Results of Proficiency Test
Crude Oil
November 2015

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

Authors: ing. A.S. Noordman-de Neef
Correctors: dr. R.G. Visser & ing. R.J. Starink

Report: iis15R01

January 2016

CONTENTS

1 INTRODUCTION

Since 1998, the Institute for Interlaboratory Studies organizes a proficiency test for Crude Oil every year. During the annual proficiency testing program 2015/2016, it was decided to continue the round robin for the analysis of Crude Oil. In this interlaboratory study 147 laboratories from 54 different countries have participated. See appendix 2 for the number of participants per country.
In this report, the results of the 2015 Crude Oil proficiency test are presented and discussed. This report is also available as PDF from the iis internet site www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, The Netherlands, was the organiser of this proficiency test. It was decided to send one sample of approx. 1 litre of Crude Oil in a one liter wide-necked bottle to enable use of a large size diameter high speed shear mixer for homogenisation. Analyses for fit-for-use and homogeneity testing were subcontracted to an accredited laboratory. Participants were requested to report rounded and unrounded results. The unrounded results were preferably used for statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC 17043:2010, since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie, R007). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentially of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

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

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

The necessary bulk material was obtained from a local refinery. The approx. 200 litre of Crude Oil was homogenised in a metal drum. After homogenisation, the material was transferred to 188 subsamples of 1 L wide-neck transparent colourless glass bottles and labelled #15215.

The homogeneity of the subsamples was checked before the addition of water by the determination of Density in accordance ASTM D5002 on 8 stratified randomly selected samples.

	Density at 15 °C in kg/m^3
Sample #15215-1	873.29
Sample #15215-2	873.33
Sample #15215-3	873.39
Sample #15215-4	873.50
Sample #15215-5	873.31
Sample #15215-6	873.35
Sample #15215-7	873.43
Sample #15215-8	873.58

Table 1: Homogeneity test results of subsamples #15215

The repeatability (r) was calculated from the test results of table 1 and compared with 0.3 times the reproducibility (R) of the reference method in agreement with the procedure of ISO 13528, Annex B2 in the next table:

	Density at 15 °C in kg/m^3
r (observed)	0.28
reference method	ASTM D5002:13
0.3*R (reference method)	1.08

Table 2: Repeatability on subsamples #15215

The calculated repeatability is less than 0.3 times the reproducibility of the reference method. Therefore, homogeneity of the subsamples #15215 was assumed.

The water content of the original Crude Oil was low (0.05 %V/V) and therefore for BSW probably only ‘less than’ results would be reported by the participating laboratories. Therefore each one litre subsample was enriched with 3.5 mL water per bottle by means of a calibrated FINN pipette.

Because brown coloured wide-neck glass bottles were not available, the (clear glass) bottles were packed in red plastics bags. In the letter of instructions, all participants were asked to shield the samples from light before analysis.

To each of the participating laboratories one bottle of 1 L (labelled #15215) was sent on October 21, 2015.

2.5 STABILITY OF THE SAMPLES

The stability of Crude Oil packed in the clear glass bottles with red plastic bag was checked in the past. The material has been found sufficiently stable for the period of the proficiency test.

2.6 ANALYSES

The participants were requested to determine on sample #15215: Acid Number, API Gravity, BS&W, Density at 15°C, Kinematic Viscosity at 40°C, Light ends (C1-C6 and total C1-C6), Mercury total, Molecular Mass Average, Pour Point (Maximum), Salt as NaCl, Sediment by Extraction (ASTM D473) and Sediment by Membrane filtration (ASTM D4807), Sulphur total, Water content and simulated Distillation by high temp GC.

To get comparable results a detailed report form, on which the units were prescribed as well as the required standards and a letter of instructions were prepared and made available on the data entry portal www.kpmd.co.uk/sgs-iis/. A SDS and a form to confirm receipt of the samples were added to the sample package.

3 RESULTS

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

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

3.1 STATISTICS

Statistical calculations were performed as described in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ of April 2014 (iis-protocol, version 3.3). For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded results. Results reported as ‘<…’ or ‘>…’ were not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test, a variant of the Kolmogorov-Smirnov test, and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either ‘unknown’, ‘OK’, ‘suspect’ or ‘not OK’. After removal of outliers,

this check was repeated. Not all data sets proved to have a normal distribution, in which cases the statistical evaluation of the results should be used with due care.

According to ISO 5725 the original results per determination were submitted to Dixon's and/or Grubbs' and/or Rosner's outlier tests. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value, the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. When the uncertainty passed the evaluation, no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.

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

3.2 GRAPHICS

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

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ASTM reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study. The target standard deviation was calculated from the literature reproducibility by division with 2.8.

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 the fit-for-use.

The z-scores were calculated in accordance with:

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

The $z_{(target)}$ scores are listed 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 sample dispatch problems were encountered during the execution. The samples to the participants in Afghanistan, Algeria, Brazil, Colombia, Ecuador, Kazakhstan, Malaysia, Peru, Russian Federation, Saudi Arabia and Turkmenistan arrived late or after the deadline or did never reach the laboratories at all due to customs clearance and/or transportation problems. In total 129 laboratories submitted 1077 numerical results. Observed were 26 statistically outlying results, which is 2.4% of the reported results. In proficiency tests, outlier percentages of 3% - 7.5% are quite normal.

4.1 EVALUATION PER TEST

In the iis PT reports, ASTM methods are referred to with a number (e.g. D4007) and an added designation for the year that the method was adopted or revised (e.g. D4007:11e1). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D4007:11e1(2013)). In the results tables of appendix 1 only the method number and year of adoption or revision e.g. D4007:11e1 will be used.

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

Acid Number: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D664-A:11a.

API Gravity: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of ASTM D287:12b.

BS&W: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D4007:11e1(2013).

Density: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in good agreement with the requirements of ASTM D5002:13. Several participants used ASTM D4052. It must be noted that in the scope of this method is mentioned that ASTM D5002 is intended for crude oils (see e.g. §1.3 of ASTM D4052:11).

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 D445:15.

Light Ends: This determination was problematic for some components. In total three statistical outliers were observed over seven components and one calculation error in total C1-C6. Three of the six calculated reproducibilities, after rejection of the statistical outliers, were in agreement with the requirements of IP344:88(2010). It is to be noted that D5134 and D6730 may not be suitable for testing crude oil.

Mercury: This determination may be problematic at the low mercury concentration (2µg/kg). One statistical outlier was observed. Regretfully no target reproducibility is available. ASTM D7623 gives only a repeatability and UOP938, used by the majority of the laboratories, is not intended to be used on 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. Therefore, it was decided to use the Horwitz equation for evaluation of the test results in this report. The calculated reproducibility is not in agreement with the estimated requirements using the Horwitz equation.

Molecular Mass: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D2503:92(2012).

Pour Point: This determination was problematic. Three test results were excluded from the calculations as the reported test methods are in principle not suitable for Crude Oils (see for example the scope of the test method of ASTM D97). After exclusion of these test results, no statistical outliers were observed. However, the calculated reproducibility after rejection of the suspect test results is not in agreement with the requirements of ASTM D5853A:11. When the ASTM D5853 test results are evaluated separatively, the calculated reproducibility is slightly better but still not in agreement with the requirements of ASTM D5853A:11. A possible explanation for the large variation could be the described rounding of to the nearest multiples of 3°C in ASTM D5853.

Salt as NaCl: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ASTM D3230:13.

Sediment by Extraction (ASTM D473): This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D3230:13.

Sediment by Membrane filtration (ASTM D4807): The determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D4807:05(2012).

Sulphur: This determination was very problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the requirements of ASTM D4294:10.

Water: This determination was very problematic. A known concentration of water was added to the samples (see §2.4) and therefore the minimum water concentration able to be determined was known (0.32%V/V=0.40%V/V-0.08%V/V$_{(R\ D4377)}$). However, 26 of the 106 laboratories reported a concentration lower than 0.32%V/V and these test results were rejected prior to statistical analysis. The reason for the reported low water concentrations may be insufficient homogenisation of the sample prior to sub sampling for analysis. After the exclusion of suspect data two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers and suspect data is still not at all in agreement with the requirements of ASTM D4377:00(2011).
One of the possible reasons for the large reproducibility in the PT may be confusion about the reporting unit. In practice %V/V is used mostly, but ASTM D4377 mentioned to report in %M/M. Remarkable is that D4377 also explains how to convert the result into %V/V. Another possible reason could be the difficulty of the sample to get it homogenised before the analysis.

Simulated Distillation: This determination was very problematic, only 14 labs reported their results. In total eleven statistical outliers were observed over eight parameters. However, the calculated reproducibilities after rejection of the statistical outliers are not in agreement with the requirements of ASTM D7169:11 for most parameters. Remarkable is the large variation in IBP while the reproducibility of IBP in ASTM D7169 is rather small compared to the other parameters. Therefore it was decided not to calculate z-score for IBP.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant standard and the reproducibility as found for the group of participating laboratories. The target reproducibilities derived from literature standards and the calculated reproducibilities are compared in the next table.

Parameter		unit	n	average	2.8 *sd_R	R (lit)
Acid Number (total)		mg KOH/g	63	0.15	0.10	0.16
API Gravity			82	30.3	0.4	0.5
BS&W		%V/V	47	0.24	0.42	0.28
Density at 15°C		kg/m^3	119	874.2	2.0	3.6
Kinematic Viscosity at 40°C		mm^2/s	68	10.29	1.28	0.76
C1 Light Ends		%M/M	18	<0.01	n.a.	n.a.
C2 Light Ends		%M/M	21	0.018	0.012	0.007
C3 Light Ends		%M/M	21	0.27	0.07	0.06
C4 Light Ends		%M/M	22	0.99	0.15	0.20
C5 Light Ends		%M/M	22	2.0	0.3	0.4
C6 Light Ends		%M/M	19	2.8	0.7	0.5
Total C1-C6 Light Ends		%M/M	18	6.1	0.7	0.6
Mercury (total)		µg/kg	11	2.0	4.0	2.3
Molecular Mass		g/mol	5	233	11	14
Pour Point, Max.		°C	45	-29	23	18
Salt as NaCl		mg/kg	75	9.3	12.8	14.8
Sediment Extraction (D473)		%V/V	65	0.007	0.013	0.035
Sediment Membrane filt. (D4807)		%M/M	38	0.019	0.030	0.016
Total Sulphur		%M/M	95	2.57	0.30	0.13
Water		%V/V	72	0.40	0.17	0.08
Simulated Distillation	IBP	°C	9	11	62	2
	5%recovered	°C	11	68	17	20
	10%recovered	°C	13	116	30	20
	30%recovered	°C	13	247	58	13
	50%recovered	°C	12	375	59	16
	70%recovered	°C	12	511	83	21
	90%recovered	°C	7	659	61	n.a.
	FBP	°C	5	726	37	n.a.

Table 3: Reproducibilities of the tests methods for sample #15215

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF NOVEMBER 2015 WITH PREVIOUS PTS

	November 2015	*November 2014*	*October 2013*	*November 2012*	*November 2011*
Number of reporting labs	129	133	125	121	132
Number of results reported	1077	985	827	860	845
Statistical outliers	26	44	36	42	43
Percentage outliers	2.4	4.5	4.4	4.9	5.1

Table 4: Comparison with previous proficiency tests

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

The performance of the determinations of the proficiency tests was compared against the requirements of the respective standards. The conclusions are given the following table:

Determination	*November 2015*	*November 2014*	*October 2013*	*November 2012*	*November 2011*
Acid Number (total)	+	++	+	++	++
API Gravity	+/-	+	+	++	++
BS&W	-	++	-	++	-
Density at 15°C	++	++	++	++	++
Kinematic Viscosity at 40ºC	-	+/-	--	--	++
Light Ends (C1-C6)	+/-	--	--	--	+/-
Mercury (total)	(--)	(-)	(--)	(--)	(--)
Molecular Mass	+	n.e.	n.e.	n.e.	n.e.
Pour Point, Max	-	+	--	+/-	--
Salt as NaCl	+	+	+	+	--
Sediment Extraction (D473)	++	n.e.	n.e.	++	++
Sediment Membrane fil. (D4807)	--	-	-	--	-
Total Sulphur	--	+/-	--	+/-	-
Water	--	+/-	--	--	--
Simulated Distillation	--	n.e.	n.e.	n.e.	n.e.

Table 5: Comparison determinations against the standard
(between brackets is a comparison against Horwitz)

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

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

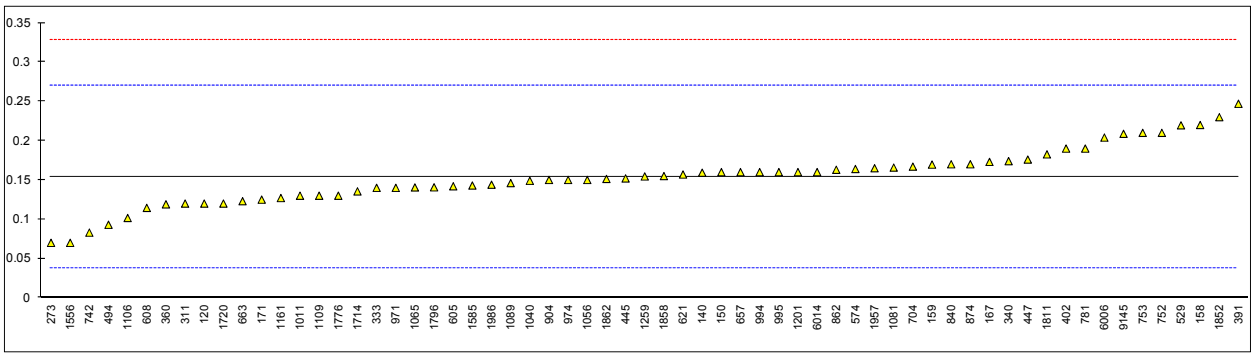
APPENDIX 1

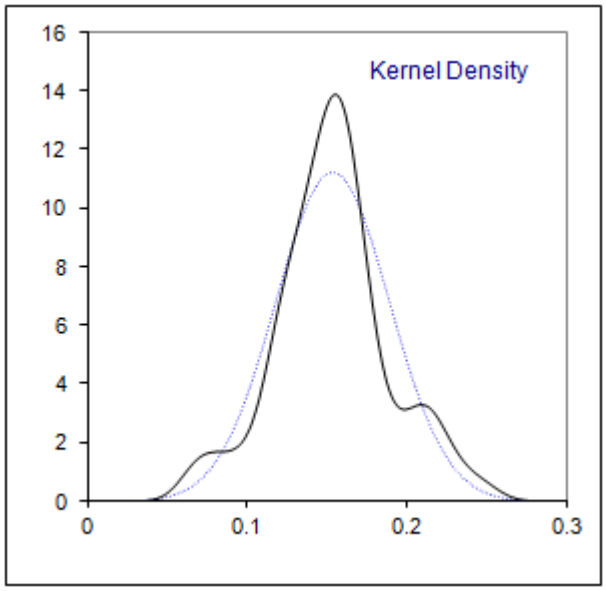
Determination of Acid Number (total) on sample #15215; results in mg KOH/g

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90		-----		-----	963		-----		-----
92		-----		-----	971	D664	0.14		-0.24
120	D664	0.12	C	-0.59	974	D664	0.15		-0.07
131		-----		-----	988		-----		-----
133		-----		-----	991		-----		-----
140	D664	0.1593		0.09	992		-----		-----
150	D664	0.16		0.10	994	D664	0.16		0.10
154		-----		-----	995	D664	0.16		0.10
158	D664	0.22		1.13	997		-----		-----
159	D664	0.1696		0.27	998		-----		-----
167	D664	0.173		0.33	1011	D664	0.13		-0.41
168		-----		-----	1040	ISO6619	0.149		-0.09
171	D664	0.125		-0.50	1056	D664	0.150		-0.07
186		-----		-----	1065	D664	0.1405		-0.23
203		-----		-----	1081	D664	0.1658		0.20
225		-----		-----	1089	D664	0.146		-0.14
238		-----		-----	1106	D664	0.1016		-0.90
242		-----		-----	1109	D664	0.13		-0.41
273	D664	0.07	C	-1.45	1128		-----		-----
311	D664	0.12		-0.59	1161	D664	0.127		-0.47
314		-----		-----	1191		-----		-----
332		-----		-----	1200		-----		-----
333	D664	0.14		-0.24	1201	D664	0.16		0.10
334		-----		-----	1236		-----		-----
335		-----		-----	1248		-----		-----
340	D664	0.174		0.34	1259	D664	0.1545		0.01
360	D664	0.119		-0.60	1264		-----		-----
391	D664	0.247		1.60	1287		-----		-----
398		-----		-----	1360		-----		-----
399		-----		-----	1543		-----		-----
402	D664	0.19		0.62	1556	D664	0.07		-1.45
441		-----		-----	1585	D664	0.143		-0.19
442		-----		-----	1616		-----		-----
444		-----		-----	1617		-----		-----
445	D664	0.152		-0.04	1654		-----		-----
446		-----		-----	1714	in house	0.1355		-0.32
447	D664	0.176		0.38	1720	D664	0.12		-0.59
485		-----		-----	1728		-----		-----
494	D664	0.093		-1.05	1776	D664	0.13		-0.41
511		-----		-----	1796	D664	0.1407		-0.23
529	D664	0.2196		1.13	1800		-----		-----
541		-----		-----	1810		-----		-----
551		-----		-----	1811	D664	0.1826	C	0.49
557		-----		-----	1815		-----		-----
574	D664	0.164		0.17	1842		-----		-----
575		-----		-----	1849		-----		-----
593		-----		-----	1852	D664	0.230		1.31
602		-----		-----	1858	D664	0.155		0.02
605	D664	0.142		-0.21	1862	D664	0.1513		-0.05
606		-----		-----	1892		-----		-----
608	D664	0.1145		-0.68	1928		-----		-----
609		-----		-----	1929		-----		-----
613		-----		-----	1930		-----		-----
621	D664	0.157		0.05	1957	D664	0.165		0.19
657	D664	0.16		0.10	1963		-----		-----
663	D664	0.123		-0.53	1986	D664	0.144		-0.17
704	D664	0.167		0.22	6001		-----		-----
732		-----		-----	6003		-----		-----
739		-----		-----	6006	D664	0.204		0.86
742	D664	0.083		-1.22	6009		-----		-----
749		-----		-----	6014	D664	0.16		0.10
750		-----		-----	6016		-----		-----
751		-----		-----	9050		-----		-----
752	D664	0.21		0.96	9051		-----		-----
753	D664	0.21		0.96	9052		-----		-----
781	D664	0.19		0.62	9057		-----		-----
784		-----		-----	9060		-----		-----
785		-----		-----	9063		-----		-----
840	D664	0.17		0.27	9132		-----		-----
862	D664	0.163		0.15	9145	D664	0.2088		0.94
874	D664	0.17		0.27	9151		-----		-----
875		-----		-----	9152		-----		-----
904	D664	0.15		-0.07					

normality	OK
n	63
outliers	0
mean (n)	0.1541
st.dev. (n)	0.03567
R(calc.)	0.0999
R(D664-A:11a)	0.1627

Lab 120 first reported: 0.02
Lab 273 first reported: 0.71
Lab 1811 first reported: 0.3250

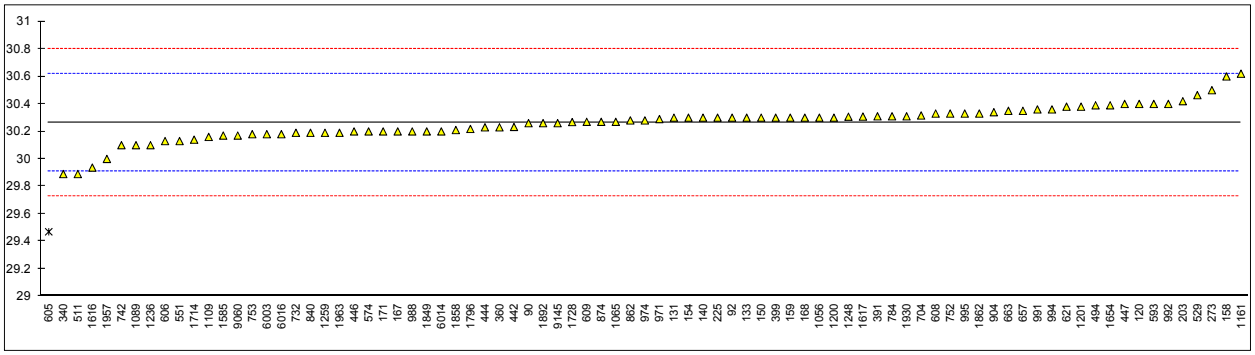


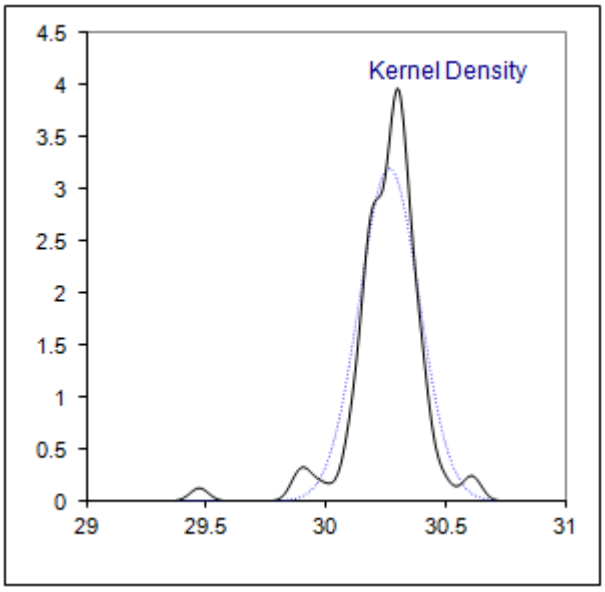


Determination of API Gravity on sample #15215;

