Results of Proficiency Test
Biogasoline E10
May 2017

Organised by: Institute for Interlaboratory Studies
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CONTENTS

1 INTRODUCTION

Since 2009, the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Biogasoline E10, in accordance with the latest applicable version of the EN228 and the ASTM D4814 specification. During the annual proficiency testing program 2016/2017, it was decided to continue the round robin for the analysis of Biogasoline E10.
In this interlaboratory study, 52 laboratories in 23 different countries registered for participation in the regular round robin. For the DVPE round robin 49 participants registered and in the ROM/MON round, 34 participants registered for participation. See appendix 3 for the number of participants per country. In this report, the results of the 2017 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 organiser of this proficiency test (PT). Sample analyses for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC 17025 accredited laboratory. In this proficiency test, the participants received, depending on their registration, 1*1 litre Biogasoline E10 (labelled #17080) and/or 1*1 litre Biogasoline E10 (± 750 mL filled, labelled #17081) for DVPE only and/or 2*1 litre Biogasoline E10 (labelled #17082) 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 (iis) in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC 17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organisation 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 March 2017 (iis-protocol, version 3.4). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

2.3 CONFIDENTIALITY STATEMENT

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

participating companies will be done only after receipt of a written agreement of the companies involved.

2.4 SAMPLES

The necessary sample material of about 400 litres (2 drums of 200 litre) of Biogasoline E10 was purchased from a petrol supplier. From the first drum, after homogenisation, 158 amber glass bottles of 1 litre were filled, 74 bottles for the main sample (labelled #17080) and 81 bottles for especially for the RON/MON only (labelled #17082).
From the second drum 78 brown glass bottles of 1 litre were filled with approx. 750 mL especially for Dry Vapour Pressure Equivalent (labelled #17081).
The homogeneity of the subsamples #17080 and #17082 was checked by determination of Density at 15°C in accordance with ASTM D4052 on 8 stratified randomly selected samples.
The homogeneity of the subsamples #17081 was checked by determination of Dry Vapour Pressure Equivalent in accordance with ASTM D5191 on 8 stratified randomly selected samples.

	Density at 15°C in kg/m^3
Sample #17080-1	738.81
Sample #17080-2	738.78
Sample #17080-3	738.77
Sample #17080-4	738.74
Sample #17082-1	738.71
Sample #17082-2	738.74
Sample #17082-3	738.77
Sample #17082-4	738.78

Table 1: homogeneity test results of subsamples #17080 and #17082

	DVPE in psi
Sample #17081-1	12.36
Sample #17081-2	12.42
Sample #17081-3	12.46
Sample #17081-4	12.46
Sample #17081-5	12.46
Sample #17081-6	12.49
Sample #17081-7	12.44
Sample #17081-8	12.47

Table 2: homogeneity test results of subsamples #17081

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

	Density at 15°C in kg/m^3	DVPE in psi
r (sample #17080/16082)	0.12	--
r (sample #17081)	--	0.11
reference test method	ISO12185:96	D5191:15
0.3 * R (ref. test method)	0.45	0.11

Table 3: evaluation of the repeatabilities of the subsamples #17080, #17082 and #17081

The calculated repeatabilities were in agreement with 0.3 times the corresponding reproducibilities of the target methods. Therefore, homogeneity of the subsamples #17080, #17081 and #17082 was assumed.

To each of the participating laboratories, depending on their registration, 1 litre of sample #17080, 1 litre (± 750 mL filled) of sample #17081 and/or 2 litres of sample #17082 were sent on May 3, 2017. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

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

2.6 ANALYSES

The participants were requested to determine on sample #17080: API gravity, Aromatics (by FIA and by GC), Benzene, Copper Strip Corrosion 3hrs/50°C, Density at 15°C, Distillation, Doctor test, Existent Gum, Lead as Pb, Manganese as Mn, Mercaptan Sulphur as S, Olefins (by FIA and by GC), Oxidation Stability, Oxygenates, Oxygen and Sulphur.
On sample #17081 the participants were requested to determine TVP and to calculate DVPE only (in accordance with ASTM D5191 and EPA requirements). The participants were requested to determine RON and MON on sample #17082 (EN228 correction not applied).

It was explicitly requested to treat the samples as if they were routine samples. Therefore, each laboratory is advised to perform only those analyses that normally are done in daily routine (but the laboratories are allowed to do all analyses). Furthermore, it was requested 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 that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis/. The participating laboratories are also requested to confirm the sample receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

3 RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis/. The reported test results are tabulated per determination in appendix 1 of this report. The laboratories are presented by their code numbers.
Directly after the deadline, a reminder was sent to those laboratories that had not reported test results at that moment.

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

3.1 STATISTICS

Statistical calculations were performed as described in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' (iis-protocol, March 2017 version 3.4). 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.

In accordance to ISO 5725 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 the averages and the standard deviations.

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

Finally, the reproducibilities were calculated from the standard deviations by multiplying 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 standard. Outliers and other data, which were excluded from the calculations, are represented as a “x”. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. The Kernel Density Graph 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, ISO reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study. The target standard deviation was calculated from the literature reproducibility by division with 2.8.

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:

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

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

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

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

4 EVALUATION

In this proficiency test some problems were encountered during the execution.
For the regular Biogasoline E10 (#17080): 3 participants reported test results after the final reporting date and 4 other participants did not report any test results at all.
For the DVPE PT (#17081): 1 participant reported test results after the final reporting date and 6 other participants did not report any test results at all.
For the RON/MON PT: 8 participants did not report any test results at all. All others reported the test results on time.

Finally, in total 967 numerical test results were reported by the participants. Observed were 51 outlying results, which is 5.3%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

4.1 EVALUATION PER SAMPLE AND PER TEST

In this section, the reported test results are discussed per sample and per test. The specified test methods and requirements were taken into account for explaining the observed differences when possible and applicable. These methods are also in the tables together with the original data. The abbreviations, used in these tables, are listed in appendix 4.

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

For sample #17080

API gravity: This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of ASTM D4052:16.

Aromatics by FIA: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D1319:15 and EN15553:07.

Aromatics by GC: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ISO22854:16. When the ISO22854 test results were evaluated separately, the calculated reproducibility is in good agreement with the requirements of ISO22854:16.

Benzene: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ISO22854:16. When the ISO22854 test results were evaluated separately, the calculated reproducibility is in full agreement with the requirements of ISO22854:16.

Copper strip corrosion: No problems have been observed, all reporting participants agreed on a test result of 1.

Density at 15°C: This determination was problematic for a number of laboratories only. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ISO12185:96 and with ASTM D4052:16.

Distillation: The determination of the distillation may not be problematic. In total seven statistical outliers were observed. However, all calculated reproducibilities after rejection of the statistical outliers, except for %evaporated at 70°C, are in agreement with the requirements of the automated mode and the manual mode of ASTM D86:17. Only three laboratories performed the test in manual mode.

Doctor test: No problems have been observed, all reporting participants agreed on a test result of “negative”.

Existent Gum: This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in agreement with requirements of ASTM D381:12 and with the more strict requirements of ISO6245:95.

Lead: The lead concentration was below the application range (2.5 – 25 mg/L) of ASTM D3237:12. Therefore, no significant conclusions were drawn.

Manganese: The manganese concentration was below the application range of the test methods used by the participants. Therefore, no significant conclusions were drawn.

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

Olefins by FIA: This determination was problematic. One statistical outlier was observed and one test result was excluded in the statistical calculations as it was suspect (Test result FIA < GC). The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTM D1319:15.

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 good agreement with the requirements of ISO22854:16.

Oxidation Stability: All participants agreed that the Oxidation Stability is >360 minutes.

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

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

Ethers (C5) only: 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 ISO22854:16.

Ethers (C5 or more C): 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 ISO22854:16.

Ethers (C6 and more C): This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO22854:16.

TAME: 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.

Other oxygenates: The concentration of the various oxygenates were near or below the application range of ISO22854:16 (min. 0.2 %V/V). Therefore, no significant conclusions were drawn.

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

Sulphur: This determination was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO20846:11.

For sample #17081

TVP: This determination was not problematic. No statistical outliers were observed, but one test result was excluded, as it does not seem to correlate with its DVPE. However, the calculated reproducibility after rejection of the suspect data is in agreement with the requirements of ASTM D5191:15 and EN13016-1:07.

DVPE: The conversion of the measured Total Vapour Pressure to the corresponding Dry Vapour Pressure Equivalent (DVPE) as described in the ASTM D5191:13 and the U.S. EPA guidelines (40 CFR Part 80, App. E, Method 3) showed in total three statistical outliers and one test result was excluded as it does not seem to correlate with its TVP. Both calculated reproducibilities after rejection of the suspect data are in agreement with the requirement of ASTM D5191:15 and EN13016-1:07.

For sample #17082

RON: This determination was problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D2699:16e1

MON: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D2700:16a.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant standard and the reproducibility as found for the group of participating laboratories. The assigned values, calculated reproducibilities and reproducibilities, derived from literature standards (in casu ASTM, ISO, EN standards) are compared in the next table.

Parameter	unit	n	average	2.8 * sd	R (lit)
API gravity		24	59.84	0.35	0.59
Aromatics by FIA	%V/V	18	27.2	5.7	3.7
Aromatics by GC	%V/V	27	21.6	1.4	1.1
Benzene	%V/V	34	0.32	0.06	0.04
Copper Strip 3 hrs at 50°C		33	1	n.a.	n.a.
Density at 15°C	kg/m^3	42	739.1	0.8	1.5
Initial Boiling Point	ºC	43	28.7	5.0	4.7
10% evaporated	ºC	42	45.8	3.7	3.6
50% evaporated	ºC	42	71.3	3.0	4.2
90% evaporated	ºC	36	153.0	3.4	6.4
Final Boiling Point	ºC	42	194.6	5.3	7.1
%Volume at 70ºC	%V/V	38	48.2	3.4	2.0
%Volume at 100ºC	%V/V	34	62.4	1.4	1.8
%Volume at 150ºC	%V/V	31	89.4	1.0	1.2
Doctor test		14	Negative	n.a.	n.a.
Existent Gum (solvent washed)	mg/100mL	18	0.7	1.5	2.2
Lead as Pb	mg/L	24	<2.5	n.a.	n.a.
Manganese as Mn	mg/L	20	<2	n.a.	n.a.
Mercaptans Sulphur as S	%M/M	12	0.0002	0.0003	0.0003
Olefins by FIA	%V/V	16	11.4	4.3	3.5
Olefins by GC	%V/V	22	9.4	0.6	1.6
Oxidation Stability	minutes	21	>360	n.a.	n.a.
Ethanol	%V/V	31	10.1	0.6	0.6
MTBE	%V/V	26	10.8	0.7	0.6
Ethers C5	%V/V	14	10.8	0.8	0.6
Ethers C5 or more C atoms	%V/V	17	10.8	1.0	0.6
Ethers C6 or more C atoms	%V/V	9	0.1	0.2	0.4
TAME	%V/V	17	0.12	0.04	0.35
Oxygen content	%M/M	30	5.8	0.3	0.3
Sulphur	mg/kg	38	5.3	1.8	1.7

Table 4: performance evaluation sample #17080

Parameter	unit	n	average	2.8 * sd	R (lit)
TVP acc.to ASTM D5191	psi	35	13.35	0.29	0.37
DVPE acc.to ASTM D5191	psi	40	12.33	0.28	0.36
DVPE acc.to EPA	psi	28	12.42	0.29	0.36

Table 5: performance evaluation sample #17081

Parameter	unit	n	average	2.8 * sd	R (lit)
RON		19	101.3	1.1	0.7
MON		23	89.3	0.8	0.9

Table 6: performance evaluation sample #17082

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF MAY 2017 WITH PREVIOUS PT

Determination	May 2017	May 2016	May 2015	May 2014	May 2013
Number of reporting labs	52	54	41	50	48
Number of results reported	967	1073	713	1164	892
Statistical outliers	51	31	20	45	25
Percentage outliers	5.3%	2.9%	2.8%	3.9%	2.8%

Table 7: comparison with previous proficiency tests

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

Determination	May 2017	May 2016	May 2015	May 2014	May 2013
API gravity	++	++	++	++	+
Aromatics by FIA	-	+/-	-	-	--
Aromatics by GC	-	+/-	+	+	-
Benzene	-	-	-	+/-	-
Density at 15°C	++	++	++	++	+/-
Distillation	+/-	+/-	++	+	+
Existent Gum (washed)	+	+	++	+/-	+/-
Mercaptans as S	+/-	n.e.	n.e.	++	++
Olefins by FIA	-	+/-	+	+	--
Olefins by GC	++	+	++	++	+
Ethanol	+/-	+/-	-	--	--
MTBE	+/-	+/-	n.e.	+	n.e.
Ethers	-	n.e.	n.e.	n.e.	n.e.
TAME	++	n.e.	n.e.	n.e.	n.e.
Oxygen content	+/-	+/-	-	+/-	+/-
Sulphur	+/-	+/-	+/-	+/-	+/-
TVP acc.to ASTM D5191	+	+	++	+	+
DVPE acc.to ASTM D5191	+	+	+	+	+
DVPE acc.to EPA	+	+	++	+	+
RON	-	+/-	+/-	-	+
MON	+	+/-	+/-	-	-

Table 8: comparison of the quality of the various determinations against the respective standard requirements

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

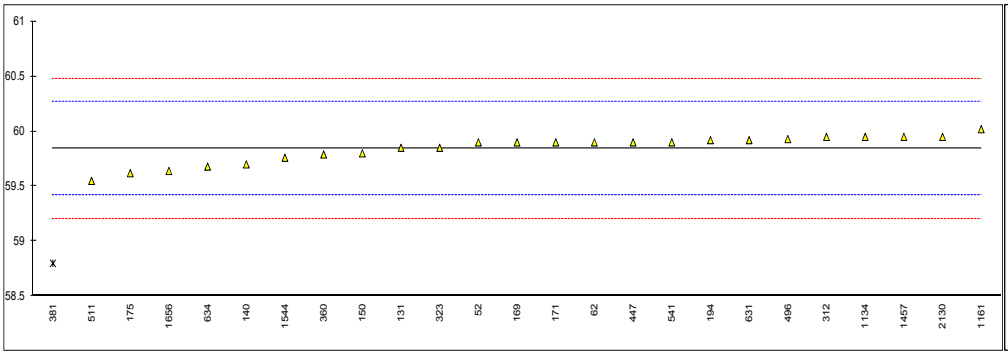
++:	group performed much better than the standard
+ :	group performed better than the standard
+/-:	group performance equals the standard
- :	group performed worse than the standard
-- :	group performed much worse than the standard
n.e.:	not evaluated

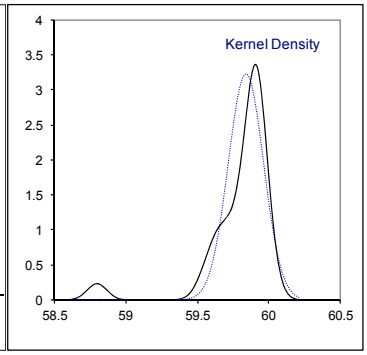
APPENDIX 1

Determination of API gravity on sample #17080;

lab	method	value	mark	z(targ)	remarks
52	D4052	59.9		0.27	
53		-----		-----	
62	D4052	59.9		0.27	
131	D4052	59.85		0.03	
140	D4052	59.7		-0.67	
150	D4052	59.8		-0.20	
158		-----		-----	
159		-----		-----	
169	D4052	59.9		0.27	
171	D4052	59.9		0.27	
175	D4052	59.62		-1.05	
194	D4052	59.92		0.36	
312	D4052	59.95		0.50	
323	D4052	59.85		0.03	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D4052	59.79		-0.25	
381	D4052	58.8	C,R(0.01)	-4.91	First reported 59.3
447	D4052	59.90		0.27	
494		-----		-----	
496	D4052	59.93		0.41	
511	D4052	59.55		-1.38	
541	D4052	59.9		0.27	
631	D4052	59.92		0.36	
634	D4052	59.68		-0.77	
970		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1131		-----		-----	
1134	D4052	59.95		0.50	
1161	D287	60.02		0.83	
1191		-----		-----	
1229		-----		-----	
1299		-----		-----	
1389		-----		-----	
1457	D4052	59.95		0.50	
1459		-----		-----	
1544	D4052	59.76		-0.39	
1634		-----		-----	
1635		-----		-----	
1656	D4052	59.64		-0.96	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130	D4052	59.95		0.50	
2146		-----		-----	
6075		-----		-----	

normality	OK
n	24
outliers	1
mean (n)	59.843
st.dev. (n)	0.1236
R(calc.)	0.346
R(D4052:16)	0.594



