Results of Proficiency Test
Biogasoline E10
June 2020

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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Report: iis20B04

October 2020

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1 INTRODUCTION

Since 2009 a proficiency test for Biogasoline E10 is organized by the Institute for Interlaboratory Studies (iis) every year. During the annual proficiency testing program 2019/2020 it was decided to continue the round robin for the analysis of Biogasoline E10 in accordance with the latest version of EN228 and ASTM D4814.

In this interlaboratory study 58 laboratories from 21 different countries registered for participation for one or more proficiency tests:
- 57 laboratories from 21 different countries for the Regular proficiency test,
- 49 participants from 19 different countries for the DVPE proficiency test and
- 30 participants from 17 different countries for the RON/MON proficiency tests.

See appendix 5 for the number of participants per country. In this report the results of the Biogasoline E10 proficiency test are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory. It was decided, depending on the registration, to send the following samples of Biogasoline E10: 1x 1L labelled #20080 for the regular round and/or 1x 1L bottle at 75% filled labelled #20081 for DVPE only and/or 2x 1L bottle labelled #20081 for RON/MON only. Participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

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

2.2 PROTOCOL

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

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

A batch of approximately 200 L of Biogasoline E10 was purchased from a local petrol supplier. After homogenization 180 amber glass bottles of 1L were filled. For the regular round 80 bottles were labelled #20080 and for the RON/MON round 100 bottles were labelled #20082.
The homogeneity of subsamples #20080 and #20082 was checked by determination of Density at 15°C in accordance with ISO12185 on 7 stratified randomly selected subsamples.

	Density at 15°C in kg/m^3
Sample 1	727.81
Sample 2	728.04
Sample 3	727.86
Sample 4	727.87
Sample 5	727.84
Sample 6	727.81
Sample 7	727.95

Table 1: homogeneity test results of subsamples #20080 and #20082

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)	0.24
reference test method	ISO12185:96
0.3 x R (reference test method)	0.45

Table 2: evaluation of the repeatability of subsamples #20080 and #20082

The calculated repeatability was in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples #20080 and #20082 was assumed.

For the DVPE round a batch of approximately 60 L of Biogasoline E10 was used from material obtained of previous proficiency tests. After homogenization 80 bottles of 1L were 75% filled and labelled #20081.
The homogeneity of subsamples was checked by determination of Dry Vapour Pressure Equivalent in accordance with ASTM D5191 on 8 stratified randomly selected subsamples.

	DVPE in psi
Sample #20081-1	12.05
Sample #20081-2	12.05
Sample #20081-3	12.10
Sample #20081-4	12.14
Sample #20081-5	12.08
Sample #20081-6	12.08
Sample #20081-7	12.08
Sample #20081-8	12.02

Table 3: homogeneity test results of subsamples #20081

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.

	DVPE in psi
r (observed)	0.10
reference test method	D5191:20
0.3 x R (reference test method)	0.11

Table 4: evaluation of the repeatability of subsamples #20081

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

Depending on the registration of the participant the appropriate set of PT samples was sent on May 20, 2020. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

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

2.6 ANALYZES

The participants were requested to determine on sample #20080: API Gravity, Aromatics (by FIA and GC), Benzene, Copper Corrosion 3 hrs at 50°C, Density at 15°C, Distillation at 760 mmHg, Doctor test, Gum (solvent washed), Lead as Pb, Manganese as Mn, Mercaptan Sulfur as S, Olefins (by FIA and GC), Oxidation Stability, Oxygenates, Oxygen content and Sulfur. Also, some extra questions were asked about distillation and FIA determination.

On sample #20081 the participants were requested to determine TVP and to calculate DVPE only (in accordance with ASTM D5191 and EPA requirements). The formulas were given in the letter of instruction. The participants were requested to determine RON and MON on sample #20082 (EN228 correction not applied).

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

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

3 RESULTS

During five weeks after sample dispatch, the test results of the participants 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 original test results are placed under 'Remarks' in the test 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.

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

For each assigned value the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. 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 was projected over the Kernel Density Graph for reference.

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ASTM, EN or ISO reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation of 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. In some cases, a reproducibility based on former iis proficiency tests could be used.
When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test result is fit-for-use.

The z-scores were calculated according to:

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

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

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

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

4 EVALUATION

In this interlaboratory study some problems were encountered with the dispatch of the samples due to the COVID-19 pandemic. Therefore, the reporting deadline was extended with one week. When considering the three rounds together four participants did not report any test results and two other participants reported test results after the reporting deadline. Not all participants were able to report all tests requested. Finally, 54 reporting laboratories submitted 960 numerical test results. Observed were 53 outlying test results, which is 5.5%. 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 reported test results in appendix 1. The abbreviations, used in these tables, are explained in appendix 6.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D3831) and an added designation for the year that the test method was adopted or revised (e.g. D3831:12). If applicable, a designation in the parentheses is added to designate the year of reapproval (e.g. D3831:12(2017)). In the test results tables of appendix 1 only the test method number and year of adoption or revision will be used (e.g. D3831:12).

Sample #20080

API gravity: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D4052:18a.

Aromatics by FIA: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D1319:20a.
The laboratories were requested to report the lot number of the Fluorescent Indicator Dyed Gel used for the test. Only one of the reporting participants used a suspect indicator batch, but no negative effect on the determination of this participant was observed.

Aromatics by GC: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ISO22854:16 as well as in agreement with the requirements of ASTM D5769:15.

Benzene: This determination was problematic for a number of participants. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ISO22854:16 procedure A as well as in agreement with the requirements of ASTM D3606:20e1.

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

Density at 15°C: 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 ISO12185:96.

Distillation at 760 mmHg: This determination may be problematic for a number of laboratories. In total, over eight distillation parameters, twenty-five statistical outliers were observed and four other test results were excluded. However, most calculated reproducibilities after rejection of the suspect data are in agreement with the requirements of ASTM D86:20a automated mode, except for temperature at 50% evaporated and % evaporated at 70°C and 100°C. All parameters with known requirements are in agreement with ASTM D86:20a manual mode.
Details were asked about the distillation equipment, see appendix 4 for the reported analytical details. Based on this information no effect of the different devices could be observed on the test results.

Doctor test: This determination was not problematic. All reporting participants agreed on a test result of “Negative”.

Gum (solvent washed): 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.

Lead as Pb: This determination may not be problematic. All reporting participants agreed on a Lead concentration below the application range of 2.5 mg/L of ASTM D3237:17. Therefore, no z-scores were calculated.

Manganese as Mn: This determination may not be problematic. All reporting participants agreed on a Manganese concentration <2 mg/L. Therefore, no z-scores were calculated.

Mercaptans Sulfur: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D3227:16.

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

Olefins by GC: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO22854:16.

Oxidation Stability: This determination was not problematic. All reporting participants agreed on an Oxidation Stability >360 minutes.

Ethanol: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ISO22854:16.

MTBE: 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 ISO22854:16.

Ethers (C5) only: 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 ISO22854:16.

Ethers (C5 or more C): This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO22854:16.

Ethers (C6 or more C): This determination may not be problematic. The concentration of the ethers “C6 or more C atoms” was near the application range of ISO22854:16. Therefore, no z-scores were calculated.

Other oxygenates: The concentration of the other oxygenates were near or below the application range of ISO22854:16. Therefore, no z-scores were calculated. The reported test results are tabulated in appendix 2.

Oxygen: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO22854:16.

Sulfur: 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 ISO20846:19.

Sample #20081

TVP: 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 D5191:20 but not with the stricter requirements of EN13016-1:18.

DVPE (ASTM D5191): The conversion of the measured Total Vapour Pressure (TVP) to the corresponding Dry Vapour Pressure Equivalent (DVPE) as described in the ASTM D5191 was not problematic. Two statistical outliers were observed and one calculation error. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5191:20 but not with the stricter requirements of EN13016-1:18.

DVPE (EPA calculation): The conversion of the measured Total Vapour Pressure (TVP) to the corresponding U.S. EPA guidelines (40 CFR Part 80, App. E, Method 3) was not problematic. Two statistical outliers were observed and one calculation error. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5191:20 but not with the stricter requirements of EN13016-1:18.

Sample #20082

RON: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D2699:19.

MON: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements of ASTM D2700:19.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant 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, EN and ISO test methods) are presented in the next three tables.

Parameter	unit	n	average	2.8 * sd	R(lit)
API gravity		24	62.75	0.34	0.70
Aromatics by FIA	%V/V	14	21.2	3.1	3.7
Aromatics by GC	%V/V	32	19.7	0.9	1.0
Benzene	%V/V	38	0.89	0.04	0.04
Copper corrosion 3 hrs at 50°C		31	1 (1a)	n.a.	n.a.
Density at 15°C	kg/m^3	51	728.0	1.0	1.5
Initial Boiling Point	°C	47	29.2	5.2	4.7
10% evaporated	°C	47	46.4	3.0	3.7
50% evaporated	°C	46	76.7	5.0	3.8
90% evaporated	°C	44	125.5	3.2	5.4
Final Boiling Point	°C	47	158.1	4.9	7.1
%Evaporated at 70°C	%V/V	42	46.5	2.8	2.1
%Evaporated at 100°C	%V/V	45	60.1	2.3	1.8
%Evaporated at 150°C	%V/V	37	97.8	0.6	1.0
Doctor test		22	Negative	n.a.	n.a.
Gum (solvent washed)	mg/100mL	16	0.5	1.3	2.0
Lead as Pb	mg/L	28	<2.5	n.a.	n.a.
Manganese as Mn	mg/L	24	<2	n.a.	n.a.
Mercaptans Sulfur as S	%M/M	9	0.0001	0.0001	0.0003
Olefins by FIA	%V/V	14	12.2	3.2	3.7
Olefins by GC	%V/V	26	12.0	0.7	1.9
Oxidation Stability	minutes	23	>360	n.a.	n.a.
Ethanol	%V/V	43	9.8	0.6	0.6
MTBE	%V/V	18	0.04	0.10	0.35
Ethers C5	%V/V	8	0.03	0.01	0.35
Ethers C5 or more C atoms	%V/V	9	0.05	0.07	0.35
Oxygen content	%M/M	38	3.7	0.3	0.3
Sulfur	mg/kg	42	4.3	1.2	1.7

Table 5 reproducibilities of tests on sample #20080

Parameter	unit	n	average	2.8 * sd	R(lit)
TVP acc.to ASTM D5191	psi	38	13.04	0.28	0.37
DVPE acc.to ASTM D5191	psi	43	12.04	0.27	0.36
DVPE acc.to EPA	psi	24	12.11	0.27	0.36

Table 6: reproducibilities of tests on sample #20081

Parameter	unit	n	average	2.8 * sd	R(lit)
RON		24	95.9	0.8	0.7
MON		24	85.5	1.0	0.9

Table 7: reproducibilities of tests on sample #20082

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF JUNE 2020 WITH PREVIOUS PTS

	June 2020	May 2019	May 2018	May 2017	May 2016
Number of reporting laboratories	54	50	53	52	54
Number of test results	960	918	1032	967	1073
Number of statistical outliers	53	31	45	51	31
Percentage of statistical outliers	5.5%	3.4%	4.4%	5.3%	2.9%

Table 8: comparison with previous proficiency tests

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

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

Determination	June 2020	May 2019	May 2018	May 2017	May 2016
API gravity	++	+	++	++	++
Aromatics by FIA	+	+	-	-	+/-
Aromatics by GC	+/-	-	-	-	+/-
Benzene	+/-	-	+/-	-	-
Density at 15°C	+	+	+	++	++
Distillation at 760 mmHg	+	+	+/-	+/-	+/-
Gum (solvent washed)	+	+	+	+	+
Mercaptans as S	++	+/-	+/-	+/-	n.e.
Olefins by FIA	+	+/-	+/-	-	+/-
Olefins by GC	++	++	+	++	+
Ethanol	+/-	+/-	-	+/-	+/-

Determination	June 2020	May 2019	May 2018	May 2017	May 2016
MTBE	++	-	++	+/-	+/-
Ethers	++	+	+/-	-	n.e.
Oxygen content	+	+/-	+/-	+/-	+/-
Sulfur	+	+	+/-	+/-	+/-
TVP acc.to ASTM D5191	+	+/-	+	+	+
DVPE acc.to ASTM D5191	+	+/-	+	+	+
DVPE acc.to EPA	+	+/-	+	+	+
RON	-	-	+/-	-	+/-
MON	+/-	-	+/-	+	+/-

Table 9: comparison determinations against the reference test method.

The following performance categories were used:

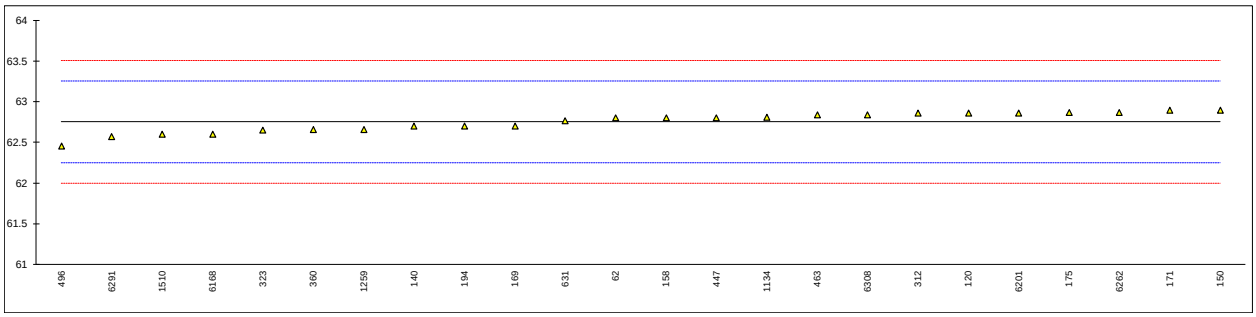
++ : group performed much better than the reference test method
+ : group performed better than the reference test method
+/- : group performance equals the reference test method
- : group performed worse than the reference test method
-- : group performed much worse than the reference test method
n.e.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

APPENDIX 1

Determination of API gravity on sample #20080;

lab	method	value	mark	z(targ)	remarks
62	D4052	62.8		0.19	
120	D4052	62.86		0.43	
140	D4052	62.7		-0.21	
150	D4052	62.9		0.58	
158	D4052	62.8		0.19	
159		-----		-----	
169	D4052	62.7		-0.21	
171	D4052	62.9		0.58	
175	D4052	62.87		0.47	
194	D4052	62.7		-0.21	
311		-----		-----	
312	D4052	62.86		0.43	
323	D4052	62.65		-0.41	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D4052	62.66		-0.37	
381		-----		-----	
447	D4052	62.8		0.19	
463	ISO12185	62.84		0.35	
496	D4052	62.46		-1.17	
511		-----		-----	
541		-----		-----	
631	D4052	62.77		0.07	
1033		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134	D4052	62.81		0.23	
1191		-----		-----	
1205		-----		-----	
1229		-----		-----	
1259	ISO12185	62.66		-0.37	
1299		-----		-----	
1320		-----		-----	
1397		-----		-----	
1443		-----		-----	
1459		-----		-----	
1510	D4052	62.60		-0.61	
1549		-----		-----	
1550		-----		-----	
1554		-----		-----	
1556		-----		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807		-----		-----	
1810		-----		-----	
2146		-----		-----	
6142		-----		-----	
6168	D4052	62.6		-0.61	
6201	D4052	62.86		0.43	
6262	D4052	62.87		0.47	
6291	D4052	62.57		-0.73	
6308	D4052	62.841		0.35	

normality	OK
n	24
outliers	0
mean (n)	62.753
st.dev. (n)	0.1203
R(calc.)	0.337
st.dev.(D4052:18a)	0.2507
R(D4052:18a)	0.702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62.5
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61.5
61
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6291
1510
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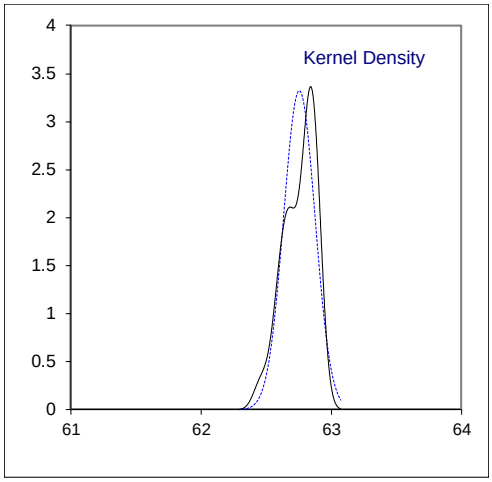
312
120
6201
175
6262
171
150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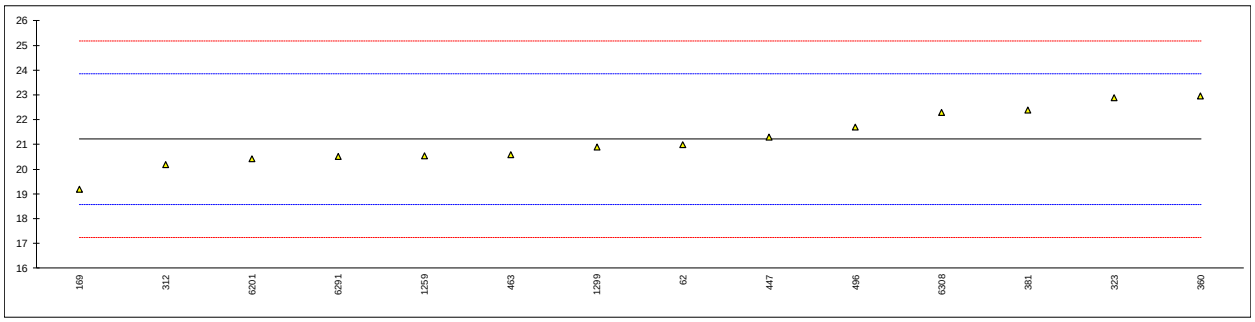
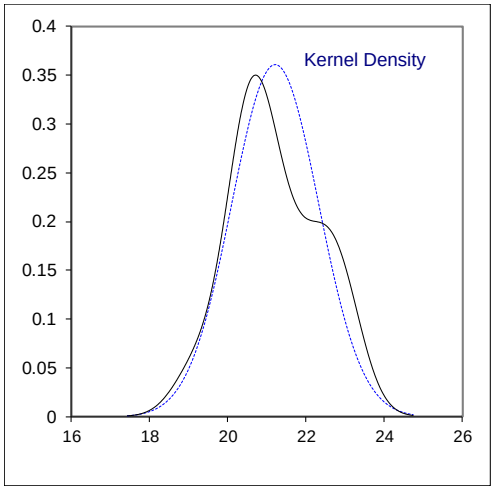
4
3.5
3
2.5
2
1.5
1
0.5
0
61
62
63
64

