Results of Proficiency Test
Biogasoline E10
May 2013

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 2009, the Institute for Interlaboratory Studies organizes every year a proficiency test for the analysis of Biogasoline E10. During the annual proficiency testing program 2012/2013, it was decided to continue the round robin for the analysis of Biogasoline E10. In this interlaboratory study, 51 laboratories in 21 different countries have participated. See appendix 3 for the number of participants per country. In this report, the results of the 2013 Biogasoline E10 proficiency test are presented and discussed.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organiser of this proficiency test. The sample analyses for fit-for-use and homogeneity testing were subcontracted. In this proficiency test, the participants received, depending on their registration, two or three samples of Biogasoline E10: 2*1 litre (labelled #13070) and/or 1*1 litre (± 800 mL filled, labelled #13071 for DVPE only).
Participants were requested to report rounded and unrounded results. The unrounded results were preferably used for statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in accordance with EN/ISO17043:2010 and ILAC-G13:2007, (R007), since January 2000, by the Dutch Accreditation Council: RvA (Raad voor Accreditatie). This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentially of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organization, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2). This protocol can be downloaded via the FAQ page of the iis website.

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 200 litres of Biogasoline E5 was purchased at a local pump station. To 190 litre of the bulk material 10 litre of Fuel-Ethanol was added to increase the Ethanol content up to 10%. After homogenisation, the material was transferred into 132 brown glass bottles of 1 litre (labelled #13070). And another 70 brown glass bottles of 1 litre were filled for approx. 800 mL for Dry Vapour Pressure Equivalent only (labelled #13071).
The homogeneity of the subsamples #13070 was checked by determination of Density @15^{o}C in accordance with ASTM D4052:11 on 7 stratified randomly selected samples.
The homogeneity of the subsamples #13071 was checked by determination of Dry Vapour Pressure Equivalent in accordance with ASTM D5191:12 on 7 stratified randomly selected samples.

	Density @ 15°C in kg/m^3
Sample #13070-1	732.95
Sample #13070-2	732.93
Sample #13070-3	732.96
Sample #13070-4	733.00
Sample #13070-5	733.02
Sample #13070-6	733.02
Sample #13070-7	733.08

table 1: homogeneity test results of subsamples #13070

	DVPE in psi
Sample #13071-1	12.56
Sample #13071-2	12.55
Sample #13071-3	12.56
Sample #13071-4	12.55
Sample #13071-5	12.57
Sample #13071-6	12.56
Sample #13071-7	12.56

table 2: homogeneity test results of subsamples #13071

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

	Density @ 15°C in kg/m^3	DVPE in psi
r (sample #13070)	0.14	--
r (sample #13071)	--	0.02
reference test	ISO12185:96	ASTM D5191:12
0.3*R (Reference)	0.15	0.11

table 3: repeatabilities of the subsamples #13070 and #13071

The calculated repeatabilities were less than 0.3 times the reproducibility of the corresponding reference method. Therefore, homogeneity of the subsamples #13070 and #13071 was assumed.

To the participants, depending on their registration, 2*1 litre of sample #13070 and/or 1*1 litre (± 800 mL filled) of sample #13071 were sent on May 8, 2013.

2.5 ANALYSIS

The participants were requested to determine on sample #13070: Aromatics (FIA & GC), API gravity, Benzene, Copper Strip Corrosion 3hrs/50°C, Density @ 15°C, Distillation, Doctor test, Ethanol, Existent Gum, Lead, Manganese, Mercaptans , Olefins (FIA & GC), Oxidation Stability, Oxygen, Sulphur, RON and MON. On sample #13071 the participants were requested to determine TVP and to calculate DVPE only (in accordance with ASTM D5191 and EPA requirements).

To get comparable results a detailed report form, on which the units were prescribed as well as some of the required standards and a letter of instructions were prepared and made available for download on the iis website.
A SDS and a form to confirm receipt of the samples were added to the sample package.

3 RESULTS

During four weeks after sample despatch, the results of the individual laboratories were gathered. The original data are tabulated per determination in appendix 1 of this report. The laboratories are presented by their code numbers. Directly after the deadline, a reminder fax was sent to the laboratories that had not reported results at that moment. Shortly after the deadline, the available results were screened for suspect data. A 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 results. Additional or corrected results are used for data analysis and original results are placed under 'Remarks' in the result tables in appendix 1.

3.1 STATISTICS

Statistical calculations were performed as described in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ of January 2010 (iis-protocol, version 3.2).
For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded results. 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. After removal of outliers, this check was repeated. Not all data sets proved to have a normal distribution, in which cases the statistical evaluation of the results should be used with due care.
In accordance to ISO 5725 (1986 and 1994) the original results per determination were submitted subsequently to Dixon and Grubbs outlier tests. Outliers are marked by D(0.01) for the Dixon test, by G(0.01) or DG(0.01) for the Grubbs test. Stragglers are marked by D(0.05) for the Dixon test, by G(0.05) or DG(0.05) for the Grubbs 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. 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 analysis results are plotted. The corresponding laboratory numbers are under 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. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms (see appendix 4; nos 14 and 15).

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. 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 the fit-for-useness of the reported test result.
The z-scores were calculated in accordance with:

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

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

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

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

4 EVALUATION

In this proficiency test, no problems were encountered during the dispatch of the samples to the participants.
Five laboratories reported the test results after the final reporting date and three laboratories did not report any result at all. Not all laboratories were able to perform all analyses requested. Finally, 48 laboratories did report 892 numerical results. Observed were 25 outlying results, which is 2.8%. In proficiency tests, outlier percentages of 3% - 7.5% are quite normal.

4.1 EVALUATION PER TEST

In this section, the results are discussed per test. Not all data sets proved to have a normal distribution. Not normal Gaussians distributions were found for the following determinations: API Gravity, Density, Olefines by GC, oxygen content. In these cases, the statistical evaluation should be used with care.

For Biogasoline E10 sample #13070

Aromatics by FIA: This determination was very problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not at all in agreement of D1319:13. The large spread may be caused by not or wrongly correcting of the results for the (high) oxygenate content.

Aromatics by GC: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN14517:04 or ISO22854:08.
Six participants used method D5769:10. This method is not technically equivalent to EN14517:04 or ISO22854:08.
Therefore, this method may be not comparable. When the data were evaluated without D5769:10 test results, the reproducibility improved. However, it is still not in agreement with the standards EN14517:04 or ISO22854:08 (updated version of EN14517:04).

API gravity: This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is in full agreement with the requirements of ASTM D1298:05.

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 EN14517:04 or ISO22854:08 (updated version of EN14517:04).

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

Density @15°C: This determination is not problematic. Four statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in agreement with the requirements of ISO12185:96.

Distillation: This determination was not problematic. In total four statistical outliers were observed. However, all calculated reproducibilities, after rejection of the statistical outliers, are in full agreement with the requirements of ISO3405:11 (Automated).

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

Ethanol: This determination was very problematic. Two statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers is not all in agreement with the requirements of EN14517:04. When the EN14517:04 data were evaluated separately, the calculated reproducibility is still not in agreement with the standard.

Existent Gum This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier is in full agreement with requirements of ISO6246:97.

Lead: The consensus value of the group is below the application range (2.5 - 25 mg/L) and all participants, except four laboratories, reported a “less then” result. Therefore, there is a consensus that no lead was present in the sample.

Manganese: Only three participants reported a numerical result and twelve participants reported a “less then” result. Therefore, there is a consensus that no manganese was present in the sample.

Mercaptans: This determination was not problematic at this low concentration level. The application range is 0.0003 – 0.01 %M/M. Four participants reported a less than result. No statistical outliers were observed. The calculated reproducibility is in full agreement with the requirements ASTM D3227:10.

