Results of Proficiency Test
Jet Fuel A1
March 2021

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

Author: ing. R.J. Starink
Correctors: ing. A.S. Noordman-de Neef & ing. G.A. Oosterlaken-Buijs
Report: iis21J01

June 2021

CONTENTS

1 INTRODUCTION

Since 1995 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Jet Fuel A1 twice a year in accordance with the latest version of the "Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS)", sometimes referred to as the "Joint Fuelling System Check List for Jet A-1". During the annual proficiency testing program 2020/2021 it was decided to continue the proficiency tests on Jet Fuel A1 and Jet Fuel A1 Particle Size in the first half of the year and in second half of the year together with other Jet Fuel (sub) rounds.

In this interlaboratory study registered for participation:
- 96 laboratories in 46 countries on Jet Fuel A1 (iis21J01)
- 42 laboratories in 28 countries on Jet Fuel A1 Particle Size (iis21J01PS)

In total 97 laboratories in 46 different countries registered for participation. See appendix 4 for the number of participants per country. In this report the results of the two Jet Fuel proficiency tests are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory.
It was decided to send two liters of Jet Fuel A1 labelled #21020 for the regular round to perform the analyzes according to the latest version of "Joint Fuelling System Check List for Jet A-1". For the Particle Size Distribution round it was decided to send one bottle with 0.5L of Jet Fuel A-1 labelled #21021.
The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

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

2.2 PROTOCOL

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

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

For the preparation of the sample for the Jet Fuel A1 a batch of approximately 400L of Jet Fuel A1 was obtained from a local refinery. After homogenization 240 amber glass bottles of 1L were filled and labelled #21020.
The homogeneity of the subsamples was checked by the determination of Density at 15°C in accordance with ASTM D4052 on 10 stratified randomly selected subsamples.

	Density at 15°C in kg/m^3
Sample #21020-1	803.50
Sample #21020-2	803.51
Sample #21020-3	803.51
Sample #21020-4	803.50
Sample #21020-5	803.50
Sample #21020-6	803.50
Sample #21020-7	803.50
Sample #21020-8	803.51
Sample #21020-9	803.50
Sample #21020-10	803.50

Table 1: homogeneity test results of subsamples #21020

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

	Density at 15°C in kg/m^3
r (observed)	0.01
reference test method	ASTM D4052:18a
0.3 x R (reference test method)	0.15

Table 2: evaluation of the repeatability of subsamples #21020

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

For the preparation of the sample for the Jet Fuel A1 Particle Size a batch of approximately 160L of Jet Fuel A1 was obtained from a local refinery. After homogenization 70 amber glass bottles of 0.5 liter were filled and labelled #21021. Each bottle was spiked with 1mL of Lube oil which contained suspended Arizona Dust A2 before filling with Jet Fuel A1.
The homogeneity of the subsamples was checked by the determination of Particle Size Distribution in accordance with IP565 on 8 stratified randomly selected subsamples.

	> 4 µm (c) counts/mL	> 6 µm (c) counts/mL
Sample #21021-1	24622	7850
Sample #21021-2	25250	7960
Sample #21021-3	25831	8226
Sample #21021-4	26802	8524
Sample #21021-5	25699	8246
Sample #21021-6	26226	8422
Sample #21021-7	25837	8090
Sample #21021-8	26607	8532

Table 3: homogeneity test results of subsamples #21021

From the above test results the relative standard deviations (RSD) were calculated and compared with 0.3 times the corresponding average relative standard deviation obtained from the last 14 iis PTS on Particle Size Determination and used as reference method in agreement with the procedure of ISO13528, Annex B2 in the next table.

	> 4 µm (c) counts/mL	> 6 µm (c) counts/mL
RSD% (observed)	3	3
reference method	RSD off 14 iis PTS	RSD off 14 iis PTS
0.3 x RSD% (reference method)	6	6

Table 4: evaluation of the relative standard deviations of subsamples #21021

The calculated relative standard deviations are in agreement with 0.3 times the corresponding average relative standard deviation obtained from the last 14 iis PTS on Particle Size Determination. Therefore, homogeneity of the subsamples #21021 was assumed.

Depending on the registration of the participant the appropriate set of PT samples was sent on February 17, 2021. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of Jet Fuel A1 packed in amber glass bottles was checked. The material has been found sufficiently stable for the period of the proficiency test. The type of bottle was chosen in accordance with ASTM D4306.

2.6 ANALYZES

The participants were requested to determine on sample #21020: Appearance, Total Acidity, Aromatics by FIA, Mono Aromatics (MAH), Di Aromatics (DAH), Total Aromatics by HPLC (in %M/M and %V/V), Color Saybolt (automated and manual), Copper Corrosion (2 hrs at 100°C), Density at 15°C, Distillation at 760 mmHg (IBP, temperature at 10%, 50%, 90% recovered and FBP), Existent Gum (unwashed), Flash Point, Freezing Point, Kinematic Viscosity at -20°C, Mercaptan Sulfur as S, MSEP, Naphthalenes, Smoke Point, Specific Energy (Net) on Sulfur free basis and Total Sulfur.
The participants were requested to determine Particle Size Distribution only on sample #21021.

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

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

3 RESULTS

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

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

3.1 STATISTICS

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

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

The assigned value is determined by consensus based on the test results of the group of participants after rejection of the statistical outliers and/or suspect data.

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

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

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

3.2 GRAPHICS

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

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

3.3 Z-SCORES

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

The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used, like Horwitz or an estimated reproducibility based on former iis proficiency tests.

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

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

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

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

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

4 EVALUATION

In this proficiency test some problems were encountered with the dispatch of the samples. For the Jet Fuel A1 eleven participants reported test results after the final reporting date and six other participants did not report any test results.
For the Jet Fuel A1 Particle Size eight participants reported test results after the final reporting date and eight other participants did not report any test results.

Finally, 91 participants reported in total 1676 numerical test results. Observed were 58 outlying test results, which is 3.5%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

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

4.1 EVALUATION PER SAMPLE AND PER TEST

In this section the reported test results are discussed per sample and per test. The test methods which were used by the various laboratories were taken into account for explaining the observed differences when possible and applicable. These test methods are also in the tables together with the original data. The abbreviations, used in these tables, are explained in appendix 5.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D3242) and an added designation for the year that the test method was adopted or revised (e.g. D3242:11). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D3242:11(2017)). In the test results tables of appendix 1 only the test method number and year of adoption or revision (e.g. D3242:11) will be used.

Since the Joint Fuelling System Check List for Jet-A1 is continuously updated, the participants are advised to monitor the updates. The latest version at the time of this Round Robin is DEF STAN 91-091/Issue 12, September 2020 and ASTM D1655:20d. One must keep in mind that ISO test methods are not mentioned in the “Checklist”.

Sample #21020

Appearance: This determination was not problematic. All participants agreed about the appearance of the sample, which was Clear and Bright.

Total Acidity: 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 D3242:11(2017).

Aromatics by FIA: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with requirements of ASTM D1319:20a.

Mono Aromatics (MAH) by HPLC: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D6379:11(2019).

Di Aromatics (DAH) by HPLC: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D6379:11(2019).

Total Aromatics by HPLC: The determination in %M/M was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with ASTM D6379:11(2019).
The determination in %V/V may be problematic. No statistical outliers were observed. Regretfully, no precision data for the determination in %V/V is mentioned in ASTM D6379:11(2019). The calculated reproducibility is higher than the calculated reproducibilities in %V/V of the iis proficiency tests iis20J01 and iis20J02 conducted in 2020.

Color Saybolt: The determination was very problematic for the automatic test method. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D6045:20.
The determination for the manual test method was also problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D156:15.

Copper Corrosion: This determination was not problematic. All reporting participants agreed on a test result of 1 (1a/1b).

Density at 15°C: This determination was not problematic. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D4052:18a.

Distillation at 760 mmHg: This determination was not problematic. In total over five parameters four statistical outliers were observed. All calculated reproducibilities after rejection of the statistical outliers are in agreement with the automated mode requirements of ASTM D86:20b.
When compared to the manual mode requirements of ASTM D86:20b only the calculated reproducibilities for 50% and 90% recovered are in agreement.

Existent Gum (unwashed): This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D381:19.

Flash Point: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of IP170:14.

Freezing Point: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D2386:19.

Kin. Viscosity at -20°C: This determination was problematic. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D445:19 and the stricter requirements of ASTM D445:19a.

Mercaptan Sulfur: This determination was problematic for a number of participants. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3227:16.

MSEP: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3948:20.

Naphthalenes: This determination may be problematic depending on the procedure used. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D1840:07(2017) procedure B but it is not in agreement with the stricter requirements of procedure A.

Smoke Point: This determination may be problematic depending on test mode used. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of the manual mode of ASTM D1322:19, but not with the stricter requirements of the automated mode.

Specific Energy: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ASTM D3338:20a. No calculation errors are observed.

Total Sulfur: This determination was problematic for a number of participants. Six statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5453:19.

Sample #21021

Particle Size Distribution Determination:

The Joint Fuelling System Check List for Jet-A1 lists test methods IP565 and IP577 as the reference test methods to determine the Particle Size Distribution in Jet Fuel A1
Almost all reporting participants mentioned to have used IP565, one participant used IP577 and one participant used IP564 which is not mentioned in the Checklist as test method since 2020. At the end of September 2019, the Energy Institute announced that it has suspended test method IP564. Therefore, it was decided to exclude the reported test results determined with IP564.

The test results for IP577 was also excluded for statical calculations as it was observed in previous iis PTS that IP577 gives deviating results compared to IP565.
Most participants used ISO11171 for the calibration. All laboratories used ISO4406 for calculating the scale numbers from the counts per mL. All participants calculated the ISO code from the test results in counts/mL correctly.

Two laboratories had three or more outliers in de particle size determination. The other test results in counts/mL or ISO scale numbers for these laboratories were excluded.

IP565: The determination according to IP565 was problematic. In total nine statistical outliers were observed and seventeen other test results were excluded for the six particle size categories. The calculated reproducibilities after rejection of the suspect data are not in agreement with the requirements of IP565:13.
The determination expressed in ISO scale numbers was not problematic. Three statistical outliers were observed and twelve other test results were excluded. The calculated reproducibilities after rejection of the suspect data are in agreement with the indicative requirements of IP565:13 Annex C.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

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

Parameter	unit	n	average	2.8 * sd	R(lit)
Appearance		75	C&B	n.a.	n.a.
Total Acidity	mg KOH/g	46	0.0015	0.0020	0.0016
Aromatics by FIA	%V/V	35	15.99	2.11	2.66
Mono Aromatics (MAH) by HPLC	%M/M	20	17.08	0.93	1.73
Di Aromatics (DAH) by HPLC	%M/M	22	1.84	0.44	0.63
Total Aromatics by HPLC	%M/M	20	19.01	1.06	1.98
Total Aromatics by HPLC	%V/V	32	16.96	2.31	n.a.
Color Saybolt (automated)		41	29.1	2.7	1.2
Color Saybolt (manual)		42	28.7	3.5	2
Copper Corrosion 2hrs at 100°C		73	1 (1a/1b)	n.a.	n.a.
Density at 15°C	kg/m^3	82	803.51	0.16	0.5
Initial Boiling Point	°C	87	150.1	7.1	8.3
Temp at 10% recovered	°C	87	171.1	3.6	3.8
Temp at 50% recovered	°C	85	198.7	2.4	3.0
Temp at 90% recovered	°C	85	235.7	3.2	3.5
Final Boiling Point	°C	87	254.4	5.1	7.1
Existent Gum (unwashed)	mg/100mL	45	0.61	1.56	3.11

Parameter	unit	n	average	2.8 * sd	R(lit)
Flash Point	°C	82	42.1	3.0	3.2
Freezing Point	°C	72	-53.0	2.2	2.5
Kinematic Viscosity at -20°C	mm^2/s	50	3.972	0.094	0.075
Mercaptan Sulfur as S	%M/M	45	0.00045	0.00024	0.00033
MSEP		61	96.3	5.2	6.6
Naphthalenes	%V/V	42	1.234	0.102	0.107
Smoke Point	mm	55	23.4	1.7	3.7
Specific Energy (Net)	MJ/kg	44	43.255	0.046	0.046
Total Sulfur	mg/kg	69	460	54	58

Table 5: reproducibilities of tests on sample #21020

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

Parameter	unit	n	average	2.8 * sd	R(lit)
Particle Size ≥4 µm (c)	counts/mL	30	27543	7859	2942
Particle Size ≥6 µm (c)	counts/mL	30	8626	3001	1819
Particle Size ≥14 µm (c)	counts/mL	30	279	267	146
Particle Size ≥21 µm (c)	counts/mL	29	25.1	41.3	21.9
Particle Size ≥25 µm (c)	counts/mL	28	6.9	13.9	8.1
Particle Size ≥30 µm (c)	counts/mL	28	2.0	4.9	3.2
Particle Size ≥4 µm (c)	ISO scale	27	22.0	0.0	1.0
Particle Size ≥6 µm (c)	ISO scale	25	20.0	0.0	1.0
Particle Size ≥14 µm (c)	ISO scale	27	15.3	1.9	1.4

Table 6: reproducibilities of tests on sample #21021

Without further statistical calculations it can be concluded that for many parameters of the Particle Size Determination there is not a good compliance of the group of participants with the relevant reference test methods.
Problematic tests have been discussed in paragraph 4.1.

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

	March 2021	September 2020	March 2020	September 2019	March 2019
Number of reporting laboratories	91	152	90	154	93
Number of test results	1676	2992	1666	3043	1789
Number of statistical outliers	58	94	67	78	53
Percentage of statistical outliers	3.5%	3.1%	4.0%	2.6%	3.0%

Table 7: comparison with previous proficiency tests

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

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

Parameter	March 2021	September 2020	March 2020	September 2019	March 2019
Total Acidity	-	-	-	-	-
Aromatics by FIA	+	+	+	+	+
Aromatics by HPLC	+	+	+/-	+/-	+
Color Saybolt (automated)	--	--	-	-	--
Color Saybolt (manual)	-	-	-	-	-
Density at 15°C	++	++	++	++	+
Distillation at 760 mmHg	+	+	+	+	+
Existent Gum	++	++	++	++	++
Flash Point	+/-	+/-	+	+	+/-
Freezing Point	+	+	+	+	+
Kinematic Viscosity at -20°C	-	-	+/-	+	+/-
Mercaptan Sulfur	+	+	+	+	+
MSEP	+	+	+/-	+/-	-
Naphthalenes	+/-	+	+	+	+
Smoke Point	++	++	++	+	++
Specific Energy (Net)	+/-	-	-	-	-
Total Sulfur	+	+	-	+/-	+/-
IP565 cumulative counts/mL	--	-	--	--	-
IP565 ISO scale numbers	+	+	++	+/-	+/-

Table 8: comparison determinations against the reference test methods on samples #21020 and #21021

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

APPENDIX 1

Determination of Appearance on sample #21020;

lab	method	value	mark	z(targ)	remarks
120	Visual	C&B		-----	
140		-----		-----	
150	Visual	C&B		-----	
159	Visual	C&B		-----	
169	Visual	Pass		-----	
171	D4176	C&B		-----	
175	Visual	Clear&Bright		-----	
177		-----		-----	
225		-----		-----	
228	Visual	Clear and bright		-----	
237	Visual	C&B		-----	
238	Visual	B & C		-----	
253	Visual	Clear & Bright		-----	
273	Visual	Pass		-----	
317	Visual	Br&Cl		-----	
323	Visual	Clear and Bright		-----	
328	Visual	C&B		-----	
333		-----		-----	
334	Visual	clear and bright FFSM		-----	
335		-----		-----	
360	Visual	Clear and Bright		-----	
365	Visual	C+B		-----	
391	Visual	C&B		-----	
396	Visual	Clear & Bright		-----	
398	Visual	Clear & Bright		-----	
399	Visual	Clear & Bright		-----	
447	Visual	Clear & Bright		-----	
594	Visual	Clear and bright		-----	
604	Visual	Clear & Bright		-----	
631	Visual	clear & bright		-----	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671	Visual	C/B		-----	
759	Visual	C&B		-----	
781	Visual	Cleare&Bright		-----	
782	Visual	C&B		-----	
785	Visual	Clear&Bright		-----	
825	Visual	Clear and Bright		-----	
840	Visual	Clear & Bright		-----	
875	Visual	Clear & Bright		-----	
922	Visual	Clear and Bright		-----	
962	Visual	Bright & Clear		-----	
963	Visual	Bright & Clear		-----	
970	Visual	C&B		-----	
974	Visual	C & B		-----	
998	Visual	C&B		-----	
1039	Visual	clear & bright		-----	
1049	Visual	Br & Cl		-----	
1059	Visual	Clear & Bright		-----	
1062	Visual	pass		-----	
1064	Visual	C&B		-----	
1079	Visual	Clear & bright		-----	
1095		-----		-----	
1097	Visual	clair et limpide		-----	
1108	Visual	Clear and bright		-----	
1109	Visual	Pass		-----	
1121	Visual	Clear & Bright		-----	
1126		-----		-----	
1150		-----		-----	
1191		-----		-----	
1212	Visual	C & B		-----	
1299	Visual	C&B		-----	
1320	Visual	C & B		-----	
1357	Visual	Clear & Bright		-----	
1399		-----		-----	
1429	Visual	Clear and Bright		-----	
1496	Visual	C&B		-----	
1498	D4176	B&C		-----	
1531	Visual	clear		-----	
1544	Visual	clear and bright		-----	
1564		-----		-----	
1585	Visual	Clear & Bright		-----	
1586	Visual	clear &bright		-----	

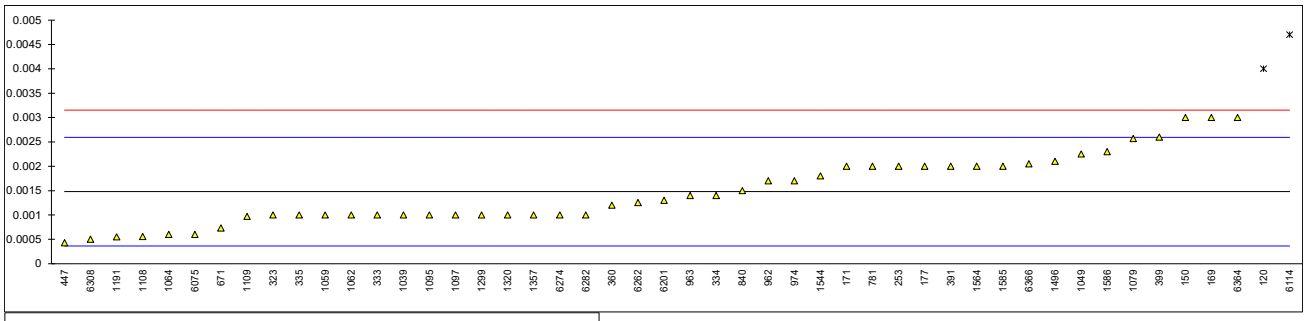
lab	method	value	mark	z(targ)	remarks
1587	Visual	Br&Cl		-----	
1610	D4176	Clear & bright		-----	
1694		-----		-----	
1730		-----		-----	
1740	Visual	B+C		-----	
1776		-----		-----	
1883		-----		-----	
6035	Visual	CBwSFW		-----	
6075	Visual	C&L		-----	
6114	Visual	clear & bright		-----	
6142		-----		-----	
6174	Visual	Clear and Bright		-----	
6192	Visual	bright &clear		-----	
6201		-----		-----	
6262	Visual	Cl. & Br.		-----	
6274	Visual	Bright and clear		-----	
6282	Visual	CBFFSMW		-----	
6299	Visual	Clear and Bright		-----	
6308	Visual	C&B		-----	
6364	Visual	clear and bright		-----	
6366	Visual	Bright and clear		-----	
6376		-----		-----	
	n	75			
	mean	Clear and Bright (Pass)			

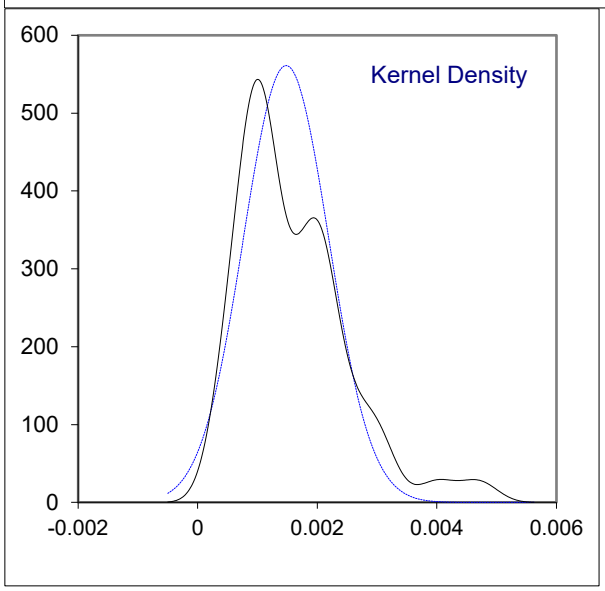
Determination of Total Acidity on sample #21020; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
120	D3242	0.004	R(0.05)	4.52	
140		-----		-----	
150	D3242	0.003		2.73	
159		-----		-----	
169	D3242	0.003		2.73	
171	D3242	0.002		0.93	
175		-----		-----	
177	D3242	0.002		0.93	
225		-----		-----	
228		-----		-----	
237		-----		-----	
238		-----		-----	
253	D3242	0.002		0.93	
273		-----		-----	
317		-----		-----	
323	D3242	0.001		-0.86	
328		-----		-----	
333	D3242	0.001		-0.86	
334	D3242	0.0014		-0.14	
335	D3242	0.001		-0.86	
360	D3242	0.0012		-0.50	
365		-----		-----	
391	D3242	0.002		0.93	
396		-----		-----	
398		-----		-----	
399	D3242	0.0026		2.01	
447	D3242	0.00043		-1.88	
594		-----		-----	
604		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671	D3242	0.00073		-1.34	
759		-----		-----	
781	D3242	0.002		0.93	
782		-----		-----	
785		-----		-----	
825		-----		-----	
840	D3242	0.0015		0.04	
875		-----		-----	
922		-----		-----	
962	D3242	0.0017		0.40	
963	D3242	0.0014		-0.14	
970		-----		-----	
974	D3242	0.0017		0.40	
998		-----		-----	
1039	D3242	0.001		-0.86	
1049	D3242	0.00225		1.38	
1059	D3242	0.001		-0.86	
1062	D3242	0.001		-0.86	
1064	D3242	0.0006		-1.58	
1079	D3242	0.00257		1.95	
1095	D3242	0.001		-0.86	
1097	D3242	0.0010		-0.86	
1108	D3242	0.00056		-1.65	
1109	D3242	0.00097		-0.91	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191	D3242	0.00055		-1.67	
1212		-----		-----	
1299	D3242	0.001		-0.86	
1320	D3242	0.0010		-0.86	
1357	D3242	0.001		-0.86	
1399		-----		-----	
1429		-----		-----	
1496	D3242	0.0021		1.11	
1498		-----		-----	
1531		-----		-----	
1544	D664-A	0.0018	C	0.57	First reported 0.02
1564	D3242	0.002		0.93	
1585	D3242	0.0020		0.93	
1586	D3242	0.0023		1.47	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610		-----		-----	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776		-----		-----	
1883		-----		-----	
6035		-----		-----	
6075	D3242	0.0006		-1.58	
6114	IP354	0.0047	R(0.05)	5.77	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201	D3242	0.0013		-0.32	
6262	D3242	0.001255		-0.40	
6274	D3242	0.001		-0.86	
6282	D3242	0.001		-0.86	
6299		-----		-----	
6308	D3242	0.0005		-1.76	
6364	D3242	0.0030		2.73	
6366	D3242	0.00205		1.02	
6376		-----		-----	

normality	OK
n	46
outliers	2
mean (n)	0.00148
st.dev. (n)	0.000711
R(calc.)	0.00199
st.dev.(D3242:11)	0.000558
R(D3242:11)	0.00156



