Results of Proficiency Test
Engine Oil (Fresh)
June 2018

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 1997, a proficiency test for fresh Engine Oil (Lubricating Oil) is organised every year by the Institute for Interlaboratory Studies. During the annual proficiency testing program 2017/2018, it was decided to continue the round robin for the analysis of Engine Oil (fresh) in accordance with the latest applicable version of ASTM D4485 and ACEA European Oil Sequences. In this interlaboratory study, 87 laboratories in 46 different countries registered for participation. See appendix 2 for the number of participants per country. In this report, the results of the 2018 Engine Oil (fresh) proficiency test are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyses for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC 17025 accredited laboratory. It was decided to send to each laboratory two bottles (1 * 1 litre bottle and 1 * 0.5 litre bottle) of the same Engine Oil (Fresh), both labelled #18095. The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

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

2.2 PROTOCOL

The protocol followed in the organisation was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of March 2017 (iis-protocol, version 3.4). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

The necessary 190 litre bulk material of a 5W40 engine oil was obtained from a local supplier. After homogenization, 94 amber glass bottles of 1 litre and 94 amber glass bottles of 0.5 litre were filled and both labelled #18095. The homogeneity of the subsamples #18095 was checked by determination of Density at 15°C in accordance with ASTM D4052 on 8 stratified randomly selected samples.

	Density at 15°C in kg/L
Sample #18095-1	0.85323
Sample #18095-2	0.85323
Sample #18095-3	0.85324
Sample #18095-4	0.85324
Sample #18095-5	0.85326
Sample #18095-6	0.85324
Sample #18095-7	0.85323
Sample #18095-8	0.85324

Table 1: homogeneity test results of subsamples #18095

From the above test results, the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibility of ASTM D4052 and the repeatability of ASTM D445, in agreement with the procedure of ISO13528, Annex B2 in the next table:

	Density at 15°C in kg/L
r (observed)	0.00001
reference test method	ASTM D4052:18
0.3 * R (ref. test method)	0.00015

Table 2: evaluation of the repeatabilities of the subsamples #18095

The calculated repeatability was less than 0.3 times the reproducibility of the target test method. Therefore, homogeneity of the subsamples #18095 was assumed.

To each of the participating laboratories 1 * 1 litre bottle and 1 * 0.5 litre (both labelled, #18095) were sent on May 23, 2018. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of the fresh engine oil packed in amber glass bottles was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6 ANALYSES

The participants were requested to determine on sample #18095: Acid Number, Base Number, Color (ASTM scale), Conradson Carbon Residue, Ramsbottom Carbon Residue, Carbon Residue (Micro method), Density at 15°C, Evaporation loss by Noack, Flash Point COC, Flash Point PMcc, Foaming Tendency, Foam Stability, Kinematic Viscosity at 40°C and at 100°C, Viscosity Index, Viscosity Stabinger at 40°C and at 100ºC, Viscosity Apparent (CSS), Viscosity High Temperature High Shear, Nitrogen, Pour Point (manual and automated), Sulphated Ash, Sulphur, Water, Calcium, Phosphorus and Zinc. Also some additional questions were asked about Acid Number and Foaming Characteristics.

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

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

3 RESULTS

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

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

3.1 STATISTICS

The protocol followed in the organisation of this proficiency test was the one as described in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' (iis-protocol, version 3.4) of March 2017.

For statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as '<…' or '>…' were not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test, a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either 'unknown', 'OK', 'suspect' or 'not OK'. After removal of outliers, this check was repeated. If a dataset does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.

According to ISO5725 the original test results per determination were submitted to Dixon's and/or Grubbs' and/or Rosner's outlier tests. Outliers are marked by D(0.01) for the Dixon's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

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

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

3.2 GRAPHICS

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

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

3.3 Z-SCORES

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

This 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 whether the reported test result is fit-for-use.

The z-scores were calculated according to:

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

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

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

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

4 EVALUATION

In this interlaboratory study no problems with sample dispatch were encountered. One participant reported after the final reporting date and six participants did not report any test results at all. Not all laboratories were able to report all analyses requested. In total 81 participants reported 1337 numerical test results. Observed were 37 outlying results, which is 2.8%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

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

4.1 EVALUATION PER TEST

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

In the iis PT reports, ASTM methods are referred to with a number (e.g. D1500) and an added designation for the year that the method was adopted or revised (e.g. D1500:12). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D1500:12 (2017)). In the results tables of appendix 1 only the method number and year of adoption or revision (e.g. D1500:12) will be used.

Acid Number: This determination was problematic depending on the type of end point and titration solvent used. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of inflection point at both titration solvents (60mL and 125mL) from ASTM D664-A:17a.
When evaluated separately for the type of endpoint the calculated reproducibility of the group using Inflection Point (IP) was still not in agreement with the requirements of inflection point at both titration solvents from test method D664-A:17a. The calculated reproducibility of the group using BEP (pH 11) is in agreement with the requirements of BEP (pH 11) from test method D664-A:17a for both volumes.
It is observed that 10 participants reported to have used BEP (pH 11) as determination end point. It is remarkedly because ASTM D664-A advise to use BEP for used oils.

Base Number: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of forward mode from ASTM D2896-A:15. When evaluated separately for procedure A or B forward mode from ASTM D2896-A, both calculated reproducibilities are still not in agreement with the requirements of forward mode A or B from test method ASTM D2896:15. NB. the reproducibility of mode A or B forward is the same.
It is observed that eleven participants reported to use back titration which is more applicable to used oils. Forward titration is the preferred method for a fresh oil.

Color (ASTM scale): This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D1500:12(2017).
The test values reported as “text”, e.g. L2.5, were converted to a numerical value (L2.5 to 2.25, see also appendix 1). A good agreement is found between the means and reproducibilities from the converted values and numerical test values.

Conradson CR: This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D189:06(2014).

Ramsbottom CR: This determination may not be problematic. Only six participants reported a test result. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D524:15.

Carbon Residue (micro method): This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D4530:15.

Density at 15°C: This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D4052:18.

Evaporation loss by Noack: This determination may be problematic dependent on the procedure of the reference test method used. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5800:15a procedure B but it is in agreement with the requirements of procedure A. When evaluated separately for the test results of procedure B from ASTM D5800:15a the calculated reproducibility is in agreement with the requirements of procedure B from ASTM D5800:15a.

Flash Point COC: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D92:16b.

Flash Point PMcc: This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in agreement with ASTM D93-A:16a.

Foaming Tendency: This determination may be problematic dependent on the sequence reported. No statistical outliers were observed. The calculated reproducibilities for the Sequences I and III are in agreement with the requirements of ASTM D892:13e1. However, the calculated reproducibility of Sequence II is not in agreement.
When evaluated separately for the different type of diffusers a difference in mean values was observed (15.9 vs 20.6 ml Foam for stone and metal diffuser respectively). Also, it was observed that the calculated reproducibility is 1,6 times higher for the group of metal diffuser than for the group of the stone diffuser. Still both groups did not meet the requirements of method ASTM D892:13e1.

Foam Stability: All reporting participants agreed on a result of 0 (Nil). Therefore, no z-scores were calculated.

Kin. Viscosity at 40°C: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D445:17a.

Kin. Viscosity at 100°C: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D445:17a.

Viscosity Index: 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 the requirements of ASTM D2270:10 (2016).

Visco. Stab. at 40°C: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D7042:16e3.

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

Visco. App. at -30°C: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D5293:17a.

Visco. HTHS: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D4683:17.

Nitrogen: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5762:18.

Pour Point manual: This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility is in full agreement with the requirements of ASTM D97:17b.

Pour Point automated: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is full in agreement with the requirements of ASTM D5950:14.

Sulphated Ash: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D874:13a.

Sulphur: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D4294:16e1.

Water: This determination was problematic for a number of laboratories. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D6304:16e1.
When evaluated separately over method A or C the calculated reproducibility was in agreement for method C but not for method A. The preferred method for a product containing interfering components is ASTM D6304 method C. It was observed that 14 participants reported to use method A.

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

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

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

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the reference test method and the reproducibility as found for the group of participating laboratories that participated. The average results, calculated reproducibilities and reproducibilities derived from reference test methods are compared in the next table.

Parameter	unit	n	average	2.8 * sd	R(lit)
Acid Number	mg KOH/g	51	2.71	1.51	0.91
Base Number	mg KOH/g	56	8.92	1.08	0.62
Color (ASTM scale)		41	2.5	0.6	1
Conradson Carbon Residue	%M/M	19	0.97	0.22	0.23
Ramsbottom Carbon Residue	%M/M	4	0.97	0.12	0.14
Carbon Residue (micro method)	%M/M	26	1.00	0.10	0.19
Density at 15°C	kg/L	68	0.8533	0.0005	0.0005
Evaporation loss by Noack	%M/M	18	9.68	1.57	1.31
Flash Point COC	°C	65	231.1	15.3	18
Flash Point PMcc	°C	54	206.2	12.4	14.6
Foaming Tendency, Sequence I	mL	33	2.4	11.1	15.0
Foaming Tendency, Sequence II	mL	35	20.1	40.0	22.8
Foaming Tendency, Sequence III	mL	33	2.6	11.7	15.0
Foam Stability, Sequence I	mL	35	0	n.a.	n.a.
Foam Stability, Sequence II	mL	35	0	n.a.	n.a.

Parameter	unit	n	average	2.8 * sd	R(lit)
Foam Stability, Sequence III	mL	35	0	n.a.	n.a.
Kinematic Viscosity at 40°C	mm^2/s	67	89.32	0.65	1.09
Kinematic Viscosity at 100°C	mm^2/s	64	14.59	0.12	0.20
Viscosity Index		62	170.7	2.0	2
Viscosity Stabinger at 40°C	mm^2/s	26	89.50	1.16	1.09
Viscosity Stabinger at 100°C	mm^2/s	26	14.61	0.18	0.14
Viscosity, Apparent at -30°C	mPa·s	26	6434	548	470
Viscosity, HTHS	mPa·s	13	3.88	0.12	0.16
Nitrogen	mg/kg	14	939	292	250
Pour Point, manual	°C	38	-42.2	9.3	9
Pour Point, automated	°C	20	-45.3	4.3	4.5
Sulphated Ash	%M/M	46	1.00	0.17	0.14
Sulphur	mg/kg	35	2152	362	270
Water	mg/kg	35	199	357	404
Calcium	mg/kg	54	2286	393	349
Phosphorus	mg/kg	51	928	147	131
Zinc	mg/kg	53	1074	197	179

Table 3: reproducibilities of tests on sample #18095

Without further statistical calculations it can be concluded that for a number of tests there is not a good compliance of the group of participants with the reference test methods. The problematic tests have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE PROFICIENCY TEST OF JUNE 2018 WITH PREVIOUS PTS

	June 2018	June 2017	June 2016	June 2015	June 2014
Number of reporting labs	81	67	69	72	87
Number of test results	1337	940	1007	961	996
Statistical outliers	37	45	25	40	20
Percentage outliers	2.8%	4.8%	2.5%	4.2%	2.0%

Table 4: comparison with previous proficiency tests

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

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

Determination	June 2018	June 2017	June 2016	June 2015	June 2014
Acid Number	-	--	--	--	--
Base Number	-	-	-	--	+
Color (ASTM scale)	+	-	+	+	++
Conradson Carbon Residue	+/-	+	+	++	+

Determination	June 2018	June 2017	June 2016	June 2015	June 2014
Ramsbottom Carbon Residue	+	+	--	--	--
Carbon Residue (micro method)	+	+/-	+	++	-
Density at 15°C	+/-	+	+	--	--
Evaporation loss by Noack	-	+	-	+/-	n.e.
Flash Point COC	+	-	+	++	+/-
Flash Point PMcc	+	+/-	+	++	+
Foaming Tendency	+/-	+/-	+/-	+/-	n.e.
Kinematic Viscosity at 40°C	+	+	+/-	+/-	-
Kinematic Viscosity at 100°C	+	+	+	++	--
Viscosity Index	+/-	+/-	-	--	--
Stabinger Viscosity at 40°C	+/-	-	-	+/-	-
Stabinger Viscosity at 100°C	-	-	-	+/-	+/-
Viscosity, Apparent (CSS)	-	+/-	+	+/-	+
Viscosity, HTHS	+	+	+	+	n.e.
Nitrogen	-	-	-	--	--
Pour Point, manual	+/-	-	+	++	+
Pour Point, automated	+/-	-	-	--	+/-
Sulphated Ash	-	+	-	--	+
Sulphur	-	-	-	--	--
Water	+	+/-	+	++	+
Calcium	-	+	--	--	+
Phosphorus	-	n.e.	--	--	-
Zinc	+/-	n.e.	--	--	-

Table 5: comparison determinations of sample #18095 against the reference test method

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

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

APPENDIX 1

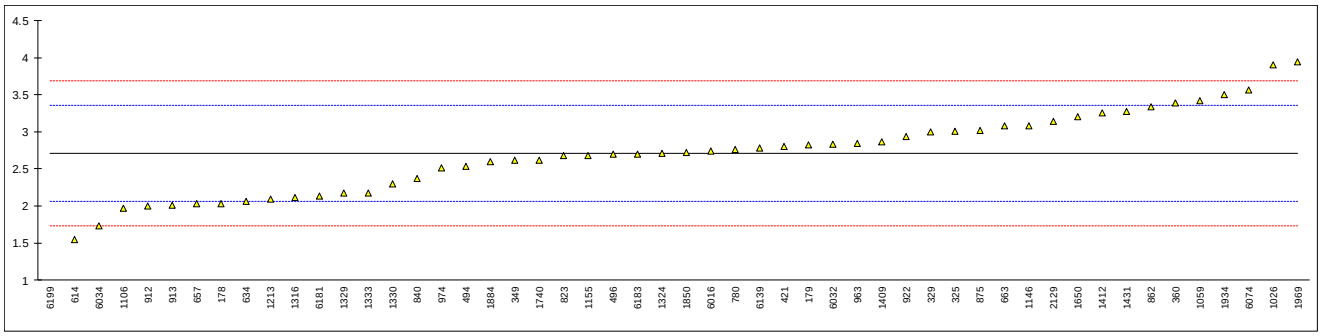
Determination of Acid Number on sample #18095; results in mg KOH/g

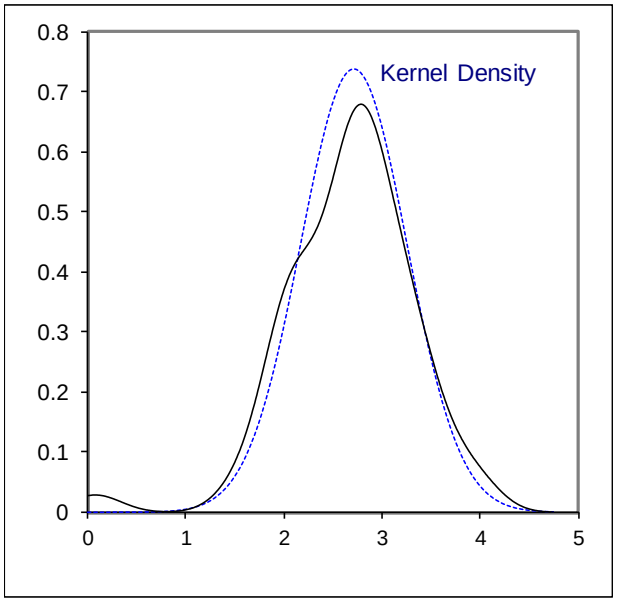
lab	method	value	mark	z(targ)	determination of end point	volume of titration solvent
173		-----		-----	---	---
178	INH-1118	2.03		-2.10	---	---
179	D664-A	2.82		0.33	---	---
211		-----		-----	---	---
237		-----		-----	---	---
254		-----		-----	---	---
255		-----		-----	---	---
325	D664-A	3.005		0.90	Buffer End Point (pH 11)	125 mL
329	D664-A	3.0		0.88	Inflection Point	125 mL
333		-----		-----	---	---
339		-----		-----	---	---
349	D664-A	2.62		-0.28	Inflection Point	125 mL
360	D664-A	3.394		2.09	Inflection Point	60 mL
398		-----		-----	---	---
421	ISO6619	2.8		0.27	---	---
432		-----		-----	---	---
494	D664-A	2.54		-0.53	Inflection Point	125 mL
496	D664-A	2.70		-0.04	Buffer End Point (pH 11)	60 mL
614	D974	1.55		-3.57	---	60 mL
634	D664-A	2.06		-2.00	Inflection Point	125 mL
657	D664-A	2.03		-2.10	---	---
663	D664-A	3.079		1.13	Buffer End Point (pH 11)	125 mL
780	D664-A	2.76		0.15	Inflection Point	60 mL
823	D664-A	2.68		-0.10	Inflection Point	125 mL
840	D664-A	2.37		-1.05	Inflection Point	125 mL
862	D664-A	3.34		1.93	Inflection Point	60 mL
875	D664-A	3.02		0.94	Inflection Point	60 mL
912	D974	2.0		-2.19	---	---
913	D664-A	2.0125		-2.15	Inflection Point	125 mL
922	D664-A	2.94		0.70	Inflection Point	125 mL
962		-----		-----	---	---
963	D664-A	2.84		0.39	Inflection Point	60 mL
974	D974	2.52		-0.59	---	---
994		-----		-----	---	---
1017		-----		-----	---	---
1023		-----		-----	---	---
1026	D664-A	3.9		3.65	Inflection Point	125 mL
1059	ISO6619	3.42		2.17	Buffer End Point (pH 11)	60 mL
1106	D664-B	1.9696		-2.28	---	---
1146	D664-A	3.082		1.13	Buffer End Point (pH 11)	60 mL
1155	ISO6619	2.68		-0.10	Inflection Point	125 mL
1173		-----		-----	---	---
1201		-----		-----	---	---
1213	D664-B	2.09	C	-1.91	---	---
1235		-----		-----	---	---
1243		-----		-----	---	---
1316	D664-A	2.11		-1.85	Buffer End Point (pH 11)	125 mL
1323		-----		-----	---	---
1324	D664-A	2.710		-0.01	Inflection Point	125 mL
1326		-----		-----	---	---
1328		-----		-----	---	---
1329	D664-A	2.18		-1.64	Inflection Point	60 mL
1330	D664-A	2.30		-1.27	Inflection Point	60 mL
1332		-----		-----	---	---
1333		2.18		-1.64	Inflection Point	60 mL
1334		-----		-----	---	---
1409	D664-A	2.86		0.45	Buffer End Point (pH 11)	125 mL
1412	D664-A	3.26		1.68	Buffer End Point (pH 11)	125 mL
1431	D664-A	3.2740		1.72	Inflection Point	60 mL
1448		-----		-----	---	---
1543		-----		-----	---	---
1564		-----		-----	---	---
1650	D664-A	3.20		1.50	Inflection Point	125 mL
1740	D664-A	2.62		-0.28	---	---
1748		-----		-----	---	---
1850	ISO6619	2.72		0.02	Inflection Point	60 mL
1877		-----		-----	---	---
1883		-----		-----	---	---
1884	D664-A	2.6		-0.35	Buffer End Point (pH 11)	60 mL
1934	D664-A	3.5		2.42	Buffer End Point (pH 11)	125 mL
1969	D664-A	3.949		3.80	---	60 mL
2129	D664-A	3.142		1.32	Inflection Point	125 mL
6016	D664-A	2.737		0.08	Inflection Point	60 mL

lab	method	value	mark	z(targ)	determination of end point	volume of titration solvent
6032	D664-A	2.839		0.39	Inflection Point	60 mL
6034	D664-A	1.73		-3.02	---	125 mL
6054		-----		-----	---	---
6074	D664-A	3.56		2.60	Inflection Point	125 mL
6139	D664-A	2.78		0.21	Inflection Point	60 mL
6181		2.138		-1.76	---	---
6183		2.70		-0.04	Inflection Point	125 mL
6194		-----		-----	---	---
6197		-----		-----	---	---
6199	D664-A	0.08	R(0.01)	-8.09	Inflection Point	60 mL
9100		-----		-----	---	---
9101		-----		-----	---	---
9142		-----		-----	---	---
9143		-----		-----	---	---