Olefins by FIA: 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 D1319:13.

Olefins by GC: This determination was not problematic. No statistical outliers were observed and the calculated reproducibility is in full agreement with the requirements of EN14517:04.

Oxidation stab.: In this determination no problems had been observed. All reporting participants agreed on a result above 900 minutes.

Oxygen: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility, after rejection of two statistical outliers is in full agreement with the requirements of EN14517:05.

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

RON: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of two statistical outliers is in full agreement with the requirements of ISO5164:05.

MON: This determination was problematic. Only one statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ISO5163:05.

For Biogasoline E10 sample #13071

TVP: This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D5191:12.

DVPE: The conversion of the measured Total Vapour Pressure to the corresponding Dry Vapour Pressure Equivalent (DVPE) as described in the ASTM D5191:10b and the U.S. EPA guidelines (40 CFR Part 80, App. E, Method 3), showed no statistical outliers. Both calculated reproducibilities after rejection of the statistical outliers are in full agreement with the requirement of ASTM D5191:12.

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)
Aromatics (FIA)	%V/V	23	26.29	6.13	3.70
Aromatics (GC)	%V/V	25	23.89	1.88	1.21
API gravity		23	61.46	0.26	0.30
Benzene	%V/V	33	0.88	0.06	0.04
Copper Strip 3 hrs @ 50°C	-----	34	1(1A)	n.a.	n.a.
Density @ 15°C	kg/m^3	38	733.08	0.53	0.50
Initial Boiling Point	ºC	41	29.6	4.4	4.8
10% evaporated	ºC	41	43.4	2.3	3.2
50% evaporated	ºC	41	66.5	1.9	1.9
90% evaporated	ºC	39	141.2	2.3	3.8
Final Boiling Point	ºC	41	178.4	6.4	6.8
%Vol @70ºC	%V/V	37	53.4	2.6	2.7
%Vol @100ºC	%V/V	36	64.6	1.4	2.2
%Vol @150ºC	%V/V	36	93.7	1.0	1.3
Doctor test		24	negative	n.a.	n.a.
Ethanol	%V/V	38	9.04	1.00	0.58
Existent Gum (washed)	mg/100mL	19	0.61	0.76	0.81
Lead as Pb	mg/L	20	<2.5	n.a.	n.a.
Manganese as Mn	mg/L	12	<2	n.a.	n.a.
Mercaptans as S	%M/M	16	0.0002	0.0002	0.0003
Olefins (FIA)	%V/V	21	11.0	5.2	3.5
Olefins (GC)	%V/V	20	11.22	1.66	1.83
Oxidation Stability	minutes	24	>900	n.a.	n.a.
Oxygen content	% M/M	31	3.77	0.44	0.45
Sulphur	mg/kg	41	5.71	1.88	1.76
RON	-----	30	97.05	0.66	0.70
MON	-----	30	85.76	1.10	0.90

table 4: performance evaluation sample #13070

Parameter	unit	n	average	2.8 * sd	R (lit)
TVP acc.to ASTM D5191	psi	39	13.47	0.28	0.37
DVPE acc.to ASTM D5191	psi	40	12.45	0.26	0.36
DVPE acc.to EPA	psi	34	12.54	0.30	0.36

table 5: performance evaluation sample #13071

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 2013 WITH PREVIOUS PT

Determination	May 2013	May 2012	May 2011	May 2010	April 2009
Number of reporting labs	48	40	34	30	50
Number of results reported	892	831	642	664	1125
Statistical outliers	25	30	21	47	41
Percentage outliers	2.8%	3.6%	3.3%	7.1%	4.0%

table 6: 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 2013	May 2012	May 2011	May 2010	April 2009
Aromatics by FIA	--	+/-	--	--	--
Aromatics by GC	-	+	++	++	++
API gravity	+	+	++	++	n.e.
Benzene	-	-	+	--	+
Density @ 15°C	+/-	+/-	-	+/-	--
Distillation	+	+	+	++	+
Ethanol	--	++	++	+/-	+
Existent Gum (washed)	+/-	--	n.a	--	++
Mercaptans as S	++	++	++	++	++
Olefins by FIA	--	++	--	--	n.e.
Olefins by GC	+	++	++	++	++
Oxidation Stability	n.e.	n.e.	n.e.	n.e.	n.e.
Oxygen	+/-	+/-	--	++	+
Sulphur	+/-	-	-	+/-	++
RON	+	+	+/-	++	+/-
MON	-	-	--	--	++
TVP acc.to ASTM D5191	+	+/-	--	++	n.e.
DVPE acc.to ASTM D5191	+	+/-	-	++	--
DVPE acc.to EPA	+	+/-	-	++	--

table 7: 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:

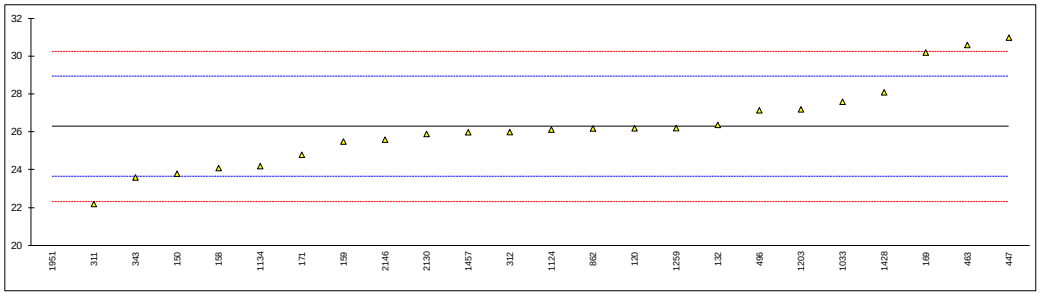
++: group performed much better than the standard
+ : group performed better than the standard
+/-: group performance equals the standard
- : group performed worse than the standard
-- : group performed much worse than the standard
n.e.: not evaluated

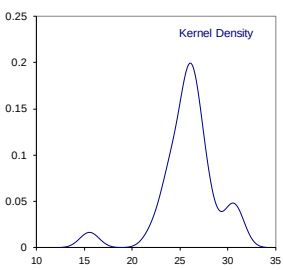
APPENDIX 1

Determination of Aromatics by FIA on sample #13070; results in %V/V

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
120	D1319	26.2		-0.07	
132	D1319	26.38		0.07	
150	D1319	23.8		-1.88	
158	D1319	24.1		-1.66	
159	D1319	25.5		-0.60	
169	D1319	30.2		2.96	
171	D1319	24.8		-1.13	
193		-----		-----	
311	D1319	22.2		-3.09	
312	D1319	26.0		-0.22	
334		-----		-----	
338		-----		-----	
340		-----		-----	
343	D1319	23.6		-2.03	
447	D1319	30.99		3.56	
463	D1319	30.6		3.26	
494		-----		-----	
495		-----		-----	
496	D1319	27.15		0.65	
511		-----		-----	
631		-----		-----	
862	D1319	26.19		-0.07	
1026		-----		-----	
1033	IP156	27.6		0.99	
1040		-----		-----	
1082		-----		-----	
1124	EN15553	26.13		-0.12	
1134	D1319	24.2		-1.58	
1140		-----		-----	
1161		-----		-----	
1191		-----		-----	
1203	D1319	27.2		0.69	
1218		-----		-----	
1229		-----		-----	
1259	D1319	26.21		-0.06	
1346		-----		-----	
1409		-----		-----	
1428	EN15553	28.1		1.37	
1457	D1319	25.99		-0.23	
1459		-----		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951	D1319	15.541	G(0.01)	-8.13	
2130	D1319	25.9		-0.29	
2146	D1319	25.6		-0.52	

normality	OK
n	23
outliers	1
mean (n)	26.289
st.dev. (n)	2.1903
R(calc.)	6.133
R(D1319:13)	3.700

