Results of Proficiency Test
Fuel Oil
January 2012

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

Authors: ing. R.J. Starink
Correctors: dr. R.G. Visser & ing L. Sweere

Report: iis12F01

April 2012

CONTENTS

Appendices:

1 INTRODUCTION

Since 1994 the Institute for Interlaboratory Studies organizes a proficiency test for Fuel Oil every year. In the annual proficiency testing program of 2011/2012, it was decided to continue the round robin for the analysis of Fuel Oil. In this interlaboratory study 78 laboratories in 31 different countries have participated. See appendix 3 for the number of participants per country. In this report the results of the proficiency test are presented and discussed.

2 SET-UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, The Netherlands, was the organiser of this proficiency test. Sample analyses for fit-for-use and homogeneity testing were subcontracted to an accredited laboratory. It was decided, depending on the registration to send two different samples: 1*1 liter bottle labelled #12001 and 1*125ml PE bottle, labelled #12002 especially for metals. 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 ISO17043:2010 and ILAC-G13:2007, (R007), since January 2000 by the Dutch Accreditation Council, RvA (Raad voor Accreditatie). This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organisation was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2). This protocol can be downloaded from the iis website http://www.iisnl.com.

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

In this proficiency test two samples were prepared, a regular Fuel Oil and a Fuel Oil positive on Aluminium and Silicon. One drum of 200 liter with regular Fuel Oil was purchased from a local refinery. After heating to 60°C and homogenisation, 100 amber glass bottles of 1L and 100 amber glass bottles of 0.5L, both labelled #12001, were filled. The homogeneity of the subsamples #12001 was checked by determination of density in accordance with ISO12185:96 on 8 stratified randomly selected samples.

	Density @15°C in kg/m^3
Sample #12001-1	990.1
Sample #12001-2	990.2
Sample #12001-3	990.2
Sample #12001-4	990.2
Sample #12001-5	990.2
Sample #12001-6	990.2
Sample #12001-7	990.3
Sample #12001-8	990.3

Table 1: test results for homogeneity of subsamples #12001.

From the test results of table 1, the repeatabilities were calculated and compared with 0.3 times the corresponding target reproducibility in agreement with the procedure of ISO 13528, Annex B2 in the next table:

	Density @15°C in kg/m^3
r (Observed)	0.2
Reference method	ISO12185:04
0.3 * R (ref. method)	0.5

Table 2: repeatabilities of test results of subsamples #12001

The calculated repeatability for Density was in agreement with 0.3 times the corresponding target reproducibility of the respective reference method. Therefore, homogeneity of the subsamples of #12001 was assumed.

For sample #12002, the remaining Fuel Oil from the 200 liter drum was after heating to 60°C and homogenisation used to fill 200 plastic PE bottles of 125 mL (for approx. 80%) and labelled #12002. The homogeneity of the subsamples was checked by determination of Aluminium and Silicon in accordance with IP501:05 on 8 stratified randomly selected samples.

	Aluminium in mg/kg	Silicon in mg/kg
Sample #12002-1	12	13
Sample #12002-2	11	13
Sample #12002-3	11	13
Sample #12002-4	12	13
Sample #12002-5	11	13
Sample #12002-6	11	13
Sample #12002-7	12	14
Sample #12002-8	12	13

Table 3: measured Aluminum and Silicon for homogeneity of subsamples #12002.

From the test results of table 3, the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibilities in agreement with the procedure of ISO 13528, Annex B2 in the next table:

	Aluminium in mg/kg	Silicon in mg/kg
r (Observed)	1.5	1.0
Reference method	IP501:05	IP501:05
0.3 * R (ref. method)	1.2	1.3

Table 4: repeatabilities of Aluminium and Silicon results of subsamples #12002

The calculated repeatability for Silicon was in agreement with 0.3 times the corresponding target reproducibility of IP501:05. The calculated reproducibility for Aluminium is almost in agreement, due to rounding of the results with the reproducibility of IP501:05
Therefore, homogeneity of the subsamples of #12002 was assumed.

Depending on the registration, to each of the participating laboratories: one bottle of 1L and one bottle of 0.5L, both labelled #12001 and/or one bottle of 125ml, labelled #12002, were sent on January 18, 2012.

2.5 STABILITY OF THE SAMPLES

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

2.6 ANALYSES

The participants were asked to determine on sample #12001: Acid Number, API gravity, Ash Content, Asphaltenes, Calculated Carbon Aromaticity Index, Conradson Carbon Residue, Density @15°C, Flash Point PMcc, Heat of Combustion (Gross and Net), Kinematic Viscosity (@ 50°C and 100°C), Viscosity Stabinger (@ 50ºC and 100ºC), Micro Carbon Residue, Pour Point (Lower, Upper and Automated), Sediments by Extraction, Total Sediment (Potential and Accelerated), Total Sulphur, Nitrogen, Water by Distillation, Distillation (IBP, 5%-50% and FBP) and Total Carbon, Hydrogen and Nitrogen (CHN-analyzer) and Nickel, Potassium, Sodium and Vanadium content.

On sample #12002 was requested to analyze: Aluminium, Silicon and total Aluminium/Silicon, To get comparable results a detailed report form, on which the units were prescribed as well as some of the required standards, was sent together with each set of samples. Also a letter of instructions and a SDS were added to the package.

3 RESULTS

During four weeks after sample despatch, the results of the individual laboratories were received. The original data are tabulated per sample in the appendix 1 of this report. The laboratories are represented by their code numbers.

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

3.1 STATISTICS

Statistical calculations were performed as described in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ of January 2010 (iis-protocol, version 3.2).

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. After removal of outliers this check was repeated. In case a data set does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.
In accordance to ISO 5725 (1986 and 1994) the original results per determination were submitted subsequently to Dixon and Grubbs outlier tests. Outliers are marked by D(0.01) for the Dixon test and by G(0.01) or DG(0.01) for the Grubbs test. Stragglers are marked by D(0.05) for the Dixon test and by G(0.05) or DG(0.05) for the Grubbs test. Both outliers and stragglers were not included in the calculations of the averages and the 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 these with a factor of 2.8.

3.2 GRAPHICS

In order to visualise 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 (see appendix 4, nr.13-14).

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 spread of 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-useness of the reported test result.
The z-scores were calculated according to:

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

The $z_{(target)}$ scores are listed in the tables in appendix 1.
Absolute values for z<2 are very common and absolute values for z>3 are very rare. The usual interpretation of z-scores is as follows:

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

4 EVALUATION

In this interlaboratory study the laboratory in Jordan received the samples late due to problems with customs clearance.
For sample #12001, in total, three participants did not report any test results and thirteen laboratories reported the test results after the final reporting date. For sample #12002, in total eight participants did not report any test results and seven participants reported the test results after the final reporting date.
Not all laboratories were able to report all analyses requested. Finally, 75 participants reported in total 1195 numerical results. Observed were 74 statistically outlying results, which is 6.2%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

Not all original data sets proved to have a normal distribution. Not normal distributions were found for the following determinations: Ash, Density, Flash Point, Pour Point (Upper, Lower and automated), Water and Vanadium. In all these cases, the results of the statistical evaluation should be used with care. One can see that this is justified from the Kernel Density Graphs.

4.1 EVALUATION PER SAMPLE AND PER TEST

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

Sample #12001

Acid Number: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D664A:11a.

API Gravity: This determination was very problematic. Only one statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not at all in agreement with the requirements of ASTM D4052:11.

Ash: This determination was very problematic. Three statistical outliers were observed and the calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the strict requirements of ASTM D482:07.

Asphaltenes: This determination was problematic. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of IP143:04.

Bromine Number: on distillate: This determination was very problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is not at all in agreement with the requirements of ASTM D1159:07. Preparation of the distillate upto 360 AET (@2mm) may be critical step that caused the large spread.

Calculated Carbon Aromaticity Index: This determination was not problematic. No statistical outliers were observed. Only one result was excluded from statistical evaluation due to a calculation error. The calculated reproducibility after rejection of the suspected result is in full agreement with estimated reproducibility of ISO8217:05.

CCR: This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in agreement with the requirements of ASTM D189:10. Two laboratories reported to have determined the Ramsbottom CR instead of the Conradson CR. These results were excluded from statistical evaluation, as the test method for Ramsbottom CR is not equivalent with the Conradson CR test method.

Density @ 15°C: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ISO12185:04.

Flash Point PMcc: This determination was very problematic. Only one statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the requirements of ASTM D93B:11.

HOC Gross: This determination of the Gross Heat of Combustion was problematic. Only one statistical outlier was observed and one test result was excluded for statistical evaluation as the reported value for HOC Gross was smaller than HOC Net. The calculated reproducibility after rejection of the suspect test results is not in agreement with the requirements of ASTM D240:09.
When the results of ASTM D240 were evaluated separately, the calculated reproducibility is smaller but still not in agreement with the requirements of ASTM D240.

HOC Net: This determination of the Net Heat of Combustion was not problematic. Four statistical outliers were observed and one test result was excluded for statistical evaluation as the reported value for HOC Net was larger than HOC Gross. However, the calculated reproducibility after rejection of the suspect test results is in agreement with the requirements of ASTM D240:09.
When the results of ASTM D240 were evaluated separately, the calculated reproducibility is larger but still in agreement with the requirements of ASTM D240.

Kin. Visc. @ 50°C: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with ASTM D445:11a.

Kin. Visc. @100°C: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with ASTM D445:11a.

Viscosity Stabinger: The test method ASTM D7042 is intended for Newtonian flow behaviour liquids only (see §1.2 in ASTM D7042) and therefore it may not be suitable for Fuel Oil. And the precision data mentioned in D7042 will not be applicable for Fuel Oil. Also no precision is given for viscosity @50°C.

MCR: This determination was very problematic. No statistical outliers were observed. However, the calculated reproducibility is not at all in agreement with the requirements of ASTM D4530:11.

Lower Pour Point: This determination may be problematic. No statistical outliers were observed. Two results were excluded as the reported result for lower PP is higher then the result for upper PP. The calculated reproducibility is not at all in agreement with the precision data of ASTM D97:11. Rounding to 3 degrees acc. ASTM D97 may partly explain the large spread.

Upper Pour Point: This determination may be problematic. No statistical outliers were observed. Two results were excluded as the reported result for upper PP is smaller then the result for lower PP. The calculated reproducibility is not in agreement with ASTM D97:11a. Rounding to 3 degrees acc. ASTM D97 may partly explain the large spread.

Pour Point (automated): This determination was problematic. Eight results were excluded as the reported method is a manual method. One statistical outlier was observed. The calculated reproducibility after rejection of the suspect test results is not in agreement with ASTM D5950:07.

Sediment by Extraction: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D473:07.

Total sediment: Potential:
This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with IP390:04. (IP390:04 is technically identical to ISO10307-2:93)

Total sediment: Accelerated:
This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in good agreement with IP390:04. (IP390:04 is technically identical to ISO10307-2:93).

Total Sulphur: This determination was problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D4294:10. When the data of the ASTM D4294 and IP336/ISO8754 were evaluated separately, the calculated reproducibility for ASTM D4294 data is smaller but still not in agreement. However the calculated reproducibility of the IP336/ISO8754 data is in full agreement.

Nitrogen: This determination was problematic. One statistical outlier was observed. Four results were excluded for statistical calculation, as the used test mehod is not suitable. The calculated reproducibility after rejection of the suspect test results is not in agreement with the requirements of ASTM D5762:11.

Water: This determination was not problematic. Only one statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with ASTM D95:10.

Distillation: This determination was problematic. In total seven statistical outliers were observed. Only the calculated reproducibility for IBP is after rejection of statistical outliers in agreement with the requirements of ASTM D1160:06.

CHN-Analyzer: This determination was not problematic. In total only one statistical outlier was observed. The calculated reproducibilities of the Carbon, Hydrogen and Nitrogen determination are after rejection of the statistical outlier all in good agreement with the requirements of ASTM D5291:10.

Nickel: This determination was problematic for a number of laboratories. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of IP501:05.

Potassium: Regretfully, the consensus value found is below or near the detection limit. Therefore no significant conclusions were drawn. One statistical outlier was observed (false positive result?).

Sodium: This determination was very problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the requirements of IP501:05.

Vanadium: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of IP501:05.

Sample #12002:

Aluminium: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after the rejection of the statistical outliers is in good agreement with IP501:05.

Silicon: This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility after the rejection of the statistical outlier is in full agreement with IP501:05.

Total Al/Si: This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility after the rejection of the statistical outliers is in full agreement with the estimated reproducibility of IP501:05.

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

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 that participated. The average results of the evaluated parameters, calculated reproducibilities and reproducibilities, derived from literature standards (in casu ASTM standards) are compared in the next table.

Parameters	Unit	n	average	2.8 * sd	R (lit)
Acid Number	mg KOH/g	23	0.135	0.155	0.160
API gravity		18	11.25	0.33	0.13
Ash	%M/M	50	0.022	0.013	0.005
Asphaltenes	%M/M	31	6.27	1.91	1.25
Bromine Number	g Br/100g	11	14.38	11.56	4.65
Calc. Carbon Aromaticity Index		16	852.3	2.20	2.27
Conradson Carbon Residue	%M/M	17	13.57	2.28	2.14
Density @ 15°C	kg/m^3	64	990.8	1.7	1.5
Flash Point PMcc	°C	56	92.8	11.6	6.0
Heat of Combustion Gross	MJ/kg	37	42.92	0.54	0.40
Heat of Combustion Net	MJ/kg	27	40.64	0.36	0.40
Kinematic Viscosity @50°C	mm^2/s	42	360.9	25.3	26.7

Kinematic Viscosity @100°C	mm^2/s	43	32.58	1.46	1.62
Stabinger Viscosity @50ºC	mm^2/s	12	364.0	13.9	unknown
Stabinger Viscosity @100ºC	mm^2/s	12	32.35	0.79	unknown
Micro Carbon Residue	%M/M	43	13.29	1.31	0.76
Lower Pour Point	°C	18	-2.8	11.2	6.6
Upper Pour Point	°C	34	0.4	10.4	6.6
Pour Point (automated)	°C	9	-4.0	7.3	6.1
Sediment by Extraction	%M/M	27	0.016	0.023	0.037
Total Sediment (Potential)	%M/M	22	0.018	0.018	0.039
Total Sediment (Accelerated)	%M/M	18	0.020	0.016	0.041
Total Sulphur	%M/M	71	0.99	0.11	0.07
Nitrogen	µg/g	13	4607	1683	1225
Water by Distillation	%V/V	39	0.06	0.09	0.20
Distillation @ 760 mm Hg					
IBP	°C	13	194.9	34.4	49.5
5% recovered	°C	15	249.9	67.1	24.1
10% recovered	°C	14	297.5	53.7	21.9
20% recovered	°C	15	368.8	45.9	20.4
30% recovered	°C	14	433.3	50.0	19.9
40% recovered	°C	13	501.3	48.7	17.7
50% recovered	°C	4	548.9	51.1	13.2
FBP	°C	10	542.1	84.8	26.9
CHN analyzer					
Total Carbon	%M/M	24	87.6	2.2	2.5
Total Hydrogen	%M/M	21	10.4	0.7	0.8
Total Nitrogen	%M/M	19	0.6	0.2	0.5
Elements					
Nickel as Ni	mg/kg	31	32.60	6.12	11.43
Potassium as K	mg/kg	10	0.83	2.11	(0.38)
Sodium as Na	mg/kg	32	7.85	6.15	3.31
Vanadium as V	mg/kg	34	32.21	7.91	13.49

table 5: summary of test results on Fuel Oil sample #12001

*results between brackets should be used with care, because the average found was below the application range

Parameters	Unit	n	average	2.8 * sd	R (lit)
Aluminium	mg/kg	18	12.02	2.69	4.05
Silicon	mg/kg	19	13.24	3.84	4.39
Total Aluminium/Silicon	mg/kg	19	25.36	5.56	5.98

Table 6: summary of test results on Fuel Oil sample #12002

Result between brackets is near of below the detection limit.

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF JANUARY 2012 WITH PREVIOUS PTS

	January 2012	February 2011	January 2010	October 2009
Number of reporting labs	75	113	75	106
Number of results reported	1195	1267	1081	1426
Statistical outliers	74	60	61	59
Percentage outliers	6.2%	4.7%	5.9%	4.1%

Table 7: comparison with previous proficiency tests

In proficiency tests, outlier percentages of 3% - 7.5% are quite normal.
The performance of the determinations of the proficiency tests was compared against the requirements of the respective standards. The conclusions are given the following table:

Determination	February 2012	February 2011	January 2010	October 2009
Acid Number	+	++	+	++
API Gravity	--	n.e.	n.e.	n.e.
Ash	--	--	--	--
Asphaltenes	--	--	-	++
Bromine Number	--	--	--	++
Calc. Carb. Aromaticity Index	+/-	--	n.e.	n.e.
Conradson Carbon Residue	-	--	++	++
Density @ 15 °C	-	--	+	+
Flash Point PMcc	--	--	--	--
Heat of Combustion Gross	--	++	-	+/-
Heat of Combustion Net	+/-	+/-	--	++
Kinematic Viscosity @ 50 °C	+	+	++	++
Kinematic Viscosity @ 100 °C	++	+	--	+
Micro Carbon Residue	--	--	+/-	+/-
Nitrogen	--	-	--	--
Lower Pour Point	--	--	-	-
Upper Pour Point	--	--	--	--
Pour Point (automated)	-	--	++	n.e.
Sediments by Extraction	++	++	++	++
Total Sediment (Accelerated)	++	++	++	++
Total Sediment (Potential)	++	++	++	++
Total Sulphur	--	-	--	--
Water by Distillation	++	++	++	++
Aluminium as Al	++	--	++	--
Nickel as Ni	++	++	--	--
Potassium as K	(--)	--	(--)	n.a.
Silicon as Si	++	+	++	+
Sodium as Na	--	-	++	++
Vanadium as V	++	(++)	++	++
Total Carbon	++	+/-	+/-	n.e.
Total Hydrogen	+	+/-	--	n.e.
Total Nitrogen	++	++	++	n.e.
Distillation	--	--	++	+/-

table 8: comparison determinations of sample #12001 and #12002 against the standard
results between brackets should used with care, because the average was below the application range

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

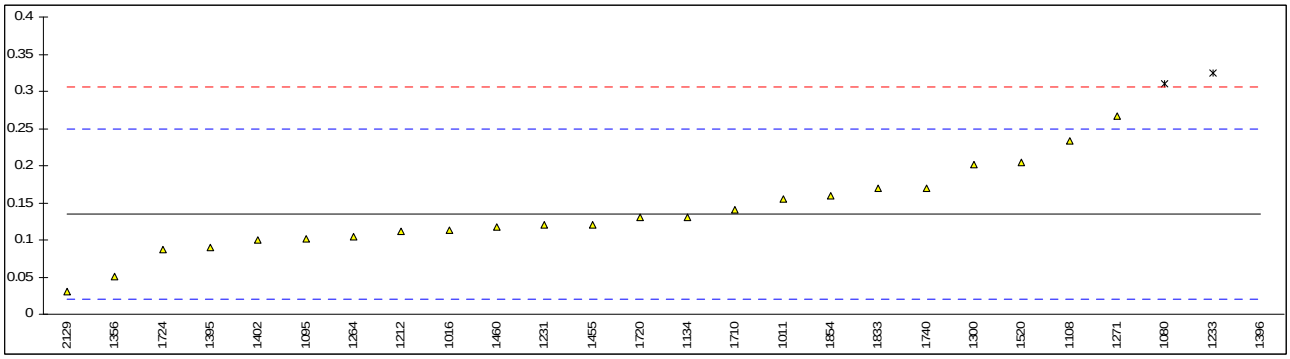
Determination of Acid Number on sample #12001; results in mg KOH/g

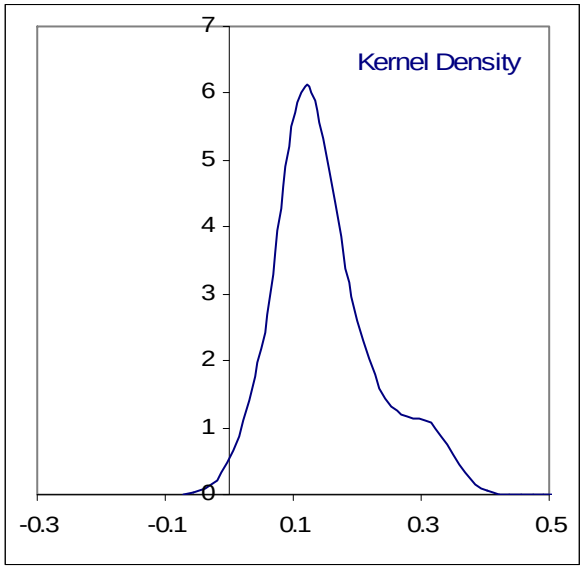
lab	method	value	mark	z(targ)	remarks
1011	D664	0.155		0.35	
1016	D664	0.113		-0.38	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		-----		-----	
1080	D664	0.31	G(0.05)	3.06	
1095	D664	0.101		-0.59	
1108	D664	0.233		1.71	
1121		-----		-----	
1126		-----		-----	
1134	IP177	0.13		-0.09	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212	D664	0.112		-0.40	
1215		-----		-----	
1231	D664	0.12		-0.26	
1233	D664	0.325	G(0.05)	3.32	
1259		-----		-----	
1264	D664	0.105		-0.52	
1269		-----		-----	
1271	D664	0.2664		2.30	
1275		-----		-----	
1300	D664	0.2015		1.16	
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356	D664	0.05		-1.49	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385		-----		-----	
1395	D664	0.09	C	-0.79	First reported 0.50
1396	IP139	4.32	C,G(0.01)	73.22	First reported 0.609
1402	D664	0.10		-0.61	
1404	D664	<0.1		<-0.61	
1419		-----		-----	
1428		-----		-----	
1431		-----		-----	
1454		-----		-----	
1455	D664	0.12		-0.26	
1459		-----		-----	
1460	D664	0.118		-0.30	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520	D664	0.204		1.21	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635		-----		-----	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710	D664	0.14		0.09	
1720	D664	0.13		-0.09	
1724	D664	0.087		-0.84	
1728		-----		-----	
1740	D664	0.17		0.61	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833	D664	0.169		0.59	
1849		-----		-----	
1854	D664	0.16		0.44	
1906		-----		-----	
1915		-----		-----	
1938		-----		-----	

1943		-----	W	-----	Result withdrawn
1948		-----		-----	
2129	D664	0.03		-1.84	
2160		-----		-----	

normality	OK
n	23
outliers	3
mean (n)	0.1350
st.dev. (n)	0.05525
R(calc.)	0.1547
R(D664:11a)	0.1600

Application range: 0.1 – 150 mgKOH/g



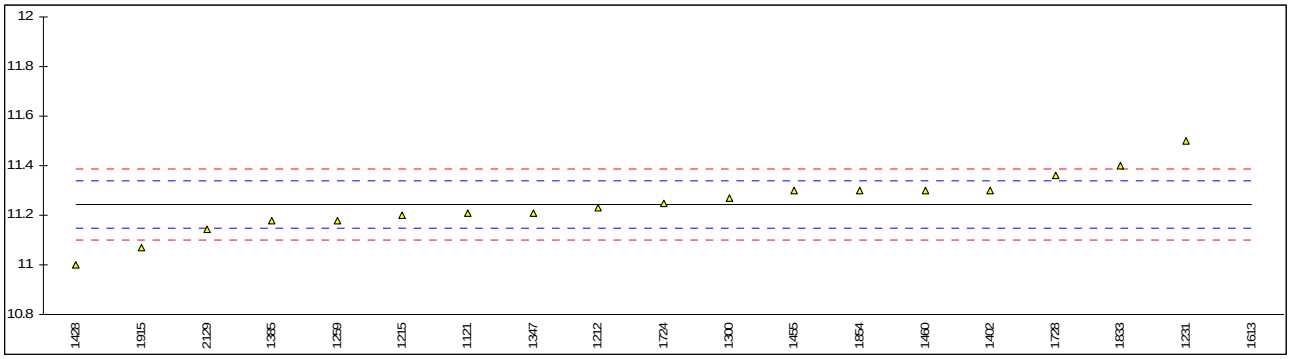


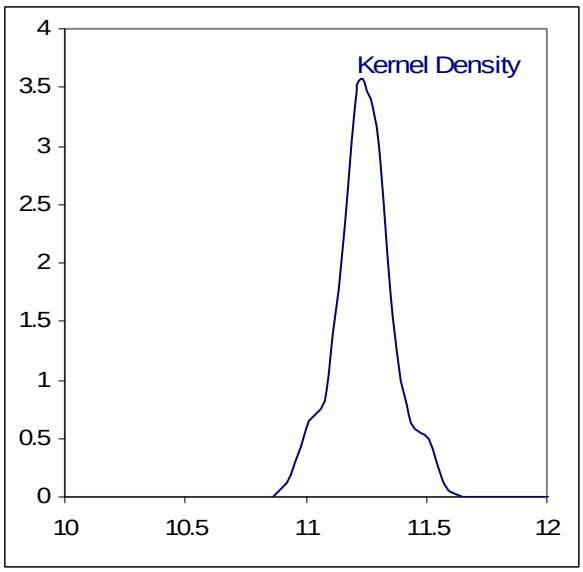
Determination of API Gravity on sample #12001;

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		-----		-----	
1080		-----		-----	
1095		-----		-----	
1108		-----		-----	
1121		11.21		-0.73	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		11.23		-0.31	
1215	D1298	11.2		-0.94	
1231	D1298	11.5		5.38	
1233		-----		-----	
1259	D287	11.18		-1.36	
1264		-----		-----	
1269		-----		-----	
1271		-----		-----	
1275		-----		-----	
1300	D4052	11.27		0.53	
1337		-----		-----	
1347	D4052	11.21		-0.73	
1348		-----		-----	
1356		-----		-----	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385	D4052	11.18		-1.36	
1395		-----		-----	
1396		-----		-----	
1402	D4052	11.3		1.16	
1404		-----		-----	
1419		-----		-----	
1428		11		-5.15	
1431		-----		-----	
1454		-----		-----	
1455		11.3		1.16	
1459		-----		-----	
1460	D7042	11.30		1.16	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520		-----		-----	
1613	D4052	28.92	G(0.01)	372.11	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635		-----		-----	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710		-----		-----	
1720		-----		-----	
1724	ISO12185	11.25		0.11	
1728	D287	11.36		2.43	
1740		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833	D1298	11.4		3.27	
1849		-----		-----	
1854		11.3		1.16	
1906		-----		-----	
1915		11.07	C	-3.68	First reported 10.76
1938		-----		-----	