		Inflection point only	BEP (pH 11) only
normality	OK	OK	OK
n	51	28	10
outliers	1	1	0
mean (n)	2.713	2.803	2.962
st.dev. (n)	0.5403	0.4544	0.4155
R(calc.)	1.513	1.272	1.163
st.dev.(D664-A:17a Inflection-60mL)	0.3255	0.3344	---
R(D664-A:17a Inflection-60mL)	0.912	0.936	---
Compare:			
R(D664-A:17a BEP-60mL)	1.192		1.299
R(D664-A:17a Inflection-125mL)	0.523	0.536	
R(D664-A:17a BEP-125mL)	1.194		1.303

lab1213 first reported 4.558



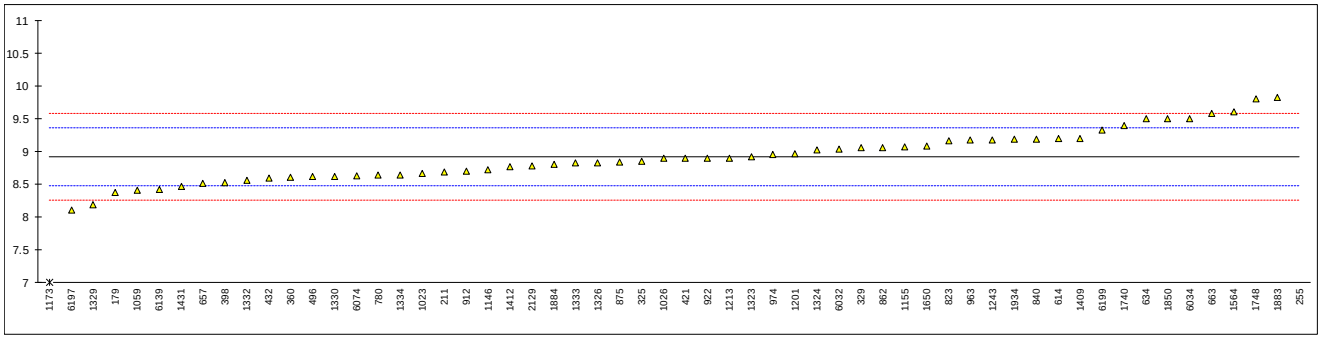


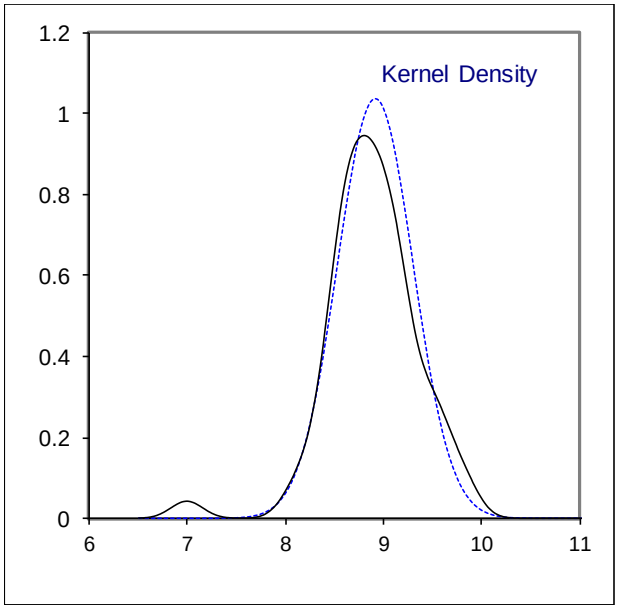
Determination of Base Number on sample #18095; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179	D2896 - B back	8.37		-2.46	
211	D2896 - B forward	8.68		-1.07	
237		-----		-----	
254		-----		-----	
255	D2896	14.65	R(0.01)	25.71	
325	D2896 - B forward	8.85		-0.30	
329	D2896 - A forward	9.06		0.64	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	D2896 - B forward	8.60		-1.42	
398	D2896 - A forward	8.52		-1.78	
421	ISO3771	8.9		-0.08	
432	D2896 - B back	8.59		-1.47	
494		-----		-----	
496	D2896 - B back	8.61		-1.38	
614	D2896 - B forward	9.2		1.27	
634	D2896 - A forward	9.5	C	2.61	first reported 7.3
657	D2896 - B forward	8.515		-1.81	
663	D2896 - A forward	9.585		2.99	
780	D2896 - B forward	8.64		-1.24	
823	D2896 - A back	9.16		1.09	
840	D2896 - B forward	9.19		1.22	
862	D2896 - B forward	9.06		0.64	
875	D2896 - A forward	8.84		-0.35	
912	D2896 - B forward	8.70		-0.98	
913		-----		-----	
922	D2896 - B forward	8.9		-0.08	
962		-----		-----	
963	D2896 - A forward	9.17		1.13	
974	D2896 - A back	8.95		0.15	
994		-----		-----	
1017		-----		-----	
1023	D2896	8.66		-1.15	
1026	D2896 - B forward	8.9		-0.08	
1059	ISO3771	8.4		-2.32	
1106		-----		-----	
1146	D2896 - A back	8.722		-0.88	
1155	ISO3771	9.07		0.68	
1173	D5984	7.0	R(0.01)	-8.60	
1201	D2896 - A forward	8.97		0.24	
1213	D2896 - B forward	8.90		-0.08	
1235		-----		-----	
1243	ISO51639	9.17		1.13	
1316		-----		-----	
1323	D2896 - A forward	8.92		0.01	
1324	D2896 - A forward	9.021		0.46	
1326	D2896 - B forward	8.83		-0.39	
1328		-----		-----	
1329	D2896 - A back	8.18		-3.31	
1330	D2896 - A forward	8.61		-1.38	
1332	SH/T0251	8.56		-1.60	
1333		8.82		-0.44	
1334		8.643		-1.23	
1409	D2896 - B forward	9.2		1.27	
1412	D4739	8.77		-0.66	
1431	D2896 - B forward	8.4637		-2.04	
1448		-----		-----	
1543		-----		-----	
1564	D2896 - B back	9.6		3.06	
1650	D2896 - A forward	9.08		0.73	
1740	D2896 - B forward	9.39		2.12	
1748	D2896 - A forward	9.797		3.95	
1850	ISO3771	9.5		2.61	
1877		-----		-----	
1883	D2896 - B forward	9.83	C	4.09	first reported 10.31
1884	D2896 - B forward	8.8		-0.53	
1934	D2896 - A forward	9.18		1.18	
1969		-----		-----	
2129	D2896 - A forward	8.780		-0.62	
6016		-----		-----	
6032	D2896 - B forward	9.04		0.55	

lab	method	value	mark	z(targ)	remarks
6034	D2896 - A back	9.5		2.61	
6054		-----		-----	
6074	D2896 - A back	8.63		-1.29	
6139	D2896 - B forward	8.42		-2.23	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197	D2896 - B forward	8.1		-3.67	
6199	D2896 - A back	9.3296		1.85	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

		Only D2896-A forward	Only D2896-B forward
normality	OK	OK	suspect
n	56	14	21
outliers	2	0	0
mean (n)	8.917	9.074	8.867
st.dev. (n)	0.3848	0.3602	0.3784
R(calc.)	1.077	1.009	1.060
st.dev.(D2896-A:15 forward)	0.2229	0.2268	0.2218
R(D2896-A:15 forward)	0.624	0.635	
Compare			
R(D2896-B:15 forward)	0.624		0.621



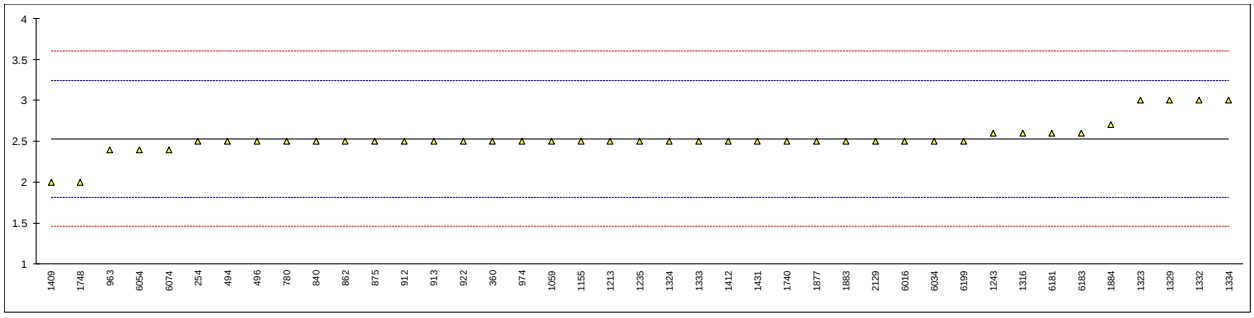


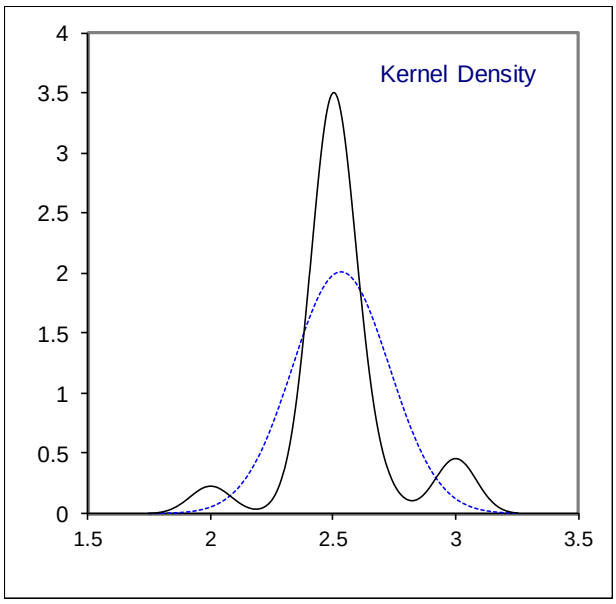
Determination of Color (ASTM scale) on sample #18095

lab	method	value	mark	z(targ)	calc. value*	mark	remarks
173	D1500	L3.0		-----	2.75		
178		-----		-----	-----		
179	D1500	L3.0		-----	2.75		
211	D1500	L 2.5		-----	2.25		
237	D1500	L3.0		-----	2.75		
254	D1500	2.5		-0.09	2.5		
255		-----		-----	-----		
325	D6045	L2.5		-----	2.25		
329	D1500	L3,0		-----	2.75		
333		-----		-----	-----		
339		-----		-----	-----		
349		-----		-----	-----		
360	D1500	2.5		-0.09	2.5		
398	D1500	L 3.0		-----	2.75		
421		-----		-----	-----		
432	D1500	L3,0		-----	2.75		
494	D1500	2.5		-0.09	2.5		
496	D1500	2.5		-0.09	2.5		
614	D1500	<2.5		-----	2.25		
634	D1500	L3.0		-----	2.75		
657	D1500	L2.5		-----	2.25		
663	D1500	L2.5		-----	2.25		
780	D1500	2.5		-0.09	2.5		
823	D1500	L3.0		-----	2.75		
840	D1500	2.5		-0.09	2.5		
862	D1500	2.5		-0.09	2.5		
875	D6045	2.5		-0.09	2.5		
912	D1500	2.5		-0.09	2.5		
913	D1500	2.5		-0.09	2.5		
922	D1500	2.5		-0.09	2.5		
962	D1500	L2.5		-----	2.25		
963	D1500	2.4		-0.37	2.4		
974	D1500	2.5		-0.09	2.5		
994	D1500	L.2.5		-----	2.25		
1017		-----		-----	-----		
1023		-----		-----	-----		
1026	D1500	L3.0		-----	2.75		
1059	D1500	2.5		-0.09	2.5		
1106		-----		-----	-----		
1146		-----		-----	-----		
1155	ISO2049	2.5		-0.09	2.5		
1173		-----		-----	-----		
1201		-----		-----	-----		
1213	D1500	2.5		-0.09	2.5		
1235	ISO2049	2.5		-0.09	2.5		
1243	ISO2049	2.6		0.19	2.6		
1316	D1500	2.6		0.19	2.6		
1323		3.0		1.31	3.0		
1324	D1500	2.5		-0.09	2.5		
1326		-----		-----	-----		
1328	D1500	<3.0		-----	2.75		
1329	D1500	3.0		1.31	3.0		
1330	D1500	L3.0		-----	2.75		
1332	D1500	3.0		1.31	3.0		
1333		2.5		-0.09	2.5		
1334	D1500	3.0		1.31	3.0		
1409	D1500	2.0		-1.49	2.0		
1412	D1500	2.5		-0.09	2.5		
1431	D1500	2.5		-0.09	2.5		
1448		-----		-----	-----		
1543		-----		-----	-----		
1564	D1500	L3		-----	2.75		
1650		-----		-----	-----		
1740	D1500	2.5		-0.09	2.5		
1748	D1500	2		-1.49	2		
1850	ISO2049	L 2,5		-----	2.25		
1877	D6045	2.5		-0.09	2.5		
1883	D1500	2.5		-0.09	2.5		
1884	D1500	2.7		0.47	2.7		
1934	D1500	< 3.0		-----	2.75		
1969		-----		-----	-----		
2129	D6045	2.5		-0.09	2.5		
6016	D1500	2.5		-0.09	2.5		
6032	D1500	L3.0		-----	2.75		

lab	method	value	mark	z(targ)	calc. value*	mark	remarks
6034	D1500	2.5		-0.09	2.5		
6054	D1500	2.4		-0.37	2.4		
6074	D1500	2.4		-0.37	2.4		
6139	D1500	L3.0		-----	2.75		
6181	D1500	2.6		0.19	2.6		
6183		2.6		0.19	2.6		
6194		-----		-----	-----		
6197	D1500	L2.5		-----	2.25		
6199	D1500	2.5		-0.09	2.5		
9100		-----		-----	-----		
9101		-----		-----	-----		
9142		-----		-----	-----		
9143		-----		-----	-----		
					all values calculated: *		
	normality	not OK			OK		
	n	41			65		
	outliers	0			0		
	mean (n)	2.53			2.54		
	st.dev. (n)	0.198			0.216		
	R(calc.)	0.55			0.61		
	st.dev.(D1500:12)	0.357			0.357		
	R(D1500:12)	1			1		

* In the calculation of the mean, standard deviation and the reproducibility of this column, a reported value of ‘L y’ is changed into y-0.25 (for example L2.5 into 2.25)



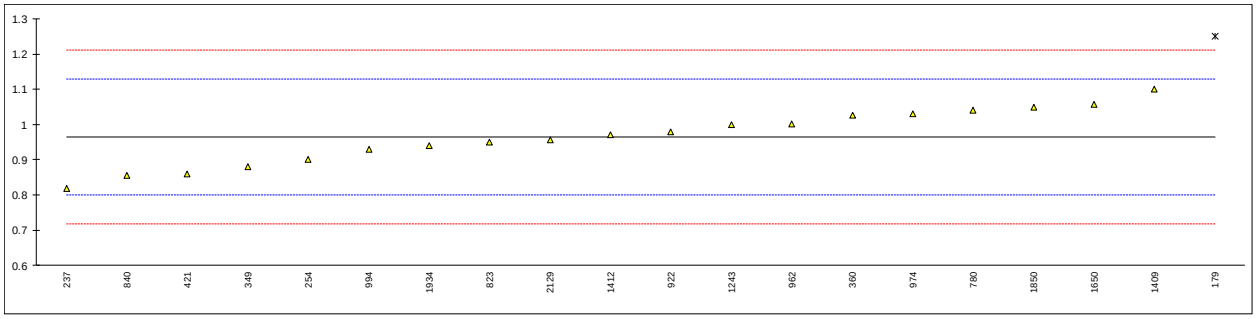


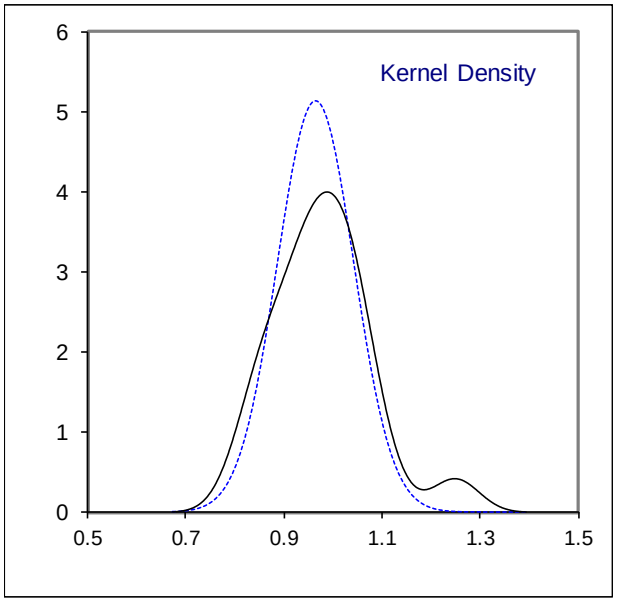
Determination of Conradson Carbon Residue on sample #18095; results in %M/M

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179	D189	1.25	C,R(0.05)	3.46	first reported 1.41
211		-----		-----	
237	D189	0.818		-1.79	
254	D189	0.90		-0.80	
255		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349	D189	0.88		-1.04	
360	D189	1.026		0.73	
398		-----		-----	
421	ISO6615	0.86		-1.28	
432		-----		-----	
494		-----		-----	
496		-----		-----	
614		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
780	D189	1.04		0.91	
823	D189	0.95		-0.19	
840	D189	0.8554		-1.34	
862		-----		-----	
875		-----		-----	
912		-----		-----	
913		-----		-----	
922	D189	0.98		0.18	
962	D189	1.002		0.44	
963		-----		-----	
974	D189	1.03		0.78	
994	D189	0.93		-0.43	
1017		-----		-----	
1023		-----		-----	
1026		-----		-----	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1155		-----		-----	
1173		-----		-----	
1201		-----		-----	
1213		-----		-----	
1235		-----		-----	
1243	ISO6615	1.00		0.42	
1316		-----		-----	
1323		-----		-----	
1324		-----		-----	
1326		-----		-----	
1328		-----		-----	
1329		-----		-----	
1330		-----		-----	
1332		-----		-----	
1333		-----		-----	
1334		-----		-----	
1409	D189	1.1		1.63	
1412	D189	0.97		0.05	
1431		-----		-----	
1448		-----		-----	
1543		-----		-----	
1564		-----		-----	
1650	D189	1.058		1.12	
1740		-----		-----	
1748		-----		-----	
1850	ISO6615	1.05		1.03	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934	D189	0.94		-0.31	
1969		-----		-----	
2129	D189	0.956		-0.12	
6016		-----		-----	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054		-----		-----	
6074		-----		-----	
6139		-----		-----	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197		-----		-----	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	19
outliers	1
mean (n)	0.966
st.dev. (n)	0.0777
R(calc.)	0.218
st.dev.(D189:06)	0.0823
R(D189:06)	0.230



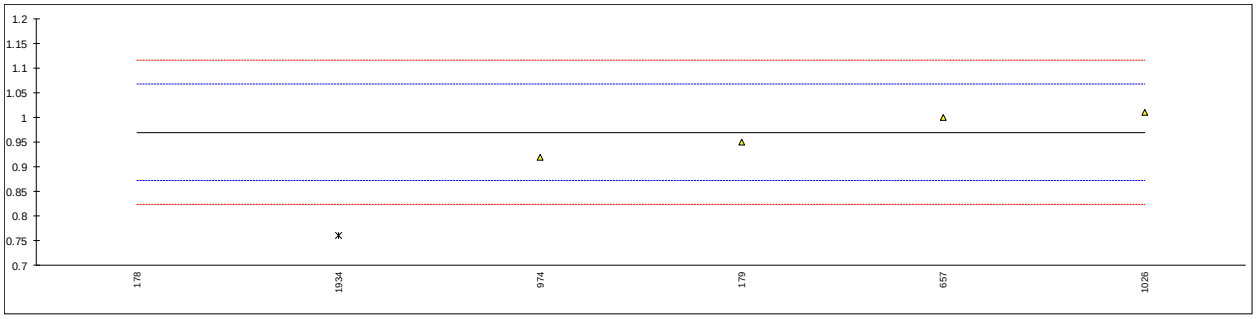


Determination of Ramsbottom Carbon Residue on sample #18095; results in %M/M

lab	method	value	mark	z(targ)	Remarks
173		-----		-----	
178	D524	0.46	C,DG(0.05)	-10.43	first reported 0.58
179	D524	0.95		-0.41	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432		-----		-----	
494		-----		-----	
496		-----		-----	
614		-----		-----	
634		-----		-----	
657	D524	1.0		0.61	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862		-----		-----	
875		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D524	0.92		-1.02	
994		-----		-----	
1017		-----		-----	
1023		-----		-----	
1026	D524	1.01		0.82	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1155		-----		-----	
1173		-----		-----	
1201		-----		-----	
1213		-----		-----	
1235		-----		-----	
1243		-----		-----	
1316		-----		-----	
1323		-----		-----	
1324		-----		-----	
1326		-----		-----	
1328		-----		-----	
1329		-----		-----	
1330		-----		-----	
1332		-----		-----	
1333		-----		-----	
1334		-----		-----	
1409		-----		-----	
1412		-----		-----	
1431		-----		-----	
1448		-----		-----	
1543		-----		-----	
1564		-----		-----	
1650		-----		-----	
1740		-----		-----	
1748		-----		-----	
1850		-----		-----	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934	D524-calc	0.76	DG(0.05)	-4.30	
1969		-----		-----	
2129		-----		-----	
6016		-----		-----	
6032		-----		-----	

lab	method	value	mark	z(targ)	Remarks
6034		-----		-----	
6054		-----		-----	
6074		-----		-----	
6139		-----		-----	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197		-----		-----	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	unknown
n	4
outliers	2
mean (n)	0.970
st.dev. (n)	0.0424
R(calc.)	0.119
st.dev.(D524:15)	0.0489
R(D524:15)	0.137