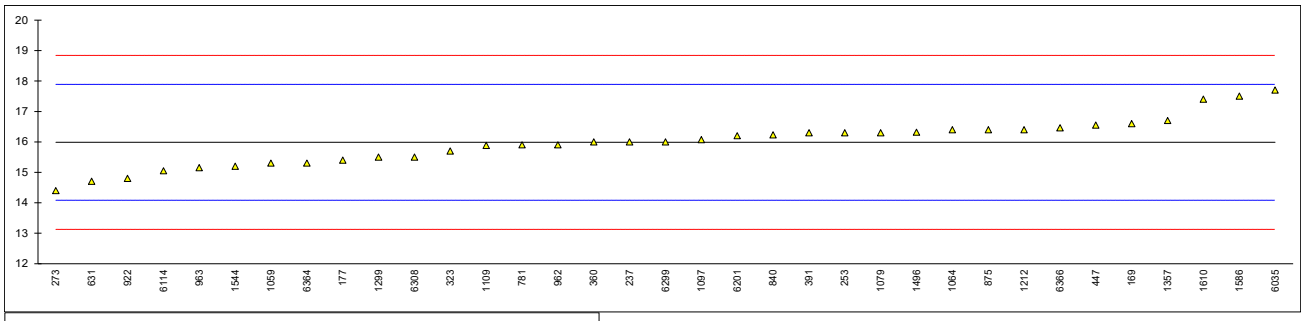


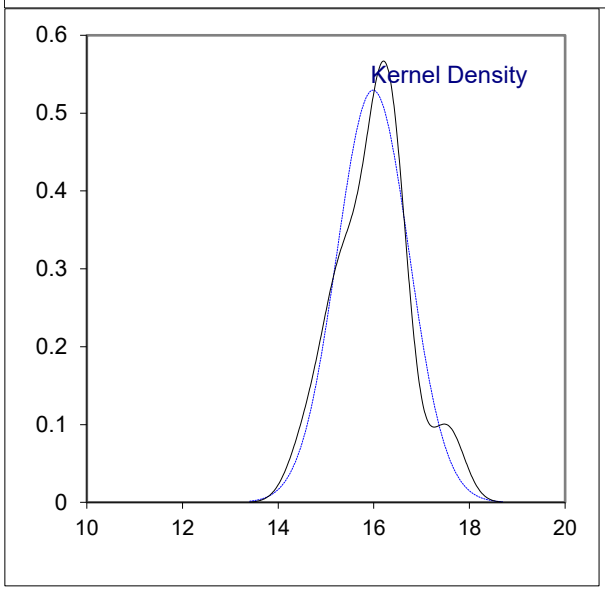
Determination of Aromatics by FIA on sample #21020; results in %V/V

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
140		-----		-----	
150		-----		-----	
159		-----		-----	
169	D1319	16.6		0.64	
171		-----		-----	
175		-----		-----	
177	D1319	15.4		-0.62	
225		-----		-----	
228		-----		-----	
237	D1319	16.0		0.01	
238		-----		-----	
253	D1319	16.3		0.33	
273	D1319	14.4		-1.67	
317		-----		-----	
323	D1319	15.7		-0.30	
328		-----		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
360	D1319	16.0		0.01	
365		-----		-----	
391	D1319	16.3		0.33	
396		-----		-----	
398		-----		-----	
399		-----		-----	
447	D1319	16.552		0.59	
594		-----		-----	
604		-----		-----	
631	D1319	14.709		-1.34	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
759		-----		-----	
781	D1319	15.9		-0.09	
782		-----		-----	
785		-----		-----	
825		-----		-----	
840	D1319	16.23		0.26	
875	D1319	16.4		0.43	
922	D1319	14.8		-1.25	
962	D1319	15.9		-0.09	
963	D1319	15.15		-0.88	
970		-----		-----	
974		-----		-----	
998		-----		-----	
1039		-----		-----	
1049		-----		-----	
1059	D1319	15.3		-0.72	
1062		-----		-----	
1064	D1319	16.4		0.43	
1079	D1319	16.30		0.33	
1095		-----		-----	
1097	D1319	16.07		0.09	
1108		-----		-----	
1109	D1319	15.88		-0.11	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191		-----		-----	
1212	D1319	16.40		0.43	
1299	D1319	15.5		-0.51	
1320		-----		-----	
1357	D1319	16.7		0.75	
1399		-----		-----	
1429		-----		-----	
1496	D1319	16.32		0.35	
1498		-----		-----	
1531		-----		-----	
1544	D1319	15.20		-0.83	
1564		-----		-----	
1585		-----		-----	
1586	D1319	17.5		1.59	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610	IP156	17.4		1.49	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776		-----		-----	
1883		-----		-----	
6035	EN15553	17.7		1.80	
6075		-----		-----	
6114	D1319	15.05		-0.98	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201	D1319	16.2		0.22	
6262		-----		-----	
6274		-----		-----	
6282		-----		-----	
6299	D1319	16.0		0.01	
6308	D1319	15.5		-0.51	
6364	D1319	15.3	C	-0.72	First reported 20.32
6366	D1319	16.465		0.50	
6376		-----		-----	

normality	OK
n	35
outliers	0
mean (n)	15.986
st.dev. (n)	0.7536
R(calc.)	2.110
st.dev.(D1319:20a)	0.9516
R(D1319:20a)	2.664



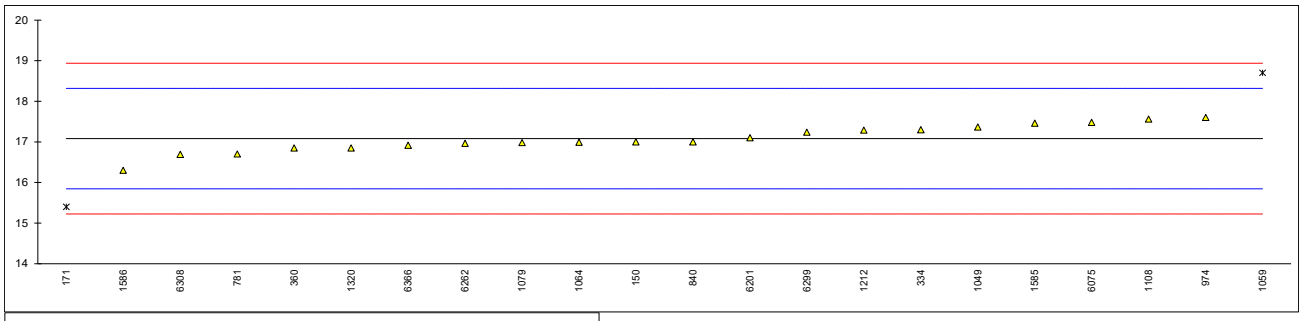


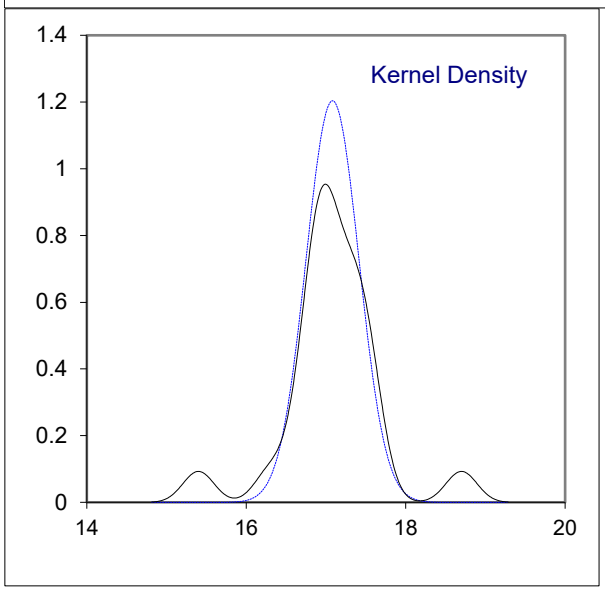
Determination of Mono Aromatics (MAH) by HPLC on sample #21020; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
140		-----		-----	
150	D6379	17.0		-0.13	
159		-----		-----	
169		-----		-----	
171	D6379	15.4	R(0.01)	-2.72	
175		-----		-----	
177		-----		-----	
225		-----		-----	
228		-----		-----	
237		-----		-----	
238		-----		-----	
253		-----		-----	
273		-----		-----	
317		-----		-----	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334	D6379	17.3		0.35	
335		-----		-----	
360	D6379	16.85		-0.37	
365		-----		-----	
391		-----		-----	
396		-----		-----	
398		-----		-----	
399		-----		-----	
447		-----		-----	
594		-----		-----	
604		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
759		-----		-----	
781	D6379	16.7		-0.62	
782		-----		-----	
785		-----		-----	
825		-----		-----	
840	D6379	17.00		-0.13	
875		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D6379	17.60		0.84	
998		-----		-----	
1039		-----		-----	
1049	D6379	17.366		0.46	
1059	D6379	18.7	R(0.01)	2.61	
1062		-----		-----	
1064	D6379	16.99		-0.15	
1079	D6379	16.98		-0.16	
1095		-----		-----	
1097		-----		-----	
1108	D6379	17.56		0.77	
1109		-----		-----	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191		-----		-----	
1212	D6379	17.290		0.34	
1299		-----		-----	
1320	D6379	16.85		-0.37	
1357		-----		-----	
1399		-----		-----	
1429		-----		-----	
1496		-----		-----	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564		-----		-----	
1585	D6379	17.46		0.61	
1586	D6379	16.3		-1.26	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610		-----		-----	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776		-----		-----	
1883		-----		-----	
6035		-----		-----	
6075	D6379	17.48		0.64	
6114		-----		-----	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201	D6379	17.1		0.03	
6262	EN12916	16.964		-0.19	
6274		-----		-----	
6282		-----		-----	
6299	D6379	17.24		0.26	
6308	IP436	16.69		-0.63	
6364		-----		-----	
6366	D6379	16.915		-0.27	
6376		-----		-----	

normality	OK
n	20
outliers	2
mean (n)	17.082
st.dev. (n)	0.3315
R(calc.)	0.928
st.dev.(D6379:11)	0.6188
R(D6379:11)	1.733



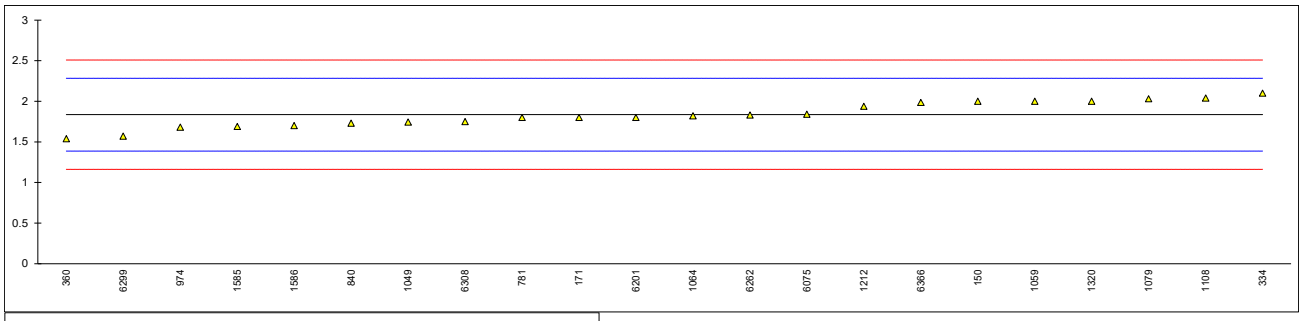


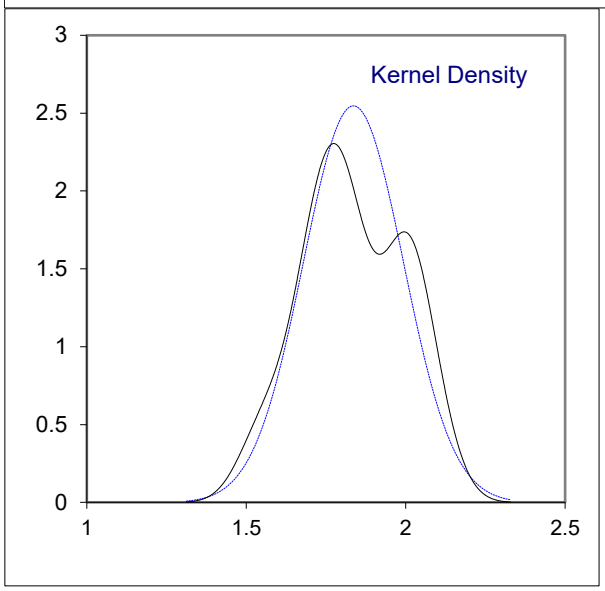
Determination of Di Aromatics (DAH) by HPLC on sample #21020; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
140		-----		-----	
150	D6379	2.0		0.73	
159		-----		-----	
169		-----		-----	
171	D6379	1.8		-0.16	
175		-----		-----	
177		-----		-----	
225		-----		-----	
228		-----		-----	
237		-----		-----	
238		-----		-----	
253		-----		-----	
273		-----		-----	
317		-----		-----	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334	D6379	2.1		1.18	
335		-----		-----	
360	D6379	1.54		-1.32	
365		-----		-----	
391		-----		-----	
396		-----		-----	
398		-----		-----	
399		-----		-----	
447		-----		-----	
594		-----		-----	
604		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
759		-----		-----	
781	D6379	1.8		-0.16	
782		-----		-----	
785		-----		-----	
825		-----		-----	
840	D6379	1.73		-0.47	
875		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D6379	1.68		-0.69	
998		-----		-----	
1039		-----		-----	
1049	D6379	1.745		-0.40	
1059	D6379	2.0		0.73	
1062		-----		-----	
1064	D6379	1.82		-0.07	
1079	D6379	2.03		0.86	
1095		-----		-----	
1097		-----		-----	
1108	D6379	2.04		0.91	
1109		-----		-----	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191		-----		-----	
1212	D6379	1.938		0.45	
1299		-----		-----	
1320	D6379	2.00		0.73	
1357		-----		-----	
1399		-----		-----	
1429		-----		-----	
1496		-----		-----	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564		-----		-----	
1585	D6379	1.69		-0.65	
1586	D6379	1.7		-0.60	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610		-----		-----	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776		-----		-----	
1883		-----		-----	
6035		-----		-----	
6075	D6379	1.84		0.02	
6114		-----		-----	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201	D6379	1.8		-0.16	
6262	EN12916	1.831		-0.02	
6274		-----		-----	
6282		-----		-----	
6299	D6379	1.57		-1.18	
6308	IP436	1.75		-0.38	
6364		-----		-----	
6366	D6379	1.985		0.66	
6376		-----		-----	

normality	OK
n	22
outliers	0
mean (n)	1.836
st.dev. (n)	0.1567
R(calc.)	0.439
st.dev.(D6379:11)	0.2247
R(D6379:11)	0.629



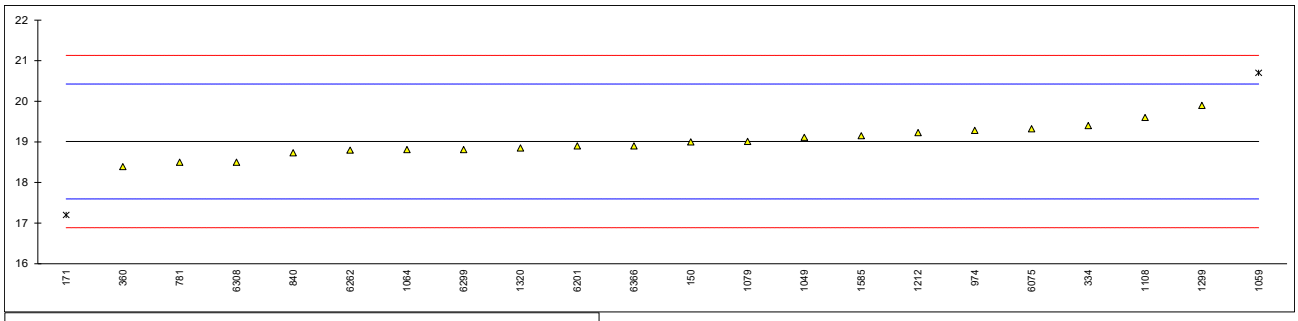


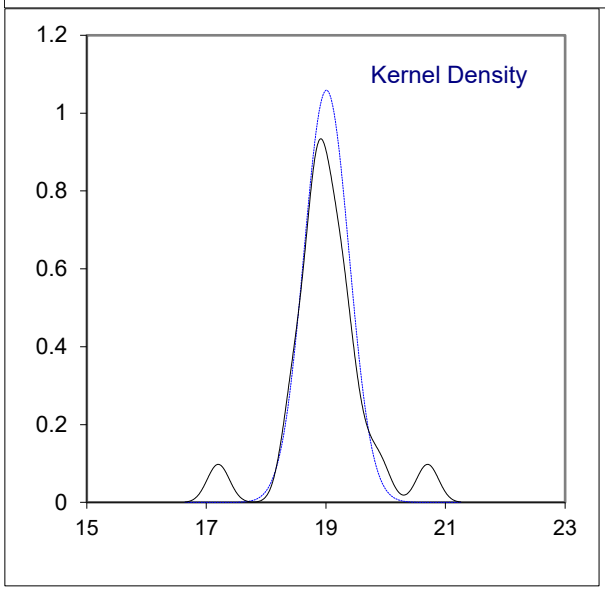
Determination of Total Aromatics by HPLC on sample #21020; results in %M/M

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
140		-----		-----	
150	D6379	19.0		-0.01	
159		-----		-----	
169		-----		-----	
171	D6379	17.2	R(0.01)	-2.56	
175		-----		-----	
177		-----		-----	
225		-----		-----	
228		-----		-----	
237		-----		-----	
238		-----		-----	
253		-----		-----	
273		-----		-----	
317		-----		-----	
323		-----		-----	
328		-----		-----	
333		-----		-----	
334	D6379	19.4		0.55	
335		-----		-----	
360	D6379	18.39		-0.87	
365		-----		-----	
391		-----		-----	
396		-----		-----	
398		-----		-----	
399		-----		-----	
447		-----		-----	
594		-----		-----	
604		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
759		-----		-----	
781	D6379	18.5		-0.72	
782		-----		-----	
785		-----		-----	
825		-----		-----	
840	D6379	18.73		-0.39	
875		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D6379	19.28		0.38	
998		-----		-----	
1039		-----		-----	
1049	D6379	19.111		0.14	
1059	D6379	20.7	R(0.01)	2.39	
1062		-----		-----	
1064	D6379	18.81		-0.28	
1079	D6379	19.01		0.00	
1095		-----		-----	
1097		-----		-----	
1108	D6379	19.60		0.83	
1109		-----		-----	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191		-----		-----	
1212	D6379	19.228		0.31	
1299	IP436	19.9		1.26	
1320	D6379	18.85		-0.22	
1357		-----		-----	
1399		-----		-----	
1429		-----		-----	
1496		-----		-----	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564		-----		-----	
1585	D6379	19.15		0.20	
1586		-----		-----	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610		-----		-----	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776		-----		-----	
1883		-----		-----	
6035		-----		-----	
6075	D6379	19.32		0.44	
6114		-----		-----	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201	D6379	18.9		-0.15	
6262	EN12916	18.795		-0.30	
6274		-----		-----	
6282		-----		-----	
6299	D6379	18.81		-0.28	
6308	IP436	18.50		-0.72	
6364		-----		-----	
6366	D6379	18.90		-0.15	
6376		-----		-----	

normality	OK
n	20
outliers	2
mean (n)	19.009
st.dev. (n)	0.3768
R(calc.)	1.055
st.dev.(D6379:11)	0.7079
R(D6379:11)	1.982



