% recovered
750
700
650
600
550
500
167
1815
171
963
445
1039
1714
1567
311
495
1539
1082
6201
1040


Kernel Density
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
0
200
400
600
800
1000

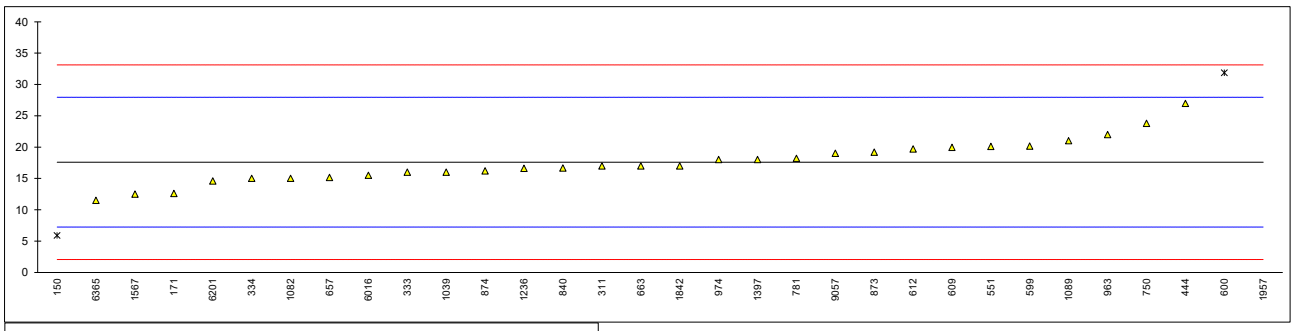
Determination of Total Mercury on sample #21221 results in µg/kg