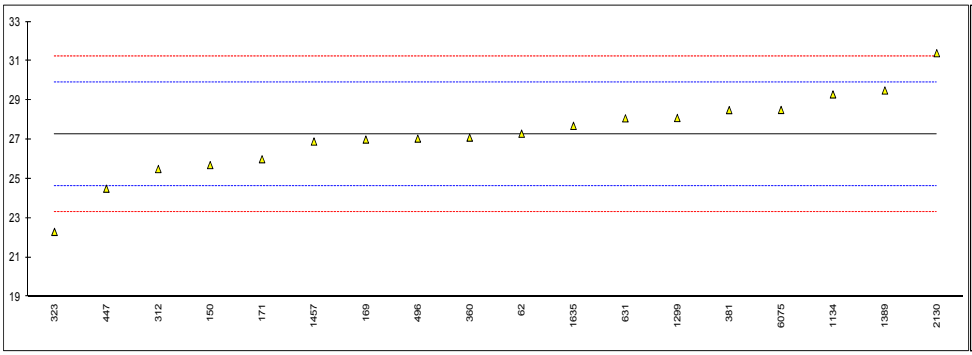


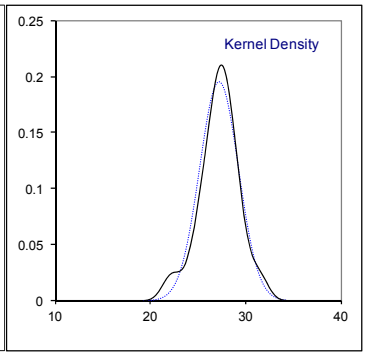
Determination of Aromatics by FIA on sample #17080; results in %V/V

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62	D1319	27.3		0.04	
131		-----		-----	
140		-----		-----	
150	D1319	25.7		-1.17	
158		-----		-----	
159		-----		-----	
169	D1319	27.0		-0.19	
171	D1319	26.0		-0.94	
175		-----		-----	
194		-----		-----	
312	D1319	25.5		-1.32	
323	D1319	22.3		-3.74	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D1319	27.1		-0.11	
381	EN15553	28.5		0.95	
447	D1319	24.5		-2.08	
494		-----		-----	
496	D1319	27.05		-0.15	
511		-----		-----	
541		-----		-----	
631	D1319	28.08		0.63	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1131		-----		-----	
1134	D1319	29.3		1.55	
1161		-----		-----	
1191		-----		-----	
1229		-----		-----	
1299	D1319	28.1		0.65	
1389	D1319	29.5		1.71	
1457	D1319	26.9		-0.26	
1459		-----		-----	
1544		-----		-----	
1634		-----		-----	
1635	D1319	27.70		0.34	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130	D1319	31.4		3.14	
2146		-----		-----	
6075	D1319	28.51		0.96	

normality	suspect
n	18
outliers	0
mean (n)	27.247
st.dev. (n)	2.0378
R(calc.)	5.706
R(D1319:15)	3.7

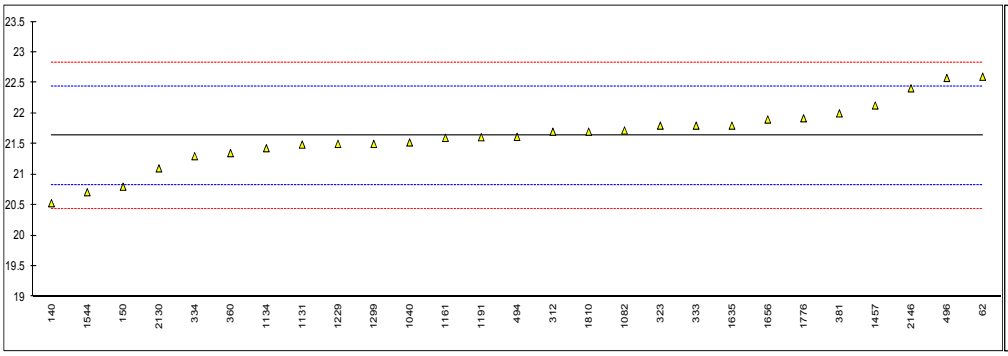
Compare R(EN15553:07) = 3.7

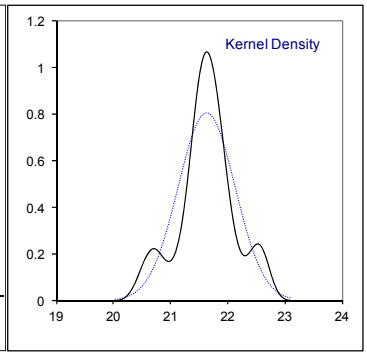




Determination of Aromatics by GC on sample #17080; results in %V/V

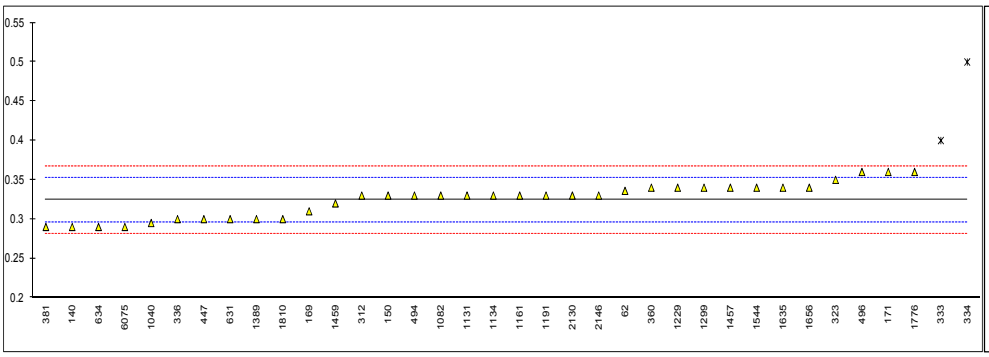
lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62	INH-CGSB	22.6		2.41	
131		-----		-----	
140	D5769	20.53		-2.76	
150	D5769	20.8	C	-2.08	First reported 19.1
158		-----		-----	
159		-----		-----	
169		-----		-----	
171		-----		-----	
175		-----		-----	
194		-----		-----	
312	ISO22854	21.7		0.16	
323	ISO22854	21.8		0.41	
333	ISO22854	21.8		0.41	
334	ISO22854	21.3		-0.83	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854	21.35		-0.71	
381	ISO22854	22.0		0.91	
447		-----		-----	
494	ISO22854	21.615		-0.05	
496	ISO22854	22.58		2.36	
511		-----		-----	
541		-----		-----	
631		-----		-----	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040	ISO22854	21.525		-0.27	
1082	ISO22854	21.72		0.21	
1131	ISO22854	21.49		-0.36	
1134	ISO22854	21.43		-0.51	
1161	ISO22854	21.6		-0.09	
1191	ISO22854	21.61		-0.06	
1229	ISO22854	21.5		-0.34	
1299	ISO22854	21.5		-0.34	
1389		-----		-----	
1457	ISO22854	22.13		1.24	
1459		-----		-----	
1544	ISO22854	20.71		-2.31	
1634		-----		-----	
1635	ISO22854	21.8	C	0.41	First reported 27.77
1656	ISO22854	21.9		0.66	
1706		-----		-----	
1776	ISO22854	21.92		0.71	
1810	ISO22854	21.7		0.16	
2130	D6730	21.1		-1.33	
2146	ISO22854	22.41		1.94	
6075		-----		-----	
					Only ISO22854
	normality	OK			suspect
	n	27			23
	outliers	0			0
	mean (n)	21.634			21.700
	st.dev. (n)	0.4969			0.3807
	R(calc.)	1.391			1.066
	R(ISO22854:16)	1.121			1.124 Compare R(D5769:15) = 2.448

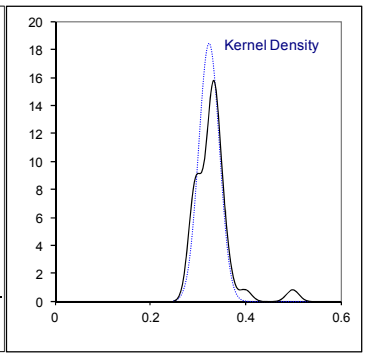




Determination of Benzene on sample #17080; results in %V/V

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62	INH-CGSB	0.336		0.81	
131		-----		-----	
140	D3606	0.29		-2.41	
150	D3606	0.33		0.39	
158		-----		-----	
159		-----		-----	
169	D3606	0.31		-1.01	
171	D3606	0.36		2.49	
175		-----		-----	
194		-----		-----	
312	D5580	0.33		0.39	
323	ISO22854	0.35		1.79	
333	ISO22854	0.4	R(0.05)	5.29	
334	ISO22854	0.5	R(0.01)	12.29	
335		-----		-----	
336	EN238	0.3		-1.71	
337		-----		-----	
338		-----		-----	
360	ISO22854	0.34		1.09	
381	EN238	0.29		-2.41	
447	IP429	0.3		-1.71	
494	ISO22854	0.33		0.39	
496	ISO22854	0.360		2.49	
511		-----		-----	
541		-----		-----	
631	D6277	0.30		-1.71	
634	D6277	0.29	C	-2.41	First reported 0.19
970		-----		-----	
1033		-----		-----	
1040	ISO22854	0.295		-2.06	
1082	ISO22854	0.33		0.39	
1131	ISO22854	0.33		0.39	
1134	ISO22854	0.33		0.39	
1161	ISO22854	0.33		0.39	
1191	ISO22854	0.33		0.39	
1229	ISO22854	0.34		1.09	
1299	ISO22854	0.34		1.09	
1389	EN12177	0.30		-1.71	
1457	ISO22854	0.34		1.09	
1459	In house	0.32		-0.31	
1544	ISO22854	0.34	C	1.09	First reported 0.43
1634		-----		-----	
1635	ISO22854	0.34		1.09	
1656	ISO22854	0.34		1.09	
1706		-----		-----	
1776	ISO22854	0.36		2.49	
1810	ISO22854	0.3		-1.71	
2130	D6730	0.33		0.39	
2146	ISO22854	0.33		0.39	
6075	EN238	0.29		-2.41	
					Only ISO22854
	normality	OK			suspect
	n	34			19
	outliers	2			2
	mean (n)	0.324			0.334
	st.dev. (n)	0.0216			0.0161
	R(calc.)	0.061			0.045
	R(ISO22854:16)	0.04			0.04





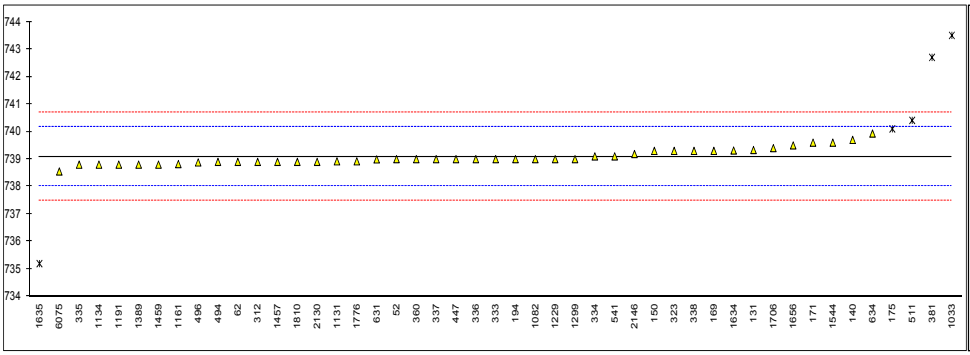
Determination of Copper strip corrosion 3hrs at 50°C on sample #17080

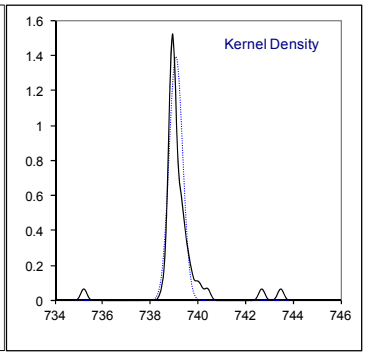
lab	method	value	mark	z(targ)	remarks
52	D130	1a		-----	
53		-----		-----	
62	D130	1b		-----	
131	D130	1a		-----	
140	D130	1a		-----	
150	D130	1a		-----	
158		-----		-----	
159		-----		-----	
169	D130	1a		-----	
171	D130	1a		-----	
175		-----		-----	
194		-----		-----	
312	D130	1a		-----	
323	D130	1A		-----	
333		-----		-----	
334	ISO2160	1		-----	
335	D130	1b		-----	
336	ISO2160	1		-----	
337	ISO2160	1		-----	
338		-----		-----	
360	ISO2160	1A		-----	
381	ISO2160	1		-----	
447	D130	1a		-----	
494	D130	1a		-----	
496	ISO2160	1a		-----	
511	D130	1a		-----	
541	D130	1a		-----	
631	D130	1A		-----	
634	D130	1a		-----	
970		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1131	ISO2160	1a		-----	
1134	D130	1a		-----	
1161	ISO2160	1A		-----	
1191		-----		-----	
1229		-----		-----	
1299	D130	1A		-----	
1389	D130	1A		-----	
1457	D130	1A		-----	
1459		-----		-----	
1544	D130	1a		-----	
1634	D130	1a		-----	
1635	D130	1A		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130	D130	1a		-----	
2146		-----		-----	
6075	ISO2160	1a		-----	
	normality	n.a.			
	n	33			
	outliers	n.a.			
	mean (n)	1			

Determination of Density at 15°C on sample #17080; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
52	D4052	739.0		-0.15	
53		-----		-----	
62	D4052	738.9		-0.34	
131	D4052	739.33		0.46	
140	D4052	739.7		1.15	
150	D4052	739.3		0.41	
158		-----		-----	
159		-----		-----	
169	D4052	739.3		0.41	
171	D4052	739.6		0.97	
175	D4052	740.1	R(0.05)	1.90	
194	D4052	739.0		-0.15	
312	ISO12185	738.9		-0.34	
323	ISO12185	739.3		0.41	
333	ISO12185	739.0		-0.15	
334	ISO12185	739.1		0.03	
335	ISO12185	738.8		-0.53	
336	ISO12185	739.0		-0.15	
337	ISO12185	739.0		-0.15	
338	ISO12185	739.3		0.41	
360	ISO12185	739.0		-0.15	
381	ISO12185	742.7	C,R(0.01)	6.75	First reported 741.0
447	D4052	739.0		-0.15	
494	ISO12185	738.9		-0.34	
496	ISO12185	738.88		-0.38	
511	D4052	740.41	R(0.05)	2.48	
541	ISO12185	739.1		0.03	
631	D4052	738.99		-0.17	
634	D4052	739.93		1.58	
970		-----		-----	
1033	IP365	743.5	R(0.01)	8.25	
1040		-----		-----	
1082	ISO12185	739.0		-0.15	
1131	ISO12185	738.92		-0.30	
1134	ISO12185	738.8		-0.53	
1161	ISO12185	738.82		-0.49	
1191	ISO12185	738.8		-0.53	
1229	ISO12185	739.0		-0.15	
1299	D4052	739.0		-0.15	
1389	D4052	738.8		-0.53	
1457	ISO12185	738.9		-0.34	
1459	ISO12185	738.8		-0.53	
1544	ISO12185	739.6		0.97	
1634	ISO12185	739.314		0.43	
1635	D4052	735.2	R(0.01)	-7.25	
1656	D4052	739.5		0.78	
1706	ISO12185	739.4		0.59	
1776	ISO12185	738.92		-0.30	
1810	ISO12185	738.9		-0.34	
2130	D4052	738.9		-0.34	
2146	ISO12185	739.185		0.19	
6075	ISO12185	738.55		-0.99	

normality	suspect	
n	42	
outliers	5	
mean (n)	739.082	
st.dev. (n)	0.2857	
R(calc.)	0.800	
R(ISO12185:96)	1.5	Compare R(D4052:16) = 2.326