Determination of Aromatics by FIA (without oxygenates correction) on sample #20080; results in %V/V

lab	method	value	mark	z(targ)	lot nr	remarks
62	D1319	21		-0.16	-----	
120		-----		-----	-----	
140		-----		-----	-----	
150		-----		-----	-----	
158		-----		-----	-----	
159		-----		-----	-----	
169	D1319	19.2		-1.52	3000000892	
171		-----		-----	-----	
175		-----		-----	-----	
194		-----		-----	-----	
311		-----		-----	-----	
312	EN15553	20.2		-0.77	-----	
323	D1319	22.9		1.28	3000000970	
333		-----		-----	-----	
334		-----		-----	-----	
335		-----		-----	-----	
336		-----		-----	-----	
337		-----		-----	-----	
338		-----		-----	-----	
360	D1319	22.97		1.33	3000000986	
381	EN15553	22.4		0.90	#962	
447	D1319	21.3		0.07	N1103	
463	D1319	20.59		-0.47	3000000870	
496	D1319	21.70		0.37	3000000901	
511		-----		-----	-----	
541		-----		-----	-----	
631		-----		-----	-----	
1033		-----		-----	-----	
1126		-----		-----	-----	
1131		-----		-----	-----	
1134		-----		-----	-----	
1191		-----		-----	-----	
1205		-----		-----	-----	
1229		-----		-----	-----	
1259	EN15553	20.55		-0.50	3000000895	
1299	D1319	20.9		-0.24	-----	
1320		-----		-----	-----	
1397		-----		-----	-----	
1443		-----		-----	-----	
1459		-----		-----	-----	
1510		-----		-----	-----	
1549		-----		-----	-----	
1550		-----		-----	-----	
1554		-----		-----	-----	
1556		-----		-----	-----	
1656		-----		-----	-----	
1706		-----		-----	-----	
1776		-----		-----	-----	
1807		-----		-----	-----	
1810		-----		-----	-----	
2146		-----		-----	-----	
6142		-----		-----	-----	
6168		-----		-----	-----	
6201	D1319	20.42		-0.60	-----	
6262		-----		-----	-----	
6291	D1319	20.53		-0.52	-----	
6308	D1319	22.3		0.82	3000000859	

normality	OK
n	14
outliers	0
mean (n)	21.211
st.dev. (n)	1.1064
R(calc.)	3.098
st.dev.(D1319:20a)	1.3214
R(D1319:20a)	3.7

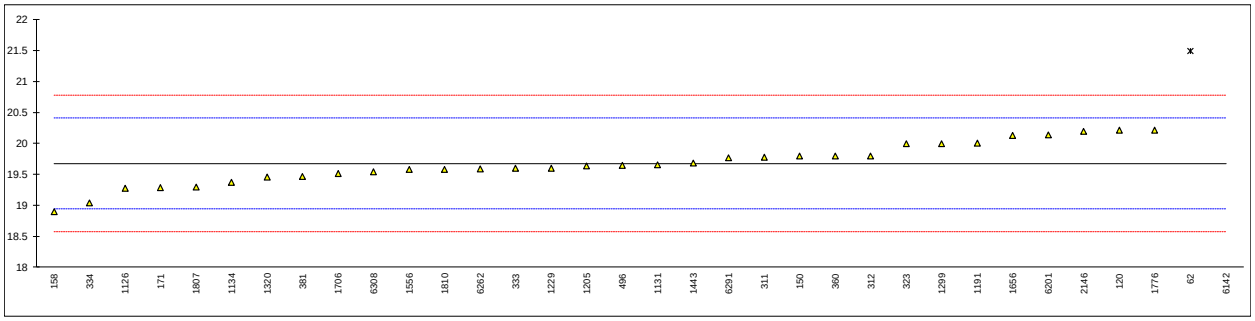

26
25
24
23
22
21
20
19
18
17
16
169
312
6201
6291
1259
463
1299
62
447
496
6308
381
323
360

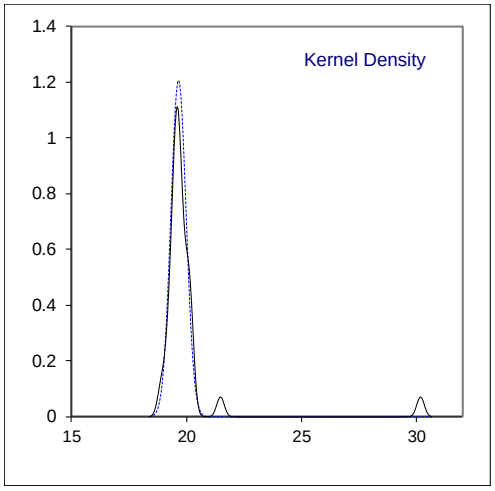

Kernel Density
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
16
18
20
22
24
26

Determination of Aromatics by GC on sample #20080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62	INH-14.3	21.50	C,R(0.01)	4.95	first reported 20.81
120	D5769	20.22		1.48	
140		-----		-----	
150	D5769	19.8		0.34	
158	D5769	18.9	C	-2.11	first reported 18.6
159		-----		-----	
169		-----		-----	
171	D5769	19.29		-1.05	
175		-----		-----	
194		-----		-----	
311	ISO22854-A	19.78		0.28	
312	ISO22854-A	19.8		0.34	
323	ISO22854-A	20.0		0.88	
333	ISO22854-A	19.6		-0.21	
334	ISO22854-A	19.04		-1.73	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854-A	19.80		0.34	
381	ISO22854-A	19.47		-0.56	
447		-----		-----	
463		-----		-----	
496	ISO22854-A	19.65		-0.07	
511		-----		-----	
541		-----		-----	
631		-----		-----	
1033		-----		-----	
1126	ISO22854-A	19.28		-1.07	
1131	ISO22854-A	19.66		-0.04	
1134	ISO22854-A	19.37		-0.83	
1191	ISO22854-A	20.01		0.91	
1205		19.638		-0.10	
1229	ISO22854-A	19.6		-0.21	
1259		-----		-----	
1299	ISO22854-A	20.0		0.88	
1320	ISO22854-A	19.46		-0.59	
1397		-----		-----	
1443	ISO22854-A	19.69		0.04	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1554		-----		-----	
1556	ISO22854-A	19.58		-0.26	
1656	ISO22854-B	20.13		1.23	
1706	ISO22854-A	19.517		-0.43	
1776	ISO22854-A	20.22		1.48	
1807	ISO22854-A	19.3		-1.02	
1810	ISO22854-A	19.58		-0.26	
2146	ISO22854-A	20.2		1.42	
6142	ISO22854-A	30.195	R(0.01)	28.55	
6168		-----		-----	
6201	ISO22854-A	20.14		1.26	
6262	ISO22854-A	19.59		-0.23	
6291	ISO22854-A	19.77		0.26	
6308	ISO22854-A	19.54		-0.37	

	normality	OK
	n	32
	outliers	2
	mean (n)	19.676
	st.dev. (n)	0.3310
	R(calc.)	0.927
	st.dev.(ISO22854:16)	0.3685
	R(ISO22854:16)	1.032
Compare:		
	R(D5769:15)	2.279

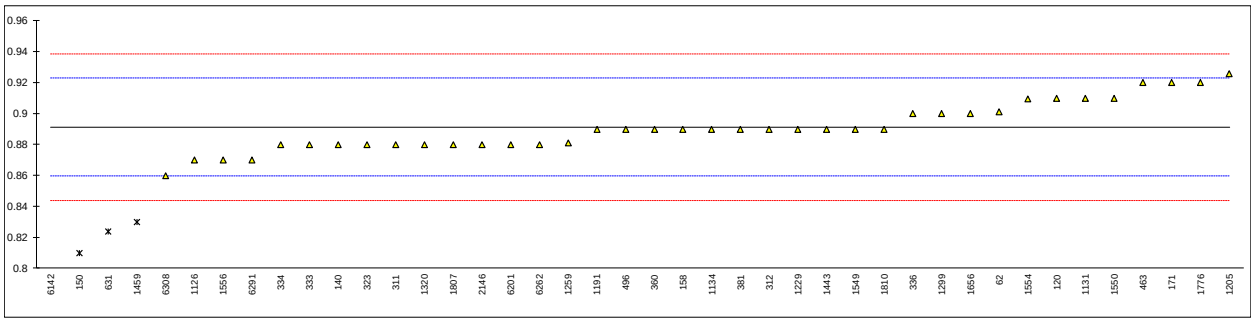

22
21.5
21
20.5
20
19.5
19
18.5
18
158
334
1126
171
1807
1134
1320
381
1706
6308
1556
1810
6262
333
1229
1205
496
1131
1443
6291
311
150
360
312
323
1299
1191
1656
6201
2146
120
1776
62
6142

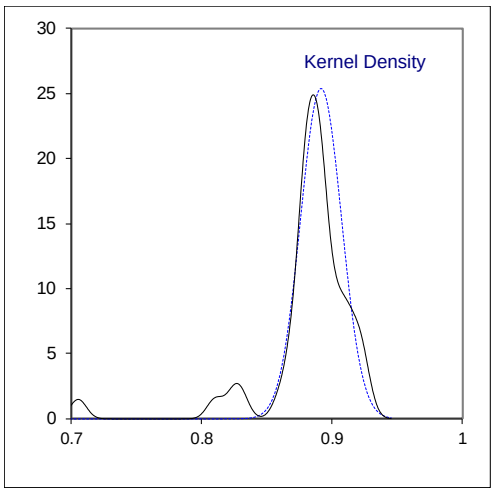

Kernel Density
1.4
1.2
1
0.8
0.6
0.4
0.2
0
15
20
25
30

Determination of Benzene on sample #20080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62	INH-14.3	0.901		0.62	
120	D3606	0.91	C	1.19	first reported 0.84
140	D3606	0.88		-0.71	
150	D3606	0.81	C,R(0.05)	-5.14	first reported 0.83
158	D3606	0.89		-0.08	
159		-----		-----	
169		-----		-----	
171	D3606	0.92		1.82	
175		-----		-----	
194		-----		-----	
311	ISO22854-A	0.88		-0.71	
312	ISO22854-A	0.89		-0.08	
323	ISO22854-A	0.88		-0.71	
333	ISO22854-A	0.88		-0.71	
334	ISO22854-A	0.88		-0.71	
335		-----		-----	
336	EN238	0.9		0.55	
337		-----		-----	
338		-----		-----	
360	EN12177	0.89		-0.08	
381	ISO22854-A	0.89		-0.08	
447		-----		-----	
463	EN238	0.92		1.82	
496	ISO22854-A	0.890		-0.08	
511		-----		-----	
541		-----		-----	
631	D6277	0.824	R(0.05)	-4.26	
1033		-----		-----	
1126	ISO22854-A	0.87		-1.34	
1131	ISO22854-A	0.91		1.19	
1134	ISO22854-A	0.89		-0.08	
1191	ISO22854-A	0.89		-0.08	
1205		0.926		2.20	
1229	ISO22854-A	0.89		-0.08	
1259	EN12177	0.881		-0.65	
1299	ISO22854-A	0.90		0.55	
1320	ISO22854-A	0.88		-0.71	
1397		-----		-----	
1443	ISO22854-A	0.89		-0.08	
1459	ISO22854-A	0.83	R(0.05)	-3.88	
1510		-----		-----	
1549	D6277	0.89		-0.08	
1550	D6277	0.91		1.19	
1554	EN12177	0.9097		1.17	
1556	ISO22854-A	0.87		-1.34	
1656	ISO22854-B	0.90		0.55	
1706		-----		-----	
1776	ISO22854-A	0.92		1.82	
1807	ISO22854-A	0.88		-0.71	
1810	ISO22854-A	0.89		-0.08	
2146	ISO22854-A	0.88		-0.71	
6142	ISO22854-A	0.705	R(0.01)	-11.79	
6168		-----		-----	
6201	ISO22854-A	0.88		-0.71	
6262	ISO22854-A	0.88		-0.71	
6291	ISO22854-A	0.87		-1.34	
6308	ISO22854-A	0.86		-1.98	

	normality	OK
	n	38
	outliers	4
	mean (n)	0.891
	st.dev. (n)	0.0157
	R(calc.)	0.044
	st.dev.(ISO22854-A:16)	0.0158
	R(ISO22854-A:16)	0.044
Compare:		
	R(D3606:20e1)	0.166


0.96
0.94
0.92
0.9
0.88
0.86
0.84
0.82
0.8
6142 150 631 1459 6308 1126 1556 6291 334 333 140 323 311 1320 1807 2146 6201 6262 1259 1191 496 360 158 1134 381 312 1229 1443 1549 1810 336 1299 1656 62 1554 120 1131 1550 463 171 1776 1205


Kernel Density
30
25
20
15
10
5
0
0.7
0.8
0.9
1

Determination of Copper corrosion 3 hrs at 50°C on sample #20080

lab	method	value	mark	z(targ)	remarks
62	D130	1a		-----	
120	D130	1A		-----	
140	D130	1a		-----	
150	D130	1a		-----	
158	D130	1a		-----	
159		-----		-----	
169	D130	1a		-----	
171	D130	1a		-----	
175		-----		-----	
194		-----		-----	
311	D130	1A		-----	
312	D130	1a		-----	
323	D130	1A		-----	
333		-----		-----	
334	ISO2160	1A		-----	
335	D130	1a		-----	
336	D130	1		-----	
337		-----		-----	
338		-----		-----	
360	D130	1A		-----	
381		-----		-----	
447	D130	1a		-----	
463	D130	1A		-----	
496	ISO2160	1a		-----	
511		-----		-----	
541		-----		-----	
631	D130	1a		-----	
1033		-----		-----	
1126		-----		-----	
1131	ISO2160	1a		-----	
1134		-----		-----	
1191		-----		-----	
1205		-----		-----	
1229		-----		-----	
1259		-----		-----	
1299	D130	1A		-----	
1320	D130	1a		-----	
1397		-----		-----	
1443	ISO2160	1a		-----	
1459		-----		-----	
1510	D130	1a		-----	
1549		-----		-----	
1550		-----		-----	
1554	ISO2160	1a		-----	
1556	ISO2160	class 1a		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807	D130	1a		-----	
1810		-----		-----	
2146		-----		-----	
6142		-----		-----	
6168	D130	1a		-----	
6201	D130	1A		-----	
6262	D130	1A		-----	
6291	D130	1A		-----	
6308	D130	1a		-----	
	n	31			
	mean (n)	1 (1a)			

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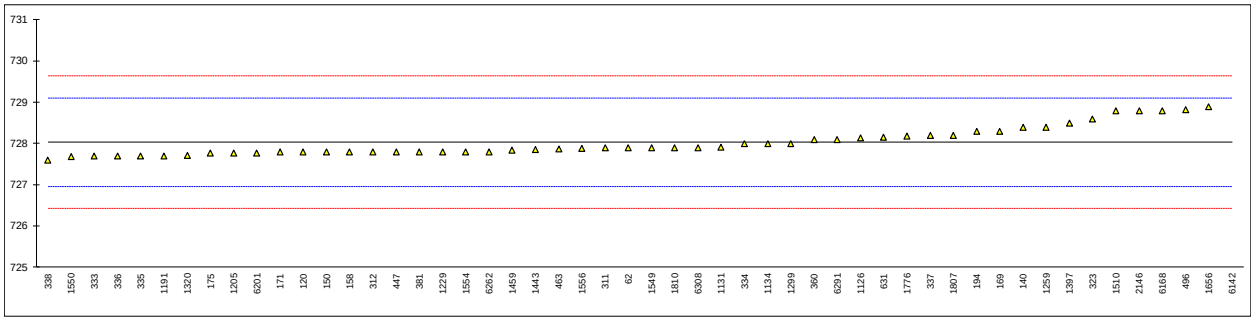
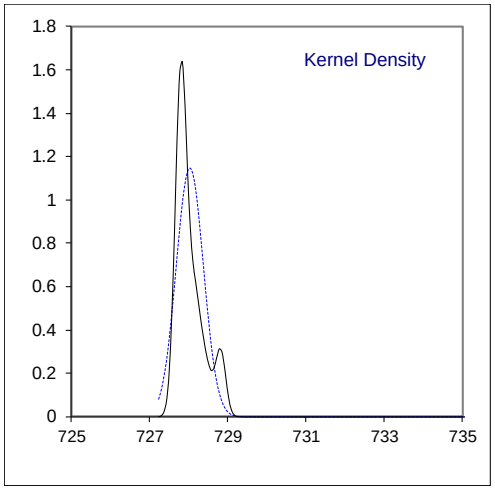
Determination of Density at 15°C on sample #20080; results in kg/m³

lab	method	value	mark	z(targ)	remarks
62	D4052	727.9		-0.25	
120	D4052	727.8		-0.43	
140	D4052	728.4		0.69	
150	D4052	727.8		-0.43	
158	D4052	727.8		-0.43	
159		-----		-----	
169	D4052	728.3		0.50	
171	D4052	727.8		-0.43	
175	D4052	727.77		-0.49	
194	D4052	728.3		0.50	
311	D4052	727.9		-0.25	
312	ISO12185	727.8		-0.43	
323	ISO12185	728.6		1.06	
333	ISO12185	727.7		-0.62	
334	ISO12185	728.0		-0.06	
335	ISO12185	727.7		-0.62	
336	ISO12185	727.7		-0.62	
337	ISO12185	728.2		0.31	
338	ISO12185	727.6		-0.81	
360	ISO12185	728.1		0.13	
381	ISO12185	727.80		-0.43	
447	D4052	727.8		-0.43	
463	ISO12185	727.87		-0.30	
496	ISO12185	728.82		1.47	
511		-----		-----	
541		-----		-----	
631	D4052	728.15		0.22	
1033		-----		-----	
1126	ISO12185	728.14		0.20	
1131	ISO12185	727.91		-0.23	
1134	IP365	728.0		-0.06	
1191	ISO12185	727.7		-0.62	
1205	ISO12185	727.77		-0.49	
1229	ISO12185	727.8		-0.43	
1259	ISO12185	728.4		0.69	
1299	D4052	728.0		-0.06	
1320	ISO12185	727.71		-0.60	
1397	D4052	728.5		0.87	
1443	ISO12185	727.85		-0.34	
1459	ISO12185	727.84		-0.36	
1510	ISO12185	728.8		1.43	
1549	ISO12185	727.90		-0.25	
1550	ISO12185	727.68		-0.66	
1554	ISO12185	727.8		-0.43	
1556	ISO12185	727.89		-0.27	
1656	ISO12185	728.9		1.62	
1706		-----		-----	
1776	ISO12185	728.18		0.28	
1807	ISO12185	728.2		0.31	
1810	ISO12185	727.9		-0.25	
2146	ISO12185	728.8		1.43	
6142	ISO12185	744.05	R(0.01)	29.90	
6168	D4052	728.8		1.43	
6201	ISO12185	727.77		-0.49	
6262	D4052	727.8		-0.43	
6291	ISO12185	728.1		0.13	
6308	ISO12185	727.9		-0.25	

normality	suspect
n	51
outliers	1
mean (n)	728.032
st.dev. (n)	0.3474
R(calc.)	0.973
st.dev.(ISO12185:96)	0.5357
R(ISO12185:96)	1.5