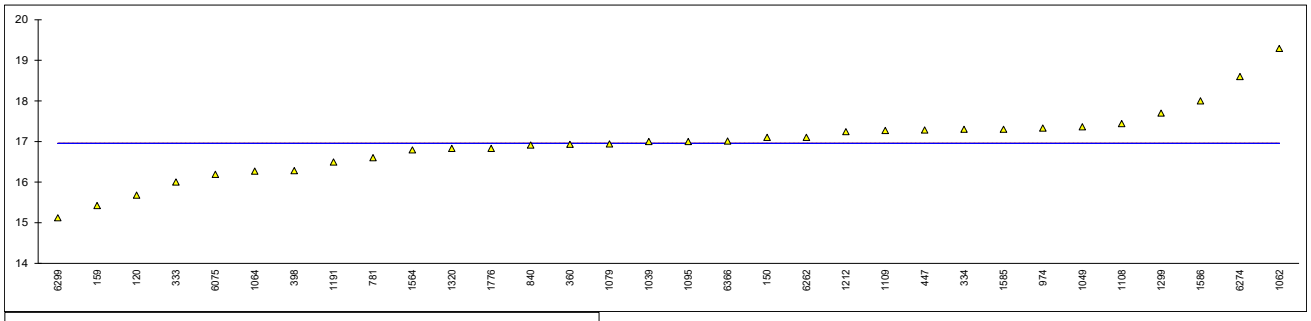


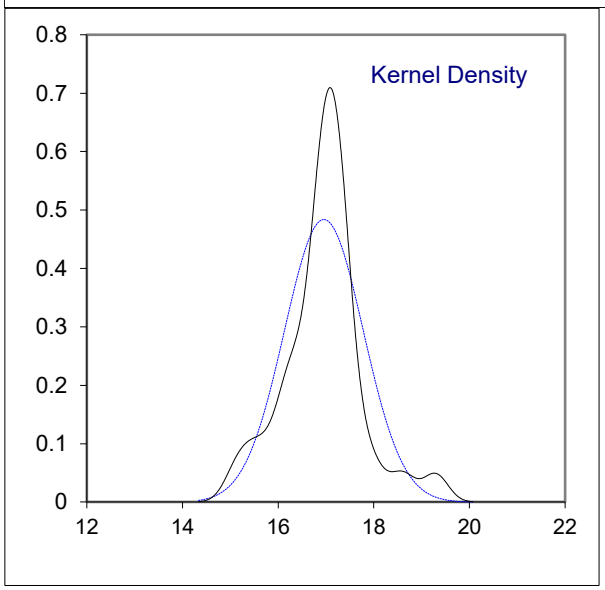
Determination of Total Aromatics by HPLC on sample #21020; results in %V/V

lab	method	value	mark	z(targ)	remarks
120	D6379	15.68		-----	
140		-----		-----	
150	D6379	17.1		-----	
159	D6379	15.42	C	-----	First reported 19.67427
169		-----		-----	
171		-----		-----	
175		-----		-----	
177		-----		-----	
225		-----		-----	
228		-----		-----	
237		-----		-----	
238		-----		-----	
253		-----		-----	
273		-----		-----	
317		-----		-----	
323		-----		-----	
328		-----		-----	
333	D6379	16.0		-----	
334	D6379	17.3		-----	
335		-----		-----	
360	D6379	16.93		-----	
365		-----		-----	
391		-----		-----	
396		-----		-----	
398	D6379	16.28		-----	
399		-----		-----	
447	IP436	17.283		-----	
594		-----		-----	
604		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
759		-----		-----	
781	D6379	16.6		-----	
782		-----		-----	
785		-----		-----	
825		-----		-----	
840	D6379	16.91		-----	
875		-----		-----	
922		-----		-----	
962		-----		-----	
963		-----		-----	
970		-----		-----	
974	D6379	17.33		-----	
998		-----		-----	
1039	D6379	17.0		-----	
1049	D6379	17.363		-----	
1059		-----		-----	
1062	D6379	19.29		-----	
1064	D6379	16.27		-----	
1079	D6379	16.94		-----	
1095	D6379	17.0		-----	
1097		-----		-----	
1108	D6379	17.44		-----	
1109	D6379	17.27		-----	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191	D6379	16.496		-----	
1212	D6379	17.241		-----	
1299	IP436	17.7		-----	
1320	D6379	16.83		-----	
1357		-----		-----	
1399		-----		-----	
1429		-----		-----	
1496		-----		-----	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564	D6379	16.793		-----	
1585		17.30		-----	
1586	D6379	18.0		-----	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610		-----		-----	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776	EN12916	16.83		-----	
1883		-----		-----	
6035		-----		-----	
6075	D6379	16.19		-----	
6114		-----		-----	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201		-----		-----	
6262	EN12916	17.1	C	-----	First reported 14.167
6274	D6379	18.6		-----	
6282		-----		-----	
6299	D6379	15.12		-----	
6308		-----		-----	
6364		-----		-----	
6366		17.01		-----	
6376		-----		-----	

	normality	suspect
	n	32
	outliers	0
	mean (n)	16.957
	st.dev. (n)	0.8248
	R(calc.)	2.310
	st.dev.(lit)	unknown
	R(lit)	unknown
Compare		
	R(iis20J02)	1.719
	R(iis20J01)	1.947



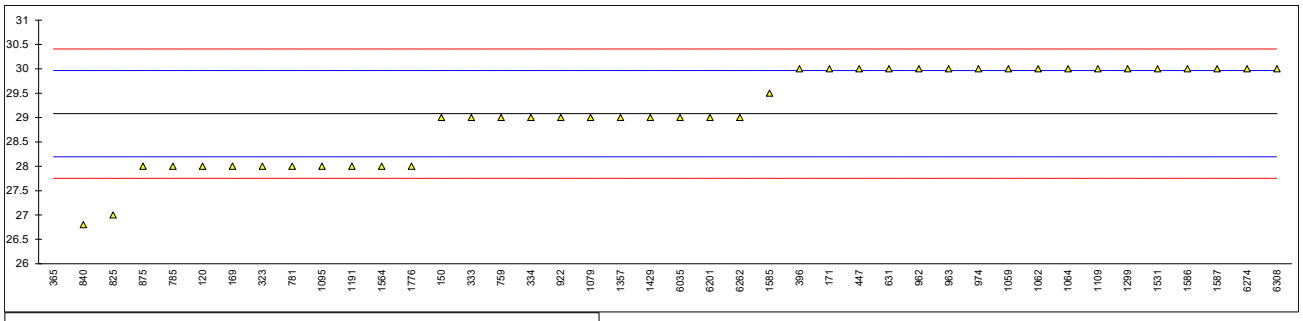


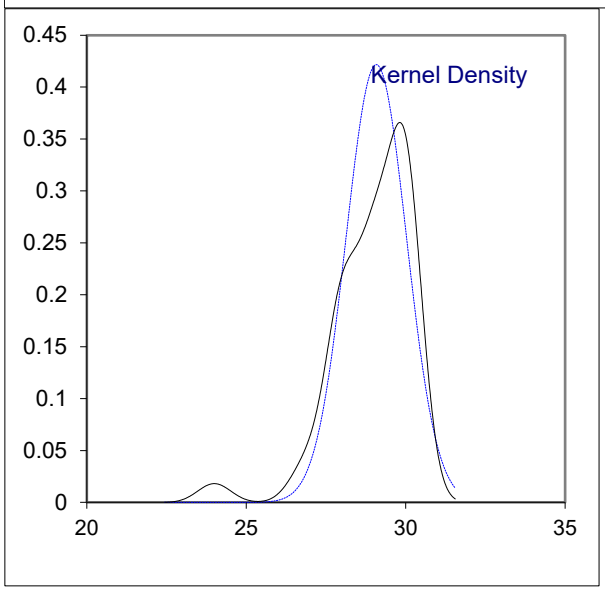
Determination of Color Saybolt (automated) on sample #21020; cell size in mm;

lab	method	cell (mm)	value	mark	z(targ)	remarks
120	D6045	50 mm	28		-2.44	
140			-----		-----	
150	D6045	100 mm	29		-0.18	
159			-----		-----	
169	D6045	50 mm	28		-2.44	
171	D6045		30		2.08	
175			-----		-----	
177			-----		-----	
225			-----		-----	
228			-----		-----	
237			-----		-----	
238			-----		-----	
253			-----		-----	
273			-----		-----	
317			-----		-----	
323	D6045	10 mm	28		-2.44	
328			-----		-----	
333	D6045	10 mm	29		-0.18	
334	D6045	50 mm	29		-0.18	
335			-----		-----	
360			-----		-----	
365	D6045		24	R(0.01)	-11.47	
391			-----		-----	
396	D6045	50 mm	30		2.08	
398			-----		-----	
399			-----		-----	
447	D6045	100 mm	30		2.08	
594			-----		-----	
604			-----		-----	
631	D6045	100 mm	30		2.08	
633			-----		-----	
634			-----		-----	
663			-----		-----	
671			-----		-----	
759	D6045	100 mm	29		-0.18	
781	D6045	100 mm	28		-2.44	
782			-----		-----	
785	D6045	50 mm	28		-2.44	
825	D6045	33 mm	27		-4.70	
840	D6045	100 mm	26.8		-5.15	
875	D6045	50 mm	28		-2.44	
922	D6045	100 mm	29		-0.18	
962	D6045		30		2.08	
963	D6045		30		2.08	
970			-----		-----	
974	D6045	100 mm	30		2.08	
998			-----		-----	
1039			-----		-----	
1049	D6045	50 mm	>30	C	-----	First reported 40
1059	D6045	50 mm	30		2.08	
1062	D6045	50 mm	30		2.08	
1064	D6045	50 mm	30		2.08	
1079	D6045	100 mm	29		-0.18	
1095	D6045		28		-2.44	
1097			-----		-----	
1108			-----		-----	
1109	D6045	100 mm	30		2.08	
1121			-----		-----	
1126			-----		-----	
1150			-----		-----	
1191	D6045	100 mm	28		-2.44	
1212			-----		-----	
1299	D6045	100 mm	30		2.08	
1320			-----		-----	
1357	D6045	50 mm	29		-0.18	
1399			-----		-----	
1429	D6045	50 mm	29		-0.18	
1496			-----		-----	
1498			-----		-----	
1531	D6045	50 mm	30		2.08	
1544			-----		-----	
1564	D6045	50 mm	28		-2.44	
1585	D6045	100 mm	29.5		0.95	
1586	D6045	50 mm	30		2.08	
1587	D6045	50 mm	30		2.08	

lab	method	cell (mm)	value	mark	z(targ)	remarks
1610			-----		-----	
1694			-----		-----	
1730			-----		-----	
1740			-----		-----	
1776	D6045		28	C	-2.44	First reported 24
1883			-----		-----	
6035	D6045	100 mm	29		-0.18	
6075			-----		-----	
6114			-----		-----	
6142			-----		-----	
6174			-----		-----	
6192			-----		-----	
6201	D6045		29		-0.18	
6262	D6045	50 mm	29		-0.18	
6274	D6045		30		2.08	
6282			-----		-----	
6299			-----		-----	
6308	D6045	50 mm	30		2.08	
6364			-----		-----	
6366			-----		-----	
6376			-----		-----	

			Only 50mm Cuvet	Only 100mm Cuvet
	normality	OK	OK	suspect
	n	41	17	14
	outliers	1	0	0
	mean (n)	29.08	29.18	29.09
	st.dev. (n)	0.946	0.883	0.960
	R(calc.)	2.65	2.47	2.69
	st.dev.(D6045:20)	0.443	0.443	0.443
	R(D6045:20)	1.24	1.24	1.24



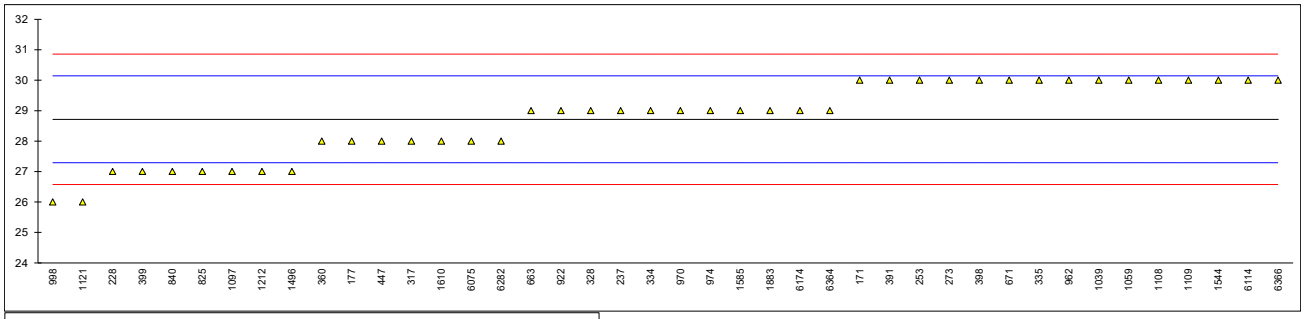


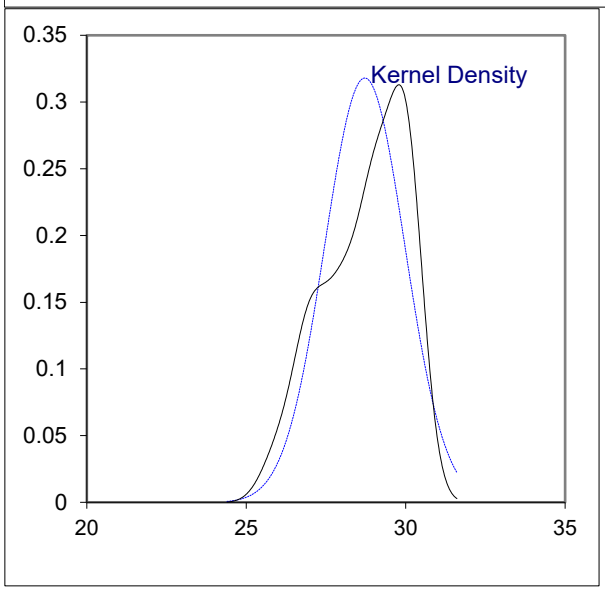
Determination of Color Saybolt (manual) on sample #21020;

lab	method	value	mark	z(targ)	remarks
120		-----		-----	
140		-----		-----	
150		-----		-----	
159		-----		-----	
169		-----		-----	
171	D156	30		1.80	
175		-----		-----	
177	D156	28		-1.00	
225		-----		-----	
228	D156	27		-2.40	
237	D156	29		0.40	
238		-----		-----	
253	D156	30		1.80	
273	D156	30		1.80	
317	D156	28		-1.00	
323		-----		-----	
328	D156	29		0.40	
333		-----		-----	
334	D156	29		0.40	
335	D156	30		1.80	
360	D156	28		-1.00	
365		-----		-----	
391	D156	30		1.80	
396		-----		-----	
398	D156	30		1.80	
399	D156	27		-2.40	
447	D156	28		-1.00	
594		-----		-----	
604		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
663	D156	29		0.40	
671	D156	30		1.80	
759		-----		-----	
781		-----		-----	
782		-----		-----	
785		-----		-----	
825	D156	27		-2.40	
840	D156	27		-2.40	
875		-----		-----	
922	D156	29		0.40	
962	D156	30		1.80	
963		-----		-----	
970	D156	29		0.40	
974	D156	29		0.40	
998	D156	26		-3.80	
1039	D156	30		1.80	
1049		-----		-----	
1059	D156	30		1.80	
1062		-----		-----	
1064		-----		-----	
1079		-----		-----	
1095		-----		-----	
1097	NF M07-003	27		-2.40	
1108	D156	30		1.80	
1109	D156	30		1.80	
1121	D156	26		-3.80	
1126		-----		-----	
1150		-----		-----	
1191		-----		-----	
1212	D156	27		-2.40	
1299		-----		-----	
1320	D156	> 30		-----	
1357		-----		-----	
1399		-----		-----	
1429		-----		-----	
1496	D156	27		-2.40	
1498		-----		-----	
1531		-----		-----	
1544	D156	30		1.80	
1564		-----		-----	
1585	D156	29		0.40	
1586		-----		-----	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610	D156	28		-1.00	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776		-----		-----	
1883	D156	29		0.40	
6035		-----		-----	
6075	D156	28		-1.00	
6114	D156	30		1.80	
6142		-----		-----	
6174	D156	29		0.40	
6192		-----		-----	
6201		-----		-----	
6262		-----		-----	
6274		-----		-----	
6282	D156	28		-1.00	
6299		-----		-----	
6308		-----		-----	
6364	D156	29		0.40	
6366	D156	30		1.80	
6376		-----		-----	

normality	OK
n	42
outliers	0
mean (n)	28.71
st.dev. (n)	1.255
R(calc.)	3.51
st.dev.(D156:15)	0.714
R(D156:15)	2





Determination of Copper Corrosion 2hrs at 100°C on sample #21020;

lab	method	value	mark	z(targ)	remarks
120	D130	1A		-----	
140		-----		-----	
150	D130	1a		-----	
159	D130	1A		-----	
169	D130	1a		-----	
171	D130	1a		-----	
175		-----		-----	
177	D130	1a		-----	
225		-----		-----	
228	D130	1A		-----	
237	D130	1A		-----	
238	D130	1A		-----	
253	D130	1A		-----	
273	D130	1a		-----	
317	D130	1a		-----	
323	D130	1A		-----	
328		-----		-----	
333	D130	1		-----	
334	D130	1A		-----	
335		-----		-----	
360	D130	1A		-----	
365	IP154	1a		-----	
391	D130	1A		-----	
396	D130	1a		-----	
398	D130	1a		-----	
399	D130	1A		-----	
447	IP154	1a		-----	
594	GOST6321	1A		-----	
604		-----		-----	
631	D130	1A		-----	
633		-----		-----	
634		-----		-----	
663	D130	1a		-----	
671	D130	1A		-----	
759		-----		-----	
781	D130	1a		-----	
782		-----		-----	
785	ISO2160	1a		-----	
825	D130	1a		-----	
840	D130	1a		-----	
875	D130	1a		-----	
922	D130	1a		-----	
962	D130	1A		-----	
963	D130	1a		-----	
970	D130	1a		-----	
974	D130	1a		-----	
998	D130	1A		-----	
1039	ISO2160	1a		-----	
1049	D130	1A		-----	
1059	D130	1a		-----	
1062	D130	1A		-----	
1064	D130	1a		-----	
1079	D130	1A		-----	
1095	D130	1A		-----	
1097	ISO2160	1a		-----	
1108		-----		-----	
1109	D130	1a		-----	
1121		-----		-----	
1126		-----		-----	
1150	ISO2160	1a		-----	
1191		-----		-----	
1212	D130	1a		-----	
1299	D130	1A		-----	
1320	D130	1a		-----	
1357	D130	1a		-----	
1399		-----		-----	
1429		-----		-----	
1496	D130	1a		-----	
1498		-----		-----	
1531	D130	1a		-----	
1544	D130	1A		-----	
1564	D130	1a		-----	
1585	D130	1a		-----	
1586	D130	1A		-----	
1587	D130	1a		-----	

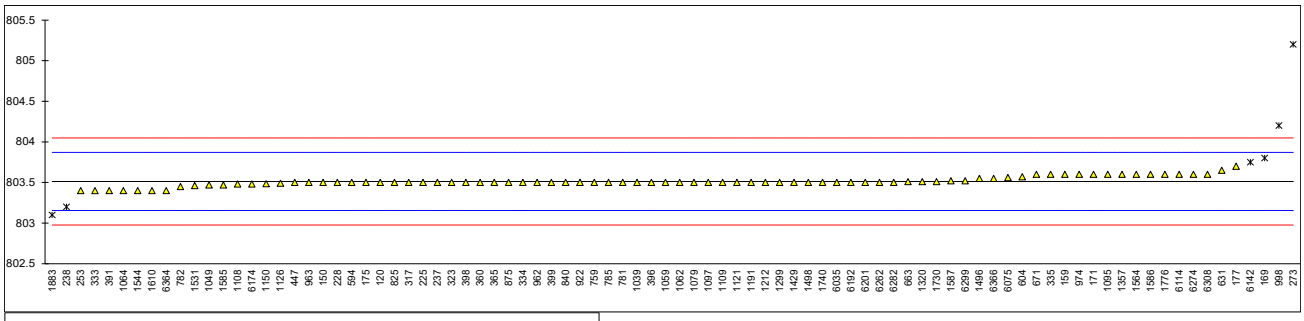
lab	method	value	mark	z(targ)	remarks
1610	D130	1a		-----	
1694		-----		-----	
1730		-----		-----	
1740	D130	1A		-----	
1776		-----		-----	
1883	D130	1		-----	
6035	ISO2160	1a		-----	
6075	D130	1a		-----	
6114	D130	1a		-----	
6142		-----		-----	
6174	D130	1A		-----	
6192		-----		-----	
6201	D130	1a		-----	
6262	D130	1A		-----	
6274	D130	1A		-----	
6282	D130	1a		-----	
6299	ISO2160	1A		-----	
6308	IP154	1a		-----	
6364	D130	1A		-----	
6366		1A		-----	
6376		-----		-----	
	n	73			
	mean (n)	1 (1a/1b)			

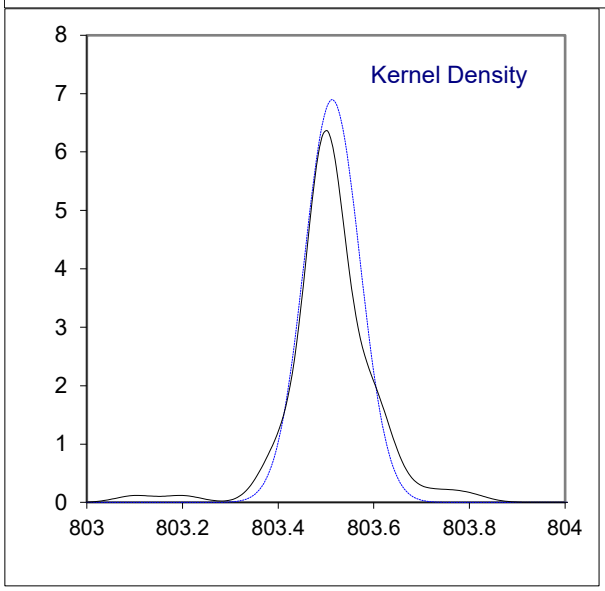
Determination of Density at 15°C on sample #21020; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
120	D4052	803.5		-0.07	
140		-----		-----	
150	D4052	803.5		-0.07	
159	D4052	803.6		0.49	
169	D4052	803.8	R(0.01)	1.61	
171	D4052	803.6		0.49	
175	D4052	803.5		-0.07	
177	D4052	803.7		1.05	
225	D4052	803.5		-0.07	
228	D4052	803.5		-0.07	
237	D4052	803.5		-0.07	
238	D4052	803.2	R(0.01)	-1.75	
253	D4052	803.4		-0.63	
273	D4052	805.2	C,R(0.01)	9.45	First reported 0.8052 kg/m3
317	D4052	803.5		-0.07	
323	D4052	803.5		-0.07	
328		-----		-----	
333	D4052	803.4		-0.63	
334	ISO12185	803.5		-0.07	
335	D4052	803.6		0.49	
360	D4052	803.5		-0.07	
365	IP365	803.5		-0.07	
391	D4052	803.4	C	-0.63	First reported 830.4
396	D4052	803.5		-0.07	
398	ISO12185	803.5		-0.07	
399	D4052	803.5		-0.07	
447	D4052	803.5		-0.07	
594	GOST3900	803.5		-0.07	
604	D4052	803.57		0.32	
631	D4052	803.65		0.77	
633		-----		-----	
634		-----		-----	
663	D4052	803.51		-0.02	
671	D4052	803.6		0.49	
759	D4052	803.5		-0.07	
781	D4052	803.5		-0.07	
782	ISO12185	803.45		-0.35	
785	ISO12185	803.5		-0.07	
825	D4052	803.5		-0.07	
840	D4052	803.50		-0.07	
875	D4052	803.5		-0.07	
922	D4052	803.5		-0.07	
962	D4052	803.5		-0.07	
963	D4052	803.5		-0.07	
970		-----		-----	
974	D4052	803.6		0.49	
998	D4052	804.2	R(0.01)	3.85	
1039	ISO12185	803.5		-0.07	
1049	D4052	803.47		-0.24	
1059	D4052	803.5		-0.07	
1062	D4052	803.5		-0.07	
1064	D4052	803.4		-0.63	
1079	D4052	803.5		-0.07	
1095	D4052	803.6		0.49	
1097	ISO12185	803.50		-0.07	
1108	D4052	803.48		-0.18	
1109	D4052	803.50		-0.07	
1121	D4052	803.5		-0.07	
1126	D4052	803.49		-0.13	
1150	ISO12185	803.484		-0.16	
1191	ISO12185	803.5		-0.07	
1212	D4052	803.5		-0.07	
1299	D4052	803.5		-0.07	
1320	D4052	803.51		-0.02	
1357	D4052	803.6		0.49	
1399		-----		-----	
1429	D4052	803.5		-0.07	
1496	D4052	803.55		0.21	
1498	D4052	803.5		-0.07	
1531	ISO12185	803.46		-0.30	
1544	D4052	803.40		-0.63	
1564	D4052	803.6		0.49	
1585	D4052	803.47		-0.24	
1586	D4052	803.6		0.49	
1587	D4052	803.52		0.04	

lab	method	value	mark	z(targ)	remarks
1610	IP365	803.4		-0.63	
1694		-----		-----	
1730	ISO12185	803.51		-0.02	
1740	D4052	803.5		-0.07	
1776	ISO12185	803.6		0.49	
1883	D1298	803.1	R(0.01)	-2.31	
6035	ISO12185	803.5		-0.07	
6075	D1298	803.56		0.26	
6114	D4052	803.6		0.49	
6142	ISO12185	803.75	R(0.01)	1.33	
6174	D4052	803.48		-0.18	
6192	D1298	803.5		-0.07	
6201	D4052	803.5		-0.07	
6262	D4052	803.5		-0.07	
6274	D4052	803.6		0.49	
6282	D4052	803.5		-0.07	
6299	ISO12185	803.52		0.04	
6308	IP365	803.6		0.49	
6364	D4052	803.4		-0.63	
6366	D4052	803.55		0.21	
6376		-----		-----	

normality	suspect
n	82
outliers	6
mean (n)	803.513
st.dev. (n)	0.0578
R(calc.)	0.162
st.dev.(D4052:18a)	0.1786
R(D4052:18a)	0.5