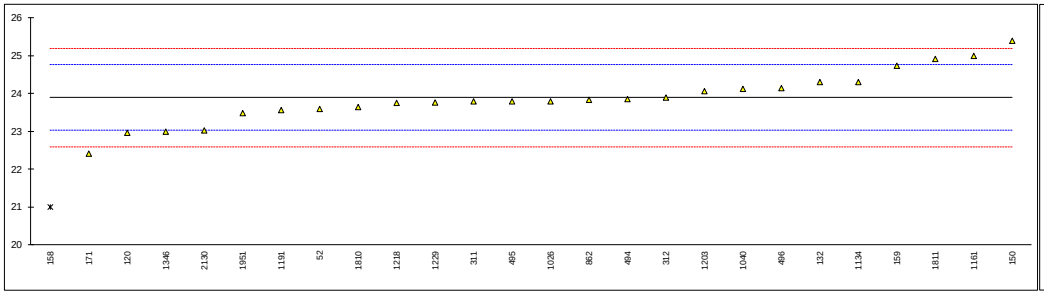


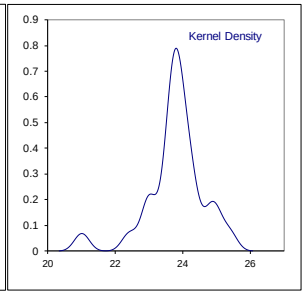


Determination of Aromatics by GC on sample #13070; results in %V/V

lab	method	value	mark	z(targ)	remarks
52	INH-14	23.6		-0.67	
62		-----		-----	
120	D5769	22.97		-2.13	
132	D5769	24.31		0.97	
150	D5769	25.4		3.48	
158	D5769	21.01	C, G(0.01)	-6.65	first reported 21.76
159	D5769	24.74		1.96	
169		-----		-----	
171	D5769	22.42		-3.40	
193		-----		-----	
311	EN22854	23.8		-0.21	
312	ISO22854	23.9		0.02	
334		-----		-----	
338		-----		-----	
340		-----		-----	
343		-----		-----	
447		-----		-----	
463		-----		-----	
494	ISO22854	23.86		-0.07	
495	EN14517	23.8		-0.21	
496	EN22854	24.15		0.60	
511		-----		-----	
631		-----		-----	
862	EN14517	23.84		-0.12	
1026	D6729	23.8		-0.21	
1033		-----		-----	
1040	EN14517	24.13		0.55	
1082		-----		-----	
1124		-----		-----	
1134	EN14517	24.31		0.97	
1140		-----		-----	
1161	EN14517	25.0		2.56	
1191	ISO22854	23.57		-0.74	
1203	EN22854	24.07		0.41	
1218	ISO22854	23.76		-0.30	
1229	ISO22854	23.77		-0.28	
1259		-----		-----	
1346	ISO22854	23.0		-2.06	
1409		-----		-----	
1428		-----		-----	
1457		-----		-----	
1459		-----		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810	EN14517	23.65		-0.56	
1811	EN14517	24.92		2.37	
1833		-----		-----	
1951	EN14517	23.49		-0.93	
2130	D6730	23.033		-1.98	
2146		-----		-----	

			without D5769	only D5769
	normality	OK	OK	OK
	n	25	20	5
	outliers	1	0	1
	mean (n)	23.892	23.873	23.968
	st.dev. (n)	0.6709	0.4926	1.241
	R(calc.)	1.879	1.379	3.474
	R(EN14517:04)	1.214	1.213	-----
	compare:			
	R(ISO22854:08)	1.214	1.213	-----
	R(D5769:10)	2.637	-----	2.643

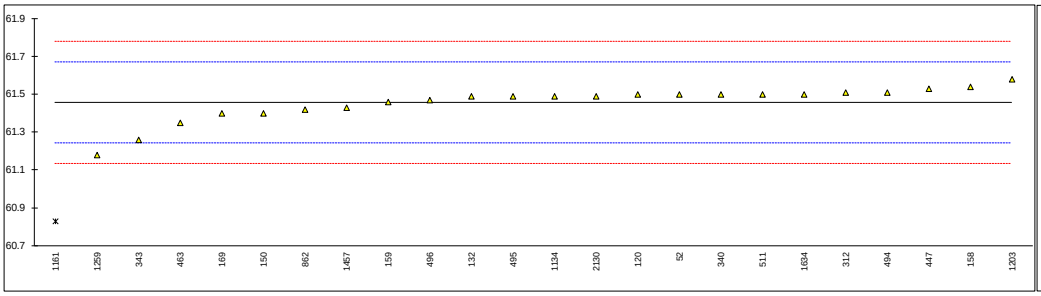


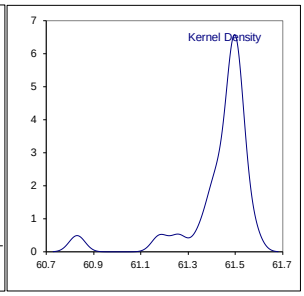


Determination of API gravity on sample #13070;

lab	method	value	mark	z(targ)	remarks
52	D4052	61.5		0.41	
62		-----		-----	
120	D4052	61.5		0.41	
132	D4052	61.49		0.31	
150	D4052	61.4		-0.53	
158	D4052	61.54		0.78	
159	D4052	61.46		0.03	
169	D4052	61.4		-0.53	
171		-----		-----	
193		-----		-----	
311		-----		-----	
312	D4052	61.51		0.50	
334		-----		-----	
338		-----		-----	
340	D287	61.5		0.41	
343	D1298	61.26		-1.83	
447	D1298	61.53		0.69	
463	D1298	61.35		-0.99	
494	D4052	61.51		0.50	
495	D1298	61.49		0.31	
496	D1298	61.47		0.13	
511	D1298	61.5		0.41	
631		-----		-----	
862	D1298	61.42		-0.34	
1026		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1124		-----		-----	
1134	D1298	61.49		0.31	
1140		-----		-----	
1161	D1298	60.83	G(0.01)	-5.85	
1191		-----		-----	
1203	D1298	61.58		1.15	
1218		-----		-----	
1229		-----		-----	
1259	D1298	61.18		-2.58	
1346		-----		-----	
1409		-----		-----	
1428		-----		-----	
1457	D1298	61.43		-0.25	
1459		-----		-----	
1634	D1298	61.5		0.41	
1706		-----		-----	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951		-----		-----	
2130	Calc.	61.490		0.31	
2146		-----		-----	

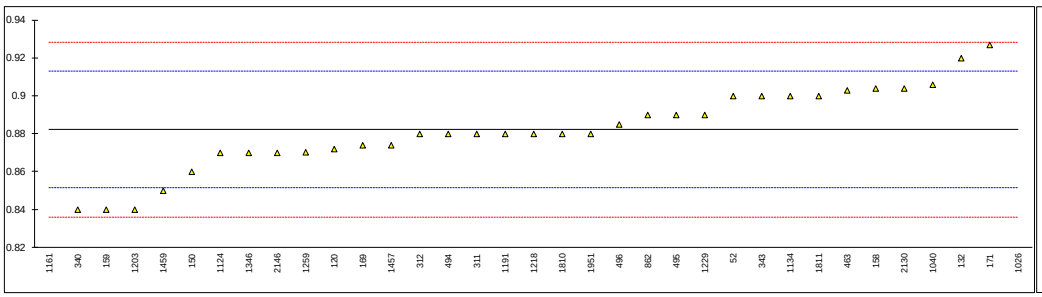
normality	not OK
n	23
outliers	1
mean (n)	61.457
st.dev. (n)	0.09104
R(calc.)	0.255
R(D1298:12)	0.300

