Results of Proficiency Test
Biogasoline E10
May 2018

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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Report no.: iis18B02

September 2018

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 2017/2018, it was decided to continue the round robin for the analysis of Biogasoline E10. In this interlaboratory study, 53 laboratories in 22 different countries registered for participation in the regular round robin. For the DVPE round robin 49 participants registered and for the RON/MON round, 31 participants registered for participation. See appendix 3 for the number of participants per country. In this report, the results of the 2018 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, one 1L of Biogasoline E10 (labelled #18080) and/or one 1L of Biogasoline E10 (± 750 mL filled, labelled #18081) for DVPE only and/or two 1L of Biogasoline E10 (labelled #18082) 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 batch material of about 400 litres of Biogasoline E10 was purchased from a local petrol supplier. After homogenisation of 200L (1 drum), 148 amber glass bottles of 1 litre were filled. For the main round 70 bottles were labelled #18080 and 78 bottles were labelled #18082 for the RON/MON round.
Another drum of 200L was homogenised and 72 amber glass bottles of 1 litre were filled with approx. 750 mL especially for Dry Vapour Pressure Equivalent and labelled #18081.
The homogeneity of the subsamples #18080 and #18082 was checked by determination of Density at 15°C in accordance with ASTM D4052 on 8 stratified randomly selected samples in total. The homogeneity of the subsamples #18081 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 #18080-1	729.89
Sample #18080-2	729.89
Sample #18080-3	729.86
Sample #18080-4	729.89
Sample #18082-1	729.99
Sample #18082-2	729.85
Sample #18082-3	730.07
Sample #18082-4	730.11

Table 1: homogeneity test results of subsamples #18080 and #18082

	DVPE in psi
Sample #18081-1	13.40
Sample #18081-2	13.46
Sample #18081-3	13.46
Sample #18081-4	13.46
Sample #18081-5	13.42
Sample #18081-6	13.43
Sample #18081-7	13.40
Sample #18081-8	13.47

Table 2: homogeneity test results of subsamples #18081

From the above test results, the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibilities of the target test 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 #18080/18082)	0.28	--
r (sample #18081)	--	0.08
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 #18080, #18082 and #18081

The calculated repeatabilities were in agreement with 0.3 times the corresponding reproducibilities of the reference test methods. Therefore, homogeneity of the subsamples #18080, #18081 and #18082 was assumed.

To each of the participating laboratories, depending on their registration, 1 litre of sample #18080, 1 litre (± 750 mL filled) of sample #18081 and/or 2 litres of sample #18082 were sent on May 2, 2018. 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 ANALYSES

The participants were requested to determine on sample #18080: API gravity, Aromatics (by FIA and by GC), Benzene, Copper Strip Corrosion 3hrs/50°C, Density at 15°C, Distillation, Doctor test, Existent Gum (solvent washed), Lead as Pb, Manganese as Mn, Mercaptan Sulphur as S, Olefins (by FIA and by GC), Oxidation Stability, Oxygenates, Oxygen content and Sulphur.
On sample #18081 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 #18082 (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 results, but report as much significant figures as possible. It was also requested not to report ‘less than’ test results, which are above the detection limit, because such test results cannot be used for meaningful statistical evaluations.

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

3 RESULTS

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

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

3.1 STATISTICS

The protocol followed in the 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 March 2017 (iis-protocol, 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.

According 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 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 visualise the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis, the reported 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. 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 reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.
The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other targets 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 result tables of 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 proficiency test some problems were encountered for the dispatch to Peru due to customs problems. For the regular Biogasoline E10 (#18080): 1 participant reported test results after the final reporting date and 2 other participants did not report any test results at all. For the DVPE PT (#18081): 2 participants did not report any test results at all. For the RON/MON PT (#18082): 1 participant reported test results after the final reporting date and 3 other participants did not report any test results at all.
Finally, in total 1032 numerical test results were reported by 53 participants. Observed were 45 outlying results, which is 4.4%. 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.

Sample #18080

API gravity: 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 D4052:18.

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.

Aromatics by GC: 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. When the ISO22854 test results were evaluated separately, the calculated reproducibility is in full agreement with the requirements of ISO22854:16.

Benzene: 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. When the ISO22854:16 test results were evaluated separately, the calculated reproducibility is also 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 not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96.

Distillation: The determination of the distillation may not be problematic. In total nineteen statistical outliers were observed and three other test results were excluded. However, all calculated reproducibilities after rejection of the suspect data are in agreement with the requirements of the automated mode of ASTM D86:17, except for temperature at 10% evaporated and percent evaporated at 100°C for automatic mode. When compared against the requirements of the manual mode, only 10% evaporated is not in agreement.

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. The calculated reproducibility after rejection of the statistical outlier is in agreement with requirements of ASTM D381:12 (2017).

Lead: The lead concentration was below the application range of ASTM D3237:17. Therefore, no z-scores were calculated.

Manganese: The manganese concentration was below the application range of the test methods used by the participants. Therefore, no z-scores were calculated.

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

Olefins by FIA: This determination was not problematic. No statistical outliers were observed and two test results were excluded. The calculated reproducibility after rejection of the suspect data is in agreement with the requirements of ASTM D1319:15.

Olefins by GC: This determination was not problematic. Two statistical outliers were observed and two other test result were excluded. However, the calculated reproducibility after rejection of the suspect data is in good agreement with the requirements of ISO22854:16.

Oxidation Stability: No problems have been observed, all, except one, participants agreed that the Oxidation Stability is >360 minutes.

Ethanol: 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 not problematic. One statistical outlier was observed and two other test results were excluded as they did not included MTBE as C5 into the reported test results. However, the calculated reproducibility after rejection of the suspect data is in full agreement with the requirements of ISO22854:16.

Ethers (C5 or more C): This determination was not problematic. One statistical outlier was observed and two other test results were excluded as they did not included MTBE as C5 into the reported test results. However, the calculated reproducibility after rejection of the suspect data is in agreement with the requirements of ISO22854:16.

Ethers (C6 and more C): The concentration of the ethers “C6 or more atoms” was near the application range of ISO22854:16. Therefore, no z-scores were calculated.

MTBE: 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.

Other oxygenates: The concentration of the other oxygenates were near or below the application range of ISO22854:16. Therefore, no significant conclusions were drawn.

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

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

Sample #18081

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 D5191:15 and EN13016-1:07.

DVPE (ASTM D5191) The conversion of the measured Total Vapour Pressure to the corresponding Dry Vapour Pressure Equivalent (DVPE) as described in the ASTM D5191:13 showed no statistical outliers. The calculated reproducibility is in agreement with the requirements of ASTM D5191:15 and EN13016-1:07.

DVPE (EPA calculation) The conversion of the measured Total Vapour Pressure to the corresponding U.S. EPA guidelines (40 CFR Part 80, App. E, Method 3) showed one statistical outlier. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5191:15 and EN13016-1:07.

Sample #18082

RON: 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 ASTM D2699:18.

MON: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D2700:18.

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 average results, the calculated reproducibilities and the reproducibilities derived from literature reference test methods (in casu ASTM, ISO, EN standards) are compared in the next table.

parameter	unit	n	average	2.8 * sd	R (lit)
API gravity		23	62.24	0.29	0.68
Aromatics by FIA	%V/V	19	24.4	5.0	3.7
Aromatics by GC	%V/V	29	22.5	1.3	1.2
Benzene	%V/V	34	0.81	0.04	0.04
Copper Strip 3 hrs at 50°C		30	1	n.a.	n.a.
Density at 15°C	kg/m^3	49	730.1	1.0	1.5
Initial Boiling Point	°C	45	28.1	4.9	4.7
10% evaporated	°C	46	44.5	4.0	3.5
50% evaporated	°C	42	68.1	2.7	4.2
90% evaporated	°C	42	154.2	4.0	6.4
Final Boiling Point	°C	45	191.5	6.2	7.1
%Volume at 70°C	%V/V	42	51.5	2.2	2.0
%Volume at 100°C	%V/V	41	64.9	2.0	1.7

parameter	unit	n	average	2.8 * sd	R (lit)
%Volume at 150°C	%V/V	39	89.1	0.7	1.2
Doctor test		18	Negative	n.a.	n.a.
Existent Gum (washed)	mg/100mL	22	0.7	1.4	2.2
Lead as Pb	mg/L	24	<2.5	n.a.	n.a.
Manganese as Mn	mg/L	19	<2	n.a.	n.a.
Mercaptans Sulphur as S	%M/M	11	0.0001	0.0003	0.0003
Olefins by FIA	%V/V	17	9.4	2.9	3.1
Olefins by GC	%V/V	23	8.9	1.2	1.6
Oxidation Stability	minutes	19	>360	n.a.	n.a.
Ethanol	%V/V	36	9.6	0.7	0.6
Ethers C5	%V/V	12	0.3	0.4	0.4
Ethers C5 or more C atoms	%V/V	12	0.3	0.4	0.4
MTBE	%V/V	27	0.3	0.1	0.4
Oxygen content	%M/M	32	3.7	0.3	0.3
Sulphur	mg/kg	43	3.2	1.5	1.5

Table 4 reproducibilities of tests on sample #18080

Parameter	unit	n	average	2.8 * sd	R (lit)
TVP acc.to ASTM D5191	psi	37	14.43	0.34	0.38
DVPE acc.to ASTM D5191	psi	42	13.37	0.33	0.37
DVPE acc.to EPA	psi	25	13.47	0.25	0.37

Table 5: reproducibilities of tests on sample #18081

Parameter	unit	n	average	2.8 * sd	R (lit)
RON		26	95.4	0.7	0.7
MON		24	85.5	1.0	0.9

Table 6: reproducibilities of tests on sample #18082

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 reference test methods. The tests that are problematic have been discussed in paragraph 4.1.

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

Determination	May 2018	May 2017	May 2016	May 2015	May 2014
Number of reporting labs	53	52	54	41	50
Number of results reported	1032	967	1073	713	1164
Statistical outliers	45	51	31	20	45
Percentage outliers	4.4%	5.3%	2.9%	2.8%	3.9%

Table 7: comparison with previous proficiency tests

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

Determination	May 2018	May 2017	May 2016	May 2015	May 2014
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	-	+/-	+/-	-	--
Ethers	+/-	-	n.e.	n.e.	n.e.
MTBE	++	+/-	+/-	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 reference test method requirements

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

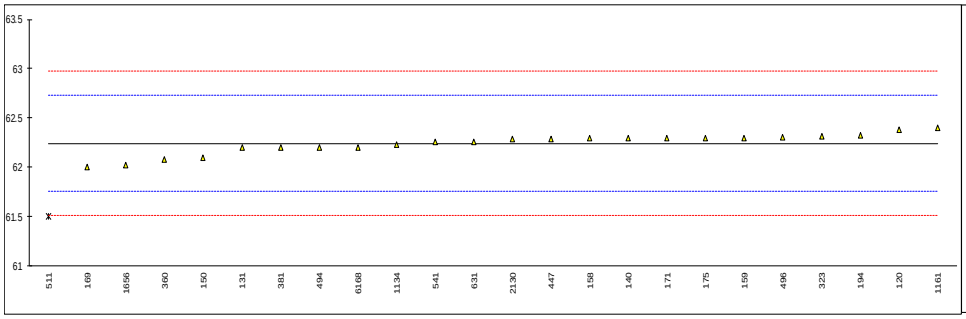
++: group performed much better than the reference test method
+ : group performed better than the reference test method
+/-: group performance equals the reference test method
- : group performed worse than the reference test method
-- : group performed much worse than the reference test method
n.e.: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

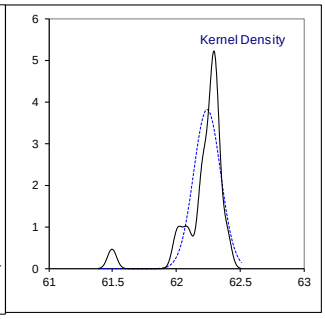
APPENDIX 1

Determination of API gravity on sample #18080;

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D4052	62.38		0.57	
131	D4052	62.2		-0.17	
140	D4052	62.3		0.24	
150	D4052	62.1		-0.58	
158	D4052	62.3		0.24	
159	D4052	62.3		0.24	
169	D4052	62.0		-0.99	
171	D4052	62.3		0.24	
175	D4052	62.30		0.24	
194	D4052	62.32		0.32	
312		-----		-----	
323	D4052	62.31		0.28	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D4052	62.08		-0.66	
381	D4052	62.2		-0.17	
447	D4052	62.29		0.20	
494	D4052	62.2		-0.17	
496	D4052	62.303		0.26	
511	D4052	61.50	R(0.01)	-3.04	
541	D4052	62.26		0.08	
631	D4052	62.261		0.08	
1026		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1126		-----		-----	
1134	D4052	62.23		-0.04	
1161	D287	62.4		0.65	
1191		-----		-----	
1229		-----		-----	
1275		-----		-----	
1299		-----	W	-----	First reported 730.3
1457		-----		-----	
1459		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656	D4052	62.02		-0.91	
1706		-----		-----	
1776		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
2130	D4052	62.283		0.17	
2146		-----		-----	
6054		-----		-----	
6142		-----		-----	
6168	D4052	62.2		-0.17	

normality	OK
n	23
outliers	1
mean (n)	62.241
st.dev. (n)	0.1047
R(calc.)	0.293
st.dev.(D4052:18)	0.2439
R(D4052:18)	0.683

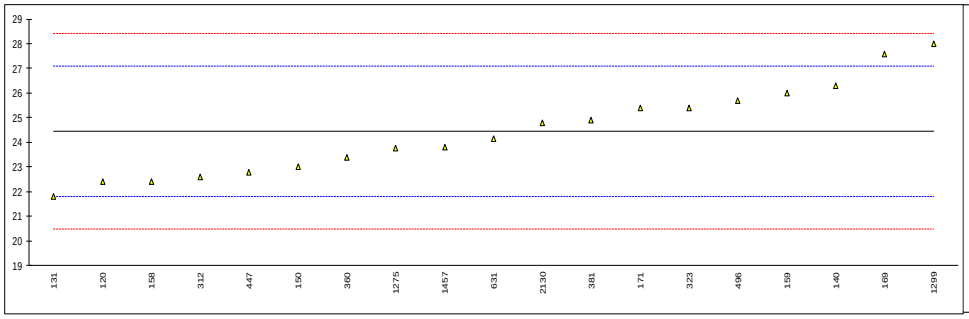


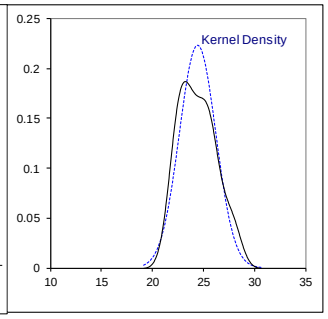


Determination of Aromatics by FIA on sample #18080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D1319	22.4		-1.54	
131	D1319	21.8		-1.99	
140	D1319	26.3		1.41	
150	D1319	23.0		-1.08	
158	D1319	22.4		-1.54	
159	D1319	26.0		1.19	
169	D1319	27.6		2.40	
171	D1319	25.4		0.73	
175		-----		-----	
194		-----		-----	
312	D1319	22.6		-1.39	
323	D1319	25.4		0.73	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D1319	23.4		-0.78	
381	D1319	24.9	C	0.35	First reported 9.7
447	D1319	22.8		-1.24	
494		-----		-----	
496	D1319	25.70		0.96	
511		-----		-----	
541		-----		-----	
631	D1319	24.16		-0.21	
1026		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1126		-----		-----	
1134		-----		-----	
1161		-----		-----	
1191		-----		-----	
1229		-----		-----	
1275	IP156	23.75		-0.52	
1299	D1319	28.0		2.70	
1457	D1319	23.8		-0.48	
1459		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
2130	D1319	24.8		0.28	
2146		-----		-----	
6054		-----		-----	
6142		-----		-----	
6168		-----		-----	