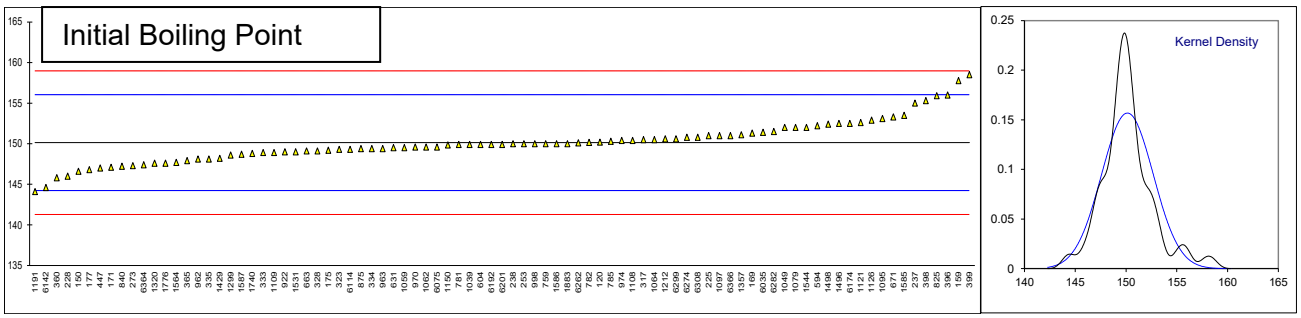


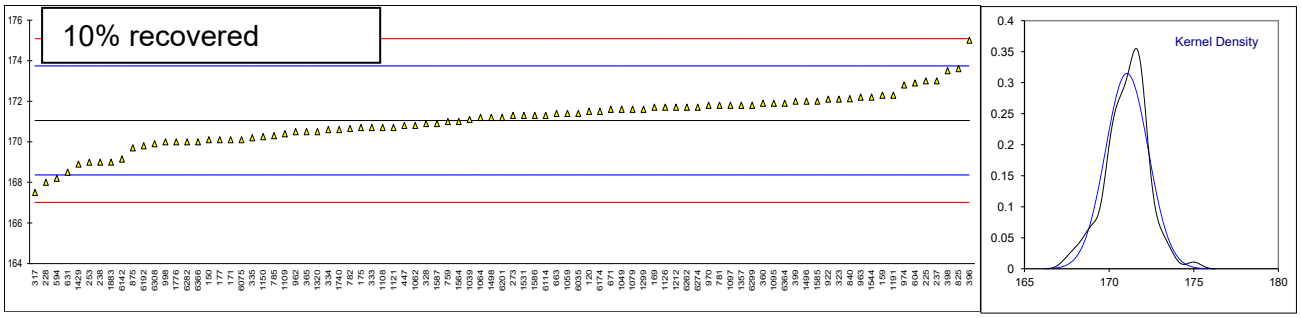
Determination of Distillation at 760 mmHg on sample #21020; results in °C

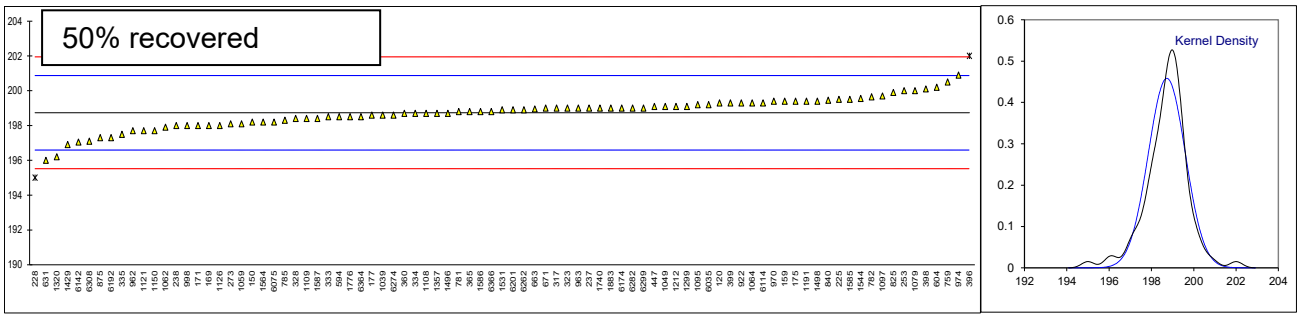
lab	method	IBP	10% rec	50% rec	90% rec	FBP	Res.	Loss
120	D86-automated	150.2	171.5	199.3	236.1	254.9	1.2	0.8
140		-----	-----	-----	-----	-----	-----	-----
150	D86-automated	146.6	170.1	198.2	235.9	252.8	1.5	0.6
159	D86-automated	157.77	172.3 C	199.4 C	235.9 C	255.3 C	0.8	0.5
169	D86-automated	151.3	171.7	198.0	234.7	254.9	0.9	0.1
171	D86-automated	147.1	170.1	198.0	234.3	252.3	1.2	0.3
175	D86-automated	149.2	170.7	199.4	237.8	255.9	1.0	1.0
177	D86	146.8	170.1	198.6	234.8	254.7	1.0	0.4
225	D86-manual	151.0	173.0	199.5	237.5	257.5	1.3	0.2
228	D86-manual	146.0	168.0	195.0 R(5)	230.0 R(1)	258.0	0.7	0.3
237	D86-manual	155.0	173.0	199.0	235.0	252.0	1.0	0.5
238	D86-manual	150.0	169.0	198.0	234.0	255.0	0.5	0.5
253	D86-manual	150.0	169.0	200.0	236.0	259.0	1.3	1.0
273	D86-automated	147.3	171.3	198.1	235.0	254.2	1.1	0.3
317	D86-automated	150.5	167.5	199.0	236.0	254.5	1.0	0.5
323	D86-automated	149.3	172.1	199.0	235.8	253.5	0.9	0.7
328	D86	149.1	170.9	198.4	234.7	254.2	0.8	0.4
333	D86-automated	148.9	170.7	198.5	234.4	254.1	-----	-----
334	D86-automated	149.4	170.6	198.7	234.8	253.3	1.0	0.5
335	D86-automated	148.1	170.2	197.5	235.2	253.2	1.2	0.4
360	D86-automated	145.8	171.9	198.7	234.9	252.9	1.2	0.1
365	IP123-automated	147.9	170.5	198.8	236.9	254.5	1.3	1.2
391		-----	-----	-----	-----	-----	-----	-----
396	D86-manual	156	175	202 R(5)	240 R(5)	256	1	0.8
398	D86-automated	155.3	173.5	200.1	237.9	257.1	1.0	0.9
399	D86-automated	158.5	172.0	199.3	236.7	255.2	1.0	1.0
447	D86-automated	147.0	170.8	199.1	236.7	254.1	1.4	0.8
594	GOST2177	152.2	168.2	198.5	236.6	253.9	1.0	0.6
604	D86-automated	149.9	172.9	200.2	237.3	254.5	1.2	1.2
631	D86-manual	149.5	168.5	196.0	233.5	251.5	0.9 C	1.1
633		-----	-----	-----	-----	-----	-----	-----
634		-----	-----	-----	-----	-----	-----	-----
663	D86-automated	149.10	171.40	198.95	235.25	253.40	-----	-----
671	D86-automated	153.3	171.6	199.0	235.8	254.0	1.1	0.9
759	D86-manual	150.0	171.0	200.5	237.5	257.0	1.0	0.5
781	D86-automated	149.9	171.8	198.8	235.3	254.7	0.9	0.6
782	D86-automated	150.15	170.65	199.65	237.05	255.3	1.1	0.5
785	D86-automated	150.3	170.3	198.3	235.3	252.8	1.2	0.9
825	D86-automated	155.9	173.6	199.9	237.7	255.3	1.3	1.3
840	D86-automated	147.22	172.12	199.45	237.10	253.77	1.3	0.5
875	D86-automated	149.4	169.7	197.3	234.2	253.0	1.0	0.7
922	D86-automated	149.0	172.1	199.3	235.8	255.1	1.2	0.3
962	D86-automated	148.1	170.5	197.7	234.6	252.0	1.2	0.6
963	D86-automated	149.4	172.2	199.0	235.8	254.3	1.2	0.7
970	D86-automated	149.6	171.8	199.4	236.1	253.8	1.2	1.0
974	D86-automated	150.4	172.8	200.9	237.2	255.0	1.2	1.2
998	D86-manual	150.0	170.0	198.0	233.0	259.0	-----	-----
1039	ISO3405-automated	149.9	171.1	198.6	234.9	254.7	1.2	0.7
1049	D86-automated	152.0	171.6	199.1	236.5	254.2	1.2	0.7
1059	D86-automated	149.5	171.4	198.1	235.0	253.3	1.2	0.3
1062	D86-automated	149.6	170.8	197.9	234.6	252.8	1.2	0.1
1064	D86-automated	150.5	171.2	199.3	236.9	254.2	1.3	0.7
1079	D86-automated	152.0	171.6	200.0	236.9	255.2	1.2	0.6
1095		153.1	171.9	199.2	236.8	255.4	1.2	0.6
1097	ISO3405-automated	151.0	171.8	199.7	237.8	255.0	1.2	0.9
1108	D86-automated	150.4	170.7	198.7	236.0	254.2	1.2	0.5
1109	D86-automated	148.9	170.4	198.4	235.7	254.0	1.1	0.7
1121	D86-automated	152.6	170.7	197.7	235.8	254.3	0.9	0.9
1126	D86-automated	152.9	171.7	198.0	235.0	254.6	0.7	0.0
1150	ISO3405-automated	149.85	170.25	197.7	236.15	252.0	1.15	1.05
1191	ISO3405-automated	144.1	172.3	199.4	236.1	255.6	1.2	1.3
1212	D86-automated	150.6	171.7	199.1	236.6	254.3	1.4	1.1
1299	D86-automated	148.6	171.6	199.1	237.1	255.6	1.2	0.4
1320		147.6	170.5	196.2	234.7	252.7	1.2	0.3
1357	D86-automated	151.1	171.8	198.7	235.5	260.0	1.0	0.4
1399		-----	-----	-----	-----	-----	-----	-----
1429	D86-automated	148.2	168.9	196.9	233.1	250.0	1.0	0.4
1496	D86-automated	152.5	172.0	198.7	236.3	252.8	1.2	0.8
1498	D86-automated	152.4	171.2	199.4	237.9	254.5	1.2	1.1
1531	D86-automated	149.0	171.3	198.9	235.9	254.4	1.0	0.7
1544	D86-automated	152.0	172.2	199.55	236.1	253.05	1.4	0.45
1564	D86-automated	147.7	171.0	198.2	234.8	254.7	1.2	0.2
1585	D86-automated	153.5	172.0	199.5	236.1	253.5	1.5	0.8
1586	D86-automated	150.0	171.3	198.8	236.4	253.2	1.2	0.7
1587	D86-automated	148.7	170.9	198.4	234.8	252.9	1.2	0.1

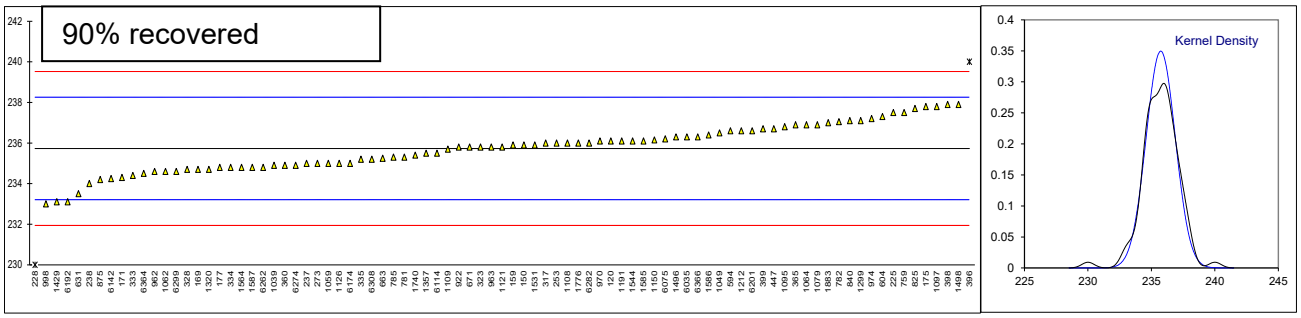
lab	method	IBP	10% rec	50% rec	90% rec	FBP		Res.	Loss
1610		-----	-----	-----	-----	-----		-----	-----
1694		-----	-----	-----	-----	-----		-----	-----
1730		-----	-----	-----	-----	-----		-----	-----
1740	D86-automated	148.8	170.6	199	235.4	254.6		0.9	0.2
1776	ISO3405-automated	147.6	170.0	198.5	236.0	253.4		1.2	1.3
1883	D86-manual	150	169	199	237	257		1	1
6035	ISO3405-automated	151.4	171.4	199.2	236.3	252.7		1.2	0.6
6075	D86-automated	149.6	170.1	198.2	236.2	256.8	C	1.2	0.4
6114	D86-automated	149.3	171.3	199.3	235.5	254.8		1.4	0.5
6142	ISO3405-automated	144.6	169.15	197.05	234.25	251.65		-----	0.8
6174	D86-manual	152.5	171.5	199.0	235.0	255.5		0.5	0.5
6192	D86-automated	149.9	169.8	197.3	233.1	252.2		1.1	0.9
6201	D86-automated	149.9	171.2	198.9	236.6	255.2		1.2	0.4
6262	D86-automated	150.1	171.7	198.9	234.8	253.7		1.0	0.1
6274	D86-automated	150.8	171.7	198.6	234.9	253.8		1.2	0.3
6282	D86-manual	151.5	170.0	199.0	236.0	260.0		0.8	0.2
6299	ISO3405-automated	150.6	171.8	199.0	234.6	251.8		0.6	0.1
6308	IP123-automated	150.8	169.9	197.1	235.2	252.5		1.4	0.7
6364		147.4	171.9	198.5	234.5	251.9		1.6	0.7
6366	D86-automated	151.0	170.0	198.8	236.3	253.6		0.9	0.8
6376		-----	-----	-----	-----	-----		-----	-----
	normality	suspect	suspect	suspect	OK	suspect			
	n	87	87	85	85	87			
	outliers	0	0	2	2	0			
	mean (n)	150.13	171.05	198.73	235.73	254.37			
	st.dev. (n)	2.543	1.267	0.870	1.141	1.824			
	R(calc.)	7.12	3.55	2.44	3.20	5.11			
	st.dev.(D86-A:20b)	2.949	1.344	1.071	1.263	2.536			
	R(D86-A:20b)	8.26	3.76	3.0	3.54	7.1			
Compare									
	R(D86-M:20b)	4.75	3.09	2.88	3.28	3.88			

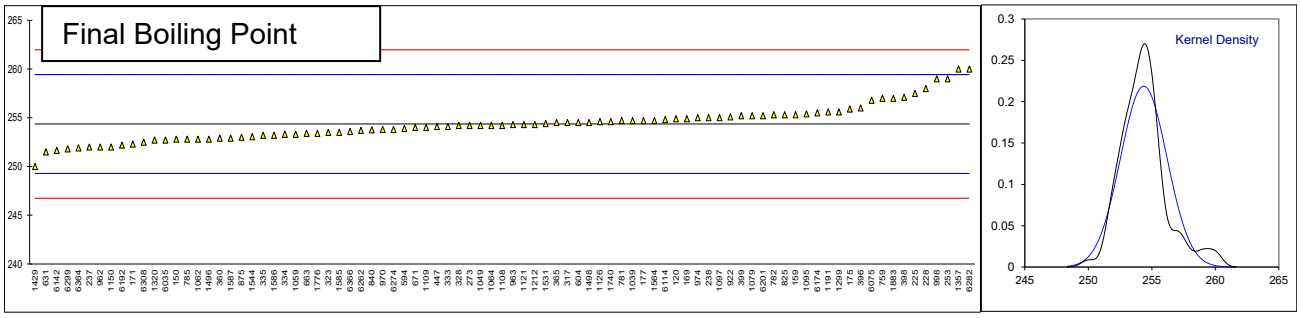
Lab 159: First reported 180.5, 209.88, 246.5, 270.11 respectively
Lab 631: First reported 98
Lab 6075: First reported 156.8


Initial Boiling Point
Kernel Density


10% recovered
Kernel Density


50% recovered
Kernel Density


90% recovered
Kernel Density

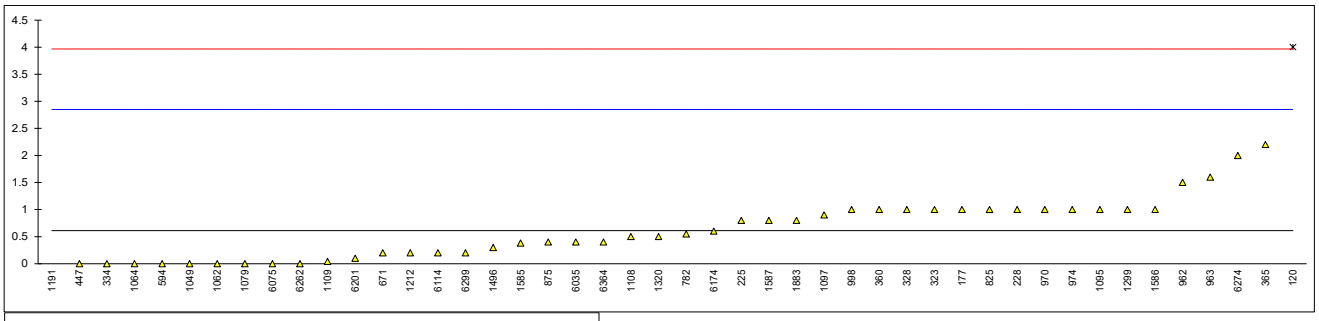

Final Boiling Point
Kernel Density

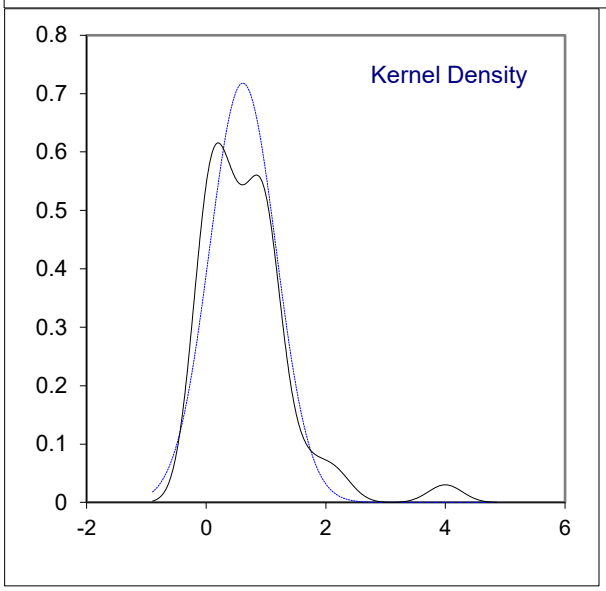
Determination of Existent Gum (unwashed) on sample #21020; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
120	IP540	4	R(0.01)	3.05	
140		-----		-----	
150	D381	<1		-----	
159		-----		-----	
169	D381	<1		-----	
171	D381	<1		-----	
175		-----		-----	
177	D381	1.0		0.35	
225	D381	0.80		0.17	
228	D381	1.0		0.35	
237	D381	<1		-----	
238		-----		-----	
253	IP540	<1		-----	
273	D381	<0.5		-----	
317	D381	<1		-----	
323	D381	1.0		0.35	
328	D381	1.0		0.35	
333	D381	<0.5		-----	
334	D381	0.0		-0.55	
335	IP540	< 1		-----	
360	D381	1.0		0.35	
365	IP540	2.2		1.43	
391		-----		-----	
396	D381	<1		-----	
398		-----		-----	
399	IP540	<1		-----	
447	D381	0		-0.55	
594	GOST1567	0		-0.55	
604		-----		-----	
631	IP540	<1		-----	
633		-----		-----	
634		-----		-----	
663	D381	<1		-----	
671	IP540	0.2		-0.37	
759		-----		-----	
781		-----		-----	
782	D381	0.55		-0.06	
785		-----		-----	
825	D381	1		0.35	
840		-----		-----	
875	D381	0.40		-0.19	
922	D381	<1		-----	
962	D381	1.5		0.80	
963	D381	1.6		0.89	
970	IP540	1.0		0.35	
974	IP540	1.0		0.35	
998	D381	1.0		0.35	
1039	ISO6246	<1		-----	
1049	D381	0		-0.55	
1059	D381	<1		-----	
1062	D381	0		-0.55	
1064	D381	0		-0.55	
1079	IP540	0.0		-0.55	
1095	D381	1		0.35	
1097	IP540	0.9		0.26	
1108	D381	0.5	C	-0.10	First reported 3.3
1109	D381	0.04		-0.51	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191	IP540	-0.04		-0.59	
1212	IP540	0.2		-0.37	
1299	IP540	1		0.35	
1320	D381	0.5		-0.10	
1357	D381	<1.0		-----	
1399		-----		-----	
1429		-----		-----	
1496	D381	0.3		-0.28	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564		-----		-----	
1585	IP540	0.38		-0.21	
1586	D381	1.0		0.35	
1587	IP540	0.8		0.17	

lab	method	value	mark	z(targ)	remarks
1610	IP540	<1		-----	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776	IP540	<1		-----	
1883	D381	0.8		0.17	
6035	ISO6246	0.4		-0.19	
6075	IP540	0		-0.55	
6114	IP540	0.2		-0.37	
6142		-----		-----	
6174	D381	0.6		-0.01	
6192		-----		-----	
6201	D381	0.1		-0.46	
6262	D381	0		-0.55	
6274	D381	2		1.25	
6282		-----		-----	
6299	IP540	0.2		-0.37	
6308	IP540	<1		-----	
6364	D381	0.4		-0.19	
6366	D381	<1		-----	
6376		-----		-----	

normality	OK
n	45
outliers	1
mean (n)	0.612
st.dev. (n)	0.5557
R(calc.)	1.556
st.dev.(D381:19)	1.1114
R(D381:19)	3.112