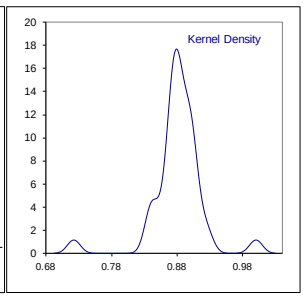




Determination of Benzene on sample #13070; results in %V/V

lab	method	value	mark	z(targ)	remarks
52	INH-14	0.90		1.15	
62		-----		-----	
120	D3606	0.872		-0.65	
132	D3606	0.920		2.44	
150	D3606	0.86		-1.42	
158	D3606	0.904		1.41	
159	D3606	0.84		-2.71	
169	D3606	0.874		-0.52	
171	D3606	0.927		2.89	
193		-----		-----	
311	EN22854	0.88		-0.14	
312	ISO22854	0.88		-0.14	
334		-----		-----	
338		-----		-----	
340	EN238	0.84		-2.71	
343	EN238	0.9		1.15	
447		-----		-----	
463	EN238	0.903		1.34	
494	ISO22854	0.88		-0.14	
495	EN14517	0.89		0.51	
496	EN22854	0.885		0.19	
511		-----		-----	
631		-----		-----	
862	EN14517	0.89		0.51	
1026	EN14517	1.00	G(0.05)	7.58	
1033		-----		-----	
1040	EN14517	0.906		1.54	
1082		-----		-----	
1124	EN12177	0.87		-0.78	
1134	EN14517	0.90		1.15	
1140		-----		-----	
1161	EN13132	0.723	G(0.01)	-10.23	
1191	ISO22854	0.88		-0.14	
1203	EN22854	0.84		-2.71	
1218	ISO22854	0.88		-0.14	
1229	ISO22854	0.89		0.51	
1259	EN12177	0.8703		-0.76	
1346	ISO22854	0.87		-0.78	
1409		-----		-----	
1428		-----	W	-----	first reported according EN12177: 0.95
1457	EN14517	0.874		-0.52	
1459	EN238	0.85		-2.06	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810	EN14517	0.88		-0.14	
1811	EN14517	0.90		1.15	
1833		-----		-----	
1951	EN12177	0.88		-0.14	
2130	D6730	0.904		1.41	
2146	EN12177	0.87		-0.78	
	normality	OK			
	n	33			
	outliers	2			
	mean (n)	0.882			
	st.dev. (n)	0.0213			
	R(calc.)	0.060			
	R(EN14517:04)	0.044			compare R(ISO22854:10) = 0.044 R(D3606:10) = 0.16





Determination of Copper strip 3hrs/50°C on sample #13070

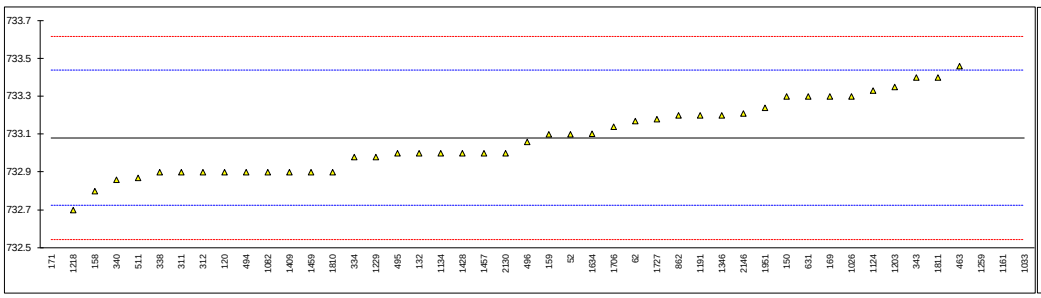
lab	method	value	mark	z(targ)	remarks
52	ISO2160	1A		-----	
62	D130	1B		-----	
120	D130	1A		-----	
132	D130	1A		-----	
150	D130	1A		-----	
158	D130	1A		-----	
159	D130	1A		-----	
169	D130	1A		-----	
171	D130	1A		-----	
193		-----		-----	
311	ISO2160	1A		-----	
312	D130	1A		-----	
334		-----		-----	
338		-----		-----	
340	ISO2160	1A		-----	
343	ISO2160	1A		-----	
447	ISO2160	1A		-----	
463	ISO2160	1A		-----	
494	ISO2160	1A		-----	
495	ISO2160	1A		-----	
496	D130	1A		-----	
511	D130	1A		-----	
631	D130	1A		-----	
862	D130	1A		-----	
1026	ISO2160	1A		-----	
1033	IP154	1A		-----	
1040		-----		-----	
1082		-----		-----	
1124	ISO2160	1A		-----	
1134	ISO2160	1A		-----	
1140		-----		-----	
1161	ISO2160	1A		-----	
1191		-----		-----	
1203	ISO2160	1		-----	
1218		-----		-----	
1229		-----		-----	
1259	ISO2160	1A		-----	
1346	ISO2160	1A		-----	
1409	ISO2160	1A		-----	
1428		-----		-----	
1457	ISO2160	1A		-----	
1459		-----		-----	
1634	ISO2160	1A		-----	
1706		-----		-----	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951	ISO2160	1A		-----	
2130	ISO2160	1A		-----	
2146		-----		-----	

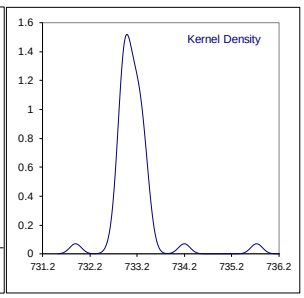
normality	n.a.
n	34
outliers	0
mean (n)	1 (1A)
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D130:12)	n.a.

Determination of Density @ 15°C on #sample #13070; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
52	D4052	733.1		0.11	
62	D4052	733.17		0.51	
120	D4052	732.9		-1.01	
132	D4052	733.0		-0.45	
150	D4052	733.3		1.23	
158	D4052	732.8		-1.57	
159	D4052	733.1	C	0.11	first reported 0.7331
169	D4052	733.3		1.23	
171	D4052	731.9	G(0.01)	-6.61	
193		-----		-----	
311	ISO12185	732.9		-1.01	
312	D4052	732.9		-1.01	
334	ISO12185	732.98		-0.56	
338	ISO12185	732.9		-1.01	
340	ISO12185	732.86		-1.23	
343	D4052	733.4		1.79	
447		-----		-----	
463	ISO12185	733.46		2.13	
494	ISO12185	732.9		-1.01	
495	ISO12185	733.0		-0.45	
496	ISO12185	733.06		-0.11	
511	D4052	732.87		-1.17	
631	D4052	733.3		1.23	
862	ISO12185	733.20		0.67	
1026	D4052	733.3		1.23	
1033	IP365	738.3	G(0.01)	29.23	
1040		-----		-----	
1082	ISO12185	732.9		-1.01	
1124	ISO12185	733.331	C	1.41	first reported 733.661
1134	IP365	733.0	C	-0.45	reported 0.7330 kg/m^3 ; converted by iis
1140		-----		-----	
1161	ISO12185	735.73	G(0.01)	14.84	
1191	ISO12185	733.2		0.67	
1203	ISO12185	733.35		1.51	
1218	ISO12185	732.7		-2.13	
1229	ISO12185	732.98		-0.56	
1259	ISO12185	734.2	G(0.01)	6.27	
1346	ISO12185	733.2		0.67	
1409	ISO12185	732.9		-1.01	
1428	ISO12185	733.0		-0.45	
1457	ISO12185	733.0		-0.45	
1459	ISO12185	732.9		-1.01	
1634	ISO12185	733.103		0.13	
1706	ISO12185	733.14		0.34	
1727	ISO12185	733.18	C	0.56	first reported 0.73318
1810	ISO12185	732.9		-1.01	
1811	ISO12185	733.40		1.79	
1833		-----		-----	
1951	ISO12185	733.24	C	0.90	reported 0.73324 kg/m^3 ; converted by iis
2130	ISO12185	733.0		-0.45	
2146	ISO12185	733.21		0.73	

normality	not OK
n	42
outliers	4
mean (n)	733.079
st.dev. (n)	0.1883
R(calc.)	0.527
R(ISO12185:96)	0.500