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90	D5002	30.26		-0.03	963		-----		-----
92	D5002	30.30		0.20	971	D5002	30.29		0.14
120	D5002	30.4		0.76	974	Calc.	30.28		0.08
131	D5002	30.3		0.20	988	D1298	30.2		-0.36
133	D287	30.3		0.20	991	Calc.	30.36		0.53
140	D287	30.3		0.20	992	Calc.	30.4		0.76
150	D287	30.3		0.20	994	D5002	30.36		0.53
154	D287	30.30		0.20	995	D1250	30.33		0.36
158	D287	30.6		1.88	997		-----		-----
159	D5002	30.30		0.20	998		-----		-----
167	D5002	30.20		-0.36	1011		-----		-----
168	D1298	30.3		0.20	1040		-----		-----
171	D287	30.2		-0.36	1056	Calc.	30.3		0.20
186		-----		-----	1065	Calc.	30.27		0.03
203	Calc.	30.42		0.87	1081		-----		-----
225	D5002	30.3		0.20	1089	D287	30.1		-0.92
238		-----		-----	1106		-----		-----
242		-----		-----	1109	D287	30.16		-0.59
273	D5002	30.5		1.32	1128		-----		-----
311		-----		-----	1161	D287	30.62		1.99
314		-----		-----	1191		-----		-----
332		-----		-----	1200	D287	30.3		0.20
333		-----		-----	1201	D287	30.38		0.64
334		-----		-----	1236	D287	30.1		-0.92
335		-----		-----	1248	Calc.	30.307		0.24
340	D287	29.89		-2.10	1259	Calc.	30.19		-0.42
360	D287	30.23		-0.20	1264		-----		-----
391	D5002	30.31		0.25	1287		-----		-----
398		-----		-----	1360		-----		-----
399	D287	30.3		0.20	1543		-----		-----
402		-----		-----	1556		-----		-----
441		-----		-----	1585	D5002	30.17		-0.53
442	D5002	30.2328		-0.18	1616	Calc.	29.937		-1.84
444	D5002	30.23		-0.20	1617	D5002	30.308		0.24
445		-----		-----	1654	D4052	30.39		0.70
446	D5002	30.2		-0.36	1714	D5002	30.14		-0.70
447	D5002	30.4		0.76	1720		-----		-----
485		-----		-----	1728	D5002	30.268		0.02
494	D4052	30.39		0.70	1776		-----		-----
511	D4052	29.89		-2.10	1796	D5002	30.218		-0.26
529	D287	30.464		1.11	1800		-----		-----
541		-----		-----	1810		-----		-----
551	D4052	30.13		-0.76	1811		-----		-----
557		-----		-----	1815		-----		-----
574	D4052	30.2		-0.36	1842		-----		-----
575		-----		-----	1849	D1298	30.2		-0.36
593	D1298	30.4		0.76	1852		-----		-----
602		-----		-----	1858	D5002	30.21		-0.31
605	D4052	29.47	R(0.01)	-4.45	1862	D5002	30.33		0.36
606	D4052	30.13		-0.76	1892	D5002	30.26		-0.03
608	Calc.	30.33		0.36	1928		-----		-----
609	D5002	30.27		0.03	1929		-----		-----
613		-----		-----	1930		30.31		0.25
621	D5002	30.38		0.64	1957	D5002	30.00		-1.48
657	D4052	30.35		0.48	1963	D5002	30.19		-0.42
663	D5002	30.35		0.48	1986		-----		-----
704	D5002/D1250	30.316		0.29	6001		-----		-----
732	D5002	30.19		-0.42	6003	D1298	30.18		-0.48
739		-----		-----	6006		-----		-----
742	D1250	30.1		-0.92	6009		-----		-----
749		-----		-----	6014	D1298	30.20		-0.36
750		-----		-----	6016	D4052	30.18		-0.48
751		-----		-----	9050		-----		-----
752		30.33		0.36	9051		-----		-----
753	D5002	30.18		-0.48	9052		-----		-----
781		-----		-----	9057		-----		-----
784	D287	30.31		0.25	9060	D5002	30.17		-0.53
785		-----		-----	9063		-----		-----
840	D5002	30.19		-0.42	9132		-----		-----
862	D287	30.28		0.08	9145	D4052	30.26		-0.03
874	D1298	30.27		0.03	9151		-----		-----
875		-----		-----	9152		-----		-----
904	D5002	30.34		0.42					

normality	not OK
n	82
outliers	1
mean (n)	30.2650
st.dev. (n)	0.12548
R(calc.)	0.3513
R(D287:12b)	0.5000



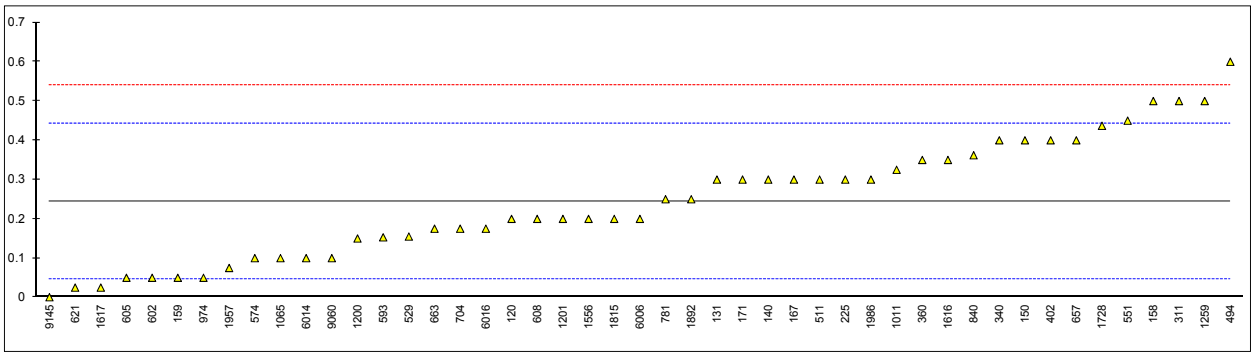


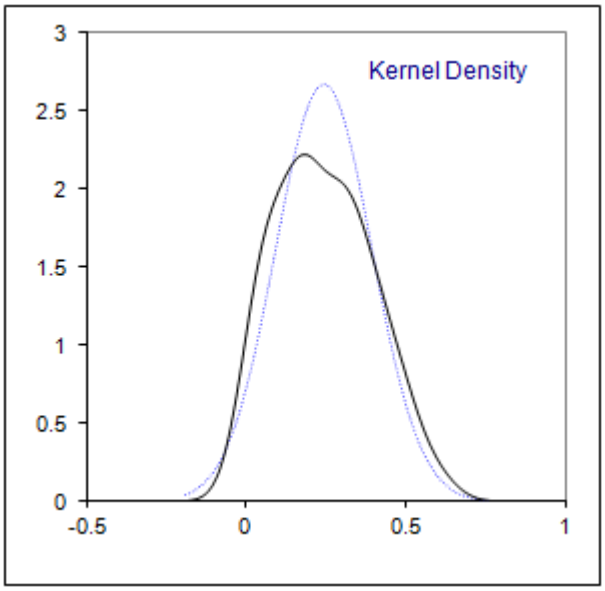
Determination of BS&W on sample #15215; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90		-----		-----	963		-----		-----
92		-----		-----	971		-----		-----
120	D4007	0.20		-0.45	974	D4007	0.05	C	-1.97
131	D4007	0.30		0.56	988		-----		-----
133		-----		-----	991		-----		-----
140	D4007	0.30		0.56	992		-----		-----
150	D4007	0.40		1.58	994		-----		-----
154		-----		-----	995		-----		-----
158	D4007	0.50		2.59	997		-----		-----
159	D4007	0.050		-1.97	998		-----		-----
167	D4007	0.30		0.56	1011	D4007	0.325		0.82
168		-----		-----	1040		-----		-----
171	D4007	0.30		0.56	1056		-----		-----
186		-----		-----	1065	D4007	0.1		-1.46
203		-----		-----	1081		-----		-----
225	D4007	0.30		0.56	1089		-----		-----
238		-----		-----	1106		-----		-----
242		-----		-----	1109		-----		-----
273		-----		-----	1128		-----		-----
311	D4007	0.50		2.59	1161		-----		-----
314		-----		-----	1191		-----		-----
332		-----		-----	1200	D4007	0.150		-0.96
333		-----		-----	1201	D4007	0.20		-0.45
334		-----		-----	1236		-----		-----
335		-----		-----	1248		-----		-----
340	D4007	0.40		1.58	1259	ISO9030	0.50		2.59
360	D4007	0.35		1.07	1264		-----		-----
391		-----		-----	1287		-----		-----
398		-----		-----	1360		-----		-----
399		-----		-----	1543		-----		-----
402	D4007	0.4		1.58	1556	ISO3734	0.20		-0.45
441		-----		-----	1585		-----		-----
442		-----		-----	1616	D4007	0.35		1.07
444		-----		-----	1617	D4007	0.025		-2.22
445		-----		-----	1654		-----		-----
446		-----		-----	1714		-----		-----
447		-----		-----	1720		-----		-----
485		-----		-----	1728		0.437		1.95
494	D4007	0.60		3.60	1776		-----		-----
511	D4007	0.30		0.56	1796		-----		-----
529	D4007	0.155		-0.90	1800		-----		-----
541		-----		-----	1810		-----		-----
551	D4007	0.45		2.08	1811		-----		-----
557		-----		-----	1815	D4007	0.20		-0.45
574	D4007	0.100		-1.46	1842		-----		-----
575		-----		-----	1849		-----		-----
593	D4006/D473	0.153		-0.92	1852		-----		-----
602	D4007	0.05		-1.97	1858		-----		-----
605	D4007	0.05		-1.97	1862		-----		-----
606		-----		-----	1892	D4007	0.25		0.06
608	D4007	0.20		-0.45	1928		-----		-----
609		-----		-----	1929		-----		-----
613		-----		-----	1930		-----		-----
621	D4007	0.025		-2.22	1957	D4007	0.075		-1.71
657	D4007	0.40		1.58	1963		-----		-----
663	D4007	0.175		-0.70	1986	D4007	0.30		0.56
704	D4007	0.175		-0.70	6001		-----		-----
732		-----		-----	6003		-----		-----
739		-----		-----	6006	D4007	0.2		-0.45
742		-----		-----	6009		-----		-----
749		-----		-----	6014	D4007	0.1		-1.46
750		-----		-----	6016	D4007	0.175		-0.70
751		-----		-----	9050		-----		-----
752		-----		-----	9051		-----		-----
753		-----		-----	9052		-----		-----
781	D4007	0.25		0.06	9057		-----		-----
784		-----		-----	9060	D4007	0.10		-1.46
785		-----		-----	9063		-----		-----
840	D4377/D473	0.362		1.19	9132		-----		-----
862		-----		-----	9145	D4007	0.0005		-2.47
874		-----		-----	9151		-----		-----
875		-----		-----	9152		-----		-----
904		-----		-----					

normality	OK
n	47
outliers	0
mean (n)	0.2443
st.dev. (n)	0.14989
R(calc.)	0.4197
R(D4007:11e1)	0.2765

Lab 974 first reported: 1.0
Lab 9145 reported most likely in a deviating unit error.



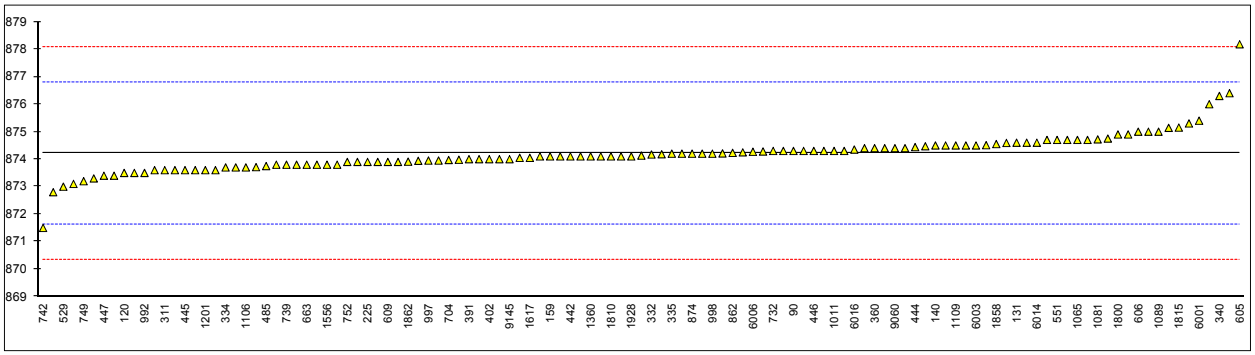


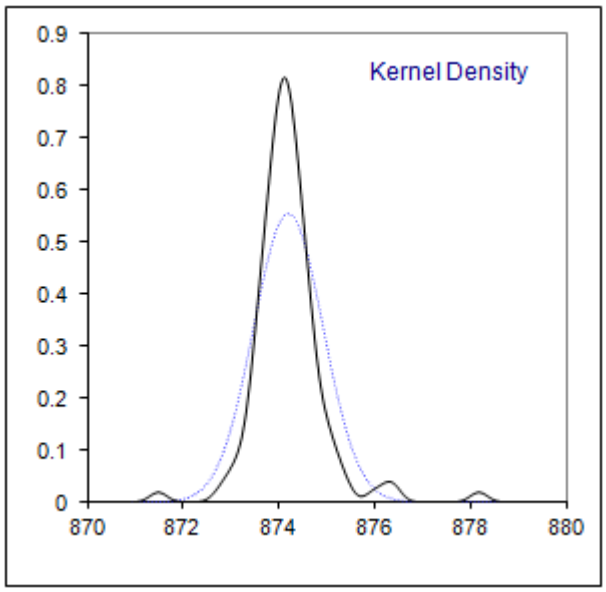
Determination of Density at 15°C on sample #15215; results in kg/m^3

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90	D5002	874.3		0.07	963		-----		-----
92	D5002	874.1		-0.08	971	D5002	874.1		-0.08
120	D5002	873.5		-0.55	974	D5002	874.2		-0.01
131	D5002	874.6		0.30	988	D1298	874.6		0.30
133		-----		-----	991	D1298	873.7		-0.39
140	D5002	874.5		0.23	992	D1298	873.5		-0.55
150	D5002	874.2		-0.01	994	D5002	873.8		-0.32
154		-----		-----	995	D5002	873.94		-0.21
158		-----		-----	997	D5002	873.95		-0.20
159	D5002	874.1		-0.08	998	D5002	874.2		-0.01
167	D5002	874.28		0.06	1011	D5002	874.3	C	0.07
168	D1298	874.1		-0.08	1040	ISO12185	874.18		-0.02
171	D5002	875		0.62	1056	D5002	874.4	C	0.15
186		-----		-----	1065	D1298	874.7		0.38
203	D1298	873.5		-0.55	1081	D5002	874.72		0.40
225	D5002	873.9		-0.24	1089	D5002	875.0		0.62
238		-----		-----	1106	D5002	873.7		-0.39
242		-----		-----	1109	D5002	874.5		0.23
273	D5002	873.4		-0.63	1128		-----		-----
311	D5002	873.6		-0.47	1161	ISO3675	872.8		-1.09
314	D5002	874.3		0.07	1191		-----		-----
332	D5002	874.17		-0.03	1200	D5002	874.25		0.03
333	D5002	873.8		-0.32	1201	ISO12185	873.6		-0.47
334	D4052	873.7		-0.39	1236	D5002	875.14	C	0.72
335	D5002	874.2		-0.01	1248	D5002	873.98		-0.18
340	D5002	876.3		1.63	1259	ISO3675	874.7		0.38
360	D5002	874.4		0.15	1264		-----		-----
391	D5002	874.0		-0.16	1287		-----		-----
398	D5002	874.3		0.07	1360	ISO12185	874.1		-0.08
399	D1298	874.0		-0.16	1543		-----		-----
402	D4052	874.0		-0.16	1556	ISO12185	873.80		-0.32
441		-----		-----	1585	D5002	874.75		0.42
442	D5002	874.1		-0.08	1616	D4052	876.0		1.39
444	D5002	874.44		0.18	1617	D5002	874.050		-0.12
445	D5002	873.6		-0.47	1654	D4052	873.95		-0.20
446	D5002	874.3		0.07	1714	D5002	874.47		0.20
447	D5002	873.4		-0.63	1720	D4052	873.3		-0.71
485	D5002	873.75		-0.36	1728	D5002	874.21		0.00
494	D4052	873.6		-0.47	1776	ISO12185	874.1		-0.08
511	D4052	876.4		1.70	1796	D5002	874.51		0.23
529	Calc.	873.0		-0.94	1800	D5002	874.9		0.54
541	D5002	874.3		0.07	1810	ISO12185	874.1		-0.08
551	D4052	874.7		0.38	1811	D5002	874.1		-0.08
557		-----		-----	1815	ISO12185	875.15		0.73
574	D4052	874.5		0.23	1842	D4052	874.9		0.54
575		-----		-----	1849		-----		-----
593		-----		-----	1852	ISO12185	873.8		-0.32
602	D1298	873.1		-0.86	1858	D5002	874.55		0.27
605	D4052	878.18		3.09	1862	D5002	873.91		-0.23
606	D1298	875.0		0.62	1892	D5002	873.6		-0.47
608	D5002	873.9		-0.24	1928	ISO12185	874.1		-0.08
609	D5002	873.9		-0.24	1929	ISO12185	874.5		0.23
613	D4052	873.6	C	-0.47	1930	ISO12185	873.71		-0.39
621	D5002	873.6		-0.47	1957	D5002	875.3	C	0.85
657	D5002	873.8		-0.32	1963	D5002	874.3		0.07
663	D5002	873.8		-0.32	1986		-----		-----
704	D5002	873.97		-0.18	6001	ISO3675	875.4		0.93
732	D5002	874.3		0.07	6003	D5002	874.5		0.23
739	INH-3900	873.8		-0.32	6006	D5002	874.27		0.05
742	D5002	871.5		-2.11	6009		-----		-----
749	INH-3900	873.2		-0.78	6014	D1298	874.6		0.30
750		-----		-----	6016	D5002	874.35		0.11
751	D1298	874.4		0.15	9050		-----		-----
752	D5002	873.9		-0.24	9051		-----		-----
753	D5002	874.7		0.38	9052		-----		-----
781	D5002	874.7		0.38	9057	D5002	874.13		-0.06
784	D5002	874.05		-0.12	9060	D5002	874.4		0.15
785	D5002	873.9		-0.24	9063		-----		-----
840	D5002	874.59		0.30	9132		-----		-----
862	D5002	874.23		0.02	9145	D5002	874.0		-0.16
874	D5002	874.2		-0.01	9151		-----		-----
875	D5002	874.0		-0.16	9152	D5002	874.4		0.15
904	D5002	873.9		-0.24					

normality	not OK
n	119
outliers	0
mean (n)	874.208
st.dev. (n)	0.7236
R(calc.)	2.026
R(D5002:13)	3.602

Lab 613 first reported: 0.87364
Lab 1011 first reported: 847.3
Lab 1056 first reported: 0.8744
Lab 1200 also reported: D1298; 874.5
Lab 1236 first reported: 0.87514
Lab 1957 first reported: 876.2



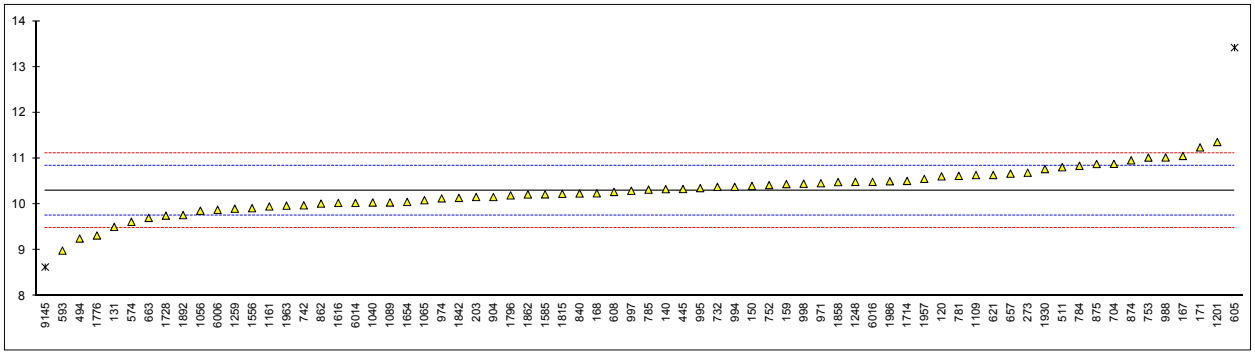


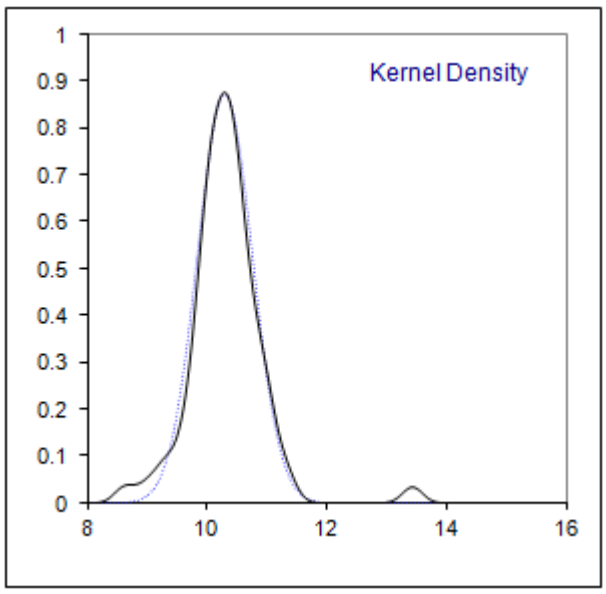
Determination of Kinematic Viscosity at 40 ºC on sample #15215; results in mm^2/s