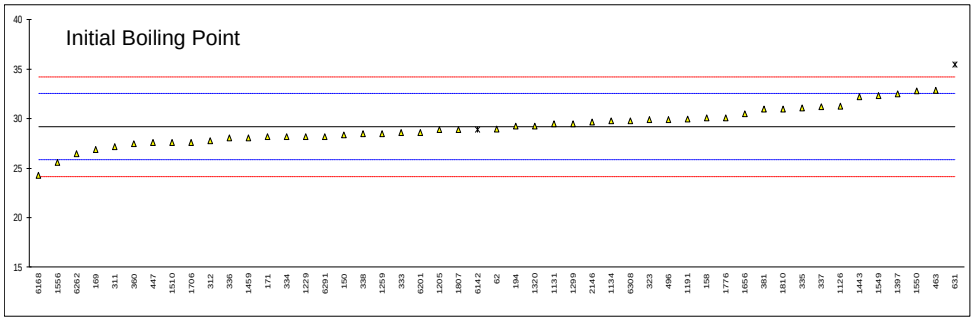

731
730
729
728
727
726
725
338 1550 333 336 335 1191 1320 175 1205 6201 171 120 150 158 312 447 381 1229 1554 6262 1459 1443 463 1556 311 62 1549 1810 6308 1131 334 1134 1299 360 6291 1126 631 1776 337 1907 194 169 140 1259 1397 323 1510 2146 6168 496 1656 6142

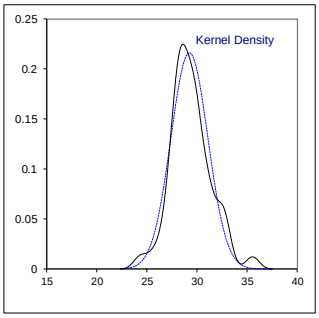

Kernel Density
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
725 727 729 731 733 735

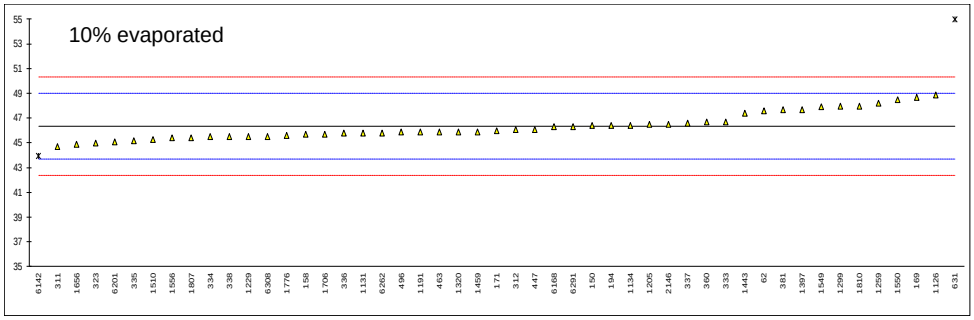
Determination of Distillation at 760 mmHg on sample #20080; results in °C

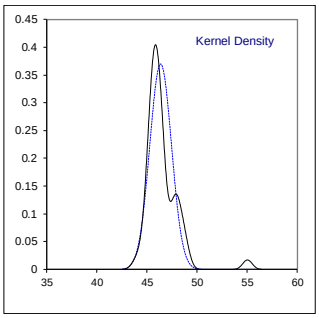
lab	method	IBP	mark	10% eva	mark	50% eva	mark	90% eva	mark	FBP	mark
62	D86-A	29.0		47.6		77.5		125.1		158.3	
120		-----		-----		-----		-----		-----	
140		-----		-----		-----		-----		-----	
150	D86-A	28.4		46.4		76.4		125.3		158.6	
158	D86-A	30.1	C	45.7	C	79.2	C	126.8	C	155.8	C
159		-----		-----		-----		-----		-----	
169	D86-A	26.9		48.7		79.2		124.5		157.7	
171	D86-A	28.2		46.0		76.6		124.7		154.7	
175		-----		-----		-----		-----		-----	
194	D86-A	29.3		46.4		77.2		126.1		160.2	
311	D86-A	27.2		44.7		74.9		125.1		159.6	
312	D86-A	27.8		46.1		76.0		125.8		158.7	
323	D86-A	29.9		45.0		75.9		125.9		157.0	
333	D86-A	28.6		46.7		78.2		125.6		159.5	
334	D86-A	28.2		45.5		75.9		124.9		154.6	
335	D86-A	31.1		45.2		75.9		125.3		151.5	R(0.01)
336	D86-A	28.1		45.8		77.1		125.1		157.2	
337	D86-A	31.2		46.6		77.2		124.9		158.6	
338	ISO3405-A	28.5		45.5		75.2		125.4		160.0	
360	ISO3405-A	27.5		46.7		76.9		125.5		154.9	
381	ISO3405-A	31.0		47.7		78.7		124.8		158.6	
447	D86-A	27.6		46.1		77.4		125.0		159.8	
463	D86-A	32.9		45.9		74.3		125.9		155.9	
496	D86-A	29.9		45.9		77.0		125.0		157.9	
511		-----		-----		-----		-----		-----	
541		-----		-----		-----		-----		-----	
631	D86	35.5	ex	55.0	R(0.01)	100.0	R(0.01)	150.0	R(0.01)	165.5	R(0.01)
1033		-----		-----		-----		-----		-----	
1126		31.3		48.9		73.3		125.2		161.9	
1131	ISO3405-A	29.5		45.8		76.1		125.5		158.8	
1134	IP123-A	29.8		46.4		77.6		125.7		158.1	
1191	ISO3405-A	30.0		45.9		75.4		125.3		160.2	
1205	D86-A	28.9		46.5		76.6		125.4		159.0	
1229	ISO3405-A	28.2		45.5		75.5		124.7		157.9	
1259	D86-A	28.5		48.2		77	C	129.9		158.7	
1299	D86-A	29.5		48.0		83.2	R(0.05)	129.0		159.9	
1320	D86-A	29.3		45.9		76.6		125.1		159.2	
1397		32.5		47.7		77.1		125.1		160.9	
1443	ISO3405-A	32.22		47.39		78.88		130.14	R(0.05)	158.20	
1459	D86-A	28.1		45.9		75.5		125.0		157.2	
1510		27.6		45.3		75.9		125.5		159.3	
1549	ISO3405-A	32.37		47.93		81.16		130.62	R(0.05)	157.52	
1550	ISO3405-A	32.82		48.52		80.76		131.05	R(0.05)	157.95	
1554		-----		-----		-----		-----		157.7	
1556		25.6		45.4		76.0		125.2		159.0	
1656	ISO3405-A	30.5		44.9		74.7		124.9		159.0	
1706		27.6		45.7		75.2		124.5		159.7	
1776	ISO3405-A	30.1		45.6		76.0		124.7		156.0	
1807	ISO3405-A	28.9		45.4		78.0		126.4	C	158.7	
1810	D86-A	31.0		48.0		78.8		126.0		157.9	
2146	ISO3405-A	29.7		46.5		77.2		124.7		154.9	
6142	ISO3405-A	28.9	ex	43.95	ex	69.05	R(0.05)	152.15	R(0.01)	186.55	R(0.01)
6168	D86-A	24.3		46.3		80.4		128.8		158.8	
6201	D86-A	28.6		45.1		75.4		124.9		159.3	
6262		26.5		45.8		75.6		125.5		155.1	
6291	D86-A	28.2		46.3		75.3		125.3		155.3	
6308	D86-A	29.8		45.5		72.8		124.7		155.6	
	normality	OK		OK		OK		not OK		OK	
	n	47		47		46		44		47	
	outliers	0 +2ex		1 +1ex		3		5		3	
	mean (n)	29.21		46.35		76.73		125.54		158.07	
	st.dev. (n)	1.845		1.080		1.771		1.131		1.760	
	R(calc.)	5.16		3.02		4.96		3.17		4.93	
	st.dev.(D86-A:20a)	1.679		1.327		1.344		1.940		2.536	
	R(D86-A:20a)	4.7		3.72		3.76		5.43		7.1	
Compare:											
	R(D86-M:20a)	5.6		3.65		3.72		3.63		7.2	

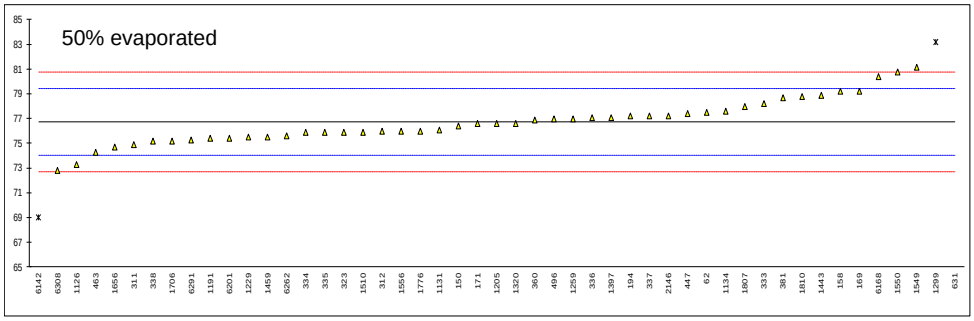
Lab 158 first reported 86.2 for IBP, 114.3 for 10% eva, 174.6 for 50% eva, 260.3 for 90% eva and 312.4 for FBP
Lab 631 test result for IBP excluded as statistical outliers at related distillation parameters
Lab 1259 first reported 85.0 for 50% eva
Lab 1807 first reported 118.9 for 90% eva
Lab 6142 test results for IBP and 10% eva excluded as statistical outliers at related distillation parameters

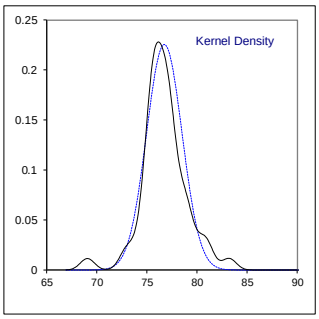

Initial Boiling Point

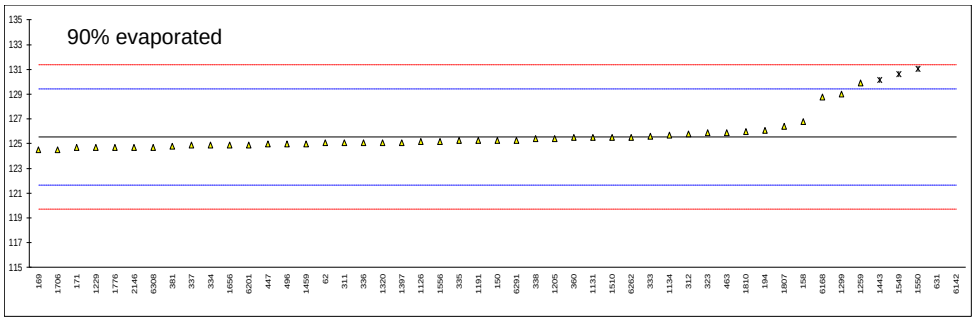

Kernel Density

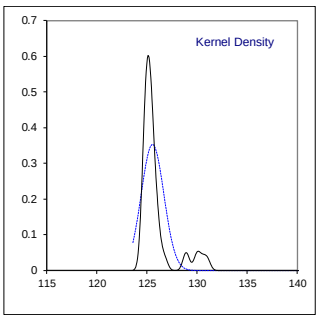

10% evaporated

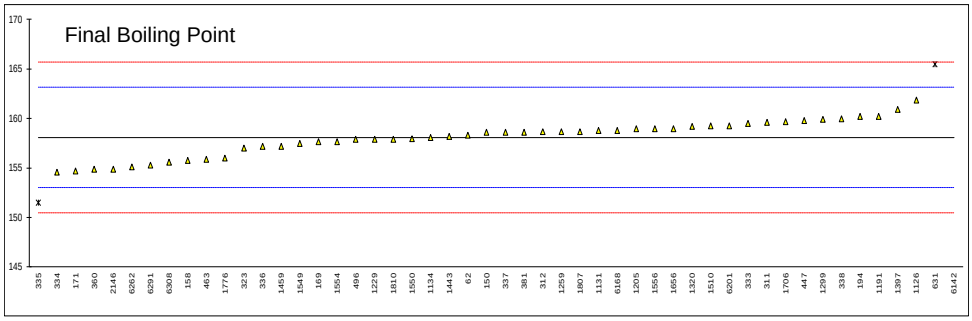

Kernel Density

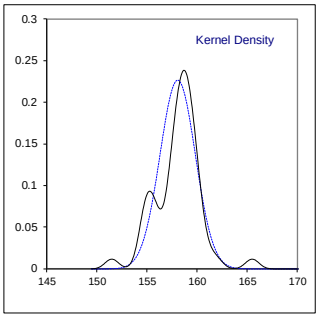

50% evaporated


Kernel Density


90% evaporated


Kernel Density

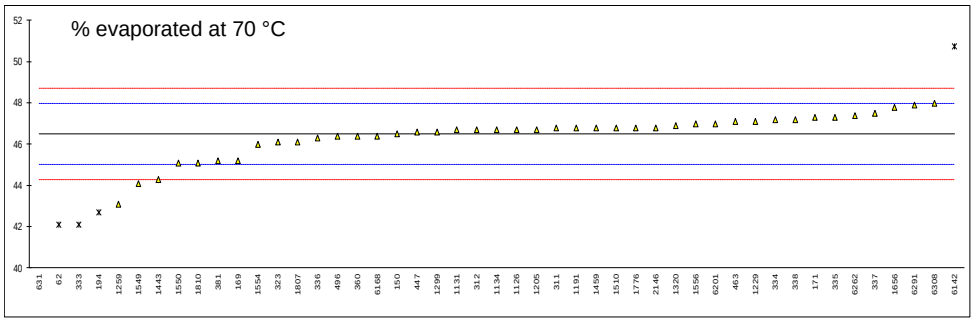

Final Boiling Point

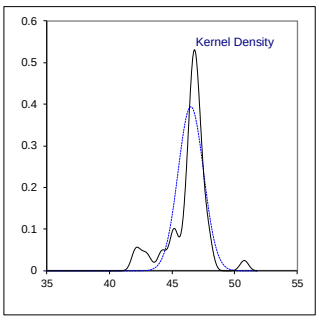

Kernel Density

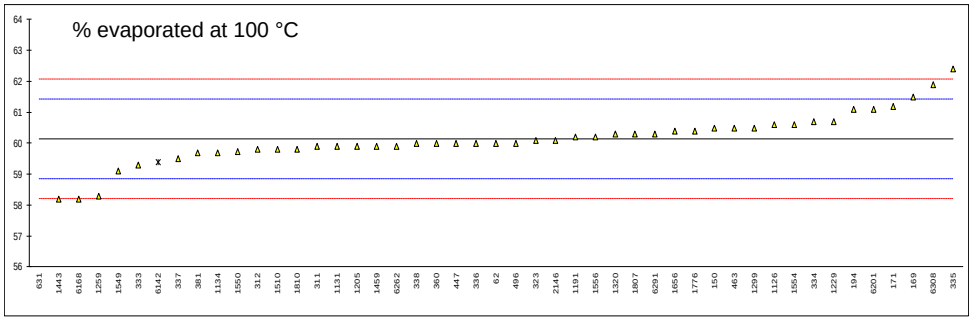
Determination of Distillation at 760 mmHg on sample #20080; results in %V/V