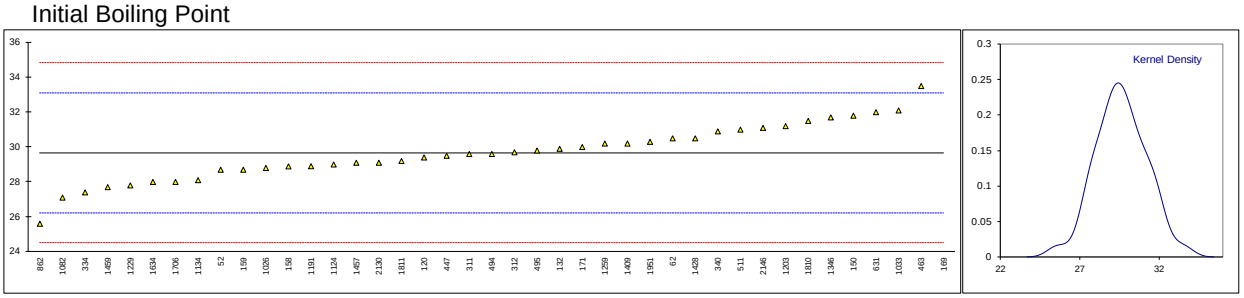


Determination of Distillation on sample #13070; results in °C

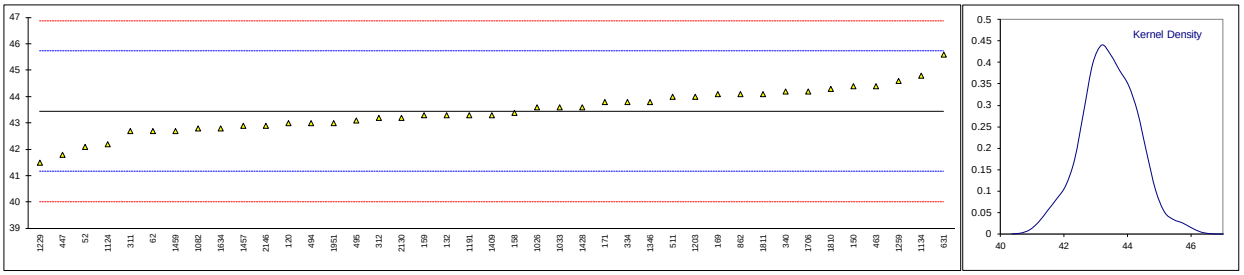
lab	method	IBP	mark	10%eva	mark	50%eva	mark	90%eva	mark	FBP	mark
52	D86-A	28.7		42.1		66.1		139.5		175.0	
62	D86-A	30.5		42.7		66.5		141.8		177.4	
120	D86-A	29.4		43.0		66.9		140.5	C	179.6	
132	D86-A	29.9		43.3		66.2		141.0		178.1	
150	D86-A	31.8		44.4		66.3		140.2		182.3	
158	D86-A	28.89		43.39		66.00		140.72		179.00	
159	D86-A	28.7		43.3		66.7		141.6		179.6	
169	D86-A	27.8	C	44.1	C	67.8	C	142.0	C	177.0	C
171	D86-A	30.0		43.8		66.3		141.6		177.9	
193		-----		-----		-----		-----		-----	
311	D86-A	29.6		42.7		65.3		140.6		177.1	
312	D86-A	29.7		43.2		65.6		141.5		180.2	
334	ISO3405-A	27.4		43.8		65.9		139.6		176.3	
338		-----		-----		-----		-----		-----	
340	ISO3405-A	30.9		44.2		67.1		141.5		177.4	
343		-----		-----		-----		-----		-----	
447	IP123-A	29.5		41.8		66.3		141.6		179.5	
463	D86-A	33.5		44.4		65.7		140.5		177.7	
494	ISO3405-A	29.6		43.0		66.1		141.1		176.9	
495	ISO3405-A	29.8		43.1		66.5		140.5		179.0	
496		-----		-----		-----		-----		-----	
511	D86-M	31.0		44.0		68.0		143.5		178.0	
631	D86-A	32	C	45.6		67.7		143.3		184.0	
862	ISO3405-A	25.6		44.1		67.3		141.2		177.3	
1026	ISO3405	28.8		43.6		66.3		140.3		178.3	
1033	IP123-A	32.1		43.6		65.8		142.1		176.7	
1040		-----		-----		-----		-----		-----	
1082	ISO3405-A	27.1		42.8		66.3		141.5		176.9	
1124	ISO3405-A	29.0		42.2		66.5		141.5		179.0	
1134	ISO3405	28.1		44.8		67.7		147.6	G(0.01)	179.1	
1140		-----		-----		-----		-----		-----	
1161		-----		-----		-----		-----		-----	
1191	ISO3405-A	28.9		43.3		66.1		141.7		177.0	
1203	ISO3405-A	31.2		44.0		66.4		141.3		182.5	
1218		-----		-----		-----		-----		-----	
1229	ISO3405-A	27.8		41.5		65.3		140.2		174.4	
1259	ISO3405-A/M	30.2		44.6		67.1		145.1	G(0.01)	178.4	
1346	ISO3405-A	31.7		43.8		66.4		141.1		178.8	
1409	ISO3405-A	30.2		43.3		67.2		140.9		180.5	
1428	ISO3405-A	30.5		43.6		66.9		141.2		181.5	
1457	ISO3405-A	29.1		42.9		66.7		140.5		179.2	
1459	ISO3405-A	27.7		42.7		65.4		140.6		175.0	
1634	ISO3405-A	28.0		42.8		66.8		141.3		175.6	
1706	ISO3405-A	28.0		44.2		67.2		140.7		174.3	
1727		-----		-----		-----		-----		-----	
1810	ISO3405-A	31.5		44.3		66.6		141.8		177.1	
1811	ISO3405-A	29.2		44.1		66.5		142.0		176.4	
1833		-----		-----		-----		-----		-----	
1951	ISO3405-A	30.3		43.0		66.0		141.3		180.8	
2130	ISO3405-A	29.1		43.2		66.8		141.2		182.9	
2146	ISO3405-A	31.1		42.9		66.2		141.5		180.0	
	normality	OK		OK		OK		OK		OK	
	n	41		41		41		39		41	
	outliers	0		0		0		2		0	
	mean (n)	29.61		43.44		66.50		141.19		178.38	
	st.dev. (n)	1.585		0.832		0.662		0.816		2.273	
	R(calc.)	4.44		2.33		1.85		2.28		6.37	
	R(ISO3405:11)	4.81		3.20		1.88		3.82		6.78	

Lab 120 first reported for 90% eva: 138.4
Lab 169 reported for IBP: 82.0, 10% eva: 111.4, 50% eva: 154.1, 90% eva: 288.2, FBP: 350.5 in Fahrenheit; converted to °C by iis
Lab 631 first reported for IBP: 35.1