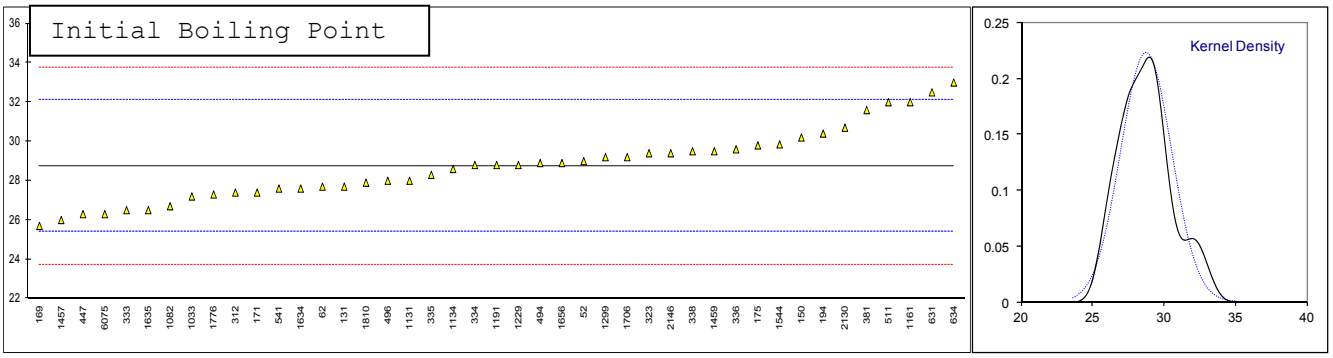


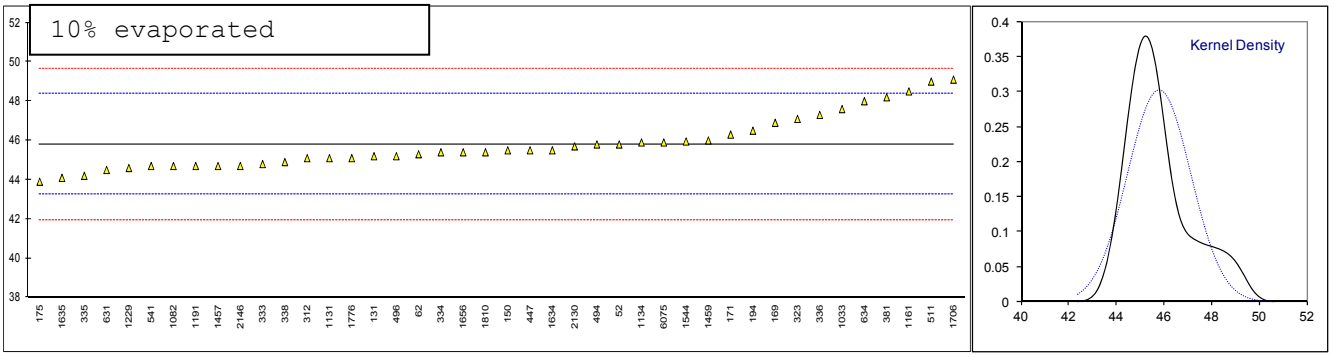


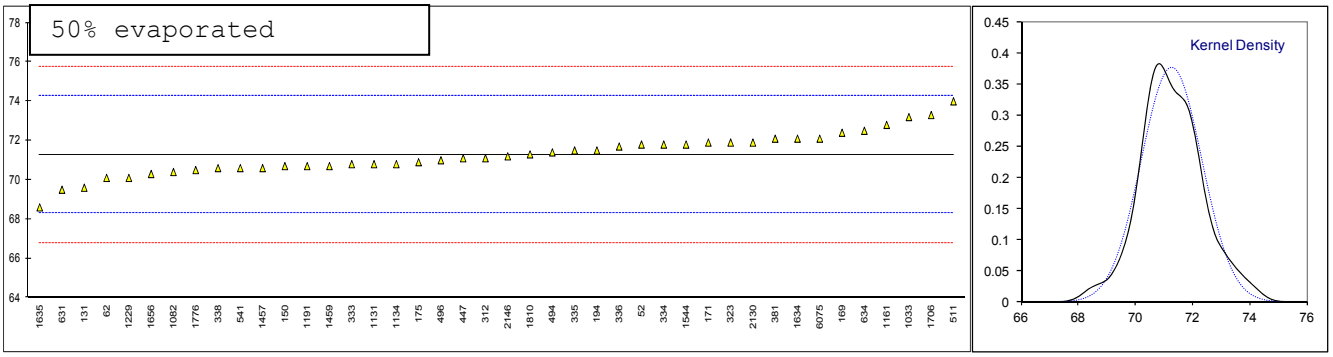
Determination of Distillation on sample #17080; results in °C

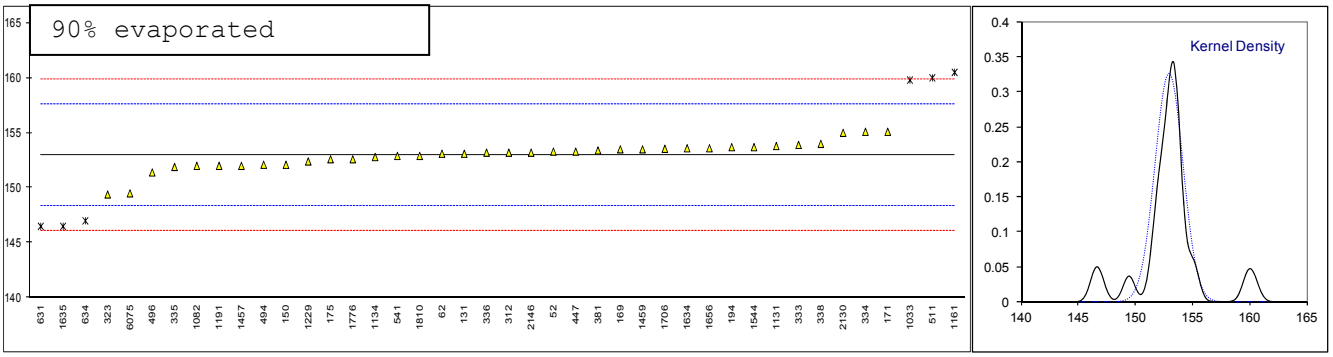
lab	method	IBP	mark	10%eva	mark	50%eva	mark	90%eva	mark	FBP	mark
52	D86-Automated	29.0		45.8		71.8		153.3		192.8	
53		-----		-----		-----		-----		-----	
62	D86-Automated	27.7		45.3		70.1		153.1		194.2	
131		27.7		45.2		69.6		153.1		194.6	
140		-----		-----		-----		-----		-----	
150	D86-Automated	30.2		45.5		70.7		152.1		193.7	
158		-----		-----		-----		-----		-----	
159		-----		-----		-----		-----		-----	
169	D86-Automated	25.7		46.9		72.4		153.5		194.6	
171	D86-Automated	27.4		46.3		71.9		155.1		192.5	
175	D86-Automated	29.8		43.9		70.9		152.6		196.1	
194	D86-Automated	30.4		46.5		71.5		153.7		193.8	
312	D86-Automated	27.4		45.1		71.1		153.2		194.3	
323	D86-Automated	29.4	C	47.1	C	71.9	C	149.4	C	191.0	C
333		26.5		44.8		70.8		153.9		194.5	
334	D86-Automated	28.8		45.4		71.8		155.1		197.1	
335	D86-Automated	28.3		44.2		71.5		151.9		195.5	
336		29.6		47.3		71.7		153.2		194.8	
337		-----		-----		-----		-----		-----	
338	D86-Automated	29.5		44.9		70.6		154.0		196.1	
360		-----		-----		-----		-----		-----	
381	ISO3405-Automated	31.6		48.2		72.1		153.4		196.3	
447	D86-Automated	26.3		45.5		71.1		153.3		197.2	
494	D86-Automated	28.9		45.8		71.4		152.1		191.0	
496	D86-Automated	28		45.2		71		151.4		193.9	
511	D86-Manual	32.0		49.0		74.0		160.0	R(5)	194.0	
541	D86-Automated	27.6		44.7		70.6		152.9		194.9	
631	D86-Manual	32.5		44.5		69.5		146.5	R(1)	198.0	
634	D86-Manual	33.0		48.0		72.5		147.0	C,R(1)	194.0	
970		-----		-----		-----		-----		-----	
1033	IP123-Automated	27.2		47.6		73.2		159.8	R(5)	195.6	
1040		-----		-----		-----		-----		-----	
1082	ISO3405-Automated	26.7		44.7		70.4		152.0		196.5	
1131	ISO3405-Automated	28.0		45.1		70.8		153.8		192.5	
1134	D86-Automated	28.6		45.9		70.8		152.8		192.4	
1161	D86-Automated	32.0		48.5		72.8		160.5	C,R(5)	195.6	
1191	ISO3405-Automated	28.8		44.7		70.7		152.0		195.0	
1229	ISO3405-Automated	28.8		44.6		70.1		152.4		193.4	
1299	D86-Automated	29.2		-----		-----		-----		195.9	
1389		-----	W	-----	W	-----	W	-----	W	-----	W
1457	ISO3405-Automated	26.0		44.7		70.6		152.0		194.0	
1459	D86-Automated	29.5		46		70.7		153.5		194.6	
1544	D86-Automated	29.85		45.95		71.80		153.70		197.30	
1634	D86-Automated	27.6		45.5		72.1		153.6		197.2	
1635	D86-Automated	26.5		44.1		68.6		146.5	R(1)	197.0	
1656	ISO3405-Automated	28.9		45.4		70.3		153.6		194.3	
1706	ISO3405-Automated	29.2		49.1		73.3		153.55		197.5	
1776	ISO3405-Automated	27.3		45.1		70.5		152.6		194.7	
1810	D86-Automated	27.9		45.4		71.3		152.9		190.3	
2130	D86-Automated	30.7		45.7		71.9		155.0		201.9	R(0.05)
2146		29.4		44.7		71.2		153.2		194.3	
6075	ISO3405-Automated	26.3		45.9		72.1		149.5		191.4	
	normality	OK		suspect		OK		not OK		OK	
	n	43		42		42		36		42	
	outliers	0		0		0		6		1	
	mean (n)	28.74		45.80		71.28		152.96		194.63	
	st.dev. (n)	1.785		1.320		1.061		1.225		1.881	
	R(calc.)	5.00		3.70		2.97		3.43		5.27	
	R(D86:17 auto)	4.7		3.60		4.18		6.44		7.1	
	Compare R(D86:17 manual)	5.6		3.48		4.33		5.10		7.2	

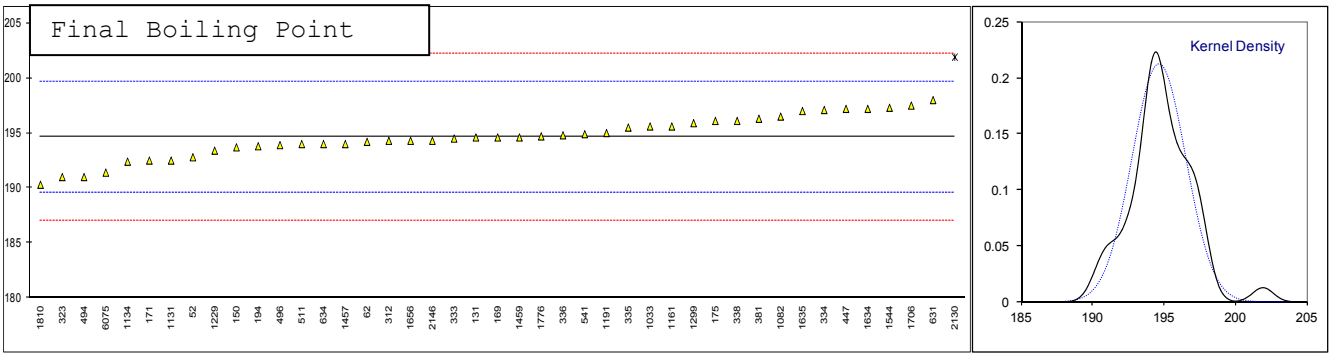
Lab 323: first reported 29.8, 42.9, 68.5, 145.0, 191.9
Lab 634: first reported 146.0
Lab 1161: first reported 161.4
Lab 1389: test results were withdrawn: 26.8, 47.2, 73.9, 161.7, 194.0


Initial Boiling Point
Kernel Density


10% evaporated
Kernel Density


50% evaporated
Kernel Density

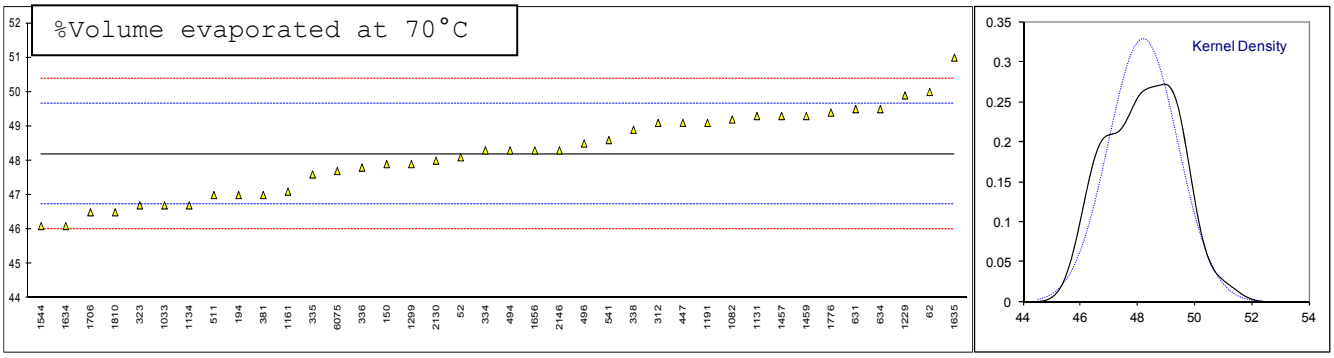

90% evaporated
Kernel Density

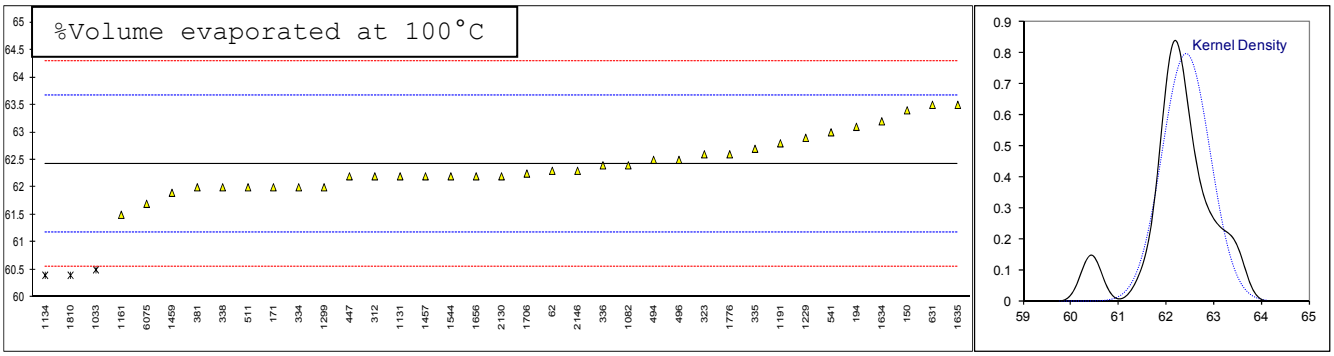

Final Boiling Point
Kernel Density

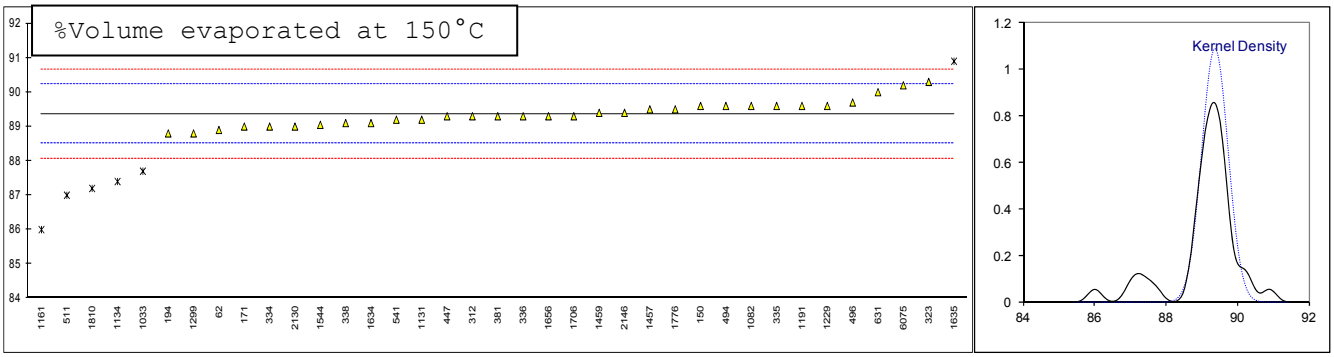
Determination of Distillation on sample #17080; results in %V/V