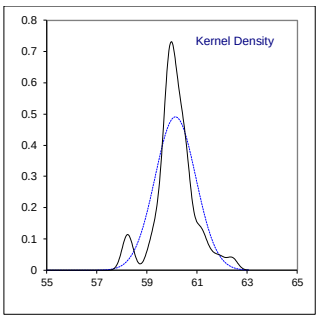
lab	method	%evap. 70°C	mark	%evap. 100°C	mark	%evap. 150°C	mark	residue	mark
62	D86-A	42.1	C,R(0.05)	60.0		97.5		0.7	
120		-----		-----		-----		-----	
140		-----		-----		-----		-----	
150	D86-A	46.5		60.5		97.8		1.0	
158		-----		-----		-----		1.0	
159		-----		-----		-----		-----	
169	D86-A	45.2	C	61.5		96.7	R(0.01)	1.0	
171	D86-A	47.3		61.2		97.9		1.2	
175		-----		-----		-----		-----	
194	D86-A	42.7	R(0.05)	61.1		-----		-----	
311	D86-A	46.8		59.9		97.7		0.9	
312	D86-A	46.7		59.8		98.0		1.0	
323	D86-A	46.1		60.1		97.6		1.0	
333	D86-A	42.1	C,R(0.05)	59.3		97.6		1.2	
334	D86-A	47.2		60.7		98.0		1.0	
335	D86-A	47.3		62.4		96.0	R(0.01)	1.0	
336	D86-A	46.3		60.0		98.1		0.8	
337	D86-A	47.5		59.5		98.2		0.8	
338	ISO3405-A	47.2		60.0		-----		1.0	
360	ISO3405-A	46.4		60.0		97.7		1.0	
381	ISO3405-A	45.2		59.7		98.8	R(0.01)	1.0	
447	D86-A	46.6		60.0		97.8		1.0	
463	D86-A	47.1		60.5		97.6	C	0.85	
496	D86-A	46.4		60.0		97.9		1.0	
511		-----		-----		-----		-----	
541		-----		-----		-----		-----	
631	D86	30	R(0.01)	50	R(0.01)	90	R(0.01)	0.5	
1033		-----		-----		-----		-----	
1126		46.7		60.6		98.2		0.2	
1131	ISO3405-A	46.7		59.9		97.7		1.0	
1134	IP123-A	46.7		59.7		97.7		1.0	
1191	ISO3405-A	46.8		60.2		97.7		0.9	
1205	D86-A	46.7		59.9		97.6		1.0	
1229	ISO3405-A	47.1		60.7		97.9		0.8	
1259	D86-A	43.1		58.3		95.5	R(0.01)	1.0	
1299	D86-A	46.6		60.5		97.9		1.0	
1320	D86-A	46.9		60.3		97.8		1.0	
1397		-----		-----		-----		-----	
1443	ISO3405-A	44.3	C	58.2		97.5		1.0	
1459	D86-A	46.8		59.9		97.8		1.0	
1510		46.8		59.8		97.7		1.0	
1549	ISO3405-A	44.1	C	59.1	C	97.3	C	1.13	
1550	ISO3405-A	45.1	C	59.73		97.70		1.0	
1554	ISO3405-A	46.0		60.6		97.8		1.0	
1556		47.0		60.2		97.8		1.0	
1656	ISO3405-A	47.8		60.4		97.9		0.9	
1706		-----		-----		-----		-----	
1776	ISO3405-A	46.8		60.4		98.0		1.0	
1807	ISO3405-A	46.1		60.3		97.2		1.6	
1810	D86-A	45.1		59.8		97.5		1.0	
2146	ISO3405-A	46.8		60.1	C	98.2	C	1.0	
6142	ISO3405-A	50.75	R(0.05)	59.4	ex	88.7	R(0.01)	-----	
6168	D86-A	46.4		58.2		96.2	R(0.01)	1.0	
6201	D86-A	47.0		61.1		97.8		1	
6262		47.4		59.9		97.8		1.0	
6291	D86-A	47.9		60.3		97.8		1.0	
6308	D86-A	48.0		61.9		-----	W	0.9	
	normality	not OK		suspect		OK			
	n	42		45		37			
	outliers	5		1 +1ex		7			
	mean (n)	46.49		60.14		97.78			
	st.dev. (n)	1.015		0.813		0.225			
	R(calc.)	2.84		2.28		0.63			
	st.dev.(D86-A:20a)	0.739		0.642		0.373			
	R(D86-A:20a)	2.07		1.80		1.04			
Compare:									
	R(D86-M:20a)	unknown		unknown		unknown			

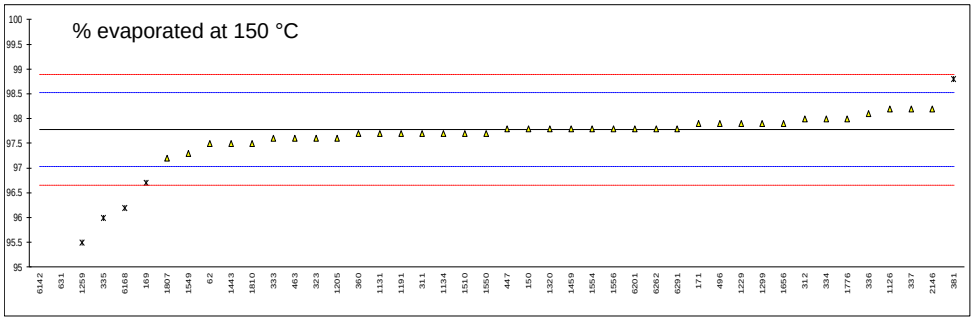
Lab 62 first reported 43.1 for % evaporated at 70 °C
Lab 169 first reported 42.2 for % evaporated at 70 °C
Lab 333 first reported 44.1 for % evaporated at 70 °C
Lab 463 first reported 95.5 for % evaporated at 150 °C
Lab 1443 first reported 41.9 for % evaporated at 70 °C
Lab 1549 first reported 42.40 for % evaporated at 70 °C, 59.00 for % evaporated at 100 °C and 95.60 for % evaporated at 150 °C
Lab 1550 first reported 42.91 for % evaporated at 70 °C
Lab 2146 first reported 58.3 for % evaporated at 100 °C and 96.4 for % evaporated at 150 °C
Lab 6142 test result for % evaporated at 100 °C excluded as statistical outliers at related distillation parameters
Lab 6308 test result withdrawn for % evaporated at 150 °C, first reported 100

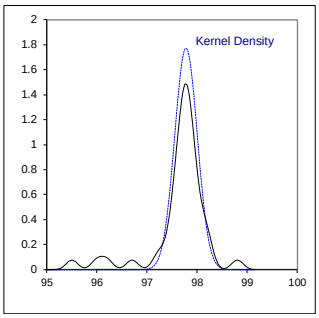












Determination of Doctor test on sample #20080

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140	D4952	Negative		-----	
150	D4952	Neg		-----	
158	D4952	Negative		-----	
159		-----		-----	
169		-----		-----	
171	D4952	Negative		-----	
175		-----		-----	
194		-----		-----	
311		-----		-----	
312	IP30	Negative		-----	
323	IP30	Negative		-----	
333		-----		-----	
334	D4952	NEGATIVE		-----	
335		-----		-----	
336	D4952	negative		-----	
337		-----		-----	
338		-----		-----	
360	D4952	Negative		-----	
381		-----		-----	
447	D4952	Negative [Sweet]		-----	
463	IP30	negative		-----	
496	D4952	negative		-----	
511		-----		-----	
541		-----		-----	
631		-----		-----	
1033		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134		-----		-----	
1191		-----		-----	
1205		-----		-----	
1229		-----		-----	
1259	D4952	negative		-----	
1299	IP30	NEGATIVE		-----	
1320	D4952	negat		-----	
1397		-----		-----	
1443		-----		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1554		-----		-----	
1556	D4952	Negative		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807	D4952	positive		-----	
1810		-----		-----	
2146		-----		-----	
6142	IP30	Negative		-----	
6168		-----		-----	
6201	D4952	Negative		-----	
6262	D4952	Negative		-----	
6291	D4952	Negative		-----	
6308	IP30	Negative		-----	
	n	22			
	mean (n)	Negative			

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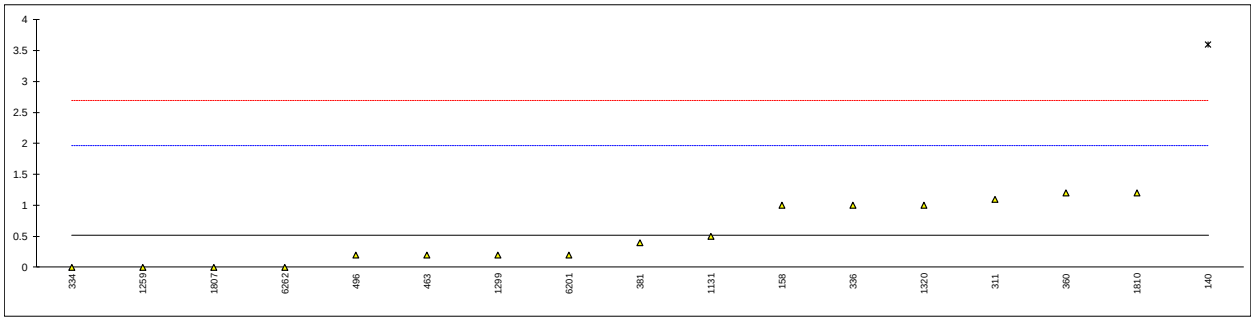
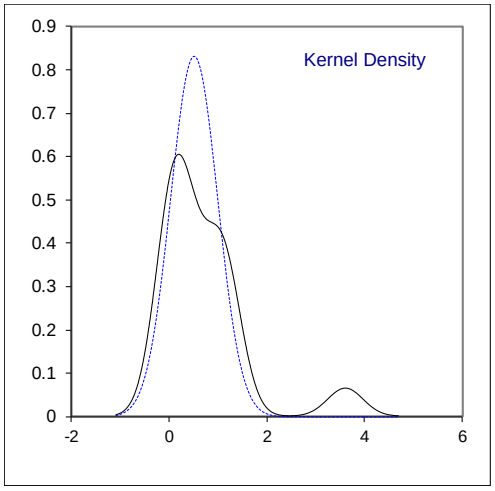
Determination of Gum (solvent washed) on sample #20080; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
62	D381	<0.5		-----	
120	D381	<0.5		-----	
140	D381	3.6	G(0.01)	4.24	
150	D381	<0.5		-----	
158	D381	1.0		0.67	
159		-----		-----	
169	D381	<0.5		-----	
171	D381	<0.5		-----	
175		-----		-----	
194		-----		-----	
311	D381	1.1		0.81	
312	D381	<0.5		-----	
323		-----		-----	
333		-----		-----	
334	D381	0.0		-0.70	
335		-----		-----	
336	D381	1		0.67	
337		-----		-----	
338		-----		-----	
360	ISO6246	1.2		0.94	
381	ISO6246	0.4		-0.15	
447	D381	<0.5		-----	
463	D381	0.2		-0.43	
496	ISO6246	0.2		-0.43	
511		-----		-----	
541		-----		-----	
631		-----		-----	
1033		-----		-----	
1126		-----		-----	
1131	ISO6246	0.5		-0.02	
1134		-----		-----	
1191		-----		-----	
1205		-----		-----	
1229		-----		-----	
1259	ISO6246	0.0		-0.70	
1299	D381	0.2		-0.43	
1320	D381	1		0.67	
1397		-----		-----	
1443		-----		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1554		-----		-----	
1556	ISO6246	<0.5		-----	
1656	ISO6246	<1		-----	
1706		-----		-----	
1776		-----		-----	
1807	ISO6246	0		-0.70	
1810	D381	1.2		0.94	
2146		-----		-----	
6142		-----		-----	
6168		-----		-----	
6201	D381	0.2		-0.43	
6262	D381	0		-0.70	
6291	D381	<0,5		-----	
6308	IP131	<1		-----	
	normality	OK			
	n	16			
	outliers	1			
	mean (n)	0.51			
	st.dev. (n)	0.480			
	R(calc.)	1.34			
	st.dev.(D381:19)	0.729			
	R(D381:19)	2.04			


4
3.5
3
2.5
2
1.5
1
0.5
0
334
1259
1907
6262
496
463
1299
6201
381
1131
158
336
1320
311
360
1810
140


Kernel Density
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-2
0
2
4
6

Determination of Lead as Pb on sample #20080; results in mg/L

lab	method	value	mark	z(targ)	remarks
62	D3237	<2.5		-----	
120	D3237	<2.5		-----	
140	D3237	<2.5		-----	
150	D3237	<2.5		-----	
158	D3237	<2.5		-----	
159		-----		-----	
169		-----		-----	
171	D3237	<2.5		-----	
175		-----		-----	
194		-----		-----	
311		-----		-----	
312	EN237	<2.5		-----	
323	EN237	<2.5		-----	
333		-----		-----	
334	D3237	<2.5		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	VLMI 01-12	< 2.5		-----	
381	EN237	<2,5		-----	
447	IP428	<2.5		-----	
463	EN237	<2,5		-----	
496	D3237	<2.5		-----	
511		-----		-----	
541		-----		-----	
631	D3237	<2.5		-----	
1033		-----		-----	
1126		-----		-----	
1131	EN237	<2,5		-----	
1134		-----		-----	
1191	In house	0.369		-----	
1205		-----		-----	
1229		<0,025		-----	
1259		-----		-----	
1299	EN237	<0.5		-----	
1320		-----		-----	
1397		-----		-----	
1443	EN237	<2,5		-----	
1459	EN237	< 2.5		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1554		-----		-----	
1556		-----		-----	
1656	EN237	<2.5		-----	
1706		-----		-----	
1776		-----		-----	
1807	EN237	0		-----	
1810		-----		-----	
2146	In house	<2		-----	
6142		-----		-----	
6168		-----		-----	
6201	D3237	0.515		-----	
6262	D3237	<2.5		-----	
6291	EN237	<0,5		-----	
6308	D3237	<2.5		-----	
	n	28			
	mean (n)	<2.5			Application range D3237:17: 2.5 – 25 mg/L

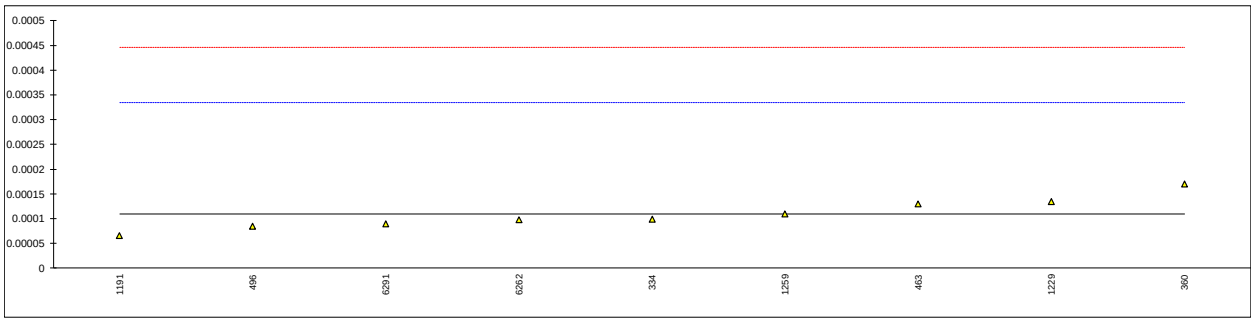
Determination of Manganese as Mn on sample #20080; results in mg/L

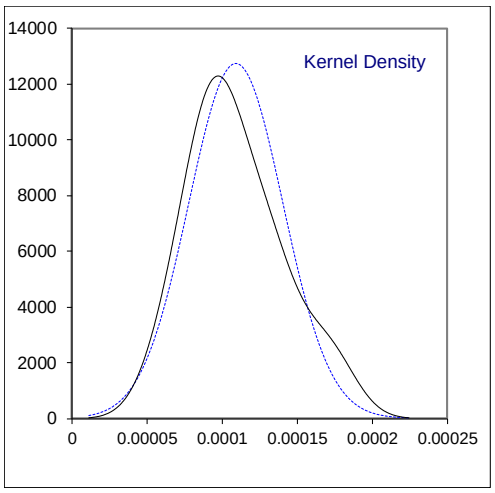
lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D3831	<0.25		-----	
140	D3831	<0.25		-----	
150	D3831	<0.25		-----	
158	D3831	<0.25		-----	
159		-----		-----	
169		-----		-----	
171	D3831	<0.25		-----	
175		-----		-----	
194		-----		-----	
311		-----		-----	
312	EN16136	<0.5		-----	
323	EN16136	<0.50		-----	
333	EN16135	<2.0		-----	
334	D3831	<0.25		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	EN16136	< 0.50		-----	
381	EN16136	<2,0		-----	
447	EN16135	<2.0		-----	
463	EN16135	0.34		-----	
496	EN16136	<0,1		-----	
511		-----		-----	
541		-----		-----	
631	D3831	<2		-----	
1033		-----		-----	
1126		-----		-----	
1131	EN16135	<2,0		-----	
1134		-----		-----	
1191		-----		-----	
1205		-----		-----	
1229		-----		-----	
1259		-----		-----	
1299		-----		-----	
1320		-----		-----	
1397		-----		-----	
1443	EN16135	<2,0		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1554		-----		-----	
1556		-----		-----	
1656	EN16135	<2		-----	
1706		-----		-----	
1776		-----		-----	
1807	EN16135	0		-----	
1810		-----		-----	
2146	In house	<1		-----	
6142		-----		-----	
6168		-----		-----	
6201	D3831	0.36		-----	
6262	D3831	<0.25		-----	
6291	EN16136	<0,25		-----	
6308	D3831	<0.25		-----	
	n	24			
	mean (n)	<2			Application range D3831:12: 0.25 – 40 mg/L