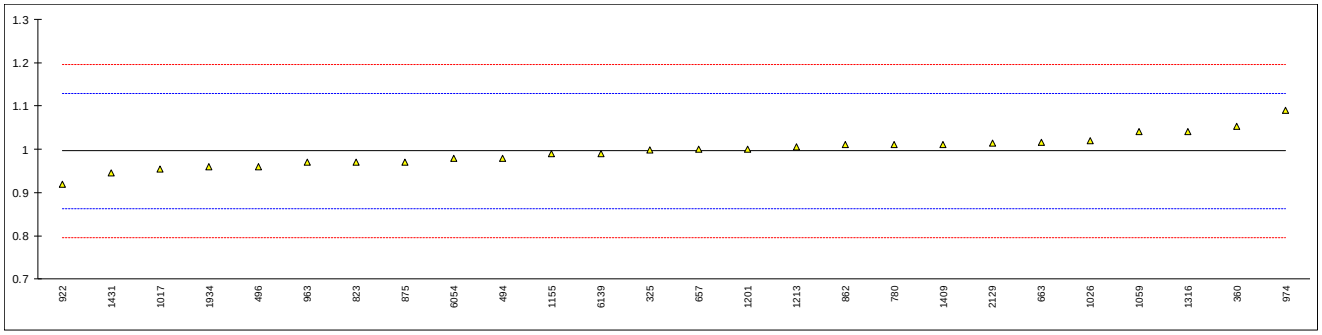


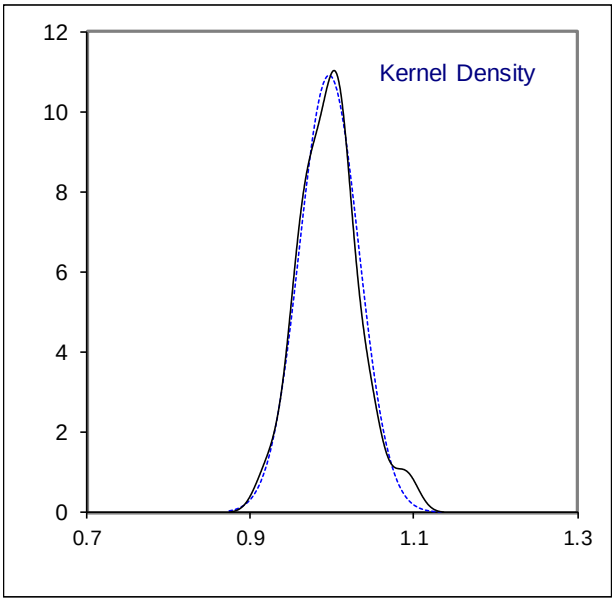
Determination of Carbon Residue (micro method) on sample #18095; results in %M/M

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179		-----		-----	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325	D4530	0.999		0.04	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	D4530	1.053		0.85	
398		-----		-----	
421		-----		-----	
432		-----		-----	
494	D4530	0.98		-0.24	
496	D4530	0.9606		-0.53	
614		-----		-----	
634		-----		-----	
657	D4530	1.00		0.06	
663	D4530	1.017		0.31	
780	D4530	1.01		0.21	
823	D4530	0.97		-0.39	
840		-----		-----	
862	D4530	1.01		0.21	
875	D4530	0.97		-0.39	
912		-----		-----	
913		-----		-----	
922	D4530	0.92		-1.14	
962		-----		-----	
963	D4530	0.97		-0.39	
974	D4530	1.09		1.41	
994		-----		-----	
1017	ISO10370	0.954		-0.63	
1023		-----		-----	
1026	ISO10370	1.02		0.36	
1059	ISO10370	1.04		0.66	
1106		-----		-----	
1146		-----		-----	
1155	D4530	0.99		-0.09	
1173		-----		-----	
1201	D4530	1.00		0.06	
1213	D4530	1.005		0.13	
1235		-----		-----	
1243		-----		-----	
1316	D4530	1.04		0.66	
1323		-----		-----	
1324		-----		-----	
1326		-----		-----	
1328		-----		-----	
1329		-----		-----	
1330		-----		-----	
1332		-----		-----	
1333		-----		-----	
1334		-----		-----	
1409	D4530	1.01		0.21	
1412		-----		-----	
1431	D4530	0.945		-0.76	
1448		-----		-----	
1543		-----		-----	
1564		-----		-----	
1650		-----		-----	
1740		-----		-----	
1748		-----		-----	
1850		-----		-----	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934	D4530	0.96		-0.54	
1969		-----		-----	
2129	ISO10370	1.014		0.27	
6016		-----		-----	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054	D4530	0.979123		-0.25	
6074		-----		-----	
6139	D4530	0.99		-0.09	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197		-----		-----	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	26
outliers	0
mean (n)	0.996
st.dev. (n)	0.0365
R(calc.)	0.102
st.dev.(D4530:15)	0.0668
R(D4530:15)	0.187



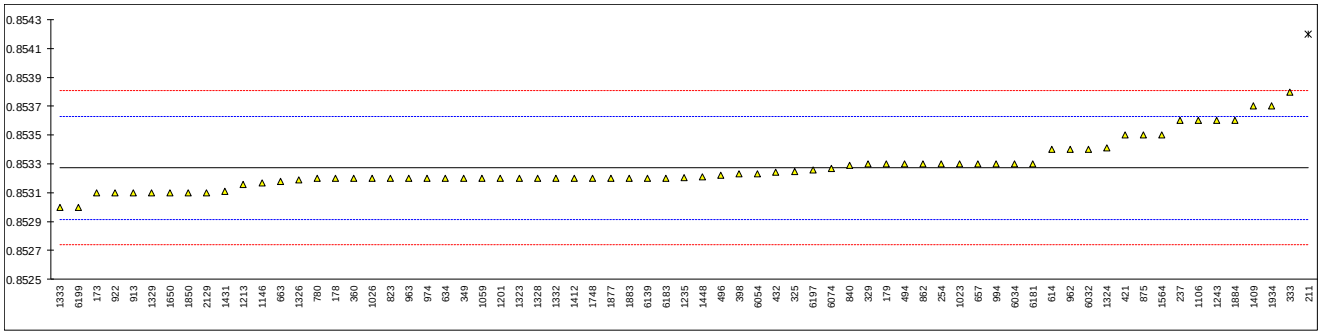


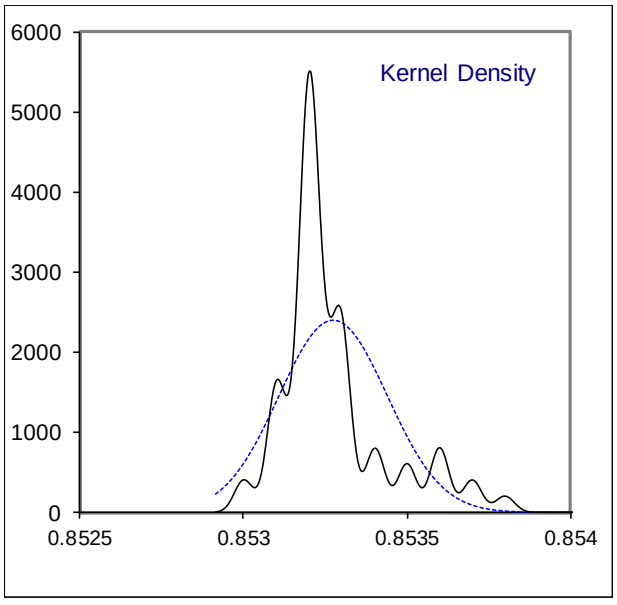
Determination of Density at 15°C on sample #18095; results in kg/L

lab	method	value	mark	z(targ)	remarks
173	D4052	0.8531		-0.97	
178	D4052	0.8532		-0.41	
179	D4052	0.8533		0.15	
211	D4052	0.8542	R(0.01)	5.19	
237	D4052	0.8536		1.83	
254	D4052	0.8533		0.15	
255		-----		-----	
325	D4052	0.85325		-0.13	
329	D4052	0.8533		0.15	
333	D4052	0.8538		2.95	
339		-----		-----	
349	D4052	0.8532		-0.41	
360	D4052	0.8532		-0.41	
398	D4052	0.85323		-0.25	
421	ISO12185	0.8535		1.27	
432	D4052	0.85324		-0.19	
494	D4052	0.8533		0.15	
496	D4052	0.85322		-0.30	
614	D4052	0.8534		0.71	
634	D4052	0.8532		-0.41	
657	D4052	0.8533		0.15	
663	D4052	0.85318		-0.53	
780	D4052	0.8532		-0.41	
823	D4052	0.8532		-0.41	
840	D4052	0.85329		0.09	
862	D4052	0.8533		0.15	
875	D4052	0.8535		1.27	
912		-----		-----	
913	D4052	0.8531		-0.97	
922	D4052	0.8531		-0.97	
962	D4052	0.8534		0.71	
963	D4052	0.8532		-0.41	
974	D4052	0.8532		-0.41	
994	ISO12185	0.8533		0.15	
1017		-----		-----	
1023	D4052	0.8533		0.15	
1026	D4052	0.8532		-0.41	
1059	D4052	0.8532		-0.41	
1106	D5002	0.8536		1.83	
1146	D4052	0.85317		-0.58	
1155		-----		-----	
1173		-----		-----	
1201	D4052	0.8532		-0.41	
1213	D4052	0.85316		-0.64	
1235	ISO12185	0.853205		-0.39	
1243	ISO12185	0.8536		1.83	
1316		-----		-----	
1323		0.8532		-0.41	
1324	D4052	0.85341		0.76	
1326	D4052	0.85319		-0.47	
1328	D4052	0.85320		-0.41	
1329	D4052	0.8531	C	-0.97	first reported 853.1 kg/L
1330		-----		-----	
1332	ISO12185	0.8532		-0.41	
1333		0.8530		-1.53	
1334		-----		-----	
1409	D4052	0.8537		2.39	
1412	D4052	0.8532		-0.41	
1431	D4052	0.85311		-0.92	
1448	D4052	0.85321		-0.36	
1543		-----		-----	
1564	D4052	0.8535		1.27	
1650	D4052	0.8531		-0.97	
1740		-----		-----	
1748	D4052	0.8532		-0.41	
1850	D4052	0.8531		-0.97	
1877	D4052	0.8532		-0.41	
1883	D1298	0.8532		-0.41	
1884	D4052	0.8536		1.83	
1934	D4052	0.8537		2.39	
1969		-----		-----	
2129	D4052	0.8531		-0.97	
6016		-----		-----	
6032	D4052	0.8534		0.71	

lab	method	value	mark	z(targ)	remarks
6034	D4052	0.8533		0.15	
6054	D4052	0.85323		-0.25	
6074	D4052	0.85327		-0.02	
6139	D4052	0.8532		-0.41	
6181	ISO12185	0.8533		0.15	
6183		0.8532		-0.41	
6194		-----		-----	
6197	D4052	0.85326		-0.08	
6199	D4052	0.8530		-1.53	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	not OK
n	68
outliers	1
mean (n)	0.85327
st.dev. (n)	0.000166
R(calc.)	0.00046
st.dev.(D4052:18)	0.000179
R(D4052:18)	0.00050



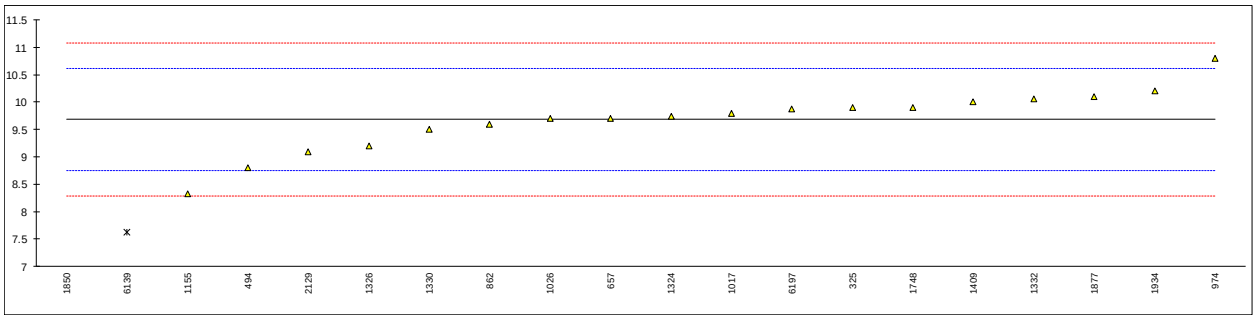


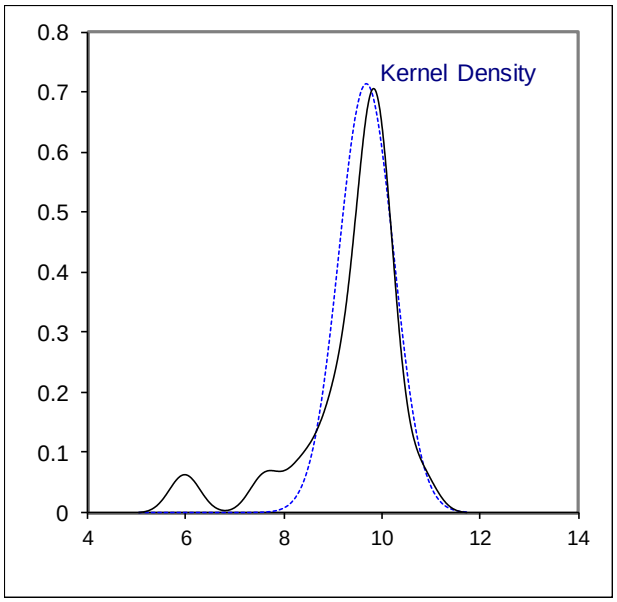
Determination of Evaporation loss by Noack on sample #18095; results in %M/M

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179		-----		-----	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325	CEC L-40-93	9.9		0.46	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432		-----		-----	
494	D5800 - B	8.8		-1.89	
496		-----		-----	
614		-----		-----	
634		-----		-----	
657	D5800 - B	9.7		0.04	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862	D5800 - B	9.6		-0.18	
875		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D5800 - B	10.8		2.39	
994		-----		-----	
1017	CEC L-40-93	9.8		0.25	
1023		-----		-----	
1026	CEC L-40-93	9.7		0.04	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1155	D5800 - A	8.325		-2.91	
1173		-----		-----	
1201		-----		-----	
1213		-----		-----	
1235		-----		-----	
1243		-----		-----	
1316		-----		-----	
1323		-----		-----	
1324	D5800 - B	9.74		0.12	
1326	D5800 - A	9.2		-1.04	
1328		-----		-----	
1329		-----		-----	
1330	D5800 - B	9.5		-0.39	
1332	NB/SH/T0059	10.06		0.81	
1333		-----		-----	
1334		-----		-----	
1409	D5800 - B	10.0		0.68	
1412		-----		-----	
1431		-----		-----	
1448		-----		-----	
1543		-----		-----	
1564		-----		-----	
1650		-----		-----	
1740		-----		-----	
1748	D5800 - B	9.9		0.46	
1850	DIN51581	5.97	R(0.01)	-7.96	
1877	D5800 - A	10.1		0.89	
1883		-----		-----	
1884		-----		-----	
1934	D5800 - B	10.2		1.11	
1969		-----		-----	
2129	D5800 - A	9.10		-1.25	
6016		-----		-----	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054		-----		-----	
6074		-----		-----	
6139	D5800 - A	7.62	R(0.05)	-4.42	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197	D5800 - B	9.873		0.41	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

		Only D5800 - B
normality	suspect	not OK
n	18	10
outliers	2	0
mean (n)	9.683	9.811
st.dev. (n)	0.5592	0.5118
R(calc.)	1.566	1.433
st.dev.(D5800-B:15a)	0.4666	0.4712
R(D5800-B:15a)	1.306	1.319
Compare		
R(D5800-A:15a)	1.772	



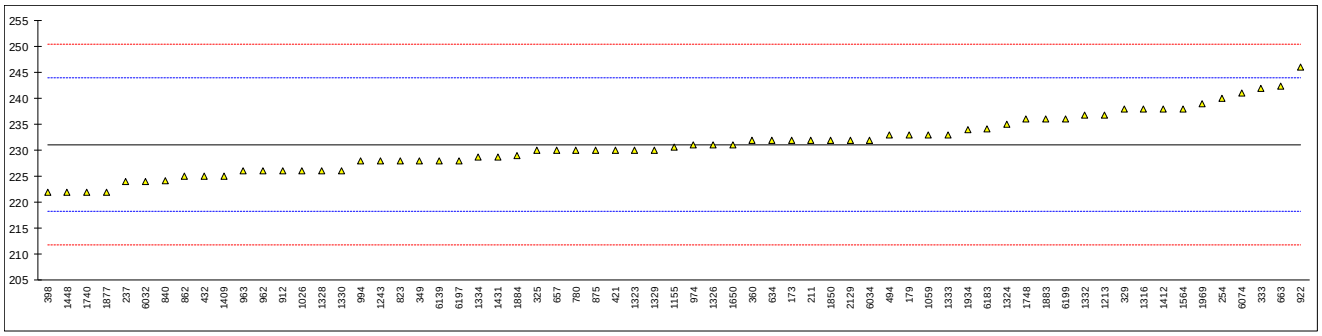


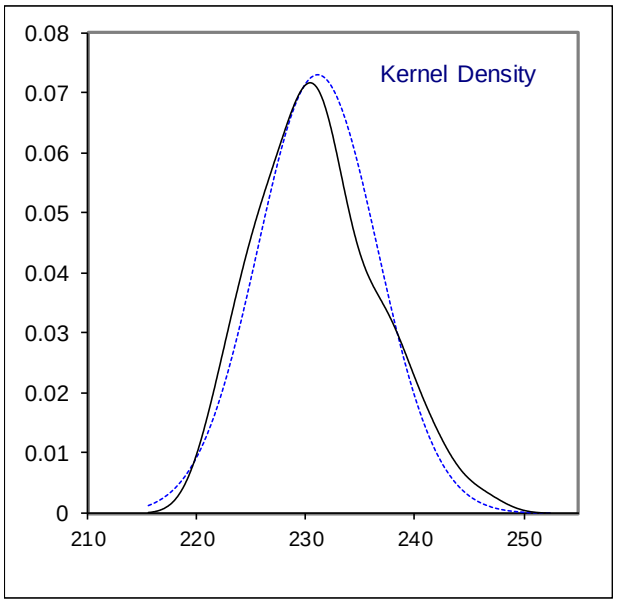
Determination of Flash Point COC on sample #18095; results in °C

lab	method	value	mark	z(targ)	remarks
173	D92	232		0.14	
178		-----		-----	
179	D92	233		0.29	
211	D92	232		0.14	
237	D92	224		-1.11	
254	D92	240		1.38	
255		-----		-----	
325	D92	230		-0.17	
329	D92	238		1.07	
333	D92	242		1.69	
339		-----		-----	
349	D92	228		-0.48	
360	D92	232		0.14	
398	D92	222		-1.42	
421	ISO2592	230		-0.17	
432	D92	225		-0.95	
494	D92	233		0.29	
496		-----		-----	
614		-----		-----	
634	D92	232		0.14	
657	D92	230		-0.17	
663	D92	242.3		1.74	
780	D92	230		-0.17	
823	D92	228		-0.48	
840	D92	224.1		-1.09	
862	D92	225		-0.95	
875	D92	230		-0.17	
912	D92	226		-0.79	
913		-----		-----	
922	D92	246		2.32	
962	D92	226		-0.79	
963	D92	226		-0.79	
974	D92	231.0		-0.02	
994	D92	228.0		-0.48	
1017		-----		-----	
1023		-----		-----	
1026	D92	226		-0.79	
1059	ISO2592	233		0.29	
1106		-----		-----	
1146		-----		-----	
1155	ISO2592	230.63		-0.07	
1173		-----		-----	
1201		-----		-----	
1213	D92	236.8		0.89	
1235		-----		-----	
1243	ISO2592	228		-0.48	
1316	D92	238		1.07	
1323		230		-0.17	
1324	D92	235		0.61	
1326	D92	231		-0.02	
1328	D92	226		-0.79	
1329	D92	230.0		-0.17	
1330	D92	226		-0.79	
1332	GB/T3536	236.76		0.88	
1333		233		0.29	
1334	D92	228.7		-0.37	
1409	D92	225		-0.95	
1412	D92	238.0		1.07	
1431	D92	228.7		-0.37	
1448	D92	222		-1.42	
1543		-----		-----	
1564	D92	238		1.07	
1650	D92	231		-0.02	
1740	D92	222		-1.42	
1748	D92	236		0.76	
1850	ISO2592	232		0.14	
1877	D92	222		-1.42	
1883	D92	236		0.76	
1884	D92	229		-0.33	
1934	D92	234		0.45	
1969	ISO2592	239		1.23	
2129	D92	232.0		0.14	
6016		-----		-----	
6032	D92	224		-1.11	

lab	method	value	mark	z(targ)	remarks
6034	D92	232		0.14	
6054		-----		-----	
6074	D92	241		1.54	
6139	D92	228		-0.48	
6181		-----		-----	
6183		234.2		0.48	
6194		-----		-----	
6197	D92	228		-0.48	
6199	D92	236		0.76	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	65
outliers	0
mean (n)	231.11
st.dev. (n)	5.473
R(calc.)	15.33
st.dev.(D92:16b)	6.43
R(D92:16b)	18