lab	method	%evap. at 70°C	mark	%evap. at 100°C	mark	%evap. at 150°C	mark	residue	mark
52	D86-Automated	48.1		-----		-----		1.2	
53		-----		-----		-----		-----	
62	D86-Automated	50.0		62.3		88.9		1.0	
131		-----		-----		-----		1.2	
140		-----		-----		-----		-----	
150	D86-Automated	47.9		63.4		89.6		1.1	
158		-----		-----		-----		-----	
159		-----		-----		-----		-----	
169		-----		-----		-----		1.0	
171	D86-Automated	-----		62.0		89.0		1.5	
175		-----		-----		-----		1.1	
194	D86-Automated	47.0		63.1		88.8		1.2	
312	D86-Automated	49.1		62.2		89.3		1.1	
323	D86-Manual	46.7	C	62.6	C	90.3	C	1.1	
333		-----		-----		-----		-----	
334	D86-Automated	48.3		62.0		89.0		1.5	
335	D86-Automated	47.6		62.7		89.6		0.8	
336		47.8		62.4		89.3		1.3	
337		-----		-----		-----		-----	
338	D86-Automated	48.9		62.0		89.1		1.1	
360		-----		-----		-----		-----	
381	ISO3405-Automated	47.0		62.0		89.3		0.6	
447	D86-Automated	49.1		62.2		89.3		1.1	
494	D86-Automated	48.3		62.5		89.6		1.1	
496	D86-Automated	48.5		62.5		89.7		0.9	
511	D86-Manual	47.0		62.0		87.0	R(5)	-----	
541	D86-Automated	48.6		63.0		89.2		1.1	
631	D86-Manual	49.5		63.5		90.0		0.9	
634	D86-Manual	50	C	-----		-----		1.0	
970		-----		-----		-----		-----	
1033	IP123-Automated	46.7		60.5	R(5)	87.7	R(1)	1.1	
1040		-----		-----		-----		-----	
1082	ISO3405-Automated	49.2		62.4		89.6		1.1	
1131	ISO3405-Automated	49.3		62.2		89.2		1.1	
1134	D86-Automated	46.7		60.4	R(5)	87.4	R(5)	1.1	
1161	D86-Automated	47.1		61.5		86.0	C,R(5)	0.9	
1191	ISO3405-Automated	49.1		62.8		89.6		1.0	
1229	ISO3405-Automated	49.9		62.9		89.6		1.0	
1299	D86-Automated	47.9		62.0		88.8		1.5	
1389		-----	W	-----	W	-----	W	-----	
1457	ISO3405-Automated	49.3		62.2		89.5		1.1	
1459	D86-Automated	49.3		61.9		89.4		1.1	
1544	D86-Automated	46.10		62.20		89.05		1.05	
1634	D86-Automated	46.1		63.2		89.1		1.0	
1635	D86-Automated	51.0		63.5		90.9	R(1)	1.0	
1656	ISO3405-Automated	48.3		62.2		89.3		1.1	
1706	ISO3405-Automated	46.5		62.25		89.3		0.8	
1776	ISO3405-Automated	49.4		62.6		89.5		1.1	
1810	D86-Automated	46.5		60.4	R(5)	87.2	R(5)	1.1	
2130	D86-Automated	48.0		62.2		89.0		1.0	
2146		48.3		62.3		89.4		1.4	
6075	ISO3405-Automated	47.7		61.7		90.2		0.6	
	normality	OK		OK		OK			
	n	38		34		31			
	outliers	0		3		6			
	mean (n)	48.19		62.43		89.37			
	st.dev. (n)	1.214		0.502		0.366			
	R(calc.)	3.40		1.41		1.03			
	R(D86:17 auto)	2.04		1.75		1.21			

Lab 323: first reported 51.1, 64.5, 91.6
Lab 634: first reported 45
Lab 1161: first reported 87.8
Lab 1389: test results were withdrawn; 46.7,60.1, 87.1


%Volume evaporated at 70°C
Kernel Density


%Volume evaporated at 100°C
Kernel Density


%Volume evaporated at 150°C
Kernel Density

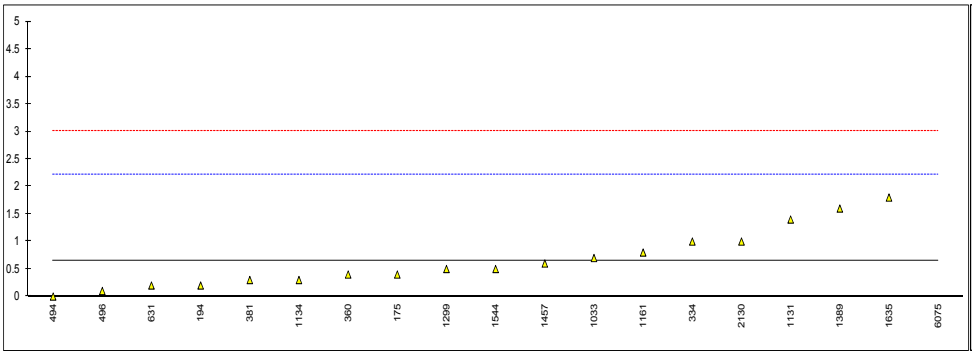
Determination of Doctor test on sample #17080

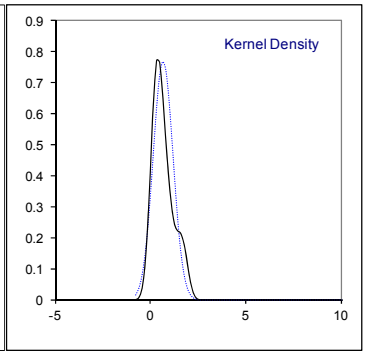
lab	method	value	mark	z(targ)	remarks
52	D4952	Neg		-----	
53		-----		-----	
62		-----		-----	
131		-----		-----	
140	D4952	negative		-----	
150	D4952	Neg		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D4952	Negative		-----	
175		-----		-----	
194		-----		-----	
312	IP30	negative		-----	
323	D4952	NEG		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D4952	NEGATIVE		-----	
381		-----		-----	
447	D4952	Negative		-----	
494		-----		-----	
496		-----		-----	
511		-----		-----	
541	IP30	negative		-----	
631		-----		-----	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1131		-----		-----	
1134	IP30	Negative		-----	
1161		-----		-----	
1191		-----		-----	
1229		-----		-----	
1299		-----		-----	
1389	IP30	Negative		-----	
1457	IP30	Negativ		-----	
1459		-----		-----	
1544	D4952	negative		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130	IP30	Negative		-----	
2146		-----		-----	
6075		-----		-----	

	normality	n.a.
	n	14
	outliers	n.a.
	mean (n)	Negative

Determination of Existent Gum (solvent washed) on sample #17080; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
52	D381	<0.5		-----	
53		-----		-----	
62	IP540	<0.5		-----	
131	D381	<0.5		-----	
140	D381	<0.5		-----	
150	D381	<0.5		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D381	<0.5		-----	
175	D381	0.4		-0.33	
194	D381	0.2		-0.58	
312	D381	<0.5		-----	
323	D381	< 0.5		-----	
333		-----		-----	
334	D381	1.0		0.44	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D381	0.4		-0.33	
381	ISO6246	0.3		-0.45	
447	D381	<0.5		-----	
494	ISO6246	0.0		-0.84	
496	D381	0.10		-0.71	
511		-----		-----	
541	D381	<0.5		-----	
631	D381	0.2		-0.58	
634		-----		-----	
970		-----		-----	
1033	IP131	0.70		0.06	
1040		-----		-----	
1082		-----		-----	
1131	ISO6246	1.4		0.95	
1134	IP131	0.3		-0.45	
1161	ISO6246	0.8		0.18	
1191		-----		-----	
1229		-----		-----	
1299	D381	0.5		-0.20	
1389	D381	1.6		1.20	
1457	D381	0.6		-0.07	
1459		-----		-----	
1544	D381	0.50		-0.20	
1634		-----		-----	
1635	D381	1.8		1.46	
1656	ISO6246	<1		-----	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130	D381	1		0.44	
2146		-----		-----	
6075	ISO6246	38.5	G(0.01)	48.23	
	normality	OK			
	n	18			
	outliers	1			
	mean (n)	0.66			
	st.dev. (n)	0.520			
	R(calc.)	1.46			
	R(D381:12)	2.20			Compare R(ISO6246:95) = 1.42





Determination of Lead as Pb on sample #17080; results in mg/L

lab	method	value	mark	z(targ)	remarks
52	D3237	<2.5		-----	
53		-----		-----	
62	D3237	<2.5		-----	
131		-----		-----	
140		-----		-----	
150	D3237	<2.5		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D3237	<0.1		-----	
175		-----		-----	
194		-----		-----	
312	D3237	<2,5		-----	
323	D3237	< 2.5		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	In house	< 2.5		-----	
381	EN237	<2,5		-----	
447	D3237	<2.5		-----	
494		-----		-----	
496		-----		-----	
511	D3237	<2.5		-----	
541	D3237	<2.5		-----	
631	D3237	<2.5		-----	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082	In house	0.008		-----	
1131		-----		-----	
1134		-----		-----	
1161	EN237	<2,5		-----	
1191	In house	0.003		-----	
1229		<0,025		-----	
1299	EN237	<0.0025		-----	
1389	D3237	<2.5		-----	
1457	IP428	0.8		-----	
1459	In house	< 5		-----	
1544	D3237	less 2.5		-----	
1634		-----		-----	
1635		-----		-----	
1656	EN237	<2.5		-----	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130	IP352	<2.5		-----	
2146	In house	0.37		-----	
6075		-----		-----	

normality	n.a.
n	24
outliers	n.a.
mean (n)	<2.5
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D3237:12)	n.a.

Determination of Manganese as Mn on sample #17080; results in mg/L

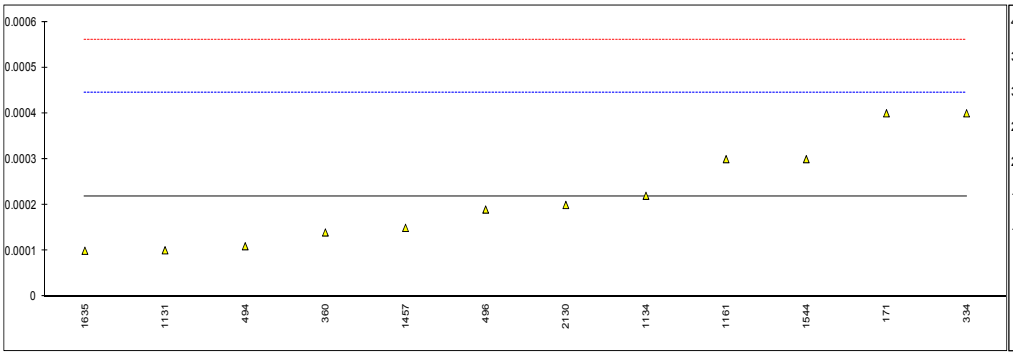
lab	method	value	mark	z(targ)	remarks
52	D3831	<0.25		-----	
53		-----		-----	
62	D3831	0.8		-----	
131		-----		-----	
140		-----		-----	
150		-----		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D3831	<0.25		-----	
175		-----		-----	
194		-----		-----	
312	EN16136	<0.25		-----	
323	D3831	< 0.2		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	EN16136	< 0.50		-----	
381	EN16135	<2,0		-----	
447	IP588	<2.0		-----	
494	EN16136	0.00		-----	
496	EN16136	<0.01		-----	
511	D3831	0.08		-----	
541	D3831	<0.25		-----	
631	D3831	<0.25		-----	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082	In house	0.012		-----	
1131		-----		-----	
1134		-----		-----	
1161	D3831	<1,0		-----	
1191		-----		-----	
1229		-----		-----	
1299	EN16135	<2.0		-----	
1389	D3831	< 0.25		-----	
1457	EN16136	<0.5		-----	
1459		-----		-----	
1544	EN16135	less 2.0		-----	
1634		-----		-----	
1635		-----		-----	
1656	EN16135	<2.0		-----	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130		-----		-----	
2146		-----		-----	
6075		-----		-----	

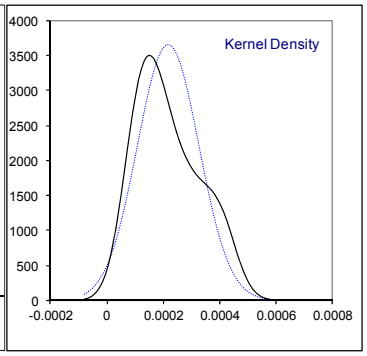
normality	n.a.
n	20
outliers	n.a.
mean (n)	<2
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D3831:12)	n.a.

Determination of Mercaptans Sulphur as S on sample #17080; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D3227	<0.0003		-----	
53		-----		-----	
62		-----		-----	
131		-----		-----	
140		-----		-----	
150	D3227	<0.0003		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D3227	0.0004		1.60	
175		-----		-----	
194		-----		-----	
312	D3227	<0.0003		-----	
323	D3227	<0.0003		-----	
333		-----		-----	
334	D3227	0.0004		1.60	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D3227	0.00014		-0.68	
381		-----		-----	
447		-----		-----	
494	D3227	0.00011		-0.94	
496	D3227	0.00019		-0.24	
511		-----		-----	
541		-----		-----	
631		-----		-----	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1131	D3227	0.00010113		-1.02	
1134	IP342	0.00022		0.02	
1161	ISO3012	0.0003		0.72	
1191		-----		-----	
1229		-----		-----	
1299		-----		-----	
1389		-----		-----	
1457	UOP163	0.00015		-0.59	
1459		-----		-----	
1544	D3227	0.0003		0.72	
1634		-----		-----	
1635	D3227	0.0001		-1.03	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130	D3227	0.0002		-0.15	
2146		-----		-----	
6075		-----		-----	

normality	OK
n	12
outliers	0
mean (n)	0.00022
st.dev. (n)	0.000109
R(calc.)	0.00031
R(D3227:16)	0.00032