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90		-----		-----	963		-----		-----
92		-----		-----	971	D445	10.46		0.60
120	D445	10.61		1.15	974	D445	10.13		-0.61
131	D445	9.507		-2.90	988	D445	11.022		2.67
133		-----		-----	991		-----		-----
140	D445	10.33		0.12	992		-----		-----
150	D445	10.40		0.38	994	D445	10.38		0.31
154		-----		-----	995	D445	10.353		0.21
158		-----		-----	997	D445	10.2959		0.00
159	D445	10.44		0.53	998	D445	10.45		0.56
167	D445	11.055		2.79	1011		-----		-----
168	D445	10.24		-0.21	1040	DIN51562-1	10.04		-0.94
171	D445	11.242	C	3.47	1056	D7042	9.86		-1.60
186		-----		-----	1065	D445	10.09		-0.76
203	D445	10.16		-0.50	1081		-----		-----
225		-----		-----	1089	D445	10.04		-0.94
238		-----		-----	1106		-----		-----
242		-----		-----	1109	D445	10.6380		1.25
273	D445	10.69		1.45	1128		-----		-----
311		-----		-----	1161	ISO3104	9.953		-1.26
314		-----		-----	1191		-----		-----
332		-----		-----	1200		-----		-----
333		-----		-----	1201	D445	11.36		3.91
334		-----		-----	1236		-----		-----
335		-----		-----	1248	IP71	10.49		0.71
340		-----		-----	1259	ISO3104	9.90504		-1.44
360		-----		-----	1264		-----		-----
391		-----		-----	1287		-----		-----
398		-----		-----	1360		-----		-----
399		-----		-----	1543		-----		-----
402		-----		-----	1556	ISO3104	9.915		-1.40
441		-----		-----	1585	D445	10.217		-0.29
442		-----		-----	1616	D445	10.03		-0.98
444		-----		-----	1617		-----		-----
445	IP71	10.334		0.14	1654	D445	10.0513		-0.90
446		-----		-----	1714	D445	10.51		0.78
447		-----		-----	1720		-----		-----
485		-----		-----	1728	D445	9.7520		-2.00
494	D445	9.2538		-3.83	1776	D7042	9.320		-3.59
511	D445	10.81		1.89	1796	D445	10.195		-0.37
529		-----		-----	1800		-----		-----
541		-----		-----	1810		-----		-----
551		-----		-----	1811		-----		-----
557		-----		-----	1815	ISO3104	10.229		-0.25
574	D7042	9.6181		-2.49	1842	IP71	10.14		-0.58
575		-----		-----	1849		-----		-----
593		8.99		-4.80	1852		-----		-----
602		-----		-----	1858	D445	10.485		0.69
605	D445	13.42	R(0.01)	11.48	1862	D445	10.2159		-0.30
606		-----		-----	1892	D7042	9.7652		-1.95
608	D445	10.27		-0.10	1928		-----		-----
609		-----		-----	1929		-----		-----
613		-----		-----	1930	DIN51562-1	10.77		1.74
621	D445	10.64		1.26	1957	D7042	10.556		0.95
657	D445	10.67		1.37	1963	D7042	9.9712		-1.20
663	D445	9.7043		-2.18	1986	D445	10.503		0.76
704	D445	10.882		2.15	6001		-----		-----
732	D445	10.38		0.31	6003		-----		-----
739		-----		-----	6006	D7042	9.8802		-1.53
742	D445	9.978		-1.17	6009		-----		-----
749		-----		-----	6014	D445	10.03		-0.98
750		-----		-----	6016	D445	10.49		0.71
751		-----		-----	9050		-----		-----
752	D445	10.42		0.45	9051		-----		-----
753	D445	11.02		2.66	9052		-----		-----
781	D445	10.62		1.19	9057		-----		-----
784	D445	10.84		2.00	9060		-----		-----
785	D445	10.321		0.09	9063		-----		-----
840	D445	10.236		-0.22	9132		-----		-----
862	D445	10.016		-1.03	9145	D7042	8.6297	R(0.05)	-6.13
874	D445	10.96		2.44	9151		-----		-----
875	D445	10.88		2.14	9152		-----		-----
904	D445	10.16		-0.50					

normality	OK
n	68
outliers	2
mean (n)	10.2966
st.dev. (n)	0.45712
R(calc.)	1.2799
R(D445:15)	0.7619

Lab 171 first reported: 11.9308



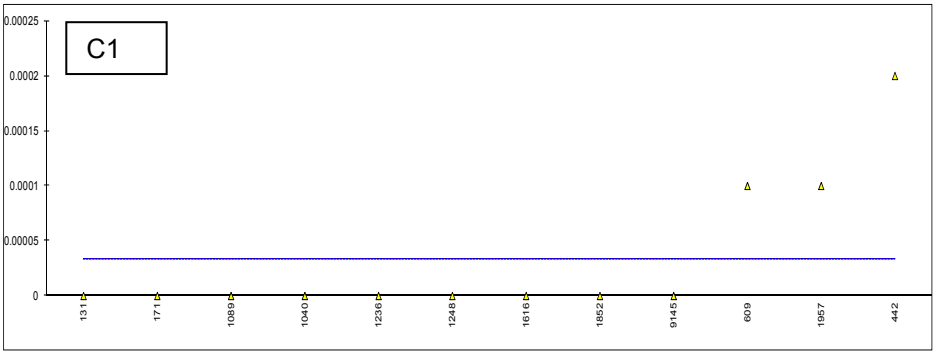


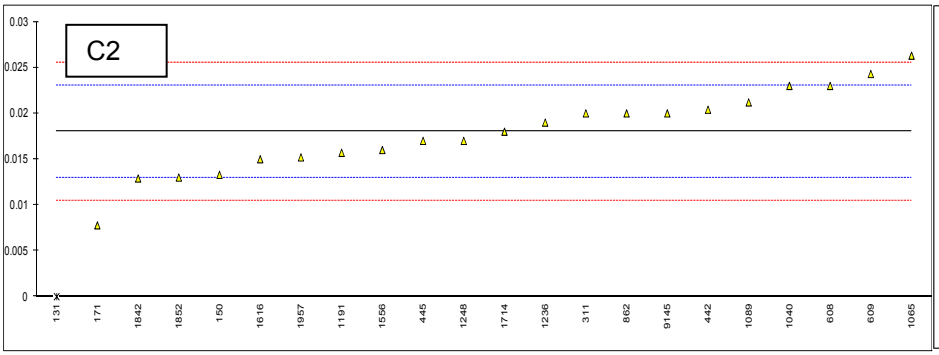
Determination of individual Light ends [C1-C3] on sample #15215; results in%M/M

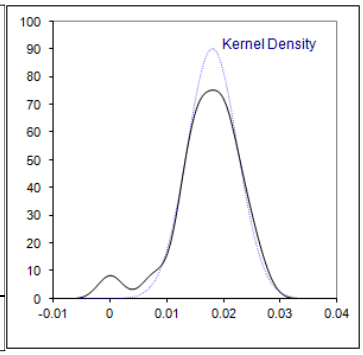
lab	method	C1	mark	z(targ)	C2	mark	z(targ)	C3	mark	z(targ)
62		-----		-----	-----		-----	-----		-----
90		-----		-----	-----		-----	-----		-----
92		-----		-----	-----		-----	-----		-----
120		-----		-----	-----		-----	-----		-----
131		0.00		-----	0.00	R(0.05)	-7.18	0.2458		-1.00
133		-----		-----	-----		-----	-----		-----
140		-----		-----	-----		-----	-----		-----
150	IP344	<0.01		-----	0.0133	C	-1.88	0.2251	C	-2.04
154		-----		-----	-----		-----	-----		-----
158		-----		-----	-----		-----	-----		-----
159		-----		-----	-----		-----	-----		-----
167		-----		-----	-----		-----	-----		-----
168		-----		-----	-----		-----	-----		-----
171	IP344	0		-----	0.007785		-4.08	0.113	C,R(0.01)	-7.70
186		-----		-----	-----		-----	-----		-----
203		-----		-----	-----		-----	-----		-----
225		-----		-----	-----		-----	-----		-----
238		-----		-----	-----		-----	-----		-----
242		-----		-----	-----		-----	-----		-----
273		-----		-----	-----		-----	-----		-----
311	INH-267	<0.01		-----	0.02		0.80	0.25		-0.78
314		-----		-----	-----		-----	-----		-----
332		-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----
335		-----		-----	-----		-----	-----		-----
340		-----		-----	-----		-----	-----		-----
360		-----		-----	-----		-----	-----		-----
391		-----		-----	-----		-----	-----		-----
398		-----		-----	-----		-----	-----		-----
399		-----		-----	-----		-----	-----		-----
402		-----		-----	-----		-----	-----		-----
441		-----		-----	-----		-----	-----		-----
442	IP344	0.0002		-----	0.0204		0.96	0.281		0.78
444		-----		-----	-----		-----	-----		-----
445	IP344	<0.01		-----	0.017		-0.40	0.261		-0.23
446		-----		-----	-----		-----	-----		-----
447		-----		-----	-----		-----	-----		-----
485		-----		-----	-----		-----	-----		-----
494		-----		-----	-----		-----	-----		-----
511		-----		-----	-----		-----	-----		-----
529		-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----
551		-----		-----	-----		-----	-----		-----
557		-----		-----	-----		-----	-----		-----
574		-----		-----	-----		-----	-----		-----
575		-----		-----	-----		-----	-----		-----
593		-----		-----	-----		-----	-----		-----
602		-----		-----	-----		-----	-----		-----
605		-----		-----	-----		-----	-----		-----
606		-----		-----	-----		-----	-----		-----
608	IP344	<0.01		-----	0.023		1.99	0.298		1.64
609	IP344	0.0001		-----	0.0243		2.51	0.2890		1.18
613		-----		-----	-----		-----	-----		-----
621		-----		-----	-----		-----	-----		-----
657		-----		-----	-----		-----	-----		-----
663		-----		-----	-----		-----	-----		-----
704		-----		-----	-----		-----	-----		-----
732		-----		-----	-----		-----	-----		-----
739		-----		-----	-----		-----	-----		-----
742		-----		-----	-----		-----	-----		-----
749		-----		-----	-----		-----	-----		-----
750		-----		-----	-----		-----	-----		-----
751		-----		-----	-----		-----	-----		-----
752		-----		-----	-----		-----	-----		-----
753		-----		-----	-----		-----	-----		-----
781		-----		-----	-----		-----	-----		-----
784		-----		-----	-----		-----	-----		-----
785		-----		-----	-----		-----	-----		-----
840		-----		-----	-----		-----	-----		-----
862	D6730	<0.01		-----	0.020		0.80	0.274		0.43
874		-----		-----	-----		-----	-----		-----
875		-----		-----	-----		-----	-----		-----
904		-----		-----	-----		-----	-----		-----
962		-----		-----	-----		-----	-----		-----
963		-----		-----	-----		-----	-----		-----
971		-----		-----	-----		-----	-----		-----
974		-----		-----	-----		-----	-----		-----

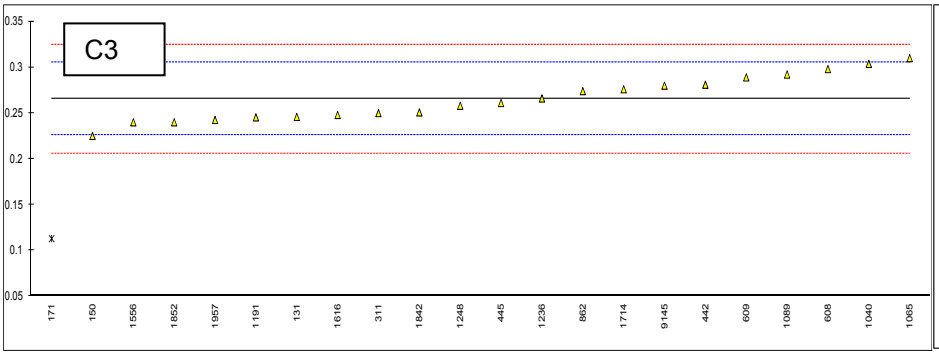
lab	method	C1	mark	z(targ)	C2	mark	z(targ)	C3	mark	z(targ)
988		-----		-----	-----		-----	-----		-----
991		-----		-----	-----		-----	-----		-----
992		-----		-----	-----		-----	-----		-----
994		-----		-----	-----		-----	-----		-----
995		-----		-----	-----		-----	-----		-----
997		-----		-----	-----		-----	-----		-----
998		-----		-----	-----		-----	-----		-----
1011		-----		-----	-----		-----	-----		-----
1040	IP344	0		-----	0.0230		1.99	0.3037		1.93
1056		-----		-----	-----		-----	-----		-----
1065	IP344	<0.0001		-----	0.0263		3.31	0.31		2.24
1081		-----		-----	-----		-----	-----		-----
1089	D5134	0.0000		-----	0.0212		1.27	0.2921		1.34
1106		-----		-----	-----		-----	-----		-----
1109		-----		-----	-----		-----	-----		-----
1128		-----		-----	-----		-----	-----		-----
1161		-----		-----	-----		-----	-----		-----
1191		-----		-----	0.0157		-0.92	0.2454		-1.02
1200		-----		-----	-----		-----	-----		-----
1201		-----		-----	-----		-----	-----		-----
1236		0.000		-----	0.019		0.40	0.266		0.02
1248	in house	0.000		-----	0.017		-0.40	0.258		-0.38
1259		-----		-----	-----		-----	-----		-----
1264		-----		-----	-----		-----	-----		-----
1287		-----		-----	-----		-----	-----		-----
1360		-----		-----	-----		-----	-----		-----
1543		-----		-----	-----		-----	-----		-----
1556		-----		-----	0.016		-0.80	0.240		-1.29
1585		-----		-----	-----		-----	-----		-----
1616	in house	0.000		-----	0.015		-1.20	0.248		-0.89
1617		-----		-----	-----		-----	-----		-----
1654		-----		-----	-----		-----	-----		-----
1714		-----		-----	0.018		0.00	0.276		0.53
1720		-----		-----	-----		-----	-----		-----
1728		-----		-----	-----		-----	-----		-----
1776		-----		-----	-----		-----	-----		-----
1796		-----		-----	-----		-----	-----		-----
1800		-----		-----	-----		-----	-----		-----
1810		-----		-----	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
1815		-----		-----	-----		-----	-----		-----
1842	IP601	n.d.		-----	0.0129		-2.04	0.2508		-0.74
1849		-----		-----	-----		-----	-----		-----
1852	in house	0.00		-----	0.013		-2.00	0.240		-1.29
1858		-----		-----	-----		-----	-----		-----
1862		-----		-----	-----		-----	-----		-----
1892		-----		-----	-----		-----	-----		-----
1928		-----		-----	-----		-----	-----		-----
1929		-----		-----	-----		-----	-----		-----
1930		-----		-----	-----		-----	-----		-----
1957	IP344	0.0001		-----	0.0152		-1.12	0.2425		-1.16
1963		-----		-----	-----		-----	-----		-----
1986		-----		-----	-----		-----	-----		-----
6001		-----		-----	-----		-----	-----		-----
6003		-----		-----	-----		-----	-----		-----
6006		-----		-----	-----		-----	-----		-----
6009		-----		-----	-----		-----	-----		-----
6014		-----		-----	-----		-----	-----		-----
6016		-----		-----	-----		-----	-----		-----
9050		-----		-----	-----		-----	-----		-----
9051		-----		-----	-----		-----	-----		-----
9052		-----		-----	-----		-----	-----		-----
9057		-----		-----	-----		-----	-----		-----
9060		-----		-----	-----		-----	-----		-----
9063		-----		-----	-----		-----	-----		-----
9132		-----		-----	-----		-----	-----		-----
9145		0		-----	0.02		0.80	0.28		0.73
9151		-----		-----	-----		-----	-----		-----
9152		-----		-----	-----		-----	-----		-----
	normality	not OK			OK			OK		
	n	18			21			21		
	outliers	0			1			1		
	mean (n)	<0.01			0.0180			0.2655		
	st.dev. (n)	n.a.			0.00443			0.02396		
	R(calc.)	n.a.			0.0124			0.0671		
	R(IP344:88)	n.a.			0.0070			0.0555		

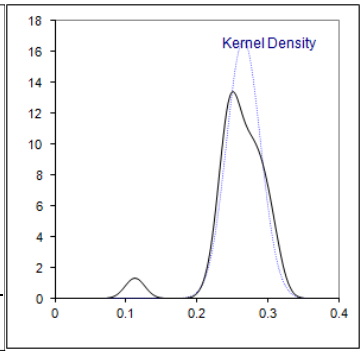
Lab 150 first reported: 0.0126 for C2 and 0.2251 for C3
Lab 171 first reported: 0.197765 for C3