1943	-----	-----
1948	-----	-----
2129	11.144	-2.12
2160	-----	-----

normality	OK
n	18
outliers	1
mean (n)	11.245
st.dev. (n)	0.1161
R(calc.)	0.325
R(D4052:11)	0.133





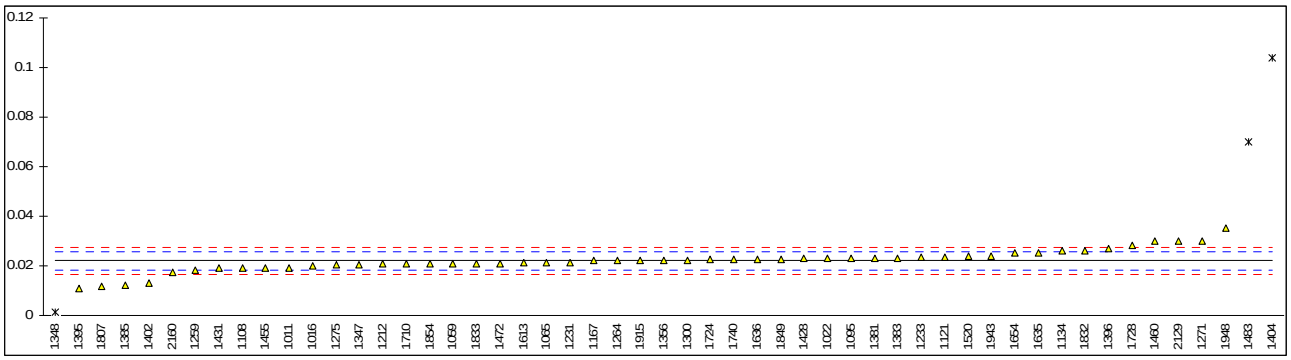
Determination of Ash on sample #12001; results in %M/M

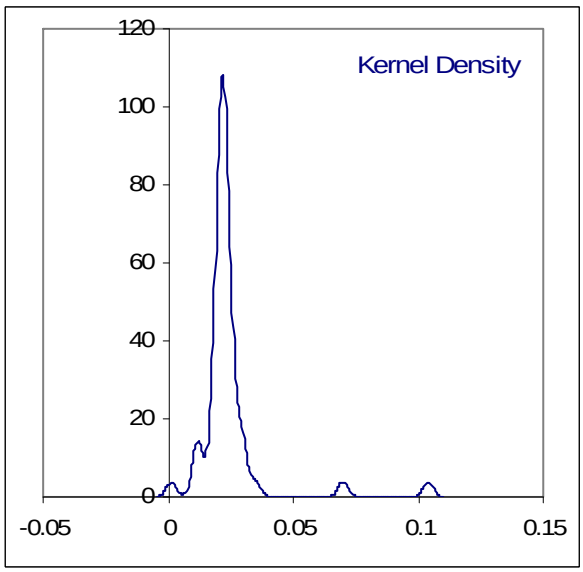
lab	method	value	mark	z(targ)	z(targ)	remarks
1011	ISO6245	0.0191		-1.65	-----	
1016	D482	0.020		-1.14	-----	
1022	D482	0.023		0.54	775	
1026		-----		-----	-----	
1059	ISO6245	0.021		-0.58	775	
1062		-----		-----	-----	
1065	D482	0.0211		-0.53	750	
1080		-----		-----	-----	
1095	D482	0.023		0.54	-----	
1108	ISO6245	0.019		-1.70	750	
1121	IP4	0.02369		0.92	774.6	
1126		-----		-----	-----	
1134	IP4	0.026		2.22	775	
1140		-----		-----	-----	
1167	ISO6245	0.022		-0.02	-----	
1177		-----		-----	-----	
1205		-----		-----	-----	
1212	ISO6245	0.0209		-0.64	-----	
1215		-----		-----	-----	
1231	D482	0.02132		-0.40	-----	
1233	ISO6245	0.0235		0.82	-----	
1259	ISO6245	0.0184		-2.04	1000	Deviating ashing temperature, typing error?
1264	D482	0.022		-0.02	-----	
1269		-----		-----	-----	
1271	ISO6245	0.03	C	4.46	775	First reported 0.09
1275	IP4	0.0203		-0.97	775	
1300	ISO6245	0.02231	C	0.15	750	First reported 0.03161
1337		-----		-----	-----	
1347	D482	0.0205		-0.86	775	
1348	D482	0.00142	G(0.01)	-11.55	775	
1356	ISO6245	0.0222		0.09	550	Deviating ashing temperature, typing error?
1358		-----		-----	-----	
1381	ISO6245	0.0231		0.59	795	
1383	IP4	0.0231		0.59	775	
1385	D482	0.012		-5.62	-----	
1395	ISO6245	0.011	C	-6.18	-----	First reported 0.014
1396	IP4	0.0270		2.78	775	
1402	ISO6245	0.013		-5.06	775	
1404	ISO6245	0.104	C,G(0.01)	45.90	775	First reported 0.011
1419		-----		-----	-----	
1428	ISO6245	0.023		0.54	775	
1431	D482	0.019		-1.70	800	
1454		-----		-----	-----	
1455	ISO6245	0.019		-1.70	775	
1459		-----		-----	-----	
1460	D482	0.0299		4.40	775.0	
1466		-----		-----	-----	
1472	ISO6245	0.021		-0.58	-----	
1483	ISO6245	0.07	G(0.01)	26.86	725	Deviating ashing temperature, typing error?
1510		-----		-----	-----	
1520	ISO6245	0.0237		0.93	775	
1613	D482	0.0211		-0.53	775	
1616		-----		-----	-----	
1631		-----		-----	-----	
1633		-----		-----	-----	
1635	ISO6245	0.025		1.66	-----	
1636	ISO6245	0.0225		0.26	-----	
1654	ISO6245	0.025	C	1.66	-----	First reported 0.0369
1656	IP4	<0.01		<-6.72	775	False negative?
1710	ISO6245	0.021		-0.58	-----	
1720		-----		-----	-----	
1724	ISO6245	0.0224		0.20	750	
1728	D482	0.0281		3.39	775	
1740	ISO6245	0.0225		0.26	775	
1807	ISO6245	0.0116		-5.85	-----	
1810		-----		-----	-----	
1811		-----		-----	775	
1832	ISO6245	0.0260		2.22	-----	
1833	ISO6245	0.021		-0.58	775	
1849	ISO6245	0.0228		0.43	775	
1854	ISO6245	0.021		-0.58	-----	
1906		-----		-----	-----	
1915	ISO6245	0.022		-0.02	-----	
1938		-----		-----	-----	

1943	ISO6245	0.0237	0.93	775	
1948	ISO6245	0.0350	7.26	-----	
2129	ISO6245	0.0299	4.40	550	Deviating ashing temperature, typing error?
2160	D482	0.0173	-2.65	-----	

normality	not OK
n	50
outliers	3
mean (n)	0.0220
st.dev. (n)	0.00449
R(calc.)	0.0126
R(D482:07)	0.0050

Acceptable oven range acc. ASTM D482: 750 – 800ºC



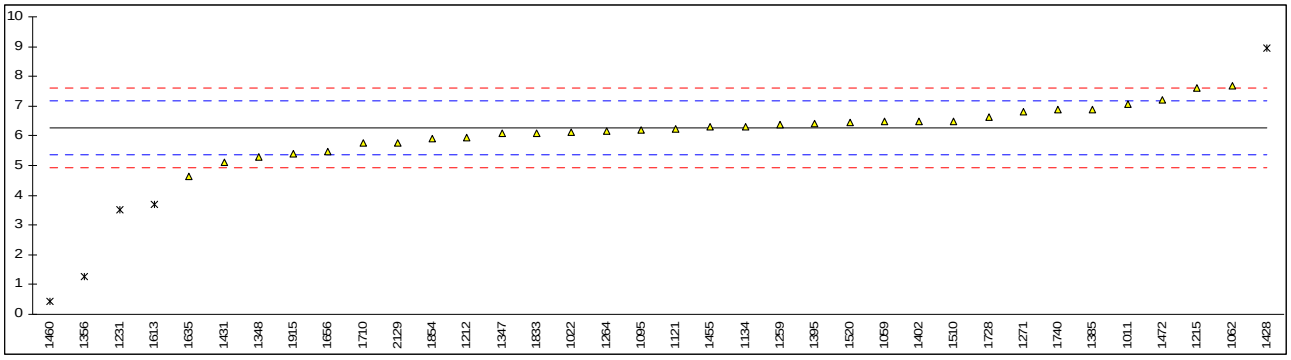


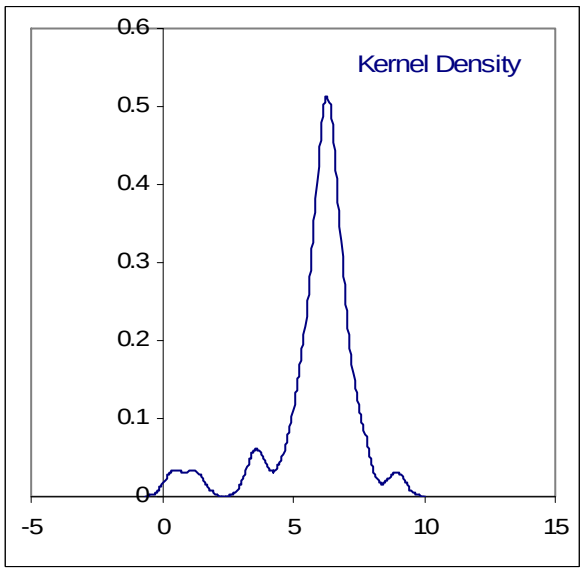
Determination of Asphaltenes on sample #12001; results in %M/M

lab	method	value	mark	z(targ)	remarks
1011	IP143	7.07		1.79	
1016		-----		-----	
1022	IP143	6.13		-0.31	
1026		-----		-----	
1059	IP143	6.47		0.45	
1062	in house	7.68		3.16	
1065		-----		-----	
1080		-----		-----	
1095	IP143	6.2		-0.15	
1108		-----		-----	
1121	IP143	6.229	C	-0.09	First reported 2.647
1126		-----		-----	
1134	IP143	6.31		0.10	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212	IP143	5.96		-0.69	
1215	IP143	7.62		3.02	
1231	IP143	3.5	C,DG(0.05)	-6.18	First reported 3.413
1233		-----		-----	
1259	IP143	6.366		0.22	
1264	IP143	6.17		-0.22	
1269		-----		-----	
1271	IP143	6.81		1.21	
1275		-----		-----	
1300		-----		-----	
1337		-----		-----	
1347	IP143	6.07		-0.44	
1348	IP143	5.3		-2.16	
1356	IP143	1.26	C,G(0.01)	-11.19	First reported 3.4
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385	IP143	6.9		1.41	
1395	IP143	6.42		0.34	
1396		-----		-----	
1402	IP143	6.5		0.52	
1404		-----		-----	
1419		-----		-----	
1428	IP143	8.94	G(0.05)	5.97	
1431	D6560	5.11		-2.59	
1454		-----		-----	
1455	IP143	6.3		0.07	
1459		-----		-----	
1460	IP143	0.4282	G(0.01)	-13.04	
1466		-----		-----	
1472	DIN51595	7.194		2.07	
1483		-----		-----	
1510	IP143	6.5		0.52	
1520	IP143	6.44		0.39	
1613	IP143	3.707	DG(0.05)	-5.72	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	IP143	4.6512		-3.61	
1636		-----		-----	
1654		-----		-----	
1656	IP143	5.46		-1.80	
1710	in house	5.745		-1.17	
1720		-----		-----	
1724		-----		-----	
1728	D6560	6.645		0.84	
1740	IP143	6.89		1.39	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833	IP143	6.1		-0.37	
1849		-----		-----	
1854	IP143	5.9		-0.82	
1906		-----		-----	
1915	IP143	5.396		-1.95	
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	IP143	5.75	-1.16
2160		-----	-----

normality	OK
n	31
outliers	5
mean (n)	6.267
st.dev. (n)	0.6816
R(calc.)	1.909
R(IP143:04)	1.253



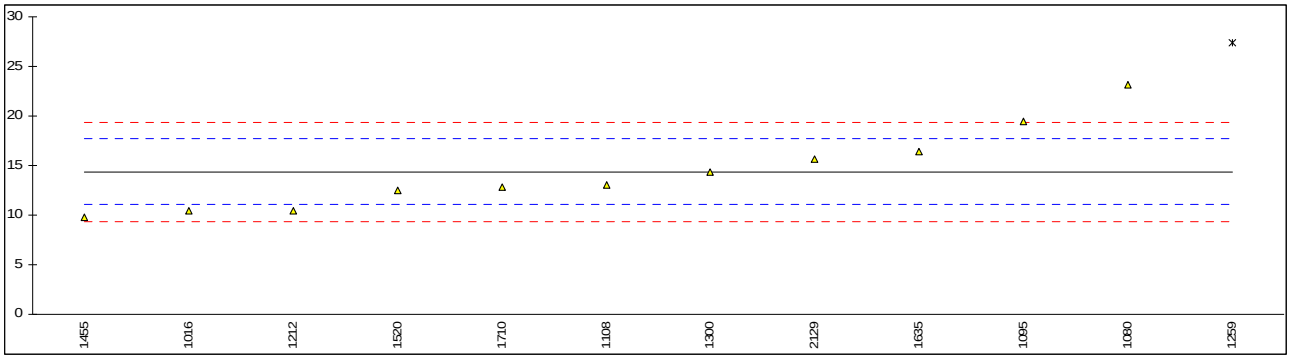


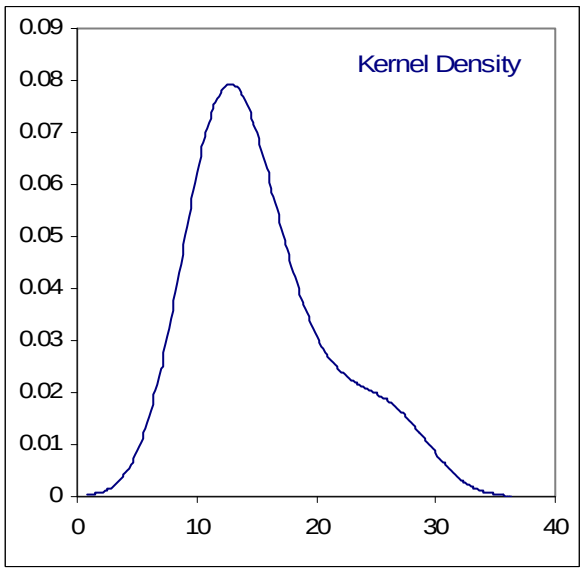
Determination of Bromine Number on distillate on sample #12001; results in g Br/100g

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016	D1159	10.4		-2.39	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		-----		-----	
1080	D1159	23.2		5.31	
1095	D1159	19.5		3.08	
1108	D1159	13		-0.83	
1121		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212	D1159	10.43		-2.38	
1215		-----		-----	
1231		-----		-----	
1233		-----		-----	
1259	D1159	27.35	G(0.01)	7.81	
1264		-----		-----	
1269		-----		-----	
1271		-----		-----	
1275		-----		-----	
1300	D1159	14.362		-0.01	
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356		-----		-----	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385		-----		-----	
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404		-----		-----	
1419		-----		-----	
1428		-----		-----	
1431		-----		-----	
1454		-----		-----	
1455	D1159	9.8		-2.75	
1459		-----		-----	
1460		-----		-----	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520	D1159	12.53		-1.11	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	D1159	16.43		1.24	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710	D1492	12.8		-0.95	
1720		-----		-----	
1724		-----		-----	
1728		-----		-----	
1740		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833		-----		-----	
1849		-----		-----	
1854		-----		-----	
1906		-----		-----	
1915		-----		-----	
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	D1159	15.7	0.80
2160		-----	-----

normality	OK
n	11
outliers	1
mean (n)	14.377
st.dev. (n)	4.1255
R(calc.)	11.551
R(D1159:07)	4.653



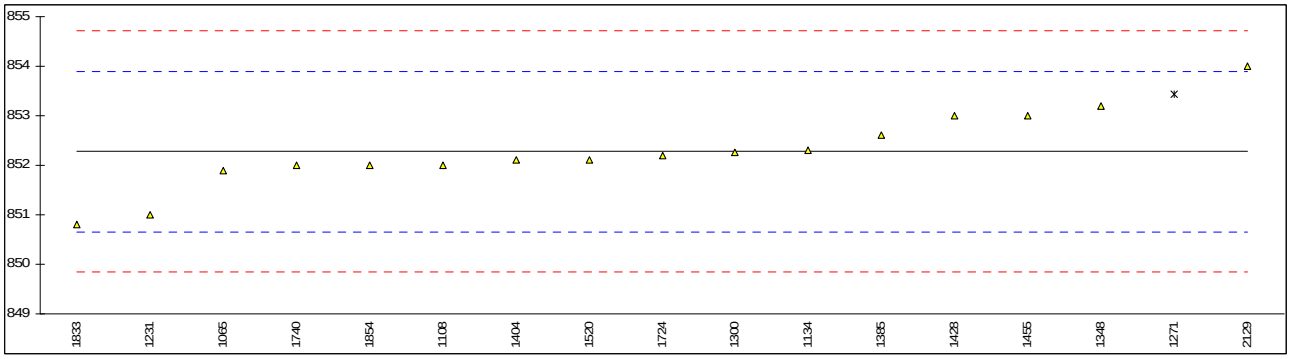


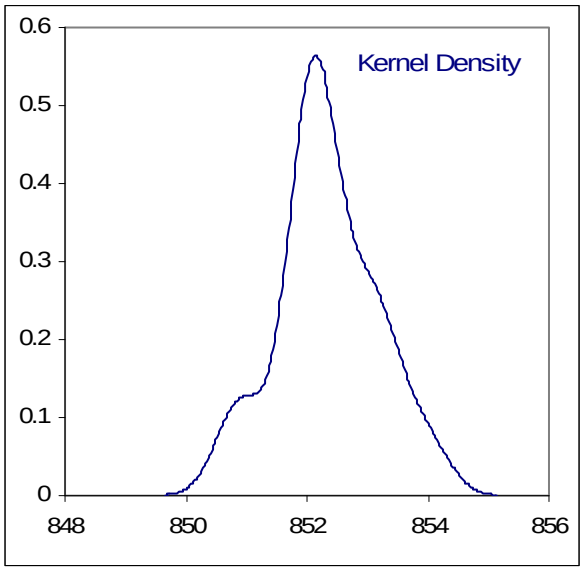
Determination of Calculated Carbon Aromaticity Index on sample #12001;

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		851.9		-0.47	
1080		-----		-----	
1095		-----		-----	
1108	ISO8217	852		-0.34	
1121		-----		-----	
1126		-----		-----	
1134	ISO8217	852.3		0.03	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215		-----		-----	
1231	Calc.	851		-1.58	
1233		-----		-----	
1259		-----		-----	
1264		-----		-----	
1269		-----		-----	
1271		853.43	C,ex	1.42	First reported 848.83, result excluded, calculation error (iis calc. 851.58)
1275		-----		-----	
1300	ISO8217	852.26		-0.02	
1337		-----		-----	
1347		-----		-----	
1348		853.2		1.14	
1356		-----		-----	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385		852.6		0.40	
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404		852.1		-0.22	
1419		-----		-----	
1428		853		0.89	
1431		-----		-----	
1454		-----		-----	
1455		853		0.89	
1459		-----		-----	
1460		-----		-----	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520		852.1		-0.22	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635		-----		-----	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710		-----		-----	
1720		-----		-----	
1724		852.2		-0.10	
1728		-----		-----	
1740	ISO8217	852		-0.34	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833		850.8		-1.83	
1849		-----		-----	
1854	ISO8217	852		-0.34	
1906		-----		-----	
1915		-----		-----	
1938		-----		-----	

1943	-----	-----
1948	-----	-----
2129	854	2.13
2160	-----	-----

normality	OK
n	16
outliers	0
mean (n)	852.28
st.dev. (n)	0.784
R(calc.)	2.20
R(ISO8217:05)	2.27



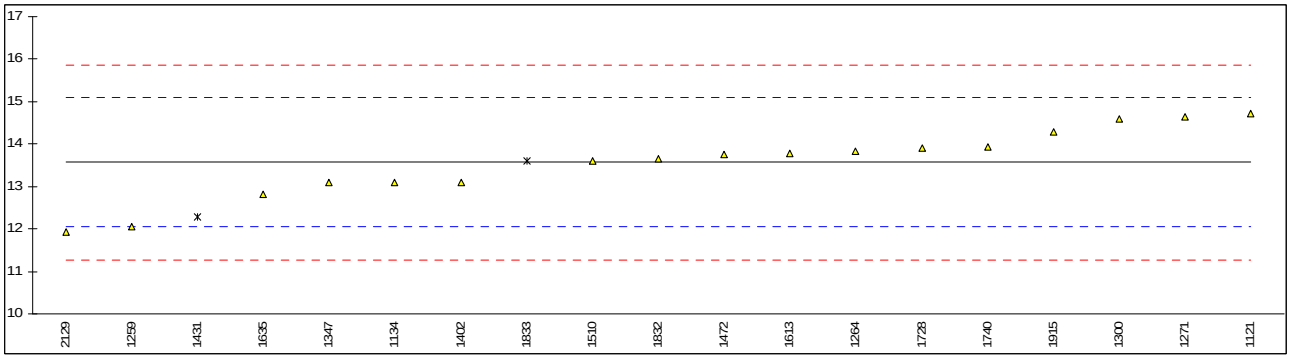


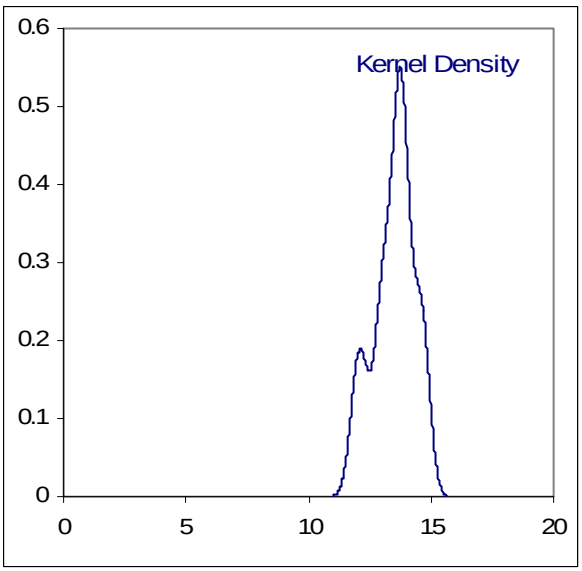
Determination of Conradson Carbon Residue on sample #12001; results in %M/M

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		-----		-----	
1080		-----		-----	
1095		-----		-----	
1108		-----		-----	
1121	IP13	14.73		1.51	
1126		-----		-----	
1134	IP13	13.1		-0.62	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215		-----		-----	
1231		-----		-----	
1233		-----		-----	
1259	D189	12.061		-1.98	
1264	D189	13.83		0.33	
1269		-----		-----	
1271	D189	14.65		1.40	
1275		-----		-----	
1300	D189	14.5879		1.32	
1337		-----		-----	
1347	D189	13.099		-0.62	
1348		-----		-----	
1356		-----		-----	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385		-----		-----	
1395		-----		-----	
1396		-----		-----	
1402	D189	13.1		-0.62	
1404		-----		-----	
1419		-----		-----	
1428		-----		-----	
1431	D524	12.29	ex	-1.68	Result excluded as used test method is not comparable
1454		-----		-----	
1455		-----		-----	
1459		-----		-----	
1460		-----		-----	
1466		-----		-----	
1472	ISO6615	13.7495		0.23	
1483		-----		-----	
1510	D189	13.6		0.03	
1520		-----		-----	
1613	D189	13.77		0.26	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	D189	12.8224		-0.98	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710		-----		-----	
1720		-----		-----	
1724		-----		-----	
1728	D189	13.9		0.43	
1740	D189	13.92		0.45	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832	ISO6615	13.640		0.09	
1833	D524	13.6	C, ex	0.03	First reported 16.5, result excluded test method is not comparable
1849		-----		-----	
1854		-----		-----	
1906		-----		-----	
1915	D189	14.276		0.92	
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	D189	11.93	-2.15
2160		-----	-----

normality	OK
n	17
outliers	0
mean (n)	13.574
st.dev. (n)	0.8144
R(calc.)	2.280
R(D189:10)	2.143