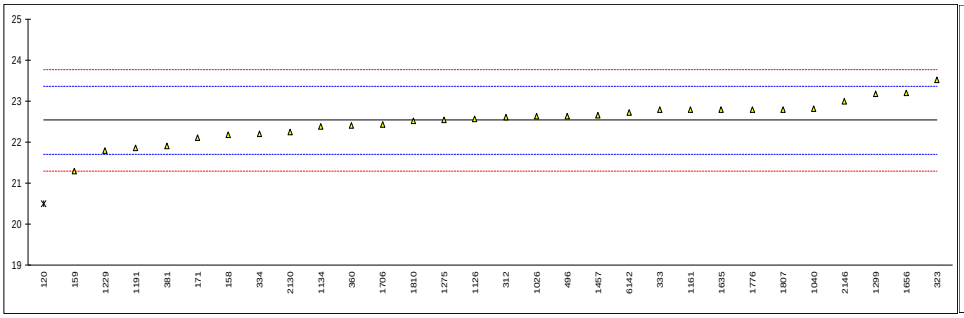
normality	OK
n	19
outliers	0
mean (n)	24.432
st.dev. (n)	1.7921
R(calc.)	5.018
st.dev.(D1319:15)	1.3214
R(D1319:15)	3.7

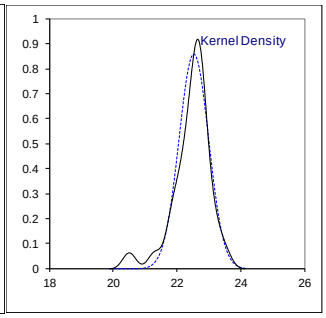




Determination of Aromatics by GC on sample #18080; results in %V/V

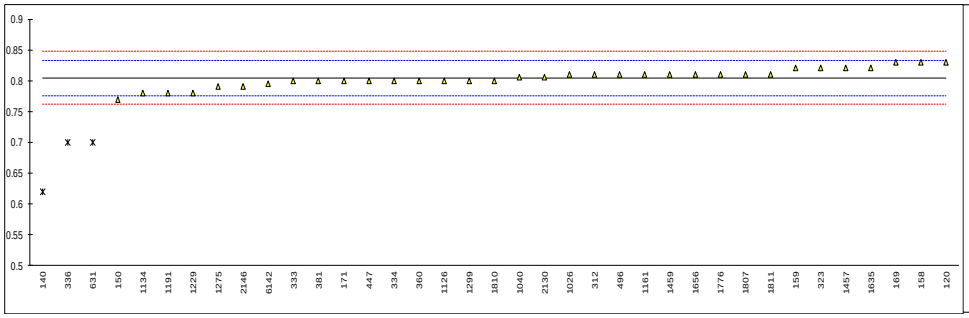
lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D5769	20.5	C,R(0.01)	-4.89	First reported 18.3
131		-----		-----	
140		-----		-----	
150		-----		-----	
158	D5769	22.17		-0.87	
159	D5769	21.3		-2.96	
169		-----		-----	
171	D5769	22.1		-1.04	
175		-----		-----	
194		-----		-----	
312	ISO22854	22.6		0.17	
323	ISO22854	23.52		2.39	
333	ISO22854	22.8		0.65	
334	ISO22854	22.2		-0.79	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854	22.41	C	-0.29	First reported 21.17
381	ISO22854	21.9		-1.52	
447		-----		-----	
494		-----		-----	
496	ISO22854	22.64		0.27	
511		-----		-----	
541		-----		-----	
631		-----		-----	
1026	ISO22854	22.62		0.22	
1033		-----		-----	
1040	ISO22854	22.810		0.68	
1082		-----		-----	
1126	ISO22854	22.56		0.07	
1134	ISO22854	22.39		-0.34	
1161	ISO22854	22.8		0.65	
1191	ISO22854	21.85		-1.64	
1229	ISO22854	21.8		-1.76	
1275	ISO22854	22.55		0.05	
1299	ISO22854	23.18		1.57	
1457	ISO22854	22.65		0.29	
1459		-----		-----	
1634		-----		-----	
1635	ISO22854	22.8		0.65	
1656	ISO22854	23.2		1.62	
1706	ISO22854	22.42		-0.26	
1776	ISO22854	22.80		0.65	
1807	ISO22854	22.8		0.65	
1810	ISO22854	22.52		-0.02	
1811		-----		-----	
2130	D6730	22.241		-0.70	
2146	ISO22854	23.0		1.13	
6054		-----		-----	
6142	ISO22854	22.72		0.46	
6168		-----		-----	
					Only ISO22854
	normality	OK			OK
	n	29			25
	outliers	1			0
	mean (n)	22.529			22.622
	st.dev. (n)	0.4649			0.4046
	R(calc.)	1.302			1.133
	st.dev.(ISO22854:16)	0.4147			0.4147
	R(ISO22854:16)	1.161			1.165 Compare R(D5769:15) = 2.523

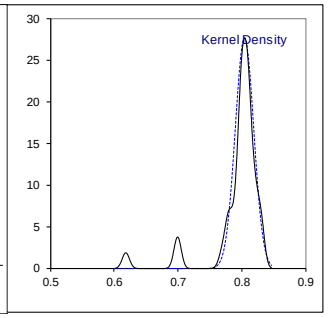




Determination of Benzene on sample #18080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D3606	0.83		1.78	
131		-----		-----	
140	D3606	0.619	C,R(0.01)	-12.99	First reported 0.725
150	D3606	0.77	C	-2.42	First reported 0.75
158	D3606	0.83		1.78	
159	D3606	0.82		1.08	
169	D3606	0.83	C	1.78	First reported 0.644
171		0.80		-0.32	
175		-----		-----	
194		-----		-----	
312	ISO22854	0.81		0.38	
323	ISO22854	0.82		1.08	
333	ISO22854	0.8		-0.32	
334	ISO22854	0.8		-0.32	
335		-----		-----	
336	EN238	0.7	R(0.01)	-7.32	
337		-----		-----	
338		-----		-----	
360	ISO22854	0.80		-0.32	
381	ISO22854	0.8		-0.32	
447	IP429	0.8		-0.32	
494		-----		-----	
496	ISO22854	0.810		0.38	
511		-----		-----	
541		-----		-----	
631	D6277	0.70	R(0.01)	-7.32	
1026	ISO22854	0.81		0.38	
1033		-----		-----	
1040	ISO22854	0.805		0.03	
1082		-----		-----	
1126	ISO22854	0.80		-0.32	
1134	ISO22854	0.78		-1.72	
1161	ISO22854	0.81		0.38	
1191	ISO22854	0.78		-1.72	
1229	ISO22854	0.78		-1.72	
1275	ISO22854	0.79		-1.02	
1299	ISO22854	0.80		-0.32	
1457	ISO22854	0.82		1.08	
1459	ISO22854	0.81		0.38	
1634		-----		-----	
1635	ISO22854	0.82		1.08	
1656	ISO22854	0.81		0.38	
1706		-----		-----	
1776	ISO22854	0.81		0.38	
1807	ISO22854	0.81		0.38	
1810	ISO22854	0.80		-0.32	
1811	ISO22854	0.81		0.38	
2130	D6730	0.806		0.10	
2146	ISO22854	0.79		-1.02	
6054		-----		-----	
6142	ISO22854	0.795		-0.67	
6168		-----		-----	
					Only ISO22854
	normality	OK			OK
	n	34			26
	outliers	3			0
	mean (n)	0.805			0.803
	st.dev. (n)	0.0144			0.0116
	R(calc.)	0.040			0.032
	st.dev.(ISO22854:16)	0.0143			0.0143
	R(ISO22854:16)	0.04			0.04





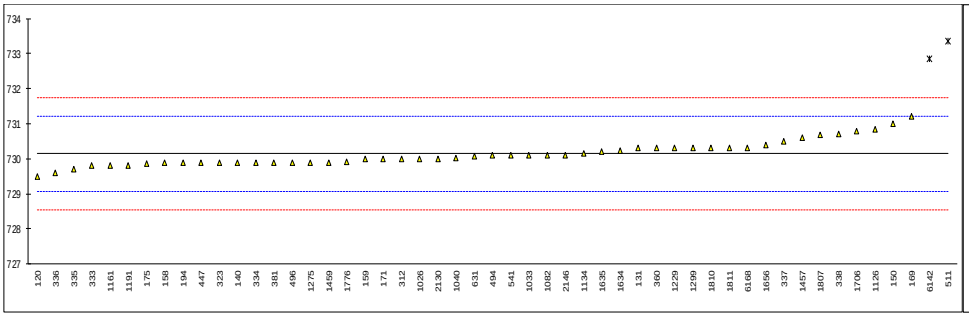
Determination of Copper strip corrosion 3hrs at 50°C on sample #18080

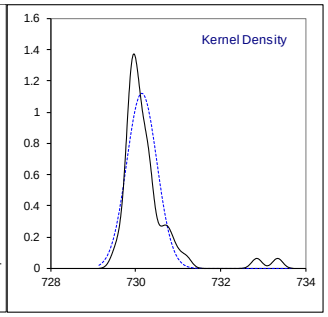
lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D130	1A		-----	
131	D130	1A		-----	
140	D130	1A		-----	
150	D130	1a		-----	
158	D130	1A		-----	
159	D130	1a		-----	
169	D130	1a		-----	
171	D130	1a		-----	
175		-----		-----	
194		-----		-----	
312		-----		-----	
323	D130	1A		-----	
333		-----		-----	
334	ISO2160	1		-----	
335		-----		-----	
336	D130	1A		-----	
337		-----		-----	
338		-----		-----	
360	D130	1A		-----	
381	ISO2160	1		-----	
447	D130	1a		-----	
494	ISO2160	1a		-----	
496	ISO2160	1a		-----	
511	D130	1A		-----	
541	D130	1A		-----	
631	D130	1a		-----	
1026	ISO2160	1A		-----	
1033	IP154	1a		-----	
1040		-----		-----	
1082		-----		-----	
1126		-----		-----	
1134	D130	1a		-----	
1161	ISO2160	1a		-----	
1191		-----		-----	
1229		-----		-----	
1275	IP154	1		-----	
1299	D130	1A		-----	
1457	D130	1A		-----	
1459		-----		-----	
1634	ISO2160	1a		-----	
1635		-----		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807	D130	1a		-----	
1810		-----		-----	
1811		-----		-----	
2130	D130	1a		-----	
2146		-----		-----	
6054		-----		-----	
6142		-----		-----	
6168	D130	1A		-----	
	n	30			
	mean (n)	1			

Determination of Density at 15°C on sample #18080; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D4052	729.5	C	-1.20	Reported 0.7295
131	D4052	730.3		0.29	
140	D4052	729.9		-0.45	
150	D4052	731.0	C	1.60	First reported 0.7360 kg/L
158	D4052	729.9		-0.45	
159	D4052	730.0		-0.27	
169	D4052	731.2	C	1.97	First reported 731.2 kg/L
171	D4052	730.0		-0.27	
175	D4052	729.86		-0.53	
194	D4052	729.9		-0.45	
312	D4052	730.0		-0.27	
323	ISO12185	729.9		-0.45	
333	ISO12185	729.8		-0.64	
334	ISO12185	729.9		-0.45	
335	ISO12185	729.7		-0.83	
336	ISO12185	729.6		-1.01	
337	ISO12185	730.5		0.67	
338	ISO12185	730.7		1.04	
360	ISO12185	730.3		0.29	
381	ISO12185	729.9		-0.45	
447	D4052	729.9		-0.45	
494	ISO12185	730.1		-0.08	
496	ISO12185	729.90		-0.45	
511	D4052	733.34	R(0.01)	5.97	
541	ISO12185	730.10		-0.08	
631	D4052	730.07		-0.14	
1026	D4052	730.0		-0.27	
1033	IP365	730.1		-0.08	
1040	ISO12185	730.020		-0.23	
1082	ISO12185	730.1		-0.08	
1126	ISO12185	730.84		1.30	
1134	D4052	730.15		0.01	
1161	ISO12185	729.8		-0.64	
1191	ISO12185	729.8		-0.64	
1229	ISO12185	730.3		0.29	
1275	IP365	729.9		-0.45	
1299	D4052	730.3		0.29	
1457	ISO12185	730.6		0.85	
1459	ISO12185	729.90		-0.45	
1634	ISO12185	730.237		0.18	
1635	D4052	730.2		0.11	
1656	D4052	730.4		0.48	
1706	ISO12185	730.8		1.23	
1776	ISO12185	729.91		-0.43	
1807	D4052	730.69		1.02	
1810	ISO12185	730.3		0.29	
1811	ISO12185	730.3		0.29	
2130	ISO12185	730.0		-0.27	
2146	ISO12185	730.1		-0.08	
6054		-----		-----	
6142	ISO12185	732.85	R(0.01)	5.05	
6168	D4052	730.3		0.29	

normality	not OK
n	49
outliers	2
mean (n)	730.142
st.dev. (n)	0.3559
R(calc.)	0.997
st.dev.(ISO12185:96)	0.5357
R(ISO12185:96)	1.5