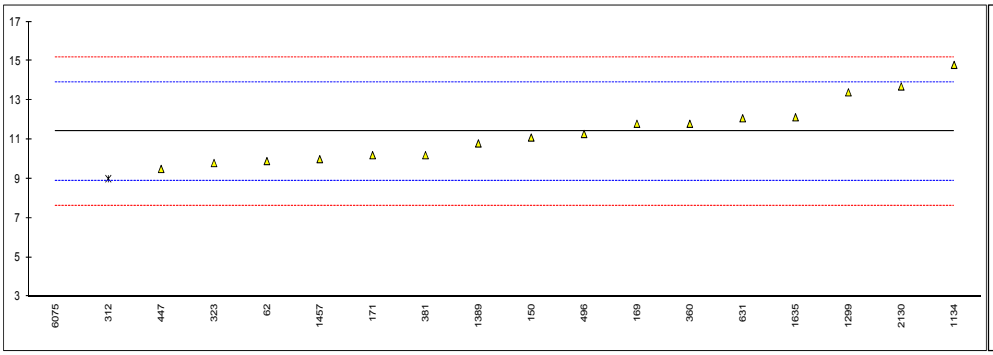


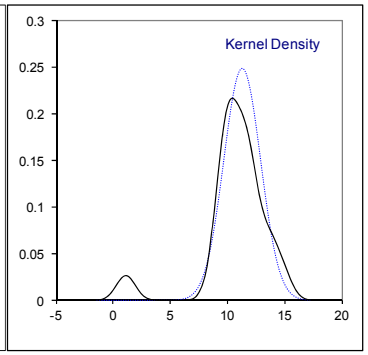


Determination of Olefins by FIA on sample #17080; results in %V/V

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62	D1319	9.9		-1.19	
131		-----		-----	
140		-----		-----	
150	D1319	11.1		-0.24	
158		-----		-----	
159		-----		-----	
169	D1319	11.8		0.31	
171	D1319	10.2		-0.96	
175		-----		-----	
194		-----		-----	
312	D1319	9.0	ex	-1.91	Test result excluded, test result is suspect as test result FIA < GC
323	D1319	9.8		-1.27	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D1319	11.8		0.31	
381	EN15553	10.2		-0.96	
447	D1319	9.5		-1.51	
494		-----		-----	
496	D1319	11.28		-0.10	
511		-----		-----	
541		-----		-----	
631	D1319	12.08		0.53	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1131		-----		-----	
1134	D1319	14.8		2.69	
1161		-----		-----	
1191		-----		-----	
1229		-----		-----	
1299	D1319	13.4		1.58	
1389	D1319	10.8		-0.48	
1457	D1319	10.0		-1.11	
1459		-----		-----	
1544		-----		-----	
1634		-----		-----	
1635	D1319	12.13		0.57	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130	D1319	13.7		1.82	
2146		-----		-----	
6075	D1319	1.08	G(0.01)	-8.18	

normality	OK
n	16
outliers	1 (+1 excl)
mean (n)	11.41
st.dev. (n)	1.547
R(calc.)	4.33
R(D1319:15)	3.53

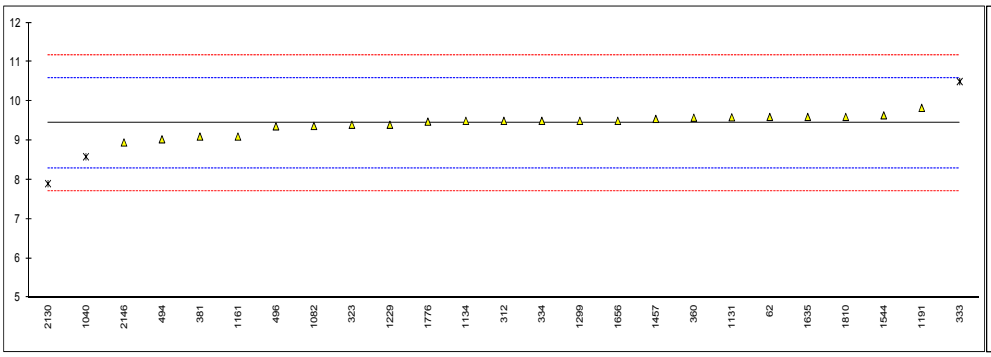


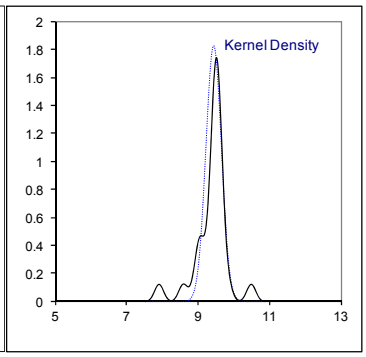


Determination of Olefins by GC on sample #17080; results in %V/V

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62	INH-CGSB	9.6		0.28	
131		-----		-----	
140		-----		-----	
150		-----		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171		-----		-----	
175		-----		-----	
194		-----		-----	
312	ISO22854	9.5		0.10	
323	ISO22854	9.4		-0.07	
333	ISO22854	10.5	R(0.05)	1.83	
334	ISO22854	9.5		0.10	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854	9.58		0.24	
381	ISO22854	9.1		-0.59	
447		-----		-----	
494	ISO22854	9.03		-0.71	
496	ISO22854	9.36		-0.14	
511		-----		-----	
541		-----		-----	
631		-----		-----	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040	ISO22854	8.585	R(0.05)	-1.48	
1082	ISO22854	9.37		-0.12	
1131	ISO22854	9.59		0.26	
1134	ISO22854	9.50		0.10	
1161	ISO22854	9.1		-0.59	
1191	ISO22854	9.83		0.67	
1229	ISO22854	9.4		-0.07	
1299	ISO22854	9.5		0.10	
1389		-----		-----	
1457	ISO22854	9.55		0.19	
1459		-----		-----	
1544	ISO22854	9.64		0.35	
1634		-----		-----	
1635	ISO22854	9.60		0.28	
1656	ISO22854	9.5		0.10	
1706		-----		-----	
1776	ISO22854	9.48		0.07	
1810	ISO22854	9.6		0.28	
2130	D6730	7.9	R(0.01)	-2.66	
2146	ISO22854	8.95		-0.85	
6075		-----		-----	

normality	OK
n	22
outliers	3
mean (n)	9.440
st.dev. (n)	0.2178
R(calc.)	0.610
R(ISO22854:16)	1.622





Determination of Oxidation Stability on sample #17080; results in minutes

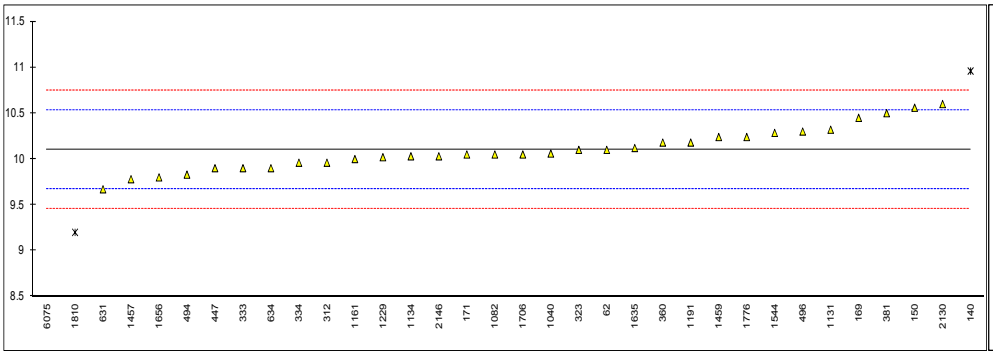
lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62		-----		-----	
131		-----		-----	
140		-----		-----	
150	D525	>900		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D525	>900		-----	
175		-----		-----	
194		-----		-----	
312	D525	>900		-----	
323	D525	360		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO7536	> 900		-----	
381		-----		-----	
447	D525	>900		-----	
494		-----		-----	
496	D525	>900		-----	
511	D525	>900		-----	
541		-----		-----	
631	D525	> 900		-----	
634		-----		-----	
970		-----		-----	
1033	D525	>900		-----	
1040		-----		-----	
1082	ISO7536	>900		-----	
1131	ISO7536	>900		-----	
1134	D525	>900		-----	
1161	ISO7536	>900		-----	
1191		-----		-----	
1229	ISO7536	>600		-----	
1299	D525	>900		-----	
1389	D525	>900		-----	
1457	D525	>900		-----	
1459		-----		-----	
1544	D525	>900		-----	
1634		-----		-----	
1635	D525	>1200		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1810		-----		-----	
2130	D525	>900		-----	
2146		-----		-----	
6075		-----		-----	

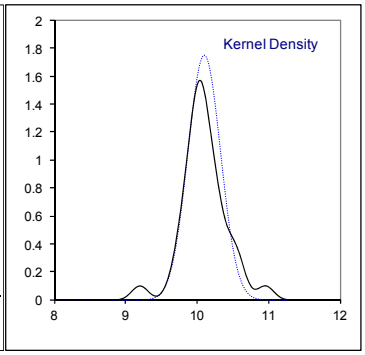
normality	n.a.
n	21
outliers	n.a.
mean (n)	>360
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D525:12a)	n.a.

Determination of Ethanol on sample #17080; results in %V/V

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62	INH-CGSB	10.1		-0.01	
131		-----		-----	
140	D5599	10.96	R(0.05)	3.97	
150	D5599	10.56		2.12	
158		-----		-----	
159		-----		-----	
169	D4815	10.45		1.61	
171	D5599	10.05		-0.24	
175		-----		-----	
194		-----		-----	
312	ISO22854	9.96		-0.66	
323	ISO22854	10.10		-0.01	
333	ISO22854	9.9		-0.94	
334	ISO22854	9.96		-0.66	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854	10.18		0.36	
381	ISO22854	10.5		1.84	
447	IP466	9.9		-0.94	
494	ISO22854	9.83	C	-1.26	First reported 11.03
496	EN1601	10.30		0.92	
511		-----		-----	
541		-----		-----	
631	D5845	9.67		-2.00	
634	D5845	9.90		-0.94	
970		-----		-----	
1033		-----		-----	
1040	ISO22854	10.06		-0.19	
1082		10.05		-0.24	
1131	ISO22854	10.32		1.01	
1134	ISO22854	10.03		-0.33	
1161	EN13132	10.0		-0.47	
1191		10.18		0.36	
1229	ISO22854	10.02		-0.38	
1299		-----		-----	
1389		-----	W	-----	Test result withdrawn, reported 9.3
1457	EN1601	9.78		-1.49	
1459	In house	10.24		0.64	
1544	ISO22854	10.285		0.85	
1634		-----		-----	
1635	ISO22854	10.12		0.08	
1656	ISO22854	9.8		-1.40	
1706		10.05		-0.24	
1776	ISO22854	10.24		0.64	
1810	ISO22854	9.2	R(0.05)	-4.17	
2130	D6730	10.6		2.30	
2146		10.03		-0.33	
6075	EN13132	3.49	R(0.01)	-30.60	

normality	OK
n	31
outliers	3
mean (n)	10.10
st.dev. (n)	0.228
R(calc.)	0.64
R(ISO22854:16)	0.61

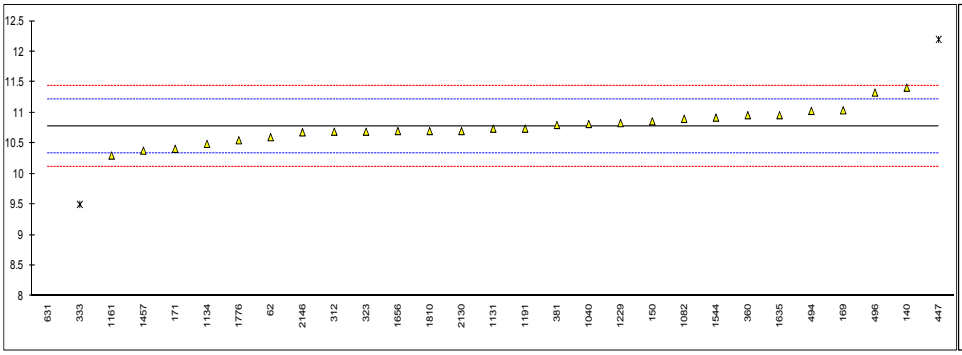


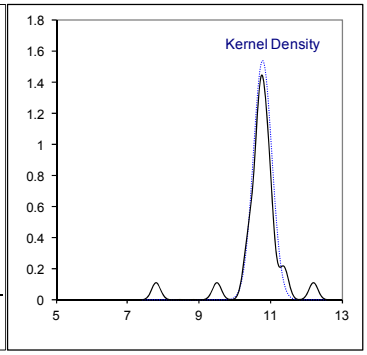


Determination of MTBE on sample #17080; results in %V/V

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62	INH-CGSB	10.6		-0.80	
131		-----		-----	
140	D5599	11.41		2.85	
150	D5599	10.86	C	0.37	First reported 11.62
158		-----		-----	
159		-----		-----	
169	D4815	11.04		1.18	
171	D5599	10.41		-1.66	
175		-----		-----	
194		-----		-----	
312	ISO22854	10.69		-0.40	
323	ISO22854	10.69		-0.40	
333	ISO22854	9.5	R(0.01)	-5.75	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854	10.96		0.82	
381	ISO22854	10.8		0.10	
447	IP466	12.2	R(0.01)	6.40	
494	ISO22854	11.03		1.13	
496	EN1601	11.33		2.49	
511		-----		-----	
541		-----		-----	
631	D5845	7.8	C,R(0.01)	-13.40	First reported 11.83
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040	ISO22854	10.815		0.17	
1082		10.90		0.55	
1131	ISO22854	10.74		-0.17	
1134	ISO22854	10.49		-1.30	
1161	EN13132	10.3		-2.15	
1191		10.74		-0.17	
1229	ISO22854	10.83		0.23	
1299		-----		-----	
1389		-----	W	-----	Test result withdrawn, reported 12.0
1457	EN1601	10.38		-1.79	
1459		-----		-----	
1544	ISO22854	10.92		0.64	
1634		-----		-----	
1635	ISO22854	10.96		0.82	
1656	ISO22854	10.7		-0.35	
1706		-----		-----	
1776	ISO22854	10.55	C	-1.03	First reported <0.2
1810	ISO22854	10.7		-0.35	
2130	D6730	10.7		-0.35	
2146		10.68		-0.44	
6075		-----		-----	

normality	OK
n	26
outliers	3
mean (n)	10.78
st.dev. (n)	0.260
R(calc.)	0.73
R(ISO22854:16)	0.62



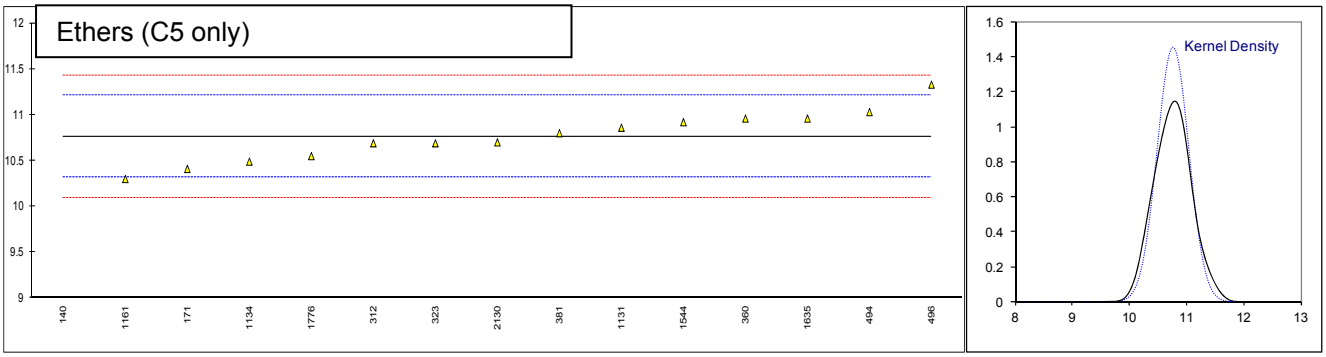


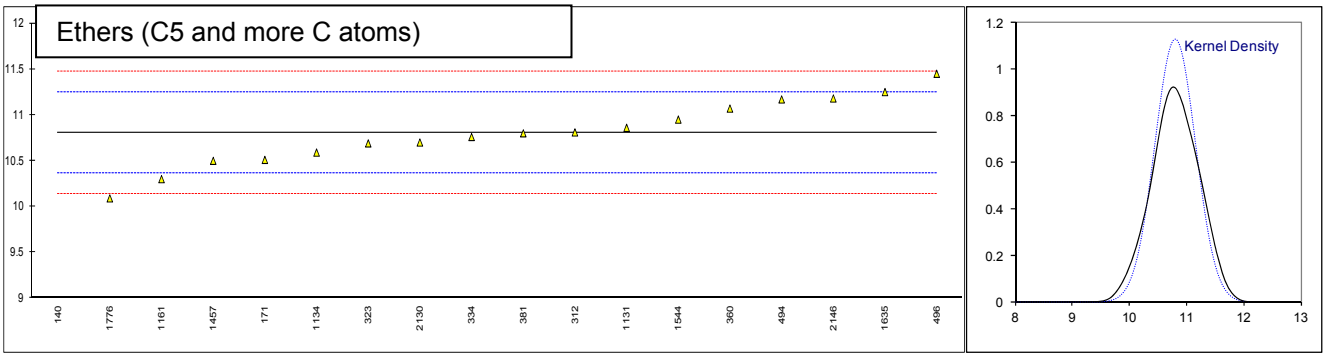
Determination of Ethers (C5, C5 or more C atoms and C6 and more c atoms) on sample #17080; results in %V/V