Determination of Mercaptans Sulfur as S on sample #20080; results in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140	D3227	<0.0003		-----	
150	D3227	<0.0003		-----	
158	D3227	<0.0003		-----	
159		-----		-----	
169	D3227	<0.0003	C	-----	first reported 0.0006
171	D3227	<0.0003		-----	
175		-----		-----	
194		-----		-----	
311		-----		-----	
312	D3227	<0.0003		-----	
323	D3227	<0.0003		-----	
333		-----		-----	
334	D3227	0.0001		-0.08	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D3227	0.00017		0.54	
381		-----		-----	
447		-----		-----	
463	D3227	0.00013		0.18	
496	D3227	0.000085		-0.22	
511		-----		-----	
541		-----		-----	
631		-----		-----	
1033		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134		-----		-----	
1191	ISO3012	0.000066		-0.39	
1205		-----		-----	
1229	ISO3012	0.000135		0.23	
1259	D3227	0.00011		0.01	
1299		-----		-----	
1320		-----		-----	
1397		-----		-----	
1443		-----		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1554		-----		-----	
1556		-----		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807		-----		-----	
1810		-----		-----	
2146		-----		-----	
6142		-----		-----	
6168		-----		-----	
6201	D3227	<0.0001		-----	
6262	D3227	0.000098		-0.10	
6291	D3227	0.000090		-0.17	
6308	D3227	<0.0001		-----	

normality	OK
n	9
outliers	0
mean (n)	0.00011
st.dev. (n)	0.000031
R(calc.)	0.00009
st.dev.(D3227:16)	0.000112
R(D3227:16)	0.00031

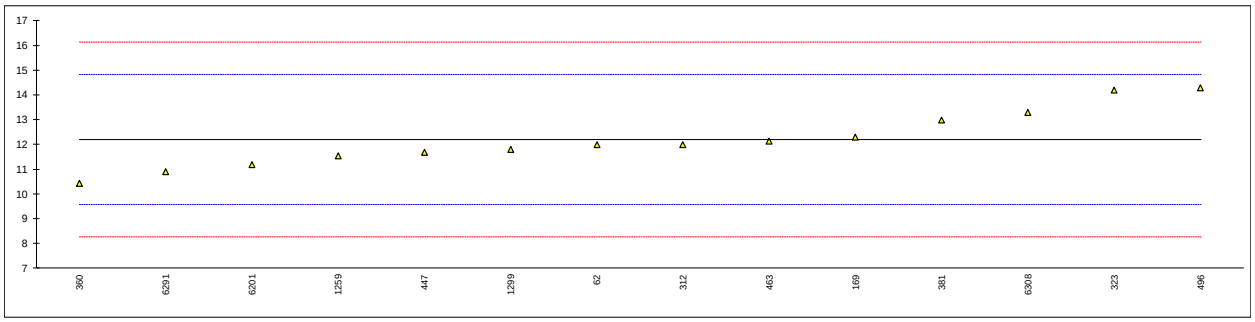

0.0005
0.00045
0.0004
0.00035
0.0003
0.00025
0.0002
0.00015
0.0001
0.00005
0
1191
496
6291
6262
334
1259
463
1229
360

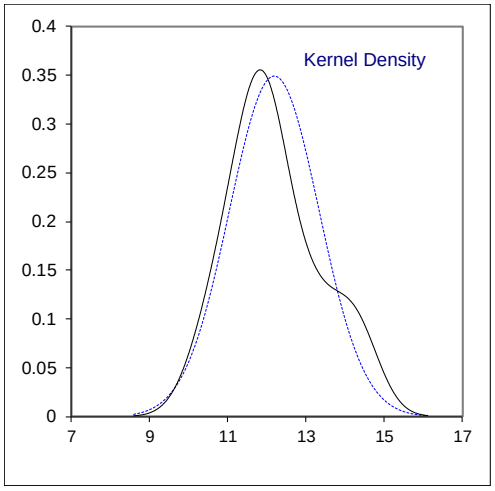

Kernel Density
14000
12000
10000
8000
6000
4000
2000
0
0
0.00005
0.0001
0.00015
0.0002
0.00025

Determination of Olefins by FIA (without oxygenates correction) on sample #20080; results in %V/V

lab	method	value	mark	z(targ)	lot nr	remarks
62	D1319	12		-0.15	-----	
120		-----		-----	-----	
140		-----		-----	-----	
150		-----		-----	-----	
158		-----		-----	-----	
159		-----		-----	-----	
169	D1319	12.3		0.08	3000000892	
171		-----		-----	-----	
175		-----		-----	-----	
194		-----		-----	-----	
311		-----		-----	-----	
312	EN15553	12.0		-0.15	-----	
323	D1319	14.2		1.52	3000000970	
333		-----		-----	-----	
334		-----		-----	-----	
335		-----		-----	-----	
336		-----		-----	-----	
337		-----		-----	-----	
338		-----		-----	-----	
360	D1319	10.43		-1.35	3000000986	
381	EN15553	13.0		0.61	#962	
447	D1319	11.7		-0.38	N1103	
463	D1319	12.14		-0.05	3000000870	
496	D1319	14.3		1.60	3000000901	
511		-----		-----	-----	
541		-----		-----	-----	
631		-----		-----	-----	
1033		-----		-----	-----	
1126		-----		-----	-----	
1131		-----		-----	-----	
1134		-----		-----	-----	
1191		-----		-----	-----	
1205		-----		-----	-----	
1229		-----		-----	-----	
1259	EN15553	11.54		-0.50	3000000895	
1299	D1319	11.8		-0.31	-----	
1320		-----		-----	-----	
1397		-----		-----	-----	
1443		-----		-----	-----	
1459		-----		-----	-----	
1510		-----		-----	-----	
1549		-----		-----	-----	
1550		-----		-----	-----	
1554		-----		-----	-----	
1556		-----		-----	-----	
1656		-----		-----	-----	
1706		-----		-----	-----	
1776		-----		-----	-----	
1807		-----		-----	-----	
1810		-----		-----	-----	
2146		-----		-----	-----	
6142		-----		-----	-----	
6168		-----		-----	-----	
6201	D1319	11.2		-0.76	-----	
6262		-----		-----	-----	
6291	EN15553	10.9		-0.99	-----	
6308	D1319	13.3	C	0.84	3000000859	first reported 16.9

normality	OK
n	14
outliers	0
mean (n)	12.20
st.dev. (n)	1.144
R(calc.)	3.20
st.dev.(D1319:20a)	1.314
R(D1319:20a)	3.68

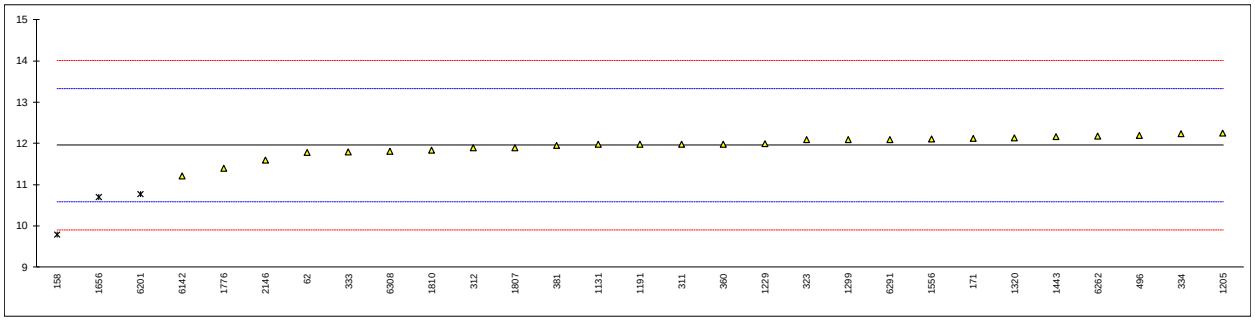

17
16
15
14
13
12
11
10
9
8
7
360
6291
6201
1259
447
1299
62
312
463
169
381
6308
323
496

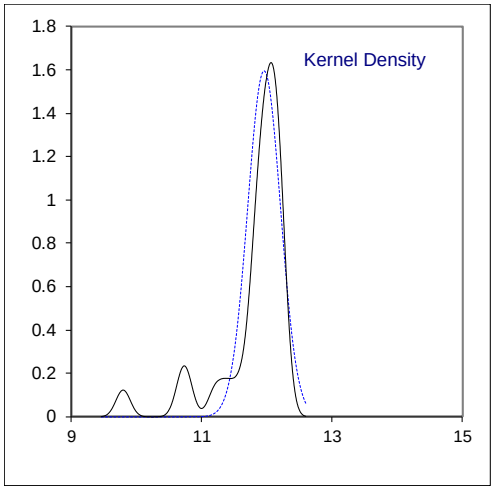

Kernel Density
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
7
9
11
13
15
17

Determination of Olefins by GC on sample #20080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62	INH-14.3	11.78		-0.26	
120		-----		-----	
140		-----		-----	
150		-----		-----	
158	D6550	9.8	R(0.01)	-3.15	
159		-----		-----	
169		-----		-----	
171	ISO22854-A	12.12		0.24	
175		-----		-----	
194		-----		-----	
311	ISO22854-A	11.99		0.05	
312	ISO22854-A	11.9		-0.08	
323	ISO22854-A	12.1		0.21	
333	ISO22854-A	11.80		-0.23	
334	ISO22854-A	12.24		0.41	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854-A	11.99		0.05	
381	ISO22854-A	11.95		-0.01	
447		-----		-----	
463		-----		-----	
496	ISO22854-A	12.20		0.36	
511		-----		-----	
541		-----		-----	
631		-----		-----	
1033		-----		-----	
1126		-----		-----	
1131	ISO22854-A	11.98		0.03	
1134		-----		-----	
1191	ISO22854-A	11.99		0.05	
1205		12.259		0.44	
1229	ISO22854-A	12.0		0.06	
1259		-----		-----	
1299	ISO22854-A	12.1		0.21	
1320	ISO22854-A	12.14		0.27	
1397		-----		-----	
1443	ISO22854-A	12.17		0.31	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1554		-----		-----	
1556	ISO22854-A	12.11		0.22	
1656	ISO22854-B	10.7	R(0.01)	-1.83	
1706		-----		-----	
1776	ISO22854-A	11.40		-0.81	
1807	ISO22854-A	11.9		-0.08	
1810	ISO22854-A	11.84		-0.17	
2146	ISO22854-A	11.6		-0.52	
6142	ISO22854-A	11.21		-1.09	
6168		-----		-----	
6201	ISO22854-A	10.77	R(0.01)	-1.73	
6262	ISO22854-A	12.18		0.33	
6291	ISO22854-A	12.1		0.21	
6308	ISO22854-A	11.82		-0.20	

normality	not OK
n	26
outliers	3
mean (n)	11.96
st.dev. (n)	0.250
R(calc.)	0.70
st.dev.(ISO22854:16)	0.685
R(ISO22854:16)	1.92


15
14
13
12
11
10
9
158
1656
6201
6142
1776
2146
62
333
6308
1810
312
1807
381
1131
1191
311
360
1229
323
1299
6291
1556
171
1320
1443
6262
496
334
1205


Kernel Density
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
9
11
13
15

Determination of Oxidation Stability on sample #20080; results in minutes

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D525	>900		-----	
140		-----		-----	
150	D525	>900		-----	
158	D525	>900		-----	
159		-----		-----	
169		-----		-----	
171	D525	>900	C	-----	first reported <900
175		-----		-----	
194		-----		-----	
311	D525	>360		-----	
312	D525	>900		-----	
323	D525	600		-----	
333		-----		-----	
334	D525	>900		-----	
335		-----		-----	
336	D525	>900		-----	
337		-----		-----	
338		-----		-----	
360	ISO7536	> 900		-----	
381		-----		-----	
447	D525	>900		-----	
463	D525	>900		-----	
496	D525	>900		-----	
511		-----		-----	
541		-----		-----	
631	D525	>900		-----	
1033		-----		-----	
1126		-----		-----	
1131	ISO7536	>900		-----	
1134		-----		-----	
1191		-----		-----	
1205		-----		-----	
1229		-----		-----	
1259		-----		-----	
1299	D525	>960		-----	
1320		-----		-----	
1397		-----		-----	
1443	ISO7536	>900		-----	
1459		-----		-----	
1510		-----		-----	
1549		-----		-----	
1550		-----		-----	
1554		-----		-----	
1556	ISO7536	>900		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807	D525	>380		-----	
1810		-----		-----	
2146		-----		-----	
6142		-----		-----	
6168		-----		-----	
6201	D525	>900		-----	
6262	D525	>900		-----	
6291	D525	>900		-----	
6308	D525	>900		-----	
	n	23			
	mean (n)	>360			

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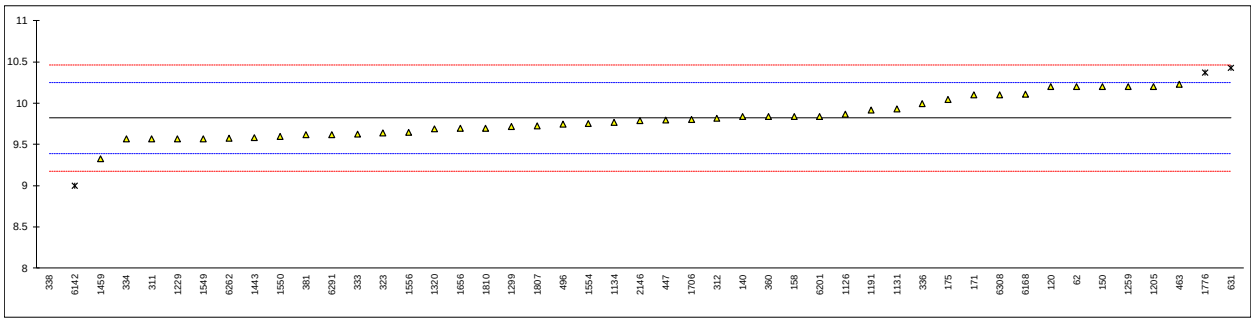
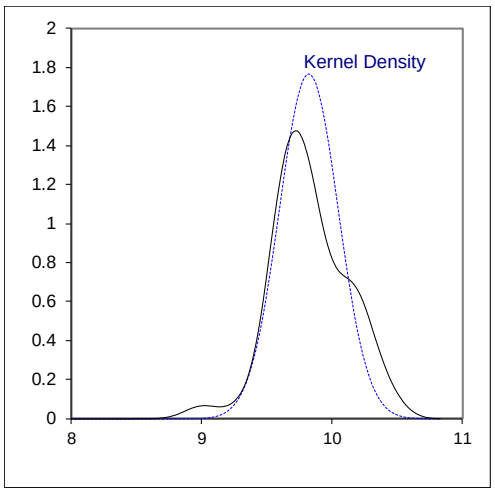
Determination of Ethanol on sample #20080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62	INH-14.3	10.2		1.78	
120	D5599	10.20		1.78	
140	D5599	9.84		0.10	
150	D5599	10.20		1.78	
158	D4815	9.84		0.10	
159		-----		-----	
169		-----		-----	
171	D5599	10.10		1.31	
175	D5599	10.046		1.06	
194		-----		-----	
311		9.57		-1.17	
312	ISO22854-A	9.82		0.00	
323	ISO22854-A	9.64		-0.84	
333	ISO22854-A	9.63		-0.89	
334	ISO22854-A	9.57		-1.17	
335		-----		-----	
336	EN1601	10.0		0.85	
337		-----		-----	
338	EN1601	0.06	R(0.01)	-45.70	
360	EN13132	9.84		0.10	
381	ISO22854	9.62		-0.93	
447	IP466	9.8		-0.09	
463	EN13132	10.23		1.92	
496	ISO22854-A	9.750		-0.33	
511		-----		-----	
541		-----		-----	
631	D5845	10.43	R(0.05)	2.86	
1033		-----		-----	
1126		9.87		0.24	
1131	ISO22854-A	9.93		0.52	
1134	ISO22854-A	9.77		-0.23	
1191	ISO22854-A	9.92		0.47	
1205		10.205		1.81	
1229	ISO22854-A	9.57		-1.17	
1259	EN13132	10.2		1.78	
1299	ISO22854-A	9.72		-0.47	
1320		9.69		-0.61	
1397		-----		-----	
1443	ISO22854-A	9.588		-1.08	
1459	ISO22854-A	9.33		-2.29	
1510		-----		-----	
1549	D5845	9.57		-1.17	
1550	D5845	9.60		-1.03	
1554	EN13132	9.7562		-0.30	
1556	ISO22854-A	9.65		-0.79	
1656	ISO22854-B	9.7		-0.56	
1706		9.803		-0.08	
1776	ISO22854-A	10.37	R(0.05)	2.58	
1807		9.73		-0.42	
1810	D6839	9.70		-0.56	
2146	ISO22854-A	9.79		-0.14	
6142	ISO22854-A	9.0	R(0.05)	-3.84	
6168	D5845	10.107		1.35	
6201	ISO22854-A	9.84		0.10	
6262	ISO22854-A	9.58		-1.12	
6291	ISO22854-A	9.62		-0.93	
6308	ISO22854-A	10.10		1.31	

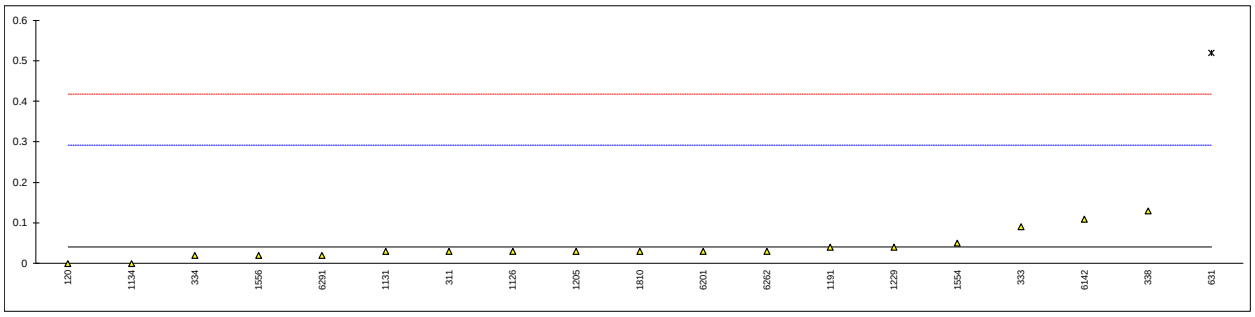
normality	OK
n	43
outliers	4
mean (n)	9.82
st.dev. (n)	0.226
R(calc.)	0.63
st.dev.(ISO22854:16)	0.214
R(ISO22854:16)	0.60