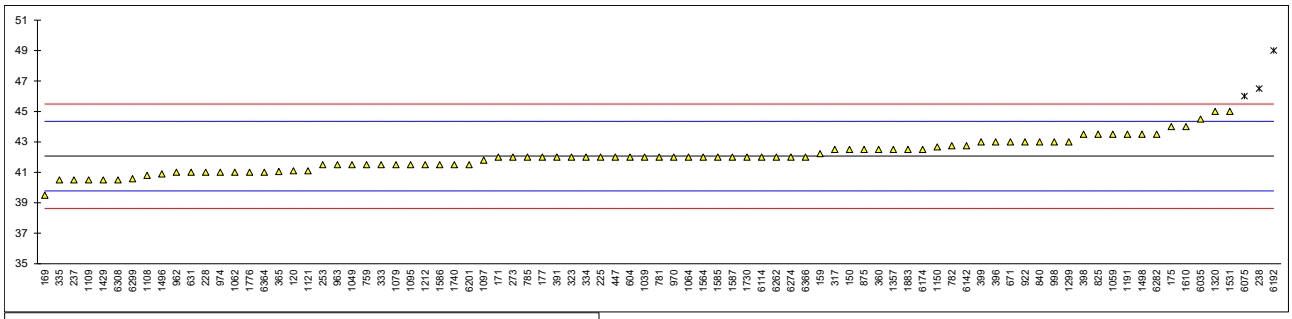


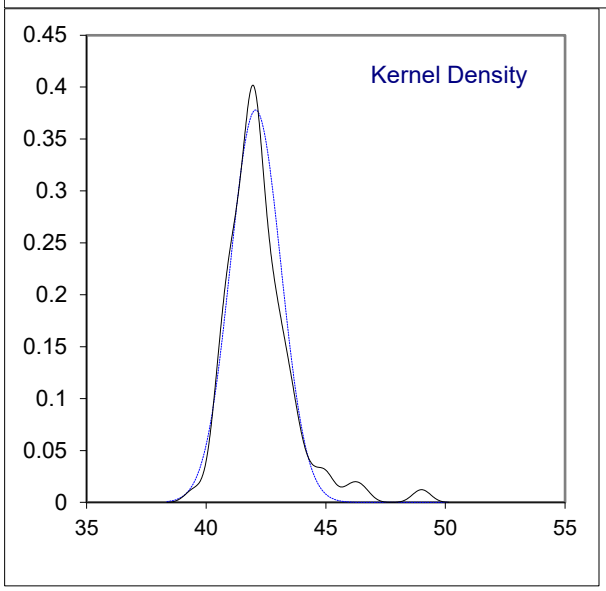
Determination of Flash Point on sample #21020; results in °C

lab	method	value	mark	z(targ)	remarks
120	D56	41.1		-0.84	
140		-----		-----	
150	D56	42.5		0.38	
159	D56	42.22		0.14	
169	D56	39.5		-2.24	
171	D56	42.0		-0.06	
175	D93	44		1.69	
177	D56	42.0		-0.06	
225	IP170	42.0		-0.06	
228	IP170	41.0		-0.93	
237	IP170	40.5		-1.37	
238	IP170	46.5	R(0.05)	3.88	
253	IP170	41.5		-0.49	
273	IP170	42.0		-0.06	
317	IP170	42.5		0.38	
323	IP170	42.0		-0.06	
328		-----		-----	
333	IP170	41.5		-0.49	
334	IP170	42.0		-0.06	
335	IP170	40.5		-1.37	
360	D56	42.5		0.38	
365	IP170	41.050		-0.89	
391	IP170	42.0		-0.06	
396	IP170	43.0		0.82	
398	D3828	43.5		1.26	
399	IP170	43		0.82	
447	IP170	42.0		-0.06	
594		-----		-----	
604	IP170	42.0		-0.06	
631	D56	41.0		-0.93	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671	IP170	43.0		0.82	
759	IP170	41.5		-0.49	
781	IP170	42.0		-0.06	
782	ISO2719	42.75		0.60	
785	IP170	42.0		-0.06	
825	IP170	43.5		1.26	
840	D3828	43.0		0.82	
875	D93	42.5		0.38	
922	IP170	43.0		0.82	
962	IP170	41.0		-0.93	
963	IP170	41.5		-0.49	
970	IP170	42.0		-0.06	
974	IP170	41.0		-0.93	
998	IP170	43.0		0.82	
1039	IP170	42.0		-0.06	
1049	ISO13736	41.5		-0.49	
1059	IP170	43.5		1.26	
1062	IP170	41.0		-0.93	
1064	IP170	42.0		-0.06	
1079	IP170	41.5		-0.49	
1095	IP170	41.5		-0.49	
1097	ISO13736	41.8		-0.23	
1108	D56	40.8		-1.11	
1109	IP170	40.5		-1.37	
1121	IP170	41.1		-0.84	
1126		-----		-----	
1150	ISO2719	42.67		0.53	
1191	ISO13736	43.5		1.26	
1212	IP170	41.5		-0.49	
1299	IP170	43.0		0.82	
1320	D93	45.0		2.57	
1357	IP170	42.5		0.38	
1399		-----		-----	
1429	D56	40.5		-1.37	
1496	IP170	40.9		-1.02	
1498	D56	43.5		1.26	
1531	D93	45	C	2.57	First reported 46
1544		-----		-----	
1564	IP170	42.0		-0.06	
1585	IP170	42.0		-0.06	
1586	IP170	41.5		-0.49	
1587	IP170	42.0		-0.06	

lab	method	value	mark	z(targ)	remarks
1610	IP170	44.0		1.69	
1694		-----		-----	
1730	D56	42.0		-0.06	
1740	IP170	41.5		-0.49	
1776	ISO2719	41.0		-0.93	
1883	D3828	42.5		0.38	
6035	ISO2719	44.5		2.13	
6075	IP170	46.0	R(0.05)	3.44	
6114	IP170	42.0		-0.06	
6142	ISO2719	42.75		0.60	
6174	IP170	42.5		0.38	
6192	D93	49	R(0.01)	6.07	
6201	IP170	41.5		-0.49	
6262	IP170	42.0		-0.06	
6274	IP170	42.0		-0.06	
6282	IP170	43.5		1.26	
6299	ISO13736	40.58		-1.30	
6308	IP170	40.5		-1.37	
6364	IP170	41.0		-0.93	
6366	IP170	42.0		-0.06	
6376		-----		-----	

normality	OK
n	82
outliers	3
mean (n)	42.064
st.dev. (n)	1.0557
R(calc.)	2.956
st.dev.(IP170:14)	1.1429
R(IP170:14)	3.2



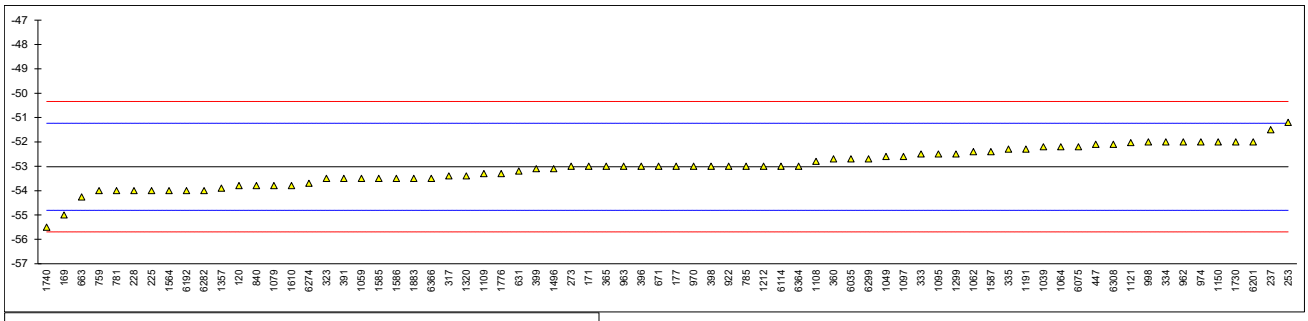


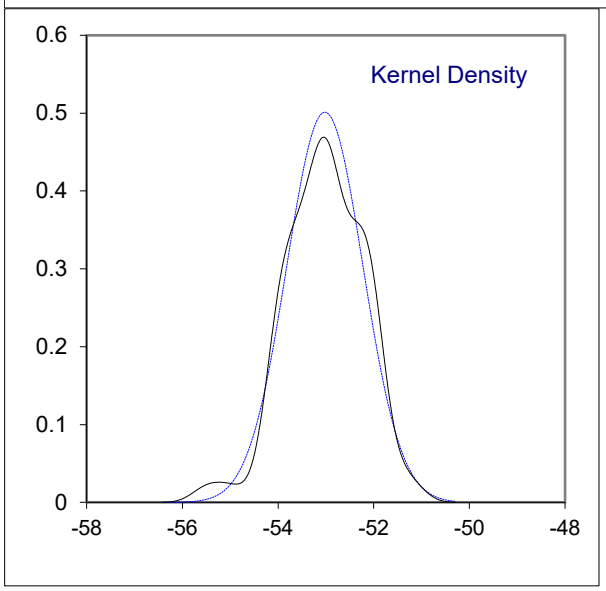
Determination of Freezing Point on sample #21020; results in °C

lab	method	value	mark	z(targ)	remarks
120	D5972	-53.8		-0.87	
140		-----		-----	
150		-----		-----	
159		-----		-----	
169	D2386	-55.0		-2.22	
171	D2386	-53.0		0.02	
175		-----		-----	
177	D2386	-53.0	C	0.02	First reported -56.0
225	D2386	-54.0		-1.10	
228	D2386	-54		-1.10	
237	D2386	-51.5		1.70	
238		-----		-----	
253	D7153	-51.2		2.04	
273	D2386	-53		0.02	
317	D5972	-53.4		-0.43	
323	D2386	-53.5		-0.54	
328		-----		-----	
333	IP529	-52.5		0.58	
334	D5972	-52.0		1.14	
335	IP529	-52.3		0.81	
360	D7153	-52.7		0.36	
365	IP16	-53.0		0.02	
391	D2386	-53.5		-0.54	
396	D2386	-53.0		0.02	
398	D2386	-53.0		0.02	
399	D7153	-53.1		-0.09	
447	IP529	-52.1		1.03	
594		-----		-----	
604		-----		-----	
631	D5972	-53.2		-0.20	
633		-----		-----	
634		-----		-----	
663	D2386	-54.26		-1.39	
671	D2386	-53		0.02	
759	D2386	-54		-1.10	
781	D2386	-54.0		-1.10	
782		-----		-----	
785	D2386	-53.0		0.02	
825		-----		-----	
840	D2386	-53.8		-0.87	
875		-----		-----	
922	D2386	-53.0		0.02	
962	D2386	-52.0	C	1.14	First reported -56.0
963	D2386	-53.0	C	0.02	First reported -56.0
970	D2386	-53.0		0.02	
974	D2386	-52.0		1.14	
998	D2386	-52.0		1.14	
1039	IP529	-52.2		0.92	
1049	D7153	-52.6		0.47	
1059	D2386	-53.5		-0.54	
1062	D2386	-52.4		0.69	
1064	D7153	-52.2		0.92	
1079	D5972	-53.8		-0.87	
1095	D7153	-52.5		0.58	
1097	IP529	-52.6		0.47	
1108	D5972	-52.8		0.25	
1109	D5972	-53.3		-0.31	
1121	D2386	-52.03		1.11	
1126		-----		-----	
1150	D2386	-52		1.14	
1191	IP529	-52.3		0.81	
1212	D2386	-53.0		0.02	
1299	D2386	-52.5		0.58	
1320	D5972	-53.4		-0.43	
1357	D2386	-53.9		-0.99	
1399		-----		-----	
1429		-----		-----	
1496	D2386	-53.1		-0.09	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564	D5972	-54		-1.10	
1585	D2386	-53.5		-0.54	
1586	D2386	-53.5		-0.54	
1587	IP529	-52.4		0.69	

lab	method	value	mark	z(targ)	remarks
1610	IP435	-53.8		-0.87	
1694		-----		-----	
1730	D2386	-52.0		1.14	
1740	D2386	-55.5		-2.78	
1776	IP529	-53.3		-0.31	
1883	D2386	-53.5		-0.54	
6035	D7153	-52.7		0.36	
6075	IP529	-52.2		0.92	
6114	D2386	-53.0		0.02	
6142		-----		-----	
6174		-----		-----	
6192	D2386	-54		-1.10	
6201	D7153	-52.0		1.14	
6262		-----		-----	
6274	D5972	-53.7		-0.76	
6282	D2386	-54.0		-1.10	
6299	IP529	-52.7		0.36	
6308	D5972	-52.1		1.03	
6364	D2386	-53.0		0.02	
6366	D2386	-53.5		-0.54	
6376		-----		-----	

normality	OK
n	72
outliers	0
mean (n)	-53.02
st.dev. (n)	0.796
R(calc.)	2.23
st.dev.(D2386:19)	0.893
R(D2386:19)	2.5



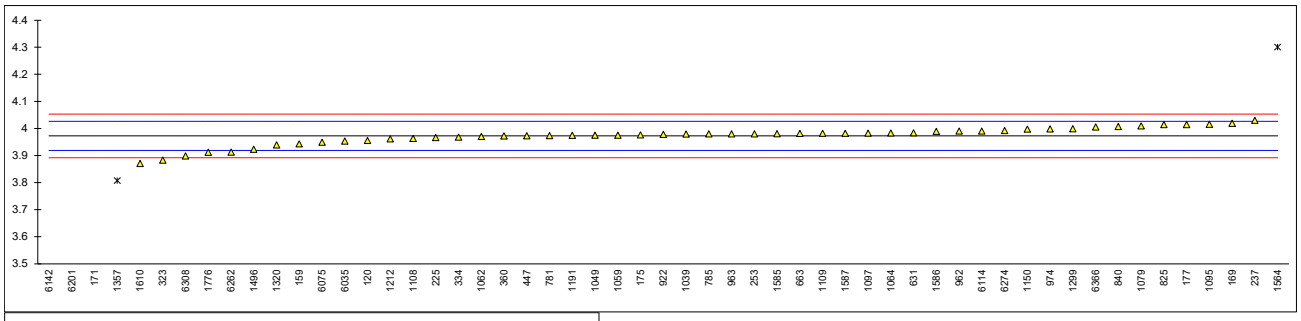


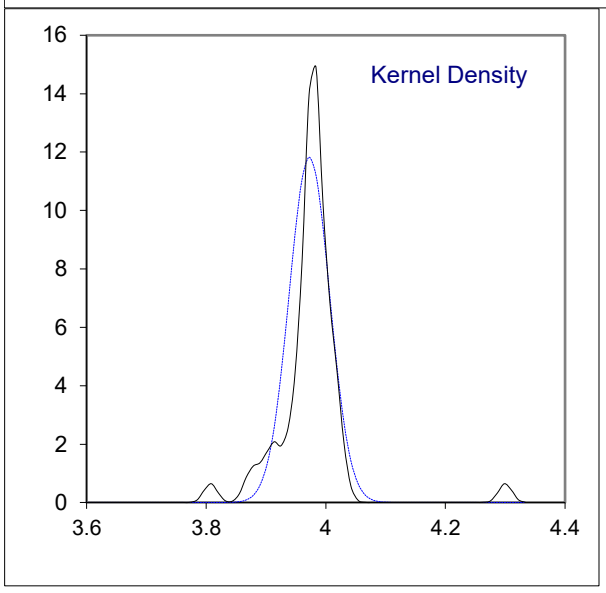
Determination of Kinematic Viscosity at -20°C on sample #21020; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
120	D445	3.955		-0.65	
140		-----		-----	
150		-----		-----	
159	D445	3.943		-1.09	
169	D445	4.019	C	1.73	First reported 4.049
171	D445	3.397	R(0.01)	-21.35	
175	D445	3.976		0.13	
177	D445	4.014		1.54	
225	D445	3.966		-0.24	
228		-----		-----	
237	D445	4.030		2.13	
238		-----		-----	
253	D445	3.980		0.28	
273		-----		-----	
317		-----		-----	
323	D445	3.883	C	-3.32	First reported 3.876
328		-----		-----	
333		-----		-----	
334	D445	3.968		-0.17	
335		-----		-----	
360	D445	3.9720		-0.02	
365		-----		-----	
391		-----		-----	
396		-----		-----	
398		-----		-----	
399		-----		-----	
447	D445	3.9725		0.00	
594		-----		-----	
604		-----		-----	
631	D445	3.9837		0.42	
633		-----		-----	
634		-----		-----	
663	D445	3.9814		0.33	
671		-----		-----	
759		-----		-----	
781	D445	3.973		0.02	
782		-----		-----	
785	D445	3.980		0.28	
825	D445	4.014		1.54	
840	D7042	4.0071		1.28	
875		-----		-----	
922	D445	3.978		0.20	
962	D445	3.990		0.65	
963	D445	3.980		0.28	
970		-----		-----	
974	D445	3.998		0.95	
998		-----		-----	
1039	ISO3104	3.979		0.24	
1049	D445	3.975		0.09	
1059	D445	3.975		0.09	
1062	D445	3.970		-0.09	
1064	D445	3.983		0.39	
1079	D445	4.0092		1.36	
1095	D445	4.015		1.58	
1097	ISO3104	3.9822		0.36	
1108	D445	3.963		-0.35	
1109	D445	3.9820		0.35	
1121		-----		-----	
1126		-----		-----	
1150	ISO3104	3.997		0.91	
1191	ISO3104	3.97404		0.06	
1212	D7042	3.9613		-0.41	
1299	D445	3.999	C	0.98	First reported 3.907
1320	ISO3104	3.939		-1.24	
1357	D445	3.8071	R(0.01)	-6.14	
1399		-----		-----	
1429		-----		-----	
1496	D445	3.9231		-1.83	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564	D445	4.300	C,R(0.01)	12.15	First reported 4.295
1585	D445	3.98055		0.30	
1586	D445	3.989	C	0.61	First reported 4.074
1587	D445	3.98201		0.35	

lab	method	value	mark	z(targ)	remarks
1610	D7042	3.8702		-3.79	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776	ISO3104	3.9119		-2.25	
1883		-----		-----	
6035	ISO3104	3.953		-0.72	
6075	D445	3.9487		-0.88	
6114	D445	3.9902		0.66	
6142	ISO3104	1.39145	R(0.01)	-95.75	
6174		-----		-----	
6192		-----		-----	
6201	D445	2.844	R(0.01)	-41.86	
6262	D445	3.9124		-2.23	
6274	D445	3.992		0.72	
6282		-----		-----	
6299		-----		-----	
6308	D7042	3.8981		-2.76	
6364		-----		-----	
6366	D445	4.0055		1.22	
6376		-----		-----	

	normality	suspect
	n	50
	outliers	5
	mean (n)	3.97248
	st.dev. (n)	0.033736
	R(calc.)	0.09446
	st.dev.(D445:19)	0.026956
	R(D445:19)	0.07548
Compare		
	R(D445:19a)	0.02000