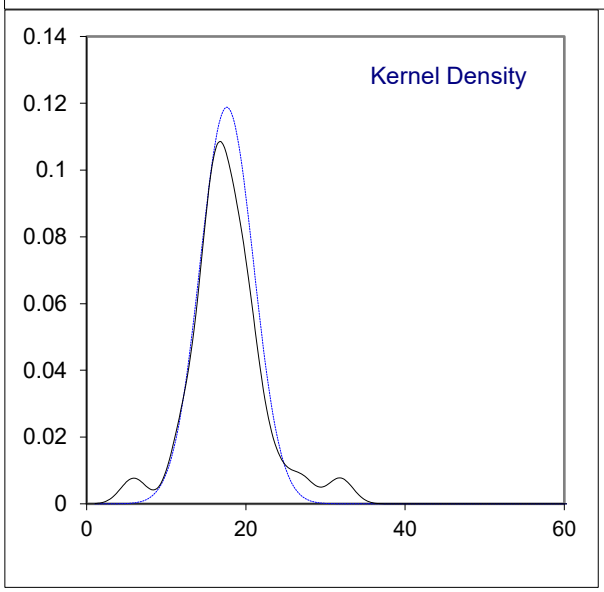
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
52		-----		-----	781	D7622	18.2		0.12
62		-----		-----	785		-----		-----
90		-----		-----	798		-----		-----
92		-----		-----	840	UOP938	16.66		-0.18
120		-----		-----	862		-----		-----
140		-----		-----	873	UOP938	19.2		0.31
141		-----		-----	874	UOP938	16.2		-0.27
150	UOP938	5.9	R(0.01)	-2.26	875		-----		-----
154		-----		-----	904		-----		-----
158		-----		-----	914		-----		-----
159		-----		-----	922		-----		-----
167		-----		-----	962		-----		-----
168		-----		-----	963	UOP938	22.0		0.85
170		-----		-----	970		-----		-----
171	UOP938	12.6		-0.97	971		-----		-----
172		-----		-----	974	UOP938	18.0		0.08
175		-----		-----	988		-----		-----
203		-----		-----	991		-----		-----
225		-----		-----	992		-----		-----
237		-----		-----	994		-----		-----
238		-----		-----	995		-----		-----
273		-----		-----	997		-----		-----
311	D7623	17		-0.12	1011		-----		-----
314		-----		-----	1023		-----		-----
328		-----		-----	1039	UOP938	16		-0.31
333	INH-9003	16		-0.31	1040		-----		-----
334	INH-9003	15		-0.50	1056		-----		-----
335		-----		-----	1065		-----		-----
355		-----		-----	1082	In house	15		-0.50
372		-----		-----	1089	In house	21		0.66
391		-----		-----	1109		-----		-----
398		-----		-----	1236	In house	16.6		-0.19
399		-----		-----	1259		-----		-----
442		-----		-----	1320		-----		-----
444	UOP938	26.96		1.81	1340		-----		-----
445		-----		-----	1360		-----		-----
446		-----		-----	1397	In house	18.0		0.08
447		-----		-----	1412		-----		-----
480		-----		-----	1510		-----		-----
495		-----		-----	1539		-----		-----
511		-----		-----	1544		-----		-----
525		-----		-----	1556		-----		-----
529		-----		-----	1567	In house	12.5		-0.99
541		-----		-----	1613	UOP938	--		-----
542		-----		-----	1654		-----		-----
551	D7622	20.12		0.49	1695		-----		-----
553		-----		-----	1714		-----		-----
557		-----		-----	1720		-----		-----
562		-----		-----	1724		-----		-----
575		-----		-----	1728		-----		-----
588		-----		-----	1741		-----		-----
589		-----		-----	1759		-----		-----
590		-----		-----	1776		-----		-----
593		-----		-----	1810		-----		-----
596		-----		-----	1811		-----		-----
597		-----		-----	1815		-----		-----
598		-----		-----	1833		-----		-----
599	D7622	20.15		0.49	1842	D7622	17		-0.12
600	D7622	31.83	R(0.01)	2.75	1849		-----		-----
603		-----		-----	1858		-----		-----
608		-----		-----	1928		-----		-----
609	D7622	19.95	C	0.45	1929		-----		-----
610		-----		-----	1930		-----		-----
611		-----		-----	1957	UOP938	102.00	C,R(0.01)	16.32
612	UOP938	19.69		0.40	6016	D7622	15.5		-0.41
621		-----		-----	6028		-----		-----
657	UOP938	15.16		-0.47	6054		-----		-----
663	UOP938	17.0		-0.12	6166		-----		-----
704		-----		-----	6201	UOP938	14.6		-0.58
710		-----		-----	6203		-----		-----
734		-----		-----	6263		-----		-----
749		-----		-----	6290		-----		-----
750	UOP938	23.780		1.20	6295		-----		-----
752		-----		-----	6296		-----		-----
753		-----		-----	6362		-----		-----

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
6365	UOP938	11.5		-1.18	9142		-----		-----
6410		-----		-----	9143		-----		-----
9051		-----		-----	9146		-----		-----
9052		-----		-----	9151		-----		-----
9057		19		0.27	9160		-----		-----
9060		-----		-----	9161		-----		-----
9063		-----		-----	9162		-----		-----
9100		-----		-----	9163		-----		-----
9132		-----		-----	9164		-----		-----
9141		-----		-----	9165		-----		-----

normality	suspect
n	29
outliers	3
mean (n)	17.599
st.dev. (n)	3.3584
R(calc.)	9.404
st.dev.(Horwitz)	5.1723
R(Horwitz)	14.483