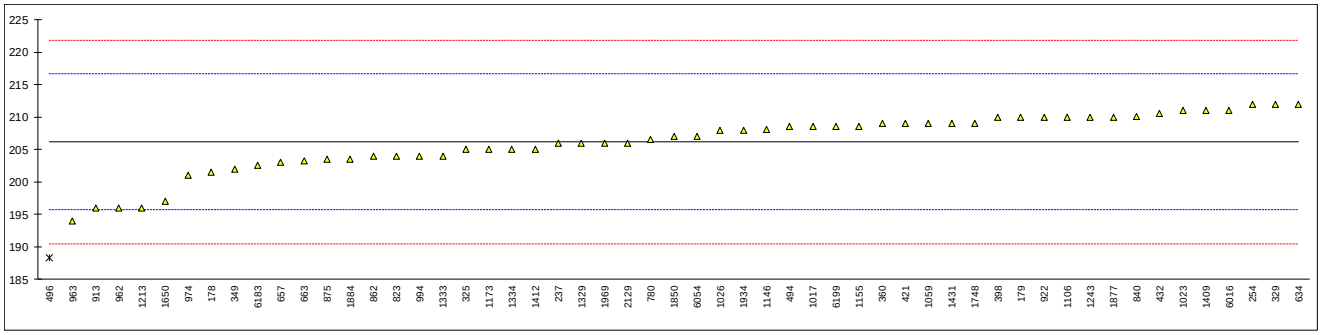


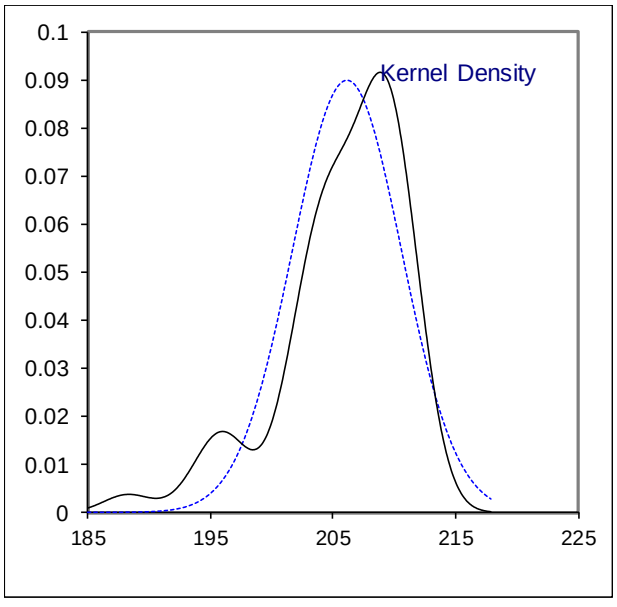
Determination of Flash Point PMcc on sample #18095; results in °C

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178	D93-A	201.5		-0.89	
179	D93-A	210.0		0.74	
211		-----		-----	
237	D93-A	206.0		-0.03	
254	D93-A	212		1.12	
255		-----		-----	
325	D93-A	205		-0.22	
329	D93-A	212		1.12	
333		-----		-----	
339		-----		-----	
349	D93-A	202		-0.80	
360	D93-A	209.0		0.54	
398	D93-A	210		0.74	
421	ISO2719-A	209.0		0.54	
432	D93-A	210.5		0.83	
494	D93-A	208.5		0.45	
496	D93-B	188.3	R(0.05)	-3.42	
614		-----		-----	
634	D93-A	212.0		1.12	
657	D93-A	203		-0.60	
663	D93-A	203.3		-0.55	
780	D93-A	206.5		0.07	
823	D93-A	204		-0.41	
840	D93-A	210.1		0.75	
862	D93-A	204		-0.41	
875	D93-A	203.5		-0.51	
912		-----		-----	
913	D93-A	196		-1.94	
922	D93-A	210		0.74	
962	D93-B	196.0		-1.94	
963	D93-A	194.0		-2.33	
974	D93-A	201.0		-0.99	
994	D93-A	204.0		-0.41	
1017	D93-A	208.5		0.45	
1023	D93-A	211.0		0.93	
1026	D93-A	208.0		0.35	
1059	ISO2719-A	209.0		0.54	
1106	D93-A	210.0		0.74	
1146	in house	208.1		0.37	
1155	ISO2719-A	208.507		0.45	
1173	D93-A	205.0		-0.22	
1201		-----		-----	
1213	D93-A	196		-1.94	
1235		-----		-----	
1243	ISO2719-A	210		0.74	
1316		-----		-----	
1323		-----		-----	
1324		-----		-----	
1326		-----		-----	
1328		-----		-----	
1329	D93-A	206.0		-0.03	
1330		-----		-----	
1332		-----		-----	
1333		204		-0.41	
1334	D93-A	205.0		-0.22	
1409	D93-A	211.0		0.93	
1412	D93-A	205.0		-0.22	
1431	D93-A	209.0		0.54	
1448		-----		-----	
1543		-----		-----	
1564		-----		-----	
1650	D93-A	197		-1.75	
1740		-----		-----	
1748	D93-A	209		0.54	
1850	ISO2719-A	207		0.16	
1877	D93-A	210		0.74	
1883		-----		-----	
1884	D93-A	203.5		-0.51	
1934	D93-A	208.0		0.35	
1969	ISO2719-A	206		-0.03	
2129	D93-A	206.0		-0.03	
6016	D93-A	211	C	0.93	first reported D93-B: 185.5
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054	D93-A	207.0		0.16	
6074		-----		-----	
6139		-----		-----	
6181		-----		-----	
6183		202.5		-0.70	
6194		-----		-----	
6197		-----		-----	
6199	D93-A	208.5		0.45	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	54
outliers	1
mean (n)	206.16
st.dev. (n)	4.444
R(calc.)	12.44
st.dev.(D93-A:16a)	5.228
R(D93-A:16a)	14.64





Determination of Foaming Tendency, 5 min blowing period on sample #18095; results in mL

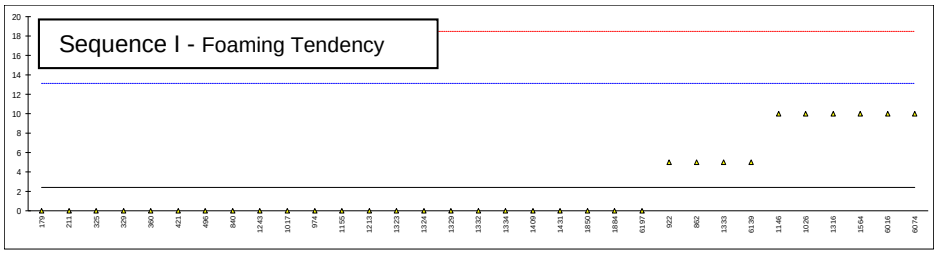
lab	method	sample used	diffuser	Seq. I	mark	z(targ)	Seq. II	mark	z(targ)	Seq. III	mark	z(targ)
173		---	---	-----		-----	-----		-----	-----		-----
178		---	---	-----		-----	-----		-----	-----		-----
179	D892	---	---	0		-0.45	40		2.44	10		1.38
211	D892	As received	Stone	0		-0.45	10		-1.25	0		-0.48
237		---	---	-----		-----	-----		-----	-----		-----
254		---	---	-----		-----	-----		-----	-----		-----
255		---	---	-----		-----	-----		-----	-----		-----
325	D892	As received	Metal	0		-0.45	50		3.67	0		-0.48
329	D892	As received	Stone	0		-0.45	10		-1.25	0		-0.48
333		---	---	-----		-----	-----		-----	-----		-----
339		---	---	-----		-----	-----		-----	-----		-----
349	D892	---	---	-----		-----	-----		-----	-----		-----
360	D892 adapted	As received	Stone	0		-0.45	0		-2.48	0		-0.48
398		---	---	-----		-----	-----		-----	-----		-----
421	ISO6247	---	---	0		-0.45	60		4.90	0		-0.48
432		---	---	-----		-----	-----		-----	-----		-----
494		---	---	-----		-----	-----		-----	-----		-----
496	D892	As received	Metal	0		-0.45	10		-1.25	0		-0.48
614		---	---	-----		-----	-----		-----	-----		-----
634		---	---	-----		-----	-----		-----	-----		-----
657	D892	As received	Stone	NIL		-----	20		-0.02	NIL		-----
663		---	---	-----		-----	-----		-----	-----		-----
780		---	---	-----		-----	-----		-----	-----		-----
823		---	---	-----		-----	-----		-----	-----		-----
840	D892	As received	Stone	0		-0.45	10		-1.25	0		-0.48
862	D892	As received	Metal	5		0.48	15		-0.63	5		0.45
875		---	---	-----		-----	-----		-----	-----		-----
912		---	---	-----		-----	-----		-----	-----		-----
913		---	---	-----		-----	-----		-----	-----		-----
922	D892	As received	Stone	5		0.48	10		-1.25	5		0.45
962		---	---	-----		-----	-----		-----	-----		-----
963		---	---	-----		-----	-----		-----	-----		-----
974	D892	As received	Metal	0		-0.45	20		-0.02	0		-0.48
994		---	---	-----		-----	-----		-----	-----		-----
1017	D892	As received	Stone	0		-0.45	20		-0.02	0		-0.48
1023		---	---	-----		-----	-----		-----	-----		-----
1026	D892	As received	Metal	10		1.42	10		-1.25	10		1.38
1059	D892	As received	Metal	nil		-----	20		-0.02	nil		-----
1106		---	---	-----		-----	-----		-----	-----		-----
1146	ISO6247	As received	Metal	10		1.42	20		-0.02	0		-0.48
1155	ISO6247	As received	Stone	0		-0.45	20		-0.02	0		-0.48
1173		---	---	-----		-----	-----		-----	-----		-----
1201		---	---	-----		-----	-----		-----	-----		-----
1213	D892	---	---	0		-0.45	0		-2.48	0		-0.48
1235		---	---	-----		-----	-----		-----	-----		-----
1243	D892	As received	Stone	0		-0.45	20		-0.02	0		-0.48
1316	D892	As received	Metal	10		1.42	50		3.67	10		1.38
1323		As received	Metal	0		-0.45	20		-0.02	0		-0.48
1324	D892	As received	Metal	0		-0.45	20		-0.02	0		-0.48
1326		---	---	-----		-----	-----		-----	-----		-----
1328		---	---	-----		-----	-----		-----	-----		-----
1329	D892	As received	Metal	0		-0.45	15		-0.63	0		-0.48
1330		---	---	-----		-----	-----		-----	-----		-----
1332	ISO6247	After agitation A	Metal	0		-0.45	5		-1.86	0		-0.48
1333		As received	Metal	5		0.48	30		1.21	5		0.45
1334	D892	As received	Metal	0		-0.45	20		-0.02	0		-0.48
1409	ISO6247	As received	Metal	0		-0.45	40		2.44	0		-0.48
1412		---	---	-----		-----	-----		-----	-----		-----
1431	D892	As received	Stone	0		-0.45	40		2.44	0		-0.48
1448		---	---	-----		-----	-----		-----	-----		-----
1543		---	---	-----		-----	-----		-----	-----		-----
1564	D892	As received	Stone	10		1.42	10		-1.25	10		1.38
1650		---	---	-----		-----	-----		-----	-----		-----
1740		---	---	-----		-----	-----		-----	-----		-----
1748		---	---	-----		-----	-----		-----	-----		-----
1850	ISO6247	As received	Stone	0		-0.45	10		-1.25	0		-0.48
1877		---	---	-----		-----	-----		-----	-----		-----
1883		---	---	-----		-----	-----		-----	-----		-----
1884	D892	As received	Metal	0		-0.45	5		-1.86	0		-0.48
1934		---	---	-----		-----	-----		-----	-----		-----

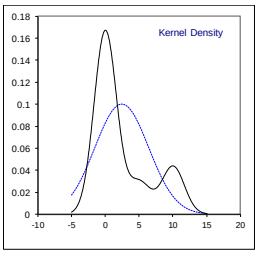
lab	method	sample used	diffuser	Seq. I	mark	z(targ)	Seq. II	mark	z(targ)	Seq. III	mark	z(targ)
1969		---	---	-----		-----	-----		-----	-----		-----
2129		---	---	-----		-----	-----		-----	-----		-----
6016	D892	As received	Stone	10		1.42	20		-0.02	10		1.38
6032		---	---	-----		-----	-----		-----	-----		-----
6034		---	---	-----		-----	-----		-----	-----		-----
6054		---	---	-----		-----	-----		-----	-----		-----
6074	D892	As received	Stone	10		1.42	25		0.60	10		1.38
6139	D892	As received	Stone	5		0.48	10		-1.25	0		-0.48
6181		---	---	-----		-----	-----		-----	-----		-----
6183		---	---	-----		-----	-----		-----	-----		-----
6194		---	---	-----		-----	-----		-----	-----		-----
6197		After agitation A	Stone	0		-0.45	20		-0.02	10		1.38
6199		---	---	-----		-----	-----		-----	-----		-----
9100		---	---	-----		-----	-----		-----	-----		-----
9101		---	---	-----		-----	-----		-----	-----		-----
9142		---	---	-----		-----	-----		-----	-----		-----
9143		---	---	-----		-----	-----		-----	-----		-----

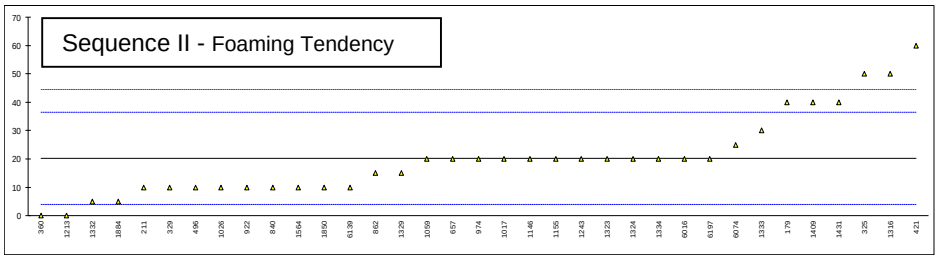
normality	suspect	not OK	suspect
n	33	35	33
outliers	0	0	0
mean (n)	2.42	20.14	2.58
st.dev. (n)	3.977	14.271	4.169
R(calc.)	11.13	39.96	11.67
st.dev.(D892:13e1)	5.345	8.130	5.369
R(D892:13e1)	14.97	22.76	15.03

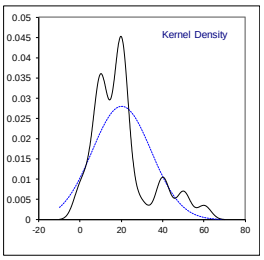
Sequence II – stone or metal diffuser:

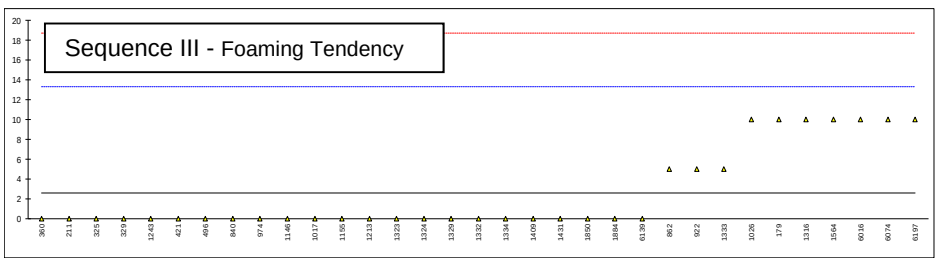
	Only stone diffuser	Only metal diffuser
normality	not OK	OK
n	16	17
outliers	0	0
mean (n)	15.94	20.59
st.dev. (n)	9.169	14.565
R(calc.)	25.67	40.78
R(D892:13e1)	20.91	22.96

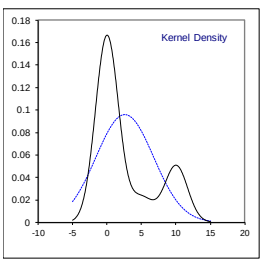












Determination of Foam Stability, 10 min settling point on sample #18095; results in mL

lab	method	Seq. I	mark	z(targ)	Seq. II	mark	z(targ)	Seq. III	mark	z(targ)
173		-----		-----	-----		-----	-----		-----
178		-----		-----	-----		-----	-----		-----
179	D892	0		-----	0		-----	0		-----
211	D892	0		-----	0		-----	0		-----
237		-----		-----	-----		-----	-----		-----
254		-----		-----	-----		-----	-----		-----
255		-----		-----	-----		-----	-----		-----
325	D892	0		-----	0		-----	0		-----
329	D892	0		-----	0		-----	0		-----
333		-----		-----	-----		-----	-----		-----
339		-----		-----	-----		-----	-----		-----
349		-----		-----	-----		-----	-----		-----
360	D892 (Alternative)	0		-----	0		-----	0		-----
398		-----		-----	-----		-----	-----		-----
421	ISO6247	0		-----	0		-----	0		-----
432		-----		-----	-----		-----	-----		-----
494		-----		-----	-----		-----	-----		-----
496	D892	0		-----	0		-----	0		-----
614		-----		-----	-----		-----	-----		-----
634		-----		-----	-----		-----	-----		-----
657	D892	NIL		-----	NIL		-----	NIL		-----
663		-----		-----	-----		-----	-----		-----
780		-----		-----	-----		-----	-----		-----
823		-----		-----	-----		-----	-----		-----
840	D892	0		-----	0		-----	0		-----
862	D892	0		-----	0		-----	0		-----
875		-----		-----	-----		-----	-----		-----
912		-----		-----	-----		-----	-----		-----
913		-----		-----	-----		-----	-----		-----
922	D892	0		-----	0		-----	0		-----
962		-----		-----	-----		-----	-----		-----
963		-----		-----	-----		-----	-----		-----
974	D892	0		-----	0		-----	0		-----
994		-----		-----	-----		-----	-----		-----
1017	D892	0		-----	0		-----	0		-----
1023		-----		-----	-----		-----	-----		-----
1026	D892	0		-----	0		-----	0		-----
1059	D892	0		-----	0		-----	0		-----
1106		-----		-----	-----		-----	-----		-----
1146	ISO6247	0		-----	0		-----	0		-----
1155	ISO6247	0		-----	0		-----	0		-----
1173		-----		-----	-----		-----	-----		-----
1201		-----		-----	-----		-----	-----		-----
1213	D892	0		-----	0		-----	0		-----
1235		-----		-----	-----		-----	-----		-----
1243	D892	0		-----	0		-----	0		-----
1316	D892	0		-----	0		-----	0		-----
1323		0		-----	0		-----	0		-----
1324	D892	0		-----	0		-----	0		-----
1326		-----		-----	-----		-----	-----		-----
1328		-----		-----	-----		-----	-----		-----
1329	D892	0		-----	0		-----	0		-----
1330		-----		-----	-----		-----	-----		-----
1332	ISO6247	0		-----	0		-----	0		-----
1333		0		-----	0		-----	0		-----
1334	D892	0		-----	0		-----	0		-----
1409	ISO6247	0		-----	0		-----	0		-----
1412		-----		-----	-----		-----	-----		-----
1431	D892	0		-----	0		-----	0		-----
1448		-----		-----	-----		-----	-----		-----
1543		-----		-----	-----		-----	-----		-----
1564	D892	0		-----	0		-----	0		-----
1650		-----		-----	-----		-----	-----		-----
1740		-----		-----	-----		-----	-----		-----
1748		-----		-----	-----		-----	-----		-----
1850	ISO6247	0		-----	0		-----	0		-----
1877		-----		-----	-----		-----	-----		-----
1883		-----		-----	-----		-----	-----		-----
1884	D892	0		-----	0		-----	0		-----
1934		-----		-----	-----		-----	-----		-----
1969		-----		-----	-----		-----	-----		-----
2129		-----		-----	-----		-----	-----		-----
6016	D892	0		-----	0		-----	0		-----
6032		-----		-----	-----		-----	-----		-----

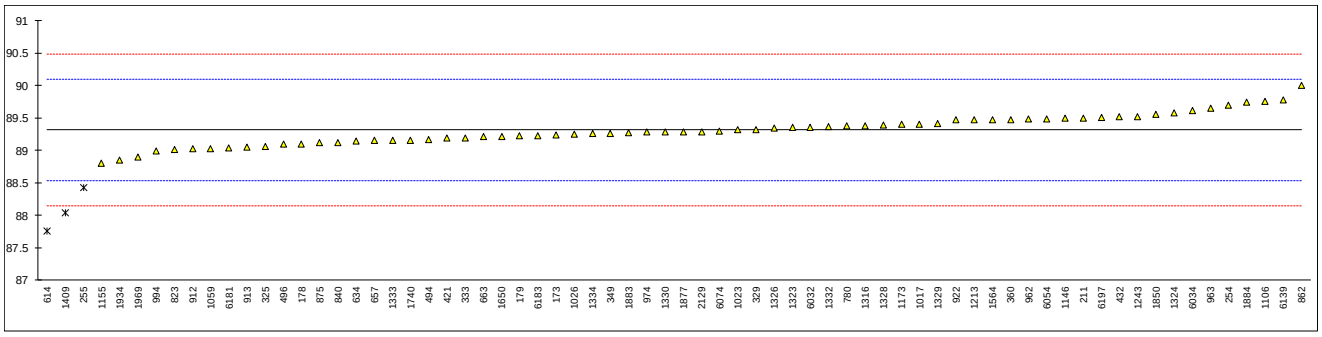
lab	method	Seq. I	mark	z(targ)	Seq. II	mark	z(targ)	Seq. III	mark	z(targ)
6034		-----		-----	-----		-----	-----		-----
6054		-----		-----	-----		-----	-----		-----
6074	D892	0		-----	0		-----	0		-----
6139	D892	0		-----	0		-----	0		-----
6181		-----		-----	-----		-----	-----		-----
6183		-----		-----	-----		-----	-----		-----
6194		-----		-----	-----		-----	-----		-----
6197	D892	0		-----	0		-----	0		-----
6199		-----		-----	-----		-----	-----		-----
9100		-----		-----	-----		-----	-----		-----
9101		-----		-----	-----		-----	-----		-----
9142		-----		-----	-----		-----	-----		-----
9143		-----		-----	-----		-----	-----		-----
	n	35			35			35		
	mean (n)	0 (nil)			0 (nil)			0 (nil)		