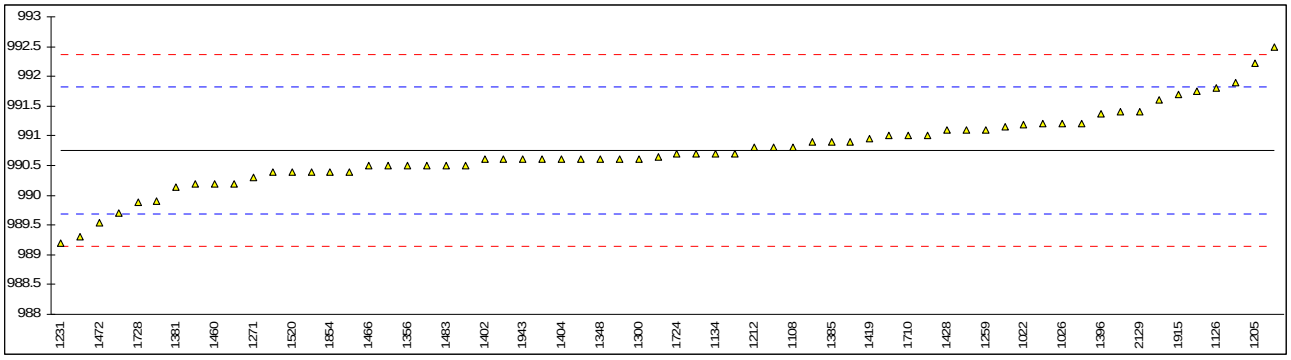


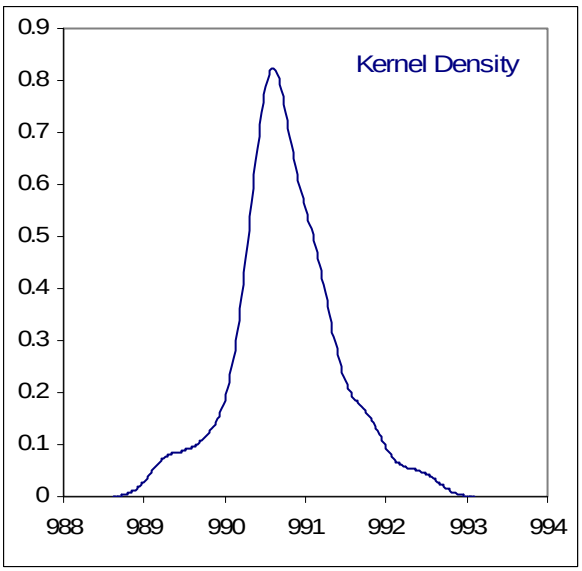
Determination of Density @ 15 °C on sample #12001; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022	ISO12185	991.18		0.79	
1026	D4052	991.2		0.83	
1059	ISO12185	990.8		0.08	
1062	D4052	991.2		0.83	
1065	D1298	989.9		-1.60	
1080	ISO12185	990.9		0.27	
1095	ISO12185	990.5		-0.48	
1108	ISO12185	990.8		0.08	
1121	IP365	990.7		-0.10	
1126	in house	991.8	C	1.95	First reported 962.19
1134	IP365	990.7	C	-0.10	First reported 0.9907
1140		-----		-----	
1167	ISO12185	990.2		-1.04	
1177		-----		-----	
1205	ISO12185	992.22		2.73	
1212	ISO12185	990.8		0.08	
1215	D1298	991.0		0.46	
1231	D1298	989.2		-2.90	
1233	ISO12185	990.4		-0.66	
1259	ISO3675	991.1		0.64	
1264	D4052	990.7		-0.10	
1269		-----		-----	
1271	ISO12185	990.3	C	-0.85	First reported 985.7
1275	IP365	991.1		0.64	
1300	ISO12185	990.6		-0.29	
1337		-----		-----	
1347	D4052	990.6		-0.29	
1348	D4052	990.6		-0.29	
1356	ISO12185	990.5		-0.48	
1358	IP160	992.5	C	3.26	First reported 0.9925
1381	ISO12185	990.14		-1.15	
1383		-----		-----	
1385	D4052	990.9		0.27	
1395	ISO12185	990.5		-0.48	
1396	IP365	991.37		1.15	
1402	ISO12185	990.6	C	-0.29	First reported 0.9906
1404	ISO12185	990.6		-0.29	
1419	ISO12185	990.95		0.36	
1428	ISO12185	991.1		0.64	
1431	D4052	990.64		-0.22	
1454		-----		-----	
1455	ISO12185	990.6		-0.29	
1459	ISO12185	991.6		1.58	
1460	D7042	990.2	C	-1.04	First reported 0.9902
1466	ISO3838	990.5	C	-0.48	First reported 0.9905
1472	D125	989.54		-2.27	
1483	ISO12185	990.5		-0.48	
1510		-----		-----	
1520	ISO12185	990.40		-0.66	
1613	D4052	990.4		-0.66	
1616		-----		-----	
1631	ISO12185	989.7		-1.97	
1633		-----		-----	
1635		-----		-----	
1636	D1298	991.0		0.46	
1654	ISO12185	991.16		0.76	
1656		-----		-----	
1710	ISO12185	991.0		0.46	
1720	D4052	990.9	C	0.27	First reported 988.8
1724	ISO12185	990.7		-0.10	
1728	D4052	989.88		-1.63	
1740	ISO3675	990.4		-0.66	
1807	ISO12185	990.2		-1.04	
1810	ISO12185	991.9		2.14	
1811	ISO12185	991.4		1.20	
1832	ISO12185	990.5		-0.48	
1833	ISO12185	989.3		-2.72	
1849	ISO12185	991.21		0.85	
1854	ISO12185	990.4		-0.66	
1906		-----		-----	
1915	D4052	991.7	C	1.76	First reported 993.4
1938	ISO12185	990.6		-0.29	

1943	ISO3675	990.6	-0.29
1948	ISO12185	990.6	-0.29
2129	D4052	991.4	1.20
2160	ISO12185	991.75	1.86

normality	not OK
n	64
outliers	0
mean (n)	990.76
st.dev. (n)	0.622
R(calc.)	1.74
R(ISO12185:04)	1.50



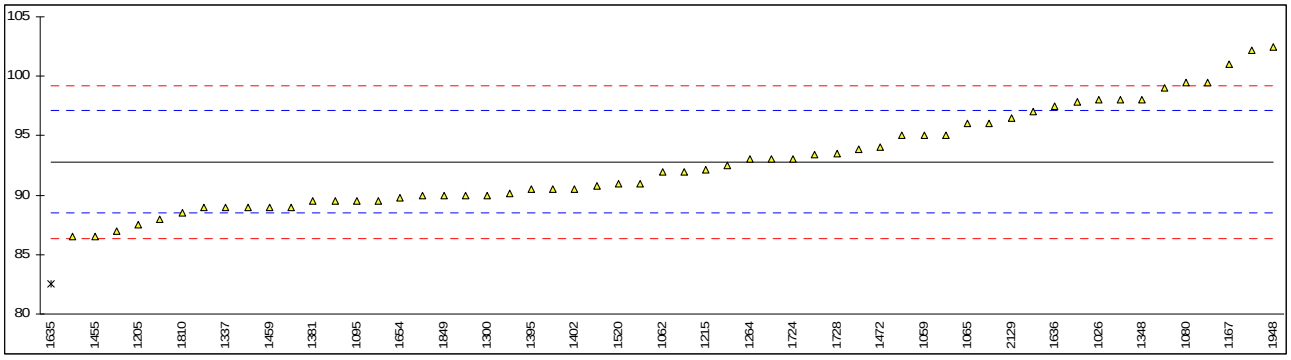


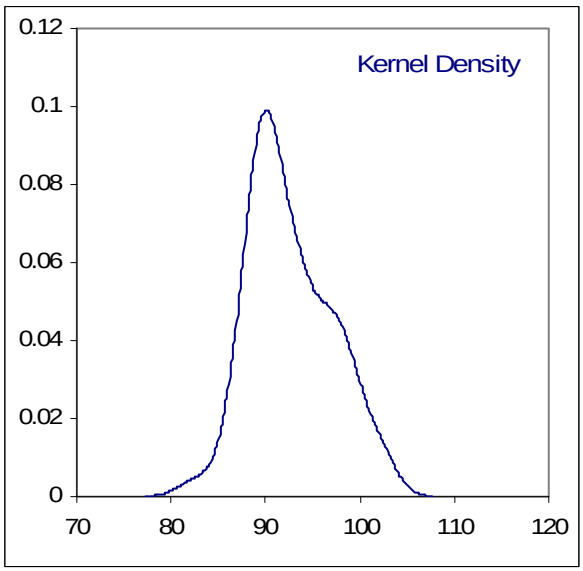
Determination of Flash Point PMcc on sample #12001; results in °C

lab	method	value	mark	z(targ)	remarks
1011	EN22719	89.0		-1.78	
1016		-----		-----	
1022		-----		-----	
1026	D93	98.0		2.42	
1059	ISO2719	95.0		1.02	
1062	D93	92.0		-0.38	
1065	D93	96		1.49	
1080	ISO2719	99.5	C	3.12	First reported 116
1095	D93	89.5		-1.54	
1108	ISO2719	97.0		1.96	
1121	IP34	88		-2.24	
1126		-----		-----	
1134	IP34	89.5		-1.54	
1140		-----		-----	
1167	ISO2719	101.0		3.82	
1177		-----		-----	
1205	D93	87.5		-2.48	
1212		-----		-----	
1215	D93	92.106		-0.33	
1231	D93	91.0		-0.84	
1233	ISO2719	95.0		1.02	
1259	ISO2719	98.0		2.42	
1264	D93	93.0		0.09	
1269	D93	89		-1.78	
1271	ISO2719	93.9		0.51	
1275		-----		-----	
1300	ISO2719	90		-1.31	
1337	ISO2719	89.0		-1.78	
1347	D93	102.2		4.38	
1348	D93	98		2.42	
1356	ISO2719	95		1.02	
1358	IP34	99.5		3.12	
1381	ISO2719	89.50		-1.54	
1383		-----		-----	
1385	D93	99		2.89	
1395	ISO2719	90.5		-1.08	
1396	IP523	97.84		2.35	
1402	ISO2719	90.5		-1.08	
1404		-----		-----	
1419		-----		-----	
1428	ISO2719	89.5		-1.54	
1431	D93	93.4		0.28	
1454		-----		-----	
1455	ISO2719	86.5		-2.94	
1459	D93	89.0		-1.78	
1460	D93	87.0		-2.71	
1466		-----		-----	
1472	ISO2719	94.00		0.56	
1483		-----		-----	
1510	IP34	90		-1.31	
1520	ISO2719	91.00		-0.84	
1613	D93	92.5		-0.14	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	ISO2719	82.5	G(0.05)	-4.81	
1636	ISO2719	97.5		2.19	
1654	ISO2719	89.8		-1.40	
1656		-----		-----	
1710	ISO2719	96.0		1.49	
1720		-----		-----	
1724	ISO2719	93		0.09	
1728	D93	93.5		0.32	
1740	ISO2719	86.5		-2.94	
1807	ISO2719	90.5		-1.08	
1810	ISO2719	88.5		-2.01	
1811	ISO2719	89		-1.78	
1832	ISO2719	90.0		-1.31	
1833	ISO2719	93		0.09	
1849	ISO2719	90		-1.31	
1854	ISO2719	90.1		-1.26	
1906		-----		-----	
1915	D93	92		-0.38	
1938		-----		-----	

1943		-----	-----
1948	ISO2719	102.5	4.52
2129	ISO2719	96.5	1.72
2160	D93	90.75	-0.96

normality	not OK
n	56
outliers	1
mean (n)	92.81
st.dev. (n)	4.158
R(calc.)	11.64
R(D93-B:11)	6.00

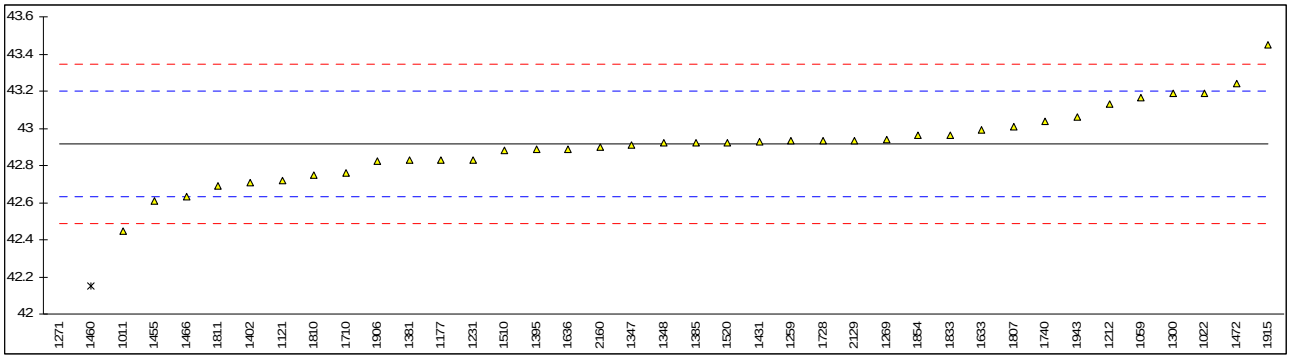


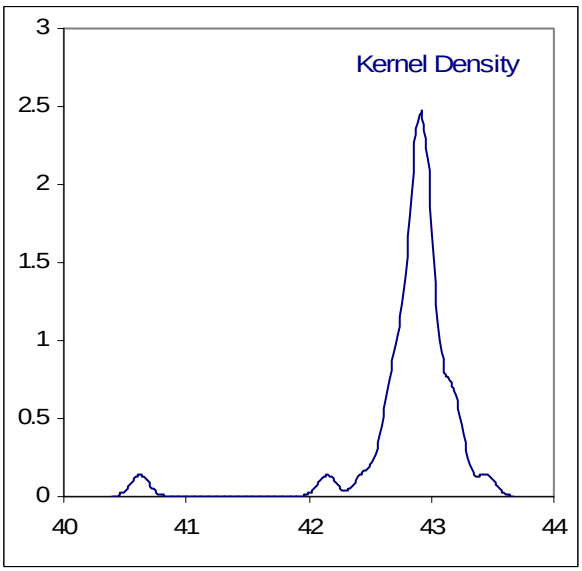


Determination of Heat of Combustion Gross on sample #12001; results in MJ/kg

lab	method	value	mark	z(targ)	remarks
1011	D240	42.4437		-3.31	
1016		-----		-----	
1022	D240	43.19		1.92	
1026		-----		-----	
1059	DIN51900Mod.	43.168		1.76	
1062		-----		-----	
1065		-----		-----	
1080		-----		-----	
1095		-----		-----	
1108		-----		-----	
1121	D240	42.716		-1.40	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167		-----		-----	
1177	DIN51900	42.830		-0.60	
1205		-----		-----	
1212	D240	43.128		1.48	
1215		-----		-----	
1231	D240	42.830	C	-0.60	First reported 42
1233		-----		-----	
1259	D240	42.932		0.11	
1264		-----		-----	
1269	DIN51900	42.937		0.15	
1271	D4868	40.622	C,ex	-16.06	First reported 40.667. Result excluded “Net” > “Gross”, results mixed up?
1275		-----		-----	
1300	ISO8217	43.1877		1.90	
1337		-----		-----	
1347	D4868	42.908		-0.06	
1348	D4868	42.92		0.03	
1356		-----		-----	
1358		-----		-----	
1381	D240	42.8286		-0.61	
1383		-----		-----	
1385	D4868	42.92		0.03	
1395	D240	42.8846		-0.22	
1396		-----		-----	
1402	IP12	42.705		-1.48	
1404		-----		-----	
1419		-----		-----	
1428		-----		-----	
1431	D240	42.927		0.08	
1454		-----		-----	
1455	D240	42.607		-2.16	
1459		-----		-----	
1460	D240	42.150	G(0.05)	-5.36	
1466	ISO1928	42.63		-2.00	
1472	ISO8217	43.243		2.29	
1483		-----		-----	
1510	D240	42.88		-0.25	
1520	D4868	42.923		0.05	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633	D5468	42.99		0.52	
1635		-----		-----	
1636	D4868	42.889		-0.19	
1654		-----		-----	
1656		-----		-----	
1710	D4809	42.760		-1.09	
1720		-----		-----	
1724		-----		-----	
1728	D4868	42.93358		0.12	
1740	D240	43.040		0.87	
1807	D240	43.007		0.64	
1810	D240	42.747		-1.18	
1811	D240	42.6885		-1.59	
1832		-----		-----	
1833	D240	42.965		0.34	
1849		-----		-----	
1854	D240	42.960		0.31	
1906	D4809	42.825		-0.64	
1915	D4809	43.4504		3.74	
1938		-----		-----	

1943	DIN51900	43.061		1.02	
1948		-----		-----	
2129	D240	42.9340		0.13	
2160	INH-1740	42.8979	C	-0.13	First reported 42897.95
					Only ASTM D240/D4809
	normality	OK			OK
	n	37			21
	outliers	1			1
	mean (n)	42.916			42.892
	st.dev. (n)	0.1922			0.2135
	R(calc.)	0.538			0.598
	R(D240:09)	0.400			0.400



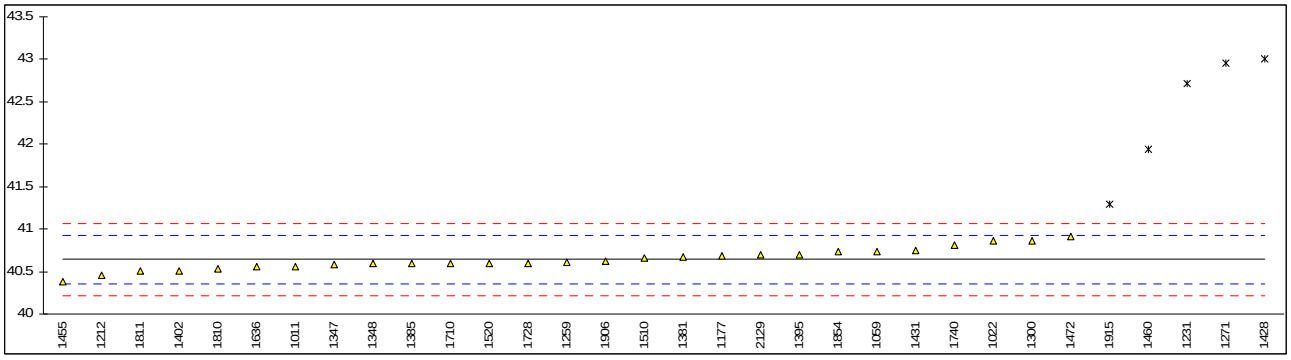


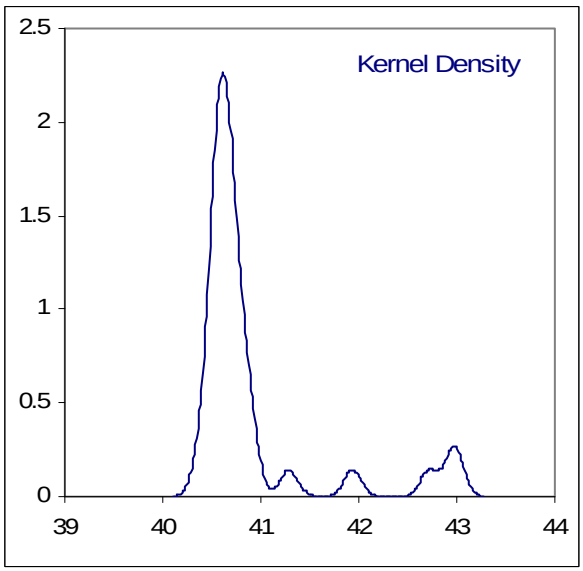
Determination of Heat of Combustion Net on sample #12001; results in MJ/kg

lab	method	value	mark	z(targ)	remarks
1011	D240	40.5638		-0.55	
1016		-----		-----	
1022	D240	40.86		1.52	
1026		-----		-----	
1059	DIN51900Mod.	40.738		0.67	
1062		-----		-----	
1065		-----		-----	
1080		-----		-----	
1095		-----		-----	
1108		-----		-----	
1121		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167		-----		-----	
1177	DIN51900	40.685		0.29	
1205		-----		-----	
1212	D240	40.454		-1.32	
1215		-----		-----	
1231	D240	42.720	C,G(0.01)	14.54	First reported 42
1233		-----		-----	
1259	D240	40.61		-0.23	
1264		-----		-----	
1269		-----		-----	
1271	D4868	42.952	C,ex	16.16	First reported 43.012, result excluded “Net” > “Gross”, results mixed up?
1275		-----		-----	
1300	ISO8217	40.8628		1.54	
1337		-----		-----	
1347	D4868	40.578		-0.45	
1348	D4868	40.59		-0.37	
1356		-----		-----	
1358		-----		-----	
1381	D240	40.6726		0.21	
1383		-----		-----	
1385	D4868	40.59		-0.37	
1395	D240	40.7033		0.42	
1396		-----		-----	
1402	IP12	40.510		-0.93	
1404		-----		-----	
1419		-----		-----	
1428	D240	43.00	G(0.05)	16.50	
1431	D240	40.742		0.69	
1454		-----		-----	
1455	D240	40.379		-1.85	
1459		-----		-----	
1460	D240	41.938	G(0.01)	9.07	
1466		-----		-----	
1472	ISO8217	40.913		1.89	
1483		-----		-----	
1510	D240	40.66		0.12	
1520	D4868	40.593		-0.35	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635		-----		-----	
1636	D4868	40.561		-0.57	
1654		-----		-----	
1656		-----		-----	
1710	D4809	40.590		-0.37	
1720		-----		-----	
1724		-----		-----	
1728	D4868	40.60199		-0.29	
1740	D240	40.810		1.17	
1807		-----		-----	
1810	D240	40.529		-0.80	
1811	D240	40.503		-0.98	
1832		-----		-----	
1833		-----		-----	
1849		-----		-----	
1854	D240	40.734		0.64	
1906	D4809	40.623		-0.14	
1915	D4809	41.2876	G(0.01)	4.51	
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	D240	40.702	0.41
2160		-----	-----

		Only ASTM D240/D4809
normality	OK	OK
n	27	16
outliers	4	4
mean (n)	40.643	40.633
st.dev. (n)	0.1272	0.1287
R(calc.)	0.356	0.360
R(D240:09)	0.400	0.400



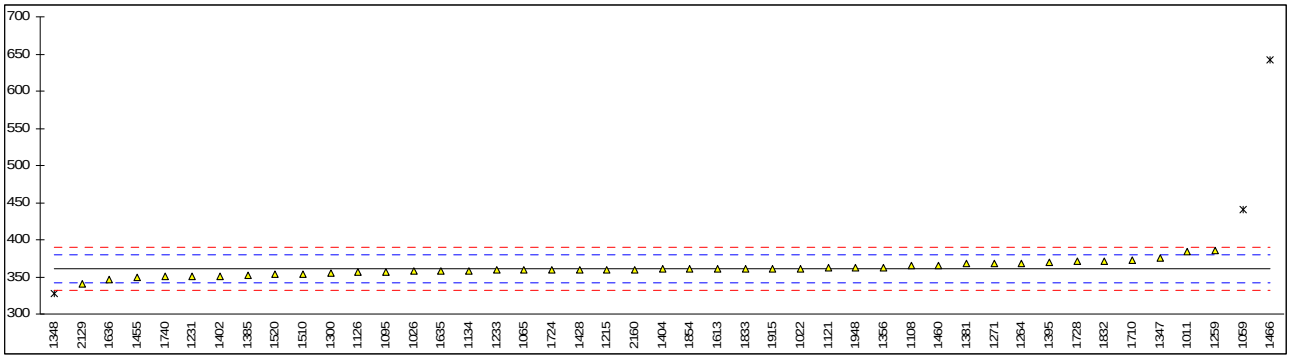


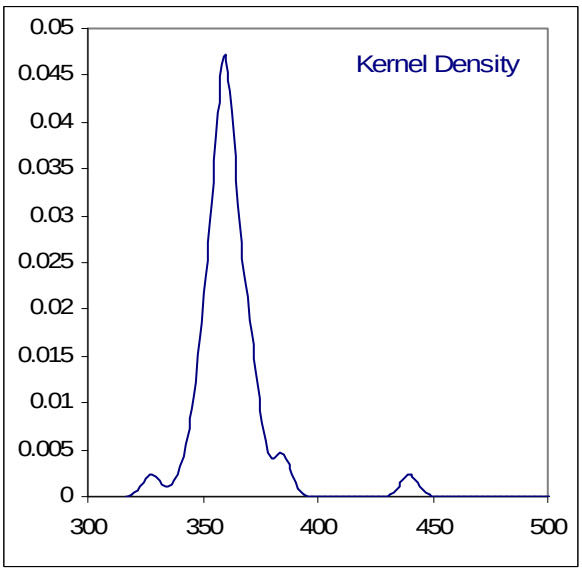
Determination of Kinematic Viscosity @ 50°C on sample #12001; results in mm²/s

lab	method	value	mark	z(targ)	remarks
1011	D445	383.75		2.39	
1016		-----		-----	
1022	D445	361.35		0.04	
1026	ISO3104	357.4		-0.37	
1059	ISO3104	439.93	G(0.01)	8.28	
1062		-----		-----	
1065	D445	359.3		-0.17	
1080		-----		-----	
1095	D445	357.0		-0.41	
1108	ISO3104	364.8		0.40	
1121	IP71	362.19		0.13	
1126	ISO3104	356.42		-0.47	
1134	IP71	357.8		-0.33	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215	D445	359.9		-0.11	
1231	D445	350.3		-1.12	
1233	ISO3104	359.03		-0.20	
1259	ISO3104	385.66		2.59	
1264	D445	368.832		0.83	
1269		-----		-----	
1271	ISO3104	367.81		0.72	
1275		-----		-----	
1300	ISO3104	354.5327		-0.67	
1337		-----		-----	
1347	D445	375.48		1.52	
1348	D445	327.8	G(0.05)	-3.47	
1356	ISO3104	362.8		0.19	
1358		-----		-----	
1381	ISO3104	367.50		0.69	
1383		-----		-----	
1385	D445	352.12		-0.92	
1395	ISO3104	369.3		0.88	
1396		-----		-----	
1402	IP71	350.7		-1.07	
1404	ISO3104	360.2		-0.08	
1419		-----		-----	
1428	ISO3104	359.6		-0.14	
1431		-----		-----	
1454		-----		-----	
1455	ISO3104	348.7		-1.28	
1459		-----		-----	
1460	D445	365.68		0.50	
1466	D2196	642.0	G(0.01)	29.46	
1472		-----		-----	
1483		-----		-----	
1510	D445	353.4		-0.79	
1520	ISO3104	353.15		-0.82	
1613	D445	360.45		-0.05	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	ISO3104	357.5		-0.36	
1636	ISO3104	346.386		-1.53	
1654		-----		-----	
1656		-----		-----	
1710	ISO3104	372.2		1.18	
1720		-----		-----	
1724	ISO3104	359.53		-0.15	
1728	INH-117	371.1		1.06	
1740	ISO3104	350.25		-1.12	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832	ISO3104	371.480		1.10	
1833	ISO3104	360.8		-0.01	
1849		-----		-----	
1854	ISO3104	360.2		-0.08	
1906		-----		-----	
1915	D445	361.163		0.02	
1938		-----		-----	

1943		-----	-----
1948	ISO3104	362.51	0.16
2129	ISO3104	341.30	-2.06
2160	D445	360	-0.10

normality	OK
n	42
outliers	3
mean (n)	360.942
st.dev. (n)	9.0407
R(calc.)	25.314
R(D445:11a)	26.710