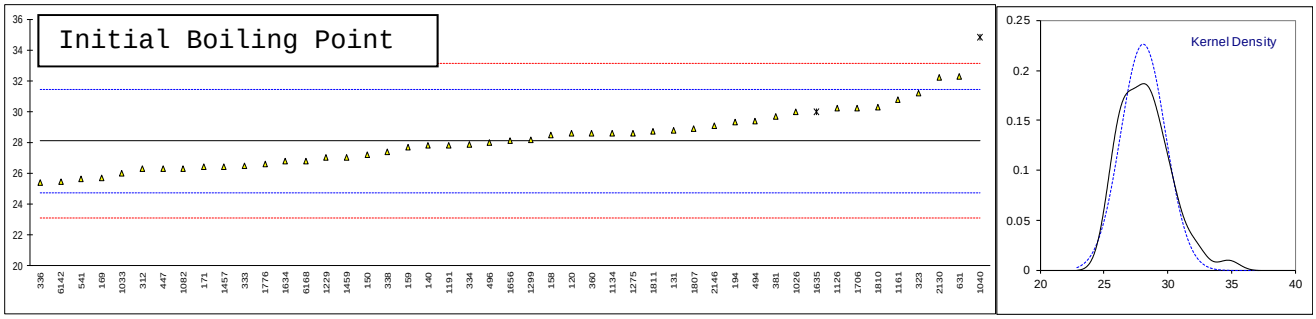


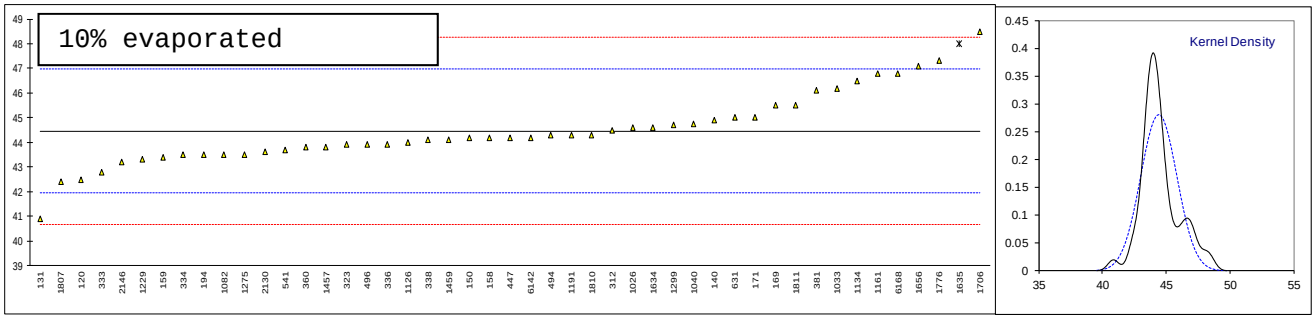


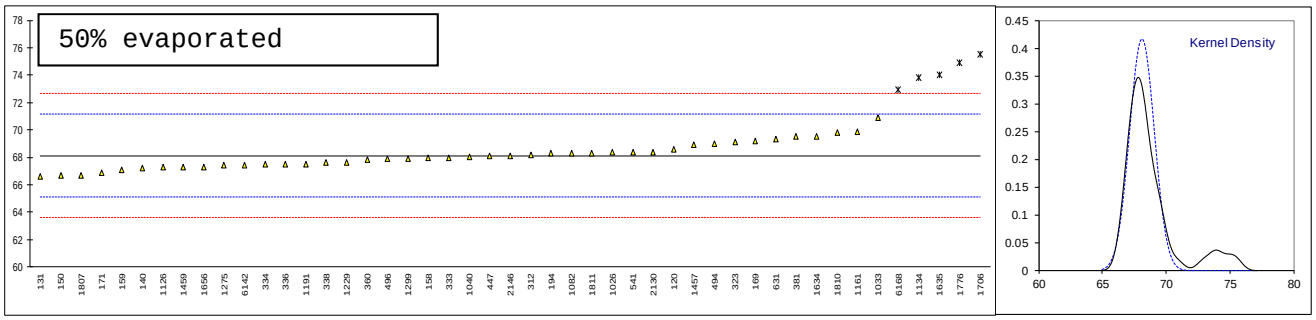
Determination of Distillation on sample #18080; results in °C

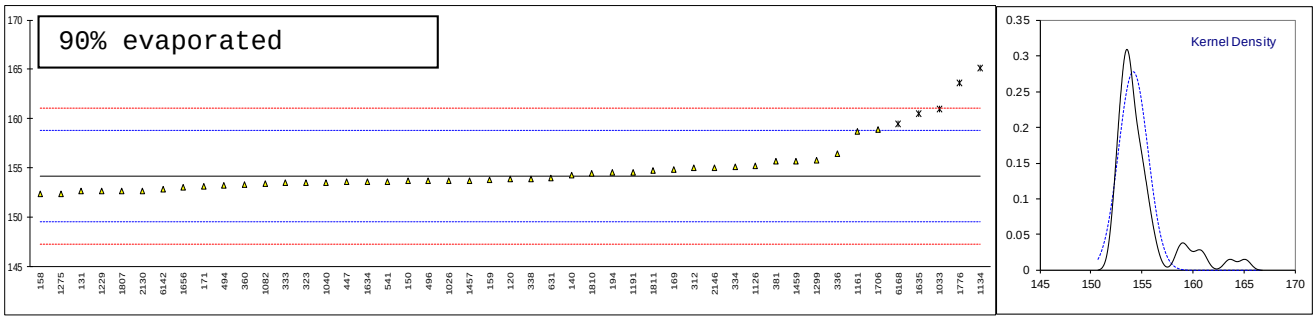
lab	method	IBP	mark	10%eva	mark	50%eva	mark	90%eva	mark	FBP	mark
62		-----		-----		-----		-----		-----	
120	D86-automated	28.6		42.5		68.6		153.9		191.2	
131	D86	28.8		40.9	C	66.6	C	152.7	C	191.2	
140	D86-automated	27.8		44.9	C	67.2	C	154.3	C	192.1	
150	D86-automated	27.2		44.2		66.7		153.7		192.8	
158	D86-automated	28.5		44.2		68.0		152.4		187.9	
159	D86-automated	27.7		43.4		67.1		153.8		192.1	
169	D86-automated	25.7		45.5		69.2		154.8		193.4	
171	D86-automated	26.4		45.0		66.9		153.1		187.7	
175		-----		-----		-----		-----		-----	
194	D86-automated	29.3		43.5		68.3		154.6		193.0	
312		26.3		44.5		68.2		155.0		191.0	
323	D86-automated	31.2		43.9		69.1		153.5		190.1	
333	D86-automated	26.5		42.8		68.0		153.5		189.4	
334	D86-automated	27.9		43.5		67.5		155.1		188.7	
335		-----		-----		-----		-----		-----	
336	D86-automated	25.4		43.9		67.5		156.4		189.8	
337		-----		-----		-----		-----		-----	
338	ISO3405-automated	27.4		44.1		67.6		153.9		193.0	
360	D86-automated	28.6		43.8		67.8		153.3		191.1	
381	D86-automated	29.7		46.1		69.5		155.7		194.2	
447	D86-automated	26.3		44.2		68.1		153.6		192.3	
494	D86-automated	29.4		44.3		69.0		153.2		188.7	
496	D86-automated	28.0		43.9		67.9	C	153.7	C	191.1	
511		-----		-----		-----		-----		-----	
541	D86-automated	25.65		43.70		68.40		153.65		191.05	
631	D86-automated	32.3		45.0		69.3		154.0		197.2	
1026		30		44.6	C	68.4		153.7		192.5	
1033	IP123-automated	26.0		46.2		70.9		161.0	R(5)	192.1	
1040	D86-automated	34.80	R(5)	44.75		68.05		153.50		191.10	
1082	ISO3405-automated	26.3		43.5		68.3		153.4		190.1	
1126		30.2		44.0		67.3		155.2		197.8	
1134	D86-automated	28.6		46.5		73.8	R(1)	165.1	R(1)	188.2	
1161	D86-automated	30.8		46.8		69.9		158.7		194.9	C
1191	ISO3405-automated	27.8		44.3		67.5		154.6		191.1	
1229	ISO3405-automated	27.0		43.3		67.6		152.7		190.6	
1275	IP123-automated	28.6		43.5		67.4		152.4		187.8	
1299	D86-automated	28.2		44.7		67.9		155.8		190.8	
1457	D86-automated	26.4		43.8		68.9		153.7		191.9	
1459	ISO3405-automated	27.0		44.1	C	67.3	C	155.7	C	193.6	
1634	D86-automated	26.8		44.6		69.5		153.6		195.4	
1635	D86-manual	30.0	ex	48.0	ex	74.0	R(1)	160.5	R(5)	192.0	ex
1656	ISO3405-automated	28.1		47.1		67.3	C	153.0	C	191.3	
1706	D86-automated	30.2		48.5		75.5	R(1)	158.9		191.6	
1776	ISO3405-automated	26.6		47.3		74.9	R(1)	163.6	R(1)	189.1	
1807	D86-automated	28.9		42.4		66.7		152.7		190.1	
1810	D86-automated	30.3		44.3		69.8		154.5		191.0	
1811	D86-automated	28.7		45.5		68.3		154.7		190.4	
2130	D86-automated	32.2		43.6		68.4		152.7		205.5	C,R(1)
2146		29.1		43.2		68.1		155.0		190.6	
6054		-----		-----		-----		-----		-----	
6142	ISO3405-automated	25.45		44.2		67.4		152.9		192.45	
6168	D86-automated	26.8		46.8		72.9	R(1)	159.5	R(5)	192.2	
	normality	OK		suspect		OK		not OK		suspect	
	n	45		46		42		42		45	
	outliers	1+1ex		0+1ex		5		5		1+1ex	
	mean (n)	28.10		44.46		68.13		154.17		191.46	
	st.dev. (n)	1.760		1.418		0.959		1.435		2.216	
	R(calc.)	4.93		3.97		2.68		4.02		6.21	
	st.dev.(D86-A:17)	1.679		1.263		1.508		2.301		2.536	
	R(D86-A:17)	4.7		3.54		4.22		6.44		7.1	
	Compare R(D86-M:17)	5.6		3.39		4.34		5.09		7.2	

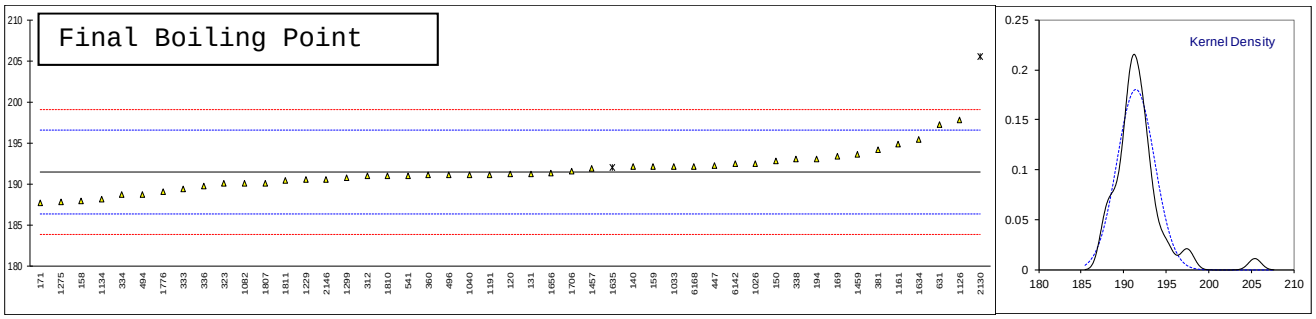
Lab 131 first reported: 46.9, 77.9, 170.6
Lab 140 first reported: 47.0, 73.2, 163.0
Lab 496 first reported: 72.8, 163.4
Lab 1026 first reported: 38.4
Lab 1161 first reported: 198.7
Lab 1459 first reported: 47.0, 72.5, 163.0
Lab 1635 test results excluded as the other reported test results were marked as statistical outliers
Lab 1656 first reported: 76.2, 167.0
Lab 2130 first reported: 198.1


Initial Boiling Point
Kernel Density


10% evaporated
Kernel Density


50% evaporated
Kernel Density

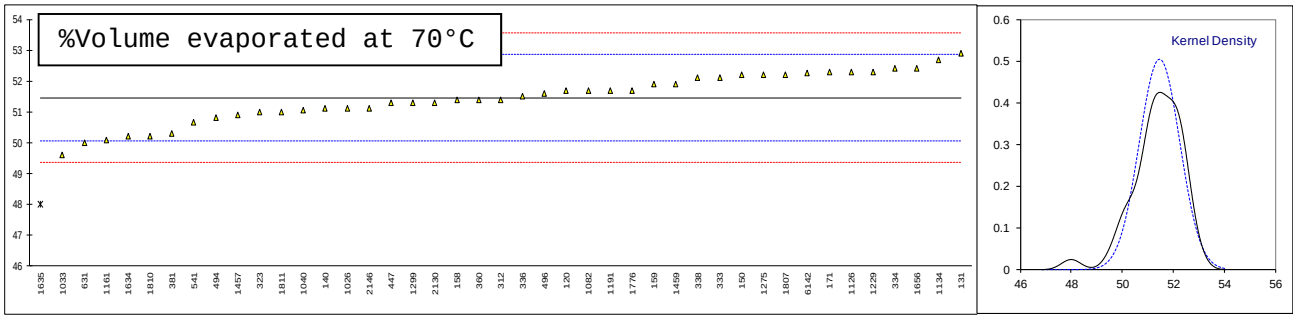

90% evaporated
Kernel Density

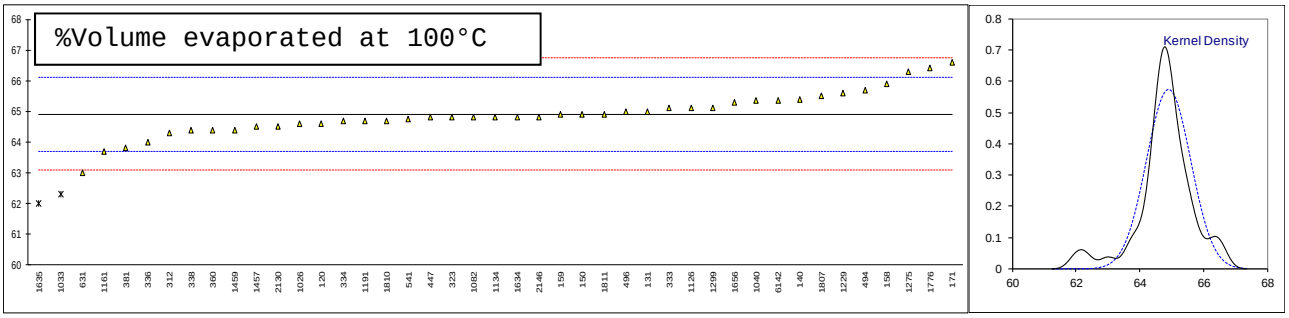

Final Boiling Point
Kernel Density

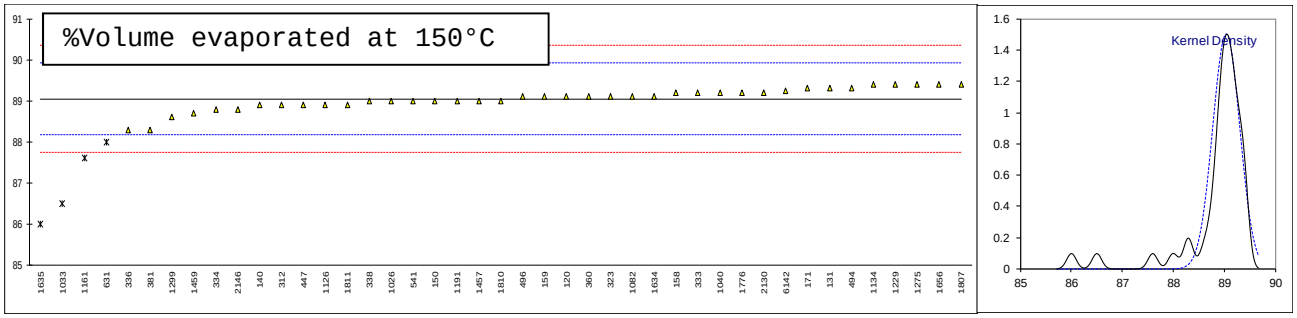
Determination of Distillation on sample #18080; results in %V/V