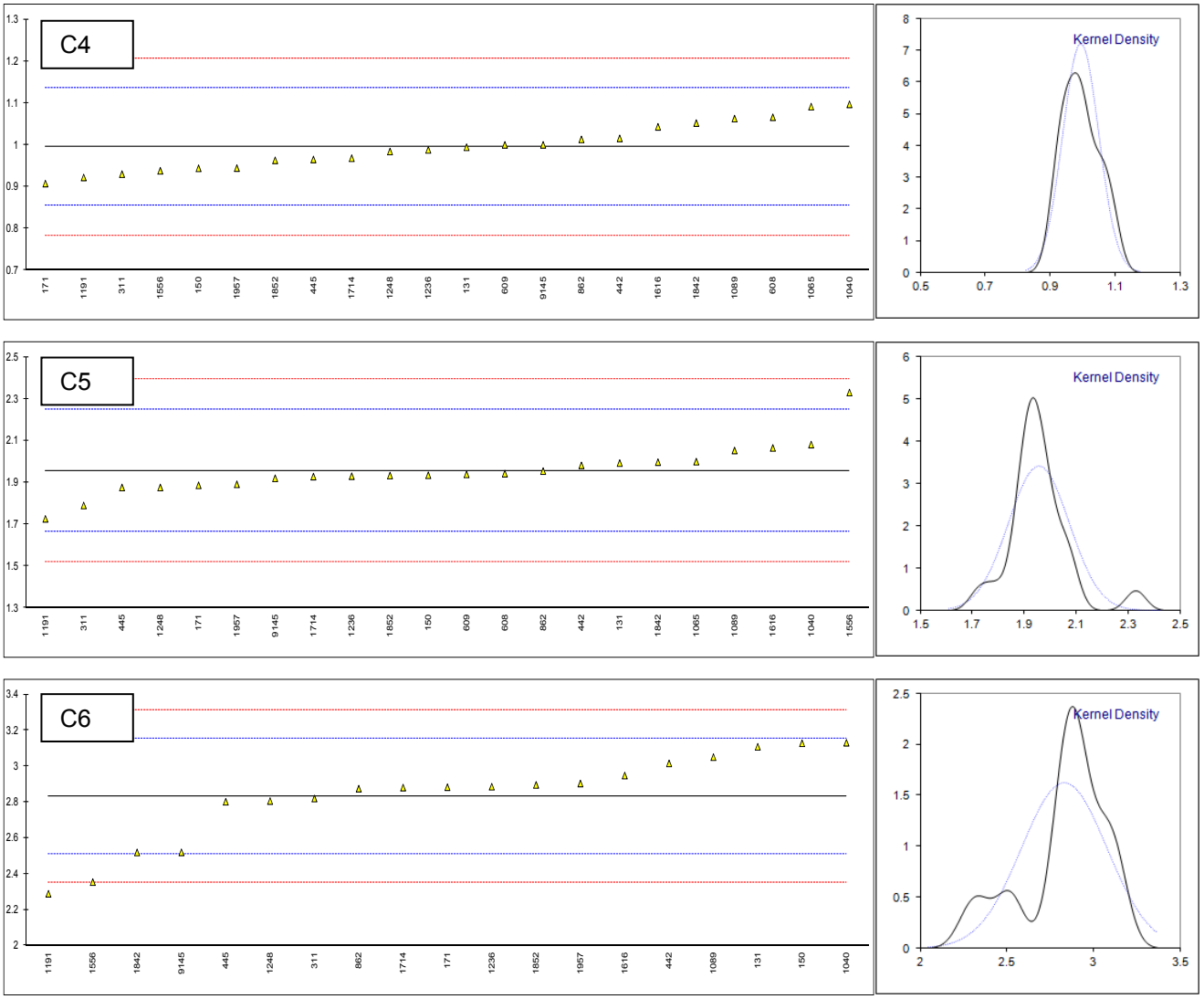


Determination of individual Light ends [C4-C6] on sample #15215; results in%M/M

lab	method	C4	mark	z(targ)	C5	mark	z(targ)	C6	mark	z(targ)
62		-----		-----	-----		-----	-----		-----
90		-----		-----	-----		-----	-----		-----
92		-----		-----	-----		-----	-----		-----
120		-----		-----	-----		-----	-----		-----
131		0.9942		-0.01	1.9926		0.25	3.1085		1.72
133		-----		-----	-----		-----	-----		-----
140		-----		-----	-----		-----	-----		-----
150	IP344	0.9439	C	-0.72	1.9344	C	-0.15	3.1282	C	1.84
154		-----		-----	-----		-----	-----		-----
158		-----		-----	-----		-----	-----		-----
159		-----		-----	-----		-----	-----		-----
167		-----		-----	-----		-----	-----		-----
168		-----		-----	-----		-----	-----		-----
171	IP344	0.90735		-1.24	1.886306		-0.48	2.883173		0.32
186		-----		-----	-----		-----	-----		-----
203		-----		-----	-----		-----	-----		-----
225		-----		-----	-----		-----	-----		-----
238		-----		-----	-----		-----	-----		-----
242		-----		-----	-----		-----	-----		-----
273		-----		-----	-----		-----	-----		-----
311	INH-267	0.93		-0.92	1.79		-1.14	2.82		-0.08
314		-----		-----	-----		-----	-----		-----
332		-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----
335		-----		-----	-----		-----	-----		-----
340		-----		-----	-----		-----	-----		-----
360		-----		-----	-----		-----	-----		-----
391		-----		-----	-----		-----	-----		-----
398		-----		-----	-----		-----	-----		-----
399		-----		-----	-----		-----	-----		-----
402		-----		-----	-----		-----	-----		-----
441		-----		-----	-----		-----	-----		-----
442	IP344	1.0154		0.29	1.9817		0.18	3.0159		1.14
444		-----		-----	-----		-----	-----		-----
445	IP344	0.965		-0.42	1.876		-0.55	2.802		-0.19
446		-----		-----	-----		-----	-----		-----
447		-----		-----	-----		-----	-----		-----
485		-----		-----	-----		-----	-----		-----
494		-----		-----	-----		-----	-----		-----
511		-----		-----	-----		-----	-----		-----
529		-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----
551		-----		-----	-----		-----	-----		-----
557		-----		-----	-----		-----	-----		-----
574		-----		-----	-----		-----	-----		-----
575		-----		-----	-----		-----	-----		-----
593		-----		-----	-----		-----	-----		-----
602		-----		-----	-----		-----	-----		-----
605		-----		-----	-----		-----	-----		-----
606		-----		-----	-----		-----	-----		-----
608	IP344	1.066		1.01	1.942		-0.09	-----		-----
609	IP344	0.9999		0.07	1.9386		-0.12	-----		-----
613		-----		-----	-----		-----	-----		-----
621		-----		-----	-----		-----	-----		-----
657		-----		-----	-----		-----	-----		-----
663		-----		-----	-----		-----	-----		-----
704		-----		-----	-----		-----	-----		-----
732		-----		-----	-----		-----	-----		-----
739		-----		-----	-----		-----	-----		-----
742		-----		-----	-----		-----	-----		-----
749		-----		-----	-----		-----	-----		-----
750		-----		-----	-----		-----	-----		-----
751		-----		-----	-----		-----	-----		-----
752		-----		-----	-----		-----	-----		-----
753		-----		-----	-----		-----	-----		-----
781		-----		-----	-----		-----	-----		-----
784		-----		-----	-----		-----	-----		-----
785		-----		-----	-----		-----	-----		-----
840		-----		-----	-----		-----	-----		-----
862	D6730	1.013		0.26	1.954		-0.01	2.875		0.26
874		-----		-----	-----		-----	-----		-----
875		-----		-----	-----		-----	-----		-----
904		-----		-----	-----		-----	-----		-----
962		-----		-----	-----		-----	-----		-----
963		-----		-----	-----		-----	-----		-----
971		-----		-----	-----		-----	-----		-----
974		-----		-----	-----		-----	-----		-----

lab	method	C4	mark	z(targ)	C5	mark	z(targ)	C6	mark	z(targ)
988		-----		-----	-----		-----	-----		-----
991		-----		-----	-----		-----	-----		-----
992		-----		-----	-----		-----	-----		-----
994		-----		-----	-----		-----	-----		-----
995		-----		-----	-----		-----	-----		-----
997		-----		-----	-----		-----	-----		-----
998		-----		-----	-----		-----	-----		-----
1011		-----		-----	-----		-----	-----		-----
1040	IP344	1.0968		1.45	2.081		0.86	3.131		1.86
1056		-----		-----	-----		-----	-----		-----
1065	IP344	1.0913		1.37	1.9996		0.30	-----		-----
1081		-----		-----	-----		-----	-----		-----
1089	D5134	1.0627		0.96	2.0528		0.67	3.0508		1.36
1106		-----		-----	-----		-----	-----		-----
1109		-----		-----	-----		-----	-----		-----
1128		-----		-----	-----		-----	-----		-----
1161		-----		-----	-----		-----	-----		-----
1191		0.922		-1.03	1.726		-1.58	2.289		-3.38
1200		-----		-----	-----		-----	-----		-----
1201		-----		-----	-----		-----	-----		-----
1236		0.988		-0.10	1.930		-0.18	2.886		0.33
1248	in house	0.984		-0.15	1.876		-0.55	2.806		-0.16
1259		-----		-----	-----		-----	-----		-----
1264		-----		-----	-----		-----	-----		-----
1287		-----		-----	-----		-----	-----		-----
1360		-----		-----	-----		-----	-----		-----
1543		-----		-----	-----		-----	-----		-----
1556		0.938		-0.81	2.3298		2.57	2.354		-2.98
1585		-----		-----	-----		-----	-----		-----
1616	in house	1.043		0.68	2.065		0.75	2.948		0.72
1617		-----		-----	-----		-----	-----		-----
1654		-----		-----	-----		-----	-----		-----
1714		0.968		-0.38	1.928		-0.19	2.881		0.30
1720		-----		-----	-----		-----	-----		-----
1728		-----		-----	-----		-----	-----		-----
1776		-----		-----	-----		-----	-----		-----
1796		-----		-----	-----		-----	-----		-----
1800		-----		-----	-----		-----	-----		-----
1810		-----		-----	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
1815		-----		-----	-----		-----	-----		-----
1842	IP601	1.052		0.81	1.9969		0.28	2.5194		-1.95
1849		-----		-----	-----		-----	-----		-----
1852	in house	0.963		-0.45	1.933		-0.16	2.896		0.40
1858		-----		-----	-----		-----	-----		-----
1862		-----		-----	-----		-----	-----		-----
1892		-----		-----	-----		-----	-----		-----
1928		-----		-----	-----		-----	-----		-----
1929		-----		-----	-----		-----	-----		-----
1930		-----		-----	-----		-----	-----		-----
1957	IP344	0.9444		-0.72	1.8911		-0.44	2.9038		0.44
1963		-----		-----	-----		-----	-----		-----
1986		-----		-----	-----		-----	-----		-----
6001		-----		-----	-----		-----	-----		-----
6003		-----		-----	-----		-----	-----		-----
6006		-----		-----	-----		-----	-----		-----
6009		-----		-----	-----		-----	-----		-----
6014		-----		-----	-----		-----	-----		-----
6016		-----		-----	-----		-----	-----		-----
9050		-----		-----	-----		-----	-----		-----
9051		-----		-----	-----		-----	-----		-----
9052		-----		-----	-----		-----	-----		-----
9057		-----		-----	-----		-----	-----		-----
9060		-----		-----	-----		-----	-----		-----
9063		-----		-----	-----		-----	-----		-----
9132		-----		-----	-----		-----	-----		-----
9145		1.0		0.07	1.92		-0.25	2.52		-1.94
9151		-----		-----	-----		-----	-----		-----
9152		-----		-----	-----		-----	-----		-----
	normality	OK			not OK			OK		
	n	22			22			19		
	outliers	0			0			0		
	mean (n)	0.9949			1.9557			2.8325		
	st.dev. (n)	0.05524			0.11726			0.24584		
	R(calc.)	0.1547			0.3283			0.6884		
	R(IP344:88)	0.1973			0.4072			0.4500		

Lab 150 first reported: 1.1814 for C4 and 2.446 for C5 and 3.9447 for C6

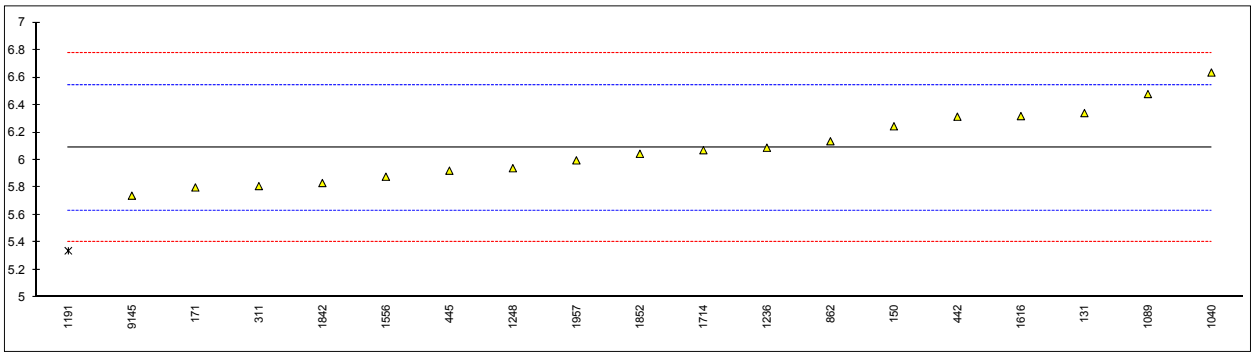


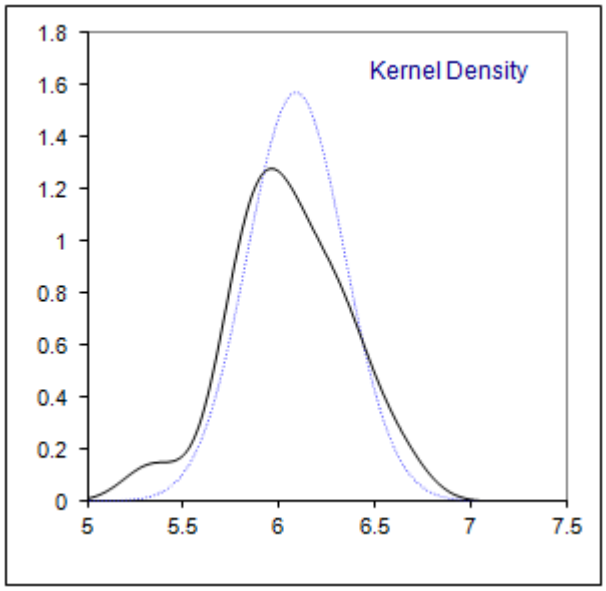
Determination of Total Light ends [C1-C6] on sample #15215; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90		-----		-----	963		-----		-----
92		-----		-----	971		-----		-----
120		-----		-----	974		-----		-----
131		6.3411		1.10	988		-----		-----
133		-----		-----	991		-----		-----
140		-----		-----	992		-----		-----
150	IP344	6.2449	C	0.68	994		-----		-----
154		-----		-----	995		-----		-----
158		-----		-----	997		-----		-----
159		-----		-----	998		-----		-----
167		-----		-----	1011		-----		-----
168		-----		-----	1040	IP344	6.636		2.39
171	IP344	5.80	C	-1.26	1056		-----		-----
186		-----		-----	1065		-----		-----
203		-----		-----	1081		-----		-----
225		-----		-----	1089	D5134	6.4796		1.71
238		-----		-----	1106		-----		-----
242		-----		-----	1109		-----		-----
273		-----		-----	1128		-----		-----
311	INH-267	5.81		-1.22	1161		-----		-----
314		-----		-----	1191	D5134Mod.	5.339	ex,E	-3.28
332		-----		-----	1200		-----		-----
333		-----		-----	1201		-----		-----
334		-----		-----	1236		6.089		0.00
335		-----		-----	1248	in house	5.940		-0.65
340		-----		-----	1259		-----		-----
360		-----		-----	1264		-----		-----
391		-----		-----	1287		-----		-----
398		-----		-----	1360		-----		-----
399		-----		-----	1543		-----		-----
402		-----		-----	1556	IP344	5.878		-0.92
441		-----		-----	1585		-----		-----
442	IP344	6.3146		0.99	1616	in house	6.319		1.01
444		-----		-----	1617		-----		-----
445	IP344	5.922		-0.73	1654		-----		-----
446		-----		-----	1714	in house	6.071		-0.08
447		-----		-----	1720		-----		-----
485		-----		-----	1728		-----		-----
494		-----		-----	1776		-----		-----
511		-----		-----	1796		-----		-----
529		-----		-----	1800		-----		-----
541		-----		-----	1810		-----		-----
551		-----		-----	1811		-----		-----
557		-----		-----	1815		-----		-----
574		-----		-----	1842	IP601	5.8320		-1.12
575		-----		-----	1849		-----		-----
593		-----		-----	1852	in house	6.045		-0.19
602		-----		-----	1858		-----		-----
605		-----		-----	1862		-----		-----
606		-----		-----	1892		-----		-----
608		-----		-----	1928		-----		-----
609		-----		-----	1929		-----		-----
613		-----		-----	1930		-----		-----
621		-----		-----	1957	IP344	5.9972		-0.40
657		-----		-----	1963		-----		-----
663		-----		-----	1986		-----		-----
704		-----		-----	6001		-----		-----
732		-----		-----	6003		-----		-----
739		-----		-----	6006		-----		-----
742		-----		-----	6009		-----		-----
749		-----		-----	6014		-----		-----
750		-----		-----	6016		-----		-----
751		-----		-----	9050		-----		-----
752		-----		-----	9051		-----		-----
753		-----		-----	9052		-----		-----
781		-----		-----	9057		-----		-----
784		-----		-----	9060		-----		-----
785		-----		-----	9063		-----		-----
840		-----		-----	9132		-----		-----
862	D6730	6.136		0.21	9145		5.74		-1.52
874		-----		-----	9151		-----		-----
875		-----		-----	9152		-----		-----
904		-----		-----					

normality	OK
n	18
outliers	1
mean (n)	6.0886
st.dev. (n)	0.25439
R(calc.)	0.7123
R(IP344:88)	0.6406

Lab 150 first reported: 7.8492
Lab 171 first reported: 5.882379
Lab 1191 excluded due to a calculation error; total C1-C6 = 5.1981





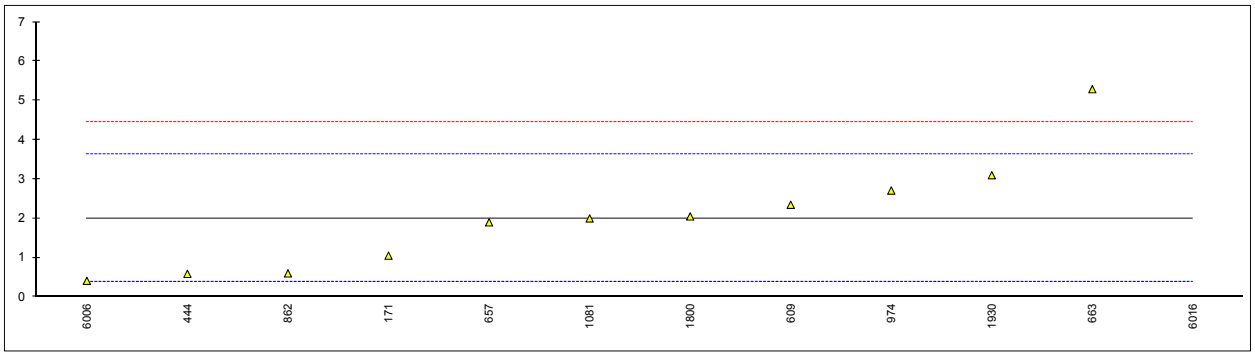
Determination of Mercury, total on sample #15215; results in µg/kg

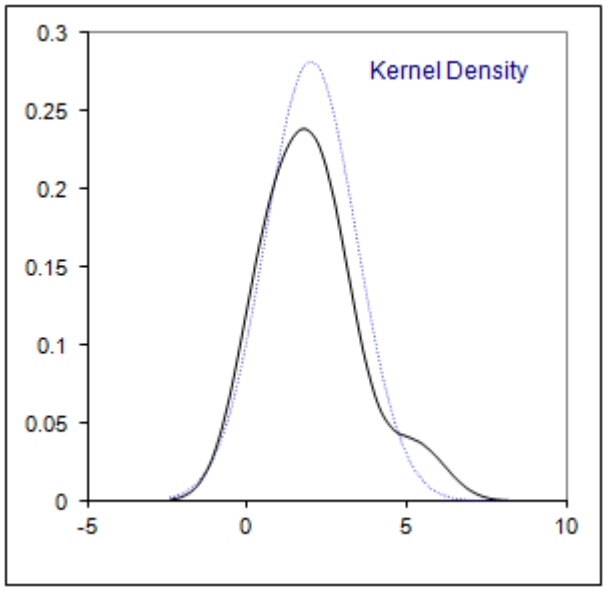
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90		-----		-----	963		-----		-----
92		-----		-----	971		-----		-----
120		-----		-----	974	UOP938	2.71		0.86
131		-----		-----	988		-----		-----
133		-----		-----	991		-----		-----
140		-----		-----	992		-----		-----
150		-----		-----	994		-----		-----
154		-----		-----	995		-----		-----
158		-----		-----	997		-----		-----
159		-----		-----	998		-----		-----
167		-----		-----	1011		-----		-----
168		-----		-----	1040		-----		-----
171	UOP938	1.052		-1.17	1056		-----		-----
186		-----		-----	1065		-----		-----
203		-----		-----	1081		2		-0.01
225		-----		-----	1089	in house	<1		-----
238		-----		-----	1106		-----		-----
242		-----		-----	1109		-----		-----
273		-----		-----	1128		-----		-----
311	D7623	<5		-----	1161		-----		-----
314		-----		-----	1191		-----		-----
332		-----		-----	1200		-----		-----
333		-----		-----	1201		-----		-----
334		-----		-----	1236		-----		-----
335		-----		-----	1248		-----		-----
340		-----		-----	1259		-----		-----
360		-----		-----	1264		-----		-----
391		-----		-----	1287		-----		-----
398		-----		-----	1360		-----		-----
399		-----		-----	1543		-----		-----
402		-----		-----	1556		-----		-----
441		-----		-----	1585		-----		-----
442		-----		-----	1616		-----		-----
444	UOP938	0.589		-1.73	1617		-----		-----
445		-----		-----	1654		-----		-----
446		-----		-----	1714	UOP938	<1		-----
447		-----		-----	1720		-----		-----
485		-----		-----	1728		-----		-----
494		-----		-----	1776		-----		-----
511		-----		-----	1796		-----		-----
529		-----		-----	1800	UOP938	2.05		0.06
541		-----		-----	1810		-----		-----
551		-----		-----	1811		-----		-----
557		-----		-----	1815		-----		-----
574		-----		-----	1842		-----		-----
575		-----		-----	1849		-----		-----
593		-----		-----	1852		-----		-----
602		-----		-----	1858		-----		-----
605		-----		-----	1862		-----		-----
606		-----		-----	1892		-----		-----
608		-----		-----	1928		-----		-----
609	UOP938	2.3470		0.42	1929		-----		-----
613		-----		-----	1930	in house	3.10		1.34
621		-----		-----	1957		-----		-----
657	UOP938	1.9		-0.13	1963		-----		-----
663	UOP938	5.290		4.02	1986		-----		-----
704		-----		-----	6001		-----		-----
732		-----		-----	6003		-----		-----
739		-----		-----	6006	UOP938	0.411		-1.95
742		-----		-----	6009		-----		-----
749		-----		-----	6014		-----		-----
750		-----		-----	6016	UOP938	113.4	C,D(0.01)	136.35
751		-----		-----	9050		-----		-----
752		-----		-----	9051		-----		-----
753		-----		-----	9052		-----		-----
781		-----		-----	9057		-----		-----
784		-----		-----	9060		-----		-----
785		-----		-----	9063		-----		-----
840		-----		-----	9132		-----		-----
862	UOP938	0.60		-1.72	9145		-----		-----
874		-----		-----	9151		-----		-----
875		-----		-----	9152		-----		-----
904		-----		-----					

normality	not OK
n	11
outliers	1
mean (n)	2.0045
st.dev. (n)	1.41582
R(calc.)	3.9643
R(Horwitz)	2.2875