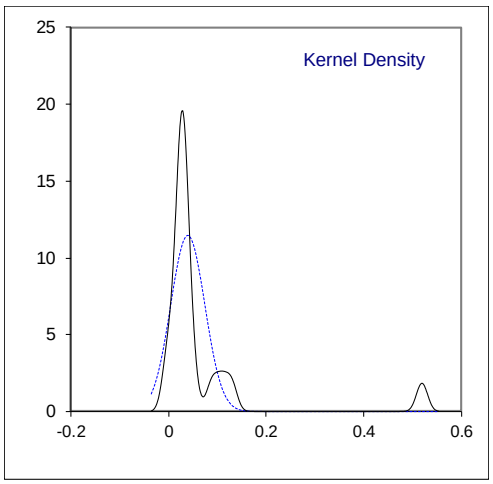

11
10.5
10
9.5
9
8.5
8
338 6142 1459 334 311 1229 1549 6262 1443 1550 381 6291 333 323 1556 1320 1656 1810 1299 1807 496 1554 1134 2146 447 1706 312 140 360 158 6201 1126 1191 1131 336 175 171 6308 6168 120 62 150 1259 1205 463 1776 631


Kernel Density
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
8
9
10
11

Determination of MTBE on sample #20080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D5599	0.00		-0.32	
140	D5599	<0.10		-----	
150	D5599	<0.10		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D5599	<0.10		-----	
175		-----		-----	
194		-----		-----	
311		0.03		-0.08	
312	ISO22854-A	<0.1		-----	
323	ISO22854-A	<0.10		-----	
333	ISO22854-A	0.09		0.39	
334	ISO22854-A	0.02		-0.16	
335		-----		-----	
336	EN1601	<0.17		-----	
337		-----		-----	
338	EN1601	0.13		0.71	
360	EN13132	< 0.17		-----	
381	ISO22854	<0,8		-----	
447		-----		-----	
463	EN13132	<0,2		-----	
496	ISO22854-A	<0.010		-----	
511		-----		-----	
541		-----		-----	
631	D5845	0.52	G(0.01)	3.81	
1033		-----		-----	
1126		0.03		-0.08	
1131	ISO22854-A	0.03		-0.08	
1134	ISO22854-A	0.00		-0.32	
1191	ISO22854-A	0.04		0.00	
1205		0.030		-0.08	
1229	ISO22854-A	0.04		0.00	
1259		-----		-----	
1299	ISO22854-A	<0.8		-----	
1320		-----		-----	
1397		-----		-----	
1443	ISO22854-A	<0.8		-----	
1459	ISO22854-A	< 0.5		-----	
1510		-----		-----	
1549	D5845	< 0,1		-----	
1550	D5845	< 0,1		-----	
1554	EN13132	0.0507		0.08	
1556	ISO22854-A	0.02		-0.16	
1656	ISO22854-B	<0.1		-----	
1706		-----		-----	
1776		-----		-----	
1807		<0.80		-----	
1810	D6839	0.03		-0.08	
2146	ISO22854-A	<0,10		-----	
6142	ISO22854-A	0.11		0.55	
6168		-----		-----	
6201	ISO22854-A	0.03		-0.08	
6262	ISO22854-A	0.03		-0.08	
6291	ISO22854-A	0.02		-0.16	
6308	ISO22854-A	<0.1		-----	
	normality	not OK			
	n	18			
	outliers	1			
	mean (n)	0.04			
	st.dev. (n)	0.035			
	R(calc.)	0.10			
	st.dev.(ISO22854:16)	0.126			
	R(ISO22854:16)	0.35			

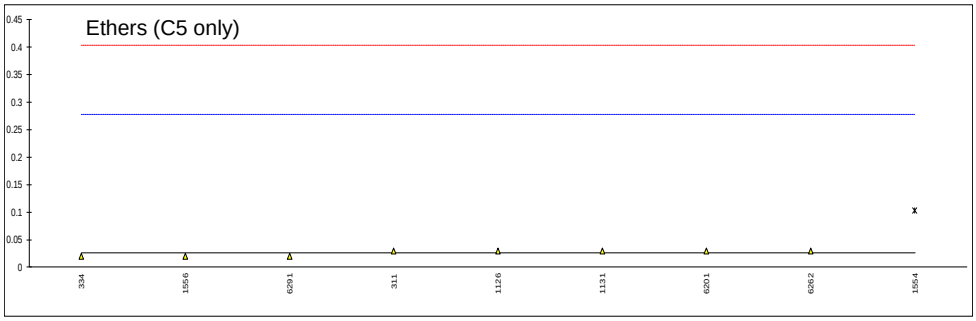

0.6
0.5
0.4
0.3
0.2
0.1
0
120
1134
334
1556
6291
1131
311
1126
1205
1810
6201
6262
1191
1229
1554
333
6142
338
631

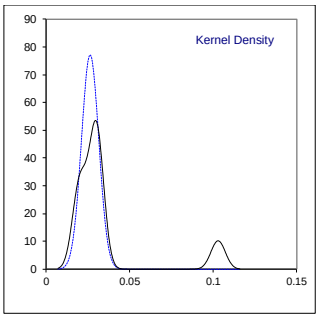

Kernel Density
25
20
15
10
5
0
-0.2
0
0.2
0.4
0.6

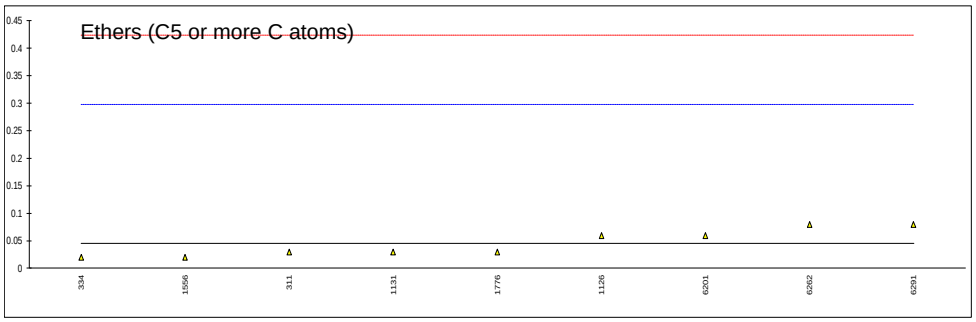
Determination of Ethers (C5 only, C5 or more C atoms and C6 or more C atoms) on sample #20080; results in %V/V

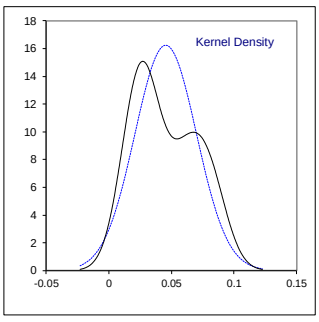
lab	method	C5	mark	z(targ)	C5 or more	mark	z(targ)	C6 or more	mark	z(targ)
62		-----		-----	-----		-----	-----		-----
120		-----		-----	-----		-----	-----		-----
140		-----		-----	-----		-----	-----		-----
150	D5599	<0.10		-----	<0.10		-----	<0.10		-----
158		-----		-----	-----		-----	-----		-----
159		-----		-----	-----		-----	-----		-----
169		-----		-----	-----		-----	-----		-----
171	D5599	<0.10		-----	<0.10		-----	<0.10		-----
175		-----		-----	-----		-----	-----		-----
194		-----		-----	-----		-----	-----		-----
311		0.03		0.03	0.03		-0.12	<0.01		-----
312	ISO22854-A	<0.1		-----	<0.1		-----	<0.1		-----
323	ISO22854-A	<0.10		-----	<0.10		-----	<0.10		-----
333		-----		-----	-----		-----	-----		-----
334	ISO22854-A	0.02		-0.05	0.02		-0.20	0.02		-----
335		-----		-----	-----		-----	-----		-----
336	EN1601	<0.17		-----	-----		-----	-----		-----
337		-----		-----	-----		-----	-----		-----
338		-----		-----	-----		-----	-----		-----
360	EN13132	< 0.17		-----	< 0.17		-----	< 0.17		-----
381	ISO22854	<0,8		-----	<0,8		-----	<0,8		-----
447		-----		-----	-----		-----	-----		-----
463	EN13132	<0,2		-----	<0,2		-----	<0,2		-----
496	ISO22854-A	<0.010		-----	<0.010		-----	<0.010		-----
511		-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----
631		-----		-----	-----		-----	-----		-----
1033		-----		-----	-----		-----	-----		-----
1126		0.03		0.03	0.06		0.11	0.03		-----
1131	ISO22854-A	0.03		0.03	0.03		-0.12	0.0		-----
1134	ISO22854-A	<0.01	C	-----	<0.01	C	-----	<0.01	C	-----
1191		-----		-----	-----		-----	0		-----
1205		-----		-----	-----		-----	-----		-----
1229		-----		-----	-----		-----	-----		-----
1259		-----		-----	-----		-----	-----		-----
1299		-----		-----	<0.8		-----	-----		-----
1320		-----		-----	-----		-----	-----		-----
1397		-----		-----	-----		-----	-----		-----
1443		-----		-----	<0,8		-----	-----		-----
1459		-----		-----	-----		-----	-----		-----
1510		-----		-----	-----		-----	-----		-----
1549		-----		-----	< 0,1		-----	-----		-----
1550		-----		-----	< 0,1		-----	-----		-----
1554	EN13132	0.103	D(0.01)	0.61	-----		-----	-----		-----
1556	ISO22854-A	0.02		-0.05	0.02		-0.20	0		-----
1656		-----		-----	-----		-----	-----		-----
1706		-----		-----	-----		-----	-----		-----
1776		-----		-----	0.03		-0.12	-----		-----
1807		<0.80		-----	<0.80		-----	<0.80		-----
1810		-----		-----	-----		-----	-----		-----
2146		-----		-----	<0,10		-----	-----		-----
6142		-----		-----	-----		-----	-----		-----
6168		-----		-----	-----		-----	-----		-----
6201	ISO22854-A	0.03		0.03	0.06		0.11	0.03		-----
6262	ISO22854-A	0.03		0.03	0.08		0.27	-----		-----
6291	ISO22854-A	0.02		-0.05	0.08		0.27	0		-----
6308	ISO22854-A	<0.1		-----	<0.1		-----	<0.1		-----
	normality	OK			OK			n.a.		
	n	8			9			19		
	outliers	1			0			0		
	mean (n)	0.03			0.05			<0.8		
	st.dev. (n)	0.005			0.025					
	R(calc.)	0.01			0.07					
	st.dev.(ISO22854:16)	0.126			0.126					
	R(ISO22854:16)	0.35			0.35					

Lab 1134 first reported 12.56 for Ethers (C5 only), 80.18 for Ethers (C5 or more C atoms) and 67.62 for Ethers (C6 or more C atoms)


Ethers (C5 only)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
334
1556
6291
311
1126
1131
6201
6262
1554

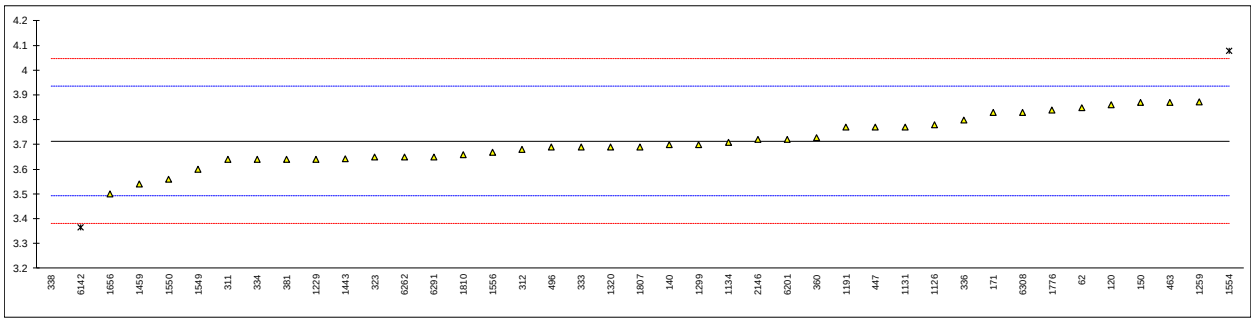

Kernel Density
90
80
70
60
50
40
30
20
10
0
0
0.05
0.1
0.15

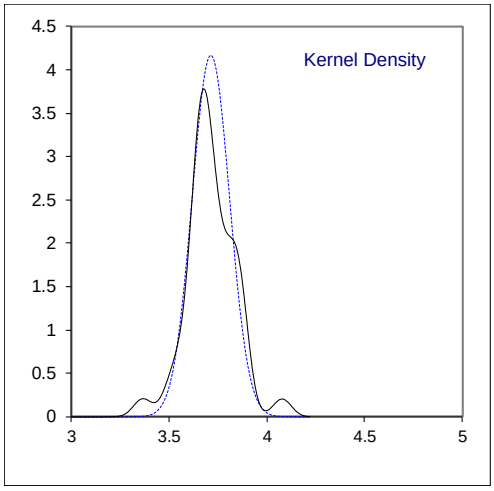

Ethers (C5 or more C atoms)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
334
1556
311
1131
1776
1126
6201
6262
6291


Kernel Density
18
16
14
12
10
8
6
4
2
0
-0.05
0
0.05
0.1
0.15

Determination of Oxygen content on sample #20080; results in %M/M

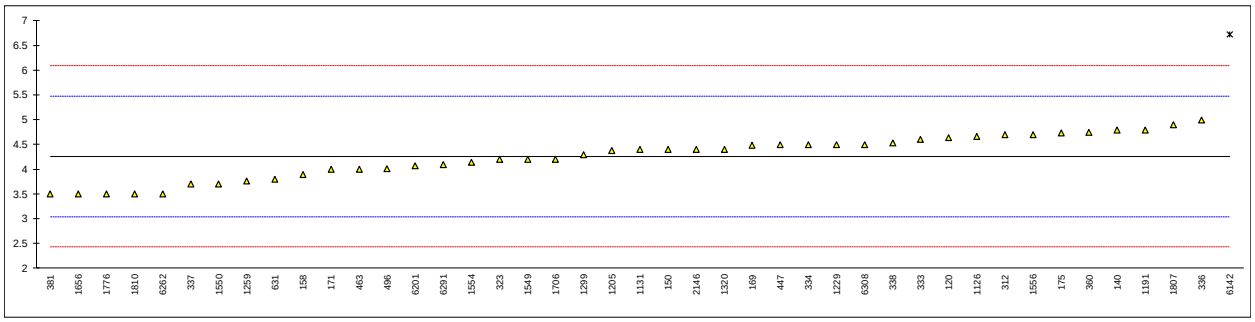
lab	method	value	mark	z(targ)	remarks
62	INH-14.3	3.85		1.23	
120	D5599	3.86		1.32	
140	D5599	3.7		-0.12	
150	D5599	3.87		1.41	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	ISO22854-A	3.83		1.05	
175		-----		-----	
194		-----		-----	
311	ISO22854-A	3.64		-0.66	
312	ISO22854-A	3.68		-0.30	
323	ISO22854-A	3.65		-0.57	
333	ISO22854-A	3.69		-0.21	
334	ISO22854-A	3.64		-0.66	
335		-----		-----	
336	EN1601	3.80		0.78	
337		-----		-----	
338	EN1601	2.01	R(0.01)	-15.39	
360	EN13132	3.728		0.13	
381	ISO22854-A	3.64		-0.66	
447	EN13132	3.77		0.51	
463	EN13132	3.87		1.41	
496	ISO22854-A	3.690		-0.21	
511		-----		-----	
541		-----		-----	
631		-----		-----	
1033		-----		-----	
1126	ISO22854-A	3.78		0.60	
1131	ISO22854-A	3.77		0.51	
1134	ISO22854-A	3.71		-0.03	
1191	ISO22854-A	3.77		0.51	
1205		-----		-----	
1229	ISO22854-A	3.64		-0.66	
1259	EN13132	3.873		1.44	
1299	ISO22854-A	3.7		-0.12	
1320	ISO22854-A	3.69		-0.21	
1397		-----		-----	
1443	ISO22854-A	3.644		-0.63	
1459	ISO22854-A	3.54		-1.57	
1510		-----		-----	
1549	D5845	3.60		-1.03	
1550	D5845	3.56		-1.39	
1554	EN13132	4.078	R(0.05)	3.29	
1556	ISO22854-A	3.67		-0.39	
1656	ISO22854-B	3.5		-1.93	
1706		-----		-----	
1776	ISO22854-A	3.84		1.14	
1807	ISO22854-A	3.69		-0.21	
1810	ISO22854-A	3.66		-0.48	
2146	ISO22854-A	3.72		0.06	
6142		3.365	R(0.05)	-3.15	
6168		-----		-----	
6201	ISO22854-A	3.72		0.06	
6262	ISO22854-A	3.65		-0.57	
6291		3.65		-0.57	
6308	ISO22854-A	3.83	C	1.05	first reported 11.02
	normality	OK			
	n	38			
	outliers	3			
	mean (n)	3.714			
	st.dev. (n)	0.0957			
	R(calc.)	0.268			
	st.dev.(ISO22854:16)	0.1107			
	R(ISO22854:16)	0.31			

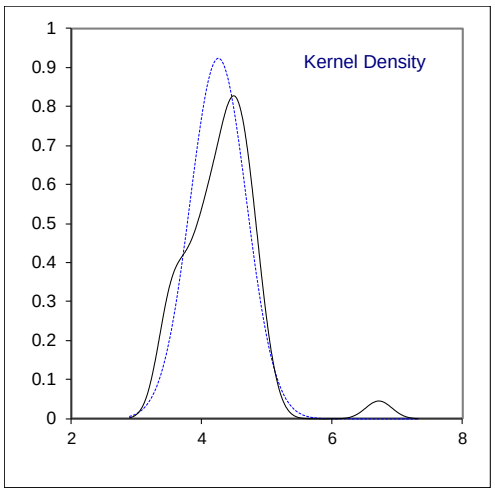

4.2
4.1
4
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
338 6142 1656 1459 1550 1549 311 334 381 1229 1443 323 6262 6291 1810 1556 312 496 333 1320 1807 140 1299 1134 2146 6201 360 1191 447 1131 1126 336 171 6308 1776 62 120 150 463 1259 1554