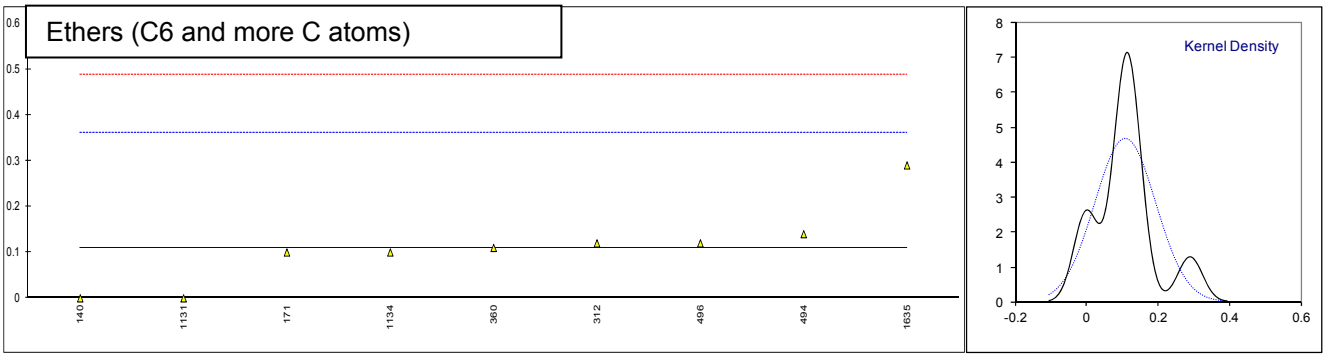
lab	Method	C5	mark	z(targ)	C5 or more	mark	z(targ)	C6 and more	mark	z(targ)
52		-----		-----	-----		-----	-----		-----
53		-----		-----	-----		-----	-----		-----
62		-----		-----	-----		-----	-----		-----
131		-----		-----	-----		-----	-----		-----
140	D5599	0	E,G(1)	-48.48	0	E,G(1)	-48.58	0		-0.86
150	D5599	-----		-----	-----		-----	-----		-----
158		-----		-----	-----		-----	-----		-----
159		-----		-----	-----		-----	-----		-----
169	D4815	ND		-----	ND		-----	ND		-----
171	D5599	10.41	C	-1.59	10.51	C	-1.33	0.10		-0.07
175		-----		-----	-----		-----	-----		-----
194		-----		-----	-----		-----	-----		-----
312	ISO22854	10.69		-0.33	10.81		0.02	0.12		0.09
323	ISO22854	10.69		-0.33	10.69		-0.52	< 0.10		-----
333		-----		-----	-----		-----	-----		-----
334		-----		-----	10.76		-0.20	-----		-----
335		-----		-----	-----		-----	-----		-----
336		-----		-----	-----		-----	-----		-----
337		-----		-----	-----		-----	-----		-----
338		-----		-----	-----		-----	-----		-----
360	ISO22854	10.96		0.88	11.07		1.19	0.11		0.01
381	ISO22854	10.8		0.16	10.8		-0.02	<0,2		-----
447	IP466	<0.2	E,F-?	-----	<0.2	E,F-?	-----	<0.2		-----
494	ISO22854	11.03	C	1.20	11.17	C	1.64	0.14		0.25
496	EN1601	11.33		2.55	11.45		2.90	0.12		0.09
511		-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----
631		-----		-----	-----		-----	-----		-----
634		-----		-----	-----		-----	-----		-----
970		-----		-----	-----		-----	-----		-----
1033		-----		-----	-----		-----	-----		-----
1040		-----		-----	-----		-----	-----		-----
1082		-----		-----	-----		-----	-----		-----
1131	ISO22854	10.86		0.43	10.86		0.25	0		-0.86
1134	ISO22854	10.49		-1.23	10.59		-0.97	0.10		-0.07
1161	EN13132	10.3		-2.09	10.3		-2.27	<0,17		-----
1191		-----		-----	-----		-----	-----		-----
1229		-----		-----	-----		-----	-----		-----
1299		-----		-----	-----		-----	-----		-----
1389		-----	W	-----	-----	W	-----	-----	W	-----
1457	EN1601	-----		-----	10.5		-1.37	-----		-----
1459		-----		-----	-----		-----	-----		-----
1544	ISO22854	10.92		0.70	10.95		0.65	less 0.8		-----
1634		-----		-----	-----		-----	-----		-----
1635	ISO22854	10.96		0.88	11.25		2.00	0.29		1.43
1656		-----		-----	-----		-----	-----		-----
1706		-----		-----	-----		-----	-----		-----
1776	ISO22854	10.55	C	-0.96	10.09		-3.21	<0.2	C	-----
1810		-----		-----	-----		-----	-----		-----
2130	D6730	10.7		-0.29	10.7		-0.47	<0.1		-----
2146		-----		-----	11.18		1.69	-----		-----
6075		-----		-----	-----		-----	-----		-----
	normality	OK			OK			not OK		
	n	14			17			9		
	outliers	1			1			0		
	mean (n)	10.76			10.80			0.11		
	st.dev. (n)	0.274			0.354			0.085		
	R(calc.)	0.77			0.99			0.24		
	R(ISO22854:16)	0.62			0.62			0.35		

Lab 171: first reported <0.10, <0.10
Lab 494: first reported “as EtOH”, 0.13
Lab1389: test results were withdrawn, first reported 12.0, 12.0, <0.2
Lab 1776: first reported 0.09, 10.09

E = calculation error, MTBE was not included in reported test result


Ethers (C5 only)
Kernel Density

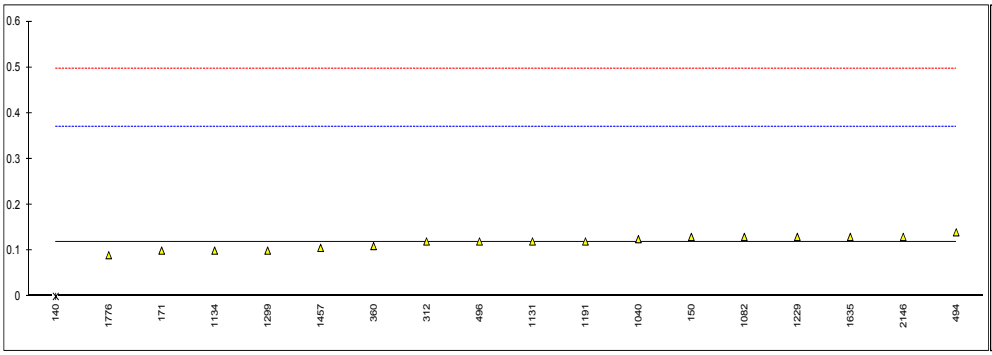

Ethers (C5 and more C atoms)
Kernel Density

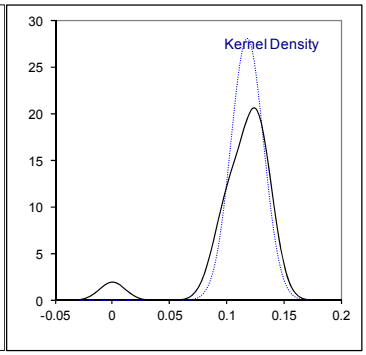

Ethers (C6 and more C atoms)
Kernel Density

Determination of TAME on sample #17080; results in %V/V

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62		-----		-----	
131		-----		-----	
140	D5599	0	G(0.01)	-0.93	
150	D5599	0.13		0.10	
158		-----		-----	
159		-----		-----	
169	D4815	ND		-----	
171	D5599	0.10		-0.14	
175		-----		-----	
194		-----		-----	
312	ISO22854	0.12		0.02	
323	ISO22854	< 0.10		-----	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854	0.11		-0.06	
381	ISO22854	<0,2		-----	
447	IP466	<0.2		-----	
494	ISO22854	0.14		0.18	
496	EN1601	0.12		0.02	
511		-----		-----	
541		-----		-----	
631		-----		-----	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040	ISO22854	0.125		0.06	
1082		0.13		0.10	
1131	ISO22854	0.12		0.02	
1134	ISO22854	0.10		-0.14	
1161	EN13132	<0,17		-----	
1191		0.12		0.02	
1229	ISO22854	0.13		0.10	
1299	ISO22854	0.1		-0.14	
1389		-----	W	-----	Test result withdrawn, first reported <0.2
1457	EN1601	0.106		-0.09	
1459		-----		-----	
1544	ISO22854	less 0.8		-----	
1634		-----		-----	
1635	ISO22854	0.13		0.10	
1656	ISO22854	<0.1		-----	
1706		-----		-----	
1776	ISO22854	0.09		-0.22	
1810		-----		-----	
2130	D6730	<0.1		-----	
2146		0.13		0.10	
6075		-----		-----	

normality	OK
n	17
outliers	1
mean (n)	0.118
st.dev. (n)	0.0142
R(calc.)	0.040
R(ISO22854:16)	0.354





Determination of Oxygenates on sample #17080; results in %V/V

lab	Method	DIPE	mark	ETBE	mark	i-BuOH	mark	IPA	mark
52		-----		-----		-----		-----	
53		-----		-----		-----		-----	
62	INH-CGSB	-----		-----		-----		-----	
131		-----		-----		-----		-----	
140	D5599	0		0		0		0	
150	D5599	<0.10		<0.10		<0.10		<0.10	
158		-----		-----		-----		-----	
159		-----		-----		-----		-----	
169	D4815	ND		ND		ND		ND	
171	D5599	<0.10		<0.10		<0.10		<0.10	
175		-----		-----		-----		-----	
194		-----		-----		-----		-----	
312	ISO22854	<0.1		<0.1		<0.1		<0.1	
323	ISO22854	< 0.10		< 0.10		< 0.10		< 0.10	
333	ISO22854	-----		-----		-----		-----	
334	ISO22854	-----		-----		-----		0.14	
335		-----		-----		-----		-----	
336		-----		-----		-----		-----	
337		-----		-----		-----		-----	
338		-----		-----		-----		-----	
360	ISO22854	0.00		0.00		0.00		0.00	
381	ISO22854	<0,2		<0,2		<0,2		<0,2	
447	IP466	<0.2		<0.2		<0.2		<0.2	
494	ISO22854	-----		-----		-----		-----	
496	EN1601	<0.01		<0.01		<0.01		<0.01	
511		-----		-----		-----		-----	
541		-----		-----		-----		-----	
631	D5845	-----		0.57		-----		-----	
634	D5845	-----		-----		-----		-----	
970		-----		-----		-----		-----	
1033		-----		-----		-----		-----	
1040	ISO22854	-----		-----		-----		0.08	
1082		-----		0		-----		-----	
1131	ISO22854	0		0		0		0.05	
1134	ISO22854	<0.01		<0.01		<0.01		0.08	
1161	EN13132	<0,17		<0,17		<0,17		<0,17	
1191		-----		0		0		0	
1229	ISO22854	0		0		<0,05		<0,05	
1299	ISO22854	-----		-----		-----		-----	
1389	EN13132	-----	W	-----	W	-----	W	-----	W
1457	EN1601	<0.1		<0.1		<0.1		0.010	
1459	In house	-----		0.0		-----		-----	
1544	ISO22854	less 0.8		less 0.8		less 0.8		less 0.8	
1634		-----		-----		-----		-----	
1635	ISO22854	ND		0.16		0.14		ND	
1656	ISO22854	<0.1		<0.1		<0.1		<0.1	
1706		-----		-----		-----		-----	
1776	ISO22854	<0.2	C	<0,2		<0,2		0.05	
1810	ISO22854	-----		0.2		-----		-----	
2130	D6730	<0.1		<0.1		<0.1		<0.1	
2146		0.00		0.00		0.00		0.00	
6075	EN13132	-----		1.10		-----		-----	

Lab 1389: test results withdrawn, reported <0.2, <0.2, <0.2, <0.2
Lab 1776: first reported 10

Determination of Oxygenates on sample #17080; results in %V/V

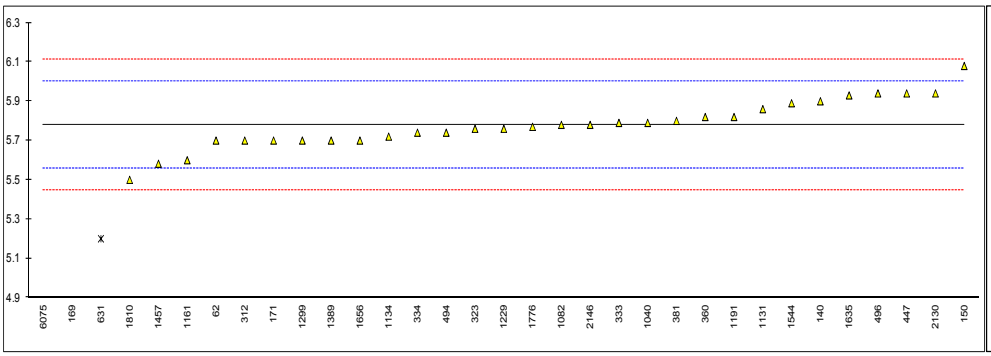
lab	Method	MeOH	mark	t-BuOH	mark	Other oxygenates	mark
52		-----		-----		-----	
53		-----		-----		-----	
62	INH-CGSB	-----		-----		-----	
131		-----		-----		-----	
140	D5599	0		0		0	
150	D5599	<0.10		<0.10		-----	
158		-----		-----		-----	
159		-----		-----		-----	
169	D4815	ND		ND		ND	
171	D5599	<0.10		<0.10		<0.10	
175		-----		-----		-----	
194		-----		-----		-----	
312	ISO22854	<0.1		<0.1		<0.1	
323	ISO22854	< 0.10		< 0.10		< 0.10	
333	ISO22854	-----		-----		-----	
334	ISO22854	-----		-----		-----	
335		-----		-----		-----	
336		-----		-----		-----	
337		-----		-----		-----	
338		-----		-----		-----	
360	ISO22854	0.00		0.00		0.00	
381	ISO22854	<0,2		<0,2		<0,2	
447	IP466	<0.2		<0.2		<0.2	
494	ISO22854	-----		0.04		-----	
496	EN1601	<0.01		<0.01		<0.01	
511		-----		-----		-----	
541		-----		-----		-----	
631	D5845	-----		0.8	C	-----	
634	D5845	-----		-----		-----	
970		-----		-----		-----	
1033		-----		-----		-----	
1040	ISO22854	-----		-----		-----	
1082		0		-----		-----	
1131	ISO22854	0		0		0	
1134	ISO22854	<0.01		<0.01		<0.01	
1161	EN13132	<0,17		<0,17		-----	
1191		0		0		-----	
1229	ISO22854	0		0		0	
1299	ISO22854	-----		-----		-----	
1389	EN13132	-----	W	-----	W	-----	W
1457	EN1601	0.006		0.022		<0.1	
1459	In house	-----		-----		-----	
1544	ISO22854	less 0.8		less 0.8		less 0.8	
1634		-----		-----		-----	
1635	ISO22854	ND		0.21		ND	
1656	ISO22854	<0.1		<0.1		<0.1	
1706		-----		-----		-----	
1776	ISO22854	<0,2		<0,2		<0,2	
1810	ISO22854	-----		-----		-----	
2130	D6730	<0.1		<0.1		<0.1	
2146		0.00		0.00		0.40	
6075	EN13132	-----		-----		-----	

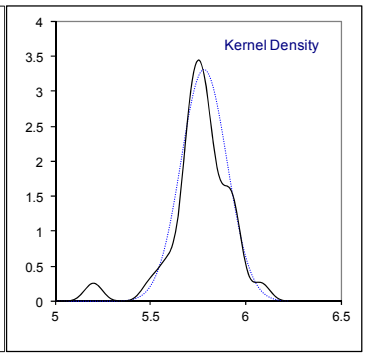
Lab 631: first reported 1.99
Lab 1389: test results withdrawn, reported <0.2, <0.2, <0.2