Compare R(D7623:10=1.9828 with an application range 5-400 µg/kg

Lab 6016 first reported: 112900 µg/kg

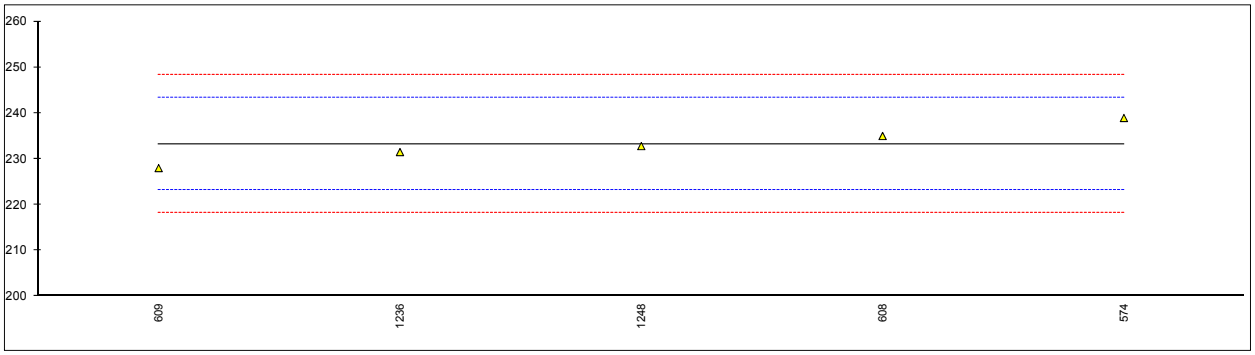




Determination of Molecular Mass, Average on sample #15215; results in g/mol

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90		-----		-----	963		-----		-----
92		-----		-----	971		-----		-----
120		-----		-----	974		-----		-----
131		-----		-----	988		-----		-----
133		-----		-----	991		-----		-----
140		-----		-----	992		-----		-----
150		-----		-----	994		-----		-----
154		-----		-----	995		-----		-----
158		-----		-----	997		-----		-----
159		-----		-----	998		-----		-----
167		-----		-----	1011		-----		-----
168		-----		-----	1040		-----		-----
171		-----		-----	1056		-----		-----
186		-----		-----	1065		-----		-----
203		-----		-----	1081		-----		-----
225		-----		-----	1089		-----		-----
238		-----		-----	1106		-----		-----
242		-----		-----	1109		-----		-----
273		-----		-----	1128		-----		-----
311		-----		-----	1161		-----		-----
314		-----		-----	1191		-----		-----
332		-----		-----	1200		-----		-----
333		-----		-----	1201		-----		-----
334		-----		-----	1236		231.5		-0.35
335		-----		-----	1248	in house	232.8		-0.09
340		-----		-----	1259		-----		-----
360		-----		-----	1264		-----		-----
391		-----		-----	1287		-----		-----
398		-----		-----	1360		-----		-----
399		-----		-----	1543		-----		-----
402		-----		-----	1556		-----		-----
441		-----		-----	1585		-----		-----
442		-----		-----	1616		-----		-----
444		-----		-----	1617		-----		-----
445		-----		-----	1654		-----		-----
446		-----		-----	1714		-----		-----
447		-----		-----	1720		-----		-----
485		-----		-----	1728		-----		-----
494		-----		-----	1776		-----		-----
511		-----		-----	1796		-----		-----
529		-----		-----	1800		-----		-----
541		-----		-----	1810		-----		-----
551		-----		-----	1811		-----		-----
557		-----		-----	1815		-----		-----
574	D2503	238.94		1.14	1842		-----		-----
575		-----		-----	1849		-----		-----
593		-----		-----	1852		-----		-----
602		-----		-----	1858		-----		-----
605		-----		-----	1862		-----		-----
606		-----		-----	1892		-----		-----
608		235		0.35	1928		-----		-----
609		228		-1.05	1929		-----		-----
613		-----		-----	1930		-----		-----
621		-----		-----	1957		-----		-----
657		-----		-----	1963		-----		-----
663		-----		-----	1986		-----		-----
704		-----		-----	6001		-----		-----
732		-----		-----	6003		-----		-----
739		-----		-----	6006		-----		-----
742		-----		-----	6009		-----		-----
749		-----		-----	6014		-----		-----
750		-----		-----	6016		-----		-----
751		-----		-----	9050		-----		-----
752		-----		-----	9051		-----		-----
753		-----		-----	9052		-----		-----
781		-----		-----	9057		-----		-----
784		-----		-----	9060		-----		-----
785		-----		-----	9063		-----		-----
840		-----		-----	9132		-----		-----
862		-----		-----	9145		-----		-----
874		-----		-----	9151		-----		-----
875		-----		-----	9152		-----		-----
904		-----		-----					

normality	unknown
n	5
outliers	0
mean (n)	233.25
st.dev. (n)	4.070
R(calc.)	11.40
R(D2503:92)	14.00

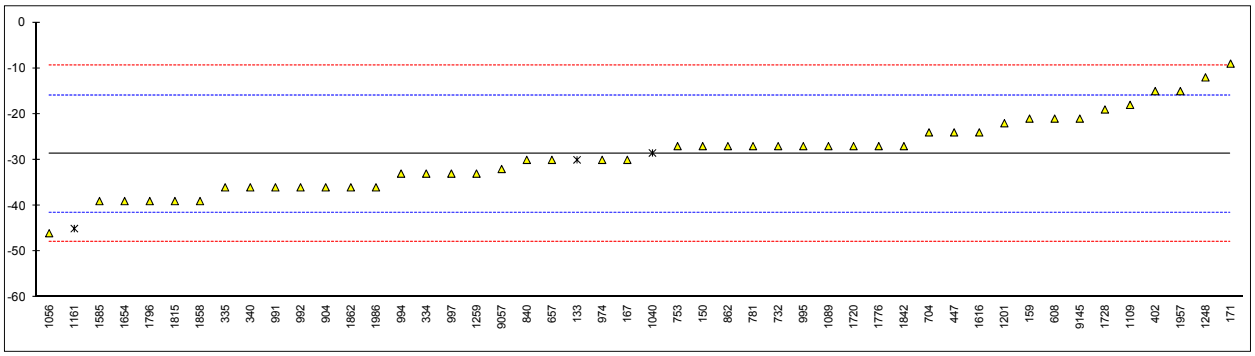


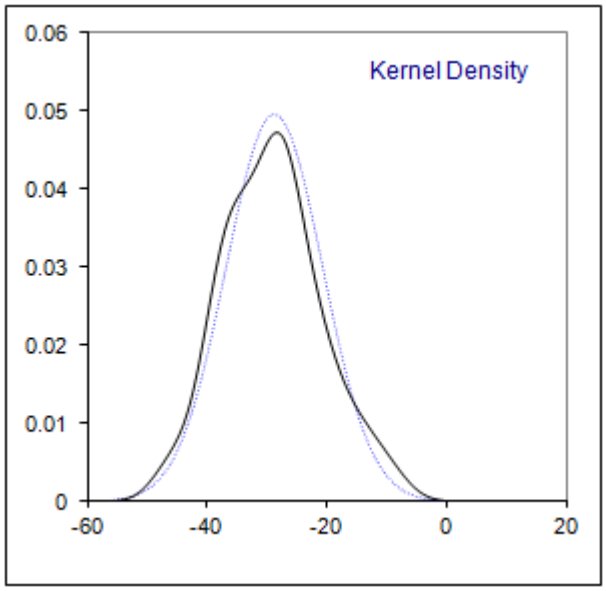
Determination of Pour Point (Maximum) on sample #15215; results in °C

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90		-----		-----	963		-----		-----
92		-----		-----	971		-----		-----
120	D5853-A	<-36		-----	974	D5853-A	-30		-0.20
131		-----		-----	988	D5853-A	<-36		-----
133	D97	-30	ex,see §4.1	-0.20	991	D5853-A	-36		-1.13
140		-----		-----	992	D5853-A	-36		-1.13
150		-27		0.27	994	D5853-A	-33		-0.67
154		-----		-----	995	D5853-A	-27		0.27
158		-----		-----	997	D5853-A	-33		-0.67
159	D5853-A	-21		1.20	998		-----		-----
167	D5853-A	-30		-0.20	1011	D5853-A	<-24		-----
168		<-25		-----	1040	ISO3016	-28.5	ex,see §4.1	0.03
171	D5853-A	-9		3.07	1056		-46		-2.69
186		-----		-----	1065	D5950	<-45		-----
203	D5853	<-30		-----	1081		-----		-----
225		-----		-----	1089	D5853-A	-27		0.27
238		-----		-----	1106		-----		-----
242		-----		-----	1109	D5853-A	-18		1.67
273	D97	<-24		-----	1128		-----		-----
311		-----		-----	1161	D6749	-45	ex,see §4.1	-2.53
314		-----		-----	1191		-----		-----
332		-----		-----	1200		-----		-----
333		-----		-----	1201		-22		1.04
334	D5853-A	-33		-0.67	1236		-----		-----
335	D5853-A	-36		-1.13	1248	IP441Mod.	-12		2.60
340	D5853-A	-36		-1.13	1259	D5853-A	-33		-0.67
360		-----		-----	1264		-----		-----
391	D5853-A	<-36		-----	1287		-----		-----
398		-----		-----	1360		-----		-----
399	D5853-A	<-36		-----	1543		-----		-----
402	D5853-A	-15		2.13	1556	ISO3016	floating at -60		-----
441		-----		-----	1585	D5853-A	-39		-1.60
442		-----		-----	1616	D5853-A	-24		0.73
444		-----		-----	1617		-----		-----
445	D5853-A	<-36		-----	1654	D5853-A	-39		-1.60
446		-----		-----	1714	D5853-A	≤-36		-----
447	D5853-A	-24		0.73	1720	D5853-A	-27		0.27
485		-----		-----	1728	D5853-A	-19		1.51
494		-----		-----	1776	D5853-A	-27	C	0.27
511		-----		-----	1796	D5853-A	-39		-1.60
529		-----		-----	1800		-----		-----
541		-----		-----	1810		-----		-----
551		-----		-----	1811		-----		-----
557		-----		-----	1815	D5853-A	-39.0		-1.60
574	D5853-A	<-21		-----	1842	D5853-A	-27		0.27
575		-----		-----	1849		-----		-----
593		-----		-----	1852		-----		-----
602		-----		-----	1858	D5853-A	-39		-1.60
605	D97	<-36		-----	1862	D5853-A	-36		-1.13
606		-----		-----	1892		-----		-----
608	D5853-A	-21		1.20	1928		-----		-----
609		-----		-----	1929		-----		-----
613		-----		-----	1930		-----		-----
621		-----		-----	1957	D5853-A	-15		2.13
657	D5853-A	-30		-0.20	1963	D97	<-36		-----
663		-----		-----	1986	D5853-A	-36		-1.13
704	D5853-A	-24		0.73	6001		-----		-----
732	D5853-A	-27		0.27	6003		-----		-----
739		-----		-----	6006	D5853-A	<-36		-----
742		-----		-----	6009		-----		-----
749		-----		-----	6014	D97	<-42		-----
750		-----		-----	6016	D5853-A	≤-36		-----
751	D5853-A	≤−36		-----	9050		-----		-----
752		-----		-----	9051		-----		-----
753	D5853-A	-27		0.27	9052		-----		-----
781	D5853-A	-27		0.27	9057	in house	-32		-0.51
784		-----		-----	9060		-----		-----
785		-----		-----	9063		-----		-----
840	D5853-A	-30		-0.20	9132		-----		-----
862	D5853-A	-27		0.27	9145		-21		1.20
874	D5853-A	<-36		-----	9151		-----		-----
875		-----		-----	9152		-----		-----
904	D5853-A	-36		-1.13					

		Results of D5853 only
normality	OK	OK
n	45	39
outliers	0+3ex	0
mean (n)	-28.7111	-29.0256
st.dev. (n)	8.06683	7.54456
R(calc.)	22.5871	21.1248
R(D5853A:11)	18.0000	18.0000

Lab 1776 first reported: 33



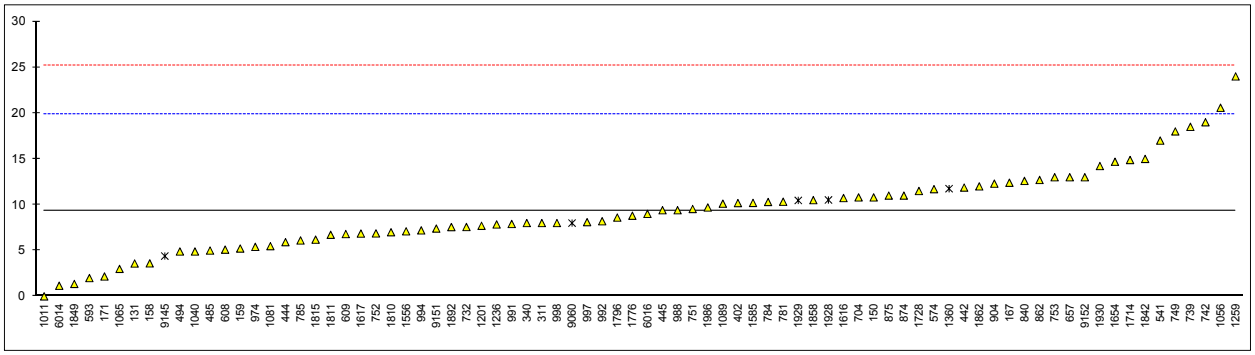


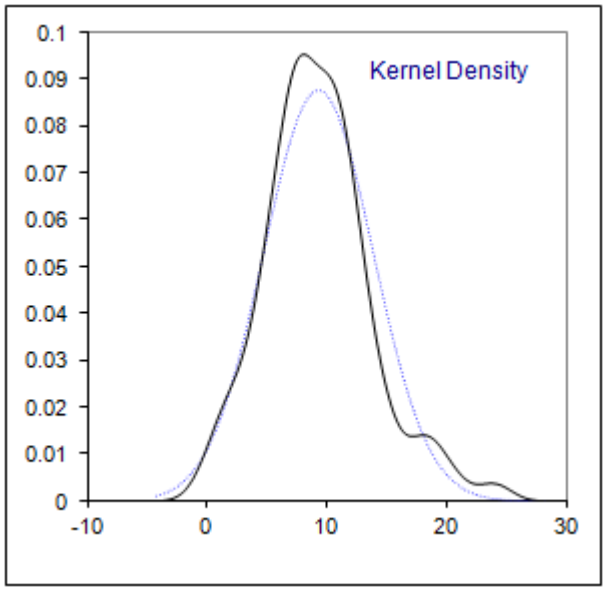
Determination of Salt as NaCl on sample #15215; results in mg/kg

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90		-----		-----	963		-----		-----
92		-----		-----	971		-----		-----
120		-----		-----	974	D3230	5.4		-0.74
131	D3230	3.588		-1.08	988	D3230	9.4		0.02
133		-----		-----	991	D3230	7.9		-0.27
140		-----		-----	992	D3230	8.2		-0.21
150	D3230	10.8		0.28	994	D3230	7.20		-0.40
154		-----		-----	995		-----		-----
158	D3230	3.6		-1.08	997	D3230	8.10		-0.23
159	D3230	5.22		-0.77	998	D3230	8		-0.25
167	D3230	12.4		0.58	1011	D3230	0.0010	U	-1.76
168		-----		-----	1040	D3230	4.9		-0.83
171	D3230	2.17		-1.35	1056	IP265	20.58		2.13
186		-----		-----	1065	D3230	3		-1.19
203		-----		-----	1081		5.48		-0.72
225		-----		-----	1089	D3230	10.114		0.15
238		-----		-----	1106		-----		-----
242		-----		-----	1109		-----		-----
273		-----		-----	1128		-----		-----
311	D3230	8		-0.25	1161		-----		-----
314		-----		-----	1191		-----		-----
332		-----		-----	1200		-----		-----
333		-----		-----	1201	D3230	7.7		-0.30
334		-----		-----	1236	D3230	7.85		-0.28
335		-----		-----	1248		-----		-----
340	D3230	8		-0.25	1259	D3230	24		2.78
360		-----		-----	1264		-----		-----
391		-----		-----	1287		-----		-----
398		-----		-----	1360		11.75	ex	0.46
399		-----		-----	1543		-----		-----
402	D3230	10.18		0.16	1556	D3230	7.1		-0.42
441		-----		-----	1585	D3230	10.2		0.17
442	IP265	11.875		0.48	1616	D3230	10.73		0.27
444	D3230	5.92		-0.64	1617	D3230	6.856		-0.46
445	IP265	9.4		0.02	1654	D3230	14.69		1.02
446		-----		-----	1714	D6470	14.88		1.05
447		-----		-----	1720		-----		-----
485	D3230	5.0		-0.81	1728		11.5		0.41
494	D3230	4.9		-0.83	1776	D3230	8.8		-0.10
511		-----		-----	1796	D3230	8.6		-0.13
529		-----		-----	1800		-----		-----
541	D3230	17		1.45	1810	D3230	7.0		-0.44
551		-----		-----	1811	D3230	6.72		-0.49
557		-----		-----	1815	D3230	6.19		-0.59
574	D3230	11.7		0.45	1842	IP265	15		1.08
575		-----		-----	1849	D3230	1.36		-1.50
593		2		-1.38	1852		-----		-----
602		-----		-----	1858	D3230	10.5		0.22
605		-----		-----	1862	D3230	12		0.51
606		-----		-----	1892	D3230	7.562		-0.33
608	D3230	5.1		-0.80	1928		10.52	ex	0.23
609	D3230	6.8		-0.47	1929		10.47	ex	0.22
613		-----		-----	1930	DIN51576	14.22		0.93
621		-----		-----	1957		-----		-----
657	IP265	13		0.70	1963		-----		-----
663		-----		-----	1986	D3230	9.7		0.07
704	D3230	10.8		0.28	6001		-----		-----
732	INH-21534	7.57		-0.33	6003		-----		-----
739	INH-21534	18.5		1.74	6006		-----		-----
742	INH-21534	19		1.83	6009		-----		-----
749	INH-21534	18.0		1.64	6014	D3230	1.16		-1.54
750		-----		-----	6016	D3230	9		-0.06
751	D3230	9.535		0.04	9050		-----		-----
752	D3230	6.87		-0.46	9051		-----		-----
753	D3230	13		0.70	9052		-----		-----
781	D3230	10.33		0.19	9057		-----		-----
784	D3230	10.3		0.19	9060	D3230	8	ex	-0.25
785	D3230	6.1		-0.61	9063		-----		-----
840	D6470	12.6		0.62	9132		-----		-----
862	D3230	12.7		0.64	9145	D3230	4.4	ex	-0.93
874	D3230	11		0.32	9151	D3230	7.4		-0.36
875	D3230	11		0.32	9152	D3230	13		0.70
904	D3230	12.3		0.56					

normality	OK
n	75
outliers	0+5ex
mean (n)	9.310
st.dev. (n)	4.5624
R(calc.)	12.775
R(D3230:13)	14.819

Lab 1011 reported most likely in a deviating unit.
Lab 1360 reported in a deviating unit: 11.75 mg/L.
Lab 1928 reported in a deviating unit: 10.52 mg/L.
Lab 1929 reported in a deviating unit: 10.47 mg/L.
Lab 9060 reported in a deviating unit: 8 mg/L.
Lab 9145 reported in a deviating unit: 4.4 lb/1000bbL.