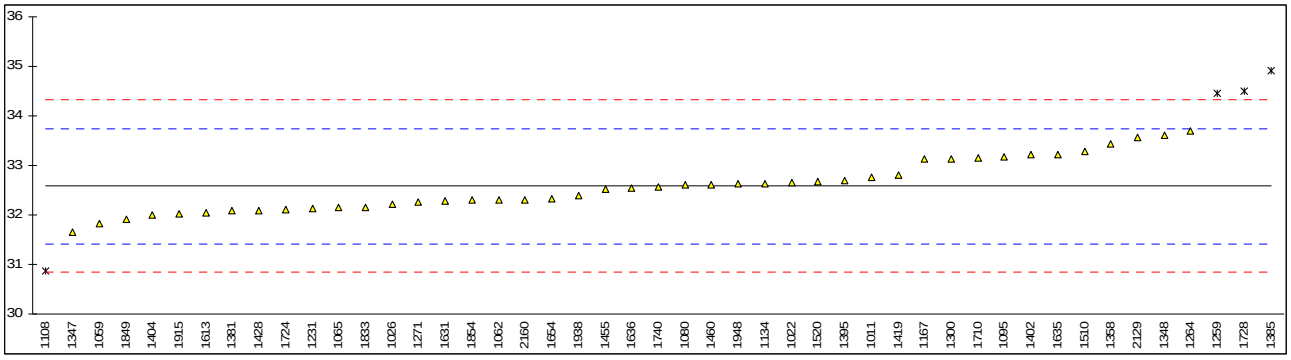


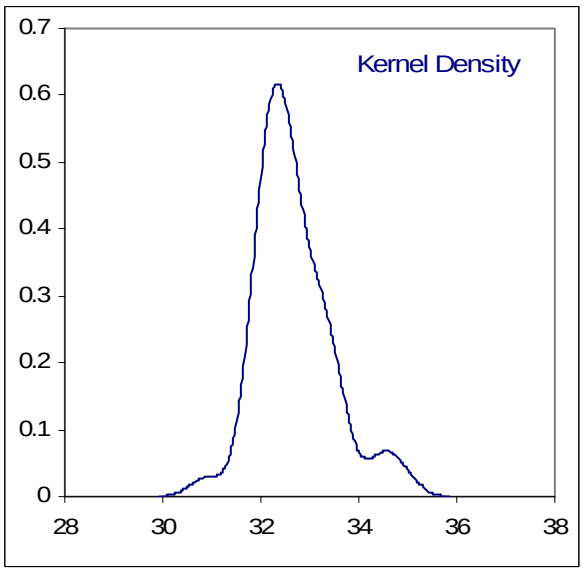
Determination of Kinematic Viscosity @ 100°C on sample #12001; results in mm²/s

lab	method	value	mark	z(targ)	remarks
1011	D445	32.770		0.33	
1016		-----		-----	
1022	D445	32.662		0.14	
1026	ISO3104	32.22		-0.62	
1059	ISO3104	31.82		-1.31	
1062	D445	32.31		-0.46	
1065	D445	32.15		-0.74	
1080	ISO3104	32.61		0.06	
1095	D445	33.17		1.02	
1108	ISO3104	30.87	G(0.05)	-2.95	
1121		-----		-----	
1126		-----		-----	
1134	IP71	32.63		0.09	
1140		-----		-----	
1167	ISO3104	33.13		0.95	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215		-----		-----	
1231	D445	32.12		-0.79	
1233		-----		-----	
1259	ISO3104	34.465	G(0.05)	3.26	
1264	D445	33.6985		1.93	
1269		-----		-----	
1271	ISO3104	32.26		-0.55	
1275		-----		-----	
1300	ISO3104	33.1387		0.97	
1337		-----		-----	
1347	D445	31.65		-1.60	
1348	D445	33.6		1.76	
1356		-----		-----	
1358	IP71	33.4435		1.49	
1381	ISO3104	32.090		-0.84	
1383		-----		-----	
1385	D445	34.91	DG(0.05)	4.02	
1395	ISO3104	32.70		0.21	
1396		-----		-----	
1402	IP71	33.21		1.09	
1404	ISO3104	32.00		-1.00	
1419	ISO3104	32.80		0.38	
1428	ISO3104	32.09		-0.84	
1431		-----		-----	
1454		-----		-----	
1455	ISO3104	32.53		-0.08	
1459		-----		-----	
1460	D445	32.618		0.07	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510	D445	33.28		1.21	
1520	ISO3104	32.668		0.16	
1613	D445	32.04		-0.93	
1616		-----		-----	
1631	ISO3104	32.276		-0.52	
1633		-----		-----	
1635	ISO3104	33.21		1.09	
1636	ISO3104	32.545		-0.06	
1654	ISO3104	32.32		-0.45	
1656		-----		-----	
1710	ISO3104	33.15		0.99	
1720		-----		-----	
1724	ISO3104	32.111		-0.81	
1728	INH-117	34.5	DG(0.05)	3.32	
1740	ISO3104	32.575		-0.01	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833	ISO3104	32.157		-0.73	
1849	ISO3104	31.906		-1.16	
1854	ISO3104	32.30		-0.48	
1906		-----		-----	
1915	D445	32.024		-0.96	
1938	ISO3104	32.386		-0.33	

1943		-----	-----
1948	ISO3104	32.620	0.07
2129	ISO3104	33.557	1.69
2160	D445	32.31	-0.46

normality	OK
n	43
outliers	4
mean (n)	32.578
st.dev. (n)	0.5221
R(calc.)	1.462
R(D445:11a)	1.623



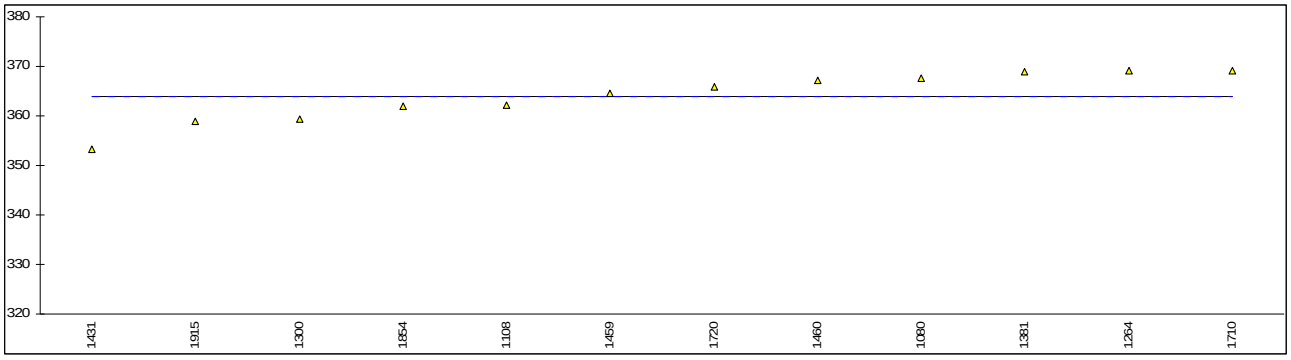


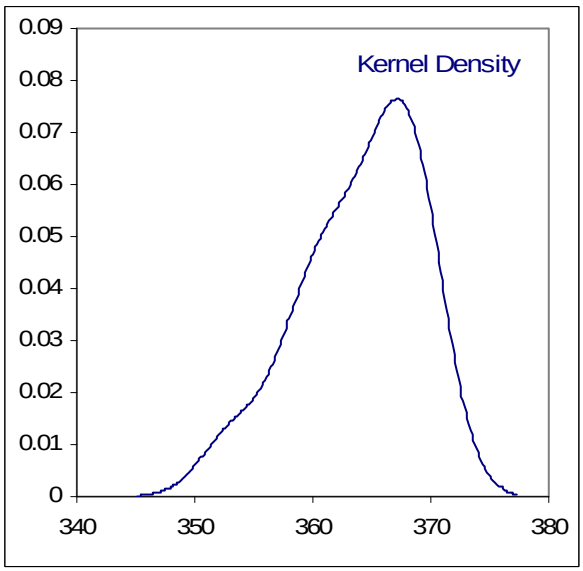
Determination of Viscosity Stabinger @ 50°C on sample #12001; results in mm²/s

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		-----		-----	
1080	D7042	367.6		-----	
1095		-----		-----	
1108	D7042	362.2		-----	
1121		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215		-----		-----	
1231		-----		-----	
1233		-----		-----	
1259		-----		-----	
1264	D7042	369.09		-----	
1269		-----		-----	
1271		-----		-----	
1275		-----		-----	
1300	D7042	359.247	C	-----	First reported 379.87
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356		-----		-----	
1358		-----		-----	
1381	D7042	368.89		-----	
1383		-----		-----	
1385		-----		-----	
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404		-----		-----	
1419		-----		-----	
1428		-----		-----	
1431	D7042	353.3		-----	
1454		-----		-----	
1455		-----		-----	
1459	D7042	364.60		-----	
1460	D7042	367.095		-----	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520		-----		-----	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635		-----		-----	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710	D7042	369.1		-----	
1720	D7042	365.8		-----	
1724		-----		-----	
1728		-----		-----	
1740		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833		-----		-----	
1849		-----		-----	
1854	D7042	362.0		-----	
1906		-----		-----	
1915	D7042	358.86		-----	
1938		-----		-----	

1943	-----	-----
1948	-----	-----
2129	-----	-----
2160	-----	-----

normality	OK
n	12
outliers	0
mean (n)	363.982
st.dev. (n)	4.9791
R(calc.)	13.941
R(D7042:11a)	unknown



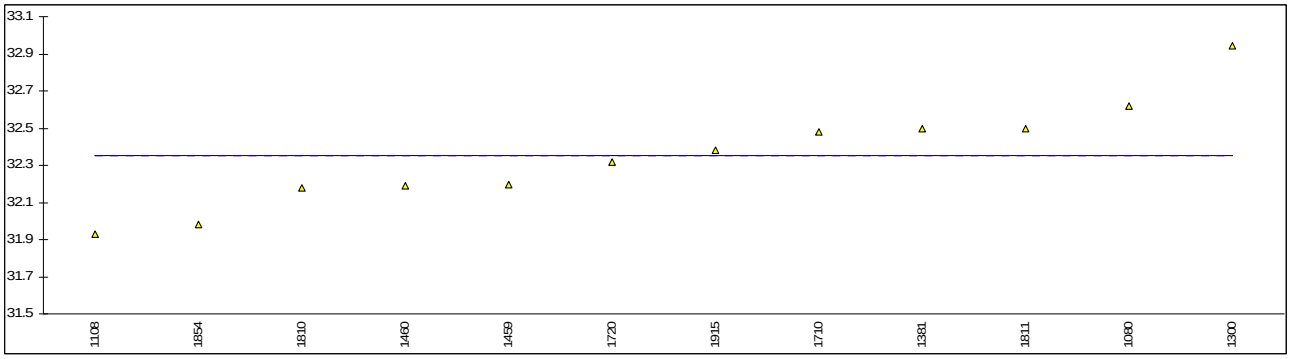


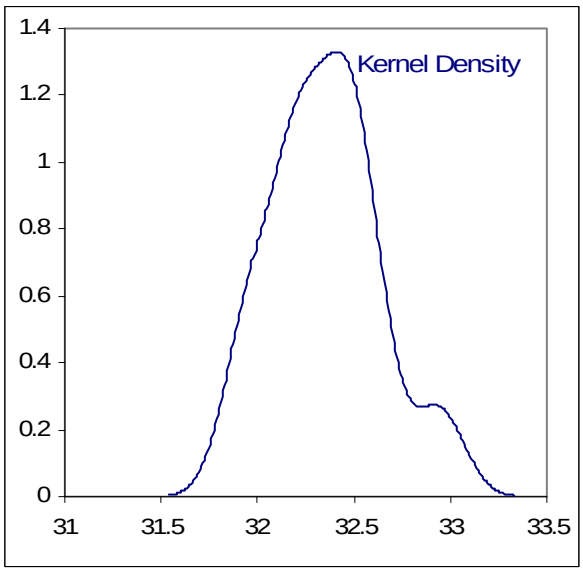
Determination of Viscosity Stabinger @ 100°C on sample #12001; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		-----		-----	
1080	D7042	32.62		-----	
1095		-----		-----	
1108	D7042	31.93		-----	
1121		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215		-----		-----	
1231		-----		-----	
1233		-----		-----	
1259		-----		-----	
1264		-----		-----	
1269		-----		-----	
1271		-----		-----	
1275		-----		-----	
1300	D7042	32.9437	C	-----	First reported 33.454
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356		-----		-----	
1358		-----		-----	
1381	D7042	32.495		-----	
1383		-----		-----	
1385		-----		-----	
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404		-----		-----	
1419		-----		-----	
1428		-----		-----	
1431		-----		-----	
1454		-----		-----	
1455		-----		-----	
1459	D7042	32.198		-----	
1460	D4530	32.1873		-----	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520		-----		-----	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635		-----		-----	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710	D7042	32.48		-----	
1720	D7042	32.32		-----	
1724		-----		-----	
1728		-----		-----	
1740		-----		-----	
1807		-----		-----	
1810	D7042	32.18		-----	
1811	D7042	32.5		-----	
1832		-----		-----	
1833		-----		-----	
1849		-----		-----	
1854	D7042	31.98		-----	
1906		-----		-----	
1915	D7042	32.38	C	-----	First reported 31.42
1938		-----		-----	

1943	-----	-----
1948	-----	-----
2129	-----	-----
2160	-----	-----

normality	OK
n	12
outliers	0
mean (n)	32.351
st.dev. (n)	0.2827
R(calc.)	0.792
R(D7042:11a)	unknown



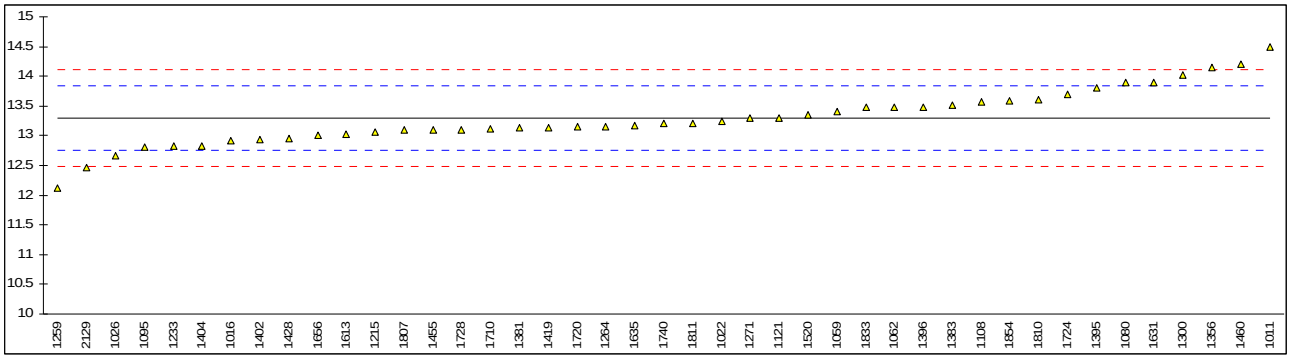


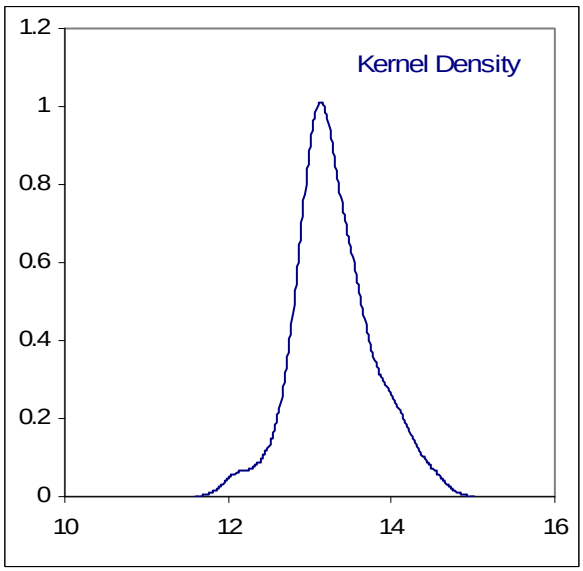
Determination of Micro Carbon Residue on sample #12001; results in %M/M

lab	method	value	mark	z(targ)	remarks
1011	D4530	14.50		4.43	
1016	ISO10370	12.922		-1.36	
1022	D4530	13.25		-0.16	
1026	ISO10370	12.655		-2.35	
1059	ISO10370	13.41		0.43	
1062	D4530	13.48		0.68	
1065		-----		-----	
1080	ISO10370	13.90		2.23	
1095	D4530	12.8		-1.81	
1108	ISO10370	13.56		0.98	
1121	IP398	13.304		0.04	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215	D4530	13.06		-0.86	
1231		-----		-----	
1233	ISO10370	12.83		-1.70	
1259	ISO10370	12.113		-4.33	
1264	D4530	13.15		-0.53	
1269		-----		-----	
1271	ISO10370	13.30		0.02	
1275		-----		-----	
1300	ISO10370	14.0203		2.67	
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356	ISO10370	14.1544		3.16	
1358		-----		-----	
1381	ISO10370	13.138		-0.57	
1383	IP398	13.5209		0.83	
1385		-----		-----	
1395	ISO10370	13.8		1.86	
1396	IP398	13.4871		0.71	
1402	ISO10370	12.94		-1.30	
1404	ISO10370	12.83		-1.70	
1419	ISO10370	13.14		-0.56	
1428	ISO10370	12.95		-1.26	
1431		-----		-----	
1454		-----		-----	
1455	ISO10370	13.1		-0.71	
1459		-----		-----	
1460	ISO10370	14.203		3.34	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520	ISO10370	13.35		0.21	
1613	D4530	13.02		-1.01	
1616		-----		-----	
1631	ISO10370	13.9		2.23	
1633		-----		-----	
1635	ISO10370	13.1655		-0.47	
1636		-----		-----	
1654		-----		-----	
1656	IP398	13.0		-1.08	
1710	ISO10370	13.11		-0.67	
1720	D4530	13.15	C	-0.53	First reported 11.39
1724	ISO10370	13.7		1.49	
1728	D4530	13.1		-0.71	
1740	ISO10370	13.20		-0.34	
1807	ISO10370	13.10		-0.71	
1810	ISO10370	13.6		1.12	
1811	ISO10370	13.2		-0.34	
1832		-----		-----	
1833	ISO10370	13.48	C	0.68	First reported 15.48
1849		-----		-----	
1854	ISO10370	13.58		1.05	
1906		-----		-----	
1915		-----		-----	
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	ISO10370	12.4598	-3.06
2160		-----	-----

normality	OK
n	43
outliers	0
mean (n)	13.294
st.dev. (n)	0.4672
R(calc.)	1.308
R(D4530:11)	0.764



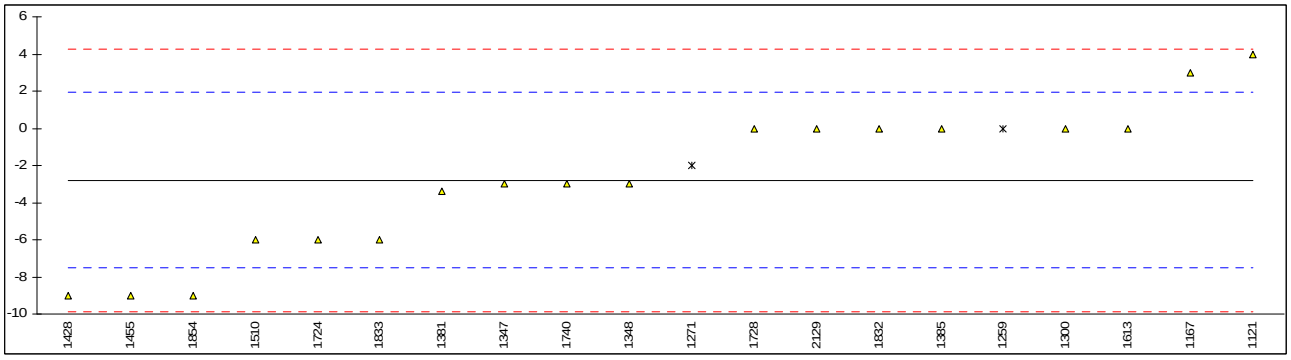


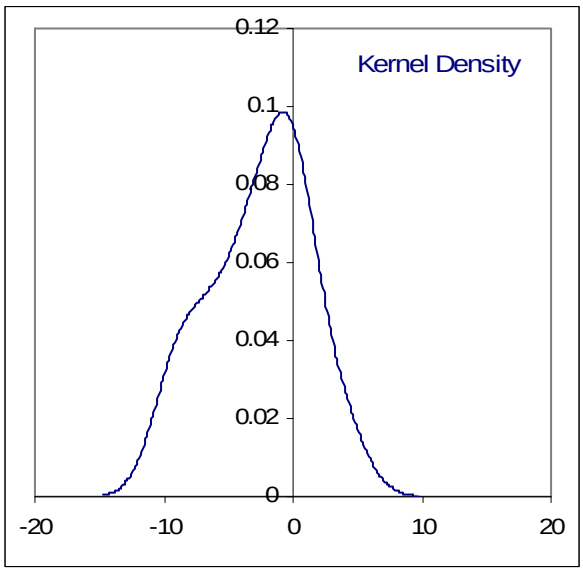
Determination of Pour Point (Lower) on sample #12001; results in ^{o}C

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		-----		-----	
1080		-----		-----	
1095		-----		-----	
1108		-----		-----	
1121	IP15	4		2.88	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167	ISO3016	3		2.46	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215		-----		-----	
1231		-----		-----	
1233		-----		-----	
1259	ISO3016	0	ex	1.19	Result excluded as “lower PP” > “upper PP”
1264		-----		-----	
1269		-----		-----	
1271	ISO3016	-2	C,ex	0.34	First reported -6, Result excluded as “lower PP” > “upper PP”
1275		-----		-----	
1300	ISO3016	0		1.19	
1337		-----		-----	
1347	D97	-3		-0.08	
1348	D97	-3		-0.08	
1356		-----		-----	
1358		-----		-----	
1381	ISO3016	-3.4		-0.25	
1383		-----		-----	
1385	D97	0	C	1.19	First reported 3
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404		-----		-----	
1419		-----		-----	
1428	ISO3016	-9		-2.63	
1431		-----		-----	
1454		-----		-----	
1455	ISO3016	-9		-2.63	
1459		-----		-----	
1460		-----		-----	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510	D97	-6		-1.36	
1520		-----		-----	
1613	D97	0.0		1.19	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635		-----		-----	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710		-----		-----	
1720		-----		-----	
1724	ISO3016	-6		-1.36	
1728	D97	0		1.19	
1740	ISO3016	-3		-0.08	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832	ISO3016	0		1.19	
1833	ISO3016	-6		-1.36	
1849		-----		-----	
1854	ISO3016	-9		-2.63	
1906		-----		-----	
1915		-----		-----	
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	ISO3016	0	1.19
2160		-----	-----

normality	not OK
n	18
outliers	0
mean (n)	-2.80
st.dev. (n)	4.011
R(calc.)	11.23
R(D97:11)	6.60



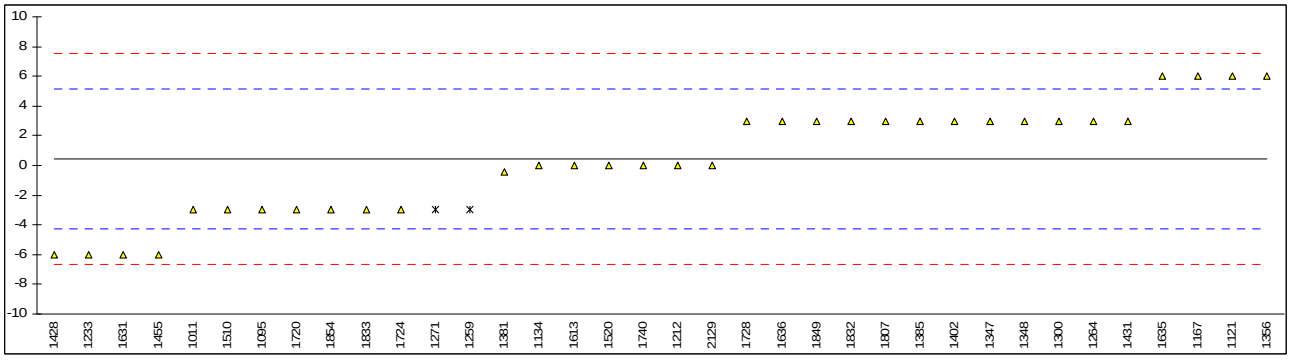


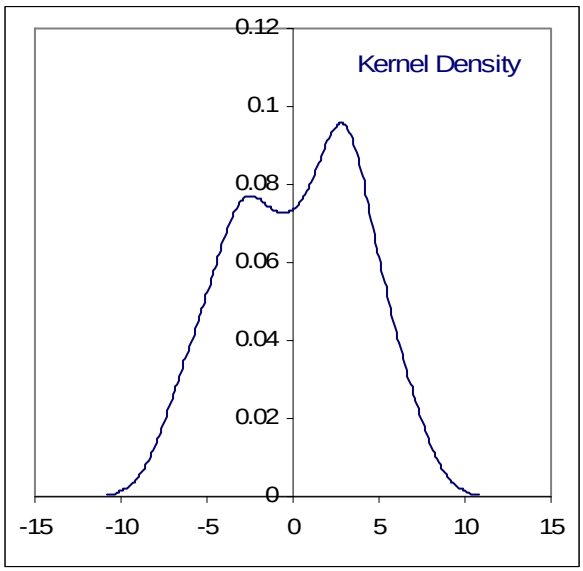
Determination of Pour Point (Upper) on sample #12001; results in ^{o}C

lab	method	value	mark	z(targ)	remarks
1011	D97	-3		-1.45	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		-----		-----	
1080		-----		-----	
1095	ISO3016	-3		-1.45	
1108		-----		-----	
1121	IP15	6		2.36	
1126		-----		-----	
1134	IP15	0		-0.18	
1140		-----		-----	
1167	ISO3016	6		2.36	
1177		-----		-----	
1205		-----		-----	
1212	D97	0		-0.18	
1215		-----		-----	
1231		-----		-----	
1233	ISO3016	-6		-2.73	
1259	ISO3016	-3	ex	-1.45	Result excluded as “lower PP” > “upper PP”
1264	D97	3		1.09	
1269		-----		-----	
1271	ISO3016	-3	C,ex	-1.45	First reported -9, Result excluded as “lower PP” > “upper PP”
1275		-----		-----	
1300	ISO3016	3		1.09	
1337		-----		-----	
1347	D97	3		1.09	
1348	D97	3		1.09	
1356	ISO3016	6		2.36	
1358		-----		-----	
1381	ISO3016	-0.4		-0.35	
1383		-----		-----	
1385	D97	3	C	1.09	First reported 0
1395		-----		-----	
1396		-----		-----	
1402	IP15	3		1.09	
1404		-----		-----	
1419		-----		-----	
1428	ISO3016	-6		-2.73	
1431	D97	3		1.09	
1454		-----		-----	
1455	ISO3016	-6		-2.73	
1459		-----		-----	
1460		-----		-----	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510	D97	-3		-1.45	
1520	ISO3016	0		-0.18	
1613	D97	0.0		-0.18	
1616		-----		-----	
1631	ISO3016	-6		-2.73	
1633		-----		-----	
1635	ISO3016	6		2.36	
1636	ISO3016	3		1.09	
1654		-----		-----	
1656		-----		-----	
1710		-----		-----	
1720	D97	-3		-1.45	
1724	ISO3016	-3		-1.45	
1728	ISO3016	3		1.09	
1740	ISO3016	0		-0.18	
1807	ISO3016	3		1.09	
1810		-----		-----	
1811		-----		-----	
1832	ISO3016	3.0		1.09	
1833	ISO3016	-3		-1.45	
1849	ISO3016	3		1.09	
1854	ISO3016	-3		-1.45	
1906		-----		-----	
1915		-----		-----	
1938		-----		-----	