lab	method	%evap. at 70°C	mark	%evap. at 100°C	mark	%evap. at 150°C	mark	residue	mark
62		-----		-----		-----		-----	
120	D86-automated	51.7		64.6		89.1		1.0	
131	D86	52.9	C	65.0	C	89.3	C	1.0	
140	D86-automated	51.1	C	65.4	C	88.9	C	1.1	
150	D86-automated	52.2		64.9		89.0		1.3	
158	D86-automated	51.4		65.9		89.2		1.0	
159	D86-automated	51.9		64.9		89.1		1.1	
169	D86-automated	-----		-----		-----		1.0	
171	D86-automated	52.3		66.6		89.3		1.0	
175		-----		-----		-----		-----	
194	D86-automated	-----		-----		-----		1.1	
312		51.4		64.3		88.9		1.1	
323	D86-automated	51.0		64.8		89.1		1.1	
333	D86-automated	52.1		65.1		89.2		1.1	
334	D86-automated	52.4		64.7		88.8		1.7	
335		-----		-----		-----		-----	
336	D86-automated	51.5		64.0		88.3		1.6	
337		-----		-----		-----		-----	
338	ISO3405-automated	52.1		64.4		89.0		1.1	
360	D86-automated	51.4		64.4		89.1		1.1	
381	D86-automated	50.3		63.8		88.3		1	
447	D86-automated	51.3		64.8		88.9		1.1	
494	D86-automated	50.8		65.7		89.3		1.1	
496	D86-automated	51.6		65.0		89.1		1	
511		-----		-----		-----		-----	
541	D86-automated	50.65		64.75		89.00		1.10	
631	D86-automated	50.0		63.0		88.0	R(5)	0.8	
1026		51.1		64.6		89.0		1.0	
1033	IP123-automated	49.6		62.3	R(5)	86.5	R(1)	1.1	
1040	D86-automated	51.05		65.35		89.2	C	0.70	
1082	ISO3405-automated	51.7		64.8		89.1		0.8	
1126		52.3		65.1		88.9		0.8	
1134	D86-automated	52.7		64.8		89.4		1.1	
1161	D86-automated	50.1		63.7		87.6	R(1)	0.9	
1191	ISO3405-automated	51.7		64.7		89.0		1.2	
1229	ISO3405-automated	52.3		65.6		89.4		1.1	
1275	IP123-automated	52.2		66.3		89.4		1.1	
1299	D86-automated	51.3		65.1		88.6		1.5	
1457	D86-automated	50.9		64.5		89.0		1.1	
1459	ISO3405-automated	51.9		64.4		88.7		1.1	
1634	D86-automated	50.2		64.8		89.1		0.8	
1635	D86-manual	48.0	R(1)	62.0	R(5)	86.0	R(1)	1.2	
1656	ISO3405-automated	52.4		65.3		89.4		1.1	
1706	D86-automated	-----		-----		-----		1.1	
1776	ISO3405-automated	51.7		66.4		89.2		1.1	
1807	D86-automated	52.2		65.5		89.4		0.8	
1810	D86-automated	50.2		64.7		89.0		1.0	
1811	D86-automated	51.0		64.9		88.9		1.1	
2130	D86-automated	51.3		64.5		89.2		1.0	
2146		51.1		64.8		88.8		1.4	
6054		-----		-----		-----		-----	
6142	ISO3405-automated	52.25		65.35		89.25		1.1	
6168	D86-automated	-----		-----		-----		1.1	
	normality	OK		suspect		suspect			
	n	42		41		39			
	outliers	1		2		4			
	mean (n)	51.46		64.91		89.05			
	st.dev. (n)	0.791		0.697		0.265			
	R(calc.)	2.21		1.95		0.74			
	st.dev.(D86-A:17)	0.704		0.608		0.435			
	R(D86-A:17)	1.97		1.70		1.22			
	Compare								
	R(D86-M:17)	unknown		unknown		unknown			

Lab 131 first reported: 47.2, 59.3, 83.6
Lab 140 first reported: 45.8, 61.3, 86.2
Lab 1040 first reported: 81.2


%Volume evaporated at 70°C
Kernel Density


%Volume evaporated at 100°C
Kernel Density


%Volume evaporated at 150°C
Kernel Density

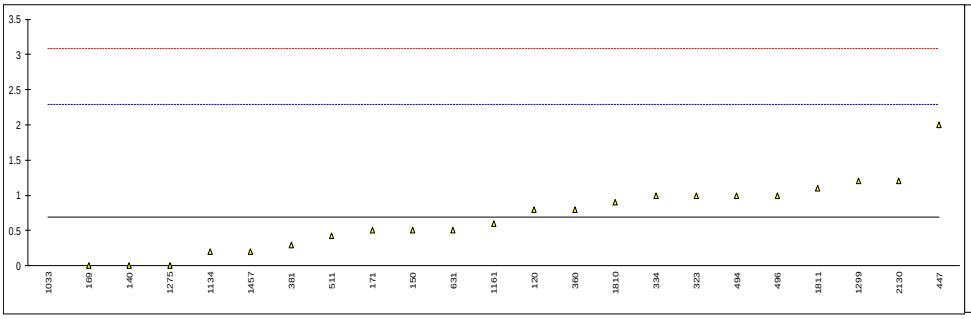
Determination of Doctor test on sample #18080

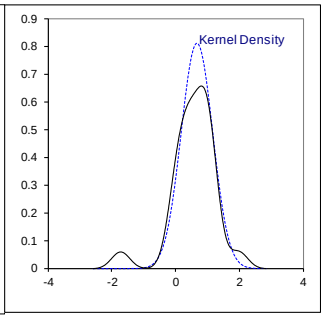
lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D4952	Negative		-----	
131		-----		-----	
140	D4952	NEGATIVE		-----	
150	D4952	negative		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D4952	negative		-----	
175		-----		-----	
194		-----		-----	
312		-----		-----	
323	D4952	negative		-----	
333		-----		-----	
334	D4952	NEGATIF		-----	
335		-----		-----	
336	D4952	NEGATIVE		-----	
337		-----		-----	
338		-----		-----	
360	D4952	Negative		-----	
381		-----		-----	
447	D4952	Negative		-----	
494		-----		-----	
496		-----		-----	
511		-----		-----	
541	IP30	Negative		-----	
631		-----		-----	
1026	D4952	Negative		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1126		-----		-----	
1134	IP30	Negative		-----	
1161		-----		-----	
1191		-----		-----	
1229		-----		-----	
1275	IP30	Doctor Negative mercaptans absent		-----	
1299	IP30	NEGATIVE		-----	
1457	IP30	Negative		-----	
1459		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807	D4952	negative		-----	
1810		-----		-----	
1811		-----		-----	
2130	IP30	Negative		-----	
2146		-----		-----	
6054		-----		-----	
6142	IP30	Negative		-----	
6168		-----		-----	
	n	18			
	mean (n)	Negative			

Determination of Existent Gum (solvent washed) on sample #18080; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D381	0.8		0.14	
131		-----		-----	
140	D381	0		-0.87	
150	D381	0.5		-0.24	
158		-----		-----	
159	D381	<0.5		-----	
169	D381	0.0		-0.87	
171	D381	0.5		-0.24	
175		-----		-----	
194		-----		-----	
312		-----		-----	
323	D381	1.0		0.39	
333		-----		-----	
334	D381	1.0		0.39	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D381	0.8		0.14	
381	ISO6246	0.3		-0.49	
447	D381	2.0		1.64	
494	D381	1.0		0.39	
496	D381	1.0		0.39	
511	D381	0.42		-0.34	
541	D381	<0.5		-----	
631	D381	0.5		-0.24	
1026	ISO6246	<0.5		-----	
1033	IP131	-1.7	R(0.01)	-3.00	
1040		-----		-----	
1082		-----		-----	
1126		-----		-----	
1134	IP131	0.2		-0.62	
1161	ISO6246	0.6		-0.12	
1191		-----		-----	
1229		-----		-----	
1275	IP131	0		-0.87	
1299	D381	1.2		0.64	
1457	D381	0.2		-0.62	
1459		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656	ISO6246	<1		-----	
1706		-----		-----	
1776		-----		-----	
1807	ISO6246	<0.5		-----	
1810	D381	0.9		0.26	
1811	D381	1.1		0.51	
2130	D381	1.2		0.64	
2146		-----		-----	
6054		-----		-----	
6142		-----		-----	
6168		-----		-----	

normality	OK
n	22
outliers	1
mean (n)	0.69
st.dev. (n)	0.493
R(calc.)	1.38
st.dev.(D381:12)	0.798
R(D381:12)	2.23





Determination of Lead as Pb on sample #18080; results in mg/L

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D3237	0.005		-----	
131		-----		-----	
140	D3237	0		-----	
150	D3237	<2.5		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D3237	<2.5		-----	
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	EN237	0.0		-----	
511	D3237	<2.5		-----	
541	D3237	<2.5		-----	
631	D3237	<0.0025		-----	
1026	D3237	<2.5		-----	
1033		-----		-----	
1040	EN237	0.0695		-----	
1082		-----		-----	
1126		-----		-----	
1134		-----		-----	
1161		-----		-----	
1191	In house	0.3		-----	
1229		<0,025		-----	
1275		-----		-----	
1299	EN237	0.2		-----	
1457		-----		-----	
1459	EN237	<2.5		-----	
1634		-----		-----	
1635	EN237	0.0		-----	
1656	EN237	<2.5		-----	
1706		-----		-----	
1776		-----		-----	
1807	EN237	<2.5		-----	
1810		-----		-----	
1811		-----		-----	
2130	IP352	0		-----	
2146	In house	<1		-----	
6054		-----		-----	
6142		-----		-----	
6168		-----		-----	
	n	24			
	mean (n)	<2.5			Application range D3237:17 (2.5 – 25 mg/L)

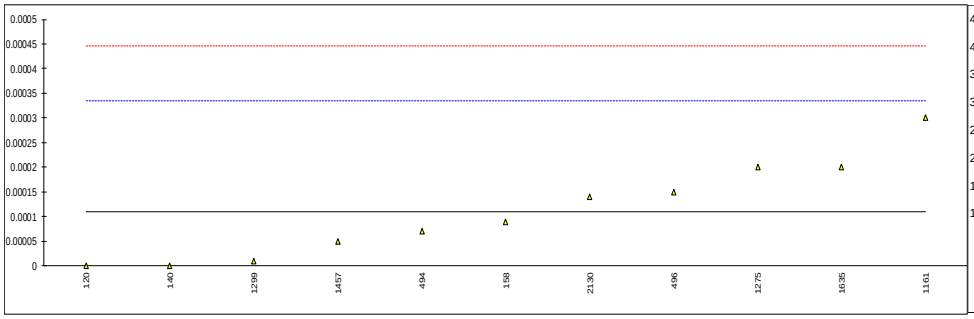
Determination of Manganese as Mn on sample #18080; results in mg/L

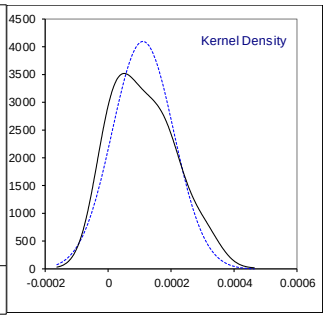
lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
131		-----		-----	
140	D3831	1.33		-----	
150		-----		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D3831	<0.25		-----	
175		-----		-----	
194		-----		-----	
312	EN16136	<0.5		-----	
323	D3831	<0.25		-----	
333	EN16135	<2.0		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	EN16136	< 0.50		-----	
381	EN16135	<2,0		-----	
447	IP588	<2.0		-----	
494	EN16136	<0,5		-----	
496		-----		-----	
511	D3831	0.25		-----	
541	D3831	<0.25		-----	
631	D3831	<0.25		-----	
1026		-----		-----	
1033		-----		-----	
1040	EN16135	0.036		-----	
1082		-----		-----	
1126		-----		-----	
1134		-----		-----	
1161		-----		-----	
1191	EN16136	0.01		-----	
1229		-----		-----	
1275		-----		-----	
1299	EN16135	0.6		-----	
1457	EN16136	0.16		-----	
1459		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656	EN16135	<2.0		-----	
1706		-----		-----	
1776		-----		-----	
1807	EN16135	<0.8		-----	
1810		-----		-----	
1811		-----		-----	
2130		-----		-----	
2146	In house	<2		-----	
6054		-----		-----	
6142		-----		-----	
6168		-----		-----	
	n	19			
	mean (n)	<2			Application range D3831:12 (0.25 – 40 mg/L)

Determination of Mercaptans Sulphur as S on sample #18080; results in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D3227	0		-0.98	
131		-----		-----	
140	D3227	0		-0.98	
150	D3227	<0.0003		-----	
158	D3227	0.00009		-0.18	
159		-----		-----	
169		-----		-----	
171	D3227	<0.0003		-----	
175		-----		-----	
194		-----		-----	
312	D3227	<0.0003		-----	
323	D3227	<0.0003		-----	
333		-----		-----	
334	D3227	<0.0003		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D3227	< 0.0003		-----	
381		-----		-----	
447		-----		-----	
494	D3227	0.00007		-0.36	
496	D3227	0.00015		0.36	
511		-----		-----	
541		-----		-----	
631		-----		-----	
1026		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1126		-----		-----	
1134		-----		-----	
1161	D3227	0.0003		1.69	
1191	ISO3012	<0.0001		-----	
1229	ISO3012	<0.0001		-----	
1275	IP342	0.0002		0.80	
1299	D3227	0.00001		-0.89	
1457	UOP163	0.00005		-0.53	
1459		-----		-----	
1634		-----		-----	
1635	D3227	0.0002		0.80	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
2130	D3227	0.00014		0.27	
2146		-----		-----	
6054		-----		-----	
6142		-----		-----	
6168		-----		-----	

normality	OK
n	11
outliers	0
mean (n)	0.00011
st.dev. (n)	0.000097
R(calc.)	0.00027
st.dev.(D3227:16)	0.000112
R(D3227:16)	0.00031