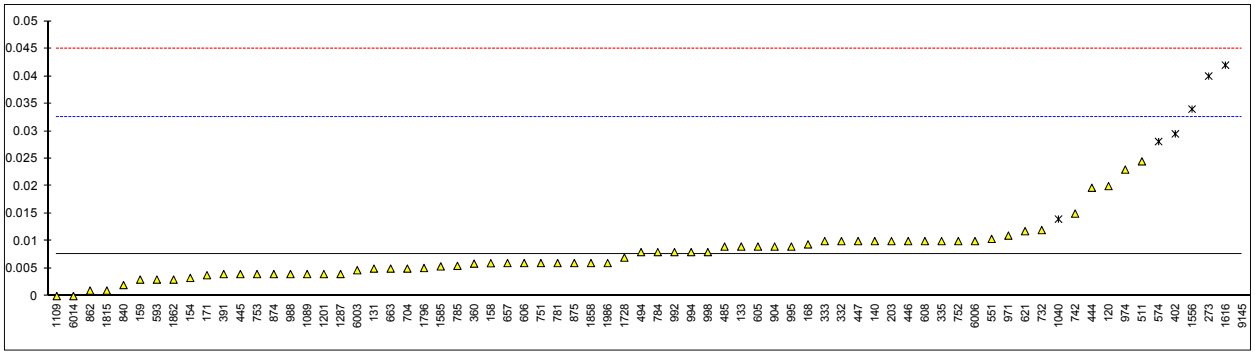


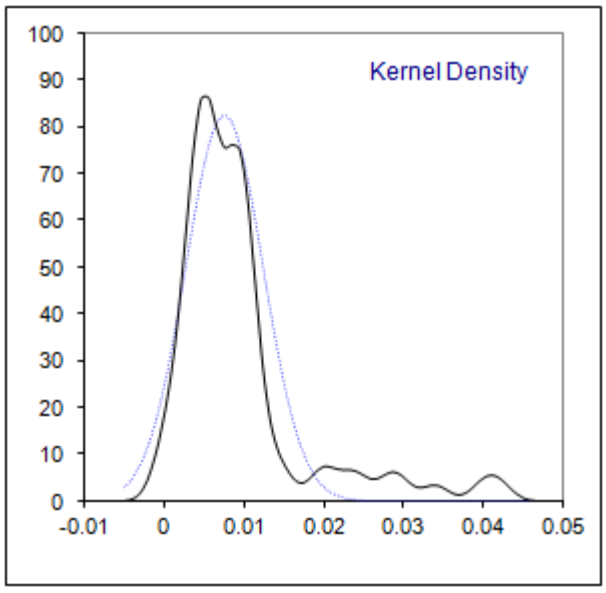
Determination of Sediment (Extraction method) ASTM D473 on sample #15215; results in %V/V

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90		-----		-----	963		-----		-----
92		-----		-----	971	D473	0.011		0.28
120	D473	0.02		1.00	974	D473	0.023		1.24
131	D473	0.005		-0.20	988	D473	0.004		-0.28
133	D473	0.009		0.12	991		-----		-----
140	D473	0.01		0.20	992	D473	0.008		0.04
150	D473	<0.01		-----	994	D473	0.008		0.04
154	D473	0.0033		-0.34	995	D473	0.009		0.12
158	D473	0.005979		-0.13	997		-----		-----
159	D473	0.003		-0.36	998	D473	0.008		0.04
167		-----		-----	1011		-----		-----
168	D473	0.0094		0.15	1040	ISO3735	0.014	ex	0.52
171	D473	0.0038		-0.30	1056		-----		-----
186		-----		-----	1065		-----		-----
203	D473	0.01		0.20	1081		-----		-----
225		-----		-----	1089	D473	0.004		-0.28
238		-----		-----	1106		-----		-----
242		-----		-----	1109	D473	0		-0.60
273	D473	0.04	R(0.01)	2.60	1128		-----		-----
311	D473	<0.01		-----	1161		-----		-----
314		-----		-----	1191		-----		-----
332	D473	0.01		0.20	1200		-----		-----
333	D473	0.01		0.20	1201	D473	0.004		-0.28
334		-----		-----	1236		-----		-----
335	D473	0.01		0.20	1248		-----		-----
340	D473	<0.01		-----	1259		-----		-----
360	D473	0.0059		-0.13	1264		-----		-----
391	D473	0.004		-0.28	1287	D473	0.00401		-0.28
398		-----		-----	1360		-----		-----
399		-----		-----	1543		-----		-----
402	D473	0.0295	ex	1.76	1556	ISO3735	0.034	ex	2.12
441		-----		-----	1585	D473	0.0054		-0.17
442		-----		-----	1616	D473	0.042	R(0.01)	2.76
444	D473	0.0197		0.97	1617		-----		-----
445	D473	0.004		-0.28	1654		-----		-----
446	D473	0.01		0.20	1714		-----		-----
447	D473	0.01		0.20	1720		-----		-----
485	D473	0.009		0.12	1728	D473	0.007		-0.04
494	D473	0.008		0.04	1776		-----		-----
511	D473	0.0245		1.36	1796	D473	0.0051		-0.20
529		-----		-----	1800		-----		-----
541	D473	<0.01		-----	1810		-----		-----
551	D473	0.0104		0.23	1811		-----		-----
557		-----		-----	1815	ISO3735	0.001		-0.52
574	D473	0.0281	R(0.01)	1.65	1842		-----		-----
575		-----		-----	1849		-----		-----
593		0.003		-0.36	1852		-----		-----
602		-----		-----	1858	D473	0.006		-0.12
605	D473	0.009		0.12	1862	D473	0.0030		-0.36
606	D473	0.006		-0.12	1892		-----		-----
608	D473	0.01		0.20	1928		-----		-----
609		-----		-----	1929		-----		-----
613		-----		-----	1930		-----		-----
621	D473	0.0118		0.34	1957		-----		-----
657	D473	0.006		-0.12	1963		-----		-----
663	D473	0.005		-0.20	1986	D473	0.006		-0.12
704	D473	0.005		-0.20	6001		-----		-----
732	D473	0.012		0.36	6003	D473	0.0047		-0.23
739		-----		-----	6006	D473	0.010		0.20
742	INH-6370	0.015		0.60	6009		-----		-----
749		-----		-----	6014	D473	0.00		-0.60
750		-----		-----	6016		-----		-----
751	D473	0.006		-0.12	9050		-----		-----
752	D473	0.01		0.20	9051		-----		-----
753	D473	0.004		-0.28	9052		-----		-----
781	D473	0.006		-0.12	9057		-----		-----
784	D473	0.008		0.04	9060		-----		-----
785	D473	0.0055		-0.16	9063		-----		-----
840	D473	0.002		-0.44	9132		-----		-----
862	D473	0.001		-0.52	9145	D473	0.2355	ex	18.28
874	D473	0.004		-0.28	9151		-----		-----
875	D473	0.006		-0.12	9152		-----		-----
904	D473	0.009		0.12					

normality	not OK
n	65
outliers	3+4ex
mean (n)	0.007546
st.dev. (n)	0.0048531
R(calc.)	0.013589
R(D473:07)	0.034924

Lab 402 reported in a deviating unit: 0.0295%M/M.
Lab 1040 reported in a deviating unit: 0.014%M/M.
Lab 1556 reported in a deviating unit: 0.034%M/M.
Lab 9145 reported in a deviating unit: 0.2355%M/M.

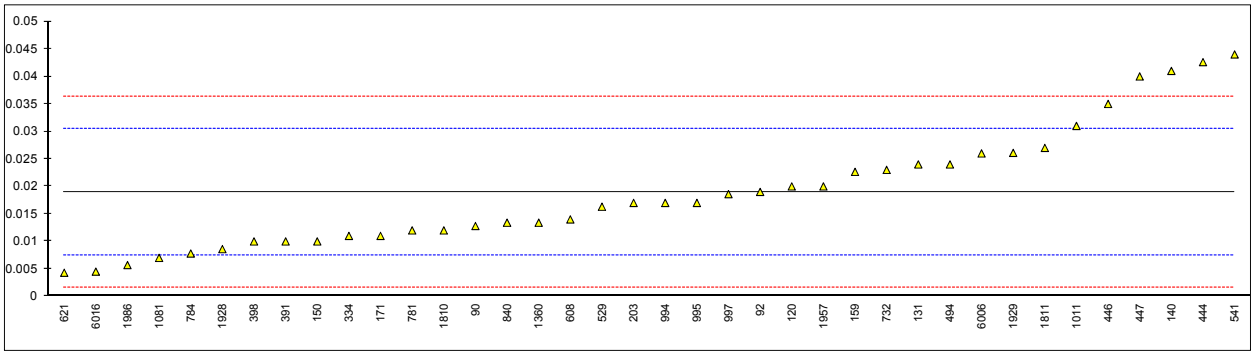


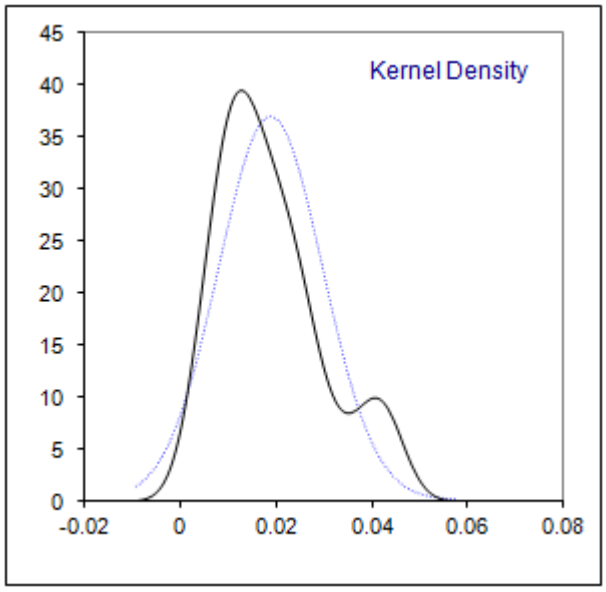


Determination of Sediment (Membrane filtration) ASTM D4807 on sample #15215; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90	D4807	0.0128		-1.06	963		-----		-----
92	D4807	0.019		0.01	971		-----		-----
120	D4807	0.02		0.19	974		-----		-----
131	D4807	0.024		0.88	988		-----		-----
133		-----		-----	991		-----		-----
140	D4807	0.041		3.82	992		-----		-----
150	D4807	0.01		-1.54	994	D4807	0.017		-0.33
154		-----		-----	995	D4807	0.017		-0.33
158		-----		-----	997	D4807	0.0186		-0.05
159	D4807	0.02265		0.65	998		-----		-----
167		-----		-----	1011	D4807	0.031		2.09
168		-----		-----	1040		-----		-----
171	D4807	0.011		-1.37	1056		-----		-----
186		-----		-----	1065		-----		-----
203	D4807	0.017		-0.33	1081		0.007		-2.06
225		-----		-----	1089		-----		-----
238		-----		-----	1106		-----		-----
242		-----		-----	1109		-----		-----
273		-----		-----	1128		-----		-----
311		-----		-----	1161		-----		-----
314		-----		-----	1191		-----		-----
332		-----		-----	1200		-----		-----
333		-----		-----	1201		-----		-----
334	D4807	0.011		-1.37	1236		-----		-----
335		-----		-----	1248		-----		-----
340		-----		-----	1259		-----		-----
360		-----		-----	1264		-----		-----
391	D4807	0.010		-1.54	1287		-----		-----
398	D4807	0.010		-1.54	1360		0.0134		-0.95
399		-----		-----	1543		-----		-----
402		-----		-----	1556		-----		-----
441		-----		-----	1585		-----		-----
442		-----		-----	1616		-----		-----
444	D4807	0.0426		4.10	1617		-----		-----
445		-----		-----	1654		-----		-----
446	D4807	0.035		2.78	1714		-----		-----
447	D4807	0.04		3.65	1720		-----		-----
485		-----		-----	1728		-----		-----
494	D4807	0.024		0.88	1776		-----		-----
511		-----		-----	1796		-----		-----
529	D4807	0.01631		-0.45	1800		-----		-----
541	D4807	0.044		4.34	1810	D4807	0.012		-1.20
551		-----		-----	1811	D4807	0.027		1.40
557		-----		-----	1815		-----		-----
574		-----		-----	1842		-----		-----
575		-----		-----	1849		-----		-----
593		-----		-----	1852		-----		-----
602		-----		-----	1858		-----		-----
605		-----		-----	1862		-----		-----
606		-----		-----	1892		-----		-----
608	D4807	0.014		-0.85	1928		0.0086		-1.79
609		-----		-----	1929		0.0261		1.24
613		-----		-----	1930		-----		-----
621	D4807	0.0043		-2.53	1957	D4807	0.020		0.19
657		-----		-----	1963		-----		-----
663		-----		-----	1986	D4807	0.0057		-2.29
704		-----		-----	6001		-----		-----
732	D4807	0.023		0.71	6003		-----		-----
739		-----		-----	6006	D4807	0.026		1.23
742		-----		-----	6009		-----		-----
749		-----		-----	6014		-----		-----
750		-----		-----	6016	INH-6370	0.0045		-2.50
751		-----		-----	9050		-----		-----
752		-----		-----	9051		-----		-----
753		-----		-----	9052		-----		-----
781	D4807	0.012		-1.20	9057		-----		-----
784	D4807	0.0078		-1.92	9060		-----		-----
785		-----		-----	9063		-----		-----
840	D4807	0.0134		-0.95	9132		-----		-----
862		-----		-----	9145		-----		-----
874		-----		-----	9151		-----		-----
875		-----		-----	9152		-----		-----
904		-----		-----					

normality	OK
n	38
outliers	0
mean (n)	0.0189
st.dev. (n)	0.01084
R(calc.)	0.0303
R(D4807:05)	0.0162



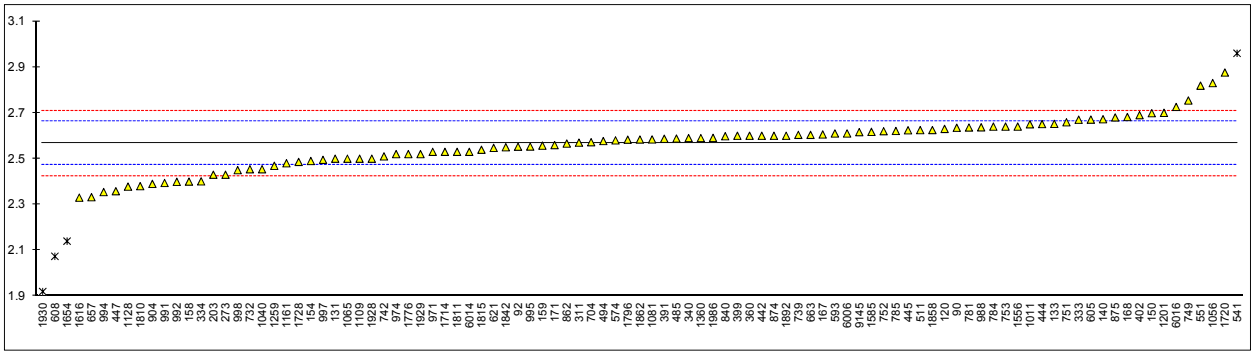


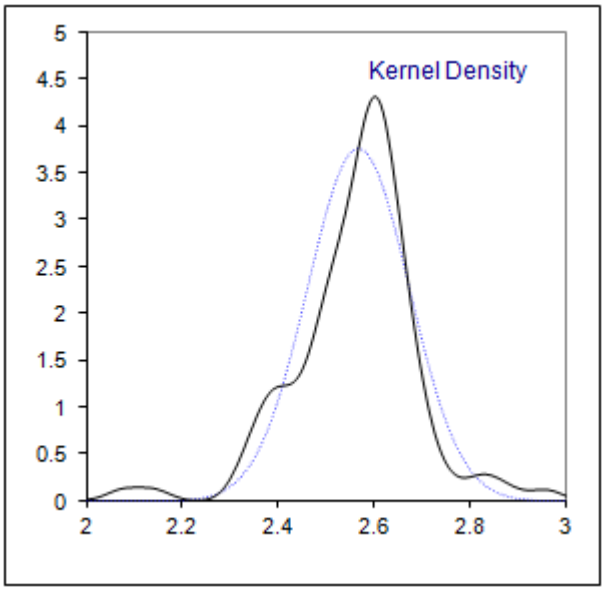
Determination of Sulphur, total on sample #15215; results in %M/M

lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90	D4294	2.635		1.42	963		-----		-----
92	D4294	2.5523		-0.31	971	D4294	2.53		-0.78
120	D4294	2.63		1.32	974	D4294	2.52		-0.99
131	D4294	2.50		-1.41	988	D4294	2.637		1.47
133	D4294	2.652		1.78	991	D4294	2.394		-3.63
140	D4294	2.6722		2.20	992	D4294	2.399		-3.53
150	D4294	2.6985		2.76	994	D4294	2.3543		-4.47
154	D4294	2.4898		-1.62	995	D4294	2.553		-0.30
158	D4294	2.40		-3.51	997	D4294	2.495		-1.51
159	D4294	2.557		-0.21	998	D4294	2.45		-2.46
167	D4294	2.60568		0.81	1011	D4294	2.65		1.74
168	D4294	2.6818		2.41	1040	ISO8754	2.454		-2.37
171	D4294	2.55945		-0.16	1056	IP336	2.83		5.52
186		-----		-----	1065	D4294	2.50	C	-1.41
203	D4294	2.43		-2.88	1081	D4294	2.584		0.35
225		-----		-----	1089		-----		-----
238		-----		-----	1106		-----		-----
242		-----		-----	1109	D4294	2.50		-1.41
273	D4294	2.43		-2.88	1128	D4294	2.378		-3.97
311	D4294	2.57		0.06	1161	ISO8754	2.48		-1.83
314		-----		-----	1191		-----		-----
332		-----		-----	1200		-----		-----
333	D4294	2.67		2.16	1201	D4294	2.70		2.79
334	D4294	2.401		-3.49	1236		-----		-----
335		-----		-----	1248		-----		-----
340	D4294	2.59		0.48	1259	ISO8754	2.469		-2.06
360	D4294	2.60		0.69	1264		-----		-----
391	D4294	2.587		0.42	1287		-----		-----
398		-----		-----	1360	ISO8754	2.59		0.48
399	D4294	2.60		0.69	1543		-----		-----
402	D4294	2.69		2.58	1556	ISO8754	2.640		1.53
441		-----		-----	1585	D4294	2.617		1.05
442	IP336	2.60		0.69	1616	D4294	2.33		-4.98
444	IP336	2.651		1.76	1617		-----		-----
445	D4294	2.624		1.19	1654	ISO8754	2.14	R(0.05)	-8.96
446		-----		-----	1714	D2622	2.53		-0.78
447	IP336	2.358		-4.39	1720	D4294	2.876		6.48
485	D4294	2.5878		0.43	1728	D4294	2.486		-1.70
494	ISO8754	2.577		0.21	1776	ISO8754	2.52		-0.99
511	D4294	2.6246		1.21	1796	D4294	2.583		0.33
529		-----		-----	1800		-----		-----
541	D4294	2.96	C,R(0.05)	8.24	1810		2.38		-3.93
551	D4294	2.81859		5.28	1811	D4294	2.53		-0.78
557		-----		-----	1815	D7035	2.539		-0.59
574	D4294	2.58		0.27	1842	INH-05	2.55		-0.36
575		-----		-----	1849		-----		-----
593		2.61		0.90	1852		-----		-----
602		-----		-----	1858	D4294	2.625		1.21
605	D4294	2.6705		2.17	1862	D4294	2.5838		0.35
606		-----		-----	1892	D4294	2.60		0.69
608	D4294	2.0738	R(0.01)	-10.35	1928	ISO8754	2.50		-1.41
609		-----		-----	1929	ISO8754	2.52		-0.99
613		-----		-----	1930	ISO8754	1.92	R(0.01)	-13.58
621	D4294	2.547		-0.42	1957		-----		-----
657	D4294	2.332	C	-4.94	1963		-----		-----
663	D4294	2.604		0.77	1986	D4294	2.591		0.50
704	D4294	2.572		0.10	6001		-----		-----
732	D4294	2.454	C	-2.37	6003		-----		-----
739	D4294	2.604		0.77	6006	D4294	2.61		0.90
742	INH-51947	2.51		-1.20	6009		-----		-----
749	D4294	2.754		3.92	6014	D2622	2.53		-0.78
750		-----		-----	6016	D4294	2.7258		3.33
751	D4294	2.659		1.93	9050		-----		-----
752	D4294	2.62		1.11	9051		-----		-----
753	D4294	2.64		1.53	9052		-----		-----
781	D4294	2.636		1.44	9057		-----		-----
784	D4294	2.64		1.53	9060		-----		-----
785	D4294	2.621		1.13	9063		-----		-----
840	D4294	2.598		0.65	9132		-----		-----
862	D2622	2.566		-0.02	9145	D4294	2.616		1.02
874	D4294	2.60		0.69	9151		-----		-----
875	D4294	2.68		2.37	9152		-----		-----
904	D4294	2.39		-3.72					

normality	OK
n	95
outliers	4
mean (n)	2.5672
st.dev. (n)	0.10629
R(calc.)	0.2976
R(D4294:10)	0.1334

Lab 541 first reported: 3.05
Lab 657 first reported: 0.40
Lab 732 first reported: 2.258
Lab 1065 first reported: 2.23