Determination of Oxygen content on sample #17080; results in %M/M

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
53		-----		-----	
62	INH-CGSB	5.7		-0.73	
131		-----		-----	
140		5.9		1.07	
150	D5599	6.08		2.70	
158		-----		-----	
159		-----		-----	
169	D4815	3.90	R(0.01)	-16.99	
171	D5599	5.7		-0.73	
175		-----		-----	
194		-----		-----	
312	ISO22854	5.70		-0.73	
323	ISO22854	5.76		-0.19	
333	ISO22854	5.79		0.08	
334	ISO22854	5.74		-0.37	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854	5.82		0.35	
381	ISO22854	5.8		0.17	
447	IP466	5.94		1.44	
494	ISO22854	5.74		-0.37	
496	ISO22854	5.940		1.44	
511		-----		-----	
541		-----		-----	
631	D5845	5.2	C,R(0.01)	-5.25	First reported 6.33
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040	ISO22854	5.79		0.08	
1082	ISO22854	5.78		-0.01	
1131	ISO22854	5.86		0.71	
1134	ISO22854	5.72		-0.55	
1161	EN13132	5.6		-1.64	
1191	ISO22854	5.82		0.35	
1229	ISO22854	5.76		-0.19	
1299	ISO22854	5.7		-0.73	
1389	EN13132	5.7		-0.73	
1457	EN1601	5.582		-1.80	
1459		-----		-----	
1544	ISO22854	5.89		0.98	
1634		-----		-----	
1635	ISO22854	5.93		1.35	
1656	ISO22854	5.7		-0.73	
1706		-----		-----	
1776	ISO22854	5.77	C	-0.10	First reported 5.41
1810	ISO22854	5.5		-2.54	
2130	D6730	5.94		1.44	
2146	ISO22854	5.78		-0.01	
6075	EN13132	2.12	R(0.01)	-33.07	

normality	OK
n	30
outliers	3
mean (n)	5.781
st.dev. (n)	0.1206
R(calc.)	0.338
R(ISO22854:16)	0.310

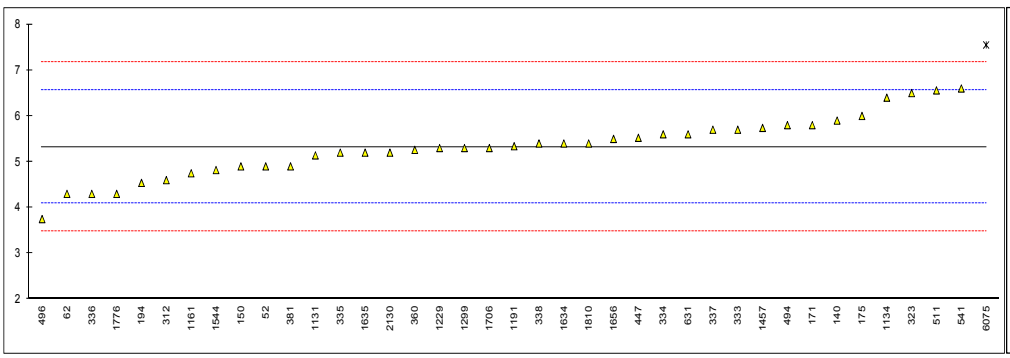


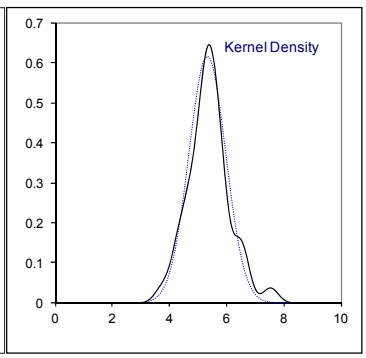


Determination of Sulphur on sample #17080; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D5453	4.9		-0.70	
53		-----		-----	
62	D5453	4.3		-1.67	
131		-----		-----	
140	D2622	5.9		0.93	
150	D5453	4.9		-0.70	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D2622	5.8		0.77	
175	D5453	6.00		1.10	
194	D2622	4.54		-1.28	
312	D5453	4.6		-1.19	
323	ISO20846	6.5		1.91	
333	ISO20846	5.7		0.61	
334	ISO20846	5.6		0.45	
335	ISO20846	5.2		-0.21	
336	ISO20846	4.3		-1.67	
337	ISO20846	5.7		0.61	
338	ISO20846	5.4		0.12	
360	ISO20846	5.26		-0.11	
381	ISO20846	4.9		-0.70	
447	D5453	5.524		0.32	
494	ISO20846	5.8		0.77	
496	ISO20846	3.75		-2.57	
511	D5453	6.558		2.01	
541	ISO20846	6.60		2.08	
631	D7039	5.6		0.45	
634		-----		-----	
970		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1131	ISO20846	5.14		-0.30	
1134	IP490	6.40		1.75	
1161	ISO20846	4.75		-0.94	
1191	ISO20846	5.34		0.02	
1229	ISO20846	5.3		-0.04	
1299	ISO20884	5.3		-0.04	
1389		-----		-----	
1457	ISO20846	5.74		0.67	
1459		-----		-----	
1544	ISO20846	4.82		-0.83	
1634	ISO20846	5.4		0.12	
1635	ISO20846	5.2		-0.21	
1656	ISO20846	5.5		0.28	
1706	ISO20884	5.3		-0.04	
1776	ISO20846	4.30		-1.67	
1810	D5453	5.4		0.12	
2130	D5453	5.2		-0.21	
2146		-----		-----	
6075	ISO20846	7.55	R(0.05)	3.63	

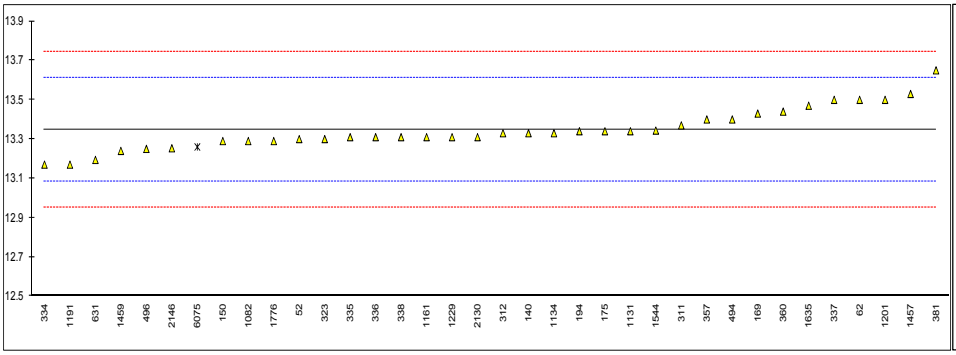
normality	OK
n	38
outliers	1
mean (n)	5.327
st.dev. (n)	0.6493
R(calc.)	1.818
R(ISO20846:11)	1.717

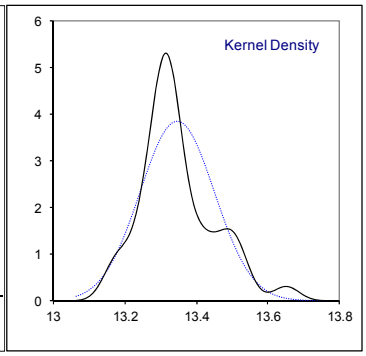




Determination of Total Vapour Pressure on sample #17081; results in psi

lab	method	value	mark	z(targ)	remarks
52	D5191	13.3		-0.36	
53		-----		-----	
62	D5191	13.50		1.15	Reported 93.1 kPA
131		-----		-----	
140	D5191	13.33		-0.13	
150	D5191	13.29		-0.43	
158		-----		-----	
159		-----		-----	
169	D5191	13.43		0.63	
171		-----		-----	
175	D5191	13.34		-0.05	
194	D5191	13.34		-0.05	
311	D5191	13.37		0.17	Reported 92.2 kPa
312	D5191	13.33	C	-0.13	First reported 86.9 kPa
323	D5191	13.30		-0.36	Reported 91.7 kPa
333		-----		-----	
334	D5191	13.17		-1.34	Reported 90.8 kPa
335	D5191	13.31		-0.28	Reported 91.8 kPa
336	D5191	13.31		-0.28	
337	D5191	13.50		1.15	
338	EN13016-1	13.31		-0.28	Reported 92.0 kPa
357	D5191	13.40		0.40	
360	EN13016-1	13.44		0.70	
381	EN13016-1	13.65		2.29	Reported 94.1 kPa
447		-----		-----	
494	D5191	13.40		0.40	Reported 92.4 kPa
496	D5191	13.25		-0.73	
631	D5191	13.194		-1.16	
970		-----		-----	
1033		-----		-----	
1082	EN13016-1	13.29		-0.43	Reported 91.6 kPa
1131	EN13016-1	13.34		-0.05	Reported 92.0 kPa
1134	D5191	13.33		-0.13	Reported 91.9 kPa
1161	EN13016-1	13.31		-0.28	Reported 91.8 kPa
1191	EN13016-1	13.17		-1.34	Reported 90.8 kPa
1201	D5191	13.50		1.15	Reported 93.1 kPa
1229	EN13016-1	13.31		-0.28	Reported 91.8 kPa
1299		-----		-----	
1389		-----		-----	
1457	D5191	13.53		1.38	Reported 93.28 kPa
1459	EN13016-1	13.24		-0.81	Reported 91.3 kPa
1544	D5191	13.3435		-0.03	
1634		-----		-----	
1635	D5191	13.47		0.93	Reported 92.9 kPa
1656		-----		-----	
1776	EN13016-1	13.29		-0.43	Reported 91.6 kPa
2130	D5191	13.31		-0.28	
2146	EN13016-1	13.25324		-0.71	
6075	EN13016-1	13.26	ex	-0.66	Suspect test result excluded, does not correlate to DVPE
	normality	OK			
	n	35			
	outliers	0 (+1excl)			
	mean (n)	13.347			
	st.dev. (n)	0.1045			
	R(calc.)	0.293			
	R(D5191:15)	0.371			Compare R(EN13016-1:07) = 0.371



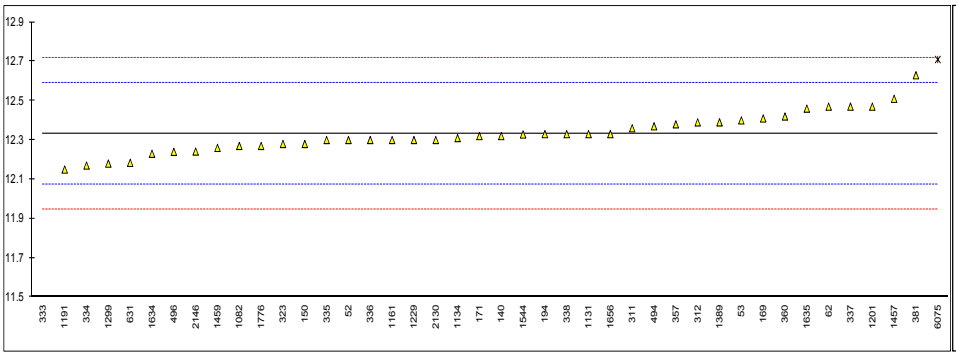


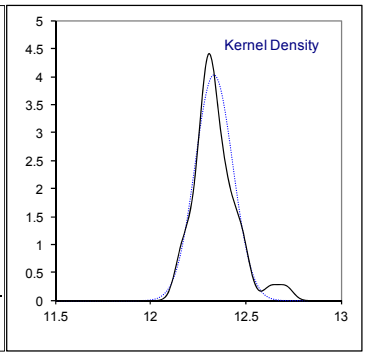
Determination of DVPE (ASTM D5191 calculation) on sample #17081; results in psi

lab	method	value	mark	z(targ)	remarks
52	D5191	12.3		-0.25	
53	D5191	12.4		0.53	Reported 85.6 kPA
62	D5191	12.47		1.07	Reported 86.0 kPA
131		-----		-----	
140	D5191	12.32		-0.09	
150	D5191	12.28		-0.40	
158		-----		-----	
159		-----		-----	
169	D5191	12.41		0.61	
171	D5191	12.32		-0.09	
175		-----		-----	
194	D5191	12.33		-0.02	
311	D5191	12.36		0.22	Reported 85.2 kPa
312	D5191	12.39		0.45	Reported 86.9 kPa
323	D5191	12.28		-0.40	Reported 84.7 kPa
333	EN13016-1	9.99	R(0.01)	-18.20	Reported 68.9 kPa
334	D5191	12.17		-1.26	Reported 83.9 kPa
335	D5191	12.30		-0.25	Reported 84.8 kPa
336	D5191	12.30		-0.25	
337	D5191	12.47		1.07	
338	EN13016-1	12.33		-0.02	Reported 85.0 kPa
357	D5191	12.38		0.37	
360	EN13016-1	12.42		0.68	
381	EN13016-1	12.63		2.32	Reported 87.1 kPa
447		-----		-----	
494	D5191	12.37		0.29	Reported 85.3 kPa
496	D5191	12.24		-0.72	
631	D5191	12.184		-1.15	
970		-----		-----	
1033		-----		-----	
1082	D5191	12.27		-0.48	Reported 84.6 kPa
1131	EN13016-1	12.33		-0.02	Reported 85.0 kPa
1134	D5191	12.31		-0.17	Reported 84.91 kPa
1161	EN13016-1	12.30		-0.25	Reported 84.8 kPa
1191	EN13016-1	12.15		-1.42	Reported 83.8 kPa
1201	D5191	12.47		1.07	Reported 86.0 kPa
1229	EN13016-1	12.30		-0.25	Reported 84.8 kPa
1299	D5191	12.18		-1.18	Reported 84.0 kPa
1389	EN13016-1	12.39		0.45	Reported 85.4 kPa
1457	D5191	12.51		1.38	Reported 86.24 kPa
1459	EN13016-1	12.26		-0.56	Reported 84.5 kPa
1544	D5191	12.3285		-0.03	
1634	D5191	12.23		-0.79	Reported 84.3 kPa
1635	D5191	12.46		0.99	Reported 85.9 kPa
1656	D5191	12.33		-0.02	Reported 85.0 kPa
1776	EN13016-1	12.27		-0.48	Reported 84.6 kPa
2130	D5191	12.30		-0.25	
2146	EN13016-1	12.24138		-0.70	
6075	EN13016-1	12.71	R(0.05),E	2.94	Calculation error, iis calculated 12.25

normality	suspect
n	40
outliers	2
mean (n)	12.332
st.dev. (n)	0.0988
R(calc.)	0.277
R(D5191:15)	0.360