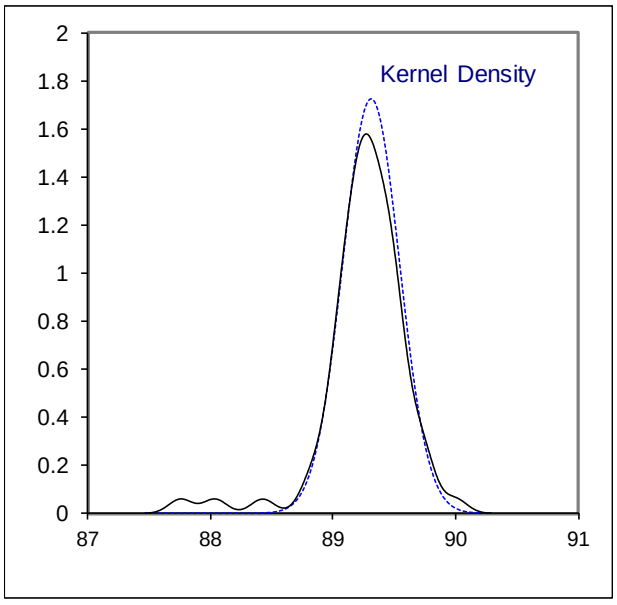
Determination of Kinematic Viscosity at 40°C on sample #18095; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
173	D445	89.24		-0.19	
178	D445	89.10		-0.55	
179	D445	89.23		-0.22	
211	D445	89.50		0.48	
237		-----		-----	
254	D445	89.69		0.96	
255	D7279 corrected to D445	88.43	R(0.05)	-2.27	
325	D445	89.065		-0.64	
329	D445	89.32		0.01	
333	D445	89.19		-0.32	
339		-----		-----	
349	D445	89.26		-0.14	
360	D445	89.475		0.41	
398		-----		-----	
421	ISO3104	89.19		-0.32	
432	D445	89.52		0.53	
494	D445	89.162		-0.39	
496	D445	89.100		-0.55	
614	D445	87.76	R(0.01)	-4.00	
634	D445	89.14		-0.45	
657	D445	89.16		-0.40	
663	D445	89.210		-0.27	
780	D445	89.38		0.17	
823	D445	89.01		-0.78	
840	D445	89.122		-0.50	
862	D445	90.002		1.77	
875	D445	89.12		-0.50	
912	D445	89.02		-0.76	
913	D445	89.05		-0.68	
922	D445	89.47		0.40	
962	D445	89.48		0.42	
963	D445	89.65		0.86	
974	D445	89.28		-0.09	
994	D445	88.995		-0.82	
1017	D445	89.40		0.22	
1023	D445	89.315		0.00	
1026	D445	89.25		-0.17	
1059	ISO3104	89.03		-0.73	
1106	D445	89.75		1.12	
1146	D445	89.49		0.45	
1155	ISO3104	88.8	C	-1.32	first reported 14.55
1173	IP71	89.397		0.21	
1201		-----		-----	
1213	D445	89.47		0.40	
1235		-----		-----	
1243	D7279 corrected to D445	89.52		0.53	
1316	ISO3104	89.38		0.17	
1323		89.35		0.09	
1324	D445	89.58		0.68	
1326	D445	89.34		0.06	
1328	D445	89.390		0.19	
1329	D445	89.41		0.24	
1330	D445	89.28		-0.09	
1332	D445	89.37		0.14	
1333		89.16		-0.40	
1334	D445	89.255		-0.15	
1409	D445	88.04	R(0.01)	-3.28	
1412		-----		-----	
1431		-----		-----	
1448		-----		-----	
1543		-----		-----	
1564	D445	89.47		0.40	
1650	D445	89.210		-0.27	
1740	D445	89.16		-0.40	
1748		-----		-----	
1850	ISO3104	89.56		0.63	
1877	D445	89.28		-0.09	
1883	D445	89.27		-0.12	
1884	D445	89.741		1.10	
1934	D445	88.85		-1.19	
1969	ISO3104	88.8977		-1.07	
2129	D445	89.29		-0.06	
6016		-----		-----	
6032	D7279 corrected to D445	89.35		0.09	

lab	method	value	mark	z(targ)	remarks
6034	D445	89.61		0.76	
6054	D7279 corrected to D445	89.48		0.42	
6074	D445	89.30		-0.04	
6139	D445	89.78		1.20	
6181	ISO3104	89.0325		-0.73	
6183		89.23		-0.22	
6194		-----		-----	
6197	D445	89.51		0.50	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	67
outliers	3
mean (n)	89.315
st.dev. (n)	0.2312
R(calc.)	0.647
st.dev.(D445:17a)	0.3892
R(D445:17a)	1.090



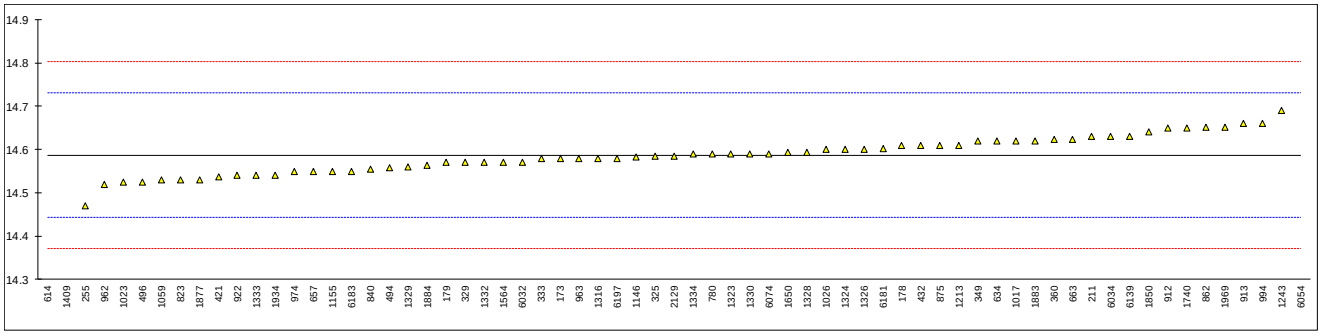


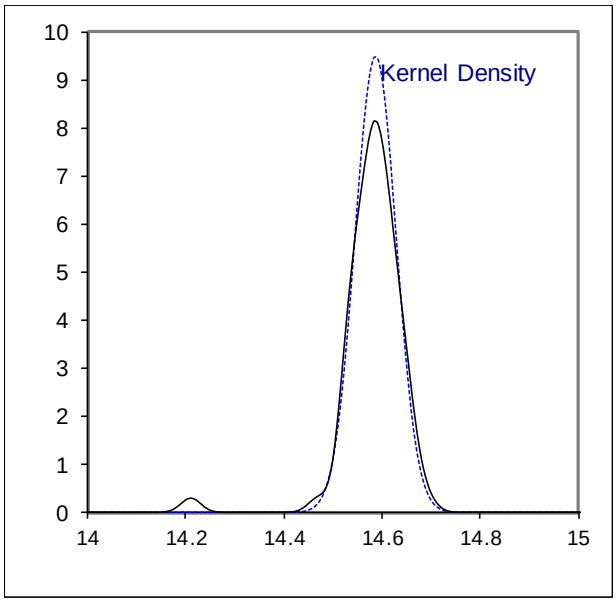
Determination of Kinematic Viscosity at 100°C on sample #18095; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
173	D445	14.58		-0.10	
178	D445	14.61		0.32	
179	D445	14.57		-0.24	
211	D445	14.63		0.60	
237		-----		-----	
254		-----		-----	
255	D7279 corrected to D445	14.47		-1.63	
325	D445	14.585		-0.03	
329	D445	14.57		-0.24	
333	D445	14.58		-0.10	
339		-----		-----	
349	D445	14.62		0.46	
360	D445	14.623		0.50	
398		-----		-----	
421	ISO3104	14.5364		-0.70	
432	D445	14.61		0.32	
494	D445	14.558		-0.40	
496	D445	14.525		-0.86	
614	D445	13.44	R(0.01)	-15.95	
634	D445	14.62		0.46	
657	D445	14.55		-0.52	
663	D445	14.624		0.51	
780	D445	14.59		0.04	
823	D445	14.53		-0.79	
840	D445	14.554		-0.46	
862	D445	14.651		0.89	
875	D445	14.61		0.32	
912	D445	14.65		0.88	
913	D445	14.66		1.01	
922	D445	14.54		-0.65	
962	D445	14.52		-0.93	
963	D445	14.58		-0.10	
974	D445	14.55		-0.52	
994	D445	14.66		1.01	
1017	D445	14.62		0.46	
1023	D445	14.524		-0.88	
1026	ISO3104	14.60		0.18	
1059	ISO3104	14.53		-0.79	
1106		-----		-----	
1146	D445	14.582		-0.07	
1155	ISO3104	14.55	C	-0.52	first reported 88.8
1173		-----		-----	
1201		-----		-----	
1213	D445	14.61		0.32	
1235		-----		-----	
1243	D7279 corrected to D445	14.69		1.43	
1316	ISO3104	14.58		-0.10	
1323		14.59		0.04	
1324	D445	14.60		0.18	
1326	D445	14.60		0.18	
1328	D445	14.594		0.10	
1329	D445	14.56		-0.38	
1330	D445	14.59		0.04	
1332	D445	14.57		-0.24	
1333		14.54		-0.65	
1334	D445	14.589		0.03	
1409	D445	14.21	R(0.01)	-5.24	
1412		-----		-----	
1431		-----		-----	
1448		-----		-----	
1543		-----		-----	
1564	D445	14.57		-0.24	
1650	D445	14.593		0.08	
1740	D445	14.65	C	0.88	first reported 14.25
1748		-----		-----	
1850	ISO3104	14.64		0.74	
1877	D445	14.53		-0.79	
1883	D445	14.62		0.46	
1884	D445	14.563		-0.33	
1934	D445	14.54		-0.65	
1969	ISO3104	14.6511		0.89	
2129	D445	14.585		-0.03	
6016		-----		-----	
6032	D7279 corrected to D445	14.57		-0.24	

lab	method	value	mark	z(targ)	remarks
6034	D445	14.63		0.60	
6054	D7279 corrected to D445	15.3	R(0.01)	9.92	
6074	D445	14.590		0.04	
6139	D445	14.63		0.60	
6181	ISO3104	14.6024		0.21	
6183		14.55		-0.52	
6194		-----		-----	
6197	D445	14.58		-0.10	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	64
outliers	3
mean (n)	14.587
st.dev. (n)	0.0420
R(calc.)	0.118
st.dev.(D445:17a)	0.0719
R(D445:17a)	0.201



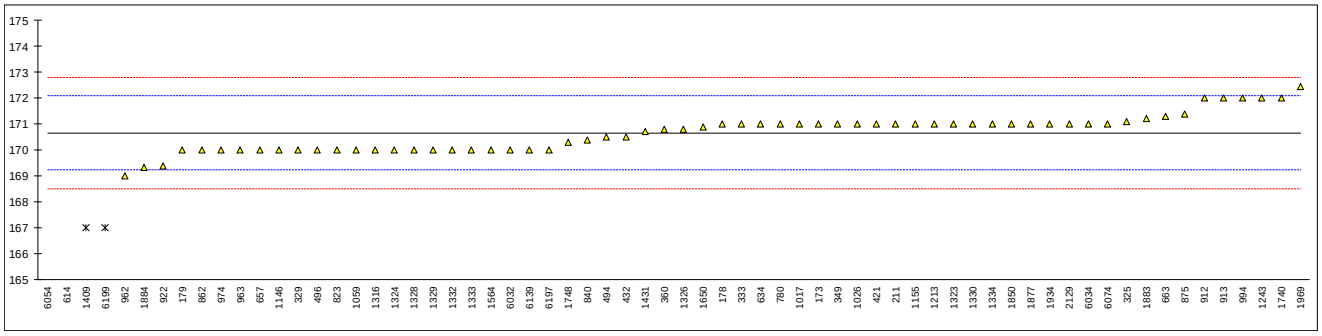


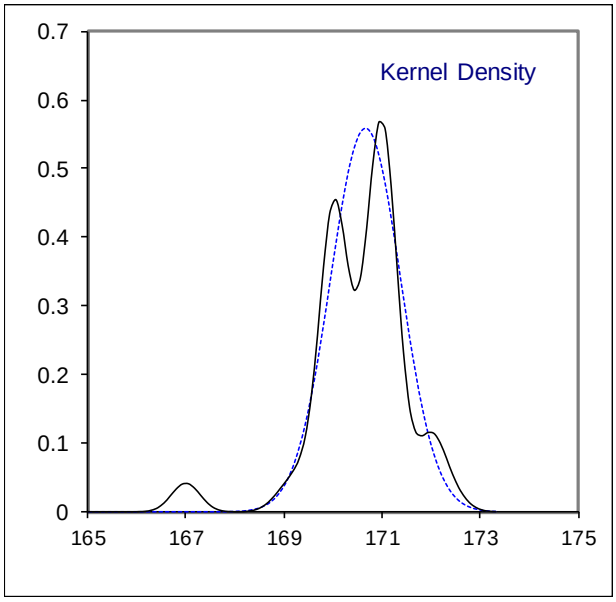
Determination of Viscosity Index on sample #18095

lab	method	value	mark	z(targ)	iis calculated	mark	remarks
173	D2270	171		0.47	170.62		
178	D2270	171		0.47	171.40		
179	D2270	170		-0.93	170.48		
211	D2270	171		0.47	170.89		
237		-----		-----	-----		
254		-----		-----	-----		
255		-----		-----	170.46		
325	D2270	171.1		0.61	171.06		
329	D2270	170		-0.93	170.29		
333	D2270	171		0.47	170.72		
339		-----		-----	-----		
349	D2270	171		0.47	171.22		
360	ISO2909	170.8		0.19	170.83		
398		-----		-----	-----		
421	ISO2909	171		0.47	170.41		VI based on Stabinger results
432	D2270	170.5		-0.23	170.54		
494	D2270	170.5		-0.23	170.41		
496	D2270	170.0		-0.93	169.99		
614	D2270	155	R(0.01)	-21.93	154.96	R(0.01)	outlier in KV 40°C & 100°C
634	D2270	171		0.47	171.47		
657	D2270	170		-0.93	170.28		
663	D2270	171.3		0.89	171.39		
780	D2270	171		0.47	170.51		
823	D2270	170		-0.93	170.25		
840	D2270	170.4		-0.37	170.43		
862	D2270	170		-0.93	170.20		
875	D2270	171.4		1.03	171.35		
912	D2270	172		1.87	172.17		
913	D2270	172		1.87	172.27		
922	D2270	169.4		-1.77	169.49		
962	D2270	169		-2.33	169.14		
963	D2270	170		-0.93	169.80		
974	D2270	170		-0.93	170.04		
994	D2270	172		1.87	172.38		
1017	D2270	171		0.47	170.94		
1023		-----		-----	169.54		
1026	D2270	171		0.47	170.94		
1059	ISO2909	170		-0.93	170.21		
1106		-----		-----	-----		
1146	D2270	170		-0.93	170.15		
1155	ISO2909	171		0.47	171.02		
1173		-----		-----	-----		
1201		-----		-----	-----		
1213	D2270	171		0.47	170.65		
1235		-----		-----	-----		
1243	ISO2909	172		1.87	171.77		
1316	D2270	170		-0.93	170.34		
1323		171		0.47	170.57		
1324	D2270	170		-0.93	170.27		
1326	D2270	170.8		0.19	170.75		
1328	D2270	170		-0.93	170.55		
1329	D2270	170		-0.93	169.95		
1330	D2270	171		0.47	170.71		
1332	D2270	170		-0.93	170.19		
1333		170		-0.93	170.12		
1334	D2270	171		0.47	170.74		
1409	D2270	167	R(0.01)	-5.13	167.14	R(0.01)	outlier in KV 40°C & 100°C
1412		-----		-----	-----		
1431	D2270	170.7		0.05	170.66		VI based on Stabinger results
1448		-----		-----	-----		
1543		-----		-----	-----		
1564	D2270	170		-0.93	169.99		
1650	D2270	170.9		0.33	170.90		
1740	D2270	172	C	1.87	171.89		first reported 166
1748	D2270	170.3		-0.51	170.24		VI based on Stabinger results
1850	ISO2909	171		0.47	170.92		
1877	D2270	171	E	0.47	169.71		calculation error
1883		171.20		0.75	171.20		
1884	D2270	169.33		-1.87	169.33		
1934	D2270	171		0.47	170.75		
1969	ISO2909	172.44		2.49	172.44		
2129	D2270	171		0.47	170.61		
6016		-----		-----	-----		
6032	D2270	170		-0.93	170.23		

lab	method	value	mark	z(targ)	iis calculated	mark	remarks
6034	D2270	171		0.47	170.67		
6054	D2270	142.270596	E,R(0.01)	-39.75	181.43	R(0.01)	outlier in KV 100°C & calc. err.
6074	D2270	171		0.47	170.67		
6139	D2270	170		-0.93	170.33		
6181		-----		-----	171.42		
6183		-----		-----	170.14		
6194		-----		-----	-----		
6197	D2270	170		-0.93	170.08		
6199	D2270	167	R(0.01)	-5.13	166.96	R(0.01)	VI based on Stabinger results
9100		-----		-----	-----		
9101		-----		-----	-----		
9142		-----		-----	-----		
9143		-----		-----	-----		

		iis calculated:
normality	OK	OK
n	62	66
outliers	4	4
mean (n)	170.66	170.64
st.dev. (n)	0.715	0.693
R(calc.)	2.00	1.94
st.dev.(D2270:10)	0.714	0.714
R(D2270:10)	2	2



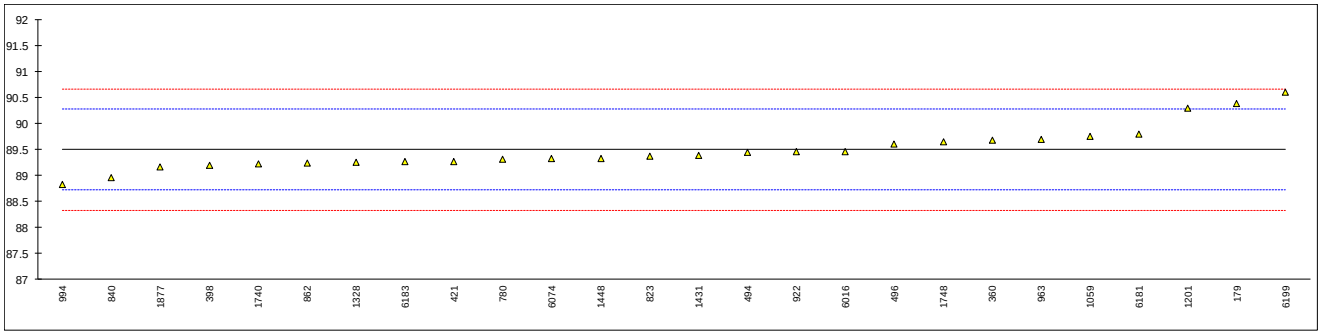


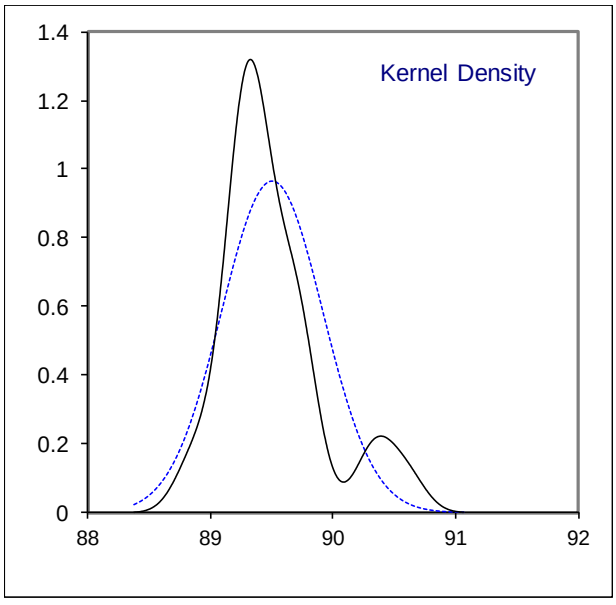
Determination of Viscosity Stabinger at 40°C on sample #18095; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179	D7042	90.38		2.27	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	D7042	89.684		0.48	
398	D7042	89.192		-0.79	
421	D7042	89.274		-0.58	
432		-----		-----	
494	D7042	89.449		-0.13	
496	D7042	89.606		0.28	
614		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
780	D7042	89.31		-0.49	
823	D7042	89.37		-0.33	
840	D7042	88.964		-1.38	
862	D7042	89.242		-0.66	
875		-----		-----	
912		-----		-----	
913		-----		-----	
922	D7042	89.46		-0.10	
962		-----		-----	
963	D7042	89.70		0.52	
974		-----		-----	
994	D7042	88.83		-1.72	
1017		-----		-----	
1023		-----		-----	
1026		-----		-----	
1059	D7042	89.75		0.65	
1106		-----		-----	
1146		-----		-----	
1155		-----		-----	
1173		-----		-----	
1201	D7042	90.3		2.06	
1213		-----		-----	
1235		-----		-----	
1243		-----		-----	
1316		-----		-----	
1323		-----		-----	
1324		-----		-----	
1326		-----		-----	
1328	NB/SH/T0870	89.254		-0.63	
1329		-----		-----	
1330		-----		-----	
1332		-----		-----	
1333		-----		-----	
1334		-----		-----	
1409		-----		-----	
1412		-----		-----	
1431	D7042	89.388		-0.29	
1448	D7042	89.327		-0.44	
1543		-----		-----	
1564		-----		-----	
1650		-----		-----	
1740	D7042	89.22		-0.72	
1748	D7042	89.650		0.39	
1850		-----		-----	
1877	D7042	89.17		-0.85	
1883		-----		-----	
1884		-----		-----	
1934		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016	D7042	89.463		-0.09	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054		-----		-----	
6074	D7042	89.325		-0.45	
6139		-----		-----	
6181	D7042	89.795		0.76	
6183		89.27		-0.59	
6194		-----		-----	
6197		-----		-----	
6199	D7042	90.602		2.84	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	not OK
n	26
outliers	0
mean (n)	89.499
st.dev. (n)	0.4131
R(calc.)	1.157
st.dev.(D7042:16e3)	0.3886
R(D7042:16e3)	1.088