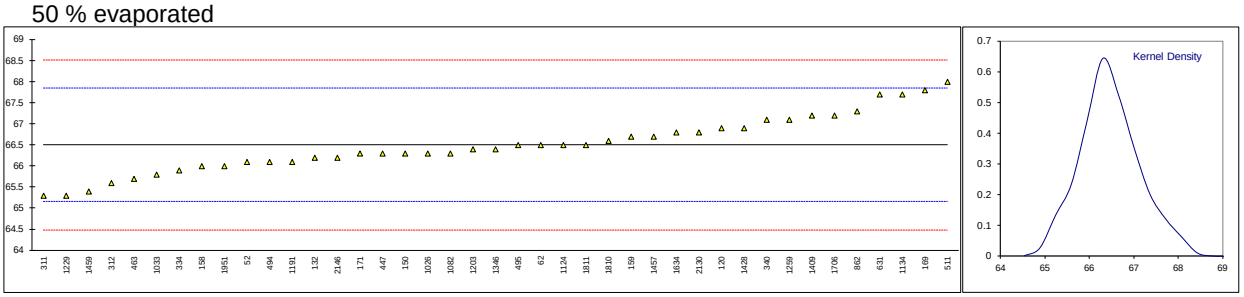
Initial Boiling Point



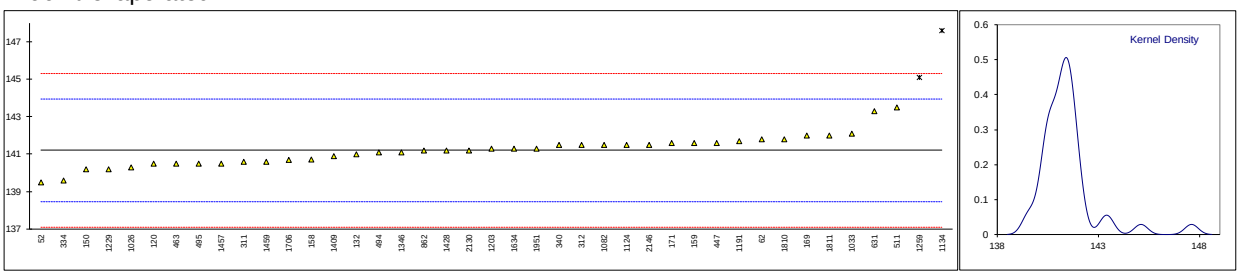
10 % evaporated



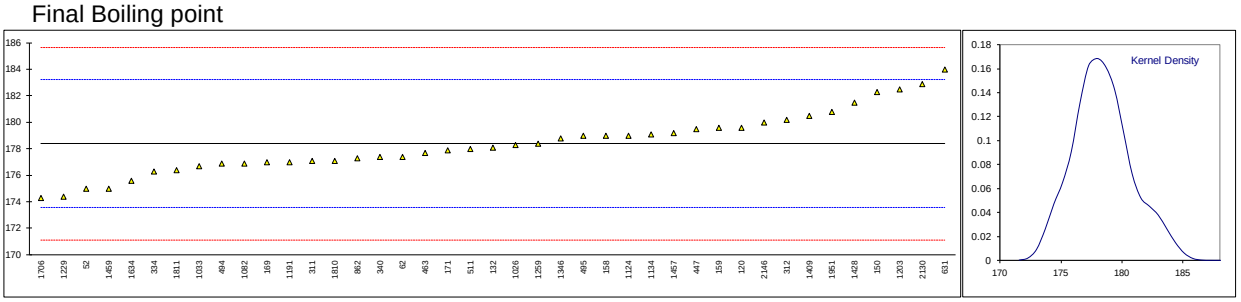
50 % evaporated



90 % evaporated



Final Boiling point

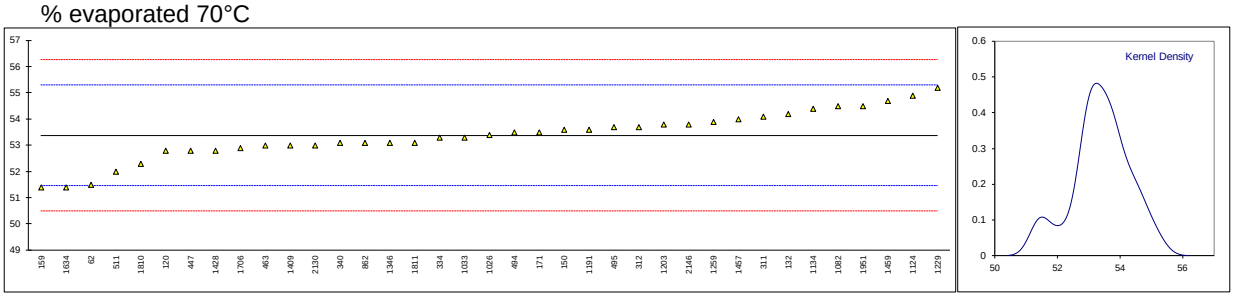


Determination of Distillation on sample #13070; results in °C

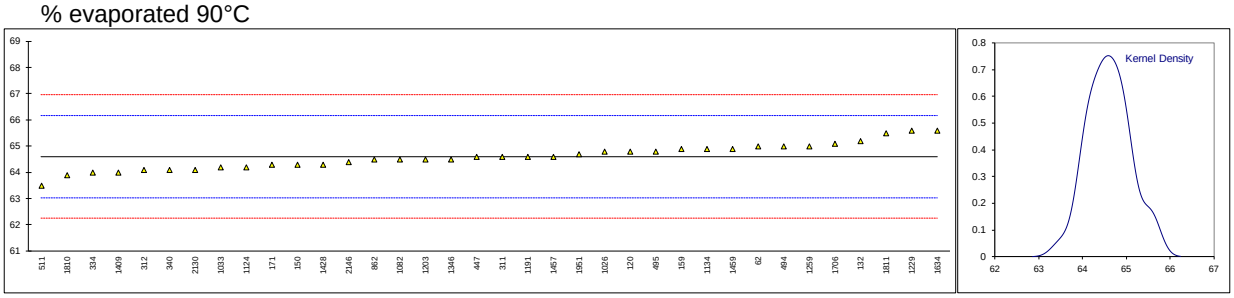
lab	Method	%vol@70°C	mark	%vol@100°C	mark	%vol@150°C	mark	residue	mark
52		-----		-----		-----		0.8	
62	D86-A	51.5		65.0		93.8		0.9	
120	D86-A	52.8		64.8		93.8		1.1	
132	D86-A	54.2		65.2		94.0		1.2	
150	D86-A	53.6		64.3		93.6		1.0	
158		-----		-----		93.5		1.0	
159	D86-A	51.4		64.9		93.2		1.0	
169		-----		-----		-----		1.2	
171	D86-A	53.5		64.3		93.5		1.1	
193		-----		-----		-----		-----	
311	D86-A	54.1		64.6		94.1		1.2	
312	D86-A	53.7		64.1		93.7		1.1	
334	ISO3405-A	53.3		64.0		94.5		1.0	
338		-----		-----		-----		-----	
340	ISO3405-A	53.1		64.1		93.4		1.0	
343		-----		-----		-----		-----	
447	IP123-A	52.8		64.6		92.6	C	1.1	
463	D86-A	53.0		66.3.		93.9		1.2	
494	ISO3405-A	53.5		65.0		93.6		1.1	
495	ISO3405-A	53.7		64.8		94.1		0.8	
496		-----		-----		-----		-----	
511	D86-M	52.0		63.5		91.0	C, G(0.01)	1.2	
631		-----		-----		-----		1.0	
862	ISO3405-A	53.1		64.5		93.9		1.0	
1026	ISO3405	53.4		64.8		94.1		0.6	
1033	IP123-A	53.3		64.2		89.0	G(0.01)	1.4	
1040		-----		-----		-----		-----	
1082	ISO3405-A	54.5		64.5		93.6		1.0	
1124	ISO3405-A	54.9		64.2		93.3		1.1	
1134	ISO3405	54.4		64.9		93.6		1.0	
1140		-----		-----		-----		-----	
1161		-----		-----		-----		-----	
1191	ISO3405-A	53.6		64.6		93.7		1.1	
1203	ISO3405-A	53.8		64.5		93.8		0.6	
1218		-----		-----		-----		-----	
1229	ISO3405-A	55.2		65.6		94.1		0.9	
1259	ISO3405-A	53.9		65.0		93.7		1.0	
1346	ISO3405-A	53.1		64.5		93.9		1.0	
1409	ISO3405-A	53.0		64.0		93.7		1.0	
1428	ISO3405-A	52.8		64.3		93.7		1.1	
1457	ISO3405-A	54.0		64.6		94.0		0.95	
1459	ISO3405-A	54.7		64.9		93.7		1.0	
1634	ISO3405-A	51.4		65.6		93.3		1.0	
1706	ISO3405-A	52.9		65.1		93.9		1.0	
1727		-----		-----		-----		-----	
1810	ISO3405-A	52.3		63.9		93.1		1	
1811	ISO3405-A	53.1		65.5		93.5		1	
1833		-----		-----		-----		-----	
1951	ISO3405-A	54.5		64.7		94.5		1.0	
2130	ISO3405-A	53.0		64.1		93.7		1.0	
2146	ISO3405-A	53.8		64.4		93.5		1.5	
	normality	OK		OK		OK			
	n	37		36		36			
	outliers	0		0		2			
	mean (n)	53.38		64.60		93.71			
	st.dev. (n)	0.9112		0.482		0.367			
	R(calc.)	2.55		1.35		1.03			
	R(ISO3405:11)	2.70		2.20		1.30			