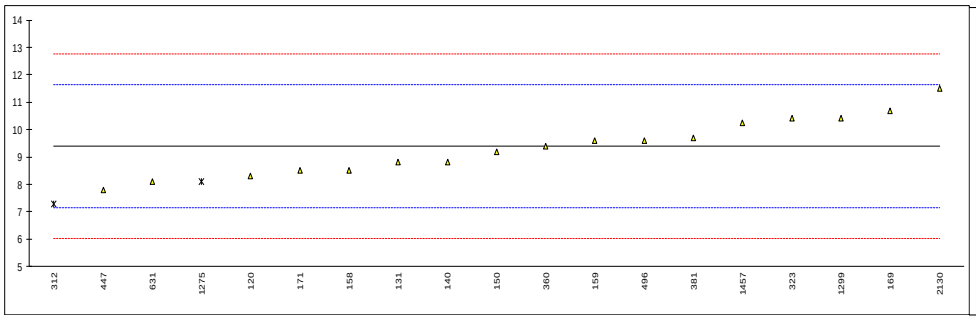


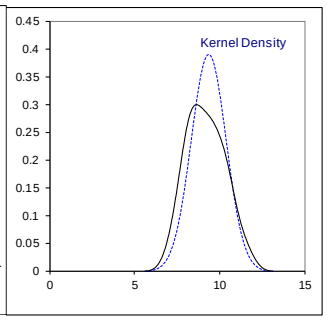


Determination of Olefins by FIA on sample #18080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D1319	8.3		-0.97	
131	D1319	8.8		-0.52	
140	D1319	8.82		-0.50	
150	D1319	9.2		-0.17	
158	D1319	8.5		-0.79	
159	D1319	9.6		0.19	
169	D1319	10.7		1.17	
171	D1319	8.5		-0.79	
175		-----		-----	
194		-----		-----	
312	D1319	7.3	ex	-1.86	Test result excluded, test result is suspect as test result FIA<GC
323	D1319	10.4		0.90	
333		-----		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	D1319	9.4		0.01	
381	EN15553	9.7		0.28	
447	D1319	7.8		-1.41	
494		-----		-----	
496	D1319	9.60		0.19	
511		-----		-----	
541		-----		-----	
631	D1319	8.099		-1.15	
1026		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1126		-----		-----	
1134		-----		-----	
1161		-----		-----	
1191		-----		-----	
1229		-----		-----	
1275	IP156	8.1	ex	-1.15	Test result excluded, test result is suspect as test result FIA<GC
1299	D1319	10.4		0.90	
1457	D1319	10.25		0.77	
1459		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807		-----		-----	
1810		-----		-----	
1811		-----		-----	
2130	D1319	11.5		1.88	
2146		-----		-----	
6054		-----		-----	
6142		-----		-----	
6168		-----		-----	

normality	OK
n	17
outliers	0 (+2ex)
mean (n)	9.39
st.dev. (n)	1.025
R(calc.)	2.87
st.dev.(D1319:15)	1.122
R(D1319:15)	3.14

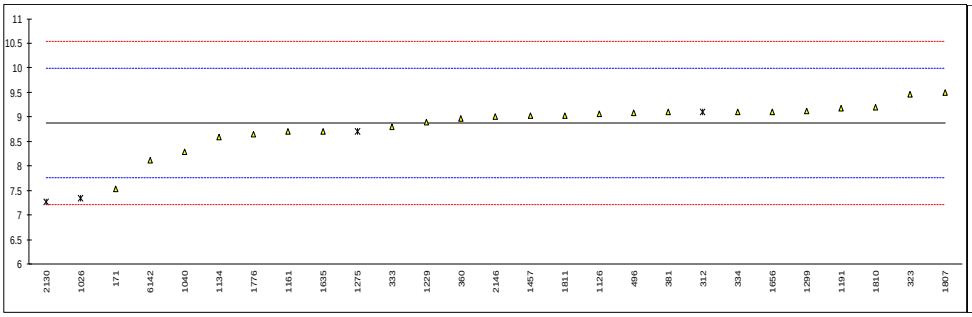


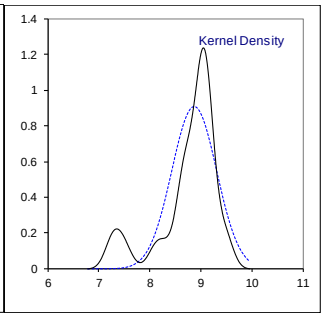


Determination of Olefins by GC on sample #18080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
131		-----		-----	
140		-----		-----	
150		-----		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	ISO22854	7.53		-2.43	
175		-----		-----	
194		-----		-----	
312	ISO22854	9.1	ex	0.40	Test result excluded, test result is suspect as test result FIA<GC
323	ISO22854	9.46		1.05	
333	ISO22854	8.8		-0.14	
334	ISO22854	9.1		0.40	
335		-----		-----	
336		-----		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854	8.97		0.16	
381	ISO22854	9.1		0.40	
447		-----		-----	
494		-----		-----	
496	ISO22854	9.09		0.38	
511		-----		-----	
541		-----		-----	
631		-----		-----	
1026	ISO22854	7.35	R(0.05)	-2.75	
1033		-----		-----	
1040	ISO22854	8.290		-1.06	
1082		-----		-----	
1126	ISO22854	9.07		0.34	
1134	ISO22854	8.60		-0.50	
1161	ISO22854	8.7		-0.32	
1191	ISO22854	9.18		0.54	
1229	ISO22854	8.9		0.04	
1275	ISO22854	8.71	ex	-0.30	Test result excluded, test result is suspect as test result FIA<GC
1299	ISO22854	9.12		0.43	
1457	ISO22854	9.02		0.25	
1459		-----		-----	
1634		-----		-----	
1635	ISO22854	8.7		-0.32	
1656	ISO22854	9.1		0.40	
1706		-----		-----	
1776	ISO22854	8.65		-0.41	
1807	ISO22854	9.5		1.12	
1810	ISO22854	9.2		0.58	
1811	ISO22854	9.02		0.25	
2130	D6730	7.262	R(0.05)	-2.91	
2146	ISO22854	9.0		0.22	
6054		-----		-----	
6142	ISO22854	8.11		-1.38	
6168		-----		-----	

normality	not OK
n	23
outliers	2 (+2ex)
mean (n)	8.879
st.dev. (n)	0.4382
R(calc.)	1.227
st.dev.(ISO22854:16)	0.5557
R(ISO22854:16)	1.556





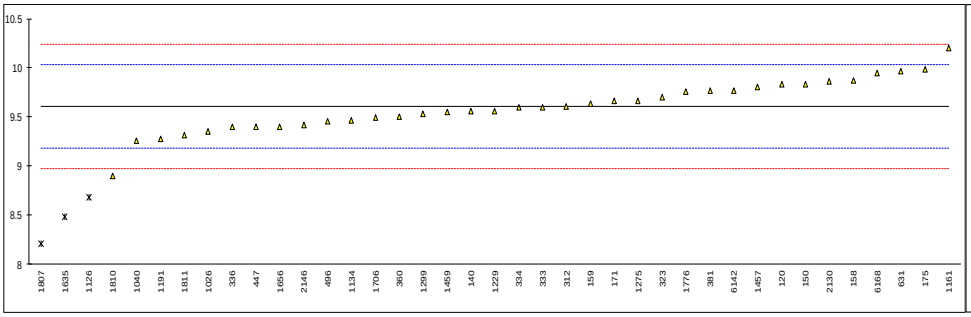
Determination of Oxidation Stability on sample #18080; results in minutes

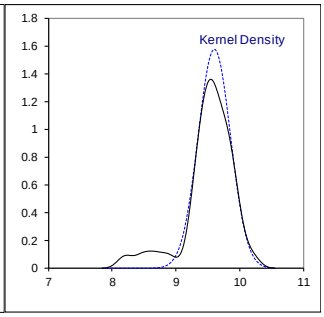
lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D525	501		-----	
131		-----		-----	
140	D525	>900		-----	
150	D525	>900		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D525	>900	C	-----	First reported 301
175		-----		-----	
194		-----		-----	
312	D525	>900		-----	
323	D525	900		-----	
333		-----		-----	
334	D525	>48		-----	Possibly a false positive test result or a type error?
335		-----		-----	
336	D525	>900		-----	
337		-----		-----	
338		-----		-----	
360	D525	> 900		-----	
381		-----		-----	
447	D525	>900		-----	
494	D525	>360		-----	
496	D525	>900		-----	
511		-----		-----	
541		-----		-----	
631	D525	1440		-----	
1026		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1126		-----		-----	
1134	D525	>900		-----	
1161	ISO7536	>900		-----	
1191		-----		-----	
1229		-----		-----	
1275	ISO7536	1431		-----	
1299	D525	>900		-----	
1457	D525	>900		-----	
1459		-----		-----	
1634		-----		-----	
1635		-----		-----	
1656		-----		-----	
1706		-----		-----	
1776		-----		-----	
1807	D525	>380		-----	
1810		-----		-----	
1811		-----		-----	
2130	D525	>900		-----	
2146		-----		-----	
6054		-----		-----	
6142		-----		-----	
6168		-----		-----	
	n	19			
	mean (n)	>360			

Determination of Ethanol on sample #18080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D5599	9.83		1.04	
131		-----		-----	
140	D5599	9.56	C	-0.23	First reported 9.78
150	D5599	9.83		1.04	
158	D5599	9.87		1.23	
159	D5599	9.64		0.15	
169		-----		-----	
171	ISO22854	9.66		0.24	
175	D5599	9.988		1.79	
194		-----		-----	
312	ISO22854	9.61		0.00	
323	ISO22854	9.70		0.43	
333	ISO22854	9.6		-0.04	
334		9.6		-0.04	
335		-----		-----	
336	EN1601	9.4		-0.99	
337		-----		-----	
338		-----		-----	
360	ISO22854	9.50		-0.52	
381	ISO22854	9.77		0.76	
447	IP466	9.4		-0.99	
494	ISO22854	-----		-----	
496	EN1601	9.46		-0.70	
511		-----		-----	
541		-----		-----	
631	D5845	9.97		1.71	
1026	ISO22854	9.35		-1.22	
1033		-----		-----	
1040	ISO22854	9.260		-1.65	
1082		-----		-----	
1126	ISO22854	8.68	R(0.05)	-4.39	
1134	ISO22854	9.47		-0.66	
1161	ISO22854	10.2		2.79	
1191		9.28		-1.55	
1229	ISO22854	9.56		-0.23	
1275	ISO22854	9.66		0.24	
1299		9.53		-0.37	
1457	ISO22854	9.81		0.95	
1459		9.55		-0.28	
1634		-----		-----	
1635		8.48	R(0.05)	-5.33	
1656		9.4		-0.99	
1706	ISO22854	9.496		-0.53	
1776	ISO22854	9.76		0.71	
1807	ISO22854	8.21	C,R(0.05)	-6.61	First reported 7.89
1810	ISO22854	8.90		-3.35	
1811	ISO22854	9.31		-1.41	
2130	D6730	9.863		1.20	
2146		9.42		-0.89	
6054		-----		-----	
6142	ISO22854	9.77		0.76	
6168	D5845Mod.	9.95		1.61	

normality	OK
n	36
outliers	3
mean (n)	9.61
st.dev. (n)	0.253
R(calc.)	0.71
st.dev.(ISO22854:16)	0.212
R(ISO22854:16)	0.59

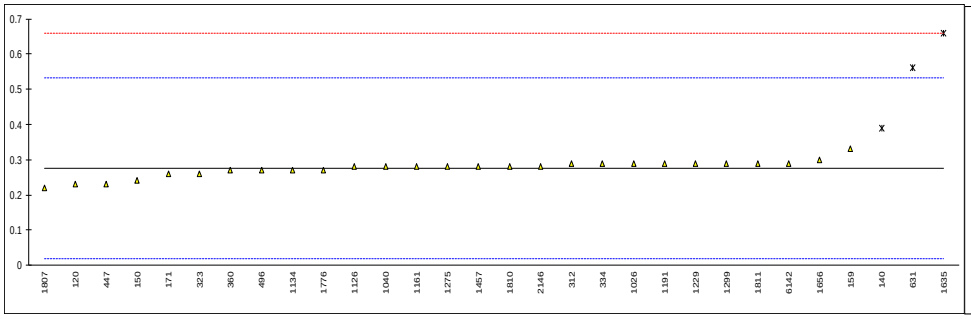


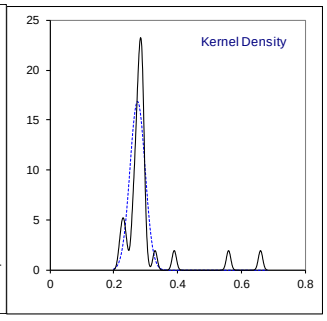


Determination of MTBE on sample #18080; results in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D5599	0.23	C	-0.35	First reported <0.01
131		-----		-----	
140	D5599	0.39	C,R(0.01)	0.90	First reported 0
150	D5599	0.24		-0.27	
158	D5599	<0.10		-----	
159	D5599	0.33		0.43	
169		-----		-----	
171	ISO22854	0.26		-0.12	
175	D5599	-----		-----	
194		-----		-----	
312	ISO22854	0.29		0.12	
323	ISO22854	0.26		-0.12	
333	ISO22854	-----		-----	
334		0.29		0.12	
335		-----		-----	
336	EN1601	<0.17		-----	
337		-----		-----	
338		-----		-----	
360	ISO22854	0.27		-0.04	
381	ISO22854	<0,8		-----	
447	IP466	0.23		-0.35	
494	ISO22854	-----		-----	
496	EN1601	0.27		-0.04	
511		-----		-----	
541		-----		-----	
631	D5845	0.56	R(0.01)	2.23	
1026	ISO22854	0.29		0.12	
1033		-----		-----	
1040	ISO22854	0.280		0.04	
1082		-----		-----	
1126	ISO22854	0.28		0.04	
1134	ISO22854	0.27		-0.04	
1161	ISO22854	0.28		0.04	
1191		0.29		0.12	
1229	ISO22854	0.29		0.12	
1275	ISO22854	0.28		0.04	
1299		0.29	C	0.12	First reported 0.02
1457	ISO22854	0.28		0.04	
1459		-----		-----	
1634		-----		-----	
1635		0.66	R(0.01)	3.01	
1656		0.3		0.19	
1706	ISO22854	-----		-----	
1776	ISO22854	0.27		-0.04	
1807	ISO22854	0.22		-0.43	
1810	ISO22854	0.28		0.04	
1811	ISO22854	0.29		0.12	
2130	D6730	<0.1	C	-----	First reported 0.096
2146		0.28		0.04	
6054		-----		-----	
6142	ISO22854	0.29		0.12	
6168	D5845Mod.	-----		-----	

normality	suspect
n	27
outliers	3
mean (n)	0.28
st.dev. (n)	0.024
R(calc.)	0.07
st.dev.(ISO22854:16)	0.128
R(ISO22854:16)	0.36