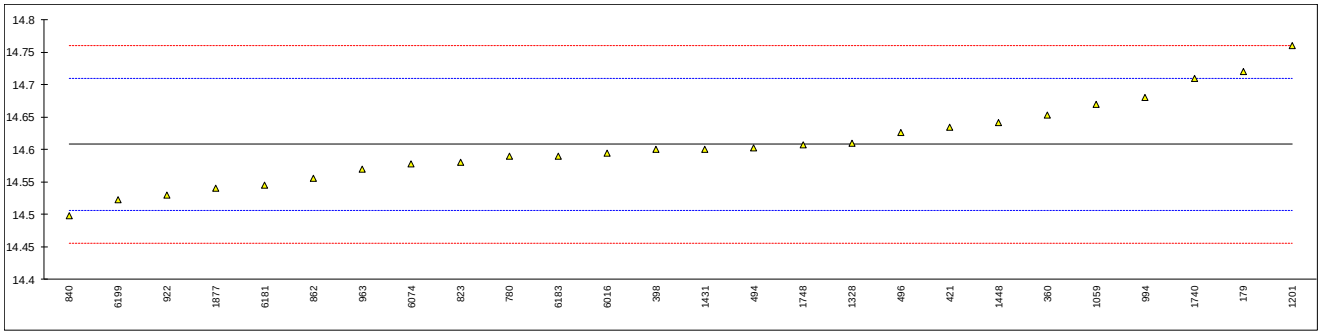


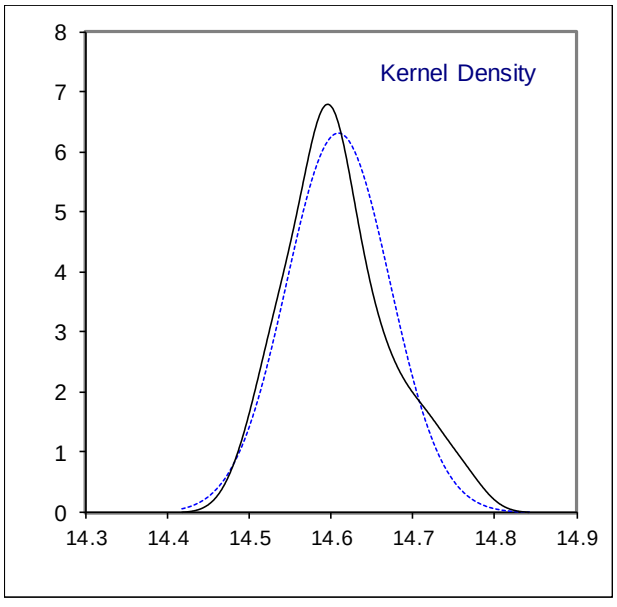
Determination of Viscosity Stabinger at 100°C on sample #18095; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179	D7042	14.72		2.21	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	D7042	14.653		0.89	
398	D7042	14.600		-0.16	
421	D7042	14.634		0.51	
432		-----		-----	
494	D7042	14.602		-0.12	
496	D7042	14.626		0.36	
614		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
780	D7042	14.59		-0.35	
823	D7042	14.58		-0.55	
840	D7042	14.498		-2.17	
862	D7042	14.556		-1.02	
875		-----		-----	
912		-----		-----	
913		-----		-----	
922	D7042	14.53		-1.54	
962		-----		-----	
963	D7042	14.57		-0.75	
974		-----		-----	
994	D7042	14.68		1.42	
1017		-----		-----	
1023		-----		-----	
1026		-----		-----	
1059	D7042	14.67		1.22	
1106		-----		-----	
1146		-----		-----	
1155		-----		-----	
1173		-----		-----	
1201	D7042	14.76		3.00	
1213		-----		-----	
1235		-----		-----	
1243		-----		-----	
1316		-----		-----	
1323		-----		-----	
1324		-----		-----	
1326		-----		-----	
1328	NB/SH/T0870	14.610		0.04	
1329		-----		-----	
1330		-----		-----	
1332		-----		-----	
1333		-----		-----	
1334		-----		-----	
1409		-----		-----	
1412		-----		-----	
1431	D7042	14.600		-0.16	
1448	D7042	14.641		0.65	
1543		-----		-----	
1564		-----		-----	
1650		-----		-----	
1740	D7042	14.71	C	2.01	first reported 14.31
1748	D7042	14.607		-0.02	
1850		-----		-----	
1877	D7042	14.54		-1.34	
1883		-----		-----	
1884		-----		-----	
1934		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016	D7042	14.594		-0.28	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054		-----		-----	
6074	D7042	14.578		-0.59	
6139		-----		-----	
6181	D7042	14.545		-1.24	
6183		14.59		-0.35	
6194		-----		-----	
6197		-----		-----	
6199	D7042	14.523		-1.68	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	26
outliers	0
mean (n)	14.608
st.dev. (n)	0.0633
R(calc.)	0.177
st.dev.(D7042:16e3)	0.0507
R(D7042:16e3)	0.142



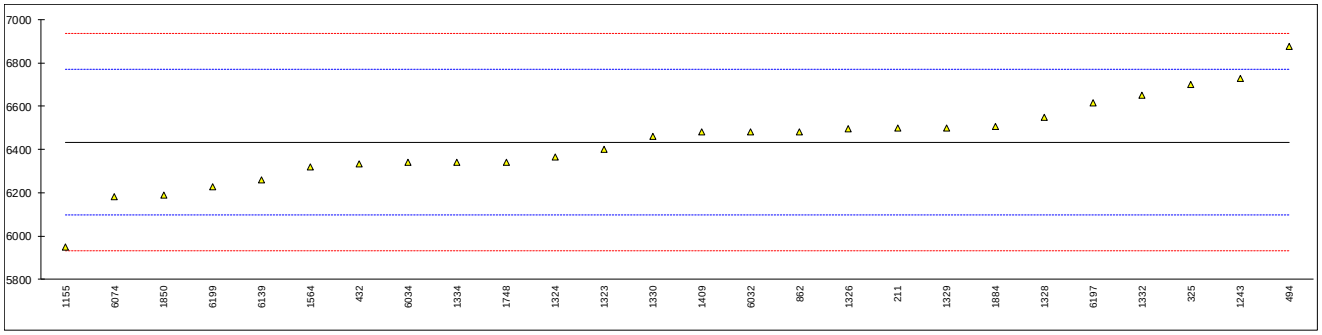


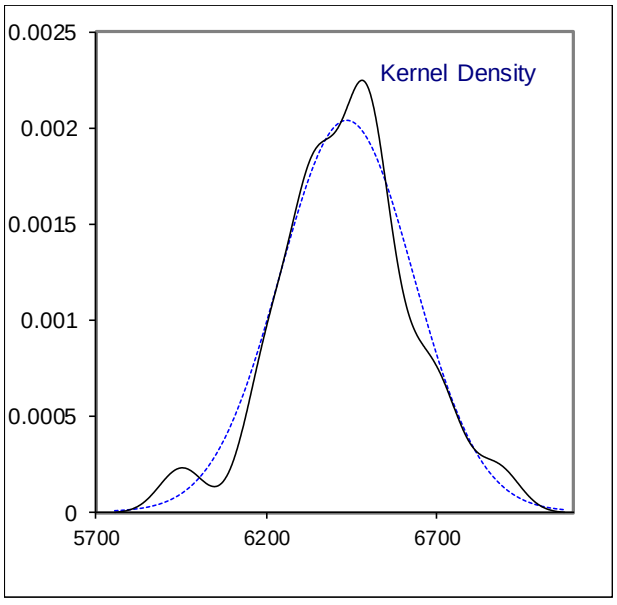
Determination of Viscosity, Apparent (CCS) at -30°C on sample #18095; results in mPa·s

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179		-----		-----	
211	D5293	6500		0.39	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325	D5293	6702		1.60	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432	D5293	6333		-0.60	
494	D5293	6876		2.64	
496		-----		-----	
614		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862	D5293	6483		0.29	
875		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
1017		-----		-----	
1023		-----		-----	
1026		-----		-----	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1155	D5293	5950		-2.88	
1173		-----		-----	
1201		-----		-----	
1213		-----		-----	
1235		-----		-----	
1243	D5293	6730		1.77	
1316		-----		-----	
1323		6400		-0.20	
1324	D5293	6365		-0.41	
1326	D5293	6495		0.37	
1328	GB/T6538	6550		0.69	
1329	D5293	6500		0.39	
1330	D5293	6460		0.16	
1332		6650		1.29	
1333		-----		-----	
1334	D5293	6341		-0.55	
1409	D5293	6480		0.28	
1412		-----		-----	
1431		-----		-----	
1448		-----		-----	
1543		-----		-----	
1564	D5293	6319		-0.68	
1650		-----		-----	
1740		-----		-----	
1748	D5293	6342		-0.55	
1850	D5293	6190		-1.45	
1877		-----		-----	
1883		-----		-----	
1884	D5293	6507		0.44	
1934		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016		-----		-----	
6032	D5293	6480		0.28	

lab	method	value	mark	z(targ)	remarks
6034	D5293	6340		-0.56	
6054		-----		-----	
6074	D5293	6182		-1.50	
6139	D5293	6260		-1.04	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197	D5293	6615		1.08	
6199	D5293	6228		-1.23	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	26
outliers	0
mean (n)	6433.8
st.dev. (n)	195.76
R(calc.)	548.1
st.dev.(D5293:17a)	167.74
R(D5293:17a)	469.7



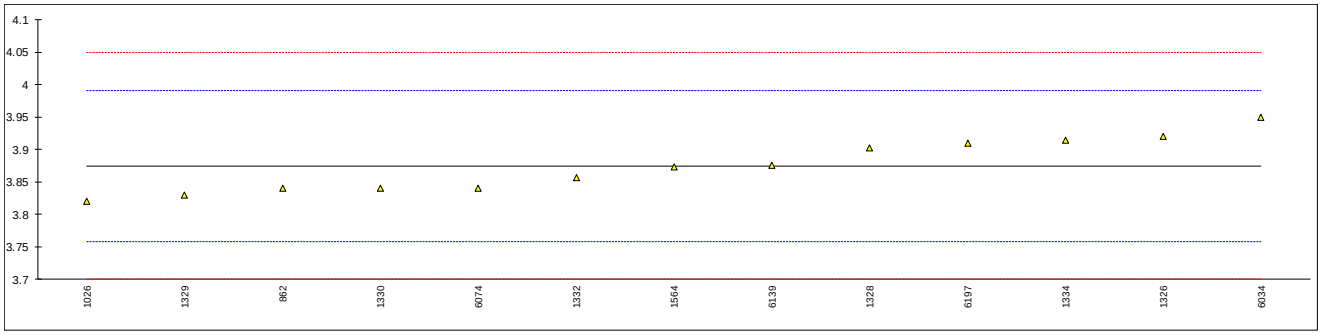


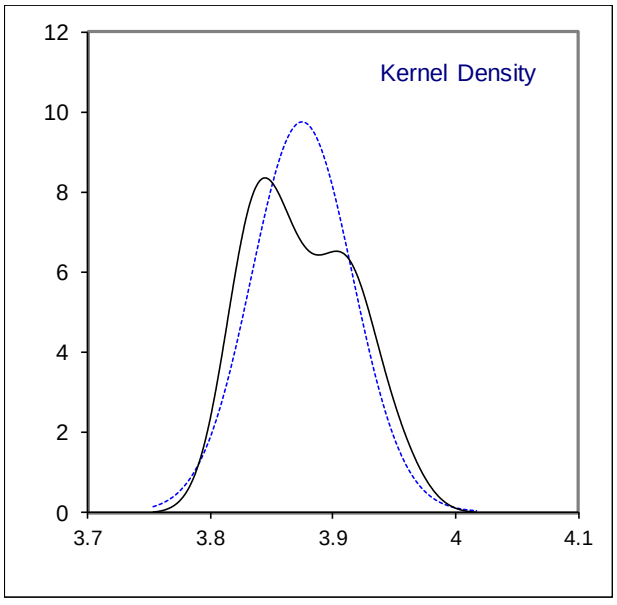
Determination of Viscosity HTHS by Tapered Bearing Simulator on sample #18095; results in mPa·s

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179		-----		-----	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432		-----		-----	
494		-----		-----	
496		-----		-----	
614		-----		-----	
634		-----		-----	
657		-----		-----	
663		-----		-----	
780		-----		-----	
823		-----		-----	
840		-----		-----	
862	D4741	3.84		-0.60	
875		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
1017		-----		-----	
1023		-----		-----	
1026	D5481	3.82		-0.94	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1155		-----		-----	
1173		-----		-----	
1201		-----		-----	
1213		-----		-----	
1235		-----		-----	
1243		-----		-----	
1316		-----		-----	
1323		-----		-----	
1324		-----		-----	
1326	D5481	3.92		0.78	
1328	SH/T0703	3.902		0.47	
1329	D4683	3.83		-0.77	
1330	D5481	3.84		-0.60	
1332	D5481	3.857		-0.30	
1333		-----		-----	
1334	D4683	3.914		0.67	
1409		-----		-----	
1412		-----		-----	
1431		-----		-----	
1448		-----		-----	
1543		-----		-----	
1564	D4683	3.873		-0.03	
1650		-----		-----	
1740		-----		-----	
1748		-----		-----	
1850		-----		-----	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016		-----		-----	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034	D5481	3.95		1.29	
6054		-----		-----	
6074	D4683	3.84		-0.60	
6139	D5481	3.875		0.01	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197	D5481	3.91		0.61	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	13
outliers	0
mean (n)	3.875
st.dev. (n)	0.0410
R(calc.)	0.115
st.dev.(D4683:17)	0.0583
R(D4683:17)	0.163



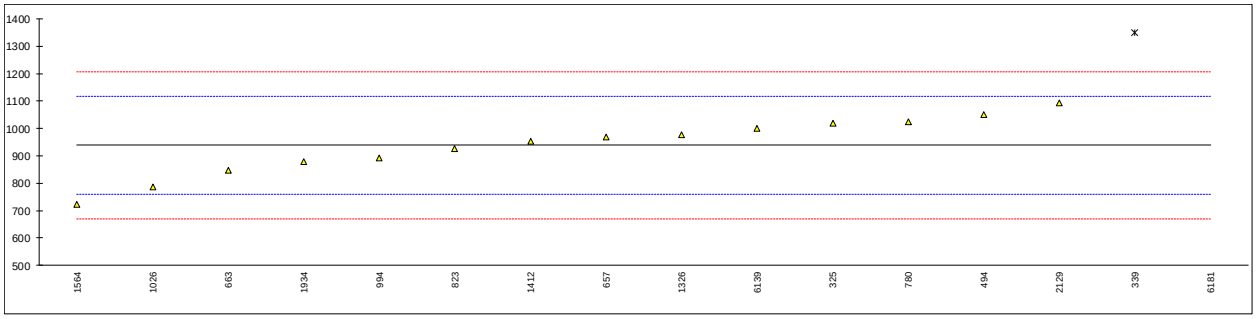


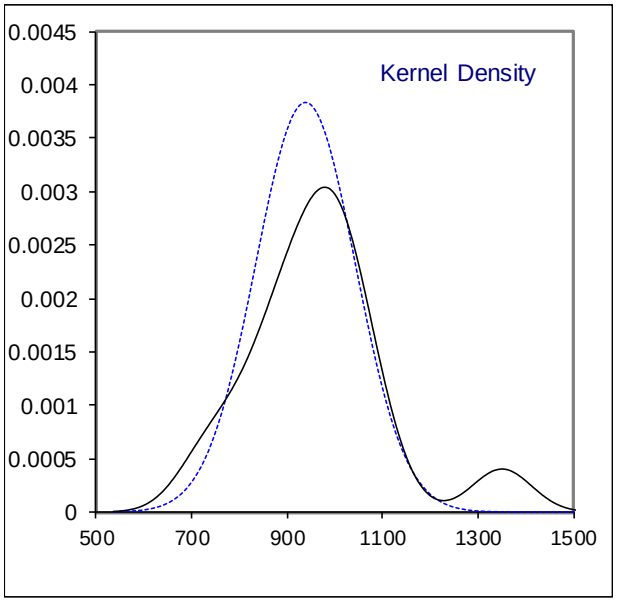
Determination of Nitrogen on sample #18095; results in mg/kg

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179		-----		-----	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325	D5762	1020		0.91	
329		-----		-----	
333		-----		-----	
339	D5291	1350	G(0.05)	4.61	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432		-----		-----	
494	D5762	1050		1.25	
496		-----		-----	
614		-----		-----	
634		-----		-----	
657	D5762	970		0.35	
663	D5762	846.9		-1.03	
780	D3228	1025		0.97	
823	D5762	926		-0.14	
840		-----		-----	
862		-----		-----	
875		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994	D5762	891		-0.53	
1017		-----		-----	
1023		-----		-----	
1026	D5762	786		-1.71	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1155		-----		-----	
1173		-----		-----	
1201		-----	W	-----	first reported 437
1213		-----		-----	
1235		-----		-----	
1243		-----		-----	
1316		-----		-----	
1323		-----		-----	
1324		-----		-----	
1326	D5762	978		0.44	
1328		-----		-----	
1329		-----		-----	
1330		-----		-----	
1332		-----		-----	
1333		-----		-----	
1334		-----		-----	
1409		-----		-----	
1412	D5762	952		0.15	
1431		-----		-----	
1448		-----		-----	
1543		-----		-----	
1564	D5762	722	C	-2.43	first reported 552
1650		-----		-----	
1740		-----		-----	
1748		-----		-----	
1850		-----		-----	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934	D5762	880		-0.66	
1969		-----		-----	
2129	D3228	1093		1.73	
6016		-----		-----	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054		-----		-----	
6074		-----		-----	
6139	D5762	1000		0.69	
6181		2300	C,G(0.01)	15.27	first reported 0.23
6183		-----		-----	
6194		-----		-----	
6197		-----		-----	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	14
outliers	2
mean (n)	938.564
st.dev. (n)	104.2547
R(calc.)	291.913
st.dev.(D5762:18)	89.1636
R(D5762:18)	249.658



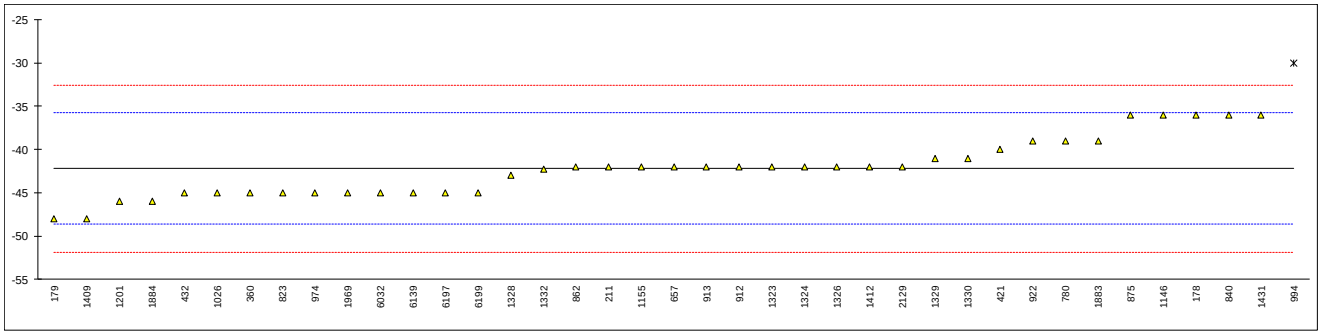


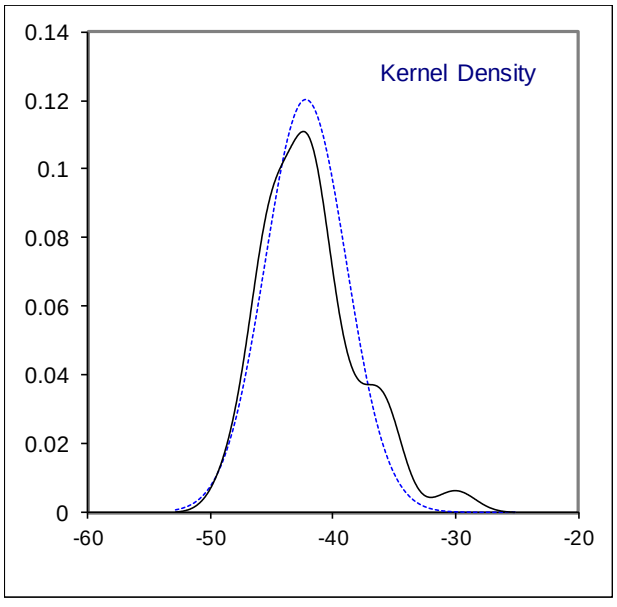
Determination of Pour Point, Manual on sample #18095; results in °C