1943		-----		-----	
1948		-----		-----	
2129	ISO3016	0	C	-0.18	First reported -3
2160		-----		-----	

normality	not OK
n	34
outliers	0
mean (n)	0.43
st.dev. (n)	3.705
R(calc.)	10.37
R(D97:11)	6.60



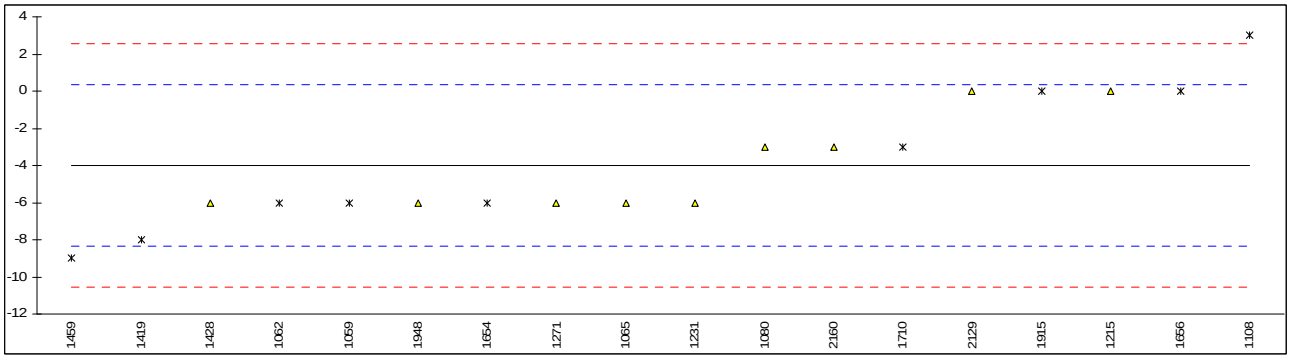


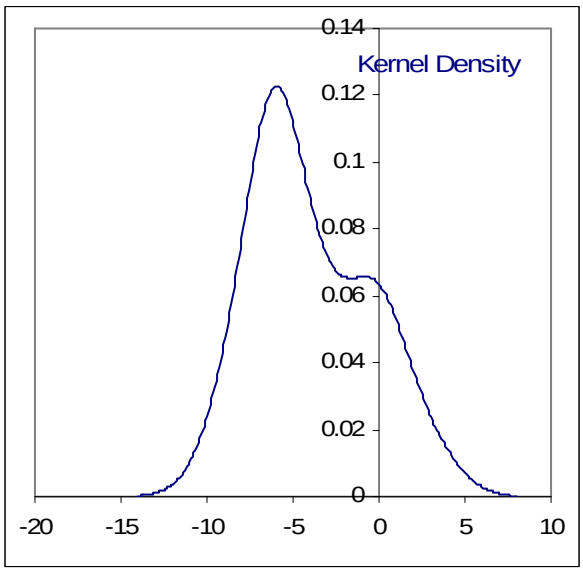
Determination of Pour Point (Automated) on sample #12001; results in ^{o}C

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059	ISO3016	-6	ex	-0.92	Result is determined with manual method
1062	D97	-6	ex	-0.92	Result is determined with manual method
1065	D5950	-6		-0.92	
1080	D5950	-3		0.46	
1095		-----		-----	
1108	D5950	3	G(0.05)	3.21	
1121		-----		-----	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215	D5950	0		1.84	
1231	D5950	-6		-0.92	
1233		-----		-----	
1259		-----		-----	
1264		-----		-----	
1269		-----		-----	
1271	D5985	-6	C	-0.92	First reported -15
1275		-----		-----	
1300		-----		-----	
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356		-----		-----	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385		-----		-----	
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404		-----		-----	
1419	D97	-8	ex	-1.84	Result is determined with manual method
1428	D6749	-6		-0.92	
1431		-----		-----	
1454		-----		-----	
1455		-----		-----	
1459	ISO3016	-9	ex	-2.30	Result is determined with manual method
1460		-----		-----	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520		-----		-----	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635		-----		-----	
1636		-----		-----	
1654	ISO3016	-6.0	ex	-0.92	Result is determined with manual method
1656	IP15	0	ex	1.84	Result is determined with manual method
1710	D97	-3	ex	0.46	Result is determined with manual method
1720		-----		-----	
1724		-----		-----	
1728		-----		-----	
1740		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833		-----		-----	
1849		-----		-----	
1854		-----		-----	
1906		-----		-----	
1915	D97	0	C,ex	1.84	First reported +6, result is determined with manual method
1938		-----		-----	

1943		-----	-----
1948		-6	-0.92
2129		0	1.84
2160	D5950	-3.0	0.46

normality	not OK
n	9
outliers	1
mean (n)	-4.00
st.dev. (n)	2.598
R(calc.)	7.27
R(D5950:07)	6.10



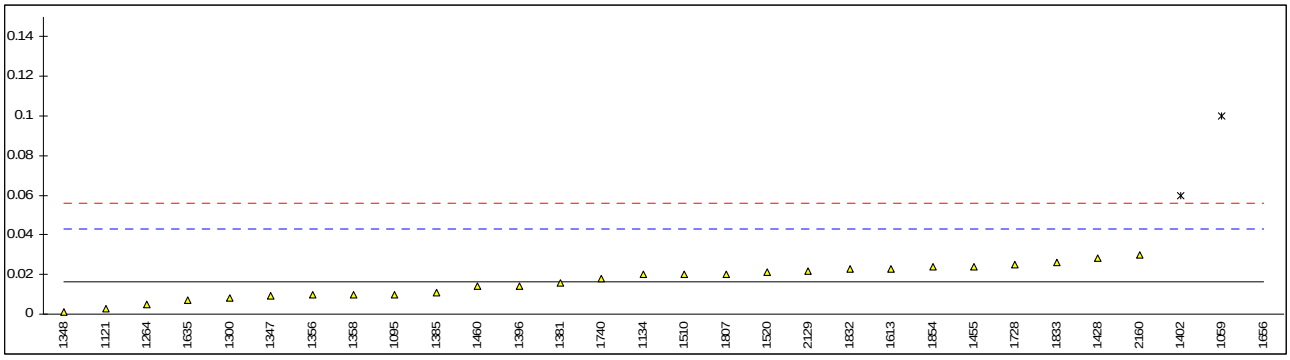


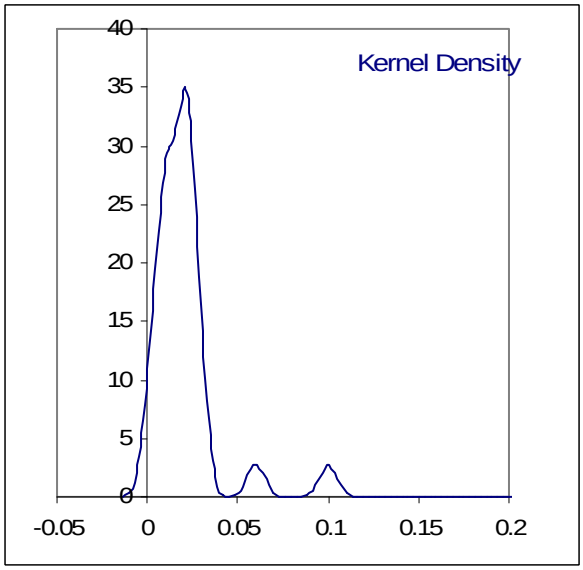
Determination of Sediment by Extraction on sample #12001; results in %M/M

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059	ISO3734	0.10	G(0.01)	6.30	
1062		-----		-----	
1065		-----		-----	
1080		-----		-----	
1095	D473	0.01		-0.48	
1108		-----		-----	
1121	IP53	0.0027		-1.03	
1126		-----		-----	
1134	IP53	0.02		0.27	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215		-----		-----	
1231		-----		-----	
1233		-----		-----	
1259		-----		-----	
1264	D473	0.005		-0.86	
1269		-----		-----	
1271		-----		-----	
1275		-----		-----	
1300	D473	0.00815		-0.62	
1337		-----		-----	
1347	D473	0.0091		-0.55	
1348	D473	0.001		-1.16	
1356	D473	0.0100		-0.48	
1358	IP375	0.01	C	-0.48	First reported 0.0972
1381	ISO3735	0.016		-0.03	
1383		-----		-----	
1385	D473	0.011		-0.41	
1395		-----		-----	
1396	IP375	0.0144		-0.15	
1402	D473	0.06	G(0.01)	3.29	
1404		-----		-----	
1419		-----		-----	
1428	D473	0.028		0.88	
1431		-----		-----	
1454		-----		-----	
1455	D473	0.024		0.57	
1459		-----		-----	
1460	D473	0.014		-0.18	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510	D473	0.02		0.27	
1520	D473	0.021		0.35	
1613	D473	0.023		0.50	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	D473	0.007		-0.71	
1636		-----		-----	
1654		-----		-----	
1656	IP53	0.76	G(0.01)	56.01	
1710		-----		-----	
1720		-----		-----	
1724		-----		-----	
1728	D473	0.025		0.65	
1740	D473	0.018		0.12	
1807	D473	0.02		0.27	
1810		-----		-----	
1811		-----		-----	
1832	INH-6370	0.0228		0.48	
1833	D473	0.026		0.72	
1849		-----		-----	
1854	D473	0.024		0.57	
1906		-----		-----	
1915		-----		-----	
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	D473	0.022	0.42
2160	D473	0.0301	1.03

normality	OK
n	27
outliers	3
mean (n)	0.0164
st.dev. (n)	0.00811
R(calc.)	0.0227
R(D473:07)	0.0372



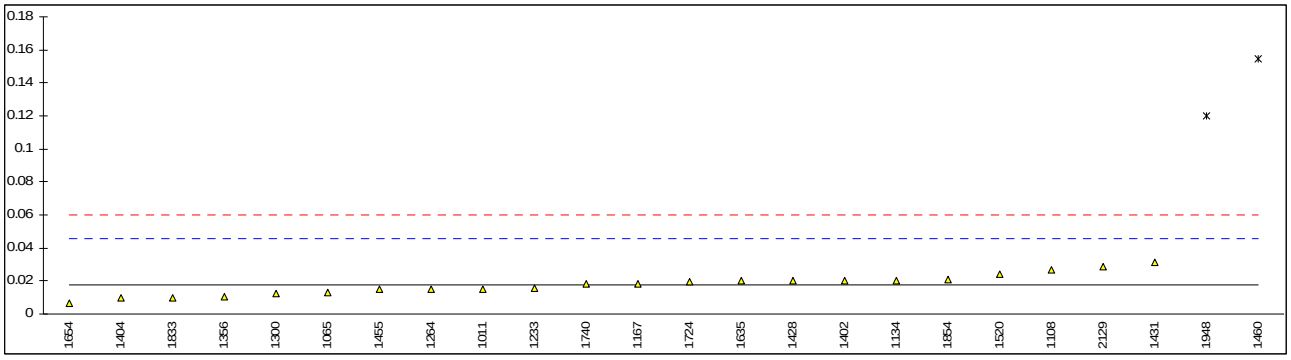


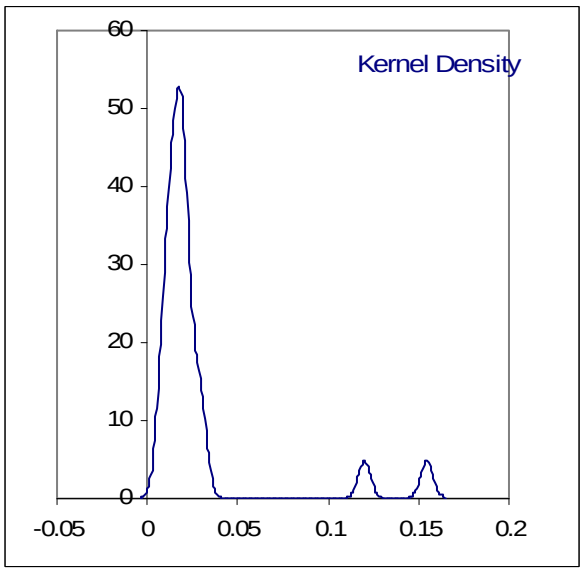
Determination of Total Sediment (Potential) of sample #12001; results in %M/M

lab	method	value	mark	z(targ)	remarks
1011	IP390	0.0152		-0.18	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065	IP390	0.013		-0.34	
1080		-----		-----	
1095		-----		-----	
1108	IP390	0.027		0.66	
1121		-----		-----	
1126		-----		-----	
1134	IP390	0.02		0.16	
1140		-----		-----	
1167	ISO10307	0.018	C	0.02	First reported 0.08
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215		-----		-----	
1231		-----		-----	
1233	IP390	0.0155		-0.16	
1259		-----		-----	
1264	IP390	0.015		-0.20	
1269		-----		-----	
1271		-----		-----	
1275		-----		-----	
1300	IP390	0.01252		-0.37	
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356	IP390	0.0104		-0.53	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385		-----		-----	
1395		-----		-----	
1396		-----		-----	
1402	IP390	0.02		0.16	
1404	IP390	0.01		-0.55	
1419		-----		-----	
1428	IP390	0.02		0.16	
1431	IP390	0.031		0.95	
1454		-----		-----	
1455	IP390	0.015		-0.20	
1459		-----		-----	
1460	IP390	0.1547	G(0.01)	9.79	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520	IP390	0.024		0.45	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	IP390	0.02		0.16	
1636		-----		-----	
1654	IP390	0.00653		-0.80	
1656		-----		-----	
1710		-----		-----	
1720		-----		-----	
1724	IP390	0.0195		0.12	
1728		-----		-----	
1740	IP390	0.018		0.02	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833	IP390	0.01		-0.55	
1849		-----		-----	
1854	IP390	0.021		0.23	
1906		-----		-----	
1915		-----		-----	
1938		-----		-----	

1943		-----		-----
1948	IP390	0.12	G(0.01)	7.31
2129	IP390	0.029		0.80
2160		-----		-----

normality	OK
n	22
outliers	2
mean (n)	0.0178
st.dev. (n)	0.00632
R(calc.)	0.0177
R(IP390:04)	0.0392



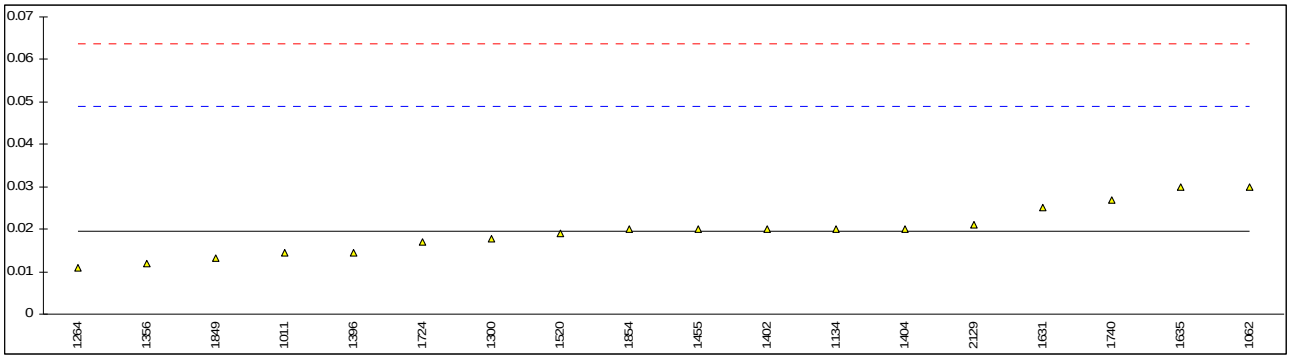


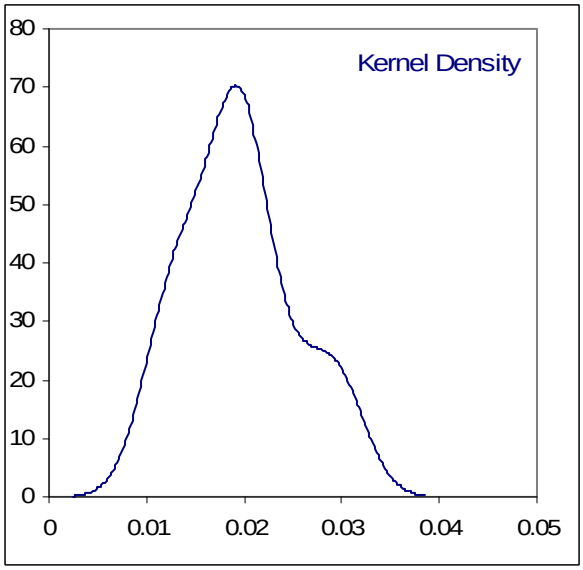
Determination of Total Sediment (Accelerated) of sample #12001; results in %M/M

lab	method	value	mark	z(targ)	remarks
1011	IP390	0.0144		-0.35	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062	IP390	0.03		0.71	
1065		-----		-----	
1080		-----		-----	
1095		-----		-----	
1108		-----		-----	
1121		-----		-----	
1126		-----		-----	
1134	IP390	0.02		0.03	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215		-----		-----	
1231		-----		-----	
1233		-----		-----	
1259		-----		-----	
1264	IP390	0.011		-0.58	
1269		-----		-----	
1271		-----		-----	
1275		-----		-----	
1300	IP390	0.01771		-0.12	
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356	IP390	0.0119		-0.52	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385		-----		-----	
1395		-----		-----	
1396	IP390	0.0144		-0.35	
1402	IP390	0.02		0.03	
1404	IP390	0.02		0.03	
1419		-----		-----	
1428		-----		-----	
1431		-----		-----	
1454		-----		-----	
1455	IP390	0.02		0.03	
1459		-----		-----	
1460		-----		-----	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520	IP390	0.019		-0.04	
1613		-----		-----	
1616		-----		-----	
1631	ISO10307	0.025		0.37	
1633		-----		-----	
1635	IP390	0.03		0.71	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710		-----		-----	
1720		-----		-----	
1724	IP390	0.017		-0.17	
1728		-----		-----	
1740	IP390	0.027		0.51	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833		-----		-----	
1849	IP390	0.0132		-0.43	
1854	IP390	0.020		0.03	
1906		-----		-----	
1915		-----		-----	
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	IP390	0.021	0.10
2160		-----	-----

normality	OK
n	18
outliers	0
mean (n)	0.0195
st.dev. (n)	0.00565
R(calc.)	0.0158
R(IP390:04)	0.0411



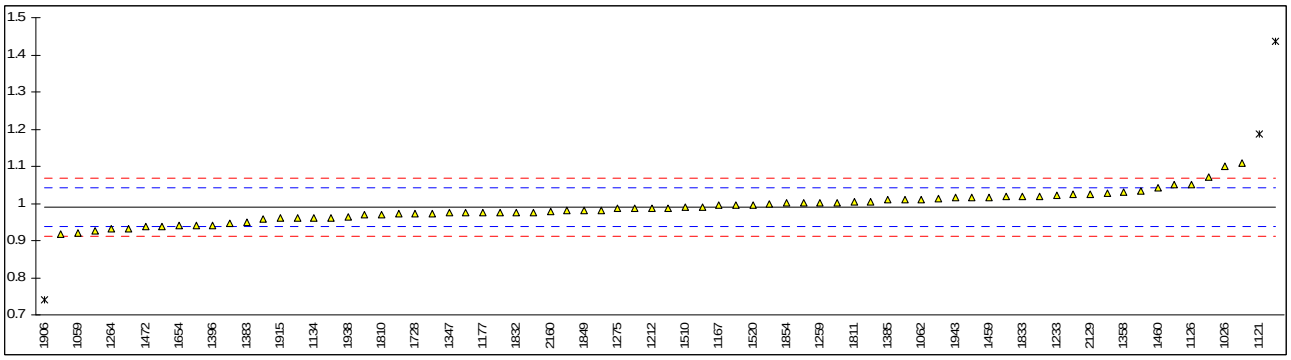


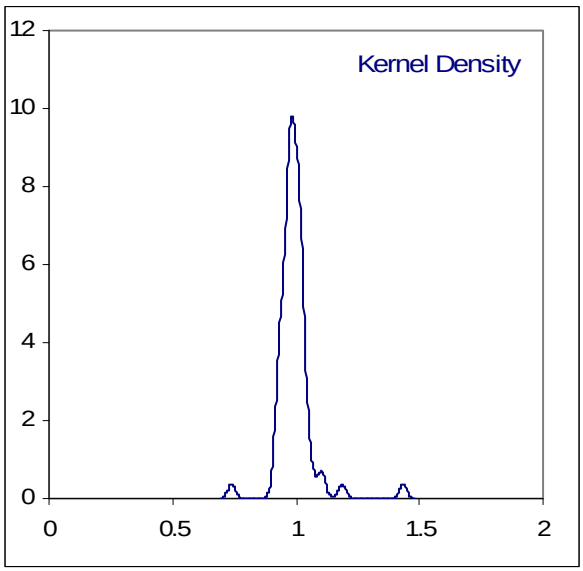
Determination of Total Sulphur on sample #12001; results in %M/M

lab	method	value	mark	z(targ)	remarks
1011	ISO8754	0.926		-2.47	
1016	D2622	0.975		-0.57	
1022	D4294	1.016		1.02	
1026	D2622	1.10		4.28	
1059	ISO14596	0.92		-2.70	
1062	D4294	1.01		0.79	
1065	IP336	1.01		0.79	
1080	D4294	1.027		1.45	
1095	D4294	0.974		-0.61	
1108	D4294	0.946		-1.69	
1121	IP336	1.188	G(0.01)	7.70	
1126	in-house	1.05		2.34	
1134	IP336	0.96		-1.15	
1140		-----		-----	
1167	ISO8754	0.995		0.21	
1177	DIN51900	0.974		-0.61	
1205	ISO14596	1.435	G(0.01)	17.28	
1212	D4294	0.988		-0.06	
1215	D4294	0.9322		-2.23	
1231	D1552	1.11		4.67	
1233	D4294	1.022		1.26	
1259	D4294	1.00		0.40	
1264	D4294	0.9317		-2.25	
1269	ISO14596	1.02		1.18	
1271	D4294	0.970		-0.76	
1275	IP336	0.987		-0.10	
1300	D4294	0.9882		-0.06	
1337	D4294	1.005		0.60	
1347	D4294	0.974		-0.61	
1348	D4294	0.991		0.05	
1356	ISO8745	0.958		-1.23	
1358	IP336	1.03		1.57	
1381	ISO8754	0.937		-2.04	
1383	IP336	0.948		-1.62	
1385	D4294	1.009		0.75	
1395	D4294	1.0135		0.93	
1396	IP336	0.9416		-1.86	
1402	D4294	1.0		0.40	
1404	ISO8754	0.94		-1.93	
1419	EN8754	0.976		-0.53	
1428	ISO8754	0.96		-1.15	
1431	D4294	0.98		-0.37	
1454		-----		-----	
1455	D2622	0.973		-0.65	
1459	ISO8754	1.017		1.06	
1460	D4294	1.0431		2.07	
1466	D4239	1.07		3.12	
1472	D155	0.937		-2.04	
1483	D4294	0.918		-2.78	
1510	IP336	0.99		0.01	
1520	D4294	0.9962		0.25	
1613	D4294	0.996		0.25	
1616		-----		-----	
1631	ISO8754	0.972		-0.68	
1633		-----		-----	
1635	D4294	1.025		1.37	
1636	D4294	1.0005		0.42	
1654	ISO8754	0.94		-1.93	
1656	IP336	1.05		2.34	
1710	D4294	0.96		-1.15	
1720	D4294	1.032		1.64	
1724	IP336	0.987		-0.10	
1728	D4294	0.972		-0.68	
1740	ISO8754	0.999		0.36	
1807	D4294	1.02		1.18	
1810	D4294	0.970		-0.76	
1811	D4294	1.003		0.52	
1832	ISO8754	0.975		-0.57	
1833	IP336	1.02		1.18	
1849	D4294	0.98		-0.37	
1854	D4294	1.00		0.40	
1906	D5623	0.74	C,G(0.05)	-9.68	First reported 1.239
1915	D4294	0.96		-1.15	
1938	D4294	0.964		-0.99	

1943	DIN51400	1.015	0.98
1948	INH-20847	0.98	-0.37
2129	D4294	1.025	1.37
2160	D4294	0.9795	-0.39

		Only ASTM D4294 data:	Only IP336/ISO8754 data:
normality	OK	OK	OK
n	71	37	22
outliers	3	0	1
mean (n)	0.990	0.990	0.978
st.dev. (n)	0.0387	0.0296	0.0337
R(calc.)	0.108	0.083	0.094
R(D4294:10)	0.072	0.072	0.098