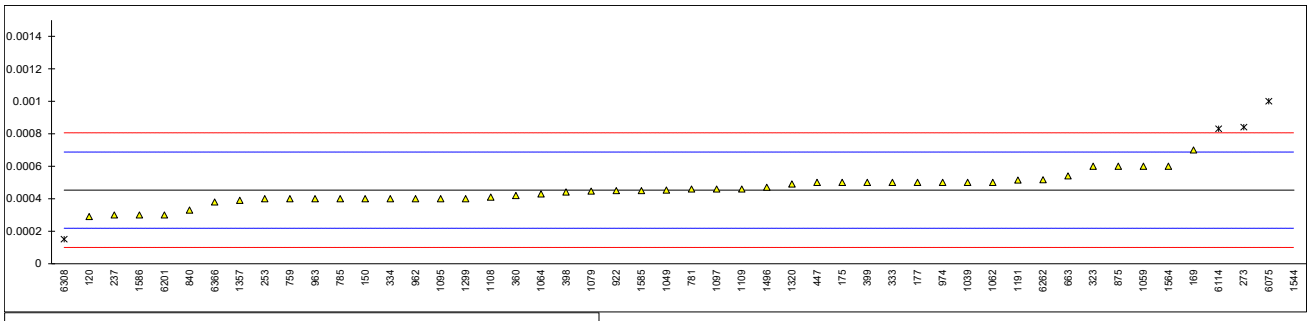


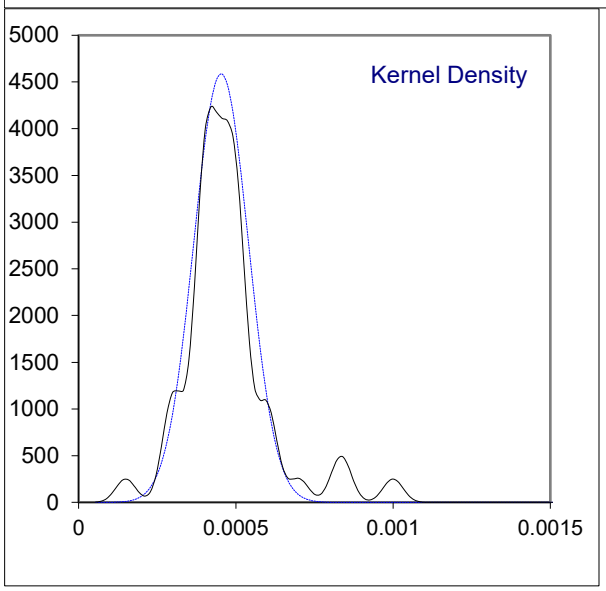
Determination of Mercaptan Sulfur as S on sample #21020; results in %M/M

lab	method	value	mark	z(targ)	remarks
120	D3227	0.00029		-1.39	
140		-----		-----	
150	D3227	0.0004		-0.45	
159		-----		-----	
169	D3227	0.0007		2.10	
171	D3227	<0.0003		-----	
175	D3227	0.0005		0.40	
177	D3227	0.0005		0.40	
225		-----		-----	
228		-----		-----	
237	D3227	0.0003		-1.31	
238		-----		-----	
253	D3227	0.0004		-0.45	
273	D3227	0.00084	R(0.01)	3.29	
317		-----		-----	
323	D3227	0.0006		1.25	
328		-----		-----	
333	D3227	0.0005		0.40	
334	D3227	0.0004		-0.45	
335		-----		-----	
360	D3227	0.00042		-0.28	
365		-----		-----	
391		-----		-----	
396		-----		-----	
398	D3227	0.000441		-0.11	
399	D3227	0.0005		0.40	
447	D3227	0.0005		0.40	
594		-----		-----	
604		-----		-----	
631		-----		-----	
633		-----		-----	
634		-----		-----	
663	D3227	0.00054		0.74	
671		-----		-----	
759	UOP163	0.0004		-0.45	
781	D3227	0.00046		0.06	
782		-----		-----	
785	UOP163	0.0004		-0.45	
825		-----		-----	
840	D3227	0.00033		-1.05	
875	UOP163	0.0006		1.25	
922	D3227	0.00045		-0.03	
962	D3227	0.00040		-0.45	
963	D3227	0.0004		-0.45	
970		-----		-----	
974	D3227	0.0005		0.40	
998		-----		-----	
1039		0.0005		0.40	
1049	D3227	0.000453		0.00	
1059	D3227	0.0006		1.25	
1062	D3227	0.0005		0.40	
1064	D3227	0.00043		-0.20	
1079	D3227	0.000447		-0.05	
1095	D3227	0.0004		-0.45	
1097	ISO3012	0.00046		0.06	
1108	D3227	0.00041		-0.37	
1109	D3227	0.00046		0.06	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191	ISO3012	0.000515		0.52	
1212		-----		-----	
1299	D3227	0.0004		-0.45	
1320	D3227	0.00049		0.31	
1357	D3227	0.00039		-0.54	
1399		-----		-----	
1429		-----		-----	
1496	D3227	0.00047		0.14	
1498		-----		-----	
1531		-----		-----	
1544	D3227	0.00441	R(0.01)	33.67	
1564	D3227	0.0006		1.25	
1585	D3227	0.00045		-0.03	
1586	D3227	0.0003		-1.31	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610		-----		-----	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776	UOP163	<0.0015		-----	
1883		-----		-----	
6035		-----		-----	
6075	D3227	0.0010	R(0.01)	4.65	
6114	D3227	0.00083	R(0.01)	3.20	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201	D3227	0.0003		-1.31	
6262	UOP163	0.00051656		0.54	
6274	D3227	<0,0003		-----	
6282		-----	W	-----	Test result withdrawn, reported 0.0001
6299		-----		-----	
6308	D3227	0.00015	R(0.01)	-2.58	
6364		-----		-----	
6366	D3227	0.00038		-0.62	
6376		-----		-----	

normality	OK
n	45
outliers	5
mean (n)	0.000453
st.dev. (n)	0.0000869
R(calc.)	0.000243
st.dev.(D3227:16)	0.0001175
R(D3227:16)	0.000329



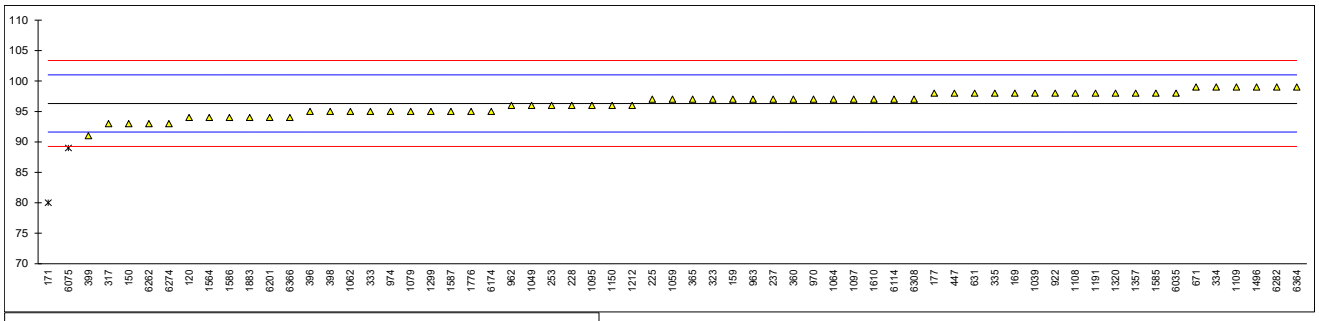


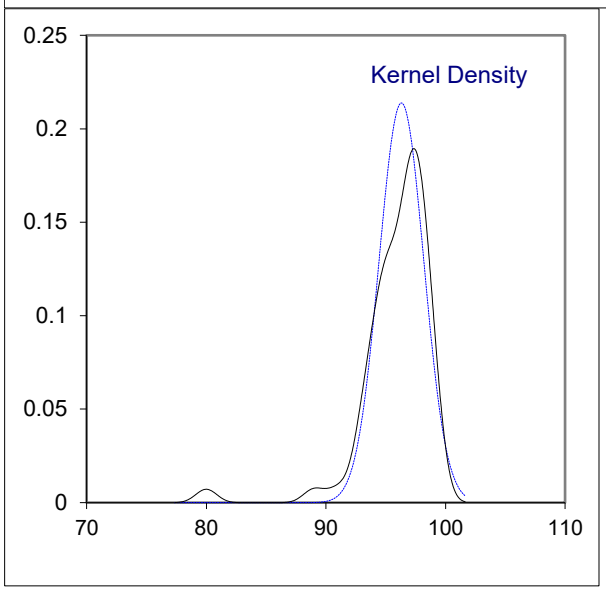
Determination of MSEP on sample #21020;

lab	method	value	mark	z(targ)	remarks
120	D3948	94		-0.98	
140		-----		-----	
150	D3948	93		-1.41	
159	D7224	97.0		0.29	
169	D3948	98		0.72	
171	D3948	80	R(0.01)	-6.95	
175		-----		-----	
177	D3948	98		0.72	
225	D3948	97		0.29	
228	D3948	96.0		-0.13	
237	D7224	97		0.29	
238		-----		-----	
253	D3948	96		-0.13	
273		-----		-----	
317	D7224	93		-1.41	
323	D7224	97		0.29	
328		-----		-----	
333	D7224	95		-0.56	
334	D7224	99		1.15	
335	D7224	98		0.72	
360	D3948	97		0.29	
365	D7224	97		0.29	
391		-----		-----	
396	D3948	95		-0.56	
398	D3948	95		-0.56	
399	D7224	91		-2.26	
447	D3948	98		0.72	
594		-----		-----	
604		-----		-----	
631	D7224	98		0.72	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671	D7224	99		1.15	
759		-----		-----	
781		-----		-----	
782		-----		-----	
785		-----		-----	
825		-----		-----	
840		-----		-----	
875		-----		-----	
922	D3948	98		0.72	
962	D3948	96		-0.13	
963	D3948	97.0		0.29	
970	D3948	97		0.29	
974	D3948	95		-0.56	
998		-----		-----	
1039	D3948	98		0.72	
1049	D7224	96		-0.13	
1059	D3948	97		0.29	
1062	D3948	95		-0.56	
1064	D7224	97		0.29	
1079	D3948	95		-0.56	
1095	D3948	96		-0.13	
1097	D3948	97		0.29	
1108	D3948	98		0.72	
1109	D3948	99		1.15	
1121		-----		-----	
1126		-----		-----	
1150	D3948	96		-0.13	
1191	D3948	98		0.72	
1212	D7224	96		-0.13	
1299	D3948	95		-0.56	
1320	D3948	98		0.72	
1357	D7226	98		0.72	
1399		-----		-----	
1429		-----		-----	
1496	D3948	99		1.15	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564	D3948	94		-0.98	
1585	D3948	98		0.72	
1586	D3948	94		-0.98	
1587	D7224	95		-0.56	

lab	method	value	mark	z(targ)	remarks
1610	D7224	97		0.29	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776	D3948	95		-0.56	
1883	D3948	94		-0.98	
6035	D3948	98		0.72	
6075	D3948	89	R(0.05)	-3.12	
6114	D7224	97		0.29	
6142		-----		-----	
6174	D3948	95		-0.56	
6192		-----		-----	
6201	D3948	94		-0.98	
6262	D3948	93		-1.41	
6274	D3948	93		-1.41	
6282	D3948	99		1.15	
6299		-----		-----	
6308	D7224	97		0.29	
6364	D3948	99		1.15	
6366	D3948	94		-0.98	
6376		-----		-----	

normality	OK
n	61
outliers	2
mean (n)	96.31
st.dev. (n)	1.867
R(calc.)	5.23
st.dev.(D3948:20)	2.347
R(D3948:20)	6.57



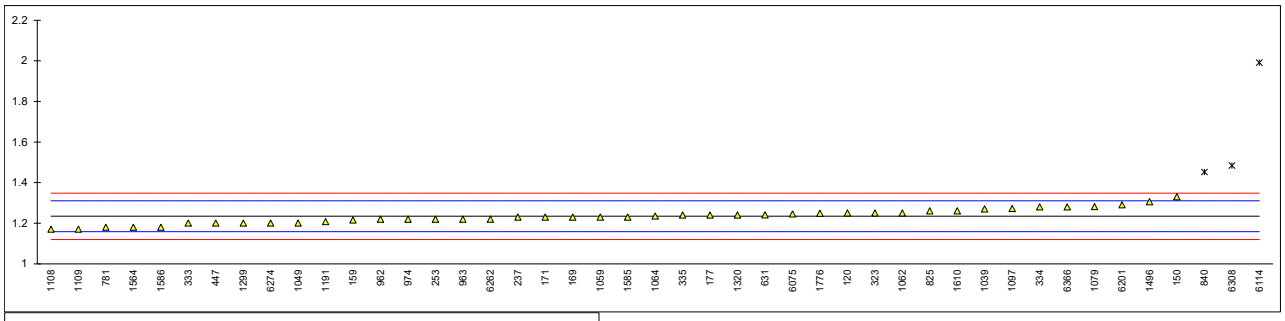


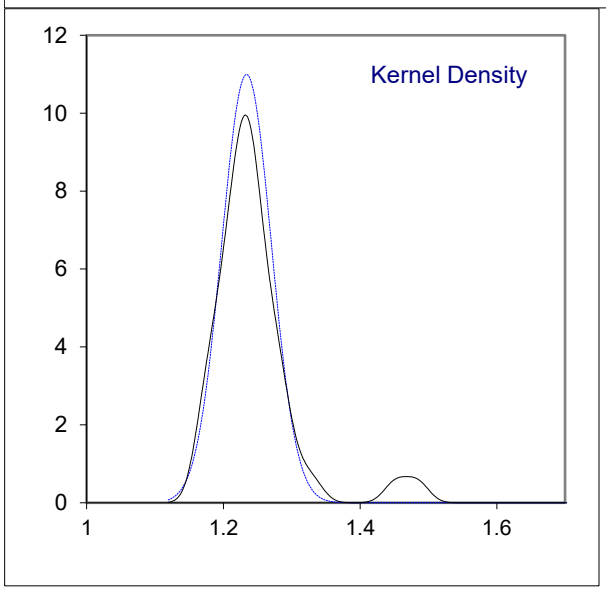
Determination of Naphthalenes on sample #21020; results in %V/V

lab	method	value	mark	z(targ)	remarks
120	D1840-B	1.250		0.42	
140		-----		-----	
150	D1840-B	1.33		2.52	
159	D1840-B	1.215	C	-0.49	First reported 0.9598
169	D1840-B	1.23	C	-0.10	First reported 1.07
171	D1840-A	1.23		-0.10	
175		-----		-----	
177	D1840-A	1.24		0.16	
225		-----		-----	
228		-----		-----	
237	D1840-B	1.23		-0.10	
238		-----		-----	
253	D1840-B	1.22		-0.36	
273		-----		-----	
317		-----		-----	
323	D1840-A	1.25		0.42	
328		-----		-----	
333	D1840-B	1.20		-0.89	
334	D1840-A	1.28		1.21	
335	D1840-B	1.24		0.16	
360		-----		-----	
365		-----		-----	
391		-----		-----	
396		-----		-----	
398		-----		-----	
399		-----		-----	
447	D1840-B	1.20		-0.89	
594		-----		-----	
604		-----		-----	
631	D1840-A	1.241	C	0.19	First reported 1.447
633		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
759		-----		-----	
781	D1840-B	1.18		-1.41	
782		-----		-----	
785		-----		-----	
825	D1840-B	1.26		0.69	
840	D1840-B	1.452	R(0.01)	5.73	
875		-----		-----	
922		-----		-----	
962	D1840-B	1.22		-0.36	
963	D1840-A	1.22		-0.36	
970		-----		-----	
974	D1840-A	1.22		-0.36	
998		-----		-----	
1039	D1840-B	1.27		0.95	
1049	D1840-A	1.201		-0.86	
1059	D1840-B	1.23		-0.10	
1062	D1840-A	1.25		0.42	
1064	D1840-A	1.235		0.03	
1079	D1840-A	1.281		1.24	
1095		-----		-----	
1097	D1840-A	1.272		1.00	
1108	D1840-B	1.17		-1.68	
1109	D1840-B	1.17		-1.68	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191	D1840-B	1.20740		-0.69	
1212		-----		-----	
1299	D1840-A	1.20		-0.89	
1320	D1840-B	1.24		0.16	
1357		-----		-----	
1399		-----		-----	
1429		-----		-----	
1496	D1840-B	1.3051		1.87	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564	D1840-A	1.18		-1.41	
1585	D1840-B	1.23		-0.10	
1586	D1840-A	1.18		-1.41	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610	D1840-B	1.26		0.69	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776	D1840-A	1.249		0.40	
1883		-----		-----	
6035		-----		-----	
6075	D1840-B	1.245		0.29	
6114	D1840-A	1.991	R(0.01)	19.88	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201	D1840-B	1.29		1.47	
6262	D1840-A	1.22		-0.36	
6274	D1840-B	1.20		-0.89	
6282		-----		-----	
6299		-----		-----	
6308	D1840-B	1.4839	R(0.01)	6.57	
6364		-----		-----	
6366	D1840-A	1.28		1.21	
6376		-----		-----	

	normality	OK
	n	42
	outliers	3
	mean (n)	1.2338
	st.dev. (n)	0.03629
	R(calc.)	0.1016
	st.dev.(D1840-B:07)	0.03808
	R(D1840-B:07)	0.1066
Compare		
	R(D1840-A:07)	0.0668



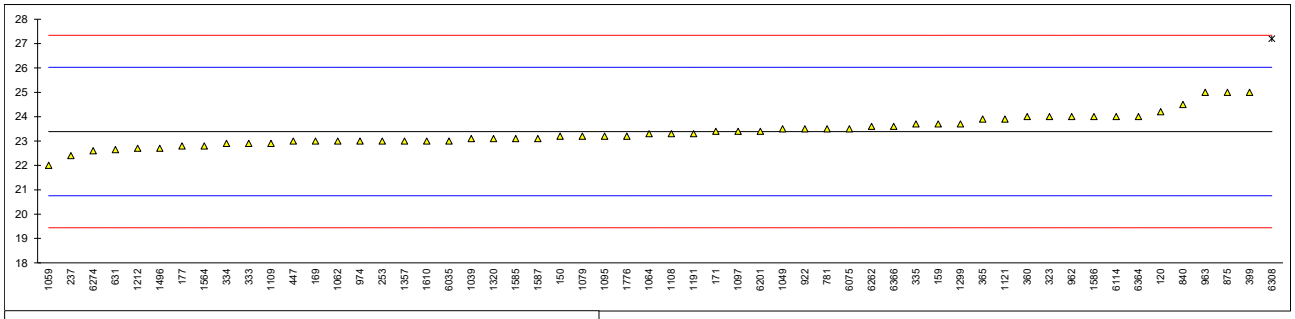


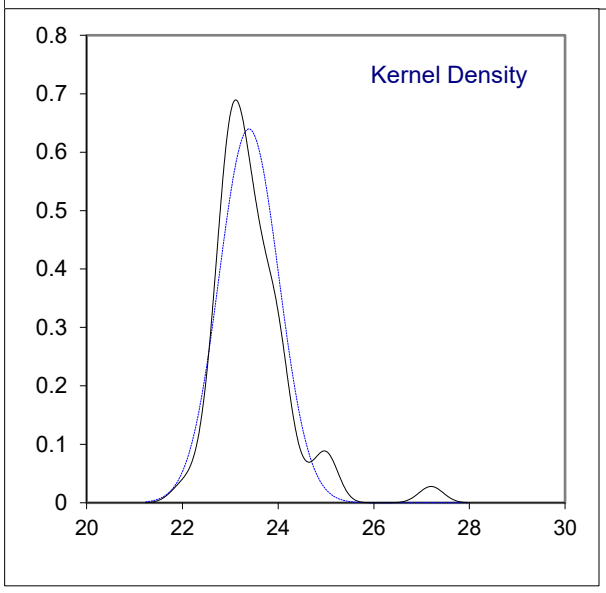
Determination of Smoke Point on sample #21020; results in mm

lab	method	value	mark	z(targ)	remarks
120	D1322-automated	24.2		0.61	
140		-----		-----	
150	D1322-automated	23.2		-0.14	
159	D1322-automated	23.7		0.24	
169	D1322-automated	23.0		-0.30	
171	D1322-automated	23.4		0.01	
175		-----		-----	
177	D1322-automated	22.8		-0.45	
225		-----		-----	
228		-----		-----	
237	D1322-automated	22.4		-0.75	
238		-----		-----	
253	D1322-manual	23		-0.30	
273		-----		-----	
317		-----		-----	
323	D1322-automated	24.0		0.46	
328		-----		-----	
333	D1322-automated	22.9		-0.37	
334	D1322-automated	22.9		-0.37	
335	D1322-manual	23.7		0.24	
360	D1322-manual	24.0		0.46	
365	IP57-manual	23.90		0.39	
391		-----		-----	
396		-----		-----	
398		-----		-----	
399	D1322-manual	25		1.22	
447	D1322-manual	23.0		-0.30	
594		-----		-----	
604		-----		-----	
631	D1322-automated	22.65		-0.56	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
759		-----		-----	
781	D1322-manual	23.5		0.08	
782		-----		-----	
785		-----		-----	
825		-----		-----	
840	D1322-manual	24.5		0.84	
875	D1322-manual	25.0		1.22	
922	D1322-manual	23.5		0.08	
962	D1322-manual	24.0		0.46	
963	D1322-manual	25.0		1.22	
970		-----		-----	
974	D1322-automated	23.0		-0.30	
998		-----		-----	
1039	D1322-automated	23.1		-0.22	
1049	D1322-automated	23.5		0.08	
1059	D1322-manual	22.0		-1.06	
1062	D1322-manual	23.0		-0.30	
1064	D1322-automated	23.3		-0.07	
1079	D1322-automated	23.2		-0.14	
1095	D1322-automated	23.2		-0.14	
1097	D1322-automated	23.4		0.01	
1108	D1322-automated	23.3		-0.07	
1109	D1322-automated	22.9		-0.37	
1121	D1322-manual	23.9		0.39	
1126		-----		-----	
1150		-----		-----	
1191	D1322-automated	23.3		-0.07	
1212	D1322-manual	22.7		-0.52	
1299	D1322-automated	23.7		0.24	
1320	D1322-automated	23.1		-0.22	
1357	D1322-manual	23.0		-0.30	
1399		-----		-----	
1429		-----		-----	
1496	D1322-automated	22.7		-0.52	
1498		-----		-----	
1531		-----		-----	
1544		-----		-----	
1564	D1322-automated	22.8		-0.45	
1585	D1322	23.1		-0.22	
1586	D1322-manual	24.0		0.46	
1587	D1322-automated	23.1		-0.22	

lab	method	value	mark	z(targ)	remarks
1610	IP598	23.0		-0.30	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776	D1322-automated	23.2		-0.14	
1883		-----		-----	
6035	D1322-automated	23.0		-0.30	
6075	D1322-automated	23.5		0.08	
6114	D1322-manual	24.0		0.46	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201	D1322-automated	23.4		0.01	
6262	D1322-automated	23.6		0.16	
6274	D1322-automated	22.6		-0.60	
6282		-----	W	-----	Test result withdrawn, reported 20
6299		-----		-----	
6308	D1322-automated	27.2	R(0.01)	2.89	
6364	D1322-manual	24.0		0.46	
6366	D1322-manual	23.6		0.16	
6376		-----		-----	

	normality	OK
	n	55
	outliers	1
	mean (n)	23.39
	st.dev. (n)	0.624
	R(calc.)	1.75
	st.dev.(D1322-M:19)	1.317
	R(D1322-M:19)	3.69
Compare		
	R(D1322-A:19)	0.88