Lab 609 first reported 35.1
Lab 1957 first reported 87.231





APPENDIX 2

z-scores of the determination of individual Light ends on sample #21220

lab	Methane	Ethane	Propane	i-Butane	n-Butane	i-Pentane	n-Pentane	cy-Pentane	Hexanes
141	-----	-0.27	-1.75	-1.55	-2.53	-2.46	-2.63	4.41	-5.00
167	-----	-2.45	-3.15	-2.80	-2.32	-1.94	-1.57	7.35	2.40
442	-----	1.78	1.62	1.88	1.48	1.75	1.64	1.07	-0.43
495	-----	-1.65	-0.38	-0.08	0.05	-0.26	-0.08	-2.29	4.72
609	-----	-0.54	0.40	1.15	1.16	1.26	1.85	-----	-----
611	-----	-0.54	-0.25	0.72	0.48	1.60	1.12	-----	-----
862	-----	1.39	1.10	0.50	0.84	0.86	0.06	-1.64	1.39
1039	-----	1.95	4.13	6.01	9.01	4.79	3.36	5.77	4.31
1040	-----	-7.18	-1.28	-0.57	-1.49	-2.66	-1.90	-4.18	-5.58
1065	-----	2.03	1.76	1.63	1.01	0.38	-0.53	-1.02	2.07
1082	-----	0.95	-0.10	-1.24	-1.41	-3.48	-3.19	-2.77	-2.96
1089	-----	1.03	1.95	2.52	2.27	2.76	1.72	1.07	-4.34
1236	-----	-3.06	-2.47	-1.34	-1.67	-0.71	-1.03	-0.45	1.91
1567	-----	-1.65	-2.21	-2.73	-1.85	-2.66	-2.72	-2.23	-2.65
1776	-----	-0.43	0.81	2.00	3.64	1.46	2.62	-4.55	-----
1957	-----	-0.79	-1.35	-1.10	-1.34	-2.82	-1.04	-0.28	4.16
6166	-----	3.88	1.98	1.58	1.74	1.40	1.77	-0.28	-----
6201	-----	-1.65	-0.81	-0.57	-0.06	0.72	0.55		-----

Please note: the table in this appendix only shows participants that reported test results

z-scores of the determination of Simulated Distillation on sample #21220

lab	IBP	5% rec	10% rec	30% rec	50% rec	70% rec	90% rec	FBP
167	-----	1.93	-2.15	-4.06	-4.19	-4.15	-----	-----
171	-----	-3.84	-4.97	-3.75	-2.42	-1.89	-----	-----
311	-----	0.16	0.42	0.95	1.51	1.75	-----	-----
445	-----	0.26	-0.33	-0.31	-0.66	-1.21	-----	-----
495	-----	-0.59	-1.22	0.80	1.17	1.14	-----	-----
963	-----	-1.38	0.86	0.12	0.00	-0.75	-----	-----
1039	-----	-1.92	-2.41	-1.98	-1.98	-1.99	-----	-----
1040	-----	1.88	2.57	2.77	3.13	3.66	-----	-----
1082	-----	0.85	2.50	2.53	2.77	3.48	-----	-----
1539	-----	0.74	0.13	1.03	1.63	1.92	-----	-----
1567	-----	1.61	1.48	1.03	0.28	-0.29	-----	-----
1714	-----	-3.45	-0.82	-1.10	-1.87	-1.74	-----	-----
1815	-----	0.74	0.30	-1.00	-1.89	-2.80	-----	-----
6201	-----	3.02	3.65	2.98	2.53	2.87	-----	-----

Please note: the table in this appendix only shows participants that reported test results