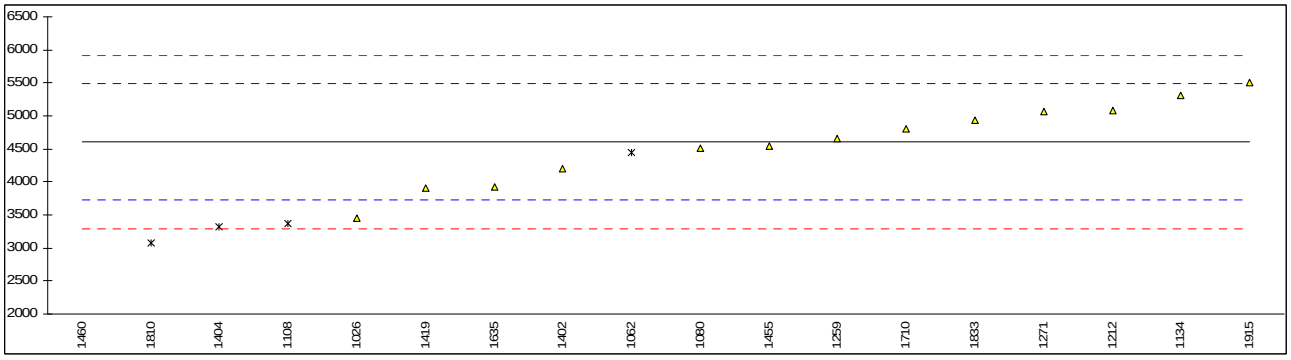


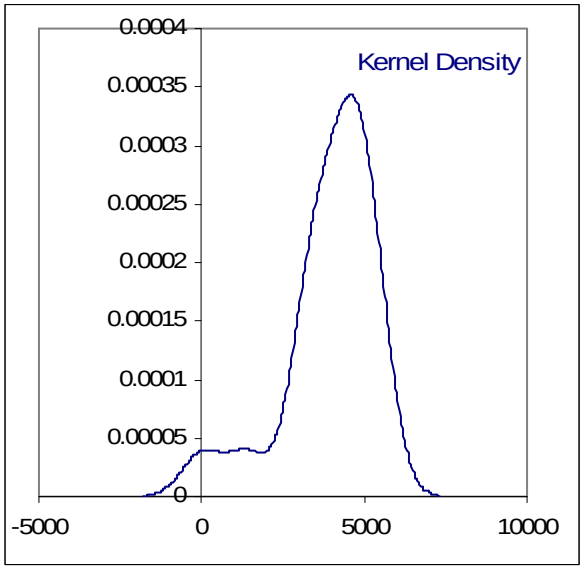
Determination of Nitrogen on sample #12001; results in µg/g

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026	D5762	3450		-2.64	
1059		-----		-----	
1062	D4629	4440	ex	-0.38	Result excluded, method is not suitable
1065		-----		-----	
1080	D5762	4505		-0.23	
1095		-----		-----	
1108	D4629	3363	ex	-2.84	Result excluded, method is not suitable
1121		-----		-----	
1126		-----		-----	
1134	D5762	5315.2		1.62	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212	D3228	5080		1.08	
1215		-----		-----	
1231		-----		-----	
1233		-----		-----	
1259	UOP384	4657	C	0.11	First reported 0.4657 (deviating unit)
1264		-----		-----	
1269		-----		-----	
1271	D3228	5060		1.04	
1275		-----		-----	
1300		-----		-----	
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356		-----		-----	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385		-----		-----	
1395		-----		-----	
1396		-----		-----	
1402	D5762	4200		-0.93	
1404	D4629	3323	ex	-2.93	Result excluded, method is not suitable
1419	D5762	3913		-1.59	
1428		-----		-----	
1431		-----		-----	
1454		-----		-----	
1455	D5762	4550		-0.13	
1459		-----		-----	
1460	D4629	1391.8	ex	-7.35	Result excluded, method is not suitable
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520		-----		-----	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	D5762	3925.56		-1.56	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710	D5762	4805		0.45	
1720		-----		-----	
1724		-----		-----	
1728		-----		-----	
1740		-----		-----	
1807		-----		-----	
1810	D5762	3070	G(0.05)	-3.51	
1811		-----		-----	
1832		-----		-----	
1833	D5762	4928		0.73	
1849		-----		-----	
1854		-----		-----	
1906		-----		-----	
1915	D3228	5500	C	2.04	First reported 135
1938		-----		-----	

1943	-----	-----
1948	-----	-----
2129	-----	-----
2160	-----	-----

normality	OK
n	13
outliers	1
mean (n)	4606.8
st.dev. (n)	601.15
R(calc.)	1683.2
R(D5762:11)	1225.4



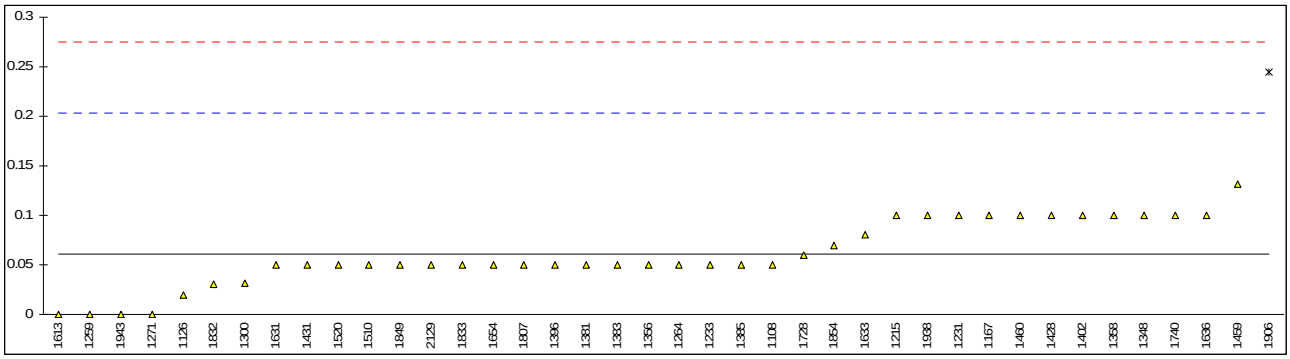


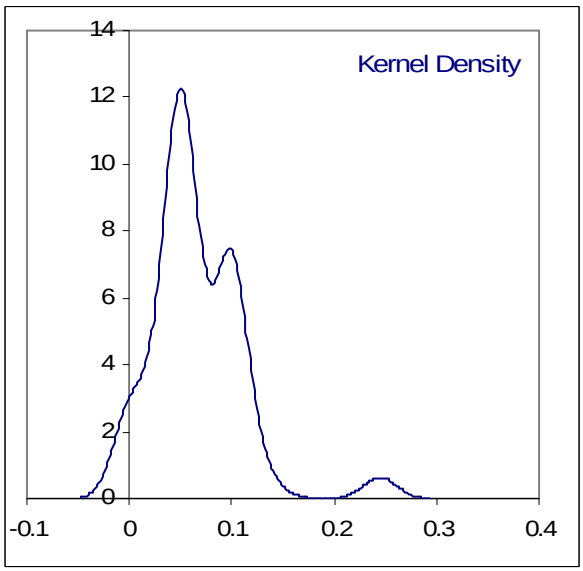
Determination of Water on sample #12001; results in %V/V

lab	method	value	mark	z(targ)	remarks
1011	D95	<0.1		-----	
1016		-----		-----	
1022	D95	<0.02		-----	
1026		-----		-----	
1059	ISO3733	<0.05		-----	
1062		-----		-----	
1065		-----		-----	
1080		-----		-----	
1095	D95	<0.10		-----	
1108	D95	0.05		-0.15	
1121	IP74	<0.05		-----	
1126	D95	0.02		-0.57	
1134	IP74	<0.05		-----	
1140		-----		-----	
1167	EN1428	0.1		0.55	
1177		-----		-----	
1205		-----		-----	
1212		-----		-----	
1215	D95	0.10		0.55	
1231	D95	0.10		0.55	
1233	D95	0.05		-0.15	
1259	ISO3733	0.0		-0.85	
1264	D95	0.05		-0.15	
1269		-----		-----	
1271	D95	0		-0.85	
1275	IP74	<0.1		-----	
1300	D95	0.032		-0.40	
1337		-----		-----	
1347	D95	<0.1		-----	
1348	D95	0.1		0.55	
1356	D95	0.05		-0.15	
1358	IP74	0.1		0.55	
1381	ISO3733	0.050		-0.15	
1383	IP74	0.05		-0.15	
1385	D95	0.05		-0.15	
1395	D95	<0.05		-----	
1396	IP74	0.05		-0.15	
1402	IP74	0.10		0.55	
1404		-----		-----	
1419		-----		-----	
1428	D95	0.1		0.55	
1431	D95	0.05		-0.15	
1454		-----		-----	
1455	D95	<0.1		-----	
1459	D95	0.132		1.00	
1460	D95	0.10		0.55	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510	IP74	0.05		-0.15	
1520	D95	0.05		-0.15	
1613	D95	0.0		-0.85	
1616		-----		-----	
1631	EN1428	0.05		-0.15	
1633	D95	0.08		0.27	
1635	D95	<0.05		-----	
1636	D95	0.1		0.55	
1654	D95	0.05		-0.15	
1656	IP74	<0.1		-----	
1710		-----		-----	
1720		-----		-----	
1724	D95	<0.05		-----	
1728	D95	0.0594		-0.02	
1740	ISO3733	0.10		0.55	
1807	D95	0.05		-0.15	
1810		-----		-----	
1811		-----		-----	
1832	INH3477	0.03		-0.43	
1833	D95	0.05		-0.15	
1849	D95	0.05		-0.15	
1854	D95	0.07		0.13	
1906	D4377	0.245	G(0.01)	2.58	
1915		-----		-----	
1938	D95	0.1		0.55	

1943	ISO3733	0.00	-0.85
1948	D95	<0.1	-----
2129	D95	0.05	-0.15
2160	EN1428	<0.1	-----

normality	not OK
n	39
outliers	1
mean (n)	0.061
st.dev. (n)	0.0335
R(calc.)	0.094
R(D95:10)	0.200



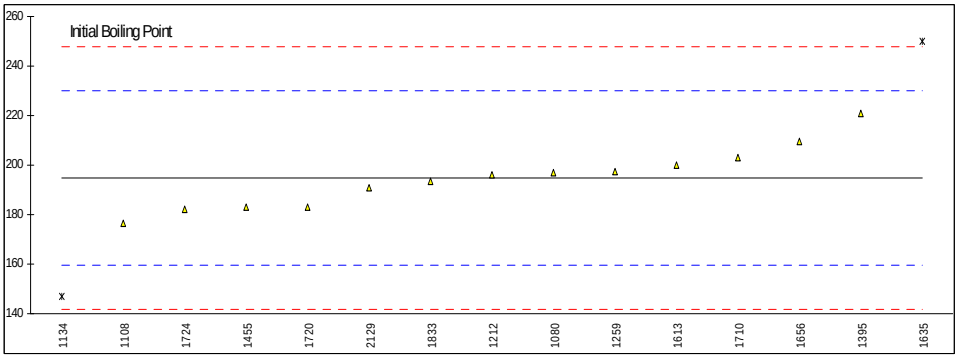


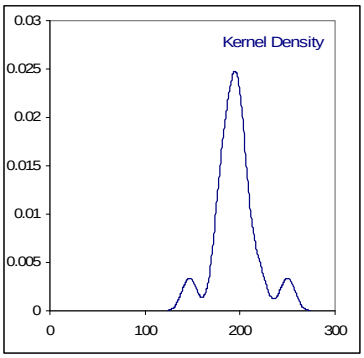
Distillation according to ASTM D1160 on sample #12001, results in °C

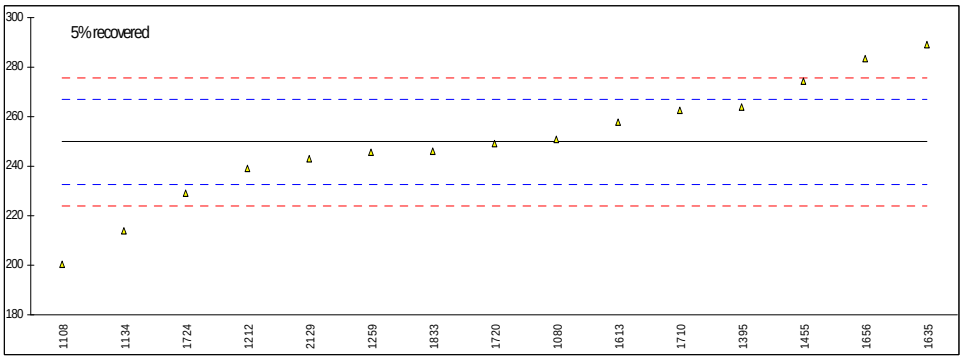
lab	method	IBP	5%	10%	20%	30%	40%	50%	FBP
1011		-----	-----	-----	-----	-----	-----	-----	-----
1016		-----	-----	-----	-----	-----	-----	-----	-----
1022		-----	-----	-----	-----	-----	-----	-----	-----
1026		-----	-----	-----	-----	-----	-----	-----	-----
1059		-----	-----	-----	-----	-----	-----	-----	-----
1062		-----	-----	-----	-----	-----	-----	-----	-----
1065		-----	-----	-----	-----	-----	-----	-----	-----
1080	D1160	197.0	250.9	287.7	361.2	421.9	489.9	-----	511.8
1095		-----	-----	-----	-----	-----	-----	-----	-----
1108	D1160	176.4	200.6	***222.4***	335.3	***374.8***	-----	-----	***398.1***
1121		-----	-----	-----	-----	-----	-----	-----	-----
1126		-----	-----	-----	-----	-----	-----	-----	-----
1134	D1160	***147***	214	266	341	400	***454***	***469***	-----
1140		-----	-----	-----	-----	-----	-----	-----	-----
1167		-----	-----	-----	-----	-----	-----	-----	-----
1177		-----	-----	-----	-----	-----	-----	-----	-----
1205		-----	-----	-----	-----	-----	-----	-----	-----
1212	D1160	196	239	281	363	414	477	538	538
1215		-----	-----	-----	-----	-----	-----	-----	-----
1231		-----	-----	-----	-----	-----	-----	-----	-----
1233		-----	-----	-----	-----	-----	-----	-----	-----
1259	D1160	197.4	245.6	292.0	366.9	428.8	495.9	-----	-----
1264		-----	-----	-----	-----	-----	-----	-----	-----
1269		-----	-----	-----	-----	-----	-----	-----	-----
1271		-----	-----	-----	-----	-----	-----	-----	-----
1275		-----	-----	-----	-----	-----	-----	-----	-----
1300		-----	-----	-----	-----	-----	-----	-----	-----
1337		-----	-----	-----	-----	-----	-----	-----	-----
1347		-----	-----	-----	-----	-----	-----	-----	-----
1348		-----	-----	-----	-----	-----	-----	-----	-----
1356		-----	-----	-----	-----	-----	-----	-----	-----
1358		-----	-----	-----	-----	-----	-----	-----	-----
1381		-----	-----	-----	-----	-----	-----	-----	-----
1383		-----	-----	-----	-----	-----	-----	-----	-----
1385		-----	-----	-----	-----	-----	-----	-----	-----
1395	D1160	221	264	300	376	439	514	564	592
1396		-----	-----	-----	-----	-----	-----	-----	-----
1402		-----	-----	-----	-----	-----	-----	-----	-----
1404		-----	-----	-----	-----	-----	-----	-----	-----
1419		-----	-----	-----	-----	-----	-----	-----	-----
1428		-----	-----	-----	-----	-----	-----	-----	-----
1431		-----	-----	-----	-----	-----	-----	-----	-----
1454		-----	-----	-----	-----	-----	-----	-----	-----
1455	D1160	183.1	274.3	324.7	390.4	456.2	512.1	-----	514.8
1459		-----	-----	-----	-----	-----	-----	-----	-----
1460		-----	-----	-----	-----	-----	-----	-----	-----
1466		-----	-----	-----	-----	-----	-----	-----	-----
1472		-----	-----	-----	-----	-----	-----	-----	-----
1483		-----	-----	-----	-----	-----	-----	-----	-----
1510		-----	-----	-----	-----	-----	-----	-----	-----
1520		-----	-----	-----	-----	-----	-----	-----	-----
1613	D1160	200.0	258.0	305.9	375.1	436.1	506.0	-----	519.8
1616		-----	-----	-----	-----	-----	-----	-----	-----
1631		-----	-----	-----	-----	-----	-----	-----	-----
1633		-----	-----	-----	-----	-----	-----	-----	-----
1635	D1160	***250.1***	289.1	330.3	390.1	451.2	519.4	564.9	592.3
1636		-----	-----	-----	-----	-----	-----	-----	-----
1654		-----	-----	-----	-----	-----	-----	-----	-----
1656	D1160	209.6	283.4	327.0	394.5	471.0	534.9	-----	551.0
1710	D1160	203.2	262.6	302.3	373.1	436.3	512.2	-----	551.8
1720	D1160	183.2	249.0	290.7	363.9	429.3	493.2	-----	513.0
1724	D1160	182	229	276	361	420	472	-----	-----
1728		-----	-----	-----	-----	-----	-----	-----	-----
1740		-----	-----	-----	-----	-----	-----	-----	-----
1807		-----	-----	-----	-----	-----	-----	-----	-----
1810		-----	-----	-----	-----	-----	-----	-----	-----
1811		-----	-----	-----	-----	-----	-----	-----	-----
1832		-----	-----	-----	-----	-----	-----	-----	-----
1833	D1160	193.5	246.0	292.9	369.7	431.6	497.1	-----	-----
1849		-----	-----	-----	-----	-----	-----	-----	-----
1854		-----	-----	-----	-----	-----	-----	-----	-----
1906		-----	-----	-----	-----	-----	-----	-----	-----
1915		-----	-----	-----	-----	-----	-----	-----	-----
1938		-----	-----	-----	-----	-----	-----	-----	-----
1943		-----	-----	-----	-----	-----	-----	-----	-----

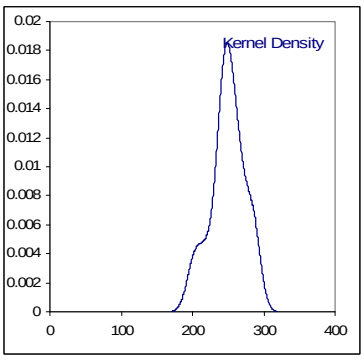
1948		-----	-----	-----	-----	-----	-----	-----	-----
2129	D1160	191	243	289	370	431	493	529	536
2160		-----	-----	-----	-----	-----	-----	-----	-----
	normality	OK	OK	OK	OK	OK	OK	OK	OK
	n	13	15	14	15	14	13	4	10
	outliers	2	0	1	0	1	1	1	1
	mean (n)	194.88	249.90	297.54	368.75	433.31	501.28	548.98	542.05
	st.dev. (n)	12.268	23.961	19.172	16.405	17.863	17.406	18.247	30.267
	R(calc.)	34.35	67.09	53.68	45.94	50.02	48.74	51.09	84.75
	R(D1160:06)	49.45	24.13	21.85	20.36	19.92	17.74	13.19	26.89

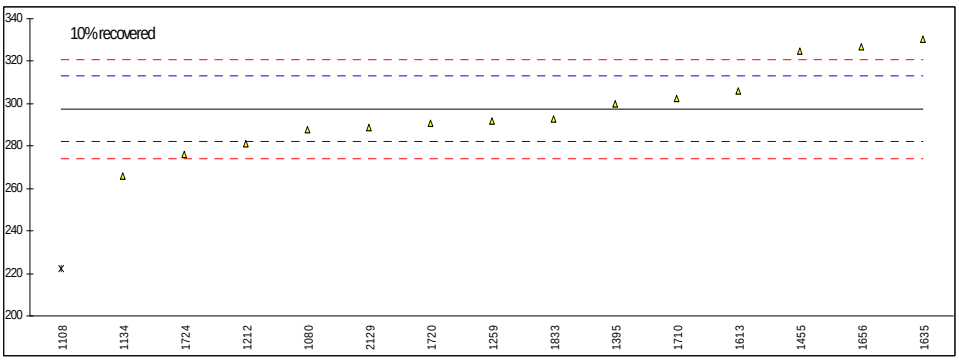
Bold, Italic and underlined is statistical outlier acc. to Grubbs/Dixon outlier test

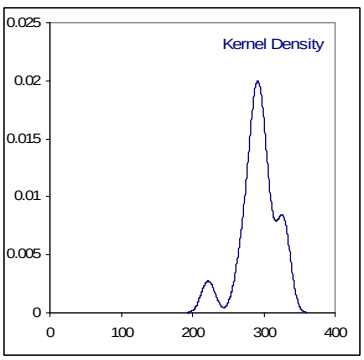

Initial Boiling Point
260
240
220
200
180
160
140
1134 1108 1724 1455 1720 2129 1833 1212 1080 1259 1613 1710 1656 1395 1635

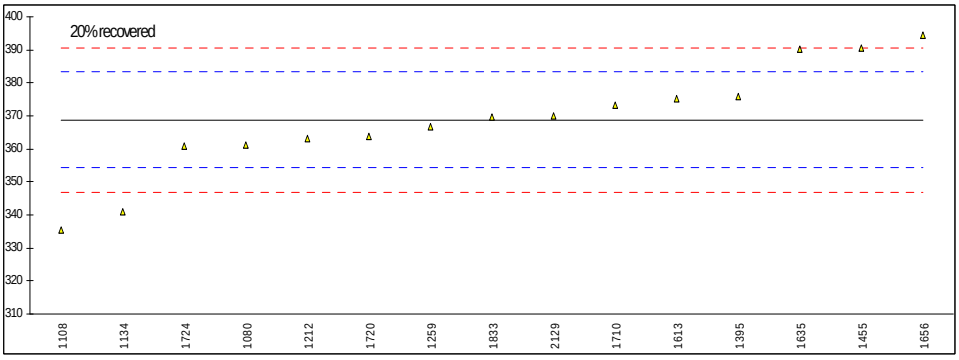

Kernel Density
0.03
0.025
0.02
0.015
0.01
0.005
0
0 100 200 300

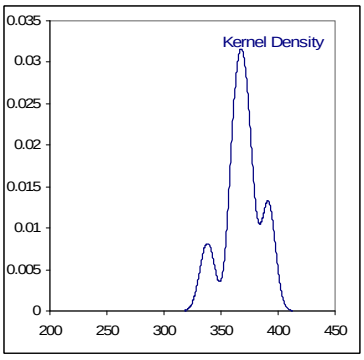

5% recovered
300
280
260
240
220
200
180
1108 1134 1724 1212 2129 1259 1833 1720 1080 1613 1710 1395 1455 1656 1635

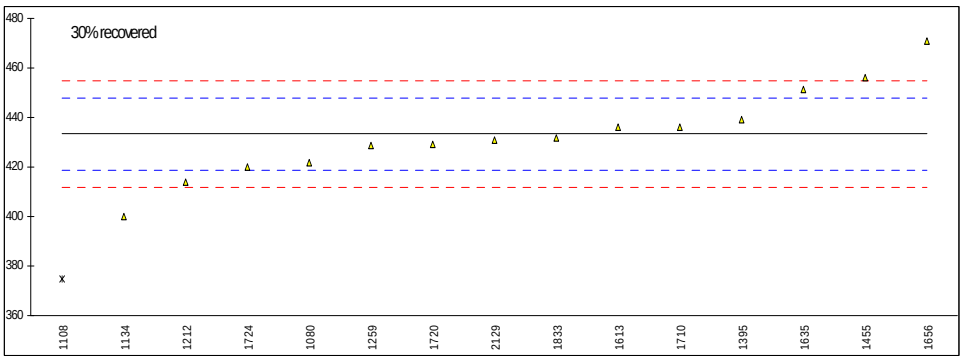

Kernel Density
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
0 100 200 300 400

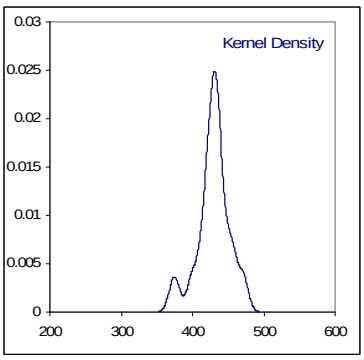

10% recovered
340
320
300
280
260
240
220
200
1108 1134 1724 1212 1080 2129 1720 1259 1833 1395 1710 1613 1455 1656 1635

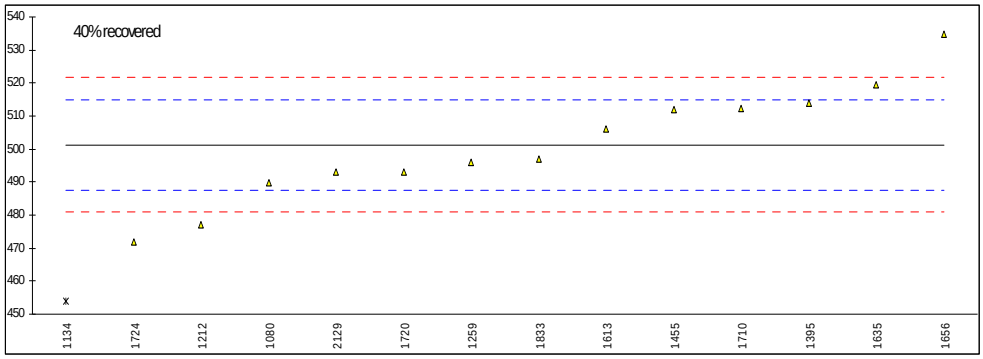

Kernel Density
0.025
0.02
0.015
0.01
0.005
0
0 100 200 300 400

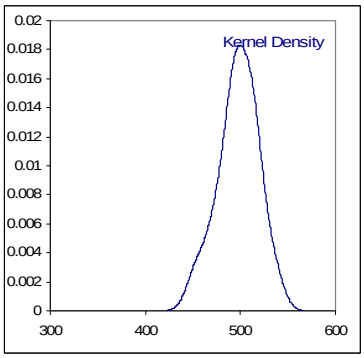

20% recovered
400
390
380
370
360
350
340
330
320
310
1108 1134 1724 1080 1212 1720 1259 1833 2129 1710 1613 1395 1635 1455 1656