Determination of Water on sample #15215; results in %V/V

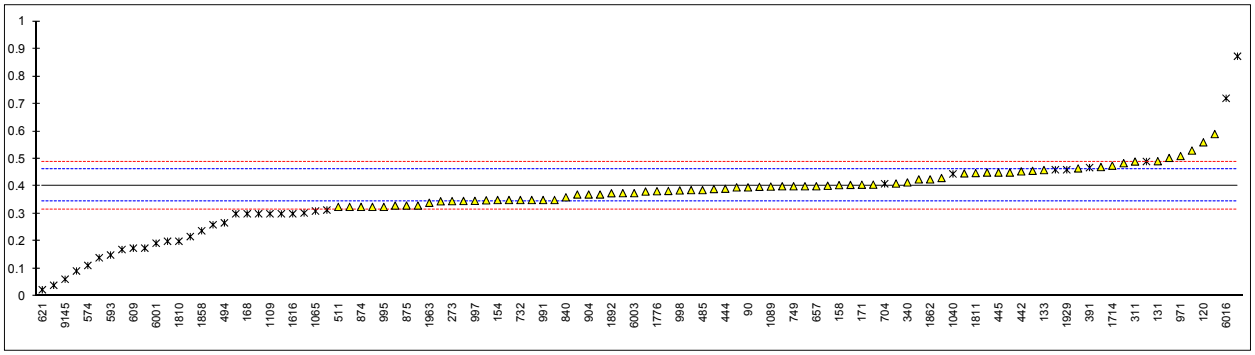
lab	method	value	mark	z(targ)	lab	method	value	mark	z(targ)
62		-----		-----	962		-----		-----
90	D4928	0.396		-0.22	963		-----		-----
92	D4377	0.406		0.13	971	D4928	0.51		3.68
120	D4377	0.56	C	5.39	974		-----		-----
131	D4928	0.4913		3.04	988	D4006	0.300	ex, see §4.1	-3.50
133	D4928	0.459		1.94	991	D4006	0.350		-1.79
140	D4928	0.3467		-1.90	992	D4006	0.350		-1.79
150	D4928	0.402		-0.01	994	D4928	0.37		-1.10
154	D4928	0.350		-1.79	995	D4377	0.325		-2.64
158	D4377	0.4042		0.06	997	D4377	0.347		-1.89
159	D4377	0.1398	ex, see §4.1	-8.97	998	D4928	0.385		-0.59
167		-----		-----	1011	D4006	0.33		-2.47
168	D4006	0.3	ex, see §4.1	-3.50	1040	DIN51777	0.445	ex	1.46
171	D4377	0.40569		0.12	1056	D4928	0.41		0.26
186		-----		-----	1065	D4006	0.31	ex, see §4.1	-3.15
203	D4928	0.59		6.41	1081		0.381		-0.73
225	D4006	0.425		0.78	1089	D4928	0.3989		-0.12
238		-----		-----	1106		-----		-----
242		-----		-----	1109	D4928	0.30	ex, see §4.1	-3.50
273	D4928	0.346	C	-1.92	1128		-----		-----
311	D4928	0.49		3.00	1161	EN1428	<0.1	C, **-?**	-----
314	D4928	0.47		2.31	1191		-----		-----
332	D4377	0.3136	ex, see §4.1	-3.03	1200	D4928	0.4563		1.84
333	D4377	0.33		-2.47	1201	D4377	0.465		2.14
334	D4377	0.405		0.09	1236	D4928	0.530		4.36
335	D4377	0.37		-1.10	1248	D4377	0.447		1.53
340	D4377	0.414		0.40	1259	ISO9029	0.3	ex, see §4.1	-3.50
360		-----		-----	1264		-----		-----
391	D4377	0.468	ex	2.24	1287		-----		-----
398	D4377	0.45		1.63	1360	D4377	0.46	ex	1.97
399		-----		-----	1543		-----		-----
402	ISO9029	0.375		-0.93	1556	D6304	0.873	R(0.01)	16.08
441		-----		-----	1585	D4006	0.2000	ex, see §4.1	-6.91
442	IP386	0.4542		1.77	1616	D4006	0.30	ex, see §4.1	-3.50
444	D4928	0.3910		-0.39	1617		-----		-----
445	D4928	0.45		1.63	1654		-----		-----
446	D4928	0.40		-0.08	1714	D4006	0.475		2.48
447	IP386	0.400	C	-0.08	1720		-----		-----
485	D4377	0.3862		-0.55	1728	D4006	0.43		0.95
494	D6304	0.267	ex, see §4.1	-4.62	1776	D6304	0.3822		-0.69
511	D4006	0.325		-2.64	1796	D4006	0.175	ex, see §4.1	-7.77
529	D4377	0.3454		-1.94	1800	D4377	0.383		-0.66
541		-----		-----	1810		0.2	ex, see §4.1	-6.91
551	D4377	0.040	ex, see §4.1	-12.38	1811	D4377	0.448		1.56
557		-----		-----	1815	D4377	0.349		-1.82
574	D4377	0.1119	ex, see §4.1	-9.92	1842	IP386	0.398		-0.15
575		-----		-----	1849		-----		-----
593		0.150	ex, see §4.1	-8.62	1852		-----		-----
602		-----		-----	1858	D4006	0.238	ex, see §4.1	-5.61
605		-----		-----	1862	D4006	0.425		0.78
606		-----		-----	1892	D4377	0.3748		-0.94
608	D4377	0.26	ex, see §4.1	-4.86	1928	D4377	0.49	ex	3.00
609	D4377	0.175	ex, see §4.1	-7.77	1929	D4377	0.46	ex	1.97
613		-----		-----	1930	DIN51777	0.386		-0.56
621	D4377	0.0236	ex, see §4.1	-12.94	1957	D4377	0.092	ex, see §4.1,C	-10.60
657	D4377	0.40		-0.08	1963	D4928	0.34		-2.13
663	D4377	0.217	ex, see §4.1	-6.33	1986	D4377	0.484		2.79
704	D4377	0.4091	ex	0.23	6001	ISO760	0.192779	ex, see §4.1	-7.16
732	INH-2477	0.35		-1.79	6003	D4006	0.375		-0.93
739	INH-2477	0.45		1.63	6006		-----		-----
742		-----		-----	6009		-----		-----
749	INH-2477	0.40		-0.08	6014	D4928	0.17	ex, see §4.1	-7.94
750		-----		-----	6016	D4377	0.72	R(0.01)	10.86
751		-----		-----	9050		-----		-----
752	D4006	0.300	ex, see §4.1	-3.50	9051		-----		-----
753	D4006	0.325		-2.64	9052		-----		-----
781	D4006	0.325		-2.64	9057	in house	0.39597		-0.22
784	D4006	0.350		-1.79	9060	D4928	0.39		-0.42
785	D4006	0.350		-1.79	9063		-----		-----
840	D4377	0.360		-1.45	9132		-----		-----
862		-----		-----	9145	D4928	0.0619	ex, see §4.1	-11.63
874	D4006	0.325		-2.64	9151	in house	0.303	ex	-3.39
875	D4006	0.330		-2.47	9152	in house	0.503		3.44
904	D4928	0.37		-1.10					

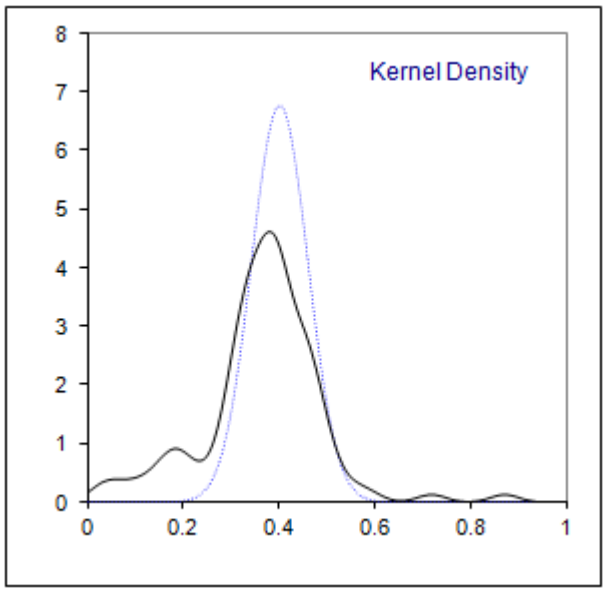
-?: false negative test result?

normality	OK
n	72
outliers	2+32ex
mean (n)	0.4023
st.dev. (n)	0.05897
R(calc.)	0.1651
R(D4377:00)	0.0819

Lab 120 first reported: 0.03
Lab 273 first reported: 0.057
Lab 391 reported in a deviating unit: 0.468%M/M.
Lab 447 first reported: 0.019
Lab 663 reported in a deviating unit: 0.217%M/M.
Lab 704 reported in a deviating unit: 0.4091%M/M.
Lab 1040 reported in a deviating unit: 0.445%M/M.
Lab 1161 first reported: 0.1; the second reported result a possibly negative test result?
Lab 1360 reported in a deviating unit: 0.46%M/M.
Lab 1928 reported in a deviating unit: 0.49%M/M.
Lab 1929 reported in a deviating unit: 0.46%M/M.
Lab 1957 first reported: 0.045
Lab 1963 reported water content acc. to D4006 <0.5%
Lab 9145 reported in a deviating unit: 0.0619%M/M.

All reported values <0.32 are excluded, see §4.1



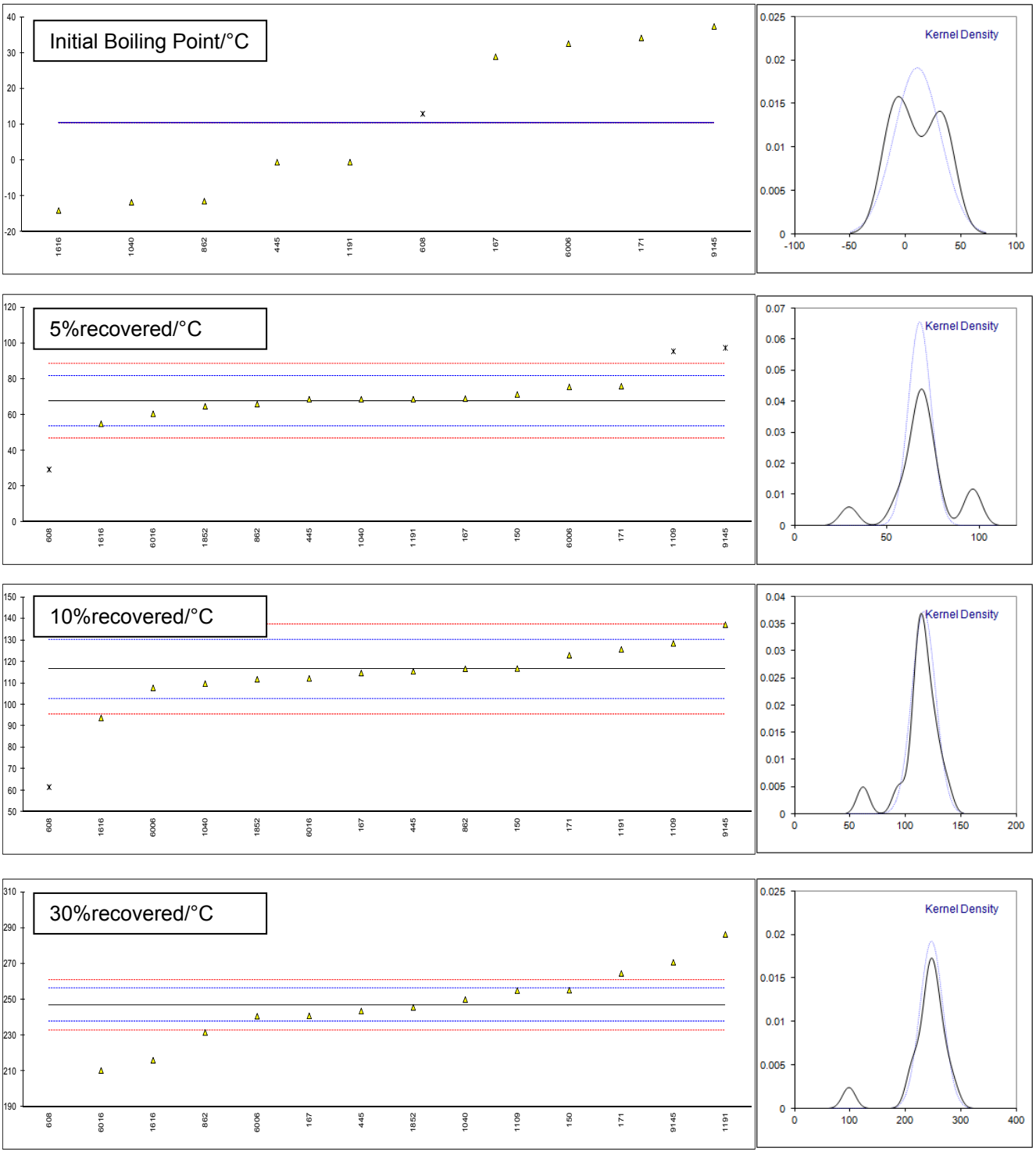


Determination of Simulated Distillation on sample #15215; results in °C

lab	method	IBP	mark	5%rec	mark	10%rec	mark	30%rec	mark
62		-----		-----		-----		-----	
90		-----		-----		-----		-----	
92		-----		-----		-----		-----	
120		-----		-----		-----		-----	
131		-----		-----		-----		-----	
133		-----		-----		-----		-----	
140		-----		-----		-----		-----	
150	D7169	<36.0		71.4		116.8		255.2	
154		-----		-----		-----		-----	
158		-----		-----		-----		-----	
159		-----		-----		-----		-----	
167	D7169	28.951		69.074		114.721		240.884	
168		-----		-----		-----		-----	
171	D7169	34.2		76.0		123.0		264.6	
186		-----		-----		-----		-----	
203		-----		-----		-----		-----	
225		-----		-----		-----		-----	
238		-----		-----		-----		-----	
242		-----		-----		-----		-----	
273		-----		-----		-----		-----	
311		-----		-----		-----		-----	
314		-----		-----		-----		-----	
332		-----		-----		-----		-----	
333		-----		-----		-----		-----	
334		-----		-----		-----		-----	
335		-----		-----		-----		-----	
340		-----		-----		-----		-----	
360		-----		-----		-----		-----	
391		-----		-----		-----		-----	
398		-----		-----		-----		-----	
399		-----		-----		-----		-----	
402		-----		-----		-----		-----	
441		-----		-----		-----		-----	
442		-----		-----		-----		-----	
444		-----		-----		-----		-----	
445	D7169	-0.5		68.7		115.5		243.6	
446		-----		-----		-----		-----	
447		-----		-----		-----		-----	
485		-----		-----		-----		-----	
494		-----		-----		-----		-----	
511		-----		-----		-----		-----	
529		-----		-----		-----		-----	
541		-----		-----		-----		-----	
551		-----		-----		-----		-----	
557		-----		-----		-----		-----	
574		-----		-----		-----		-----	
575		-----		-----		-----		-----	
593		-----		-----		-----		-----	
602		-----		-----		-----		-----	
605		-----		-----		-----		-----	
606		-----		-----		-----		-----	
608	D7169	13.01	ex	29.44	D(0.05)	61.61	D(0.01)	98.37	D(0.01)
609		-----		-----		-----		-----	
613		-----		-----		-----		-----	
621		-----		-----		-----		-----	
657		-----		-----		-----		-----	
663		-----		-----		-----		-----	
704		-----		-----		-----		-----	
732		-----		-----		-----		-----	
739		-----		-----		-----		-----	
742		-----		-----		-----		-----	
749		-----		-----		-----		-----	
750		-----		-----		-----		-----	
751		-----		-----		-----		-----	
752		-----		-----		-----		-----	
753		-----		-----		-----		-----	
781		-----		-----		-----		-----	
784		-----		-----		-----		-----	
785		-----		-----		-----		-----	
840		-----		-----		-----		-----	
862	D7169	-11.4		66.0		116.7		231.6	
874		-----		-----		-----		-----	
875		-----		-----		-----		-----	
904		-----		-----		-----		-----	
962		-----		-----		-----		-----	
963		-----		-----		-----		-----	
971		-----		-----		-----		-----	
974		-----		-----		-----		-----	

lab	method	IBP	mark	5%rec	mark	10%rec	mark	30%rec	mark
988		-----		-----		-----		-----	
991		-----		-----		-----		-----	
992		-----		-----		-----		-----	
994		-----		-----		-----		-----	
995		-----		-----		-----		-----	
997		-----		-----		-----		-----	
998		-----		-----		-----		-----	
1011		-----		-----		-----		-----	
1040	D2887	-11.7		68.7		109.8		250.0	
1056		-----		-----		-----		-----	
1065		-----		-----		-----		-----	
1081		-----		-----		-----		-----	
1089		-----		-----		-----		-----	
1106		-----		-----		-----		-----	
1109	D7169	<36.0		95.5	DG(0.05)	128.5		255.0	
1128		-----		-----		-----		-----	
1161		-----		-----		-----		-----	
1191	EN5199-3	-0.5		68.7		125.7		286.4	
1200		-----		-----		-----		-----	
1201		-----		-----		-----		-----	
1236		-----		-----		-----		-----	
1248		-----		-----		-----		-----	
1259		-----		-----		-----		-----	
1264		-----		-----		-----		-----	
1287		-----		-----		-----		-----	
1360		-----		-----		-----		-----	
1543		-----		-----		-----		-----	
1556		-----		-----		-----		-----	
1585		-----		-----		-----		-----	
1616	D7169	-14		55		93.8		216.1	
1617		-----		-----		-----		-----	
1654		-----		-----		-----		-----	
1714		-----		-----		-----		-----	
1720		-----		-----		-----		-----	
1728		-----		-----		-----		-----	
1776		-----		-----		-----		-----	
1796		-----		-----		-----		-----	
1800		-----		-----		-----		-----	
1810		-----		-----		-----		-----	
1811		-----		-----		-----		-----	
1815		-----		-----		-----		-----	
1842		-----		-----		-----		-----	
1849		-----		-----		-----		-----	
1852	D7169	< 36		64.8		111.8		245.6	
1858		-----		-----		-----		-----	
1862		-----		-----		-----		-----	
1892		-----		-----		-----		-----	
1928		-----		-----		-----		-----	
1929		-----		-----		-----		-----	
1930		-----		-----		-----		-----	
1957		-----		-----		-----		-----	
1963		-----		-----		-----		-----	
1986		-----		-----		-----		-----	
6001		-----		-----		-----		-----	
6003		-----		-----		-----		-----	
6006	D7169	32.6		75.6		107.8		240.7	
6009		-----		-----		-----		-----	
6014		-----		-----		-----		-----	
6016	D7169	-----		60.6		112.2		210.4	
9050		-----		-----		-----		-----	
9051		-----		-----		-----		-----	
9052		-----		-----		-----		-----	
9057		-----		-----		-----		-----	
9060		-----		-----		-----		-----	
9063		-----		-----		-----		-----	
9132		-----		-----		-----		-----	
9145	D7169	37.4		97.4	DG(0.05)	137.2		270.8	
9151		-----		-----		-----		-----	
9152		-----		-----		-----		-----	
	normality	OK		OK		suspect		OK	
	n	9		11		13		13	
	outliers	0+1ex		3		1		1	
	mean (n)	10.5612		67.6885		116.4247		246.9911	
	st.dev. (n)	22.16082		6.10636		10.72400		20.79852	
	R(calc.)	62.0503		17.0978		30.0272		58.2359	
	R(D7169:11)	(2.4900)		19.6000		19.5000		13.1000	

Lab 608: the reported value of IBP excluded due to outlying results in other simulated distillation parameters

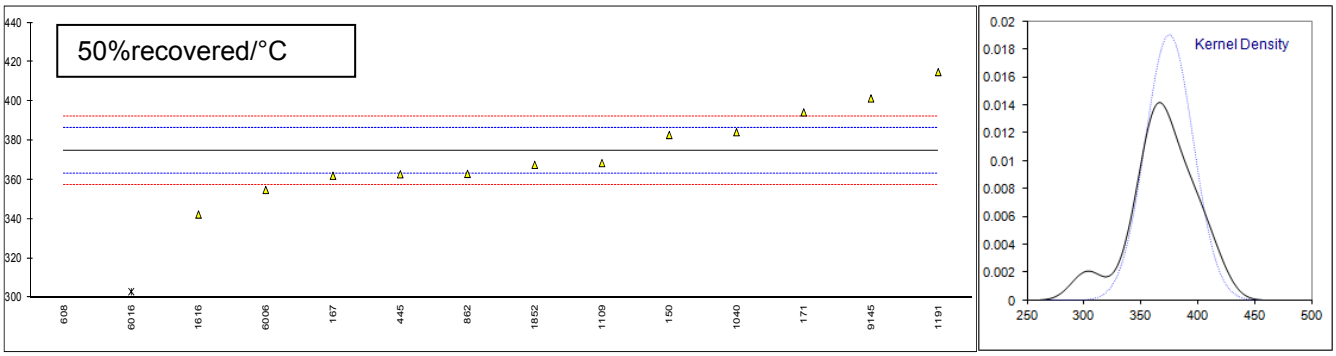

Initial Boiling Point/°C
Kernel Density
5%recovered/°C
Kernel Density
10%recovered/°C
Kernel Density
30%recovered/°C
Kernel Density

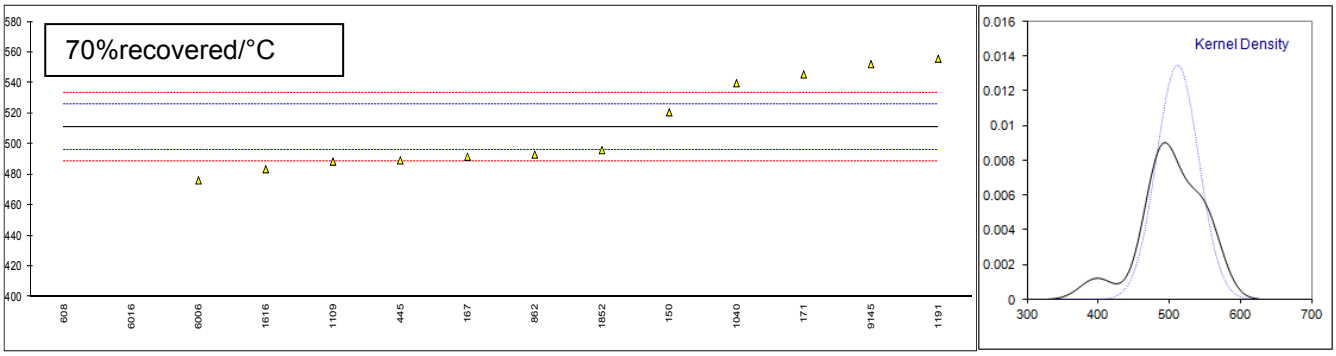
Determination of Simulated Distillation on sample #15215; results in °C, continued