APPENDIX 3

Analytical details Total Acid Number determination

lab	determination of end point	volume of titration solvent
52	Inflection Point	125 mL
90	Inflection Point	60 mL
92	Inflection Point	125 mL
120	Buffer End Point (pH 10)	60 mL
140	Inflection Point	125 mL
158	Inflection Point	125 mL
159	Inflection Point	125 mL
170	Inflection Point	60 mL
172	Inflection Point	60 mL
273	Inflection Point	60 mL
334	Inflection Point	125 mL
372	Inflection Point	60 mL
447	Inflection Point	125 mL
495	Inflection Point	60 mL
551	Inflection Point	125 mL
557	Inflection Point	125 mL
588	---	60 mL
598	Inflection Point	125 mL
600	Inflection Point	125 mL
603	Buffer End Point (pH 10)	125 mL
608	Inflection Point	125 mL
611	Inflection Point	60 mL
621	Inflection Point	125 mL
657	Inflection Point	125 mL
663	Inflection Point	125 mL
704	Inflection Point	125 mL
750	Inflection Point	60 mL
752	Inflection Point	60 mL
781	Inflection Point	125 mL
840	Inflection Point	60 mL
862	Inflection Point	---
873	Buffer End Point (pH 10)	125 mL
874	Buffer End Point (pH 10)	125 mL
922	Inflection Point	125 mL
963	Inflection Point	60 mL
971	Inflection Point	125 mL
974	Inflection Point	125 mL
994	Inflection Point	125 mL
995	---	125 mL
1039	Inflection Point	125 mL
1056	Inflection Point	60 mL
1089	Inflection Point	125 mL
1109	Inflection Point	125 mL
1340	Inflection Point	---
1412	Inflection Point	125 mL
1539	Inflection Point	125 mL
1544	Buffer End Point (pH 10)	125 mL
1556	Buffer End Point (pH 10)	125 mL
1567	Inflection Point	60 mL
1613	Inflection Point	125 mL
1741	Inflection Point	125 mL
1759	Inflection Point	125 mL
1776	Buffer End Point (pH 10)	125 mL
1858	---	125 mL
1957	Buffer End Point (pH 10)	125 mL
6201	Buffer End Point (pH 10)	125 mL
6203	Inflection Point	125 mL
6365	Inflection Point	125 mL
6410	Inflection Point	60 mL

Please note: the table in this appendix only shows participants that reported analytical details

APPENDIX 4

Number of participants per country

1 lab in	ALBANIA
2 labs in	ARGENTINA
1 lab in	AUSTRALIA
2 labs in	AZERBAIJAN
1 lab in	BOSNIA and HERZEGOVINA
3 labs in	BRAZIL
2 labs in	BULGARIA
4 labs in	CANADA
1 lab in	CHILE
1 lab in	CHINA, People's Republic
1 lab in	COLOMBIA
2 labs in	COTE D'IVOIRE
2 labs in	CROATIA
2 labs in	CZECH REPUBLIC
4 labs in	ECUADOR
1 lab in	EGYPT
1 lab in	ESTONIA
1 lab in	FINLAND
4 labs in	FRANCE
2 labs in	GEORGIA
3 labs in	GERMANY
1 lab in	INDIA
1 lab in	INDONESIA
1 lab in	ISRAEL
3 labs in	ITALY
1 lab in	JORDAN
4 labs in	KAZAKHSTAN
13 labs in	MALAYSIA
2 labs in	MEXICO
7 labs in	NETHERLANDS
12 labs in	NIGERIA
5 labs in	NORWAY
3 labs in	OMAN
1 lab in	PAKISTAN
1 lab in	PERU
6 labs in	POLAND
1 lab in	PORTUGAL
2 labs in	ROMANIA
12 labs in	RUSSIAN FEDERATION
2 labs in	SAUDI ARABIA
2 labs in	SERBIA
1 lab in	SINGAPORE
4 labs in	SLOVAKIA
1 lab in	SOUTH AFRICA
1 lab in	SPAIN
1 lab in	SUDAN
2 labs in	SWEDEN
1 lab in	THAILAND
1 lab in	TUNISIA
5 labs in	TURKEY
2 labs in	TURKMENISTAN
1 lab in	UKRAINE
2 labs in	UNITED ARAB EMIRATES
12 labs in	UNITED KINGDOM
14 labs in	UNITED STATES OF AMERICA
1 lab in	VIETNAM

APPENDIX 5

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's outlier test
E	= calculation difference between reported test result and result calculated by iis
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
f+?	= possibly a false positive test result?
f-?	= possibly a false negative test result?
SDS	= Safety Data Sheet

Literature

1 iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, June 2018
2 ISO5725:86
3 ISO5725 parts 1-6:94
4 ISO13528:05
5 M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
6 W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
7 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
8 J.N. Miller, Analyst, 118, 455, (1993)
9 Analytical Methods Committee, Technical Brief, No 4, January 2001
10 P.J. Lowthian and M. Thompson, The Royal Society of Chemistry, Analyst, 127, 1359-1364, (2002)
11 W. Horwitz and R. Albert, J. AOAC Int, 79.3, 589-621, (1996)
12 Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, Technometrics, 25(2), 165-172, (1983)