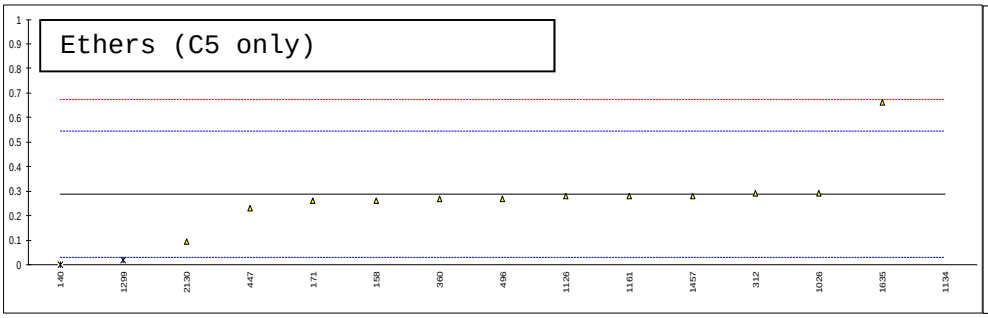


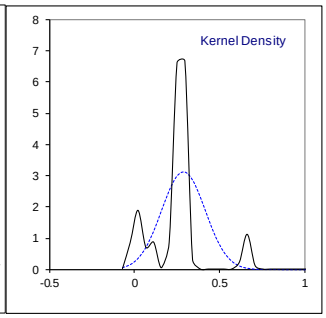


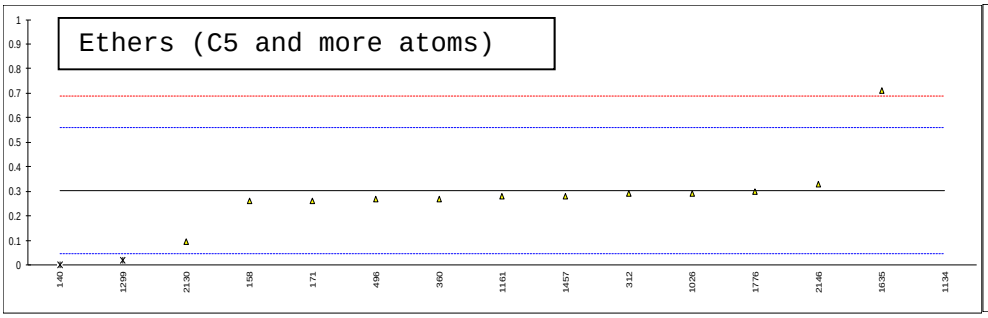
Determination of Ethers (C5, C5 or more C atoms and C6 and more c atoms) on sample #18080; results in %V/V

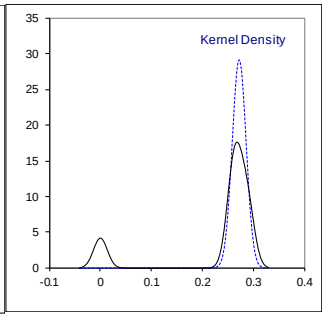
lab	method	C5	mark	z(targ)	C5 or more	mark	z(targ)	C6 or more	mark	z(targ)
62		-----		-----	-----		-----	-----		-----
120	D5599	<0.01	E	-----	<0.01	E	-----	<0.01		-----
131		-----		-----	-----		-----	-----		-----
140	D5599	0	ex,E	-2.25	0	ex,E	-2.36	0		-----
150		-----		-----	-----		-----	-----		-----
158	D5599	0.26		-0.23	0.26		-0.34	<0.10		-----
159		-----		-----	-----		-----	-----		-----
169		-----		-----	-----		-----	-----		-----
171	ISO22854	0.26		-0.23	0.26		-0.34	<0.10		-----
175		-----		-----	-----		-----	-----		-----
194		-----		-----	-----		-----	-----		-----
312	ISO22854	0.29		0.01	0.29		-0.10	<0.1		-----
323	ISO22854	<0.10	E	-----	<0.10	E	-----	<0.10		-----
333		-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----
335		-----		-----	-----		-----	-----		-----
336	EN1601	<0.17		-----	<0.17		-----	<0.17		-----
337		-----		-----	-----		-----	-----		-----
338		-----		-----	-----		-----	-----		-----
360	ISO22854	0.27		-0.15	0.27		-0.26	0.00		-----
381	ISO22854	<0,8		-----	<0,8		-----	<0,8		-----
447	IP466	0.23		-0.46	<0.2		-----	<0.2		-----
494		-----		-----	-----		-----	-----		-----
496	EN1601	0.27		-0.15	0.27		-0.26	<0.1		-----
511		-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----
631	D5845	ND		-----	ND		-----	ND		-----
1026	ISO22854	0.29		0.01	0.29		-0.10	<0.1		-----
1033		-----		-----	-----		-----	-----		-----
1040	ISO22854	-----		-----	-----		-----	-----		-----
1082		-----		-----	-----		-----	-----		-----
1126	ISO22854	0.28		-0.07	<0.1	E	-----	<0.1		-----
1134	ISO22854	11.56	G(1)	87.97	80.43	G(1)	624.76	68.87	f+?	-----
1161	ISO22854	0.28		-0.07	0.28		-0.18	<0,17		-----
1191		-----		-----	-----		-----	-----		-----
1229		-----		-----	-----		-----	-----		-----
1275		-----		-----	-----		-----	-----		-----
1299		0.02	ex,E	-2.10	0.02	ex,E	-2.21	<0.01		-----
1457	ISO22854	0.28		-0.07	0.28		-0.18	0		-----
1459		-----		-----	-----		-----	-----		-----
1634		-----		-----	-----		-----	-----		-----
1635		0.66		2.90	0.71		3.17	0.05		-----
1656		-----		-----	-----		-----	-----		-----
1706		-----		-----	-----		-----	-----		-----
1776	ISO22854	-----		-----	0.3		-0.02	-----		-----
1807	ISO22854	<0.80		-----	<0.80		-----	<0.80		-----
1810		-----		-----	-----		-----	-----		-----
1811		-----		-----	-----		-----	-----		-----
2130	D6730	0.096		-1.51	0.096		-1.61	<0.1		-----
2146		-----		-----	0.33		0.21	-----		-----
6054		-----		-----	-----		-----	-----		-----
6142		-----		-----	-----		-----	-----		-----
6168		-----		-----	-----		-----	-----		-----
	normality	not OK			not OK			n.a.		
	n	12			12			19		
	outliers	1(+2ex)			1(+2ex)			n.a.		
	mean (n)	0.29			0.30			<1		
	st.dev. (n)	0.128			0.140			n.a.		
	R(calc.)	0.36			0.39			n.a.		
	st.dev.(ISO22854:16)	0.128			0.128			n.a.		
	R(ISO22854:16)	0.36			0.36			n.a.		

E= calculation error, MTBE was not included in reported test results.
Lab 1126 calculation error in “C5 or more”; C5 was not included in reported test result.


Ethers (C5 only)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
140
1299
2130
447
171
158
360
496
1126
1161
1457
312
1026
1635
1134


Kernel Density
8
7
6
5
4
3
2
1
0
-0.5
0
0.5
1


Ethers (C5 and more atoms)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
140
1299
2130
158
171
496
360
1161
1457
312
1026
1776
2146
1635
1134


Kernel Density
35
30
25
20
15
10
5
0
-0.1
0
0.1
0.2
0.3
0.4

Determination of Oxygenates on sample #18080; results in %V/V

lab	method	DIPE	mark	ETBE	mark	i-BuOH	mark	IPA	mark
62		-----		-----		-----		-----	
120	D5599	<0.01		<0.01		<0.01		<0.01	
131		-----		-----		-----		-----	
140	D5599	0		0		0		0	
150		-----		-----		-----		-----	
158	D5599	<0.10		<0.10		<0.10		<0.10	
159		-----		-----		-----		-----	
169		-----		-----		-----		-----	
171	ISO22854	<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		-----		-----		-----		-----	
334		<0.01		<0.01		<0.8		<0.8	
335		-----		-----		-----		-----	
336	EN1601	<0.17		<0.17		<0.17		<0.17	
337		-----		-----		-----		-----	
338		-----		-----		-----		-----	
360	ISO22854	0.00		0.00		0.00		0.00	
381	ISO22854	<0,8		<0,8		<0,8		<0,8	
447	IP466	<0.2		<0.2		<0.2		<0.2	
494		-----		-----		-----		-----	
496	EN1601	<0.10		<0.10		<0.10		<0.10	
511		-----		-----		-----		-----	
541		-----		-----		-----		-----	
631	D5845	0		0		ND		ND	
1026	ISO22854	<0.1		<0.1		<0.1		<0.1	
1033		-----		-----		-----		-----	
1040	ISO22854	-----		0.000		0.000		0.000	
1082		-----		-----		-----		-----	
1126	ISO22854	<0.1		<0.1		<0.1		<0.1	
1134	ISO22854	0.00		0.00		0.00		0.00	
1161	ISO22854	<0,17		<0,17		<0,17		<0,17	
1191		-----		0		0		0	
1229	ISO22854	0		0		<0,05		<0,05	
1275		-----		-----		-----		-----	
1299		<0.01		<0.01		<0.01		<0.01	
1457	ISO22854	0		0		0		0	
1459		-----		0.00		-----		-----	
1634		-----		-----		-----		-----	
1635		-----		0.06		-----		-----	
1656		<0.1		<0.1		<0.1		<0.1	
1706	ISO22854	-----		0		-----		-----	
1776	ISO22854	-----		<0,2		-----		-----	
1807	ISO22854	-----		0.26		-----		-----	
1810	ISO22854	-----		0.0		-----		-----	
1811	ISO22854	-----		0.00		-----		-----	
2130	D6730	<0.1		<0.1		<0.1		<0.1	
2146		0		0		0		0	
6054		-----		-----		-----		-----	
6142		-----		-----		-----		-----	
6168		-----		-----		-----		-----	

Determination of Oxygenates on sample #18080; results in %V/V

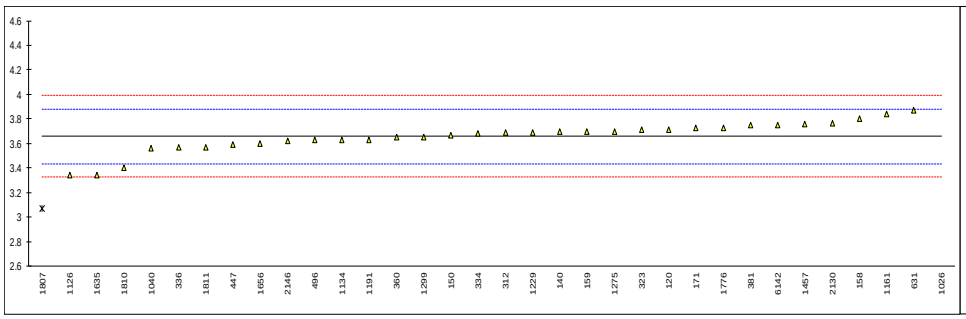
lab	method	MeOH	mark	TAME	mark	t-BuOH	mark	Other oxygenates	mark
62		-----		-----		-----		-----	
120	D5599	<0.01		0		0		9.38	
131		-----		-----		-----		-----	
140	D5599	0		0		0		0	
150		-----		-----		-----		-----	
158	D5599	<0.10		<0.10		<0.10		<0.10	
159		-----		-----		-----		-----	
169		-----		-----		-----		-----	
171	ISO22854	<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		-----		-----		-----		-----	
334		<0.8		<0.8		<0.8		-----	
335		-----		-----		-----		-----	
336	EN1601	<0.17		<0.17		<0.17		<0.17	
337		-----		-----		-----		-----	
338		-----		-----		-----		-----	
360	ISO22854	0.00		0.00		0.00		0.00	
381	ISO22854	<0,8		<0,8		<0,8		<0,8	
447	IP466	<0.2		<0.2		<0.2		<0.2	
494		-----		-----		-----		-----	
496	EN1601	<0.10		<0.10		<0.10		<0.10	
511		-----		-----		-----		-----	
541		-----		-----		-----		-----	
631	D5845	0		0		0		ND	
1026	ISO22854	<0.1		<0.1		<0.1		<0.1	
1033		-----		-----		-----		-----	
1040	ISO22854	-----		0.000		-----		-----	
1082		-----		-----		-----		-----	
1126	ISO22854	<0.1		-----		-----		-----	
1134	ISO22854	0.00		0.00		0.00		0.00	
1161	ISO22854	<0,17		<0,17		<0,17		<0,17	
1191		0		0		0		-----	
1229	ISO22854	0		0.01		<0,0,5		-----	
1275	ISO22854	-----		-----		-----		-----	
1299		<0.01		<0.01		<0.01	C	<0.01	
1457	ISO22854	0		0		0		0	
1459		-----		-----		-----		-----	
1634		-----		-----		-----		-----	
1635		-----		-----		-----		-----	
1656		<0.1		<0.1		<0.1		<0.1	
1706	ISO22854	-----		-----		-----		-----	
1776	ISO22854	<0,2		-----		-----		-----	
1807	ISO22854	<0.80		-----		-----		-----	
1810		-----		-----		-----		-----	
1811		-----		-----		-----		-----	
2130	D6730	<0.1		<0.1		<0.1		<0.1	
2146		0		0		0		0	
6054		-----		-----		-----		-----	
6142		-----		-----		-----		-----	
6168		-----		-----		-----		-----	

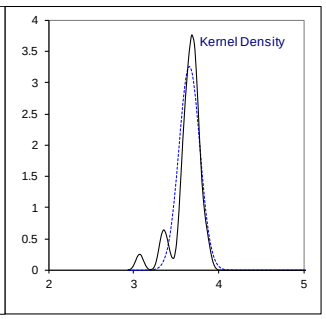
Lab 1299 first reported: 0.24

Determination of Oxygen content on sample #18080; results in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D5599	3.71		0.48	
131		-----		-----	
140	D5599	3.7		0.39	
150	D5599	3.67		0.12	
158	D5599	3.8		1.29	
159	D5599	3.70		0.39	
169		-----		-----	
171	ISO22854	3.73		0.66	
175		-----		-----	
194		-----		-----	
312	ISO22854	3.69		0.30	
323	ISO22854	3.71		0.48	
333		-----		-----	
334	ISO22854	3.68		0.21	
335		-----		-----	
336	EN1601	3.57		-0.79	
337		-----		-----	
338		-----		-----	
360	ISO22854	3.65		-0.06	
381	ISO22854	3.75		0.84	
447	IP466	3.59		-0.60	
494		-----		-----	
496	EN1601	3.628		-0.26	
511		-----		-----	
541		-----		-----	
631	D6730	3.87		1.92	
1026	ISO22854	10.46	R(0.01)	61.45	
1033		-----		-----	
1040	ISO22854	3.560		-0.88	
1082		-----		-----	
1126	ISO22854	3.34		-2.86	
1134	ISO22854	3.63		-0.24	
1161	ISO22854	3.84		1.65	
1191	ISO22854	3.63		-0.24	
1229	ISO22854	3.69		0.30	
1275	ISO22854	3.70		0.39	
1299	ISO22854	3.65		-0.06	
1457	ISO22854	3.76		0.93	
1459		-----		-----	
1634		-----		-----	
1635	ISO22854	3.34		-2.86	
1656	ISO22854	3.6		-0.51	
1706		-----		-----	
1776	ISO22854	3.73		0.66	
1807	ISO22854	3.07	R(0.01)	-5.30	
1810	ISO22854	3.4		-2.32	
1811	ISO22854	3.57		-0.79	
2130	D6730	3.765		0.98	
2146	ISO22854	3.62		-0.33	
6054		-----		-----	
6142	ISO22854	3.75		0.84	
6168		-----		-----	

normality	suspect
n	32
outliers	2
mean (n)	3.657
st.dev. (n)	0.1227
R(calc.)	0.344
st.dev.(ISO22854:16)	0.1107
R(ISO22854:16)	0.310