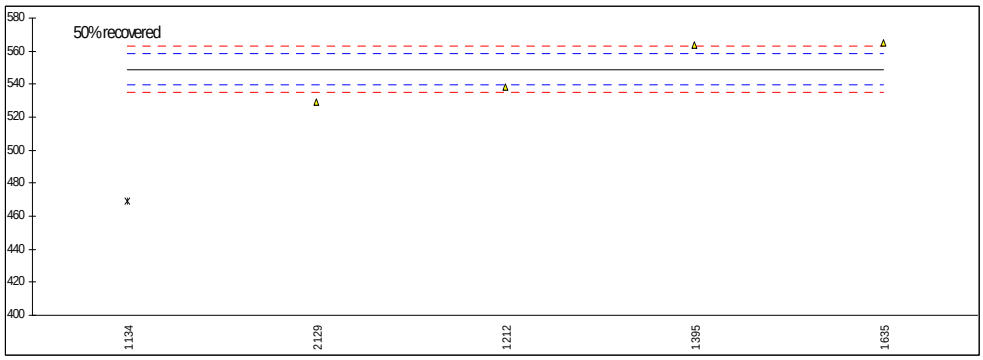

Kernel Density
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
200 250 300 350 400 450

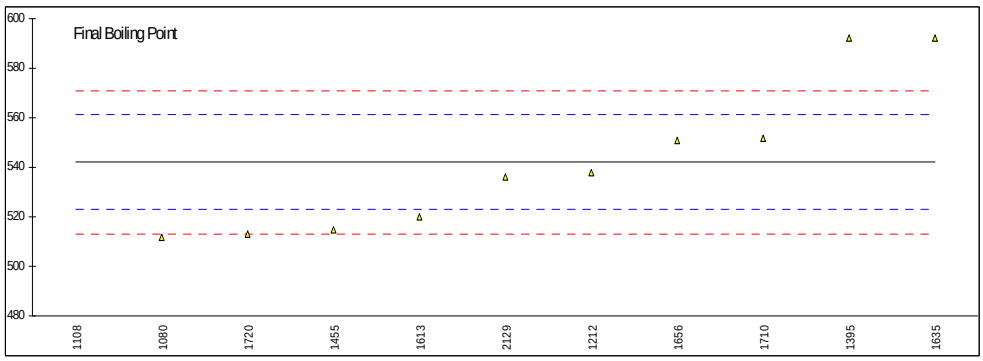

30% recovered
480
460
440
420
400
380
360
1108 1134 1212 1724 1080 1259 1720 2129 1833 1613 1710 1395 1635 1455 1656

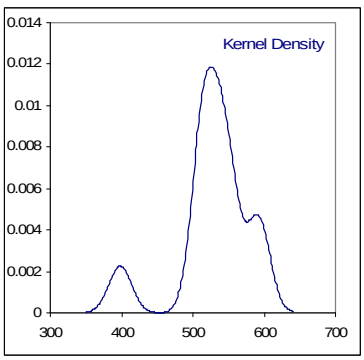

Kernel Density
0.03
0.025
0.02
0.015
0.01
0.005
0
200 300 400 500 600


40% recovered
540
530
520
510
500
490
480
470
460
450
1134
1724
1212
1080
2129
1720
1259
1833
1613
1455
1710
1395
1635
1656


Kernel Density
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
300
400
500
600


50% recovered
580
560
540
520
500
480
460
440
420
400
1134
2129
1212
1395
1635

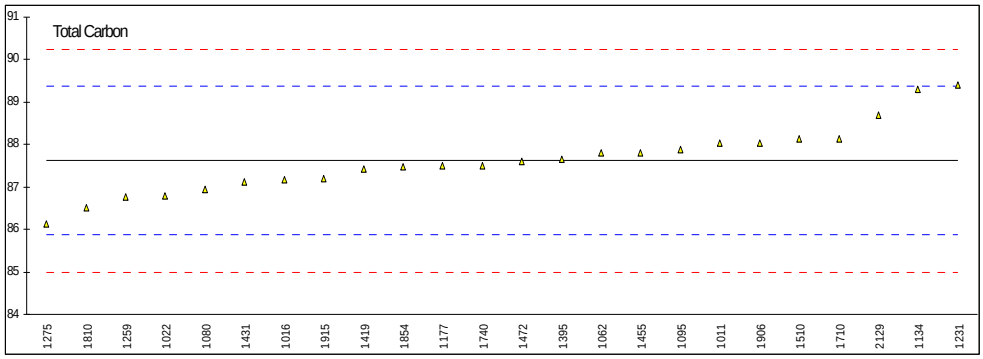

Final Boiling Point
600
580
560
540
520
500
480
1108
1080
1720
1455
1613
2129
1212
1656
1710
1395
1635

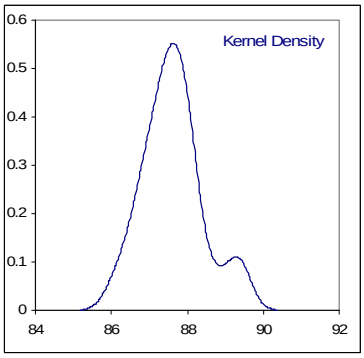

Kernel Density
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
300
400
500
600
700

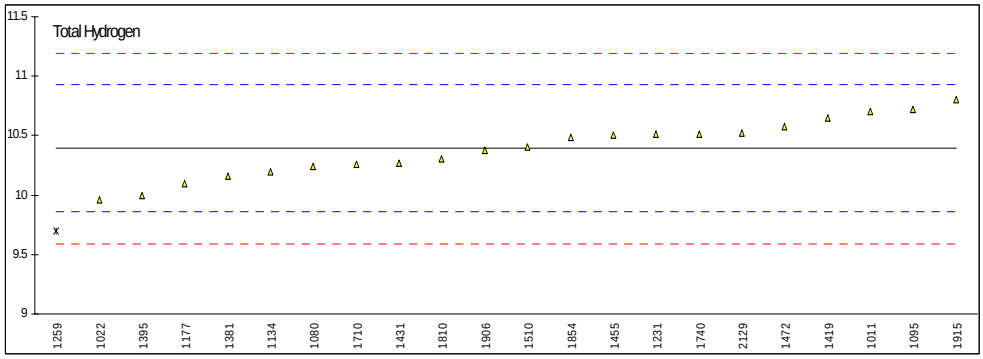
Determination of Total Carbon, Hydrogen and Nitrogen on sample #12001; results in %M/M

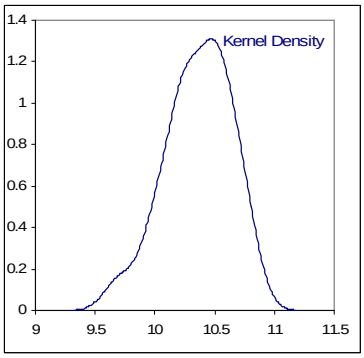
Lab	method	Tot.Carbon	mark	z(targ)	Tot.Hydrogen	mark	z(targ)	Tot.Nitrogen	mark	z(targ)	remarks
1011	D5291	88.02		0.45	10.70		1.15	0.579		0.11	
1016	D5291	87.16		-0.53	-----		-----	0.560		-0.01	
1022	D5291	86.79		-0.95	9.96		-1.62	0.46		-0.64	
1026		-----		-----	-----		-----	-----		-----	
1059		-----		-----	-----		-----	-----		-----	
1062	D5291	87.80		0.20	-----		-----	-----		-----	
1065		-----		-----	-----		-----	-----		-----	
1080	D5291	86.93		-0.79	10.24		-0.57	-----		-----	
1095	D5291	87.89		0.30	10.72		1.23	0.42		-0.89	
1108		-----		-----	-----		-----	-----		-----	
1121		-----		-----	-----		-----	-----		-----	
1126		-----		-----	-----		-----	-----		-----	
1134	D5291	89.3		1.92	10.2		-0.72	0.5		-0.39	
1140		-----		-----	-----		-----	-----		-----	
1167		-----		-----	-----		-----	-----		-----	
1177	D5291	87.5		-0.14	10.1		-1.10	0.577		0.10	
1205		-----		-----	-----		-----	-----		-----	
1212		-----		-----	-----		-----	-----		-----	
1215		-----		-----	-----		-----	-----		-----	
1231	D5291	89.39		2.02	10.51		0.44	0.61		0.30	
1233		-----		-----	-----		-----	-----		-----	
1259	D5291	86.76		-0.99	9.70	G(0.05)	-2.60	0.54		-0.14	
1264		-----		-----	-----		-----	-----		-----	
1269		-----		-----	-----		-----	-----		-----	
1271		-----		-----	-----		-----	-----		-----	
1275	in house	86.126		-1.71	-----		-----	-----		-----	
1300		-----		-----	-----		-----	-----		-----	
1337		-----		-----	-----		-----	-----		-----	
1347		-----		-----	-----		-----	-----		-----	
1348		-----		-----	-----		-----	-----		-----	
1356		-----		-----	-----		-----	-----		-----	
1358		-----		-----	-----		-----	-----		-----	
1381		-----		-----	10.158		-0.88	-----		-----	
1383		-----		-----	-----		-----	-----		-----	
1385		-----		-----	-----		-----	-----		-----	
1395	D5291	87.65		0.03	10.00		-1.47	0.75		1.18	
1396		-----		-----	-----		-----	-----		-----	
1402		-----		-----	-----		-----	-----		-----	
1404		-----		-----	-----		-----	-----		-----	
1419	D5291	87.42		-0.23	10.65		0.97	0.50		-0.39	
1428		-----		-----	-----		-----	-----		-----	
1431	D5291	87.12		-0.58	10.27		-0.46	0.57		0.05	
1454		-----		-----	-----		-----	-----		-----	
1455	D5291	87.8		0.20	10.50		0.40	0.64		0.49	
1459		-----		-----	-----		-----	-----		-----	
1460		-----		-----	-----		-----	-----		-----	
1466		-----		-----	-----		-----	-----		-----	
1472	D5291	87.605		-0.02	10.580		0.70	0.4645		-0.61	
1483		-----		-----	-----		-----	-----		-----	
1510	D5291	88.14		0.59	10.40		0.03	0.73		1.06	
1520		-----		-----	-----		-----	-----		-----	
1613		-----		-----	-----		-----	-----		-----	
1616		-----		-----	-----		-----	-----		-----	
1631		-----		-----	-----		-----	-----		-----	
1633		-----		-----	-----		-----	-----		-----	
1635		-----		-----	-----		-----	-----		-----	
1636		-----		-----	-----		-----	-----		-----	
1654		-----		-----	-----		-----	-----		-----	
1656		-----		-----	-----		-----	-----		-----	
1710	D5291	88.14		0.59	10.26		-0.50	0.62		0.37	
1720		-----		-----	-----		-----	-----		-----	
1724		-----		-----	-----		-----	-----		-----	
1728		-----		-----	-----		-----	-----		-----	
1740	D5291	87.51		-0.13	10.51		0.44	0.482		-0.50	
1807		-----		-----	-----		-----	-----		-----	
1810	D5291	86.5		-1.28	10.3		-0.35	-----		-----	
1811		-----		-----	-----		-----	-----		-----	
1832		-----		-----	-----		-----	-----		-----	
1833		-----		-----	-----		-----	-----		-----	
1849		-----		-----	-----		-----	-----		-----	
1854	D5291	87.47		-0.18	10.49		0.37	0.55		-0.07	
1906	D5291	88.04	C	0.48	10.373		-0.07	0.611		0.31	Fr 85.339
1915	D5291	87.2		-0.48	10.8		1.53	<1.0	C	-----	Fr <0.10
1938		-----		-----	-----		-----	-----		-----	
1943		-----		-----	-----		-----	-----		-----	

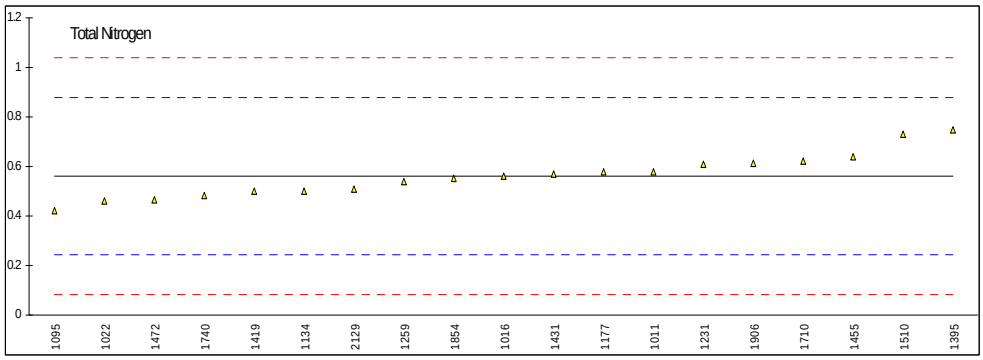
1948		-----	-----	-----	-----	-----	-----
2129	D5291	88.70	1.23	10.52	0.48	0.51	-0.33
2160		-----	-----	-----	-----	-----	-----
	normality	OK		OK		OK	
	n	24		21		19	
	outliers	0		1		0	
	mean (n)	87.62		10.39		0.56	
	st.dev. (n)	0.787		0.236		0.087	
	R(calc.)	2.20		0.66		0.24	
	R(D5291:10)	2.45		0.75		0.45	

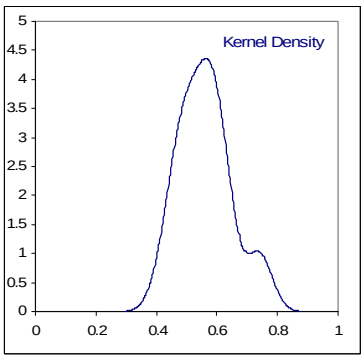










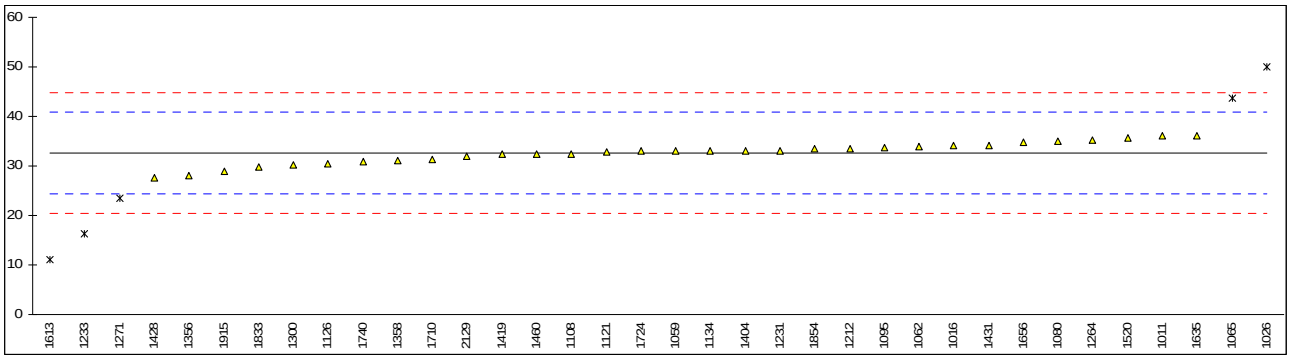


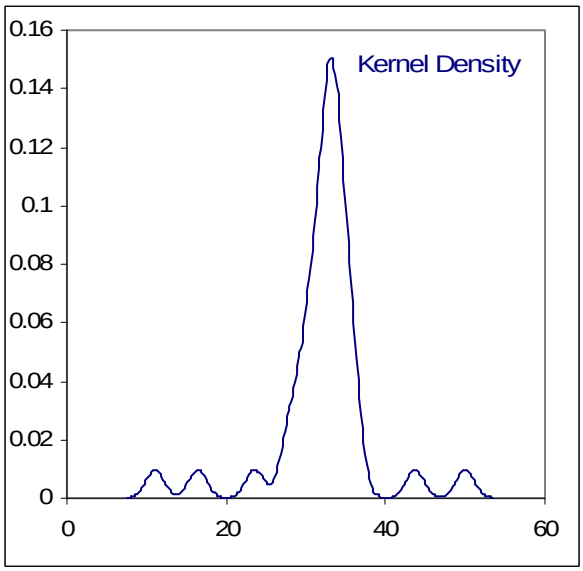
Determination of Nickel on sample #12001; results in mg/kg\

lab	method	value	mark	z(targ)	remarks
1011	D5863-AAS	36		0.83	
1016	in house-XRF	34.1		0.37	
1022		-----		-----	
1026	DIN51790-XRF	50	G(0.01)	4.26	
1059	in house-XRF	33		0.10	
1062	EDXRF	34.0		0.34	
1065	EDXRF	43.7	G(0.01)	2.72	
1080	D5863	35		0.59	
1095	IP501	33.63		0.25	
1108	D5863-AAS	32.5		-0.02	
1121	IP501	32.9		0.07	
1126	IP501-ICP	30.5		-0.52	
1134	IP501	33		0.10	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212	IP470	33.5	C	0.22	First reported 10.3
1215		-----		-----	
1231	ICP	33.05		0.11	
1233	IP501-ICP	16.4	G(0.05)	-3.97	
1259		-----		-----	
1264	IP501	35.18		0.63	
1269		-----		-----	
1271	ICP	23.56	G(0.05)	-2.22	
1275		-----		-----	
1300	IP501	30.2739		-0.57	
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356	IP501-ICP	28		-1.13	
1358	IP593-XRF	31.0		-0.39	
1381		-----		-----	
1383		-----		-----	
1385		-----		-----	
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404	IP470-AAS	33		0.10	
1419	in house-ICP	32.36		-0.06	
1428	IP501-ICP	27.7		-1.20	
1431	ICP	34.1		0.37	
1454		-----		-----	
1455		-----		-----	
1459		-----		-----	
1460	IP501-ICP	32.3883		-0.05	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520	IP501-AAS	35.6		0.73	
1613	D5863-AAS	11.02	G(0.01)	-5.29	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	IP501-ICP	36.0		0.83	
1636		-----		-----	
1654		-----		-----	
1656	IP501	34.8		0.54	
1710	IP501	31.2		-0.34	
1720		-----		-----	
1724	IP501	32.98		0.09	
1728		-----		-----	
1740	IP501-ICP	30.8		-0.44	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833	IP501	29.8		-0.69	
1849		-----		-----	
1854	IP501-ICP	33.4		0.20	
1906		-----		-----	
1915	D3605-AAS	29	C	-0.88	First reported 16.5
1938		-----		-----	
1943		-----		-----	

1948		-----	-----
2129	IP470-AAS	31.9	-0.17
2160		-----	-----

normality	OK
n	31
outliers	5
mean (n)	32.602
st.dev. (n)	2.1865
R(calc.)	6.122
R(IP501:05)	11.428



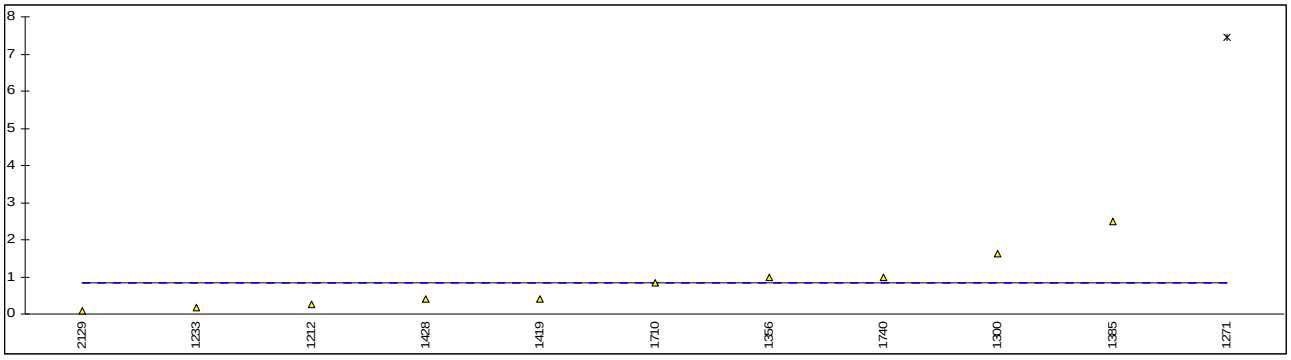


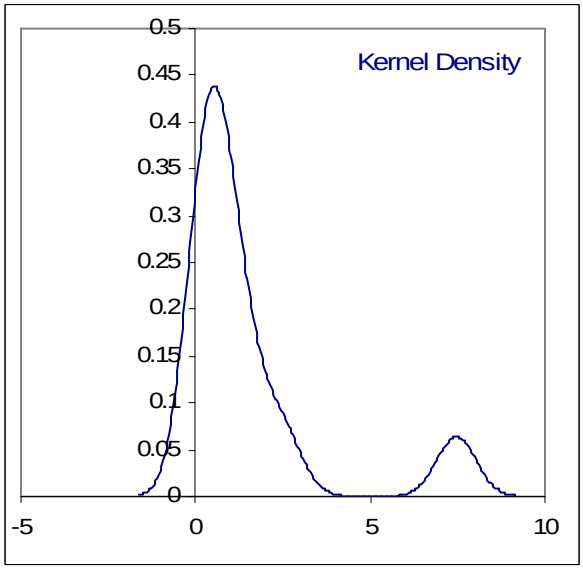
Determination of Potassium on sample #12001; results in mg/kg

lab	method	value	mark	z(targ)	remarks
1011		-----		-----	
1016		-----		-----	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062		-----		-----	
1065		-----		-----	
1080	D5863	<4		-----	
1095		-----		-----	
1108		-----		-----	
1121	IP501	<2		-----	
1126		-----		-----	
1134		-----		-----	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212	IP470	0.26	C	-----	First reported 0.1
1215		-----		-----	
1231		-----		-----	
1233		0.18		-----	
1259		-----		-----	
1264		-----		-----	
1269		-----		-----	
1271	ICP	7.46	C,G(0.01)	-----	First reported 9.44, false positive result?
1275		-----		-----	
1300	in house	1.6287		-----	
1337		-----		-----	
1347		-----		-----	
1348		-----		-----	
1356	IP501-ICP	1		-----	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385	in house-AAS	2.5		-----	
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404		-----		-----	
1419	in house-AAS	0.416		-----	
1428	IP501-ICP	0.4		-----	
1431		-----		-----	
1454		-----		-----	
1455		-----		-----	
1459		-----		-----	
1460	IP501-ICP	<0.01	C	-----	First reported 4.5656
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520		-----		-----	
1613		-----		-----	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635		-----		-----	
1636		-----		-----	
1654		-----		-----	
1656		-----		-----	
1710	in house-ICP	0.83		-----	
1720		-----		-----	
1724		-----		-----	
1728		-----		-----	
1740	IP501-ICP	1.0		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833		-----		-----	
1849		-----		-----	
1854		-----		-----	
1906		-----		-----	
1915	D3605-AAS	<1		-----	
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	IP470-AAS	0.1	-----
2160		-----	-----

normality	OK
n	10
outliers	1
mean (n)	0.831
st.dev. (n)	0.7543
R(calc.)	2.112
R(Horwitz)	(0.383)



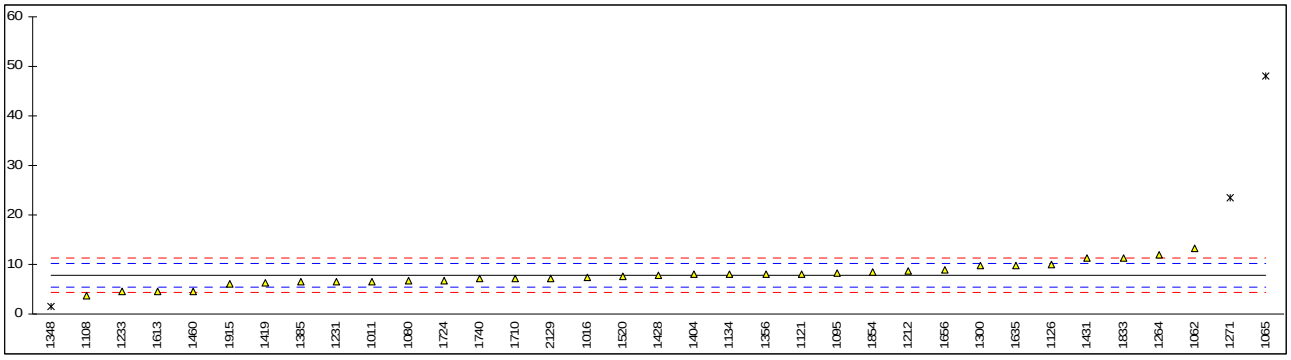


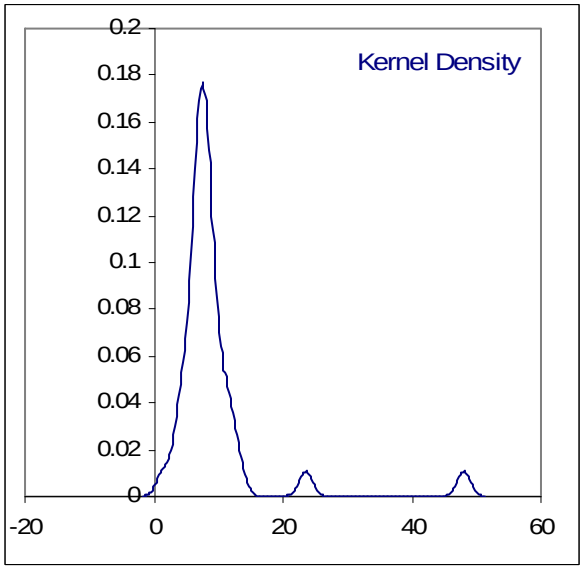
Determination of Sodium on sample #12001; results in mg/kg

lab	method	value	mark	z(targ)	remarks
1011	D5863-AAS	6.6		-1.05	
1016	in house-ICP	7.46		-0.33	
1022		-----		-----	
1026		-----		-----	
1059		-----		-----	
1062	AAS	13.2		4.52	
1065	Flame Photomtr	48	G(0.01)	33.94	
1080	D5863	6.7		-0.97	
1095	IP501	8.27		0.36	
1108	D5863-AAS	3.7		-3.51	
1121	IP501	8.1		0.21	
1126	IP501-ICP	9.9		1.73	
1134	IP501	8		0.13	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212	IP470	8.8	C	0.80	First reported 2.7
1215		-----		-----	
1231	ICP	6.6		-1.05	
1233	IP501-ICP	4.5		-2.83	
1259		-----		-----	
1264	IP501	11.9		3.43	
1269		-----		-----	
1271	ICP	23.56	C,G(0.01)	13.28	First reported 17.43
1275		-----		-----	
1300	IP501	9.8100		1.66	
1337		-----		-----	
1347		-----		-----	
1348	in house-AAS	1.5	G(0.05)	-5.37	
1356	IP501-ICP	8		0.13	
1358		-----		-----	
1381		-----		-----	
1383		-----		-----	
1385	in house-AAS	6.5		-1.14	
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404	IP470-AAS	8		0.13	
1419	in house-AAS	6.25		-1.35	
1428	IP501-ICP	7.8		-0.04	
1431	ICP	11.3		2.92	
1454		-----		-----	
1455		-----		-----	
1459		-----		-----	
1460	IP501-ICP	4.5558		-2.78	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520	IP501-AAS	7.7		-0.13	
1613	D5863-AAS	4.52		-2.81	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	IP501-ICP	9.85		1.69	
1636		-----		-----	
1654		-----		-----	
1656	IP501	9.0		0.97	
1710	IP501	7.2		-0.55	
1720		-----		-----	
1724	IP501	6.82		-0.87	
1728		-----		-----	
1740	IP501-ICP	7.1		-0.63	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833	IP501	11.4		3.00	
1849		-----		-----	
1854	IP501-ICP	8.4		0.47	
1906		-----		-----	
1915	D3605-AAS	6	C	-1.56	First reported 39.2
1938		-----		-----	