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178	D97	-36		1.93	
179	D97	-48		-1.80	
211	D97	-42		0.07	
237	D97	<-21		-----	
254	D97	<-18		-----	
255		-----		-----	
325		-----		-----	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	D97	-45		-0.87	
398		-----		-----	
421	ISO3016	-40		0.69	
432	D97	-45		-0.87	
494		-----		-----	
496		-----		-----	
614		-----		-----	
634		-----		-----	
657	D97	-42		0.07	
663	D97	Less than -39		-----	
780	D97	-39		1.00	
823	D97	-45		-0.87	
840	D97	-36		1.93	
862	D97	-42		0.07	
875	D97	-36		1.93	
912	D97	-42		0.07	
913	D97	-42		0.07	
922	D97	-39		1.00	
962		-----		-----	
963		-----		-----	
974	D97	-45		-0.87	
994	D97	-30	R(0.05)	3.80	
1017		-----		-----	
1023	D97	<-36		-----	
1026	D97	-45		-0.87	
1059	ISO3016	<-42		-----	
1106		-----		-----	
1146	D97	-36.0		1.93	
1155	ISO3016	-42		0.07	
1173		-----		-----	
1201	ISO3016	-46		-1.18	
1213	D97	<-27		-----	
1235		-----		-----	
1243		-----		-----	
1316		-----		-----	
1323		-42		0.07	
1324	D97	-42		0.07	
1326	D97	-42		0.07	
1328	D97	-43		-0.24	
1329	D97	-41.0		0.38	
1330	D97	-41		0.38	
1332	GBIT3535	-42.3		-0.03	
1333		-----		-----	
1334		-----		-----	
1409	ISO3016	-48		-1.80	
1412	D97	-42		0.07	
1431	D97	-36		1.93	
1448		-----		-----	
1543		-----		-----	
1564		-----		-----	
1650		-----		-----	
1740		-----		-----	
1748		-----		-----	
1850		-----		-----	
1877		-----		-----	
1883	D97	-39		1.00	
1884	D97	-46		-1.18	
1934	D97	below - 42		-----	
1969	ISO3016	-45		-0.87	
2129	D97	-42		0.07	
6016		-----		-----	
6032	D97	-45		-0.87	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054		-----		-----	
6074		-----		-----	
6139	D97	-45		-0.87	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197	D97	-45		-0.87	
6199	D97	-45		-0.87	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	38
outliers	1
mean (n)	-42.22
st.dev. (n)	3.314
R(calc.)	9.28
st.dev.(D97:17b)	3.214
R(D97:17b)	9



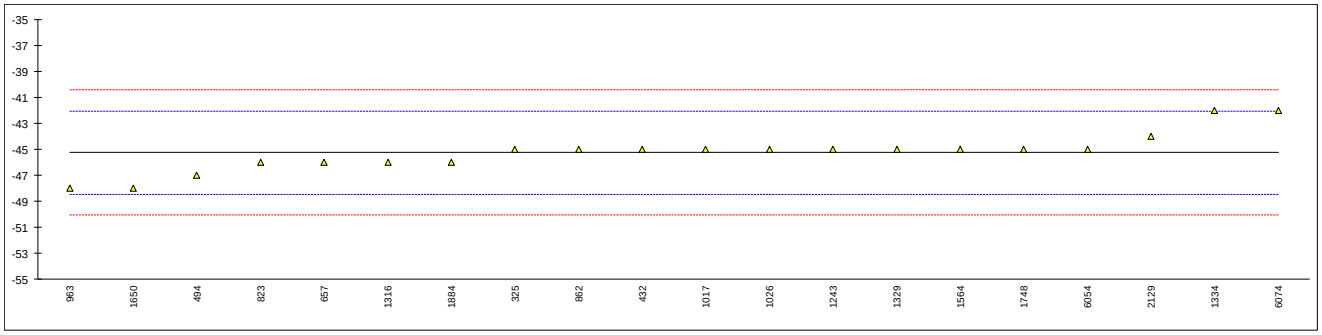


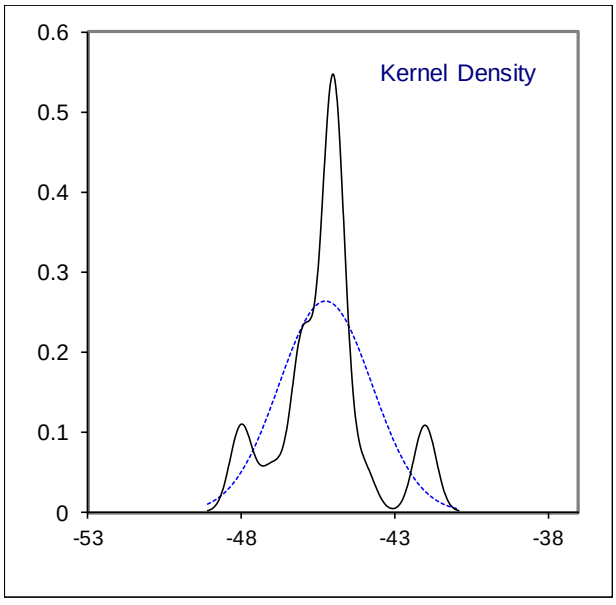
Determination of Pour Point, Automated, 1°C interval on sample #18095; results in °C

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179		-----		-----	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325	D5950	-45		0.16	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360		-----		-----	
398		-----		-----	
421		-----		-----	
432	D5950	-45		0.16	
494	D5950	-47		-1.09	
496		-----		-----	
614		-----		-----	
634		-----		-----	
657	D5950	-46		-0.47	
663		-----		-----	
780		-----		-----	
823	D5950	-46		-0.47	
840		-----		-----	
862	D5950	-45		0.16	
875		-----		-----	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963	D5950	-48		-1.71	
974		-----		-----	
994		-----		-----	
1017	D5950	-45		0.16	
1023		-----		-----	
1026	D5950	-45		0.16	
1059		-----		-----	
1106		-----		-----	
1146		-----		-----	
1155		-----		-----	
1173		-----		-----	
1201		-----		-----	
1213		-----		-----	
1235		-----		-----	
1243	D7346	-45		0.16	
1316	D5950	-46		-0.47	
1323		-----		-----	
1324		-----		-----	
1326		-----		-----	
1328		-----		-----	
1329	D5950	-45.0		0.16	
1330		-----		-----	
1332		-----		-----	
1333		-----		-----	
1334	D5950	-42.0		2.02	
1409		-----		-----	
1412		-----		-----	
1431		-----		-----	
1448		-----		-----	
1543		-----		-----	
1564	D5950	-45		0.16	
1650	D5950	-48		-1.71	
1740		-----		-----	
1748	D7346	-45		0.16	3°C interval
1850		-----		-----	
1877		-----		-----	
1883		-----		-----	
1884	D5950	-46		-0.47	
1934		-----		-----	
1969		-----		-----	
2129	D5949	-44		0.78	
6016		-----		-----	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054	D5950	-45		0.16	
6074	D5949	-42		2.02	
6139		-----		-----	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197		-----		-----	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	suspect
n	20
outliers	0
mean (n)	-45.25
st.dev. (n)	1.517
R(calc.)	4.25
st.dev.(D5950:14)	1.607
R(D5950:14)	4.5



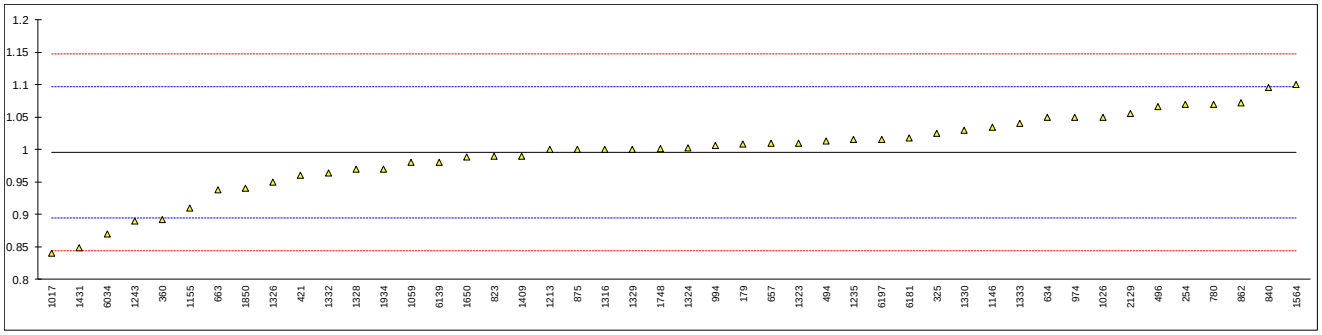


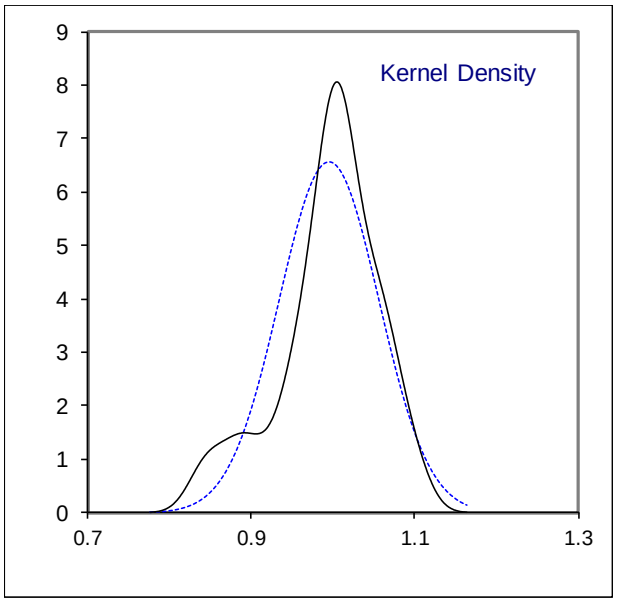
Determination of Sulphated Ash on sample #18095; results in %M/M

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179	D874	1.009		0.27	
211		-----		-----	
237		-----		-----	
254	D874	1.07		1.48	
255		-----		-----	
325	D874	1.024484		0.58	
329		-----		-----	
333		-----		-----	
339		-----		-----	
349		-----		-----	
360	D874	0.892		-2.04	
398		-----		-----	
421	ISO3987	0.96		-0.70	
432		-----		-----	
494	D874	1.013		0.35	
496	D874	1.066		1.40	
614		-----		-----	
634	D874	1.050		1.09	
657	D874	1.01		0.29	
663	D874	0.938		-1.13	
780	D874	1.07		1.48	
823	D874	0.99		-0.10	
840	D874	1.095		1.98	
862	D874	1.072		1.52	
875	D874	1.00		0.10	
912		-----		-----	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D874	1.05		1.09	
994	D874	1.006		0.21	
1017	D874	0.840		-3.07	
1023		-----		-----	
1026	D874	1.05		1.09	
1059	ISO3987	0.98		-0.30	
1106		-----		-----	
1146	D874	1.0347		0.78	
1155	ISO3987	0.91		-1.69	
1173		-----		-----	
1201		-----		-----	
1213	D874	1.00		0.10	
1235	ISO3987	1.0149		0.39	
1243	ISO3987	0.89		-2.08	
1316	D874	1.00		0.10	
1323		1.01		0.29	
1324	D874	1.002		0.14	
1326	D874	0.95		-0.89	
1328	D874	0.970		-0.50	
1329	D874	1.00		0.10	
1330	D874	1.03		0.69	
1332	ISO3987	0.964		-0.62	
1333		1.04		0.89	
1334		-----		-----	
1409	D874	0.99		-0.10	
1412		-----		-----	
1431	D874	0.8482		-2.91	
1448		-----		-----	
1543		-----		-----	
1564	D874	1.10		2.07	
1650	D874	0.989		-0.12	
1740		-----		-----	
1748	D874	1.00175		0.13	
1850	ISO3987	0.94		-1.09	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934	D874	0.97		-0.50	
1969		-----		-----	
2129	D874	1.055		1.18	
6016		-----		-----	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034	D874	0.87	C	-2.48	first reported 8.7
6054		-----		-----	
6074		-----		-----	
6139	ISO3987	0.98		-0.30	
6181		1.0179		0.45	
6183		-----		-----	
6194		-----		-----	
6197	D874	1.015		0.39	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	46
outliers	0
mean (n)	0.995
st.dev. (n)	0.0608
R(calc.)	0.170
st.dev.(D874:13a)	0.0505
R(D874:13a)	0.141



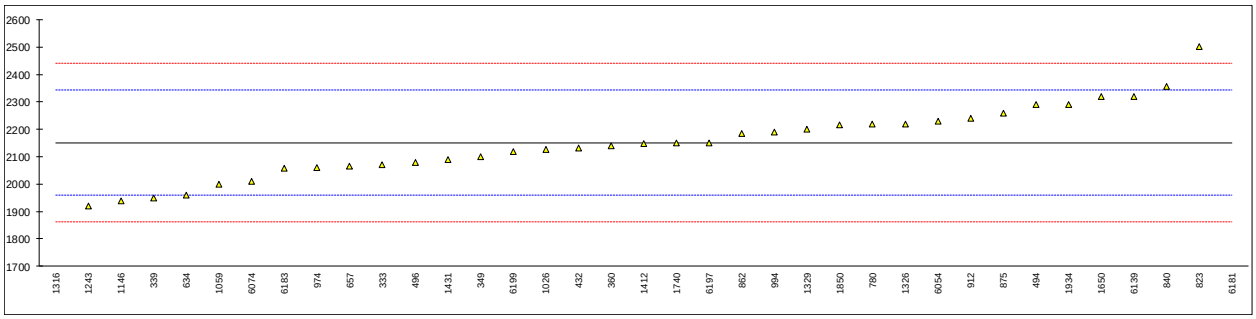


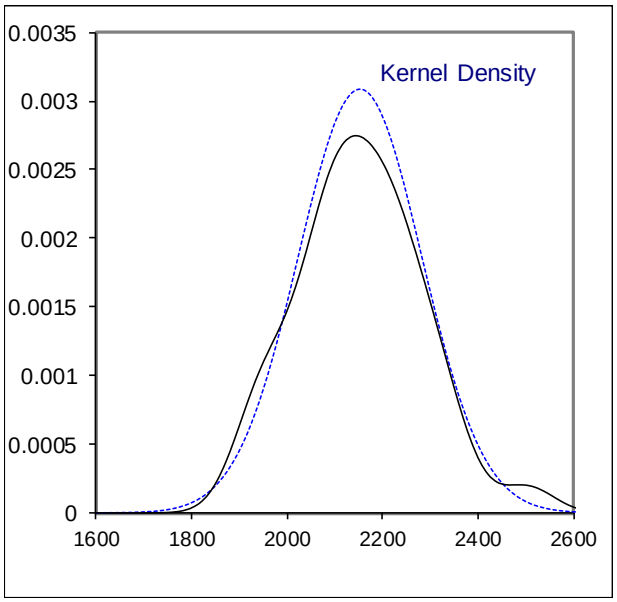
Determination of Sulphur on sample #18095; results in mg/kg

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178		-----		-----	
179		-----		-----	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325		-----		-----	
329		-----		-----	
333	D4294	2070		-0.85	
339	in house	1950		-2.09	
349	D2622	2100		-0.54	
360	D4294	2139		-0.13	
398		-----		-----	
421		-----		-----	
432	D5185	2132		-0.20	
494	D4294	2290		1.44	
496	D2622	2078		-0.76	
614		-----		-----	
634	D4294	1960		-1.99	
657	D4294	2065		-0.90	
663		-----		-----	
780	D4294	2220		0.71	
823	D4294	2501		3.63	
840	D4294	2356		2.12	
862	D2622	2185		0.35	
875	D4294	2260		1.12	
912	D4294	2240		0.92	
913		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
974	D4294	2060		-0.95	
994	D4294	2189		0.39	
1017		-----		-----	
1023		-----		-----	
1026	D5185	2126		-0.27	
1059	ISO14596	2000		-1.57	
1106		-----		-----	
1146	D4294	1940	C	-2.20	first reported 194
1155		-----		-----	
1173		-----		-----	
1201		-----		-----	
1213		-----		-----	
1235		-----		-----	
1243	ISO8754	1919		-2.41	
1316	D7751	210	R(0.01)	-20.14	
1323		-----		-----	
1324		-----		-----	
1326	D4294	2220		0.71	
1328		-----		-----	
1329	D5453	2200	C	0.50	first reported 0.22
1330		-----		-----	
1332		-----		-----	
1333		-----		-----	
1334		-----		-----	
1409		-----		-----	
1412	D4294	2149	C	-0.03	first reported 0.21
1431	D4294	2090	C	-0.64	first reported 0.209
1448		-----		-----	
1543		-----		-----	
1564		-----		-----	
1650	D4294	2320		1.75	
1740	D4294	2150		-0.02	
1748		-----		-----	
1850	ISO8754	2217		0.68	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934	D4294	2290		1.44	
1969		-----		-----	
2129		-----		-----	
6016		-----		-----	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034		-----		-----	
6054	D4294	2230		0.81	
6074	D2622	2011.4	C	-1.45	first reported 0.2
6139	D4294	2320		1.75	
6181		4400	C,R(0.01)	23.33	first reported 0.44
6183	D2622	2058.41		-0.97	
6194		-----		-----	
6197	D4294	2150	C	-0.02	first reported 0.215
6199	D5185	2119.5		-0.33	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

Normality	OK
n	35
Outliers	2
mean (n)	2151.6
st.dev. (n)	129.17
R(calc.)	361.7
st.dev.(D4294:16e1)	96.39
R(D4294:16e1)	269.9