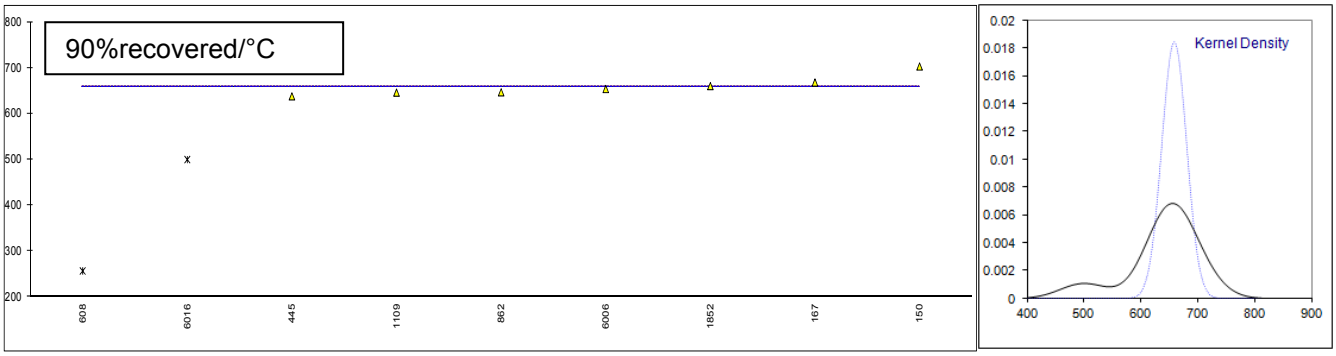
lab	method	50%rec	mark	70%rec	mark	90%rec	mark	FBP	mark
62		-----		-----		-----		-----	
90		-----		-----		-----		-----	
92		-----		-----		-----		-----	
120		-----		-----		-----		-----	
131		-----		-----		-----		-----	
133		-----		-----		-----		-----	
140		-----		-----		-----		-----	
150	D7169	382.8		520.8		703.0		>720.0	
154		-----		-----		-----		-----	
158		-----		-----		-----		-----	
159		-----		-----		-----		-----	
167	D7169	362.036		491.674		668.050		1018.6	D(0.05)
168		-----		-----		-----		-----	
171	D7169	394.3		545.6		-----		719.8	
186		-----		-----		-----		-----	
203		-----		-----		-----		-----	
225		-----		-----		-----		-----	
238		-----		-----		-----		-----	
242		-----		-----		-----		-----	
273		-----		-----		-----		-----	
311		-----		-----		-----		-----	
314		-----		-----		-----		-----	
332		-----		-----		-----		-----	
333		-----		-----		-----		-----	
334		-----		-----		-----		-----	
335		-----		-----		-----		-----	
340		-----		-----		-----		-----	
360		-----		-----		-----		-----	
391		-----		-----		-----		-----	
398		-----		-----		-----		-----	
399		-----		-----		-----		-----	
402		-----		-----		-----		-----	
441		-----		-----		-----		-----	
442		-----		-----		-----		-----	
444		-----		-----		-----		-----	
445	D7169	362.8		489.3		637.9		738.3	
446		-----		-----		-----		-----	
447		-----		-----		-----		-----	
485		-----		-----		-----		-----	
494		-----		-----		-----		-----	
511		-----		-----		-----		-----	
529		-----		-----		-----		-----	
541		-----		-----		-----		-----	
551		-----		-----		-----		-----	
557		-----		-----		-----		-----	
574		-----		-----		-----		-----	
575		-----		-----		-----		-----	
593		-----		-----		-----		-----	
602		-----		-----		-----		-----	
605		-----		-----		-----		-----	
606		-----		-----		-----		-----	
608	D7169	134.18	G(0.01)	177.94	G(0.01)	256.74	G(0.01)	387.89	ex
609		-----		-----		-----		-----	
613		-----		-----		-----		-----	
621		-----		-----		-----		-----	
657		-----		-----		-----		-----	
663		-----		-----		-----		-----	
704		-----		-----		-----		-----	
732		-----		-----		-----		-----	
739		-----		-----		-----		-----	
742		-----		-----		-----		-----	
749		-----		-----		-----		-----	
750		-----		-----		-----		-----	
751		-----		-----		-----		-----	
752		-----		-----		-----		-----	
753		-----		-----		-----		-----	
781		-----		-----		-----		-----	
784		-----		-----		-----		-----	
785		-----		-----		-----		-----	
840		-----		-----		-----		-----	
862	D7169	363.0		493.1		646.7		-----	
874		-----		-----		-----		-----	
875		-----		-----		-----		-----	
904		-----		-----		-----		-----	
962		-----		-----		-----		-----	
963		-----		-----		-----		-----	
971		-----		-----		-----		-----	
974		-----		-----		-----		-----	

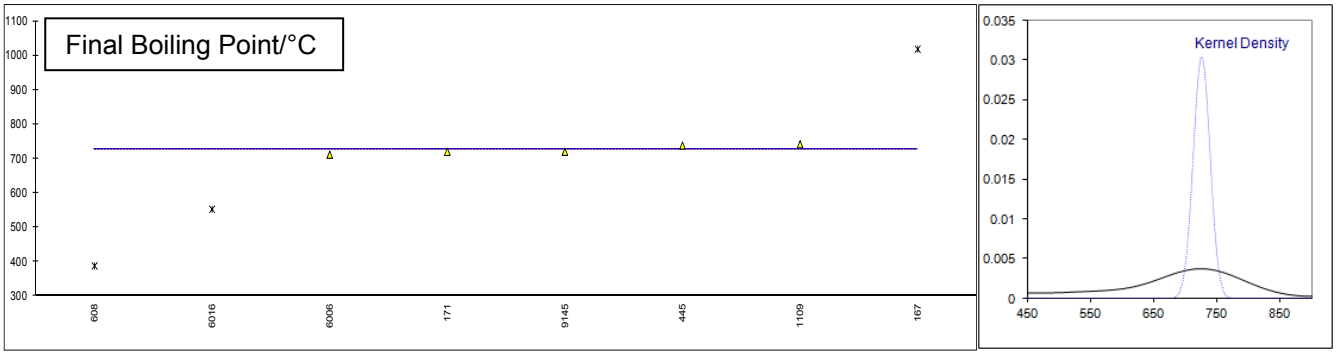
lab	method	50%rec	mark	70%rec	mark	90%rec	mark	FBP	mark
988		-----		-----		-----		-----	
991		-----		-----		-----		-----	
992		-----		-----		-----		-----	
994		-----		-----		-----		-----	
995		-----		-----		-----		-----	
997		-----		-----		-----		-----	
998		-----		-----		-----		-----	
1011		-----		-----		-----		-----	
1040	D2887	384.2		539.8		-----		-----	
1056		-----		-----		-----		-----	
1065		-----		-----		-----		-----	
1081		-----		-----		-----		-----	
1089		-----		-----		-----		-----	
1106		-----		-----		-----		-----	
1109	D7169	368.5		488.5		646.0		742.0	
1128		-----		-----		-----		-----	
1161		-----		-----		-----		-----	
1191	EN5199-3	414.8		555.9		>735		>735	
1200		-----		-----		-----		-----	
1201		-----		-----		-----		-----	
1236		-----		-----		-----		-----	
1248		-----		-----		-----		-----	
1259		-----		-----		-----		-----	
1264		-----		-----		-----		-----	
1287		-----		-----		-----		-----	
1360		-----		-----		-----		-----	
1543		-----		-----		-----		-----	
1556		-----		-----		-----		-----	
1585		-----		-----		-----		-----	
1616	D7169	342.3		483.5		-----		-----	
1617		-----		-----		-----		-----	
1654		-----		-----		-----		-----	
1714		-----		-----		-----		-----	
1720		-----		-----		-----		-----	
1728		-----		-----		-----		-----	
1776		-----		-----		-----		-----	
1796		-----		-----		-----		-----	
1800		-----		-----		-----		-----	
1810		-----		-----		-----		-----	
1811		-----		-----		-----		-----	
1815		-----		-----		-----		-----	
1842		-----		-----		-----		-----	
1849		-----		-----		-----		-----	
1852	D7169	367.6		496.0		660.2		> 741	
1858		-----		-----		-----		-----	
1862		-----		-----		-----		-----	
1892		-----		-----		-----		-----	
1928		-----		-----		-----		-----	
1929		-----		-----		-----		-----	
1930		-----		-----		-----		-----	
1957		-----		-----		-----		-----	
1963		-----		-----		-----		-----	
1986		-----		-----		-----		-----	
6001		-----		-----		-----		-----	
6003		-----		-----		-----		-----	
6006	D7169	354.8		476.2		653.9		711.7	
6009		-----		-----		-----		-----	
6014		-----		-----		-----		-----	
6016	D7169	303.0	ex	397.6	G(0.05)	499.8	G(0.01)	552.6	ex
9050		-----		-----		-----		-----	
9051		-----		-----		-----		-----	
9052		-----		-----		-----		-----	
9057		-----		-----		-----		-----	
9060		-----		-----		-----		-----	
9063		-----		-----		-----		-----	
9132		-----		-----		-----		-----	
9145	D7169	401.4		552.3		-----		720	
9151		-----		-----		-----		-----	
9152		-----		-----		-----		-----	
	normality	OK		OK		unknown		unknown	
	n	12		12		7		5	
	outliers	1+1ex		2		2		1+2ex	
	mean (n)	374.8780		511.0562		659.39		726.36	
	st.dev. (n)	20.96325		29.70711		21.640		13.092	
	R(calc.)	58.6971		83.1799		60.59		36.66	
	R(D7169:11)	16.4000		21.2000		unknown		unknown	

Lab 608: the reported value of FBP excluded due to outlying results in other simulated distillation parameters
Lab 6016: the reported values of 50%rec and FBP excluded due to outlying results in 70%rec and 90%rec









z-scores of Simulated Distillation on sample #15215

lab	method	IBP	5%rec	10%rec	30%rec	50%rec	70%rec	90%rec	FBP
62		-----	-----	-----	-----	-----	-----	-----	-----
90		-----	-----	-----	-----	-----	-----	-----	-----
92		-----	-----	-----	-----	-----	-----	-----	-----
120		-----	-----	-----	-----	-----	-----	-----	-----
131		-----	-----	-----	-----	-----	-----	-----	-----
133		-----	-----	-----	-----	-----	-----	-----	-----
140		-----	-----	-----	-----	-----	-----	-----	-----
150	D7169	-----	0.53	0.05	1.75	1.35	1.29	-----	-----
154		-----	-----	-----	-----	-----	-----	-----	-----
158		-----	-----	-----	-----	-----	-----	-----	-----
159		-----	-----	-----	-----	-----	-----	-----	-----
167	D7169	-----	0.20	-0.24	-1.31	-2.19	-2.56	-----	-----
168		-----	-----	-----	-----	-----	-----	-----	-----
171	D7169	-----	1.19	0.94	3.76	3.32	4.56	-----	-----
186		-----	-----	-----	-----	-----	-----	-----	-----
203		-----	-----	-----	-----	-----	-----	-----	-----
225		-----	-----	-----	-----	-----	-----	-----	-----
238		-----	-----	-----	-----	-----	-----	-----	-----
242		-----	-----	-----	-----	-----	-----	-----	-----
273		-----	-----	-----	-----	-----	-----	-----	-----
311		-----	-----	-----	-----	-----	-----	-----	-----
314		-----	-----	-----	-----	-----	-----	-----	-----
332		-----	-----	-----	-----	-----	-----	-----	-----
333		-----	-----	-----	-----	-----	-----	-----	-----
334		-----	-----	-----	-----	-----	-----	-----	-----
335		-----	-----	-----	-----	-----	-----	-----	-----
340		-----	-----	-----	-----	-----	-----	-----	-----
360		-----	-----	-----	-----	-----	-----	-----	-----
391		-----	-----	-----	-----	-----	-----	-----	-----
398		-----	-----	-----	-----	-----	-----	-----	-----
399		-----	-----	-----	-----	-----	-----	-----	-----
402		-----	-----	-----	-----	-----	-----	-----	-----
441		-----	-----	-----	-----	-----	-----	-----	-----
442		-----	-----	-----	-----	-----	-----	-----	-----
444		-----	-----	-----	-----	-----	-----	-----	-----
445	D7169	-----	0.14	-0.13	-0.72	-2.06	-2.87	-----	-----
446		-----	-----	-----	-----	-----	-----	-----	-----
447		-----	-----	-----	-----	-----	-----	-----	-----
485		-----	-----	-----	-----	-----	-----	-----	-----
494		-----	-----	-----	-----	-----	-----	-----	-----
511		-----	-----	-----	-----	-----	-----	-----	-----
529		-----	-----	-----	-----	-----	-----	-----	-----
541		-----	-----	-----	-----	-----	-----	-----	-----
551		-----	-----	-----	-----	-----	-----	-----	-----
557		-----	-----	-----	-----	-----	-----	-----	-----
574		-----	-----	-----	-----	-----	-----	-----	-----
575		-----	-----	-----	-----	-----	-----	-----	-----
593		-----	-----	-----	-----	-----	-----	-----	-----
602		-----	-----	-----	-----	-----	-----	-----	-----
605		-----	-----	-----	-----	-----	-----	-----	-----
606		-----	-----	-----	-----	-----	-----	-----	-----
608	D7169	-----	-5.46	-7.87	-31.77	-41.09	-44.00	-----	-----
609		-----	-----	-----	-----	-----	-----	-----	-----
613		-----	-----	-----	-----	-----	-----	-----	-----
621		-----	-----	-----	-----	-----	-----	-----	-----
657		-----	-----	-----	-----	-----	-----	-----	-----
663		-----	-----	-----	-----	-----	-----	-----	-----
704		-----	-----	-----	-----	-----	-----	-----	-----
732		-----	-----	-----	-----	-----	-----	-----	-----
739		-----	-----	-----	-----	-----	-----	-----	-----
742		-----	-----	-----	-----	-----	-----	-----	-----
749		-----	-----	-----	-----	-----	-----	-----	-----
750		-----	-----	-----	-----	-----	-----	-----	-----
751		-----	-----	-----	-----	-----	-----	-----	-----
752		-----	-----	-----	-----	-----	-----	-----	-----
753		-----	-----	-----	-----	-----	-----	-----	-----
781		-----	-----	-----	-----	-----	-----	-----	-----
784		-----	-----	-----	-----	-----	-----	-----	-----
785		-----	-----	-----	-----	-----	-----	-----	-----
840		-----	-----	-----	-----	-----	-----	-----	-----
862	D7169	-----	-0.24	0.04	-3.29	-2.03	-2.37	-----	-----
874		-----	-----	-----	-----	-----	-----	-----	-----
875		-----	-----	-----	-----	-----	-----	-----	-----
904		-----	-----	-----	-----	-----	-----	-----	-----
962		-----	-----	-----	-----	-----	-----	-----	-----
963		-----	-----	-----	-----	-----	-----	-----	-----
971		-----	-----	-----	-----	-----	-----	-----	-----
974		-----	-----	-----	-----	-----	-----	-----	-----

lab	method	IBP	5%rec	10%rec	30%rec	50%rec	70%rec	90%rec	FBP
988		-----	-----	-----	-----	-----	-----	-----	-----
991		-----	-----	-----	-----	-----	-----	-----	-----
992		-----	-----	-----	-----	-----	-----	-----	-----
994		-----	-----	-----	-----	-----	-----	-----	-----
995		-----	-----	-----	-----	-----	-----	-----	-----
997		-----	-----	-----	-----	-----	-----	-----	-----
998		-----	-----	-----	-----	-----	-----	-----	-----
1011		-----	-----	-----	-----	-----	-----	-----	-----
1040	D2887	-----	0.14	-0.95	0.64	1.59	3.80	-----	-----
1056		-----	-----	-----	-----	-----	-----	-----	-----
1065		-----	-----	-----	-----	-----	-----	-----	-----
1081		-----	-----	-----	-----	-----	-----	-----	-----
1089		-----	-----	-----	-----	-----	-----	-----	-----
1106		-----	-----	-----	-----	-----	-----	-----	-----
1109	D7169	-----	3.97	1.73	1.71	-1.09	-2.98	-----	-----
1128		-----	-----	-----	-----	-----	-----	-----	-----
1161		-----	-----	-----	-----	-----	-----	-----	-----
1191	EN5199-3	-----	0.14	1.33	8.42	6.82	5.92	-----	-----
1200		-----	-----	-----	-----	-----	-----	-----	-----
1201		-----	-----	-----	-----	-----	-----	-----	-----
1236		-----	-----	-----	-----	-----	-----	-----	-----
1248		-----	-----	-----	-----	-----	-----	-----	-----
1259		-----	-----	-----	-----	-----	-----	-----	-----
1264		-----	-----	-----	-----	-----	-----	-----	-----
1287		-----	-----	-----	-----	-----	-----	-----	-----
1360		-----	-----	-----	-----	-----	-----	-----	-----
1543		-----	-----	-----	-----	-----	-----	-----	-----
1556		-----	-----	-----	-----	-----	-----	-----	-----
1585		-----	-----	-----	-----	-----	-----	-----	-----
1616	D7169	-----	-1.81	-3.25	-6.60	-5.56	-3.64	-----	-----
1617		-----	-----	-----	-----	-----	-----	-----	-----
1654		-----	-----	-----	-----	-----	-----	-----	-----
1714		-----	-----	-----	-----	-----	-----	-----	-----
1720		-----	-----	-----	-----	-----	-----	-----	-----
1728		-----	-----	-----	-----	-----	-----	-----	-----
1776		-----	-----	-----	-----	-----	-----	-----	-----
1796		-----	-----	-----	-----	-----	-----	-----	-----
1800		-----	-----	-----	-----	-----	-----	-----	-----
1810		-----	-----	-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----	-----	-----
1815		-----	-----	-----	-----	-----	-----	-----	-----
1842		-----	-----	-----	-----	-----	-----	-----	-----
1849		-----	-----	-----	-----	-----	-----	-----	-----
1852	D7169	-----	-0.41	-0.66	-0.30	-1.24	-1.99	-----	-----
1858		-----	-----	-----	-----	-----	-----	-----	-----
1862		-----	-----	-----	-----	-----	-----	-----	-----
1892		-----	-----	-----	-----	-----	-----	-----	-----
1928		-----	-----	-----	-----	-----	-----	-----	-----
1929		-----	-----	-----	-----	-----	-----	-----	-----
1930		-----	-----	-----	-----	-----	-----	-----	-----
1957		-----	-----	-----	-----	-----	-----	-----	-----
1963		-----	-----	-----	-----	-----	-----	-----	-----
1986		-----	-----	-----	-----	-----	-----	-----	-----
6001		-----	-----	-----	-----	-----	-----	-----	-----
6003		-----	-----	-----	-----	-----	-----	-----	-----
6006	D7169	-----	1.13	-1.24	-1.34	-3.43	-4.60	-----	-----
6009		-----	-----	-----	-----	-----	-----	-----	-----
6014		-----	-----	-----	-----	-----	-----	-----	-----
6016	D7169	-----	-1.01	-0.61	-7.82	-12.27	-14.98	-----	-----
9050		-----	-----	-----	-----	-----	-----	-----	-----
9051		-----	-----	-----	-----	-----	-----	-----	-----
9052		-----	-----	-----	-----	-----	-----	-----	-----
9057		-----	-----	-----	-----	-----	-----	-----	-----
9060		-----	-----	-----	-----	-----	-----	-----	-----
9063		-----	-----	-----	-----	-----	-----	-----	-----
9132		-----	-----	-----	-----	-----	-----	-----	-----
9145	D7169	-----	4.24	2.98	5.09	4.53	5.45	-----	-----
9151		-----	-----	-----	-----	-----	-----	-----	-----
9152		-----	-----	-----	-----	-----	-----	-----	-----

APPENDIX 2

Number of participants per country

1 lab in	AFGHANISTAN
1 lab in	ALGERIA
1 lab in	ARGENTINA
2 labs in	AUSTRALIA
1 lab in	AZERBAIJAN
2 labs in	BRAZIL
1 lab in	BRUNEI
1 lab in	BULGARIA
5 labs in	CANADA
1 lab in	CHINA, People's Republic
2 labs in	COLOMBIA
1 lab in	CONGO Brazzaville
1 lab in	COTE D'IVOIRE
2 labs in	CROATIA
2 labs in	CZECH REPUBLIC
1 lab in	DAGESTAN, Republic of
1 lab in	ECUADOR
1 lab in	EGYPT
1 lab in	FINLAND
5 labs in	FRANCE
2 labs in	GEORGIA
4 labs in	GERMANY
1 lab in	INDONESIA
1 lab in	IRAQ
1 lab in	ISRAEL
4 labs in	ITALY
2 labs in	KAZAKHSTAN
6 labs in	MALAYSIA
1 lab in	MEXICO
9 labs in	NETHERLANDS
1 lab in	NIGERIA
4 labs in	NORWAY
1 lab in	OMAN
1 lab in	PERU
2 labs in	POLAND
1 lab in	PORTUGAL
2 labs in	QATAR
3 labs in	ROMANIA
17 labs in	RUSSIAN FEDERATION
3 labs in	SAUDI ARABIA
1 lab in	SINGAPORE
3 labs in	SLOVAKIA
1 lab in	SOUTH AFRICA
1 lab in	ST. LUCIA - WEST INDIES
2 labs in	SUDAN
2 labs in	SWEDEN
1 lab in	THAILAND
5 labs in	TURKEY
2 labs in	TURKMENISTAN
2 labs in	UKRAINE
3 labs in	UNITED ARAB EMIRATES
13 labs in	UNITED KINGDOM
11 labs in	UNITED STATES OF AMERICA
1 lab in	VIETNAM

APPENDIX 3

Abbreviations

C	= final result after checking of first reported suspect result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner outlier test
R(0.05)	= straggler in Rosner outlier test
E	= error in calculations
U	= reported in different unit
W	= withdrawn on request participant
ex	= excluded from calculations
fr.	= first reported
n.a.	= not applicable
n.d.	= not determined
SDS	= Safety data Sheet

Literature

1 iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, April 2014

2 ASTM E178-02

3 ASTM E1301-03

4 ISO 13528-05

5 ISO 5725-86

6 ISO 5725, parts 1-6, 1994

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

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

9 IP 367/84

10 DIN 38402 T41/42

11 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)

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

13 Analytical Methods Committee Technical brief, No4 February 2001.

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

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