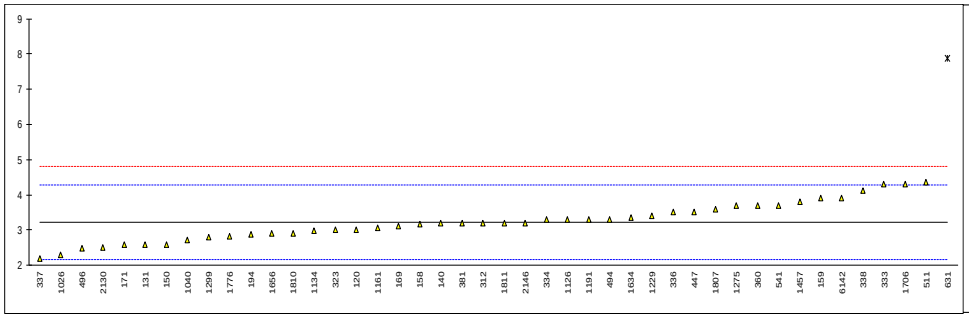


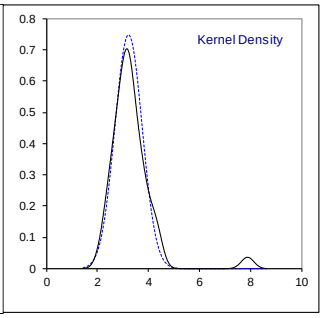


Determination of Sulphur on sample #18080; results in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D2622	3.02		-0.40	
131	D5453	2.6		-1.19	
140	D2622	3.2		-0.06	
150	D5453	2.6		-1.19	
158	D2622	3.17		-0.12	
159	D5453	3.9		1.26	
169	D5453	3.11		-0.23	
171	D5453	2.6		-1.19	
175		-----		-----	
194	D2622	2.87		-0.68	
312	D5453	3.2		-0.06	
323	ISO20846	3.0		-0.44	
333	ISO20846	4.3		2.02	
334	ISO20846	3.3		0.13	
335		-----		-----	
336	ISO20846	3.5		0.51	
337	ISO20846	2.2		-1.95	
338	ISO20846	4.11		1.66	
360	ISO20846	3.70		0.89	
381	D5453	3.2		-0.06	
447	IP490	3.5		0.51	
494	ISO20846	3.31		0.15	
496	ISO20846	2.47		-1.44	
511	D5453	4.36		2.13	
541	ISO20846	3.70		0.89	
631	D4294	7.8869	R(0.01)	8.80	
1026	ISO20846	2.3		-1.76	
1033		-----		-----	
1040	ISO20846	2.715		-0.97	
1082		-----		-----	
1126	ISO20846	3.3		0.13	
1134	IP490	2.98		-0.47	
1161	ISO20846	3.05		-0.34	
1191	ISO20846	3.3		0.13	
1229	ISO20846	3.4		0.32	
1275	IP490	3.69		0.87	
1299	ISO20884	2.8		-0.81	
1457	ISO20846	3.80		1.08	
1459		<10		-----	
1634	ISO20846	3.345		0.22	
1635		-----		-----	
1656	ISO20846	2.9		-0.63	
1706	ISO20884	4.3		2.02	
1776	ISO20846	2.83		-0.76	
1807	ISO20846	3.6		0.70	
1810	ISO20846	2.9		-0.63	
1811	D5453	3.2		-0.06	
2130	IP490	2.5		-1.38	
2146	ISO20846	3.2		-0.06	
6054		-----		-----	
6142		3.9		1.26	
6168		-----		-----	

normality	OK
n	43
outliers	1
mean (n)	3.231
st.dev. (n)	0.5337
R(calc.)	1.494
st.dev.(ISO20846:11)	0.5292
R(ISO20846:11)	1.482



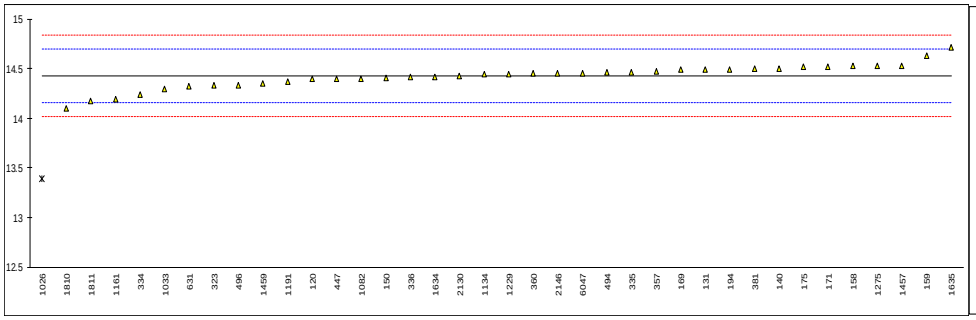


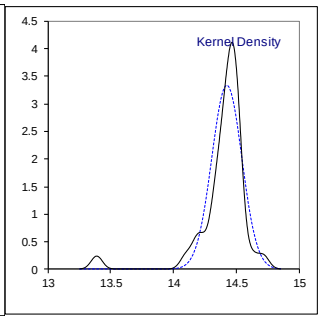
Determination of Total Vapour Pressure on sample #18081; results in psi

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D5191	14.40		-0.20	
131	D5191	14.49		0.46	
140	D5191	14.50		0.54	
150	D5191	14.41		-0.12	
158	D5191	14.53		0.76	
159	D5191	14.63		1.49	
169	D5191	14.49		0.46	
171	D5191	14.52		0.68	
175	D5191	14.52		0.68	
194	D5191	14.49		0.46	
312		-----		-----	
323	D5191	14.34		-0.64	Reported 98.9 kPa
333		-----		-----	
334	D5191	14.24		-1.37	Reported 98.2 kPa
335	D5191	14.47		0.32	Reported 99.8 kPa
336	D5191	14.42		-0.05	Reported 99.4 kPa
337		-----		-----	
338		-----		-----	
357	D5191	14.48		0.39	
360	D5191	14.46		0.24	
381	D5191	14.50		0.54	
447	D5191	14.40		-0.20	Reported 99.3 kPa
494	D5191	14.47		0.32	Reported 99.8 kPa
496	D5191	14.34		-0.64	Reported 98.9 kPa
541		-----		-----	
631	D5191	14.3297		-0.71	
1026	D5191	13.39	R(0.01)	-7.61	Reported 92.3 kPa
1033	D5191	14.30		-0.93	Reported 98.6 kPa
1082	EN13016-1	14.40		-0.20	Reported 99.3 kPa
1134	D5191	14.45		0.17	Reported 99.61 kPa
1161	EN13016-1	14.20		-1.66	Reported 97.9 kPa
1191	EN13016-1	14.37		-0.42	Reported 99.1 kPa
1229	EN13016-1	14.45		0.17	Reported 99.6 kPa
1275	EN13016-1	14.53		0.76	Reported 100.2 kPa
1299		-----		-----	
1457	D5191	14.53		0.76	Reported 100.21 kPa
1459	EN13016-1	14.36		-0.50	Reported 99.0 kPa
1634	D5191	14.42		-0.05	Reported 99.4 kPa
1635	D5191	14.72		2.15	Reported 101.5 kPa
1656		-----		-----	
1776		-----		-----	
1810	EN13016-1	14.10		-2.40	Reported 97.2 kPa
1811	D5191	14.18		-1.81	Reported 97.8 kPa
2130	D5191	14.43		0.02	Reported 99.5 kPa
2146	EN13016-1	14.46		0.24	Reported 99.7 kPa
6047	EN13016-1	14.46		0.24	Reported 99.7 kPa
6054		-----		-----	
6142		-----		-----	

normality	suspect
n	37
outliers	1
mean (n)	14.427
st.dev. (n)	0.1196
R(calc.)	0.335
st.dev.(D5191:15)	0.1363
R(D5191:15)	0.382

Compare R(EN13016-1:07) = 0.382



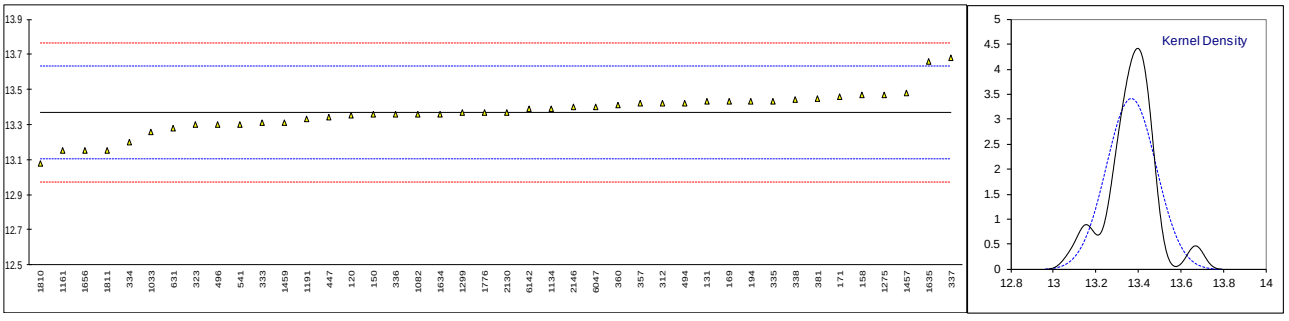


Determination of DVPE (ASTM D5191 calculation) on sample #18081; results in psi

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D5191	13.35		-0.13	
131	D5191	13.43		0.47	
140		-----		-----	
150	D5191	13.36		-0.06	
158	D5191	13.47		0.77	
159		-----		-----	
169	D5191	13.43		0.47	
171	D5191	13.46		0.70	
175		-----		-----	
194	D5191	13.43		0.47	
312	D5191	13.42		0.40	Reported 92.5 kPa
323	D5191	13.30		-0.51	Reported 91.7 kPa
333	EN13016-1	13.31		-0.43	Reported 91.8 kPa
334	D5191	13.20		-1.27	Reported 91.0 kPa
335	D5191	13.43		0.47	Reported 92.6 kPa
336	D5191	13.36		-0.06	Reported 92.1 kPa
337	EN13016-1	13.68		2.36	Reported 94.3 kPa
338	EN13016-1	13.44		0.55	Reported 92.7 kPa
357	D5191	13.42		0.40	
360	D5191	13.41		0.32	
381	D5191	13.45		0.62	
447	D5191	13.34		-0.21	Reported 92.0 kPa
494	D5191	13.42		0.40	Reported 92.5 kPa
496	D5191	13.30		-0.51	Reported 91.7 kPa
541	D6378	13.30		-0.51	
631	D5191	13.28		-0.66	
1026		-----		-----	
1033	D5191	13.26		-0.81	Reported 91.4 kPa
1082	EN13016-1	13.36		-0.06	Reported 92.1 kPa
1134	D5191	13.39		0.17	Reported 92.34 kPa
1161	EN13016-1	13.15		-1.64	Reported 90.7 kPa
1191	EN13016-1	13.33		-0.28	Reported 91.9 kPa
1229		-----		-----	
1275	EN13016-1	13.47		0.77	Reported 92.9 kPa
1299	D5191	13.37		0.02	Reported 92.2 kPa
1457	D5191	13.48		0.85	Reported 92.92 kPa
1459	EN13016-1	13.31		-0.43	Reported 91.8 kPa
1634	D5191	13.36		-0.06	Reported 92.1 kPa
1635	D5191	13.66		2.21	Reported 94.2 kPa
1656	D5191	13.15		-1.64	Reported 90.7 kPa
1776	EN13016-1	13.37		0.02	Reported 92.2 kPa
1810	EN13016-1	13.08		-2.17	Reported 90.2 kPa
1811	D5191	13.15		-1.64	Reported 90.7 kPa
2130	D5191	13.37		0.02	Reported 92.2 kPa
2146	EN13016-1	13.4	C	0.25	First reported 95.7 kPa
6047	EN13016-1	13.40		0.25	Reported 92.4 kPa
6054		-----		-----	
6142	EN13016-1	13.39		0.15	Reported 92.3 kPa

	normality	suspect
	n	42
	outliers	0
	mean (n)	13.368
	st.dev. (n)	0.1170
	R(calc.)	0.328
	st.dev.(D5191:15)	0.1324
	R(D5191:15)	0.371