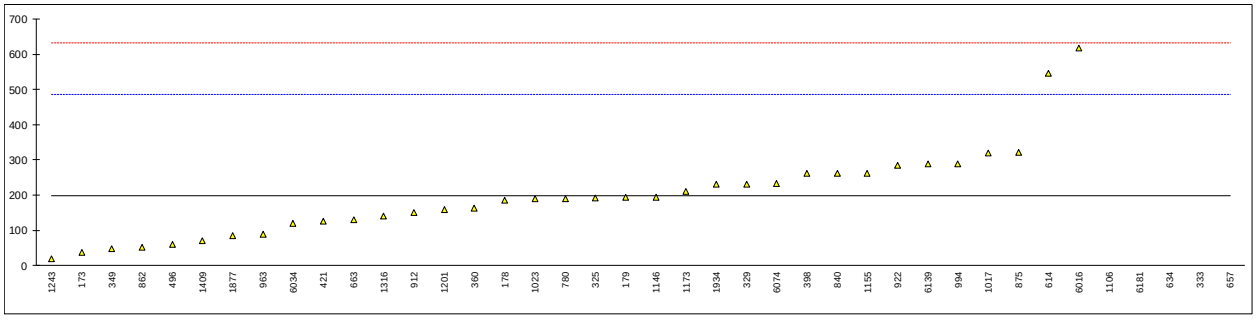


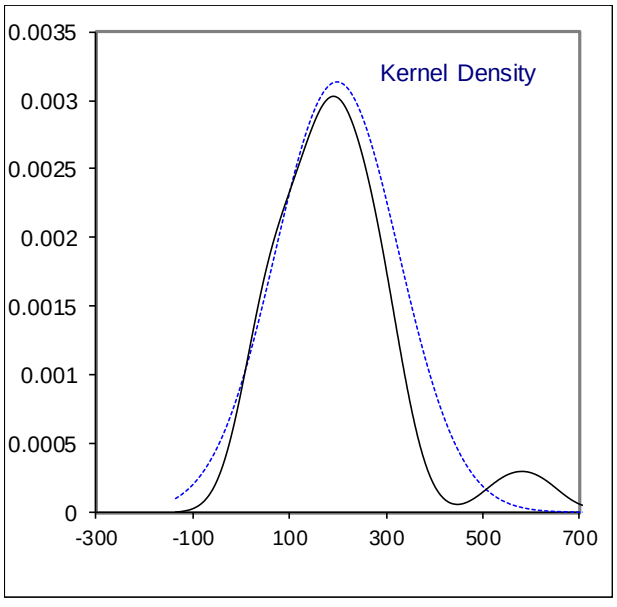
Determination of Water content by KF on sample #18095; results in mg/kg

lab	method	value	mark	z(targ)	remarks
173	D6304-C	37		-1.12	
178	D6304-C	185		-0.09	
179	D6304-C	193		-0.04	
211		-----		-----	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325	D6304-C	192.5		-0.04	
329	D6304-C	231	C	0.22	first reported 931 D6304-A
333	D6304-A	1000	R(0.01)	5.55	
339		-----		-----	
349	D6304-A	48	C	-1.04	first reported 1089
360	D6304-C	163.0		-0.25	
398	D6304-C	261		0.43	
421	D6304-C	126		-0.50	
432		-----		-----	
494		-----		-----	
496	D6304-C	61		-0.95	
614	D6304-C	545		2.40	
634	D6304-A	921	C,R(0.01)	5.01	first reported 0.1733 %M/M
657	D6304-C	1061	C,R(0.01)	5.98	first reported 1182
663	D6304-C	130		-0.48	
780	D6304-C	190		-0.06	
823		-----		-----	
840	D6304-C	261.8		0.44	
862	D6304-C	52		-1.02	
875	D6304-A	321		0.85	
912	D6304-C	150		-0.34	
913		-----		-----	
922	D6304-C	285		0.60	
962		-----		-----	
963	D6304-C	89		-0.76	
974		-----		-----	
994	IP438	289		0.63	
1017	D6304-A	320		0.84	
1023	D6304-C	189		-0.07	
1026	D6304-A	<10		-----	
1059		-----		-----	
1106	D6304-A	840.3	R(0.01)	4.45	
1146	D6304-C	194		-0.03	
1155	D6304-A	262.7		0.44	
1173	in house	210.55		0.08	
1201	D6304-A	160		-0.27	
1213		-----		-----	
1235		-----		-----	
1243	ISO12937	20		-1.24	
1316	D6304-C	140		-0.41	
1323		-----		-----	
1324		-----		-----	
1326		-----		-----	
1328	GB/T11133-2015	-----		-----	
1329		-----		-----	
1330		-----		-----	
1332		-----		-----	
1333		-----		-----	
1334		-----		-----	
1409	D6304-A	70		-0.89	
1412		-----		-----	
1431		-----		-----	
1448		-----	W	-----	first reported 1151
1543		-----		-----	
1564		-----		-----	
1650		-----		-----	
1740		-----		-----	
1748		-----		-----	
1850		-----		-----	
1877	D6304-C	84		-0.79	
1883		-----		-----	
1884		-----		-----	
1934	D6304-C	230		0.22	
1969		-----		-----	
2129		-----		-----	
6016	D6304-A	618		2.91	
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034	D6304-A	120	C	-0.54	first reported 1170
6054		-----		-----	
6074	D6304-A	232.807		0.24	
6139	D6304-A	288.4		0.62	
6181		881.6	R(0.01)	4.73	
6183		-----		-----	
6194		-----		-----	
6197		-----		-----	
6199		-----		-----	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

		D6304-C only	D6304-A only
normality	not OK	OK	not OK
n	35	21	11
outliers	5	2	3
mean (n)	198.564	164.014	298.292
st.dev. (n)	127.4877	71.2162	238.3908
R(calc.)	356.966	199.405	667.494
st.dev.(D6304:16e1)	144.2965	128.6601	184.2042
R(D6304:16e1)	404.030	360.248	515.772



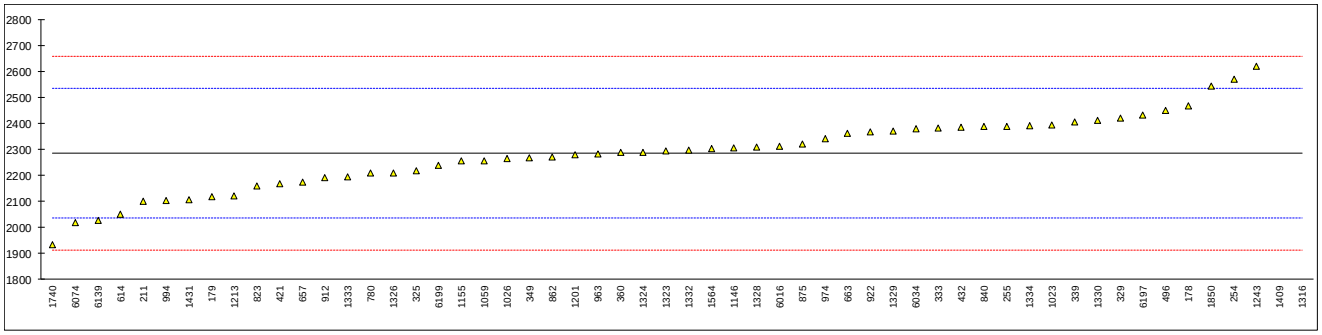


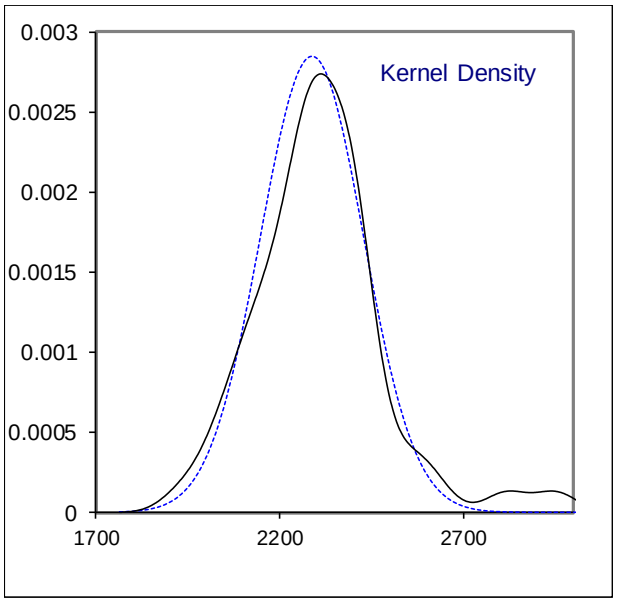
Determination of Calcium as Ca on sample #18095; results in mg/kg

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178	D5185	2469		1.47	
179	D5185	2117		-1.35	
211	D6595	2100		-1.49	
237		-----		-----	
254	INH-018	2570.17		2.28	
255	INH-0L1	2389		0.83	
325	D5185	2218		-0.54	
329	D4951	2422		1.09	
333	D5185	2383		0.78	
339		2405		0.96	
349		2268		-0.14	
360	D5185	2288		0.02	
398		-----		-----	
421	D5185	2169		-0.94	
432		2385		0.80	
494		-----		-----	
496	D5185	2449		1.31	
614		2051.8		-1.88	
634		-----		-----	
657	D5185	2174		-0.90	
663	D5185	2362.4		0.62	
780	D5185	2210		-0.61	
823		2158		-1.02	
840		2388		0.82	
862	D5185	2272		-0.11	
875	D5185	2320		0.28	
912		2192		-0.75	
913		-----		-----	
922	D5185	2369		0.67	
962		-----		-----	
963	D5185	2283.40		-0.02	
974		2343		0.46	
994	D5185	2104		-1.46	
1017		-----		-----	
1023	D5185	2394.49		0.87	
1026	D5185	2266		-0.16	
1059	in house	2256		-0.24	
1106		-----		-----	
1146	D5185/D4951	2305		0.16	
1155	D5185	2255		-0.25	
1173		-----		-----	
1201	D5185	2280	C	-0.04	first reported 3140
1213	D5185	2120		-1.33	
1235		-----		-----	
1243	DIN51399	2620		2.68	
1316	D5185	2950	R(0.01)	5.33	
1323		2295		0.08	
1324	D5185	2290		0.04	
1326		2210		-0.61	
1328	GB/T17476	2308		0.18	
1329	D5185	2370		0.68	
1330	D5185	2411		1.01	
1332		2298		0.10	
1333		2194		-0.73	
1334	D5185	2390.7		0.84	
1409	D5185	2815	R(0.05)	4.25	
1412		-----		-----	
1431	in house	2107		-1.43	
1448		-----		-----	
1543		-----		-----	
1564		2302		0.13	
1650		-----		-----	
1740		1933		-2.83	
1748		-----		-----	
1850		2545		2.08	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016	D5185	2313	C	0.22	first reported 231.3
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034	D5185	2380		0.76	
6054		-----		-----	
6074	D6595	2018.7		-2.14	
6139	D6595	2026.1		-2.08	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197	D4951	2432	C	1.18	first reported 0.2432
6199		2240	C	-0.37	first reported 22.38
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	54
outliers	2
mean (n)	2285.55
st.dev. (n)	140.246
R(calc.)	392.69
st.dev.(D5185:13e1)	124.630
R(D5185:13e1)	348.96



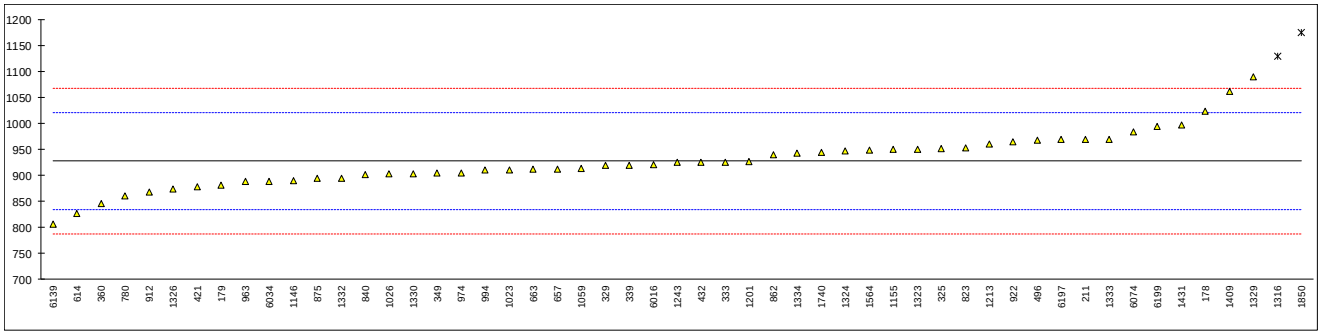


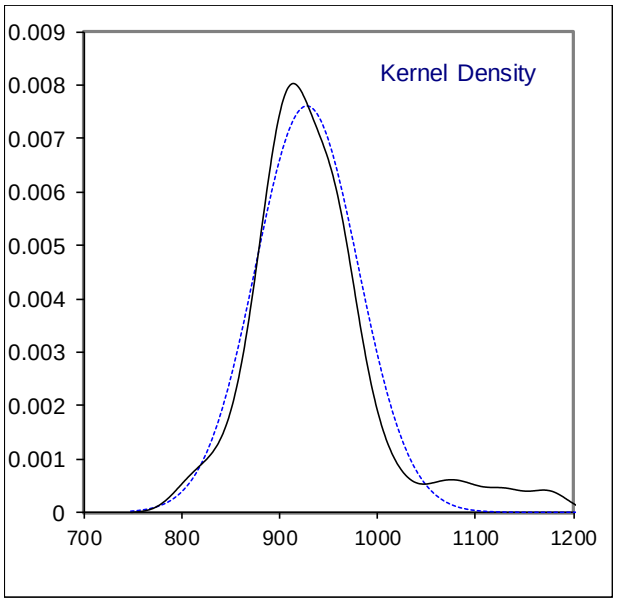
Determination of Phosphorus as P on sample #18095; results in mg/kg

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178	D5185	1023		2.04	
179	D5185	881		-1.00	
211	D6595	970		0.90	
237		-----		-----	
254		-----		-----	
255		-----		-----	
325	D5185	951		0.50	
329	D4951	920		-0.17	
333	D5185	926		-0.04	
339		920		-0.17	
349		905		-0.49	
360	D5185	846		-1.75	
398		-----		-----	
421	D5185	878		-1.06	
432		925.8		-0.04	
494		-----		-----	
496	D5185	967.8		0.86	
614		827.3		-2.15	
634		-----		-----	
657	D5185	912		-0.34	
663	D5185	911.9		-0.34	
780	D5185	860		-1.45	
823		953.2		0.54	
840		902.0	C	-0.55	first reported 1101
862	D5185	940		0.26	
875	D5185	894		-0.72	
912		868		-1.28	
913		-----		-----	
922	D5185	965		0.80	
962		-----		-----	
963	D5185	887.96		-0.85	
974		905		-0.49	
994	D5185	910		-0.38	
1017		-----		-----	
1023	D5185	910.356		-0.37	
1026	D5185	903		-0.53	
1059	in house	914		-0.29	
1106		-----		-----	
1146	D5185/D4951	889.4		-0.82	
1155	D5185	950		0.48	
1173		-----		-----	
1201	D5185	927	C	-0.02	first reported 1266
1213	D5185	960		0.69	
1235		-----		-----	
1243	DIN51399	925		-0.06	
1316	D5185	1130	R(0.05)	4.32	
1323		950		0.48	
1324	D5185	948		0.43	
1326		874		-1.15	
1328		-----		-----	
1329	D5185	1090		3.47	
1330	D5185	903		-0.53	
1332		894		-0.72	
1333		970		0.90	
1334	D5185	942.5		0.32	
1409	D5185	1062		2.87	
1412		-----		-----	
1431	in house	998		1.50	
1448		-----		-----	
1543		-----		-----	
1564		949		0.45	
1650		-----		-----	
1740		944		0.35	
1748		-----		-----	
1850		1175	R(0.01)	5.29	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016	D5185	921.2	C	-0.14	first reported 92.12
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034	D5185	888	C	-0.85	first reported 1248
6054		-----		-----	
6074	D6595	984.08		1.20	
6139	D6595	806.3		-2.60	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197	D4951	969	C	0.88	first reported 0.0969
6199		993.7		1.41	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	suspect
n	51
outliers	2
mean (n)	927.75
st.dev. (n)	52.422
R(calc.)	146.78
st.dev.(D5185:13e1)	46.776
R(D5185:13e1)	130.97



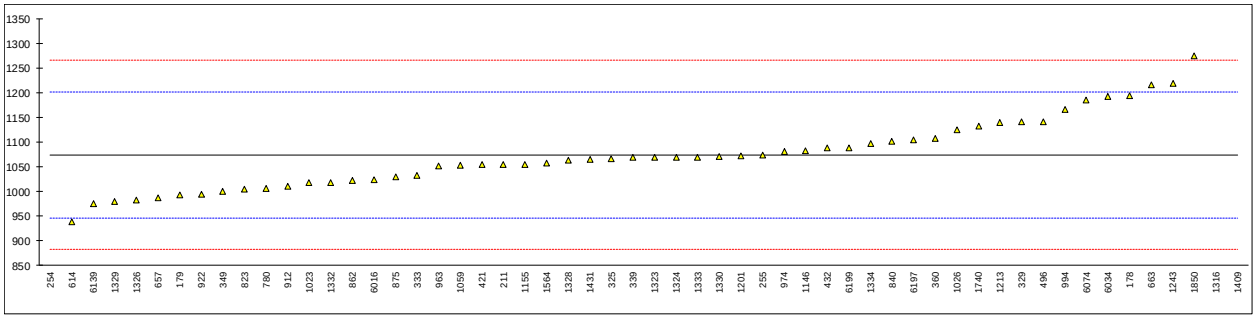


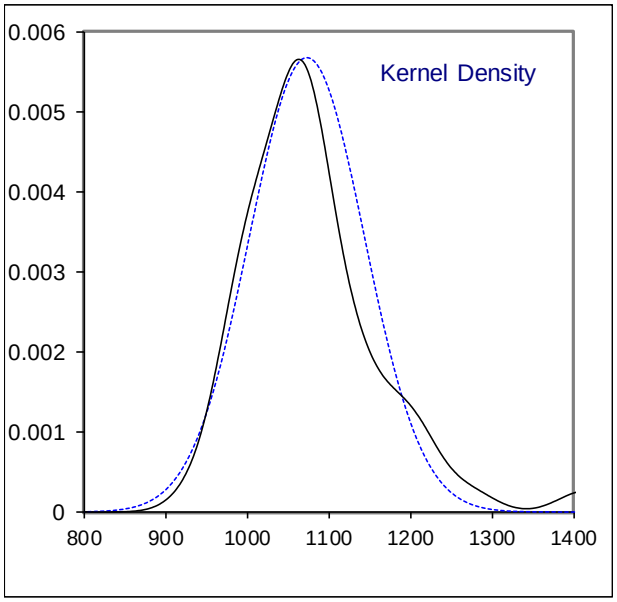
Determination of Zinc as Zn on sample #18095; results in mg/kg

lab	method	value	mark	z(targ)	remarks
173		-----		-----	
178	D5185	1195		1.89	
179	D5185	993		-1.26	
211	D6595	1055		-0.30	
237		-----		-----	
254	INH-018	701.077	R(0.01)	-5.83	
255	INH-0L1	1074		0.00	
325	D5185	1066		-0.12	
329	D4951	1141		1.05	
333	D5185	1032		-0.66	
339		1070		-0.06	
349		1001		-1.14	
360	D5185	1108		0.53	
398		-----		-----	
421	D5185	1054		-0.31	
432		1088		0.22	
494		-----		-----	
496	D5185	1142		1.06	
614		938.68		-2.11	
634		-----		-----	
657	D5185	986.5		-1.37	
663	D5185	1216.3		2.23	
780	D5185	1006		-1.06	
823		1004		-1.09	
840		1101	C	0.42	first reported 902.0
862	D5185	1022		-0.81	
875	D5185	1030		-0.69	
912		1010		-1.00	
913		-----		-----	
922	D5185	995		-1.23	
962		-----		-----	
963	D5185	1051.39		-0.35	
974		1081		0.11	
994	D5185	1166		1.44	
1017		-----		-----	
1023	D5185	1017.8		-0.88	
1026	D5185	1125		0.80	
1059	in house	1053		-0.33	
1106		-----		-----	
1146	D5185/D4951	1082		0.13	
1155	D5185	1055		-0.30	
1173		-----		-----	
1201	D5185	1073	C	-0.01	first reported 1445
1213	D5185	1140		1.03	
1235		-----		-----	
1243	DIN51399	1220		2.28	
1316	D5185	1410	R(0.01)	5.25	
1323		1070		-0.06	
1324	D5185	1070		-0.06	
1326		983		-1.42	
1328	GB/T17476	1064		-0.16	
1329	D5185	980		-1.47	
1330	D5185	1071		-0.05	
1332		1018		-0.87	
1333		1070		-0.06	
1334	D5185	1097.2		0.36	
1409	D5185	1472	R(0.01)	6.22	
1412		-----		-----	
1431	in house	1065		-0.14	
1448		-----		-----	
1543		-----		-----	
1564		1058		-0.25	
1650		-----		-----	
1740		1132		0.91	
1748		-----		-----	
1850		1275		3.14	
1877		-----		-----	
1883		-----		-----	
1884		-----		-----	
1934		-----		-----	
1969		-----		-----	
2129		-----		-----	
6016	D5185	1024	C	-0.78	first reported 102.4
6032		-----		-----	

lab	method	value	mark	z(targ)	remarks
6034	D5185	1193		1.86	
6054		-----		-----	
6074	D6595	1185.9		1.75	
6139	D6595	975.2		-1.54	
6181		-----		-----	
6183		-----		-----	
6194		-----		-----	
6197	D4951	1105	C	0.49	first reported 0.1105 mg/kg
6199		1089		0.24	
9100		-----		-----	
9101		-----		-----	
9142		-----		-----	
9143		-----		-----	

normality	OK
n	53
outliers	3
mean (n)	1073.92
st.dev. (n)	70.377
R(calc.)	197.06
st.dev.(D5185:13e1)	63.972
R(D5185:13e1)	179.12





APPENDIX 2

Number of participants per country

1 lab in	AUSTRALIA	2 labs in	MOROCCO
1 lab in	AUSTRIA	3 labs in	NETHERLANDS
2 labs in	AZERBAIJAN	5 labs in	NIGERIA
5 labs in	BELGIUM	1 lab in	NORWAY
1 lab in	BRUNEI	1 lab in	PAKISTAN
1 lab in	BULGARIA	1 lab in	PERU
11 labs in	CHINA, People's Republic	1 lab in	PHILIPPINES
1 lab in	COTE D'IVOIRE	2 labs in	RUSSIAN FEDERATION
1 lab in	CROATIA	2 labs in	SAUDI ARABIA
1 lab in	CZECH REPUBLIC	1 lab in	SERBIA
2 labs in	FRANCE	2 labs in	SINGAPORE
1 lab in	GEORGIA	1 lab in	SLOVENIA
5 labs in	GERMANY	2 labs in	SOUTH KOREA
2 labs in	GREECE	2 labs in	SPAIN
2 labs in	INDIA	1 lab in	SUDAN
1 lab in	ITALY	1 lab in	SWEDEN
1 lab in	JORDAN	1 lab in	TANZANIA
1 lab in	KAZAKHSTAN	1 lab in	THAILAND
1 lab in	KENYA	1 lab in	TURKEY
1 lab in	LATVIA	1 lab in	UNITED ARAB EMIRATES
1 lab in	LEBANON	3 labs in	UNITED KINGDOM
1 lab in	MACEDONIA	3 labs in	UNITED STATES OF AMERICA
3 labs in	MALAYSIA	2 labs in	VIETNAM

APPENDIX 3

Abbreviations:

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

Literature:

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