Kernel Density
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
3
3.5
4
4.5
5

Determination of Sulfur on sample #20080; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D2622	4.64		0.63	
140	D2622	4.8		0.89	
150	D5453	4.4		0.23	
158	D2622	3.9		-0.59	
159		-----		-----	
169	D5453	4.49		0.38	
171	D2622	4.0		-0.43	
175	D5453	4.73		0.77	
194		-----		-----	
311		-----		-----	
312	ISO20846	4.7		0.72	
323	ISO20846	4.2		-0.10	
333	ISO20846	4.6		0.56	
334	ISO20846	4.5		0.40	
335		-----		-----	
336	ISO20846	5.0		1.22	
337	ISO20846	3.7		-0.92	
338	ISO20846	4.53		0.44	
360	ISO20846	4.75		0.81	
381	ISO20846	3.5		-1.25	
447	IP490	4.5		0.40	
463	ISO20846	4.0		-0.43	
496	ISO20846	4.01	C	-0.41	first reported 43.97
511		-----		-----	
541		-----		-----	
631	D7039	3.8		-0.75	
1033		-----		-----	
1126	ISO20846	4.67		0.67	
1131	ISO20846	4.40		0.23	
1134		-----		-----	
1191	ISO20846	4.8		0.89	
1205	ISO20846	4.38		0.20	
1229	ISO20846	4.5		0.40	
1259	ISO20846	3.77		-0.80	
1299	ISO20884	4.3		0.07	
1320	ISO20846	4.41		0.25	
1397		-----		-----	
1443	ISO20884	<5,0		-----	
1459	ISO20884	< 5		-----	
1510		-----		-----	
1549	ISO20884	4.2		-0.10	
1550	ISO20884	3.7		-0.92	
1554	ISO20846	4.14		-0.20	
1556	ISO20884	4.7		0.72	
1656	ISO20846	3.5		-1.25	
1706	ISO20884	4.2		-0.10	
1776	ISO20846	3.5		-1.25	
1807	ISO20846	4.9		1.05	
1810	ISO20846	3.5		-1.25	
2146	ISO20846	4.4		0.23	
6142		6.725	R(0.01)	4.05	
6168		-----		-----	
6201	ISO20846	4.07		-0.31	
6262	ISO20846	3.5		-1.25	
6291		4.10		-0.26	
6308	IP490	4.5		0.40	
	normality	OK			
	n	42			
	outliers	1			
	mean (n)	4.259			
	st.dev. (n)	0.4320			
	R(calc.)	1.210			
	st.dev.(ISO20846:19)	0.6089			
	R(ISO20846:19)	1.705			

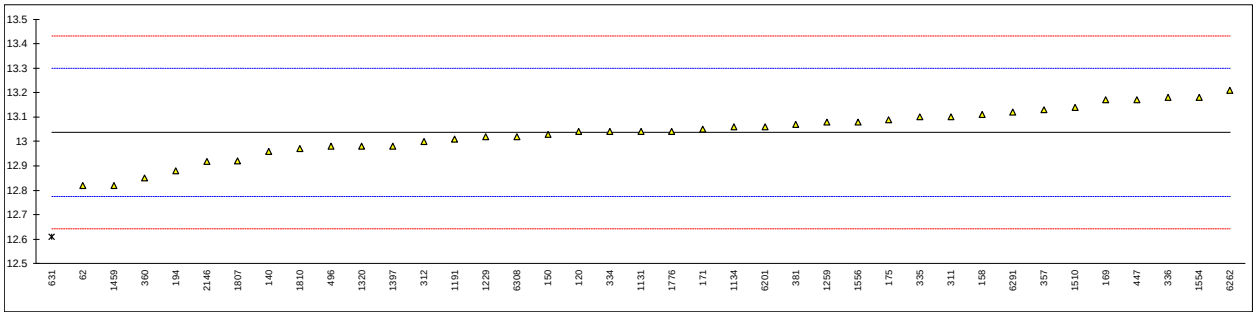

7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
381 1656 1776 1810 6262 337 1550 1259 631 158 171 463 496 6201 6291 1554 323 1549 1706 1299 1205 1131 150 2146 1320 169 447 334 1229 6308 338 333 120 1126 312 1556 175 360 140 1191 1807 336 6142

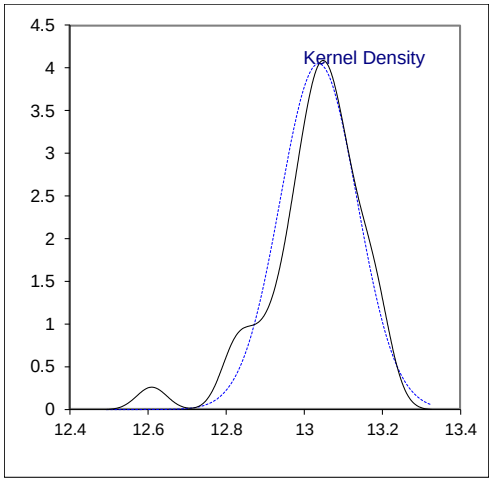

Kernel Density
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2
4
6
8

Determination of Total Vapour Pressure on sample #20081; results in psi

lab	method	value	mark	z(targ)	remarks
62	D5191	12.82		-1.66	
120	D5191	13.04		0.02	
140	D5191	12.96		-0.59	
150	D5191	13.03		-0.06	
158	D5191	13.11		0.55	
159		-----		-----	
169	D5191	13.17		1.01	
171	D5191	13.05		0.10	
175	D5191	13.09		0.40	
194	D5191	12.88		-1.20	
311	D5191	13.10		0.48	
312	D5191	13.00		-0.28	
323		-----		-----	
333		-----		-----	
334	D5191	13.04		0.02	
335	D5191	13.10		0.48	
336	D5191	13.18		1.09	
337		-----		-----	
338		-----		-----	
357	D5191	13.13		0.71	
360	EN13016-1	12.85		-1.43	
381	EN13016-1	13.07		0.25	
447	D5191	13.17		1.01	
496	D5191	12.98	C	-0.44	first reported 82.6 kPa
541		-----		-----	
631	D5191	12.61	R(0.01)	-3.26	
1033		-----		-----	
1131	EN13016-1	13.04		0.02	
1134	EN13016-1	13.06		0.17	
1191	EN13016-1	13.01		-0.21	
1229	EN13016-1	13.02		-0.13	
1259	EN13016-1	13.08		0.33	
1299		-----		-----	
1320	EN13016-1	12.98		-0.44	
1397	D5191	12.98		-0.44	
1459	EN13016-1	12.82		-1.66	
1510	D5191	13.14		0.78	
1554	EN13016-1	13.18		1.09	
1556	EN13016-1	13.08		0.33	
1656		-----		-----	
1776	EN13016-1	13.04		0.02	
1807	EN13016-1	12.92		-0.89	
1810	EN13016-1	12.97		-0.51	
2146	EN13016-1	12.919		-0.90	
6142		-----		-----	
6201	D5191	13.060		0.17	
6262	D5191	13.210		1.32	
6291		13.120		0.63	
6308	D5191	13.020		-0.13	

	normality	OK
	n	38
	outliers	1
	mean (n)	13.037
	st.dev. (n)	0.0985
	R(calc.)	0.276
	st.dev.(D5191:20)	0.1312
	R(D5191:20)	0.367
Compare:		
	R(EN13016-1:18)	0.229

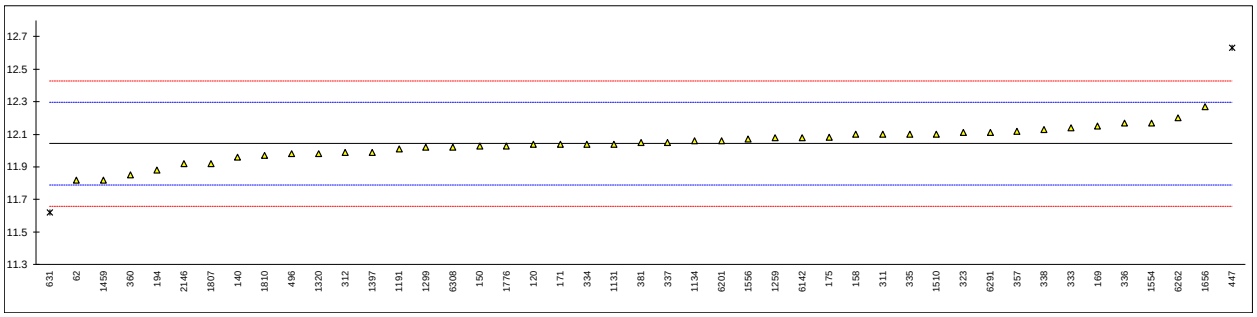

13.5
13.4
13.3
13.2
13.1
13
12.9
12.8
12.7
12.6
12.5
631
62
1459
360
194
2146
1807
140
1810
496
1320
1397
312
1191
1229
6308
150
120
334
1131
1776
171
1134
6201
381
1259
1556
175
335
311
158
6291
357
1510
169
447
336
1554
6262

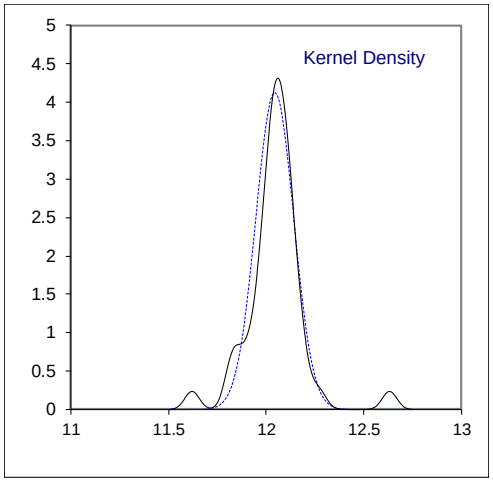

Kernel Density
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
12.4
12.6
12.8
13
13.2
13.4

Determination of DVPE (ASTM D5191 calculation) on sample #20081; results in psi

lab	method	value	mark	z(targ)	remarks
62	D5191	11.82		-1.75	
120	D5191	12.04		-0.02	
140	D5191	11.96		-0.65	
150	D5191	12.03		-0.10	
158	D5191	12.10		0.45	
159		-----		-----	
169	D5191	12.15		0.84	
171	D5191	12.04		-0.02	
175	D5191	12.084		0.32	
194	D5191	11.88		-1.28	
311	D5191	12.10		0.45	
312	D5191	11.99		-0.42	
323	D5191	12.11		0.52	
333	EN13016-1	12.14		0.76	
334	D5191	12.04		-0.02	
335	D5191	12.10		0.45	
336	D5191	12.17		0.99	
337	EN13016-1	12.05		0.05	
338	D5191	12.13		0.68	
357	D5191	12.12		0.60	
360	EN13016-1	11.85		-1.51	
381	EN13016-1	12.05		0.05	
447	D5191	12.63	E,R(0.01)	4.60	calculation error, iis calculated 12.16
496	D5191	11.98	C	-0.49	first reported 76.6 kPa
541		-----		-----	
631	D5191	11.62	R(0.01)	-3.31	
1033		-----		-----	
1131	EN13016-1	12.04		-0.02	
1134	EN13016-1	12.06		0.13	
1191	EN13016-1	12.01		-0.26	
1229		-----		-----	
1259	D5191	12.08		0.29	
1299		12.02		-0.18	
1320	EN13016-1	11.98		-0.49	
1397	D5191	11.99		-0.42	
1459	EN13016-1	11.82		-1.75	
1510	D5191	12.10		0.45	
1554	EN13016-1	12.17		0.99	
1556	EN13016-1	12.07		0.21	
1656	EN13016-1	12.27		1.78	
1776	EN13016-1	12.03		-0.10	
1807	EN13016-1	11.92		-0.96	
1810	EN13016-1	11.97		-0.57	
2146	EN13016-1	11.919		-0.97	
6142	EN13016-1	12.08		0.29	
6201	D5191	12.06		0.13	
6262	D5191	12.20		1.23	
6291		12.11		0.52	
6308	D5191	12.02		-0.18	

	normality	OK
	n	43
	outliers	2
	mean (n)	12.043
	st.dev. (n)	0.0967
	R(calc.)	0.271
	st.dev.(D5191:20)	0.1276
	R(D5191:20)	0.357
Compare:		
	R(EN13016-1:18)	0.229

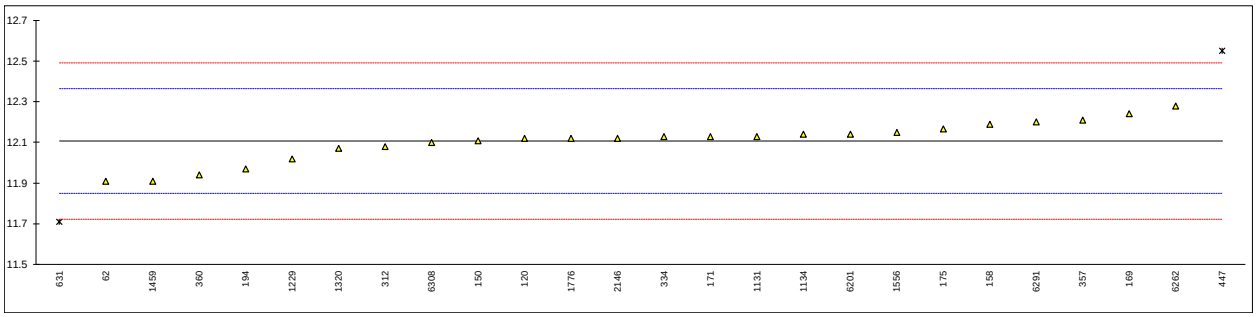

12.7
12.5
12.3
12.1
11.9
11.7
11.5
11.3
631 62 1459 360 194 2146 1807 140 1810 496 1320 312 1397 1191 1299 6308 150 1776 120 171 334 1131 381 337 1134 6201 1556 1259 6142 175 158 311 335 1510 323 6291 357 338 333 169 336 1554 6262 1656 447

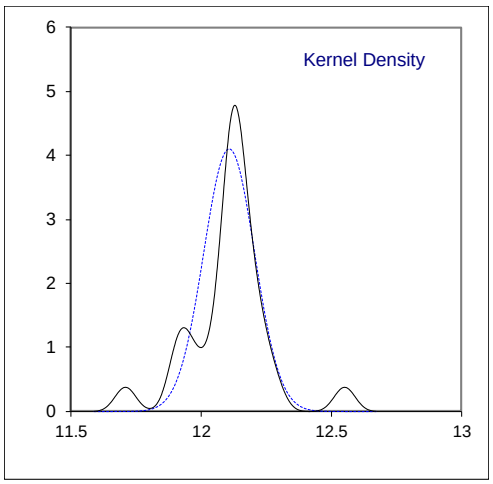

Kernel Density
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
11
11.5
12
12.5
13

Determination of DVPE (EPA calculation) on sample #20081; results in psi

lab	method	value	mark	z(targ)	remarks
62	D5191	11.91		-1.54	
120	D5191	12.12		0.10	
140		-----		-----	
150	D5191	12.11		0.02	
158	D5191	12.19		0.65	
159		-----		-----	
169	D5191	12.24		1.04	
171	D5191	12.13		0.18	
175	D5191	12.167		0.47	
194	D5191	11.97		-1.07	
311		-----		-----	
312	D5191	12.08		-0.21	
323		-----		-----	
333		-----		-----	
334	D5191	12.13		0.18	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
357	D5191	12.21		0.80	
360	EN13016-1	11.94		-1.31	
381		-----		-----	
447	D5191	12.55	E,R(0.05)	3.46	calculation error, iis calculated 12.24
496		-----		-----	
541		-----		-----	
631	D5191	11.71	R(0.05)	-3.11	
1033		-----		-----	
1131	D5191	12.13		0.18	
1134	EN13016-1	12.14		0.26	
1191		-----		-----	
1229	EN13016-1	12.02		-0.68	
1259		-----		-----	
1299		-----		-----	
1320	EN13016-1	12.07		-0.29	
1397		-----		-----	
1459	EN13016-1	11.91		-1.54	
1510		-----		-----	
1554		-----		-----	
1556	EN13016-1	12.15		0.33	
1656		-----		-----	
1776	EN13016-1	12.12		0.10	
1807		-----		-----	
1810		-----		-----	
2146	EN13016-1	12.120		0.10	
6142		-----		-----	
6201	D5191	12.14		0.26	
6262	D5191	12.28		1.35	
6291		12.20		0.72	
6308	D5191	12.10		-0.06	

	normality	OK
	n	24
	outliers	2
	mean (n)	12.107
	st.dev. (n)	0.0972
	R(calc.)	0.272
	st.dev.(D5191:20)	0.1279
	R(D5191:20)	0.358
Compare:		
	R(EN13016-1:18)	0.229