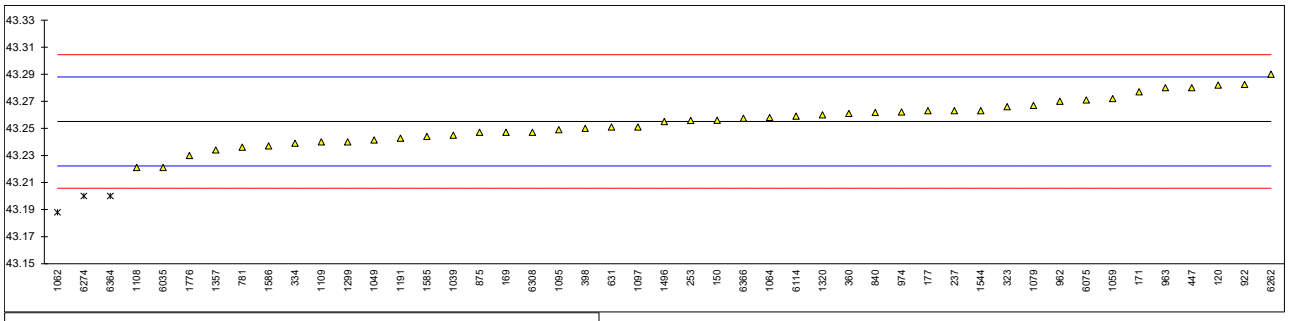


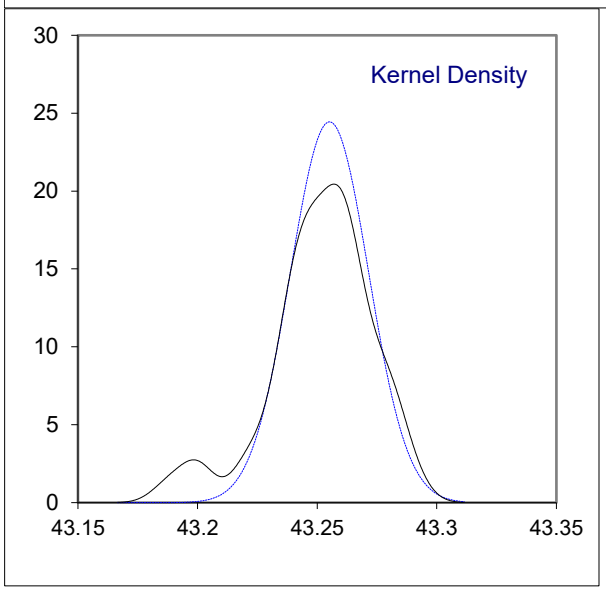
Determination of Specific Energy (Net) on Sulfur free basis on sample #21020; results in MJ/kg

lab	method	value	mark	z(targ)	remarks
120	D3338	43.282		1.64	
140		-----		-----	
150	D3338	43.256		0.05	
159		-----		-----	
169	D3338	43.247		-0.49	
171	D3338	43.277		1.33	
175		-----		-----	
177	D3338	43.263		0.48	
225		-----		-----	
228		-----		-----	
237	D3338	43.263		0.48	
238		-----		-----	
253	D3338	43.2558		0.04	
273		-----		-----	
317		-----		-----	
323	D3338	43.266		0.66	
328		-----		-----	
333		-----		-----	
334	D3338	43.239		-0.98	
335		-----		-----	
360	D3338	43.261		0.36	
365		-----		-----	
391		-----		-----	
396		-----		-----	
398	D3338	43.250		-0.31	
399		-----		-----	
447	D3338	43.280		1.51	
594		-----		-----	
604		-----		-----	
631	D3338	43.251		-0.25	
633		-----		-----	
634		-----		-----	
663		-----		-----	
671		-----		-----	
759		-----		-----	
781	D3338	43.236		-1.16	
782		-----		-----	
785		-----		-----	
825		-----		-----	
840	D3338	43.2617		0.40	
875	D3338	43.247		-0.49	
922	D3338	43.2824		1.66	
962	D3338	43.27		0.91	
963	D3338	43.28		1.51	
970		-----		-----	
974	D3338	43.262		0.42	
998		-----		-----	
1039	D3338	43.245	C	-0.62	First reported 43245 MJ/kg
1049	D3338	43.24143		-0.83	
1059	D3338	43.272	C	1.03	First reported 43.172
1062	D3338	43.188	G(0.05)	-4.09	
1064	D3338	43.258		0.18	
1079	D3338	43.267		0.72	
1095	D3338	43.249		-0.37	
1097	D3338	43.251		-0.25	
1108	D3338	43.221		-2.08	
1109	D3338	43.24		-0.92	
1121		-----		-----	
1126		-----		-----	
1150		-----		-----	
1191	D3338	43.2427		-0.76	
1212		-----		-----	
1299	D3338	43.24		-0.92	
1320	D3338	43.26		0.30	
1357	D3338	43.234		-1.29	
1399		-----		-----	
1429		-----		-----	
1496	D3338	43.255		-0.01	
1498		-----		-----	
1531		-----		-----	
1544	D3338	43.263		0.48	
1564		-----		-----	
1585	D3338	43.244		-0.68	
1586	D3338	43.237		-1.10	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610		-----		-----	
1694		-----		-----	
1730		-----		-----	
1740		-----		-----	
1776	D3338	43.23		-1.53	
1883		-----		-----	
6035	D3338	43.221		-2.08	
6075	D3338	43.271		0.97	
6114	D3338	43.259		0.24	
6142		-----		-----	
6174		-----		-----	
6192		-----		-----	
6201		-----		-----	
6262	D3338	43.290		2.12	
6274	D3338	43.200	DG(0.05)	-3.36	
6282		-----		-----	
6299		-----		-----	
6308	D3338	43.247		-0.49	
6364	D3338	43.2	DG(0.05)	-3.36	
6366	D3338	43.2575		0.14	
6376		-----		-----	

normality	OK
n	44
outliers	3
mean (n)	43.2551
st.dev. (n)	0.01633
R(calc.)	0.0457
st.dev.(D3338:20a)	0.01643
R(D3338:20a)	0.0460



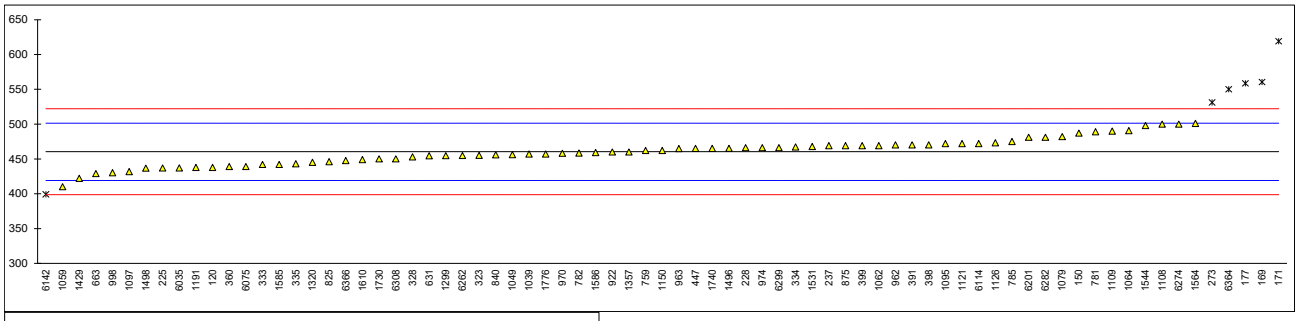


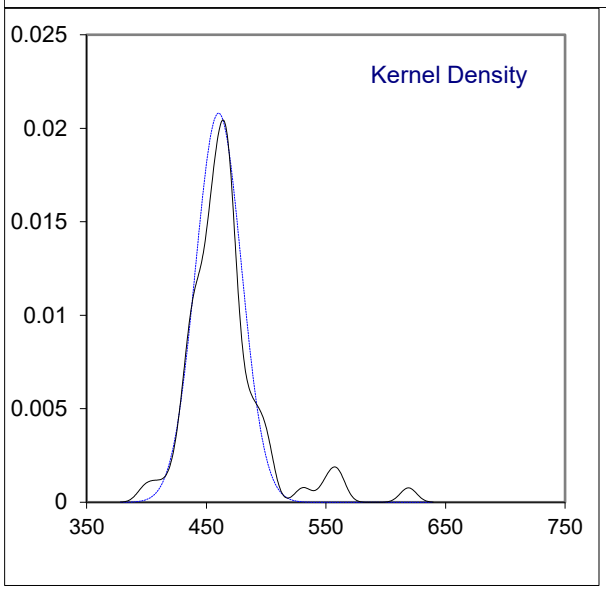
Determination of Total Sulfur on sample #21020; results in mg/kg

lab	method	value	mark	z(targ)	remarks
120	D4294	437.8		-1.09	
140		-----		-----	
150	D5453	487		1.30	
159		-----		-----	
169	D4294	560.5	C,R(0.01)	4.87	First reported 587.8
171	D5453	619	R(0.01)	7.71	
175		-----		-----	
177	D4294	558.6	C,R(0.01)	4.78	First reported 0.05586 mg/kg
225	D4294	436.8		-1.14	
228	D2622	466.0		0.28	
237	D4294	469		0.42	
238		-----		-----	
253		-----		-----	
273	D5453	530.985	R(0.05)	3.44	
317		-----		-----	
323	D5453	455		-0.26	
328	ISO20847	453		-0.36	
333	D4294	442		-0.89	
334	ISO20846	467		0.33	
335	D4294	443		-0.84	
360	D5453	439		-1.04	
365		-----		-----	
391	ISO8754	470		0.47	
396		-----		-----	
398	D5453	470		0.47	
399	D4294	469		0.42	
447	IP336	465		0.23	
594		-----		-----	
604		-----		-----	
631	D4294	454.4		-0.29	
633		-----		-----	
634		-----		-----	
663	D5453	428.8		-1.53	
671		-----		-----	
759	D4294	462		0.08	
781	D5453	489		1.39	
782	ISO20884	458.4		-0.09	
785	D4294	475		0.71	
825	D5453	446		-0.70	
840	D5453	455.9		-0.21	
875	ISO20884	469		0.42	
922	D4294	460		-0.01	
962	D5453	470		0.47	
963	D5453	464.8		0.22	
970	D4294	458		-0.11	
974	D4294	466		0.28	
998	D4294	430	C	-1.47	Reported 0.0430 mg/kg
1039	D2622	457	C	-0.16	First reported 0.0457 mg/kg
1049	D5453	456.1		-0.20	
1059	ISO14596	410		-2.44	
1062	D5453	469		0.42	
1064	D5453	490.6		1.47	
1079	D2622	482		1.05	
1095	ISO20847	472		0.57	
1097	D5453	431.84		-1.38	
1108	D4294	500	C	1.93	First reported 50
1109	D2622	489.9		1.44	
1121	IP336	472		0.57	
1126	ISO20846	473.1		0.62	
1150	ISO20884	462.1		0.09	
1191	ISO8754	437.776		-1.09	
1212		-----		-----	
1299	D2622	454.655	C	-0.27	First reported 0.045 mg/kg
1320	ISO20884	445		-0.74	
1357	D5453	460		-0.01	
1399		-----		-----	
1429	D5453	422		-1.86	
1496	D4294	465.1		0.23	
1498	D5453	436.7		-1.15	
1531	ISO20846	467.7		0.36	
1544	ISO8754	498	C	1.83	First reported 0.0498 mg/kg
1564	ISO20846	501		1.98	
1585	D4294	442		-0.89	
1586	D5453	459		-0.06	
1587		-----		-----	

lab	method	value	mark	z(targ)	remarks
1610	IP336	449		-0.55	
1694		-----		-----	
1730	D4294	450		-0.50	
1740	D4294	465		0.23	
1776	ISO20846	457		-0.16	
1883		-----		-----	
6035	ISO20846	437		-1.13	
6075	D5453	439	C	-1.04	First reported 0.0439 mg/kg
6114	D4294	472		0.57	
6142	ISO20846	399.055	R(0.05)	-2.98	
6174		-----		-----	
6192		-----		-----	
6201	D5453	481		1.01	
6262	D5453	454.815		-0.27	
6274	D4294	500		1.93	
6282	D2622	481		1.01	
6299	D5453	466		0.28	
6308	IP336	450		-0.50	
6364	D4294	550	C,R(0.01)	4.36	First reported 0.063 mg/kg
6366	D5453	447.7		-0.61	
6376		-----		-----	

	normality	OK
	n	69
	outliers	6
	mean (n)	460.30
	st.dev. (n)	19.174
	R(calc.)	53.69
	st.dev.(D5453:19)	20.574
	R(D5453:19)	57.61
Compare		
	R(2622:16	58.23

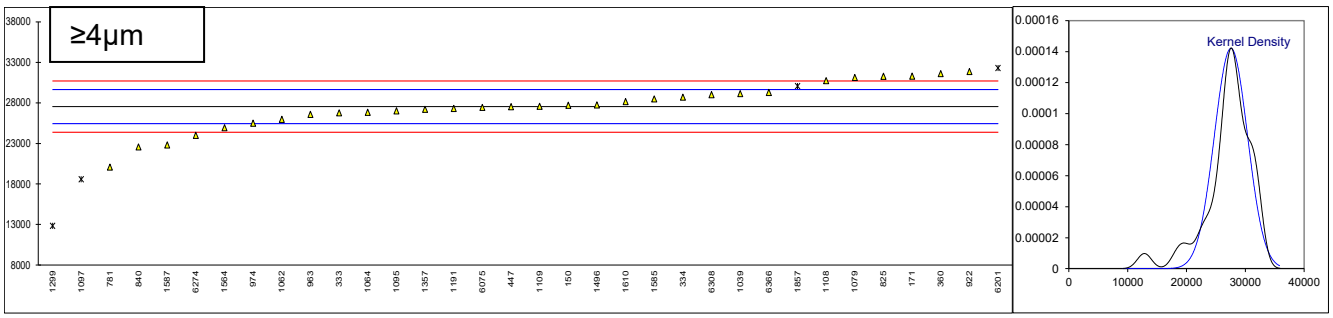


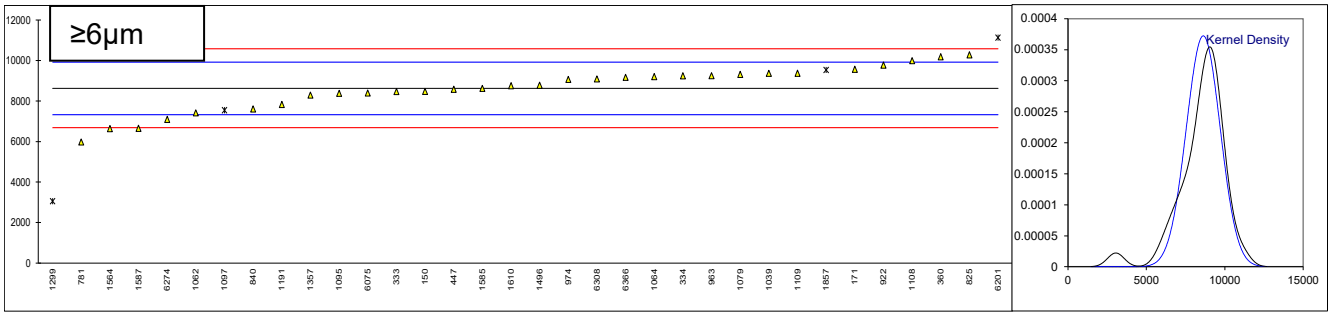


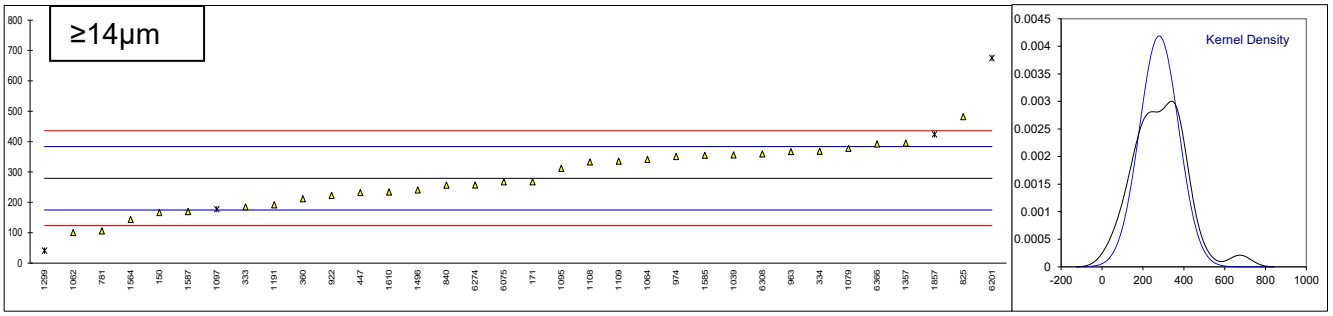
Determination of Particle Size Distribution on sample #21021 acc. to IP565, results in counts/mL

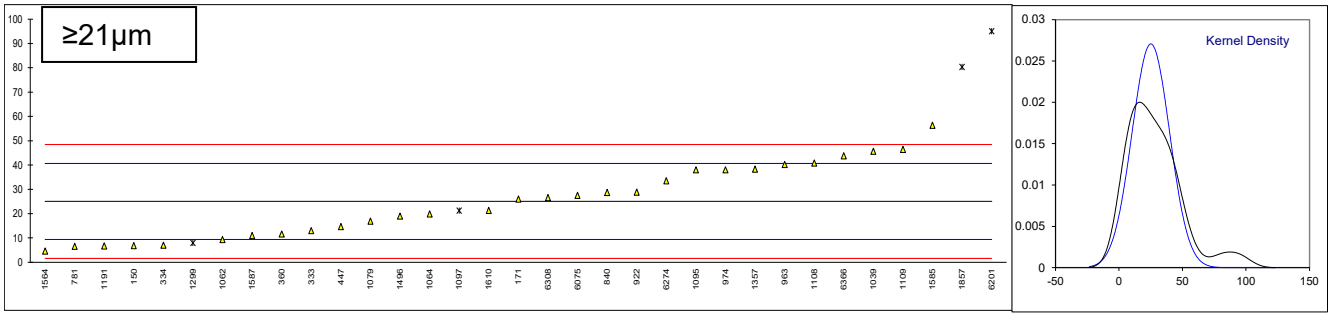
lab	method	≥4 µm (c)	m	≥6 µm(c)	m	≥14 µm (c)	m	≥21 µm (c)	m	≥25 µm (c)	m	≥30 µm (c)	m
140		-----		-----		-----		-----		-----		-----	
150	IP565	27705.6		8473.7		166.5		6.8		1.0		0.2	
171	IP565	31293		9565		268		26		5		1	
225		-----		-----		-----		-----		-----		-----	
237		-----		-----		-----		-----		-----		-----	
253		-----		-----		-----		-----		-----		-----	
323		-----		-----		-----		-----		-----		-----	
333	IP565	26760		8461		185		13		3		1	
334	IP565	28699		9242		368		7	C	3	C	1	C
335		-----		-----		-----		-----		-----		-----	
360	IP565	31598.8		10186.2		211.8		11.6		2.2		0.2	
447	IP565	27531.4		8580.5		232.2		14.7		2.7		0.6	
781	IP565	20080.9		5975.6		105.7		6.5		1.6		0.2	
825	IP565	31288		10276		482		-----		-----		-----	
840	IP565	22561.3		7605.0		256.7		28.7		5.3		1.0	
922	IP565	31859.0		9773.1		223.0		28.8		10.5		3.4	
963	IP565	26583.3		9248.8		367.2		40.2		10.7		2.2	
974	IP565	25498		9069		351		38		10		2	
1039	IP565	29147.3		9366.7		356.2		45.6		15.7		2.8	
1059		-----		-----		-----		-----		-----		-----	
1062	IP565	25968		7413		100.7		9.3		3.6		1.2	
1064	IP565	26830.0		9204.2		341.4		19.9		3.2		0.2	
1079	IP565	31138.8		9314.3		377.5		16.9		4.4		1.2	
1095	IP565	27013		8377		312		38		13		5	
1097	IP564	18569.7	ex	7540.5	ex	177.4	ex	21.2	ex	4.9	ex	0.4	ex
1108	IP565	30746.2		9984.0		332.7		40.8		11.8		3.2	
1109	IP565	27584.5		9369.2		335.7		46.4		14.6		5.7	
1191	IP565	27313.8		7824.2		191.8		6.7		1.2		0.3	
1299	IP577	12828.3	ex	3050.2	ex	40.9	ex	7.9	ex	4.9	ex	2.9	ex
1320		-----		-----		-----		-----		-----		-----	
1357	IP565	27196		8289		395		38.3		14.3		3.2	
1496	IP565	27746.9		8773.6		240.9		19.0		3.4		0.5	
1564	IP565	24931.0	C	6634.0	C	143.6	C	4.6	C	1.0	C	0.3	C
1585	IP565	28497.2		8620.5		355.0		56.3		26.8	R(5)	9.9	R(1)
1587	IP565	22809.4		6649.2		169.5		11.0		3.4		1.2	
1610	IP565	28170.8		8757.2		234.2		21.3		7.1		2.5	
1857	IP565	30060.0	ex	9531.5	ex	423.3	ex	80.3	R(5)	32.3	R(5)	14.3	R(1)
6075	IP565	27432.3		8389.1		267.4		27.5		6.7		2.5	
6201	IP565	32289	ex	11123	ex	675	R(5)	95	R(5)	43	R(1)	21	R(1)
6274	IP565	23983.0		7092.5		257.4		33.5		8.7		2.3	
6308	IP565	29014.5		9087.3		359.2		26.6		9.1		3.4	
6366	IP565	29294.55		9169.8		392.2		43.75		17.25		6.8	
normality		OK		OK		OK		OK		OK		not OK	
n		30		30		30		29		28		28	
outliers		0 (+4ex)		0 (+4ex)		1 (+3ex)		2 (+2ex)		3 (+2ex)		3 (+2ex)	
mean (n)		27542.52		8625.69		279.32		25.06		6.91		1.88	
st.dev. (n)		2806.689		1071.762		95.245		14.737		4.970		1.763	
R(calc.)		7858.73		3000.93		266.69		41.26		13.92		4.94	
st.dev.(IP565:13)		1050.764		649.554		52.083		7.807		2.894		1.078	
R(IP565:13)		2942.14		1818.75		145.83		21.86		8.10		3.02	

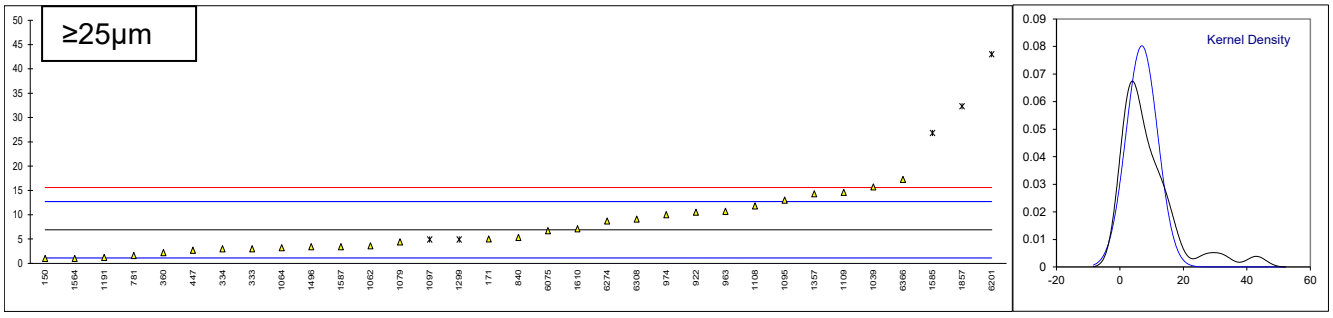
Lab 334: first reported 72, 30, 11 respectively
Lab 1097: test results excluded for statistical evaluation as test results were determined with IP564, see also §4.1
Lab 1299: test results excluded for statistical evaluation as test results were determined with IP577, see also §4.1
Lab 1564: first reported 20650.1, 5558.6, 99.8, 6.0, 2.2, 0.4 respectively
Lab 1857: test results excluded, there were three or more other outliers in related test results
Lab 6201: test results excluded, there were three or more other outliers in related test results