Lab 447 first reported @150°C: 89.0
Lab 551 first reported @150°C: 91.0

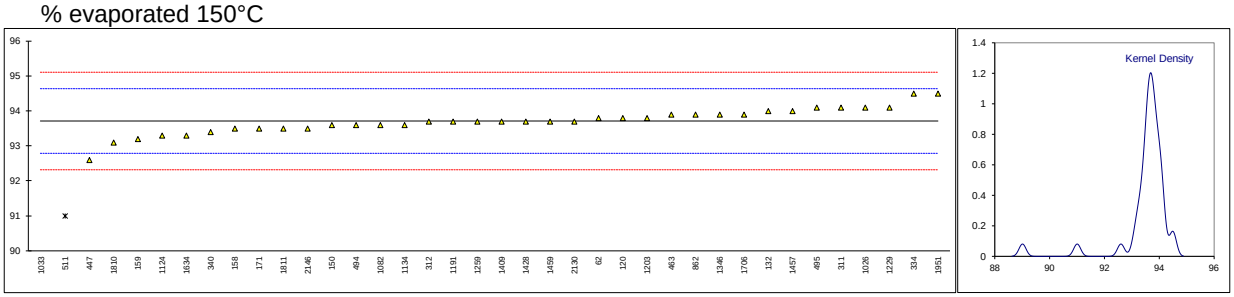
% evaporated 70°C



% evaporated 90°C



% evaporated 150°C



Determination of Doctor test on sample #13070

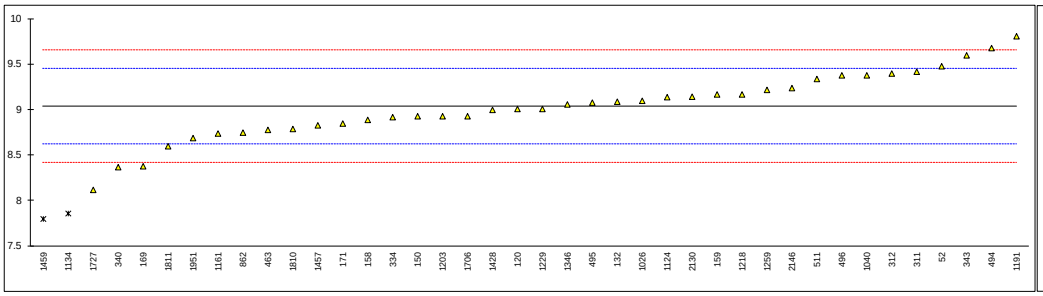
lab	method	value	mark	z(targ)	remarks
52	D4925	NEG		-----	
62		-----		-----	
120	D4925	NEG		-----	
132	D4925	NEG		-----	
150	D4925	NEG		-----	
158	D4925	NEG		-----	
159	D4925	NEG		-----	
169		-----		-----	
171	D4925	NEG		-----	
193		-----		-----	
311	D4925	NEG		-----	
312	IP30	NEG		-----	
334		-----		-----	
338		-----		-----	
340	D4925	NEG		-----	
343		-----		-----	
447	IP30	NEG		-----	
463	IP30	NEG		-----	
494	D4925	NEG		-----	
495	D4925	NEG		-----	
496		-----		-----	
511		-----		-----	
631		-----		-----	
862	D4925	NEG		-----	
1026	D4925	NEG		-----	
1033		-----		-----	
1040		-----		-----	
1082	D4925	NEG		-----	
1124		-----		-----	
1134	IP30	NEG		-----	
1140		-----		-----	
1161		-----		-----	
1191		-----		-----	
1203	D4925	NEG		-----	
1218		-----		-----	
1229		-----		-----	
1259	D4925	NEG		-----	
1346		-----		-----	
1409		-----		-----	
1428	D4925	NEG		-----	
1457	D4925	NEG		-----	
1459		-----		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951	IP30	NEG		-----	
2130	IP30	NEG		-----	
2146		-----		-----	

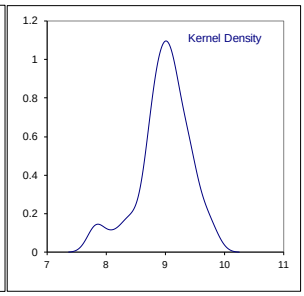
normality	n.a.
n	24
outliers	0
mean (n)	Negative
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D4952:12)	n.a.

Determination of Ethanol on sample #13070; results in %V/V

lab	method	value	mark	z(targ)	remarks
52	INH-14	9.48		2.14	
62		-----		-----	
120	D4815	9.01		-0.13	
132	D5599	9.09		0.25	
150	D5599	8.93		-0.52	
158	D5599	8.89		-0.71	
159	D5599	9.17		0.64	
169	D4815	8.38		-3.18	
171	D5599	8.85		-0.91	
193		-----		-----	
311	EN22854	9.42		1.85	
312	ISO22854	9.4		1.75	
334	EN1601	8.92		-0.57	
338		-----		-----	
340	EN1601	8.37		-3.23	
343	EN13132	9.6		2.72	
447		-----		-----	
463	EN13132	8.78		-1.25	
494	ISO22854	9.68		3.11	
495	EN14517	9.08		0.21	
496	EN22854	9.380		1.66	
511	D5845	9.34		1.46	
631		-----		-----	
862	EN14517	8.75		-1.39	
1026	EN13132	9.1		0.30	
1033		-----		-----	
1040	EN14517	9.38		1.66	
1082		-----		-----	
1124	EN13132	9.14		0.50	
1134	EN14517	7.86	DG(0.05)	-5.69	
1140		-----		-----	
1161	EN13132	8.74		-1.44	
1191	EN1601	9.810		3.74	
1203	EN22854	8.93		-0.52	
1218	ISO22854	9.17		0.64	
1229	EN1601	9.01		-0.13	
1259	EN13132	9.22		0.88	
1346	ISO22854	9.06		0.11	
1409		-----		-----	
1428	EN13132	9.0		-0.18	
1457	EN1601	8.83		-1.00	
1459	in house	7.8	DG(0.05)	-5.98	
1634		-----		-----	
1706	EN13132	8.93		-0.52	
1727	EN14517	8.12	C	-4.44	first reported 7.81
1810	EN14517	8.79		-1.20	
1811	EN14517	8.60	C	-2.12	first reported 7.47
1833		-----		-----	
1951	EN12177	8.69		-1.68	
2130	D6730	9.145		0.52	
2146	EN13132	9.24		0.98	

			only EN14517	only D5599
	normality	OK	OK	OK
	n	38	6	5
	outliers	2	1	0
	mean (n)	9.038	8.787	8.986
	st.dev. (n)	0.3582	0.4287	0.1374
	R(calc.)	1.003	1.200	0.385
	R(EN14517:04)	0.578	0.572	-----
	compare:			
	R(D5599:10)	1.571	-----	1.564
	R(EN13132:10)	0.800	-----	-----