1943		-----	-----
1948		-----	-----
2129	IP470-AAS	7.2	-0.55
2160		-----	-----

normality	OK
n	32
outliers	3
mean (n)	7.848
st.dev. (n)	2.1974
R(calc.)	6.153
R(IP501:05)	3.313



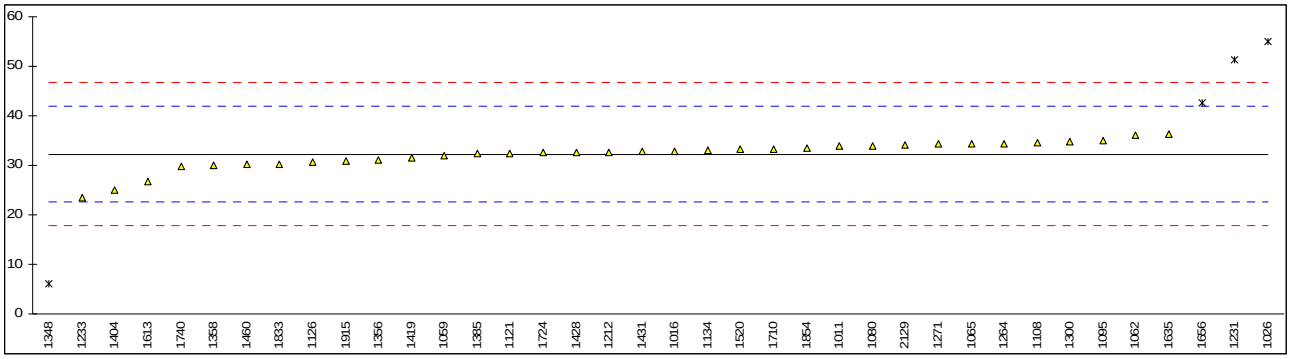


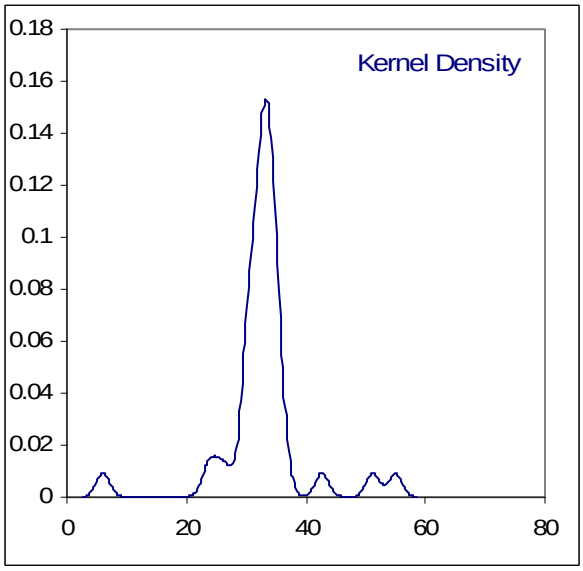
Determination of Vanadium on sample #12001; results in mg/kg

lab	method	value	mark	z(targ)	remarks
1011	D5863-AAS	34		0.37	
1016	in house-XRF	32.9		0.14	
1022		-----		-----	
1026	DIN51790-XRF	55	G(0.05)	4.73	
1059	in house-XRF	32		-0.04	
1062	EDXRF	36.0		0.79	
1065	EDXRF	34.4		0.45	
1080	D5863	34		0.37	
1095	IP501	35.08		0.60	
1108	D5863-AAS	34.6		0.50	
1121	IP501	32.5		0.06	
1126	IP501-ICP	30.7		-0.31	
1134	IP501	33		0.16	
1140		-----		-----	
1167		-----		-----	
1177		-----		-----	
1205		-----		-----	
1212	IP470	32.7	C	0.10	First reported 10.1
1215		-----		-----	
1231	ICP	51.2	G(0.01)	3.94	
1233	IP501-ICP	23.5		-1.81	
1259		-----		-----	
1264	IP501	34.45		0.46	
1269		-----		-----	
1271	XRF	34.30	C	0.43	First reported 49.14
1275		-----		-----	
1300	IP501	34.7125		0.52	
1337		-----		-----	
1347		-----		-----	
1348	in house-AAS	6	G(0.01)	-5.44	
1356	IP501-ICP	31		-0.25	
1358	IP593-XRF	30.1		-0.44	
1381		-----		-----	
1383		-----		-----	
1385	in house-AAS	32.3		0.02	
1395		-----		-----	
1396		-----		-----	
1402		-----		-----	
1404	IP470-AAS	25		-1.50	
1419	in house-ICP	31.54		-0.14	
1428	IP501-ICP	32.7		0.10	
1431	ICP	32.8		0.12	
1454		-----		-----	
1455		-----		-----	
1459		-----		-----	
1460	IP501-ICP	30.1640		-0.42	
1466		-----		-----	
1472		-----		-----	
1483		-----		-----	
1510		-----		-----	
1520	IP501-AAS	33.2		0.21	
1613	D5863-AAS	26.81		-1.12	
1616		-----		-----	
1631		-----		-----	
1633		-----		-----	
1635	IP501-ICP	36.3		0.85	
1636		-----		-----	
1654		-----		-----	
1656	IP501	42.7	G(0.05)	2.18	
1710	IP501	33.3		0.23	
1720		-----		-----	
1724	IP501	32.62		0.08	
1728		-----		-----	
1740	IP501-ICP	29.8		-0.50	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
1832		-----		-----	
1833	IP501	30.2		-0.42	
1849		-----		-----	
1854	IP501-ICP	33.4		0.25	
1906		-----		-----	
1915	D3605-AAS	30.9		-0.27	
1938		-----		-----	
1943		-----		-----	

1948		-----	-----
2129	IP470-AAS	34.2	0.41
2160		-----	-----

normality	not OK
n	34
outliers	4
mean (n)	32.211
st.dev. (n)	2.8235
R(calc.)	7.906
R(IP501:05)	13.492

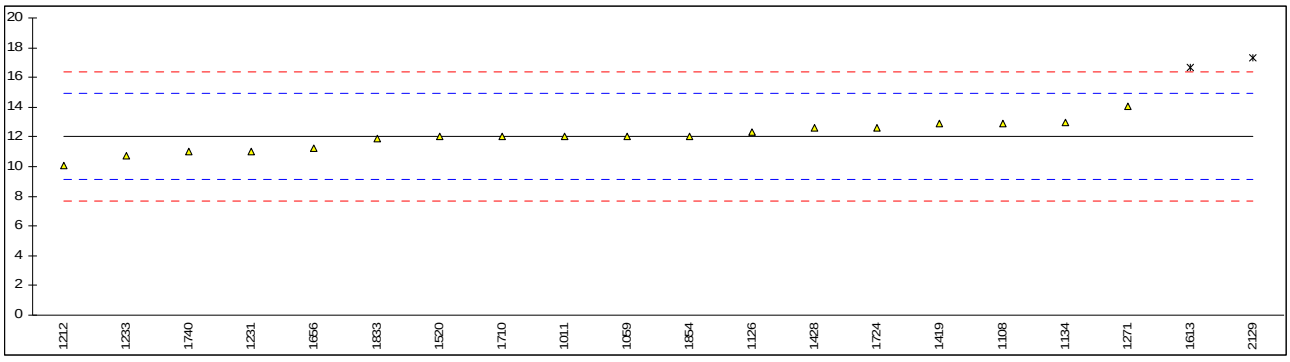


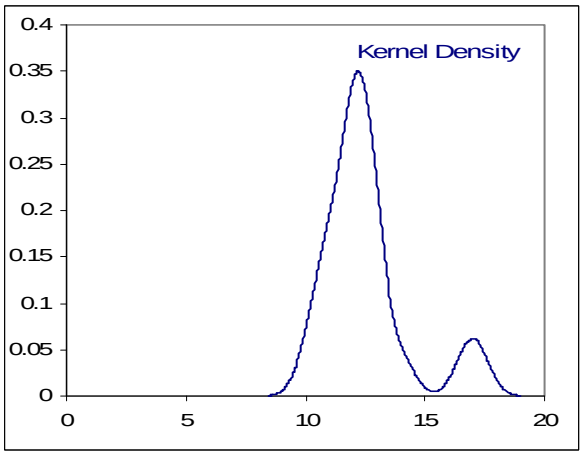


Determination of Aluminium on sample #12002; results in mg/kg

lab	method	value	mark	z(targ)	remarks
1011	IP377-AAS	12		-0.01	
1026		-----		-----	
1059	in house-XRF	12		-0.01	
1095		-----		-----	
1108	IP470-AAS	12.9		0.61	
1126	IP501-ICP	12.3		0.20	
1134	IP501-ICP	13		0.68	
1140		-----		-----	
1212	IP470-AAS	10.1		-1.33	
1231	D5184	11		-0.70	
1233	IP501	10.7		-0.91	
1259		-----		-----	
1271	IP501-ICP	14.07		1.42	
1419	D5184-ICP	12.88		0.60	
1428	IP502-ICP	12.6		0.40	
1454		-----		-----	
1455		-----		-----	
1510		-----		-----	
1520	IP501-AAS	12.0		-0.01	
1613	D5184-AAS	16.7	DG(0.01)	3.24	
1616		-----		-----	
1656	IP501-ICP	11.2		-0.56	
1710	IP501	12		-0.01	
1724	IP501-ICP	12.63		0.42	
1740	IP501-AAS	11		-0.70	
1807		-----		-----	
1833	IP501	11.92		-0.07	
1854	IP501-ICP	12		-0.01	
2129	IP377-AAS	17.3	DG(0.01)	3.65	

normality	OK
n	18
outliers	2
mean (n)	12.017
st.dev. (n)	0.9597
R(calc.)	2.687
R(IP501:05)	4.050

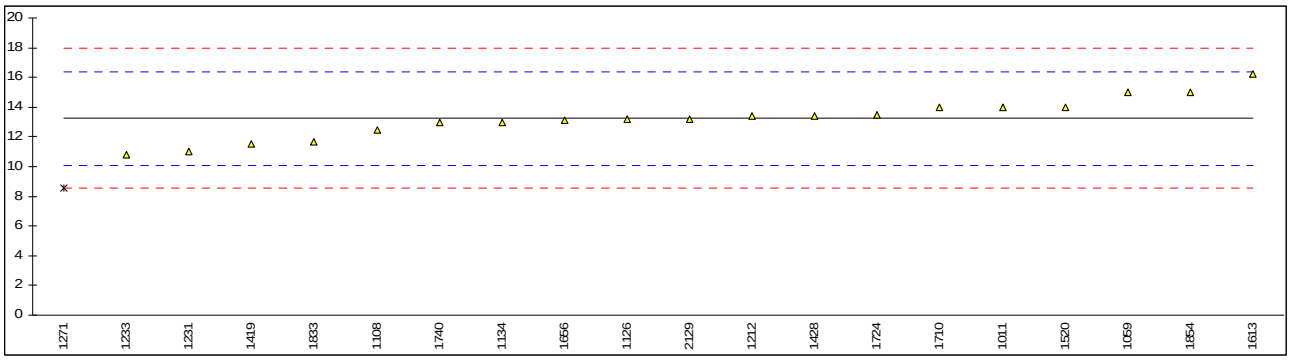


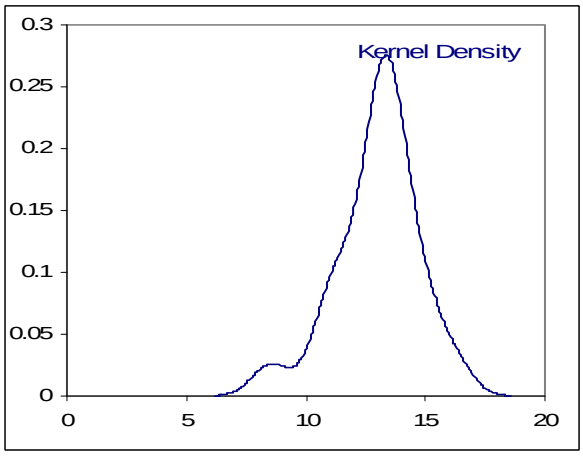


Determination of Silicon on sample #12002; results in mg/kg

lab	method	value	mark	z(targ)	remarks
1011	IP377-AAS	14		0.49	
1026		-----		-----	
1059	in house-XRF	15		1.12	
1095		-----		-----	
1108	IP470-AAS	12.5		-0.47	
1126	IP501-ICP	13.2		-0.02	
1134	IP501-ICP	13		-0.15	
1140		-----		-----	
1212	IP470-AAS	13.4		0.10	
1231	D5184	11		-1.42	
1233	IP501	10.8		-1.55	
1259		-----		-----	
1271	IP501-ICP	8.541	C,G(0.05)	-2.99	First reported 38.65
1419	D5184-ICP	11.54		-1.08	
1428	IP502-ICP	13.4		0.10	
1454		-----		-----	
1455		-----		-----	
1510		-----		-----	
1520	IP501-AAS	14.0		0.49	
1613	D5184-AAS	16.2		1.89	
1616		-----		-----	
1656	IP501-ICP	13.1		-0.09	
1710	IP501	14		0.49	
1724	IP501-ICP	13.47		0.15	
1740	IP501-AAS	13		-0.15	
1807		-----		-----	
1833	IP501	11.68		-0.99	
1854	IP501-ICP	15		1.12	
2129	IP377-AAS	13.2		-0.02	

normality	OK
n	19
outliers	1
mean (n)	13.236
st.dev. (n)	1.3698
R(calc.)	3.835
R(IP501:05)	4.394

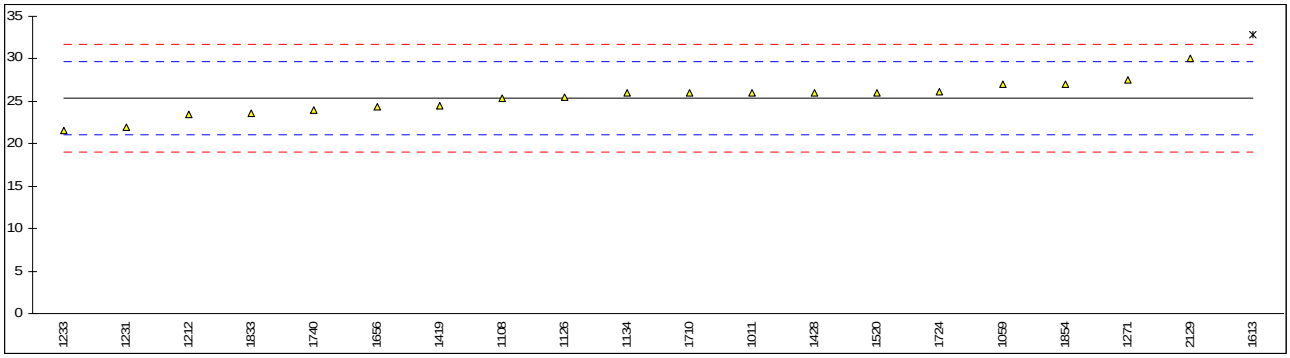


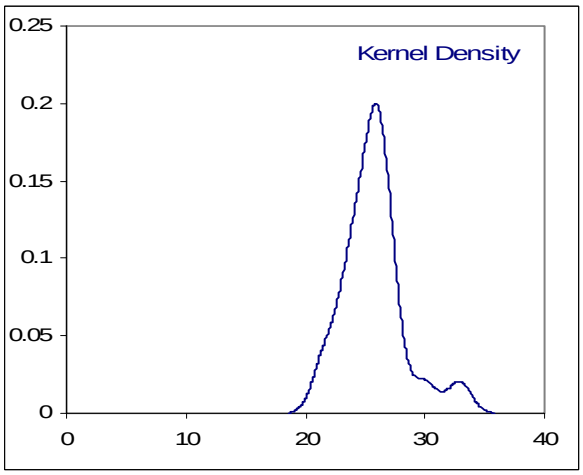


Determination of Total Aluminium/Silicon on sample #12002; results in mg/kg

lab	method	value	mark	z(targ)	remarks
1011	IP377-AAS	26		0.30	
1026		-----		-----	
1059	in house-XRF	27		0.77	
1095		-----		-----	
1108	IP470-AAS	25.4		0.02	
1126	IP501-ICP	25.5		0.06	
1134	IP501-ICP	26		0.30	
1140		-----		-----	
1212	IP470-AAS	23.5		-0.87	
1231	D5184	22		-1.58	
1233	IP501	21.5		-1.81	
1259		-----		-----	
1271	IP501-ICP	27.56		1.03	
1419	D5184-ICP	24.42		-0.44	
1428	IP502-ICP	26.0		0.30	
1454		-----		-----	
1455		-----		-----	
1510		-----		-----	
1520	IP501-AAS	26.0		0.30	
1613	D5184-AAS	32.9	G(0.05)	3.53	
1616		-----		-----	
1656	IP501-ICP	24.3		-0.50	
1710	IP501	26		0.30	
1724	IP501-ICP	26.1		0.35	
1740	IP501-AAS	24		-0.64	
1807		-----		-----	
1833	IP501	23.6		-0.83	
1854	IP501-ICP	27		0.77	
2129	Calc	30		2.17	

normality	OK
n	19
outliers	1
mean (n)	25.362
st.dev. (n)	1.9856
R(calc.)	5.560
R(IP501:05)	5.976





APPENDIX 2

Z-scores Distillation according to ASTM D1160 on sample #12001

lab	IBP	5%	10%	20%	30%	40%	50%	FBP
1011	-----	-----	-----	-----	-----	-----	-----	-----
1016	-----	-----	-----	-----	-----	-----	-----	-----
1022	-----	-----	-----	-----	-----	-----	-----	-----
1026	-----	-----	-----	-----	-----	-----	-----	-----
1059	-----	-----	-----	-----	-----	-----	-----	-----
1062	-----	-----	-----	-----	-----	-----	-----	-----
1065	-----	-----	-----	-----	-----	-----	-----	-----
1080	0.12	0.12	-1.27	-1.04	-1.58	-1.67	-----	-3.15
1095	-----	-----	-----	-----	-----	-----	-----	-----
1108	-1.05	-5.72	-9.69	-4.60	-8.12	-----	-----	-14.99
1121	-----	-----	-----	-----	-----	-----	-----	-----
1126	-----	-----	-----	-----	-----	-----	-----	-----
1134	-2.71	-4.17	-4.07	-3.81	-4.62	-6.94	-17.03	-----
1140	-----	-----	-----	-----	-----	-----	-----	-----
1167	-----	-----	-----	-----	-----	-----	-----	-----
1177	-----	-----	-----	-----	-----	-----	-----	-----
1205	-----	-----	-----	-----	-----	-----	-----	-----
1212	0.06	-1.27	-2.13	-0.79	-2.68	-3.56	-2.34	-0.42
1215	-----	-----	-----	-----	-----	-----	-----	-----
1231	-----	-----	-----	-----	-----	-----	-----	-----
1233	-----	-----	-----	-----	-----	-----	-----	-----
1259	0.14	-0.50	-0.71	-0.25	-0.63	-0.79	-----	-----
1264	-----	-----	-----	-----	-----	-----	-----	-----
1269	-----	-----	-----	-----	-----	-----	-----	-----
1271	-----	-----	-----	-----	-----	-----	-----	-----
1275	-----	-----	-----	-----	-----	-----	-----	-----
1300	-----	-----	-----	-----	-----	-----	-----	-----
1337	-----	-----	-----	-----	-----	-----	-----	-----
1347	-----	-----	-----	-----	-----	-----	-----	-----
1348	-----	-----	-----	-----	-----	-----	-----	-----
1356	-----	-----	-----	-----	-----	-----	-----	-----
1358	-----	-----	-----	-----	-----	-----	-----	-----
1381	-----	-----	-----	-----	-----	-----	-----	-----
1383	-----	-----	-----	-----	-----	-----	-----	-----
1385	-----	-----	-----	-----	-----	-----	-----	-----
1395	1.48	1.64	0.32	1.00	0.79	1.87	3.20	5.20
1396	-----	-----	-----	-----	-----	-----	-----	-----
1402	-----	-----	-----	-----	-----	-----	-----	-----
1404	-----	-----	-----	-----	-----	-----	-----	-----
1419	-----	-----	-----	-----	-----	-----	-----	-----
1428	-----	-----	-----	-----	-----	-----	-----	-----
1431	-----	-----	-----	-----	-----	-----	-----	-----
1454	-----	-----	-----	-----	-----	-----	-----	-----
1455	-0.67	2.83	3.51	2.98	3.18	1.59	-----	-2.84
1459	-----	-----	-----	-----	-----	-----	-----	-----
1460	-----	-----	-----	-----	-----	-----	-----	-----
1466	-----	-----	-----	-----	-----	-----	-----	-----
1472	-----	-----	-----	-----	-----	-----	-----	-----
1483	-----	-----	-----	-----	-----	-----	-----	-----
1510	-----	-----	-----	-----	-----	-----	-----	-----
1520	-----	-----	-----	-----	-----	-----	-----	-----
1613	0.29	0.94	1.08	0.87	0.39	0.69	-----	-2.32
1616	-----	-----	-----	-----	-----	-----	-----	-----
1631	-----	-----	-----	-----	-----	-----	-----	-----
1633	-----	-----	-----	-----	-----	-----	-----	-----
1635	3.13	4.55	4.23	2.93	2.48	2.66	3.39	5.23
1636	-----	-----	-----	-----	-----	-----	-----	-----
1654	-----	-----	-----	-----	-----	-----	-----	-----
1656	0.83	3.89	3.80	3.54	5.23	4.93	-----	0.93
1710	0.47	1.47	0.61	0.60	0.41	1.60	-----	1.02
1720	-0.66	-0.10	-0.88	-0.67	-0.56	-1.19	-----	-3.02
1724	-0.73	-2.43	-2.78	-1.06	-1.85	-4.30	-----	-----
1728	-----	-----	-----	-----	-----	-----	-----	-----
1740	-----	-----	-----	-----	-----	-----	-----	-----
1807	-----	-----	-----	-----	-----	-----	-----	-----
1810	-----	-----	-----	-----	-----	-----	-----	-----
1811	-----	-----	-----	-----	-----	-----	-----	-----
1832	-----	-----	-----	-----	-----	-----	-----	-----
1833	-0.08	-0.45	-0.60	0.13	-0.24	-0.61	-----	-----
1849	-----	-----	-----	-----	-----	-----	-----	-----
1854	-----	-----	-----	-----	-----	-----	-----	-----
1906	-----	-----	-----	-----	-----	-----	-----	-----
1915	-----	-----	-----	-----	-----	-----	-----	-----
1938	-----	-----	-----	-----	-----	-----	-----	-----
1943	-----	-----	-----	-----	-----	-----	-----	-----

1948	-----	-----	-----	-----	-----	-----	-----	-----
2129	-0.22	-0.80	-1.10	0.17	-0.32	-1.22	-4.25	-0.63
2160	-----	-----	-----	-----	-----	-----	-----	-----

APPENDIX 3

Number of participants per country

3	laboratories in BELGIUM
1	laboratory in BOSNIA and HERZEGOVINA
2	laboratories in CROATIA
2	laboratories in CZECH REPUBLIC
1	laboratory in DENMARK
3	laboratories in ESTONIA
2	laboratories in FRANCE
6	laboratories in GREECE
2	laboratories in HUNGARY
1	laboratory in ISRAEL
1	laboratory in JORDAN
2	laboratories in LATVIA
3	laboratories in LEBANON
1	laboratory in POLAND
1	laboratory in MAURITIUS
2	laboratories in PORTUGAL
1	laboratory in QATAR
1	laboratory in REPUBLIC OF MACEDONIA
1	laboratory in ROMANIA
2	laboratories in SAUDI ARABIA
1	laboratory in SLOVAKIA
2	laboratories in SLOVENIA
1	laboratory in SOUTH KOREA
3	laboratories in SPAIN
1	laboratory in SUDAN
1	laboratory in SWEDEN
2	laboratories in THAILAND
4	laboratories in THE NETHERLANDS
10	laboratories in TURKEY
1	laboratory in U.A.E.
14	laboratories in UNITED KINGDOM

APPENDIX 4

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
ex	= excluded from calculations
E	= error in calculations
n.a.	= not applicable

Literature:

1 i.i.s. Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, January 2010
2 ASTM E178-02
3 ASTM E1301-03
4 ISO 5725-86
5 ISO 5725, parts 1-6, 1994
6 ISO 13528:05
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, No 4.January 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/)