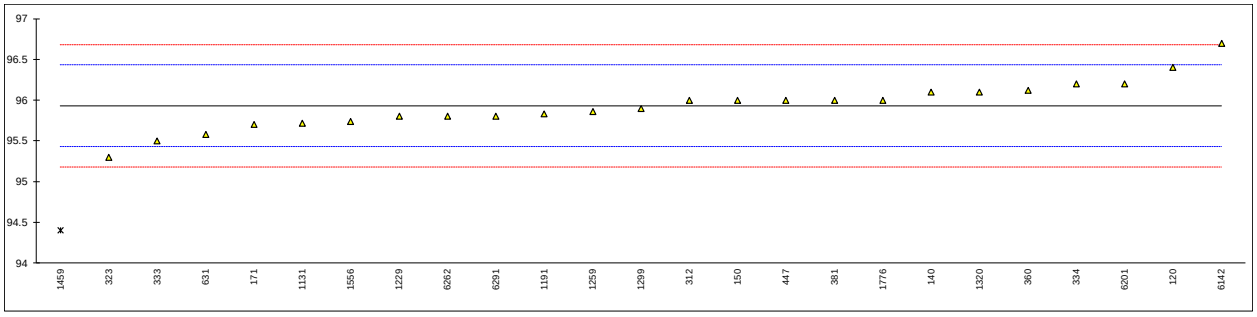

12.7
12.5
12.3
12.1
11.9
11.7
11.5
631
62
1459
360
194
1229
1320
312
6308
150
120
1776
2146
334
171
1131
1134
6201
1556
175
158
6291
357
169
6262
447

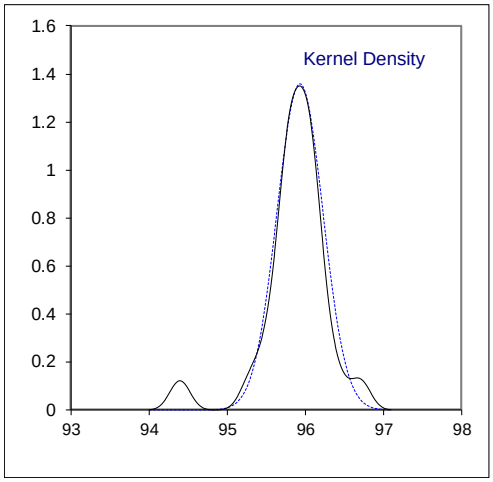

Kernel Density
6
5
4
3
2
1
0
11.5
12
12.5
13

Determination of RON on sample #20082

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D2699	96.4		1.88	
140	D2699	96.1		0.68	
150	D2699	96.0		0.28	
159		-----		-----	
169		-----		-----	
171	D2699	95.7		-0.92	
312	D2699	96.0		0.28	
323	D2699	95.3		-2.52	
333	D2699	95.5		-1.72	
334	D2699	96.2		1.08	
360	ISO5164	96.12		0.76	
381	D2699	96.0		0.28	
447	D2699	96.0		0.28	
511		-----		-----	
631	D2699	95.58		-1.40	
1131	ISO5164	95.72		-0.84	
1191	ISO5164	95.83		-0.40	
1229	ISO5164	95.8		-0.52	
1259	ISO5164	95.86		-0.28	
1299	D2699	95.9		-0.12	
1320	ISO5164	96.1		0.68	
1459	In house	94.4	R(0.01)	-6.12	
1556	ISO5164	95.74		-0.76	
1776	ISO5164	96.0		0.28	
6142	ISO5164	96.7		3.08	
6201	D2699	96.2		1.08	
6262	D2699	95.8		-0.52	
6291	D2699	95.8		-0.52	
6308		-----		-----	

normality	suspect
n	24
outliers	1
mean (n)	95.93
st.dev. (n)	0.294
R(calc.)	0.82
st.dev.(D2699:19)	0.250
R(D2699:19)	0.7

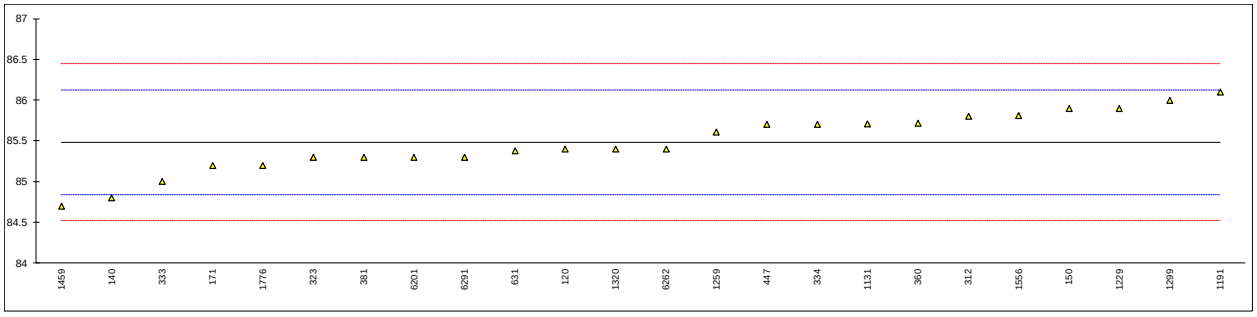


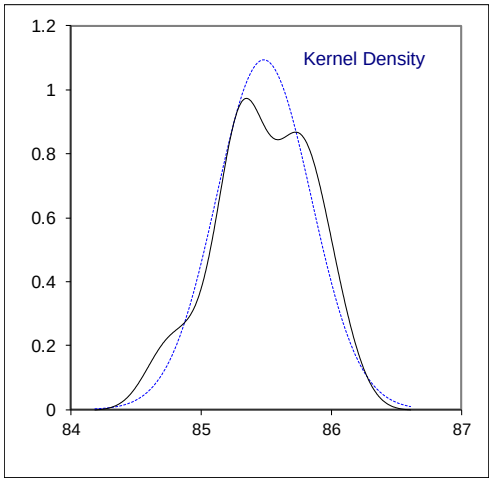


Determination of MON on sample #20082

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D2700	85.4		-0.26	
140	D2700	84.8		-2.13	
150	D2700	85.9		1.29	
159		-----		-----	
169		-----		-----	
171	D2700	85.2		-0.89	
312	D2700	85.8		0.98	
323	D2700	85.3		-0.57	
333	D2700	85.0		-1.51	
334	D2700	85.7		0.67	
360	ISO5163	85.72		0.73	
381	D2700	85.3		-0.57	
447	D2700	85.7		0.67	
511		-----		-----	
631	D2700	85.38		-0.33	
1131	ISO5163	85.71		0.70	
1191	ISO5163	86.10		1.91	
1229	ISO5163	85.9		1.29	
1259	ISO5163	85.61		0.39	
1299	D2700	86.0		1.60	
1320	ISO5163	85.4		-0.26	
1459	In house	84.7		-2.44	
1556	ISO5163	85.81		1.01	
1776	ISO5163	85.2		-0.89	
6142		-----		-----	
6201	D2700	85.3		-0.57	
6262	D2700	85.4		-0.26	
6291	D2700	85.3		-0.57	
6308		-----		-----	

normality	OK
n	24
outliers	0
mean (n)	85.48
st.dev. (n)	0.365
R(calc.)	1.02
st.dev.(D2700:19)	0.321
R(D2700:19)	0.9





APPENDIX 2: Determination of other Oxygenates on sample #20080; results in %V/V

lab	method	DIPE	ETBE	i-BuOH	IPA	MeOH	TAME	t-BuOH	Other oxygenates
62		-----	-----	-----	-----	-----	-----	-----	-----
120	D5599	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-----
140	D5599	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-----
150	D5599	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
158		-----	-----	-----	-----	-----	-----	-----	-----
159		-----	-----	-----	-----	-----	-----	-----	-----
169		-----	-----	-----	-----	-----	-----	-----	-----
171	D5599	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
175		-----	-----	-----	-----	-----	-----	-----	-----
194		-----	-----	-----	-----	-----	-----	-----	-----
311		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
312	ISO22854-A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
323	ISO22854-A	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
333		-----	-----	-----	-----	-----	-----	-----	-----
334	ISO22854-A	0	0	0	0	0	0	0	0
335		-----	-----	-----	-----	-----	-----	-----	-----
336		-----	<0.17	-----	-----	-----	-----	-----	-----
337		-----	-----	-----	-----	-----	-----	-----	-----
338		-----	**12.3 f+**	-----	-----	-----	-----	-----	-----
360		-----	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
381	ISO22854	<0,8	<0,8	<0,8	<0,8	<0,8	<0,8	<0,8	<0,8
447		-----	-----	-----	-----	<0.2	-----	-----	-----
463	EN13132	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2
496	ISO22854-A	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
511		-----	-----	-----	-----	-----	-----	-----	-----
541		-----	-----	-----	-----	-----	-----	-----	-----
631		-----	-----	-----	-----	<0.1	<0.1	-----	-----
1033		-----	-----	-----	-----	-----	-----	-----	-----
1126		<0.03	<0.03	<0.03	<0.03	0.04	<0.03	<0.03	<0.03
1131	ISO22854-A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1134	ISO22854-A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1191		-----	0	0	0	0	0	0	-----
1205		-----	0.056	-----	-----	-----	-----	-----	-----
1229	ISO22854-A	0	0	0	0	0	0	0	0
1259		-----	-----	-----	-----	-----	-----	-----	-----
1299		-----	<0.8	<0.8	<0.8	<0.8	-----	<0.8	<0.8
1320		-----	-----	-----	-----	-----	-----	-----	-----
1397		-----	-----	-----	-----	-----	-----	-----	-----
1443		-----	<0,8	<0,8	<0,8	<0,8	-----	<0,8	-----
1459		-----	< 0.5	-----	-----	-----	-----	-----	-----
1510		-----	-----	-----	-----	-----	-----	-----	-----
1549	D5845	< 0,1	< 0,1	-----	-----	< 0,1	< 0,1	< 0,1	-----
1550	D5845	< 0,1	< 0,1	-----	-----	< 0,1	< 0,1	< 0,1	-----
1554		-----	0.0000	0.0237	0.0000	0.5787	0.0526	0.1631	-----
1556	ISO22854-A	0	0	0	0	0	0	0	0.02
1656		-----	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1706		-----	-----	-----	-----	-----	-----	-----	-----
1776		-----	-----	-----	-----	-----	-----	-----	-----
1807		<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	-----
1810		-----	-----	-----	-----	-----	-----	-----	-----
2146		-----	<0,10	-----	-----	<0,10	<0,10	-----	-----
6142		-----	-----	-----	-----	-----	-----	-----	-----
6168		-----	-----	-----	-----	-----	-----	-----	-----
6201	ISO22854-A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6262	ISO22854-A	0	0	0	0	0	0	0	0
6291	ISO22854-A	0	0	0	0	0	0	0	0
6308	ISO22854-A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Lab 338 possibly a false positive test result on ETBE?

APPENDIX 3: z-scores of Distillation at 760 mmHg

lab	IBP	10%eva	50%eva	90%eva	FBP	%evap.70°C	%evap.100°C	%evap.150°C
62	-0.12	0.94	0.57	-0.23	0.09	-5.93	-0.22	-0.74
120	-----	-----	-----	-----	-----	-----	-----	-----
140	-----	-----	-----	-----	-----	-----	-----	-----
150	-0.48	0.04	-0.24	-0.12	0.21	0.02	0.56	0.07
158	0.53	-0.49	1.84	0.65	-0.90	-----	-----	-----
159	-----	-----	-----	-----	-----	-----	-----	-----
169	-1.38	1.77	1.84	-0.54	-0.15	-1.74	2.12	-2.88
171	-0.60	-0.27	-0.10	-0.43	-1.33	1.10	1.65	0.33
175	-----	-----	-----	-----	-----	-----	-----	-----
194	0.05	0.04	0.35	0.29	0.84	-5.12	1.50	-----
311	-1.20	-1.24	-1.36	-0.23	0.60	0.42	-0.37	-0.20
312	-0.84	-0.19	-0.54	0.13	0.25	0.29	-0.53	0.60
323	0.41	-1.02	-0.62	0.19	-0.42	-0.52	-0.06	-0.47
333	-0.36	0.26	1.09	0.03	0.56	-5.93	-1.31	-0.47
334	-0.60	-0.64	-0.62	-0.33	-1.37	0.96	0.87	0.60
335	1.13	-0.87	-0.62	-0.12	-2.59	1.10	3.52	-4.76
336	-0.66	-0.42	0.28	-0.23	-0.34	-0.25	-0.22	0.87
337	1.19	0.19	0.35	-0.33	0.21	1.37	-0.99	1.14
338	-0.42	-0.64	-1.14	-0.07	0.76	0.96	-0.22	-----
360	-1.02	0.26	0.13	-0.02	-1.25	-0.12	-0.22	-0.20
381	1.07	1.02	1.47	-0.38	0.21	-1.74	-0.68	2.75
447	-0.96	-0.19	0.50	-0.28	0.68	0.15	-0.22	0.07
463	2.20	-0.34	-1.81	0.19	-0.86	0.83	0.56	-0.47
496	0.41	-0.34	0.20	-0.28	-0.07	-0.12	-0.22	0.33
511	-----	-----	-----	-----	-----	-----	-----	-----
541	-----	-----	-----	-----	-----	-----	-----	-----
631	3.75	6.52	17.31	12.61	2.93	-22.30	-15.80	-20.84
1033	-----	-----	-----	-----	-----	-----	-----	-----
1126	1.25	1.92	-2.55	-0.17	1.51	0.29	0.72	1.14
1131	0.17	-0.42	-0.47	-0.02	0.29	0.29	-0.37	-0.20
1134	0.35	0.04	0.65	0.08	0.01	0.29	-0.68	-0.20
1191	0.47	-0.34	-0.99	-0.12	0.84	0.42	0.10	-0.20
1205	-0.18	0.11	-0.10	-0.07	0.37	0.29	-0.37	-0.47
1229	-0.60	-0.64	-0.91	-0.43	-0.07	0.83	0.87	0.33
1259	-0.42	1.39	0.20	2.25	0.25	-4.58	-2.86	-6.10
1299	0.17	1.24	4.81	1.78	0.72	0.15	0.56	0.33
1320	0.05	-0.34	-0.10	-0.23	0.44	0.56	0.25	0.07
1397	1.96	1.02	0.28	-0.23	1.12	-----	-----	-----
1443	1.79	0.78	1.60	2.37	0.05	-2.96	-3.02	-0.74
1459	-0.66	-0.34	-0.91	-0.28	-0.34	0.42	-0.37	0.07
1510	-0.96	-0.79	-0.62	-0.02	0.48	0.42	-0.53	-0.20
1549	1.88	1.19	3.30	2.62	-0.22	-3.23	-1.62	-1.28
1550	2.15	1.63	3.00	2.84	-0.05	-1.88	-0.64	-0.20
1554	-----	-----	-----	-----	-0.15	-0.66	0.72	0.07
1556	-2.15	-0.72	-0.54	-0.17	0.37	0.69	0.10	0.07
1656	0.77	-1.09	-1.51	-0.33	0.37	1.77	0.41	0.33
1706	-0.96	-0.49	-1.14	-0.54	0.64	-----	-----	-----
1776	0.53	-0.57	-0.54	-0.43	-0.82	0.42	0.41	0.60
1807	-0.18	-0.72	0.95	0.44	0.25	-0.52	0.25	-1.54
1810	1.07	1.24	1.54	0.24	-0.07	-1.88	-0.53	-0.74
2146	0.29	0.11	0.35	-0.43	-1.25	0.42	-0.06	1.14
6142	-0.18	-1.81	-5.71	13.72	11.23	5.76	-1.15	-24.33
6168	-2.92	-0.04	2.73	1.68	0.29	-0.12	-3.02	-4.22
6201	-0.36	-0.94	-0.99	-0.33	0.48	0.69	1.50	0.07
6262	-1.61	-0.42	-0.84	-0.02	-1.17	1.23	-0.37	0.07
6291	-0.60	-0.04	-1.06	-0.12	-1.09	1.91	0.25	0.07
6308	0.35	-0.64	-2.92	-0.43	-0.97	2.04	2.74	-----

APPENDIX 4: Analytical details

lab	Manufacturer name of the distillation device	Manufacturer type of the distillation device
62	PAC astm d86	
120		
140	PAC	Opti Distillation Unit
150		
158	Tanaka	AD-7
159		
169		
171	PAC	OptiDist
175		
194		
311		
312	Walter Herzog	Optidist
323	Optimus	Optidist
333	PAC	Optidist
334	PAC	OPTIDIST V
335		
336		
337		
338	PAC	AUTOMATIC
360	HERZOG by PAC	OptiDist
381		
447	Pac Automated distillation unit ASTM D86.	W.Herzog MP 626 - HDA 627/628 - OptiDis by Pac
463	Orbis Pam Distillation	Condenser Module C Orbis BV PAM
496	PAC	Optidist
511		
541		
631		
1033		
1126	Petrotest	
1131		
1134	Herzog by PAC	OptiDist
1191	PAC	Optidist
1205	Optimus	OptiDist
1229		
1259	PAC	OptiDist
1299		
1320	OPTIDIST - PAC	
1397	ASTM D86, OptiDist, Herzog by PAC	
1443	Estanit; Model 40.10	
1459	ISL PAC	Optidist
1510		
1549	Estanit GmbH Germany	Distillation Analyzer Model 40.10
1550	Estanit GmbH Germany	Distillation Analyzer Model 40.10
1554	Anton Paar GmbH, Austria - ISO 3405	Type of the distillation device is ADU5.
1556		
1656	ISL	Optidist
1706	PAC	OptiDist
1776	pac	optidist
1807		
1810		
2146	PAC	
6142		
6168	HERZOG by PAC	Optidist
6201	PAC	Optidist
6262	PAC (Optidist)	Optidist
6291	optidist	optidis
6308	Anton Paar	Diana 700

APPENDIX 5

Number of participants per country

1 lab in	ARGENTINA
1 lab in	AUSTRIA
3 labs in	BELGIUM
5 labs in	BULGARIA
1 lab in	CANADA
2 labs in	CROATIA
1 lab in	CZECH REPUBLIC
4 labs in	FINLAND
7 labs in	FRANCE
1 lab in	GERMANY
1 lab in	IRELAND
1 lab in	LITHUANIA
5 labs in	NETHERLANDS
2 labs in	PERU
1 lab in	PHILIPPINES
1 lab in	SERBIA
1 lab in	SLOVAKIA
2 labs in	SPAIN
3 labs in	SWEDEN
6 labs in	UNITED KINGDOM
9 labs in	UNITED STATES OF AMERICA

APPENDIX 6

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's outlier test
E	= possibly an error in calculations
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

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