Compare R(EN13016-1:07) = 0.360

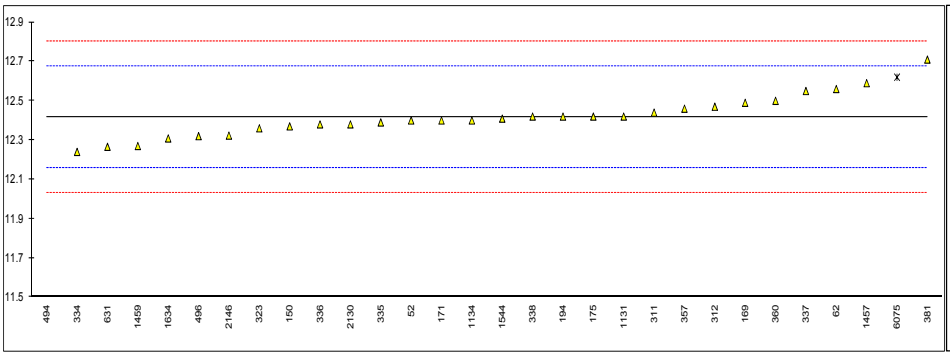


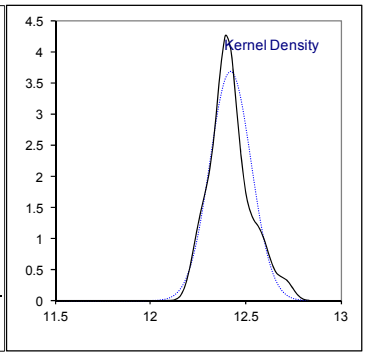


Determination of DVPE (EPA calculation) on sample #17081; results in psi

lab	method	value	mark	z(targ)	remarks
52	D5191	12.4		-0.13	
53		-----		-----	
62	D5191	12.6		1.11	Reported 86.6 kPA
131		-----		-----	
140		-----		-----	
150	D5191	12.37		-0.36	
158		-----		-----	
159		-----		-----	
169	D5191	12.49		0.57	
171	D5191	12.40		-0.13	
175	D5191	12.42		0.03	
194	D5191	12.42		0.03	
311	D5191	12.44		0.18	Reported 85.8 kPa
312	D5191	12.47		0.41	
323	D5191	12.36		-0.44	Reported 85.2 kPa
333		-----		-----	
334	D5191	12.24		-1.37	Reported 84.4 kPa
335	D5191	12.39		-0.21	Reported 85.4 kPa
336	D5191	12.38		-0.28	
337	D5191	12.55		1.03	
338	EN13016-1	12.42		0.03	Reported 85.6 kPa
357	D5191	12.46		0.34	
360	EN13016-1	12.50		0.65	
381	EN13016-1	12.71		2.27	Reported 87.6 kPa
447		-----		-----	
494	D5191	5.48	R(0.01)	-53.78	Reported 37.8 kPa
496	D5191	12.32		-0.75	
631	D5191	12.266		-1.17	
970		-----		-----	
1033		-----		-----	
1082		-----		-----	
1131	EN13016-1	12.42		0.03	Reported 85.6 kPa
1134	D5191	12.40		-0.13	Reported 85.46 kPa
1161		-----		-----	
1191		-----		-----	
1201		-----		-----	
1229		-----		-----	
1299		-----		-----	
1389		-----		-----	
1457	D5191	12.59		1.34	
1459	EN13016-1	12.27		-1.14	
1544	D5191	12.4094		-0.06	
1634	D5191	12.3085		-0.84	
1635		-----		-----	
1656		-----		-----	
1776		-----		-----	
2130	D5191	12.38		-0.28	
2146	EN13016-1	12.32310		-0.73	
6075	EN13016-1	12.62	E,ex	1.58	Calculation error, iis calculated 12.33, result was excluded

normality	suspect
n	28
outliers	1 (+1excl)
mean (n)	12.417
st.dev. (n)	0.1031
R(calc.)	0.289
R(D5191:15)	0.361

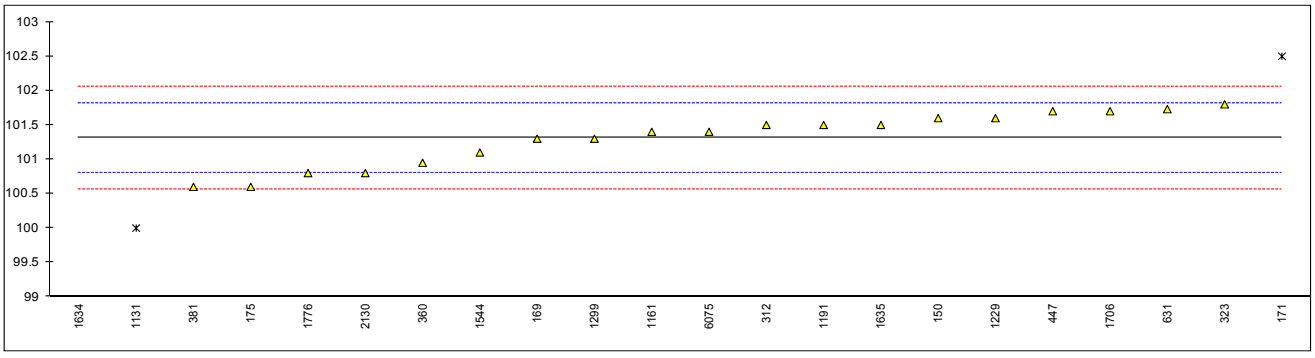


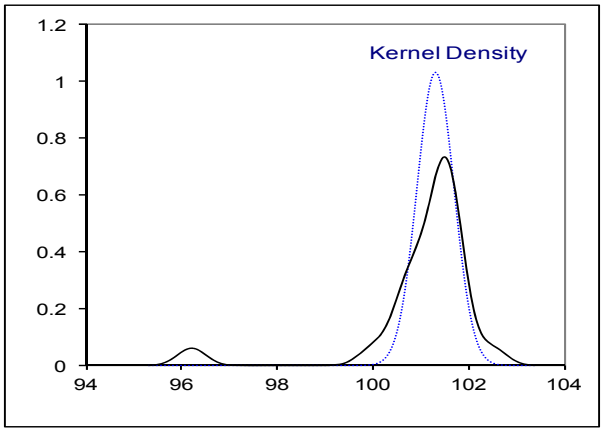


Determination of RON on sample #17082

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
140		-----		-----	
150	D2699	101.6		1.16	
159		-----		-----	
169	D2699	101.3		-0.04	
171	D2699	102.5	R(0.05)	4.76	
175	D2699	100.6		-2.84	
312	D2699	101.5		0.76	
323	D2699	101.8		1.96	
334		>100		-----	
360	ISO5164	100.95		-1.44	
381	D2699	100.6		-2.84	
447	D2699	101.7		1.56	
511		-----		-----	
541		-----		-----	
631	D2699	101.73		1.68	
970		-----		-----	
1082		-----		-----	
1131	ISO5164	100.0	R(0.05)	-5.24	
1134		-----		-----	
1161	ISO5164	101.4		0.36	
1191	ISO5164	101.5		0.76	
1229	ISO5164	101.6		1.16	
1299	D2699	101.3		-0.04	
1389	D2699	>100		-----	
1544	D2699	101.1		-0.84	
1634		96.2	C,R(0.01)	-20.44	First reported 98.9
1635	ISO5164	101.5		0.76	
1656		-----		-----	
1706	In house	101.7		1.56	
1776	ISO5164	100.8		-2.04	
2130	IP237	100.8		-2.04	
6075	ISO5164	101.40		0.36	

normality	OK
n	19
outliers	3
mean (n)	101.31
st.dev. (n)	0.388
R(calc.)	1.09
R(D2699:16e1)	0.7

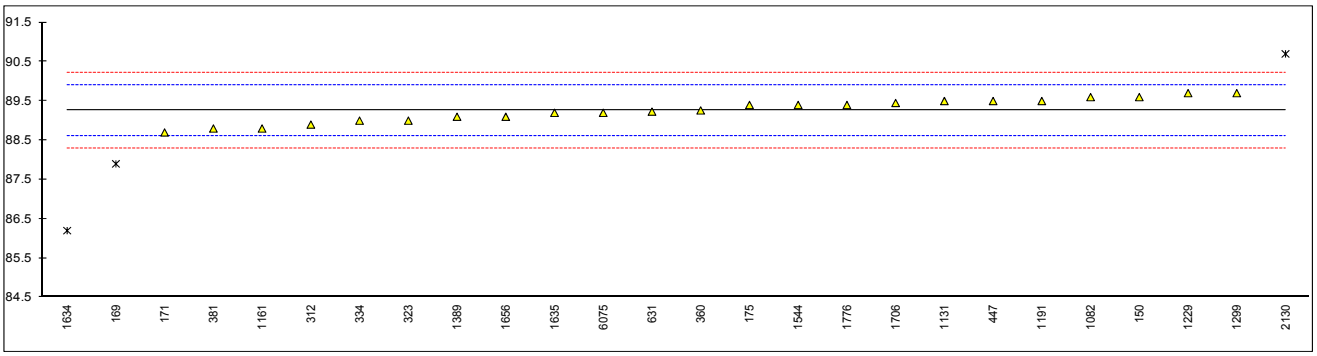


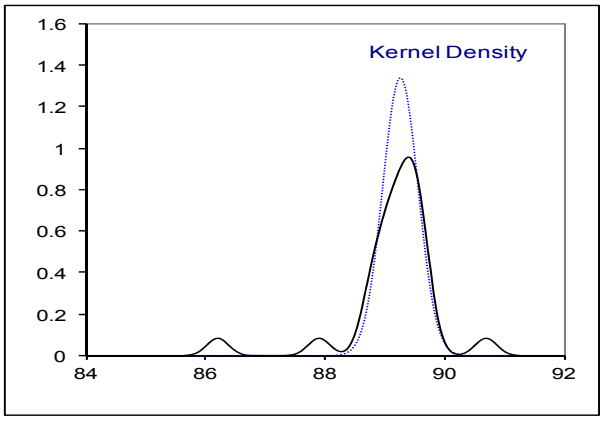


Determination of MON on sample #17082

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
140		-----		-----	
150	D2700	89.6		1.05	
159		-----		-----	
169	D2700	87.9	R(0.01)	-4.24	
171	D2700	88.7		-1.75	
175	D2700	89.4		0.43	
312	D2700	88.9		-1.13	
323	D2700	89.0		-0.82	
334	D2700	89.0		-0.82	
360	ISO5163	89.26		-0.01	
381	D2700	88.8		-1.44	
447	D2700	89.5		0.74	
511		-----		-----	
541		-----		-----	
631	D2700	89.23		-0.10	
970		-----		-----	
1082	ISO5163	89.6	C	1.05	First reported 86.9
1131	ISO5163	89.5		0.74	
1134		-----		-----	
1161	ISO5163	88.8		-1.44	
1191	ISO5163	89.5		0.74	
1229	ISO5163	89.7		1.36	
1299	D2700	89.7		1.36	
1389	D2700	89.1		-0.51	
1544	D2700	89.4		0.43	
1634		86.2	C,R(0.01)	-9.53	First reported 87.9
1635	ISO5163	89.2		-0.19	
1656	D2700	89.1		-0.51	
1706	MID IR Fuel anal.	89.45		0.58	
1776	ISO5163	89.4		0.43	
2130	IP236	90.7	R(0.05)	4.47	
6075	ISO5163	89.20		-0.19	

normality	OK
n	23
outliers	3
mean (n)	89.26
st.dev. (n)	0.297
R(calc.)	0.83
R(D2700:16a)	0.9





APPENDIX 2

Z-scores of Distillation (ASTM D86)

lab	IBP	10%eva	50%eva	90%eva	FBP	%volat70°C	%volat100°C	%volat150°C
52	0.16	0.00	0.35	0.15	-0.72	-0.13	-----	-----
53	-----	-----	-----	-----	-----	-----	-----	-----
62	-0.62	-0.39	-0.79	0.06	-0.17	2.49	-0.20	-1.09
131	-0.62	-0.47	-1.12	0.06	-0.01	-----	-----	-----
140	-----	-----	-----	-----	-----	-----	-----	-----
150	0.87	-0.24	-0.39	-0.37	-0.37	-0.40	1.56	0.53
158	-----	-----	-----	-----	-----	-----	-----	-----
159	-----	-----	-----	-----	-----	-----	-----	-----
169	-1.81	0.85	0.75	0.24	-0.01	-----	-----	-----
171	-0.80	0.39	0.42	0.93	-0.84	-----	-0.68	-0.86
175	0.63	-1.48	-0.25	-0.16	0.58	-----	-----	-----
194	0.99	0.54	0.15	0.32	-0.33	-1.64	1.08	-1.32
312	-0.80	-0.55	-0.12	0.11	-0.13	1.25	-0.36	-0.17
323	0.39	1.01	0.42	-1.55	-1.43	-2.05	0.28	2.14
333	-1.33	-0.78	-0.32	0.41	-0.05	-----	-----	-----
334	0.04	-0.31	0.35	0.93	0.97	0.15	-0.68	-0.86
335	-0.26	-1.25	0.15	-0.46	0.34	-0.81	0.44	0.53
336	0.51	1.17	0.28	0.11	0.07	-0.54	-0.04	-0.17
337	-----	-----	-----	-----	-----	-----	-----	-----
338	0.45	-0.70	-0.45	0.45	0.58	0.97	-0.68	-0.63
360	-----	-----	-----	-----	-----	-----	-----	-----
381	1.70	1.87	0.55	0.19	0.66	-1.64	-0.68	-0.17
447	-1.45	-0.24	-0.12	0.15	1.01	1.25	-0.36	-0.17
494	0.10	0.00	0.08	-0.37	-1.43	0.15	0.12	0.53
496	-0.44	-0.47	-0.19	-0.68	-0.29	0.42	0.12	0.76
511	1.94	2.49	1.82	3.06	-0.25	-1.64	-0.68	-5.48
541	-0.68	-0.86	-0.45	-0.02	0.11	0.56	0.92	-0.40
631	2.24	-1.01	-1.19	-2.81	1.33	1.80	1.72	1.45
634	2.54	1.71	0.82	-2.59	-0.25	1.80	-----	-----
970	-----	-----	-----	-----	-----	-----	-----	-----
1033	-0.92	1.40	1.29	2.97	0.38	-2.05	-3.08	-3.86
1040	-----	-----	-----	-----	-----	-----	-----	-----
1082	-1.21	-0.86	-0.59	-0.42	0.74	1.39	-0.04	0.53
1131	-0.44	-0.55	-0.32	0.37	-0.84	1.52	-0.36	-0.40
1134	-0.08	0.08	-0.32	-0.07	-0.88	-2.05	-3.24	-4.56
1161	1.94	2.10	1.02	3.28	0.38	-1.50	-1.48	-7.79
1191	0.04	-0.86	-0.39	-0.42	0.15	1.25	0.60	0.53
1229	0.04	-0.94	-0.79	-0.24	-0.48	2.35	0.76	0.53
1299	0.28	-----	-----	-----	0.50	-0.40	-0.68	-1.32
1389	-----	-----	-----	-----	-----	-----	-----	-----
1457	-1.63	-0.86	-0.45	-0.42	-0.25	1.52	-0.36	0.29
1459	0.45	0.15	-0.39	0.24	-0.01	1.52	-0.84	0.06
1544	0.66	0.11	0.35	0.32	1.05	-2.88	-0.36	-0.74
1634	-0.68	-0.24	0.55	0.28	1.01	-2.88	1.24	-0.63
1635	-1.33	-1.33	-1.79	-2.81	0.94	3.86	1.72	3.53
1656	0.10	-0.31	-0.65	0.28	-0.13	0.15	-0.36	-0.17
1706	0.28	2.57	1.35	0.26	1.13	-2.33	-0.28	-0.17
1776	-0.86	-0.55	-0.52	-0.16	0.03	1.66	0.28	0.29
1810	-0.50	-0.31	0.01	-0.02	-1.71	-2.33	-3.24	-5.02
2130	1.17	-0.08	0.42	0.89	2.87	-0.26	-0.36	-0.86
2146	0.39	-0.86	-0.05	0.11	-0.13	0.15	-0.20	0.06
6075	-1.45	0.08	0.55	-1.50	-1.27	-0.68	-1.16	1.91

APPENDIX 3

Number of participants per country

#17080 Regular round

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

#17081 DVPE round

1 lab in BELGIUM
2 labs in BULGARIA
3 labs in CANADA
1 lab in CROATIA
5 lab in FINLAND
7 labs in FRANCE
2 labs in GERMANY
1 lab in LITHUANIA
1 lab in MARTINIQUE
4 labs in NETHERLANDS
1 lab in OMAN
1 lab in PHILIPPINES
1 lab in PORTUGAL
1 lab in SERBIA
2 labs in SPAIN
1 lab in SWEDEN
1 lab in TURKEY
5 labs in UNITED KINGDOM
9 labs in UNITED STATES OF AMERICA

#17082 RON/MON round

1 lab in ARGENTINA
1 lab in AUSTRIA
1 lab in BELGIUM
2 labs in BULGARIA
2 labs in CANADA
1 lab in CROATIA
3 labs in FINLAND
1 lab in FRANCE
1 lab in LITHUANIA
1 lab in MARTINIQUE
1 lab in NETHERLANDS
1 lab in OMAN
1 lab in PERU
1 lab in PHILIPPINES
1 lab in PORTUGAL
1 lab in SERBIA
2 labs in SPAIN
1 lab in SWEDEN
1 lab in TURKEY
4 labs in UNITED KINGDOM
6 labs in UNITED STATES OF AMERICA

APPENDIX 4

Abbreviations:

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner outlier test
R(0.05)	= straggler in Rosner outlier test
R(1)	= outlier in Rosner outlier test
R(5)	= straggler in Rosner outlier test
ex	= test result excluded from statistical evaluation
E	= probably an error in calculations
n.a.	= not applicable
n.e.	= not evaluated
W	= test result withdrawn on request of the participant
fr.	= first reported
U	= test result probably reported in a different unit
SDS	= Safety Data Sheet

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