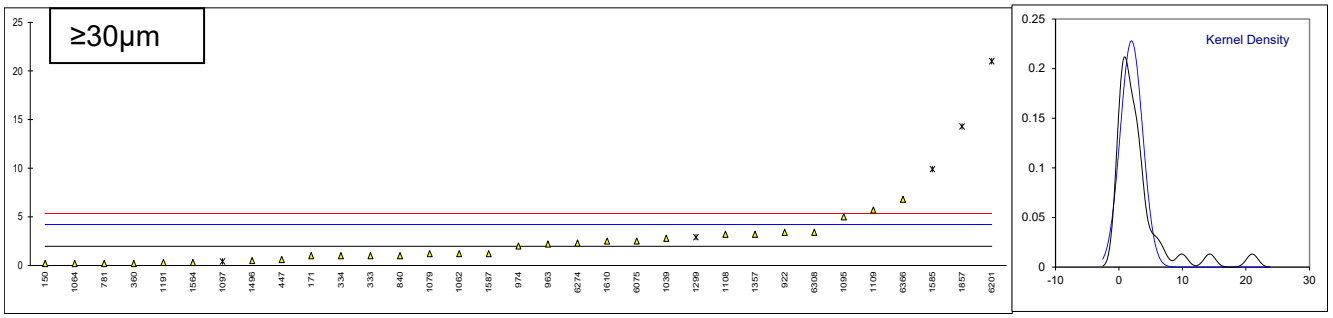

≥4µm
Kernel Density


≥6µm
Kernel Density


≥14µm
Kernel Density


≥21µm
Kernel Density

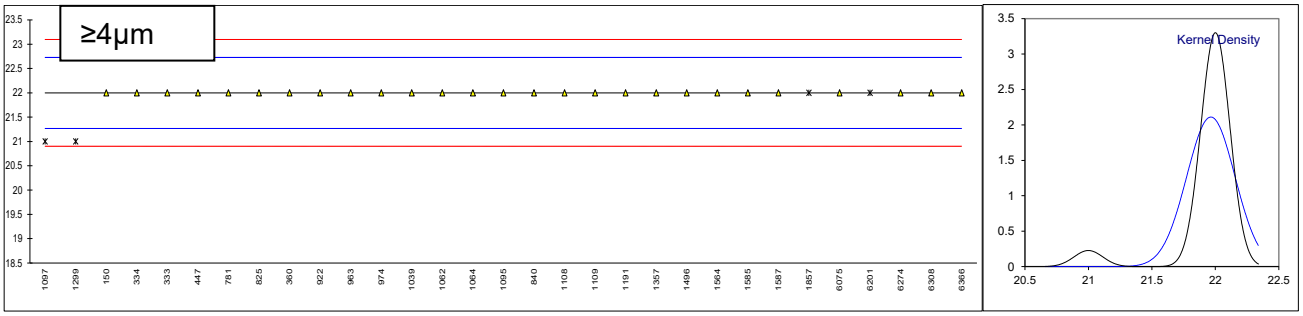

≥25µm
Kernel Density

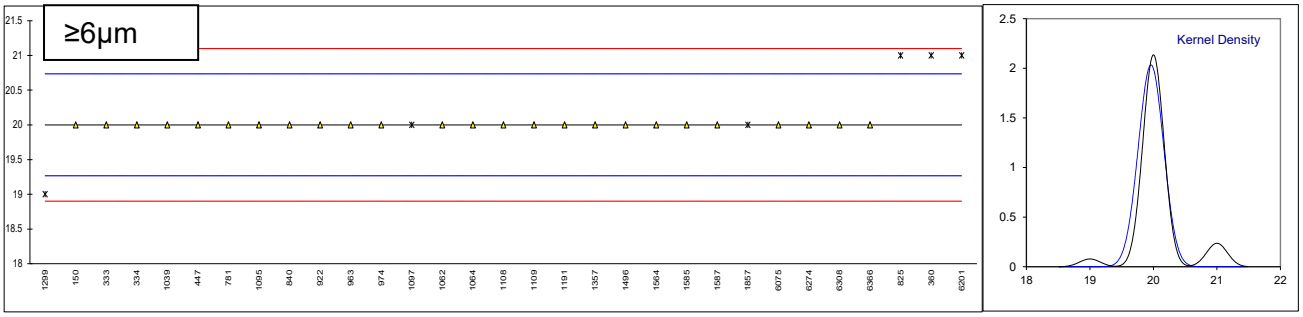

≥30µm
Kernel Density

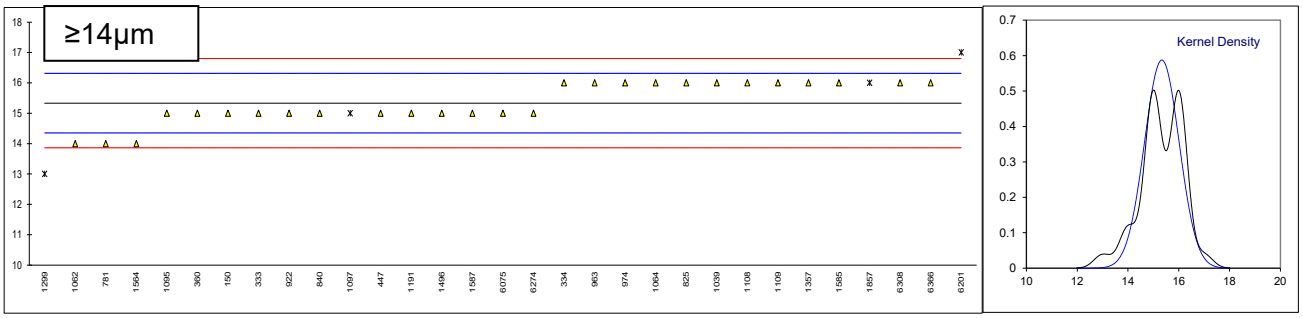
Determination of Particle Size Distribution by IP565 on sample #21021, results in ISO scale numbers

lab	method	≥4µm(c)	mark	z(targ)	≥6µm(c)	mark	z(targ)	≥14 µm (c)	mark	z(targ)
140		-----		-----	-----		-----	-----		-----
150	ISO4406 acc. to IP565	22		0.00	20		0.00	15		-0.68
171		-----		-----	-----		-----	-----		-----
225		-----		-----	-----		-----	-----		-----
237		-----		-----	-----		-----	-----		-----
253		-----		-----	-----		-----	-----		-----
323		-----		-----	-----		-----	-----		-----
333	ISO4406 acc. to IP565	22		0.00	20		0.00	15		-0.68
334	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
335		-----		-----	-----		-----	-----		-----
360	ISO4406 acc. to IP565	22		0.00	21	R(0.01)	2.73	15		-0.68
447	ISO4406 acc. to IP565	22		0.00	20		0.00	15		-0.68
781	ISO4406 acc. to IP565	22		0.00	20		0.00	14		-2.72
825	ISO4406 acc. to IP565	22		0.00	21	R(0.01)	2.73	16		1.36
840	ISO4406 acc. to IP565	22		0.00	20		0.00	15		-0.68
922	ISO4406 acc. to IP565	22		0.00	20		0.00	15		-0.68
963	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
974	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
1039	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
1059		-----		-----	-----		-----	-----		-----
1062	ISO4406 acc. to IP565	22		0.00	20		0.00	14		-2.72
1064	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
1079		-----		-----	-----		-----	-----		-----
1095	ISO4406	22		0.00	20		0.00	15		-0.68
1097	ISO4406 acc. to IP564	21	ex	-2.73	20	ex	0.00	15	ex	-0.68
1108	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
1109	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
1191	ISO4406 acc. to IP565	22		0.00	20		0.00	15		-0.68
1299		21	ex	-2.73	19	ex	-2.73	13	ex	-4.76
1320		-----		-----	-----		-----	-----		-----
1357	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
1496	ISO4406 acc. to IP565	22		0.00	20		0.00	15		-0.68
1564	ISO4406 acc. to IP565	22		0.00	20		0.00	14		-2.72
1585	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
1587	ISO4406 acc. to IP565	22		0.00	20		0.00	15		-0.68
1610		-----		-----	-----		-----	-----		-----
1857	ISO4406 acc. To IP565	22	ex	0.00	20	ex	0.00	16	ex	1.36
6075		22		0.00	20		0.00	15		-0.68
6201	ISO4406 acc. to IP565	22	ex	0.00	21	R(0.01)	2.73	17	ex	3.40
6274	ISO4406 acc. to IP565	22		0.00	20		0.00	15		-0.68
6308	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
6366	ISO4406 acc. to IP565	22		0.00	20		0.00	16		1.36
	normality	n.a.			n.a.			OK		
	n	27			25			27		
	outliers	0 (+4ex)			3 (+3ex)			0 (+4ex)		
	mean (n)	22.00			20.00			15.33		
	st.dev. (n)	0.000			0.000			0.679		
	R(calc.)	0.00			0.00			1.90		
	st.dev.(IP565:13)	0.366			0.366			0.490		
	R(IP565:13)	1.03			1.03			1.37		

Lab 1097: test results excluded for statistical evaluation as test results were determined with IP564, see also §4.1
Lab 1299: test results excluded for statistical evaluation as test results were determined with IP577, see also §4.1
Lab 1857: test results excluded, there were three or more other outliers in related test results
Lab 6201: test results excluded, there were three or more other outliers in related test results


≥4µm
Kernel Density


≥6µm
Kernel Density


≥14µm
Kernel Density

APPENDIX 2

The z-scores of Distillation

Lab	IBP	10% rec	50% rec	90% rec	FBP
120	0.02	0.33	0.53	0.29	0.21
140	-----	-----	-----	-----	-----
150	-1.20	-0.71	-0.49	0.13	-0.62
159	2.59	0.93	0.63	0.13	0.37
169	0.40	0.48	-0.68	-0.82	0.21
171	-1.03	-0.71	-0.68	-1.13	-0.81
175	-0.32	-0.26	0.63	1.64	0.61
177	-1.13	-0.71	-0.12	-0.74	0.13
225	0.29	1.45	0.72	1.40	1.24
228	-1.40	-2.27	-3.48	-4.54	1.43
237	1.65	1.45	0.25	-0.58	-0.93
238	-0.04	-1.53	-0.68	-1.37	0.25
253	-0.04	-1.53	1.19	0.21	1.83
273	-0.96	0.18	-0.59	-0.58	-0.07
317	0.12	-2.64	0.25	0.21	0.05
323	-0.28	0.78	0.25	0.05	-0.34
328	-0.35	-0.11	-0.31	-0.82	-0.07
333	-0.42	-0.26	-0.21	-1.05	-0.10
334	-0.25	-0.34	-0.03	-0.74	-0.42
335	-0.69	-0.63	-1.15	-0.42	-0.46
360	-1.47	0.63	-0.03	-0.66	-0.58
365	-0.76	-0.41	0.07	0.93	0.05
391	-----	-----	-----	-----	-----
396	1.99	2.94	3.05	3.38	0.64
398	1.75	1.82	1.28	1.72	1.08
399	2.84	0.70	0.53	0.77	0.33
447	-1.06	-0.19	0.35	0.77	-0.10
594	0.70	-2.12	-0.21	0.69	-0.18
604	-0.08	1.37	1.37	1.24	0.05
631	-0.21	-1.90	-2.55	-1.77	-1.13
633	-----	-----	-----	-----	-----
634	-----	-----	-----	-----	-----
663	-0.35	0.26	0.21	-0.38	-0.38
671	1.07	0.41	0.25	0.05	-0.14
759	-0.04	-0.04	1.65	1.40	1.04
781	-0.08	0.56	0.07	-0.34	0.13
782	0.01	-0.30	0.86	1.04	0.37
785	0.06	-0.56	-0.40	-0.34	-0.62
825	1.96	1.90	1.09	1.56	0.37
840	-0.99	0.79	0.67	1.08	-0.23
875	-0.25	-1.01	-1.33	-1.21	-0.54
922	-0.38	0.78	0.53	0.05	0.29
962	-0.69	-0.41	-0.96	-0.90	-0.93
963	-0.25	0.85	0.25	0.05	-0.03
970	-0.18	0.56	0.63	0.29	-0.22
974	0.09	1.30	2.03	1.16	0.25
998	-0.04	-0.78	-0.68	-2.16	1.83
1039	-0.08	0.04	-0.12	-0.66	0.13
1049	0.63	0.41	0.35	0.61	-0.07
1059	-0.21	0.26	-0.59	-0.58	-0.42
1062	-0.18	-0.19	-0.77	-0.90	-0.62
1064	0.12	0.11	0.53	0.93	-0.07
1079	0.63	0.41	1.19	0.93	0.33
1095	1.01	0.63	0.44	0.85	0.41
1097	0.29	0.56	0.91	1.64	0.25
1108	0.09	-0.26	-0.03	0.21	-0.07
1109	-0.42	-0.49	-0.31	-0.03	-0.14
1121	0.84	-0.26	-0.96	0.05	-0.03
1126	0.94	0.48	-0.68	-0.58	0.09
1150	-0.10	-0.60	-0.96	0.33	-0.93
1191	-2.05	0.93	0.63	0.29	0.49
1212	0.16	0.48	0.35	0.69	-0.03
1299	-0.52	0.41	0.35	1.08	0.49
1320	-0.86	-0.41	-2.36	-0.82	-0.66
1357	0.33	0.56	-0.03	-0.18	2.22
1399	-----	-----	-----	-----	-----
1429	-0.66	-1.60	-1.71	-2.08	-1.72
1496	0.80	0.70	-0.03	0.45	-0.62
1498	0.77	0.11	0.63	1.72	0.05
1531	-0.38	0.18	0.16	0.13	0.01
1544	0.63	0.85	0.77	0.29	-0.52
1564	-0.82	-0.04	-0.49	-0.74	0.13
1585	1.14	0.70	0.72	0.29	-0.34
1586	-0.04	0.18	0.07	0.53	-0.46
1587	-0.49	-0.11	-0.31	-0.74	-0.58

Lab	IBP	10% rec	50% rec	90% rec	FBP
1610	-----	-----	-----	-----	-----
1694	-----	-----	-----	-----	-----
1730	-----	-----	-----	-----	-----
1740	-0.45	-0.34	0.25	-0.26	0.09
1776	-0.86	-0.78	-0.21	0.21	-0.38
1883	-0.04	-1.53	0.25	1.00	1.04
6035	0.43	0.26	0.44	0.45	-0.66
6075	-0.18	-0.71	-0.49	0.37	0.96
6114	-0.28	0.18	0.53	-0.18	0.17
6142	-1.88	-1.42	-1.57	-1.17	-1.07
6174	0.80	0.33	0.25	-0.58	0.45
6192	-0.08	-0.93	-1.33	-2.08	-0.85
6201	-0.08	0.11	0.16	0.69	0.33
6262	-0.01	0.48	0.16	-0.74	-0.26
6274	0.23	0.48	-0.12	-0.66	-0.22
6282	0.46	-0.78	0.25	0.21	2.22
6299	0.16	0.56	0.25	-0.90	-1.01
6308	0.23	-0.86	-1.52	-0.42	-0.74
6364	-0.93	0.63	-0.21	-0.98	-0.97
6366	0.29	-0.78	0.07	0.45	-0.30
6376	-----	-----	-----	-----	-----

Particle Size Distribution determination

z-scores on sample #21021 acc. to IP565, in (cumulative) counts/mL

Lab	≥4 µm	≥6 µm	≥14 µm	≥21 µm	≥25 µm	≥30 µm
140	-----	-----	-----	-----	-----	-----
150	0.16	-0.23	-2.17	-2.34	-2.04	-1.57
171	3.57	1.45	-0.22	0.12	-0.66	-0.86
225	-----	-----	-----	-----	-----	-----
237	-----	-----	-----	-----	-----	-----
253	-----	-----	-----	-----	-----	-----
323	-----	-----	-----	-----	-----	-----
333	-0.74	-0.25	-1.81	-1.54	-1.35	-0.86
334	1.10	0.95	1.70	-2.31	-1.35	-0.86
335	-----	-----	-----	-----	-----	-----
360	3.86	2.40	-1.30	-1.72	-1.63	-1.57
447	-0.01	-0.07	-0.90	-1.33	-1.45	-1.21
781	-7.10	-4.08	-3.33	-2.38	-1.83	-1.57
825	3.56	2.54	3.89	-----	-----	-----
840	-4.74	-1.57	-0.43	0.47	-0.56	-0.86
922	4.11	1.77	-1.08	0.48	1.24	1.27
963	-0.91	0.96	1.69	1.94	1.31	0.21
974	-1.95	0.68	1.38	1.66	1.07	0.03
1039	1.53	1.14	1.48	2.63	3.04	0.74
1059	-----	-----	-----	-----	-----	-----
1062	-1.50	-1.87	-3.43	-2.02	-1.14	-0.68
1064	-0.68	0.89	1.19	-0.66	-1.28	-1.57
1079	3.42	1.06	1.89	-1.05	-0.87	-0.68
1095	-0.50	-0.38	0.63	1.66	2.10	2.69
1097	-8.54	-1.67	-1.96	-0.49	-0.69	-1.39
1108	3.05	2.09	1.02	2.02	1.69	1.09
1109	0.04	1.14	1.08	2.73	2.66	3.31
1191	-0.22	-1.23	-1.68	-2.35	-1.97	-1.48
1299	-14.00	-8.58	-4.58	-2.20	-0.69	0.83
1320	-----	-----	-----	-----	-----	-----
1357	-0.33	-0.52	2.22	1.70	2.55	1.09
1496	0.19	0.23	-0.74	-0.78	-1.21	-1.30
1564	-2.49	-3.07	-2.61	-2.62	-2.04	-1.48
1585	0.91	-0.01	1.45	4.00	6.87	7.04
1587	-4.50	-3.04	-2.11	-1.80	-1.21	-0.68
1610	0.60	0.20	-0.87	-0.48	0.07	0.47
1857	2.40	1.39	2.76	7.08	8.77	10.95
6075	-0.10	-0.36	-0.23	0.31	-0.07	0.47
6201	4.52	3.84	7.60	8.96	12.47	16.90
6274	-3.39	-2.36	-0.42	1.08	0.62	0.29
6308	1.40	0.71	1.53	0.20	0.76	1.27
6366	1.67	0.84	2.17	2.39	3.57	4.29

APPENDIX 3

Equipment used in Particle Size distribution

lab	Equipment	Test Method based on equipment	Test Method reported	Calibration method reported	Remark
140					
150	Stanhope-Seta	IP565	IP565		
171	Stanhope-Seta	IP565	IP565	Calibrated by vendor	
225					
237	Stanhope-Seta			ISO11171	
253					
323					
333	Stanhope-Seta	IP565	IP565	ISO11171	
334	Stanhope-Seta	IP565	IP565	ISO11171	
335					
360	Stanhope-Seta	IP565	IP565	ISO11171	
447	Stanhope-Seta	IP565	IP565	ISO11171	
781	Stanhope-Seta	IP565	IP565	ISO11171	
825	Stanhope-Seta	IP565	IP565	ISO11171	
840	Stanhope-Seta	IP565	IP565	ISO11171	
922	Stanhope-Seta	IP565	IP565	ISO11171	
963	Stanhope-Seta	IP565	IP565	ISO11171	
974	Stanhope-Seta	IP565	IP565	ISO11171	
1039	Stanhope-Seta	IP565	IP565	ISO11171	
1059					
1062	Stanhope-Seta	IP565	IP565	ISO11171	
1064	Stanhope-Seta	IP565	IP565	ISO11171	
1079	Stanhope-Seta	IP565	IP565		
1095	Stanhope-Seta	IP565	IP565		
1097	Parker Hannifin	IP564	IP564	ISO11171	
1108	Stanhope-Seta	IP565	IP565	ISO11171	
1109	Stanhope-Seta	IP565	IP565	ISO11171	
1191	Stanhope-Seta	IP565	IP565	ISO11171	
1299	Pamas	IP577	IP577	ISO11171	
1320					
1357	Stanhope-Seta	IP565	IP565	OEM Calib.	
1496	Stanhope-Seta	IP565	IP565	ISO11171	
1564	Stanhope-Seta	IP565	IP565	ISO11171	
1585	Stanhope-Seta	IP565	IP565	ISO11171	
1587	Stanhope-Seta	IP565	IP565	ISO11171	
1610	Stanhope-Seta	IP565	IP565	ISO11171	
1857	Stanhope-Seta	IP565	IP565	ISO11171	
6075	Stanhope-Seta	IP565	IP565	ISO11171	
6201	Stanhope-Seta	IP565	IP565	ISO11171	
6274	Stanhope-Seta	IP565	IP565	ISO11171	
6308	Stanhope-Seta	IP565	IP565	ISO11171	
6366	Stanhope-Seta	IP565	IP565	ISO11171	

APPENDIX 4

Number of participants per country

1	AFGHANISTAN	5	NETHERLANDS
2	ALGERIA	2	NIGERIA
1	AUSTRALIA	2	OMAN
5	BELGIUM	1	PAKISTAN
3	BULGARIA	3	PHILIPPINES
1	CHILE	1	POLAND
1	CHINA	1	PORTUGAL
1	COTE D'IVOIRE	7	RUSSIAN FEDERATION
1	DENMARK	2	SAUDI ARABIA
1	DJIBOUTI	1	SLOVAKIA
1	FINLAND	1	SLOVENIA
6	FRANCE	1	SOMALIA
1	FRENCH GUIANA	2	SOUTH AFRICA
1	GERMANY	1	SOUTH KOREA
5	GREECE	2	SPAIN
1	GUAM	2	SWEDEN
2	IRELAND	1	THAILAND
4	ITALY	1	TOGO
1	KENYA	1	TURKEY
1	LEBANON	1	UNITED ARAB EMIRATES
3	MALAYSIA	5	UNITED KINGDOM
1	MALTA	8	UNITED STATES OF AMERICA
1	MARTINIQUE	1	VIETNAM

APPENDIX 4

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01), G(1)	= outlier in Grubbs' outlier test
G(0.05), G(5)	= straggler in Grubbs' outlier test
DG(0.01), DG(1)	= outlier in Double Grubbs' outlier test
DG(0.05), DG(5)	= straggler in Double Grubbs' outlier test
R(0.01), R(1)	= outlier in Rosner's outlier test
R(0.05), R(5)	= straggler in Rosner's outlier test
E	= calculation difference between reported test result and result calculated by iis
W	= test result withdrawn on request of participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported
SDS	= Safety Data Sheet

Literature

1 iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, June 2018
2 ISO5725:86
3 ISO5725 parts 1-6:94
4 ISO13528:05
5 M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
6 W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
7 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
8 J.N. Miller, Analyst, 118, 455, (1993)
9 Analytical Methods Committee, Technical Brief, No 4, January 2001
10 P.J. Lowthian and M. Thompson, The Royal Society of Chemistry, Analyst, 127, 1359-1367, (2002)
11 Horwitz, R. Albert, J. AOAC Int, 79, 3, 589, (1996)
12 Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, Technometrics, 25(2), 165-172, (1983).
13 Defence Standard 91-091, Issue 12, Publication date 14th of September 2020.
14 Aviation Fuel Quality Requirements for Jointly Operated Systems (AFQRJOS), Issue 32 September 2020, Bulletin No. 125.
15 Joel Schmitigal and Jill Bramer, Field Evaluation of Particle Counter Technology for Aviation Fuel Contamination Detection, US Army TARDEC, Technical Report 23966, (June 2013)