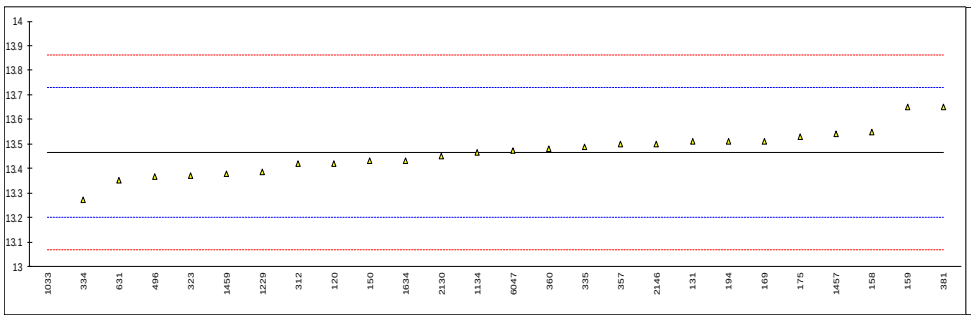
Compare R(EN13016-1:07) = 0.371

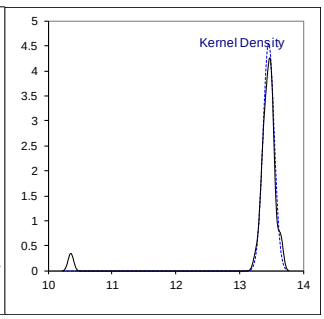


Determination of DVPE (EPA calculation) on sample #18081; results in psi

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D5191	13.42		-0.34	
131	D5191	13.51		0.34	
140		-----		-----	
150	D5191	13.43		-0.27	
158	D5191	13.55		0.64	
159	D5191	13.65		1.39	
169	D5191	13.51		0.34	
171		-----		-----	
175	D5191	13.53		0.49	
194	D5191	13.51		0.34	
312	D5191	13.42		-0.34	
323	D5191	13.37		-0.70	Reported 92.2 kPa
333		-----		-----	
334	D5191	13.27		-1.46	Reported 91.5 kPa
335	D5191	13.49		0.17	Reported 93.0 kPa
336		-----		-----	
337		-----		-----	
338		-----		-----	
357	D5191	13.50		0.26	
360	D5191	13.48		0.11	
381	D5191	13.65		1.39	
447		-----		-----	
494		-----		-----	
496	D5191	13.366		-0.75	
541		-----		-----	
631	D5191	13.352		-0.85	
1026		-----		-----	
1033	D5191	10.36	E,R(0.01)	-23.42	Calculation error, iis calc. 13.32, Reported 71.4 kPa
1082		-----		-----	
1134	D5191	13.46		-0.01	Reported 92.83 kPa
1161		-----		-----	
1191		-----		-----	
1229	EN13016-1	13.39		-0.59	Reported 92.3 kPa
1275		-----		-----	
1299		-----		-----	
1457	D5191	13.54	C	0.56	First reported 12.54 psi
1459	EN13016-1	13.38		-0.64	
1634	D5191	13.430		-0.27	
1635		-----		-----	
1656		-----		-----	
1776		-----		-----	
1810		-----		-----	
1811		-----		-----	
2130	D5191	13.45		-0.12	
2146	EN13016-1	13.5	C	0.26	First reported 95.0 kPa
6047	EN13016-1	13.47		0.06	Reported 92.9 kPa
6054		-----		-----	
6142		-----		-----	

normality	OK
n	25
outliers	1
mean (n)	13.465
st.dev. (n)	0.0875
R(calc.)	0.245
st.dev.(D5191:15)	0.1328
R(D5191:15)	0.372

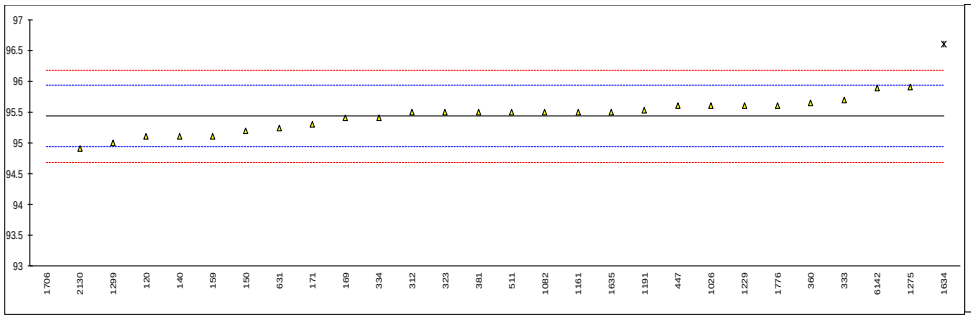


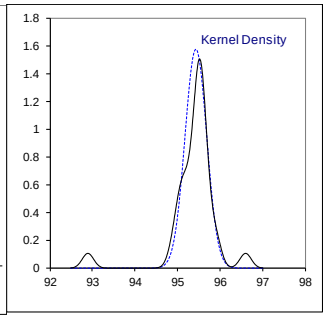


Determination of RON on sample #18082

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D2699	95.1		-1.34	
140	D2699	95.1		-1.34	
150	D2699	95.2		-0.94	
159	D2699	95.1		-1.34	
169	D2699	95.4		-0.14	
171	D2699	95.3		-0.54	
312	D2699	95.49		0.22	
323	D2699	95.5		0.26	
333	D2699	95.7		1.06	
334	D2699	95.4		-0.14	
360	D2699	95.64		0.82	
381	D2699	95.5		0.26	
447	D2699	95.6		0.66	
511	D2699	95.5		0.26	
631	D2699	95.24		-0.78	
1026	ISO5164	95.6		0.66	
1082	ISO5164	95.5		0.26	
1134		-----		-----	
1161	ISO5164	95.5		0.26	
1191	ISO5164	95.52		0.34	
1229	ISO5164	95.6		0.66	
1275	IP237	95.9		1.86	
1299	D2699	95.0		-1.74	
1634	D2699	96.6	C,R(0.01)	4.66	First reported 96.7
1635	ISO5164	95.5		0.26	
1706	In house	92.9	R(0.01)	-10.14	
1776	ISO5164	95.6		0.66	
2130	D2699	94.9		-2.14	
6054		-----		-----	
6142	ISO5164	95.89		1.82	

normality	OK
n	26
outliers	2
mean (n)	95.43
st.dev. (n)	0.253
R(calc.)	0.71
st.dev.(D2699:18)	0.250
R(D2699:18)	0.7

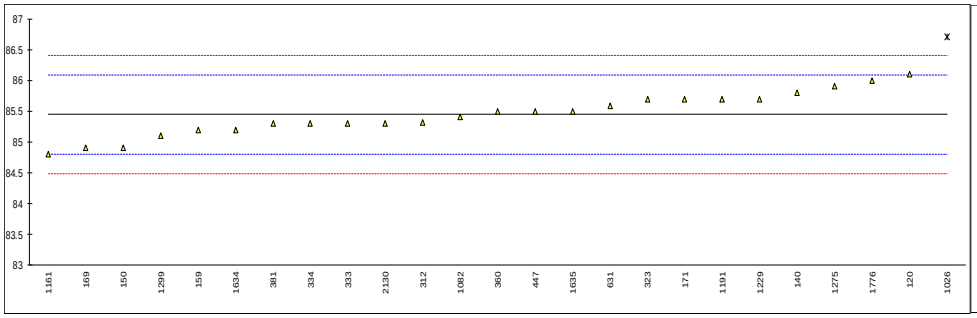


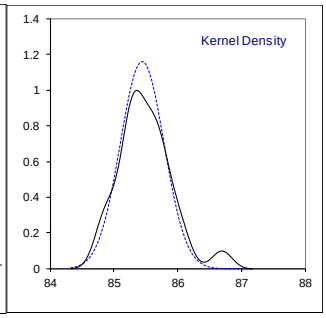


Determination of MON on sample #18082

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D2700	86.1		2.04	
140	D2700	85.8		1.10	
150	D2700	84.9		-1.70	
159	D2700	85.2		-0.76	
169	D2700	84.9	C	-1.70	First reported 84.0
171	D2700	85.7		0.79	
312	D2700	85.31		-0.42	
323	D2700	85.7		0.79	
333	D2700	85.3		-0.45	
334	D2700	85.3		-0.45	
360	D2700	85.50		0.17	
381	D2700	85.3		-0.45	
447	D2700	85.5		0.17	
511		-----		-----	
631	D2700	85.589		0.45	
1026	ISO5163	86.7	R(0.05)	3.90	
1082	ISO5163	85.4		-0.14	
1134		-----		-----	
1161	ISO5163	84.8		-2.01	
1191	ISO5163	85.7		0.79	
1229	ISO5163	85.7		0.79	
1275	IP236	85.9		1.41	
1299	D2700	85.1		-1.08	
1634	D2700	85.2		-0.76	
1635	ISO5163	85.5		0.17	
1706		-----		-----	
1776	ISO5163	86.0		1.72	
2130	D2700	85.3		-0.45	
6054		-----		-----	
6142		-----		-----	

normality	OK
n	24
outliers	1
mean (n)	85.45
st.dev. (n)	0.343
R(calc.)	0.96
st.dev.(D2700:18)	0.321
R(D2700:18)	0.9





APPENDIX 2

Z-scores of Distillation (ASTM D86)

lab	IBP	10%eva	50%eva	90%eva	FBP	%evap.70°C	%evap.100°C	%evap.150°C
62	-----	-----	-----	-----	-----	-----	-----	-----
120	0.30	-1.56	0.31	-0.12	-0.10	0.34	-0.51	0.12
131	0.41	-2.82	-1.01	-0.64	-0.10	2.05	0.15	0.58
140	-0.18	0.35	-0.62	0.06	0.25	-0.51	0.81	-0.34
150	-0.54	-0.21	-0.95	-0.21	0.53	1.05	-0.01	-0.11
158	0.24	-0.21	-0.09	-0.77	-1.40	-0.08	1.63	0.35
159	-0.24	-0.84	-0.68	-0.16	0.25	0.63	-0.01	0.12
169	-1.43	0.82	0.71	0.27	0.77	-----	-----	-----
171	-1.02	0.42	-0.82	-0.47	-1.48	1.20	2.78	0.58
175	-----	-----	-----	-----	-----	-----	-----	-----
194	0.71	-0.76	0.11	0.19	0.61	-----	-----	-----
312	-1.07	0.03	0.05	0.36	-0.18	-0.08	-1.00	-0.34
323	1.84	-0.45	0.64	-0.29	-0.54	-0.65	-0.18	0.12
333	-0.96	-1.32	-0.09	-0.29	-0.81	0.91	0.31	0.35
334	-0.12	-0.76	-0.42	0.40	-1.09	1.34	-0.34	-0.57
335	-----	-----	-----	-----	-----	-----	-----	-----
336	-1.61	-0.45	-0.42	0.97	-0.65	0.06	-1.49	-1.72
337	-----	-----	-----	-----	-----	-----	-----	-----
338	-0.42	-0.29	-0.35	-0.12	0.61	0.91	-0.84	-0.11
360	0.30	-0.53	-0.22	-0.38	-0.14	-0.08	-0.84	0.12
381	0.95	1.30	0.91	0.66	1.08	-1.65	-1.82	-1.72
447	-1.07	-0.21	-0.02	-0.25	0.33	-0.22	-0.18	-0.34
494	0.77	-0.13	0.58	-0.42	-1.09	-0.94	1.30	0.58
496	-0.06	-0.45	-0.15	-0.21	-0.14	0.20	0.15	0.12
511	-----	-----	-----	-----	-----	-----	-----	-----
541	-1.46	-0.61	0.18	-0.23	-0.16	-1.15	-0.26	-0.11
631	2.50	0.42	0.78	-0.08	2.26	-2.07	-3.14	-2.41
1026	1.13	0.11	0.18	-0.21	0.41	-0.51	-0.51	-0.11
1033	-1.25	1.37	1.84	2.97	0.25	-2.64	-4.29	-5.85
1040	3.99	0.23	-0.05	-0.29	-0.14	-0.58	0.73	0.35
1082	-1.07	-0.76	0.11	-0.34	-0.54	0.34	-0.18	0.12
1126	1.25	-0.37	-0.55	0.45	2.50	1.20	0.31	-0.34
1134	0.30	1.61	3.76	4.75	-1.29	1.76	-0.18	0.81
1161	1.61	1.85	1.17	1.97	1.36	-1.93	-1.99	-3.32
1191	-0.18	-0.13	-0.42	0.19	-0.14	0.34	-0.34	-0.11
1229	-0.66	-0.92	-0.35	-0.64	-0.34	1.20	1.14	0.81
1275	0.30	-0.76	-0.48	-0.77	-1.44	1.05	2.29	0.81
1299	0.06	0.19	-0.15	0.71	-0.26	-0.22	0.31	-1.03
1457	-1.02	-0.53	0.51	-0.21	0.17	-0.79	-0.67	-0.11
1459	-0.66	-0.29	-0.55	0.66	0.84	0.63	-0.84	-0.80
1634	-0.78	0.11	0.91	-0.25	1.55	-1.79	-0.18	0.12
1635	1.13	2.80	3.89	2.75	0.21	-4.91	-4.79	-7.00
1656	0.00	2.09	-0.55	-0.51	-0.06	1.34	0.64	0.81
1706	1.25	3.20	4.89	2.05	0.06	-----	-----	-----
1776	-0.90	2.25	4.49	4.10	-0.93	0.34	2.45	0.35
1807	0.47	-1.63	-0.95	-0.64	-0.54	1.05	0.97	0.81
1810	1.31	-0.13	1.11	0.14	-0.18	-1.79	-0.34	-0.11
1811	0.35	0.82	0.11	0.23	-0.42	-0.65	-0.01	-0.34
2130	2.44	-0.68	0.18	-0.64	5.54	-0.22	-0.67	0.35
2146	0.59	-1.00	-0.02	0.36	-0.34	-0.51	-0.18	-0.57
6054	-----	-----	-----	-----	-----	-----	-----	-----
6142	-1.58	-0.21	-0.48	-0.55	0.39	1.12	0.73	0.47
6168	-0.78	1.85	3.16	2.32	0.29	-----	-----	-----

APPENDIX 3

Number of participants per country

#18080 Regular round

1 lab in ARGENTINA
1 lab in AUSTRIA
1 lab in BELGIUM
1 lab in BULGARIA
1 lab in CANADA
1 lab in COTE D'IVOIRE
1 lab in CROATIA
2 labs in CZECH REPUBLIC
4 labs in FINLAND
7 labs in FRANCE
3 labs in GERMANY
1 lab in IRELAND
4 labs in NETHERLANDS
2 labs 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
6 labs in UNITED KINGDOM
10 labs in UNITED STATES OF AMERICA

#18081 DVPE round

1 lab in ARGENTINA
1 lab in BELGIUM
2 labs in BULGARIA
1 lab in CANADA
1 lab in COTE D'IVOIRE
1 lab in CROATIA
2 labs in CZECH REPUBLIC
5 labs in FINLAND
7 labs in FRANCE
2 labs in GERMANY
1 lab in IRELAND
3 labs in NETHERLANDS
1 lab in PHILIPPINES
1 lab in PORTUGAL
1 lab in SERBIA
1 lab in SPAIN
1 lab in SWEDEN
1 lab in TURKEY
6 labs in UNITED KINGDOM
10 labs in UNITED STATES OF AMERICA

#18082 RON/MON round

1 lab in AUSTRIA
1 lab in BELGIUM
1 lab in BULGARIA
1 lab in CANADA
1 lab in COTE D'IVOIRE
1 lab in CROATIA
3 labs in FINLAND
2 labs in FRANCE
1 lab in IRELAND
2 labs in NETHERLANDS
1 lab in PERU
1 lab in PHILIPPINES
1 lab in PORTUGAL
1 lab in SERBIA
1 lab 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's outlier test
R(0.05)	= straggler in Rosner's outlier test
R(1)	= outlier in Rosner's outlier test
R(5)	= straggler in Rosner's outlier test
E	= probably an error in calculations
U	= test result reported probably in a different unit
W	= test result withdrawn on request of participant
ex	= test result excluded from the statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported
SDS	= Material Safety Data Sheet

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