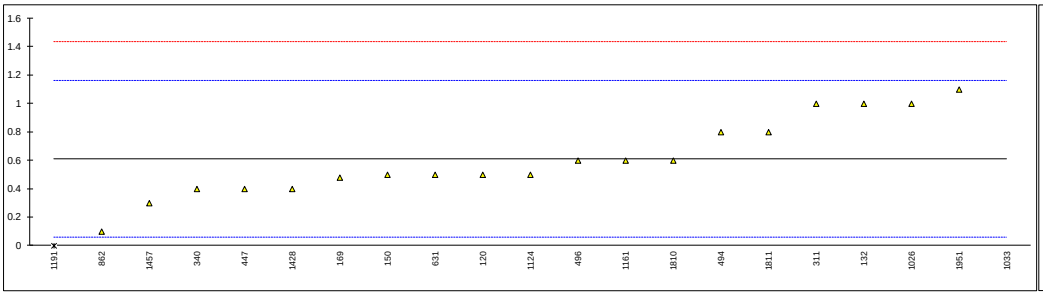


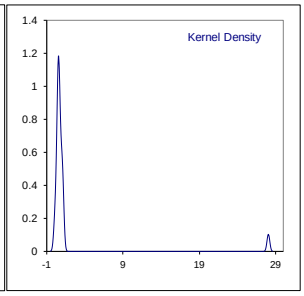


Determination of Existent Gum (washed) on sample #13070; results in mg/100mL

lab	method	value	mark	z(targ)	remarks
52	D381	<0.5		-----	
62		-----		-----	
120	D381	0.5		-0.38	
132	D381	1.0		1.35	
150	D381	0.5		-0.38	
158		-----		-----	
159		-----		-----	
169	D381	0.48		-0.45	
171	D381	<0.5		-----	
193		-----		-----	
311	ISO6246	1.0		1.35	
312	D381	<0.5		-----	
334		-----		-----	
338		-----		-----	
340	ISO6246	0.4		-0.72	
343	D381	<0.5		-----	
447	IP131	0.4		-0.72	
463	ISO6246	<1		-----	
494	ISO6246	0.8		0.66	
495	ISO6246	<1		-----	
496	ISO6246	0.6		-0.03	
511	D381	<0.5		-----	
631	D381	0.5		-0.38	
862	ISO6246	0.1		-1.76	
1026	ISO6246	1.0		1.35	
1033	IP131	28.1	G(0.01)	94.74	
1040		-----		-----	
1082	ISO6246	<1		-----	
1124	ISO6246	0.5		-0.38	
1134		-----		-----	
1140		-----		-----	
1161	ISO6246	0.6		-0.03	
1191	ISO6246	0	ex	-2.10	zero is not a real value
1203	ISO6246	<0.2		-----	
1218		-----		-----	
1229		-----		-----	
1259	ISO6246	<1		-----	
1346		-----		-----	
1409	ISO6246	<1		-----	
1428	ISO6246	0.4		-0.72	
1457	ISO6246	0.3		-1.07	
1459		-----		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810	ISO6246	0.6		-0.03	
1811	ISO6246	0.8		0.66	
1833		-----		-----	
1951	ISO6246	1.1		1.69	
2130	ISO6246	<1		-----	
2146		-----		-----	

normality	not OK
n	19
outliers	1 (+1 ex)
mean (n)	0.61
st.dev. (n)	0.271
R(calc.)	0.76
R(ISO6246:97)	0.81





Determination of Lead as Pb on sample #13070; results in mg/L

lab	method	value	mark	z(targ)	remarks
52	D3237	<2.5		-----	
62		-----		-----	
120		-----		-----	
132	D3237	<2.5		-----	
150	D3237	<2.6		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D3237	<2.5		-----	
193		-----		-----	
311		-----		-----	
312	EN237	<2.5		-----	
334		-----		-----	
338		-----		-----	
340		-----		-----	
343	D3237	<2.5		-----	
447	IP428	<0.1		-----	
463	EN237	<2.5		-----	
494		-----		-----	
495		-----		-----	
496		-----		-----	
511	D3237	1.827		-----	
631	D3237	<0.0025		-----	
862	EN237	0.05		-----	
1026		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1124	EN237	<2.5		-----	
1134		-----		-----	
1140		-----		-----	
1161	EN237	<5		-----	
1191	in house	0		-----	
1203	EN237	<2.5		-----	
1218		-----		-----	
1229	INH-5502	0		-----	
1259	EN237	<2.5		-----	
1346		-----		-----	
1409	EN237	<2.5		-----	
1428	EN237	<2.5		-----	
1457	EN237	<2.5		-----	
1459	in house	<5.0		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951	EN237	<3		-----	
2130	IP352	<2		-----	
2146	ISO8754	0.37		-----	
	normality	n.a.			
	n	20			
	outliers	0			
	mean (n)	<2.5			
	st.dev. (n)	n.a.			
	R(calc.)	n.a.			
	R(EN237:96)	n.a.			application range: 2.5 – 25 mg/l

Determination of Manganese as Mn on sample #13070; results in mg/L

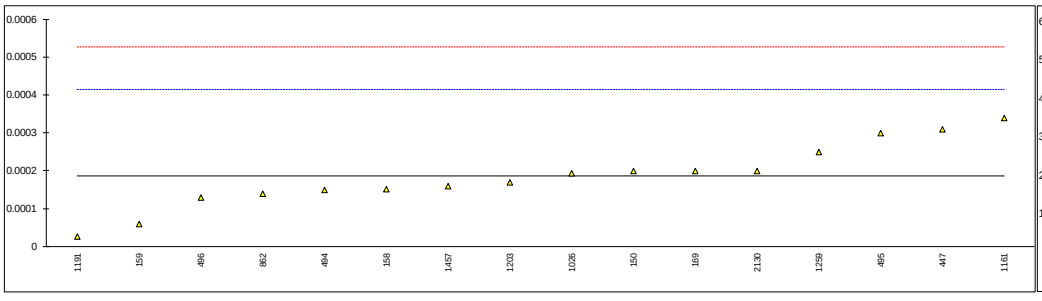
lab	method	value	mark	z(targ)	remarks
52	D3831	0.26		-----	
62		-----		-----	
120		-----		-----	
132		-----		-----	
150		-----		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	INH-014	6		-----	false positive?
193		-----		-----	
311		-----		-----	
312	D3831	<0.25		-----	
334		-----		-----	
338		-----		-----	
340		-----		-----	
343		-----		-----	
447		-----		-----	
463	EN16135	<2		-----	
494	EN16136	<0.1		-----	
495	D3831	<0.1		-----	
496		-----		-----	
511	D3831	2.3		-----	
631	D3831	<0.25		-----	
862	D3831	<0.25		-----	
1026		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1124	EN16136	<0.25		-----	
1134		-----		-----	
1140		-----		-----	
1161	D3831	<0.25		-----	
1191		-----		-----	
1203	D3831	<0.5		-----	
1218		-----		-----	
1229		-----		-----	
1259		-----		-----	
1346		-----		-----	
1409	D3831	<2		-----	
1428		-----		-----	
1457	D3831	<0.25		-----	
1459	in house	<5.0		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951		-----		-----	
2130		-----		-----	
2146		-----		-----	

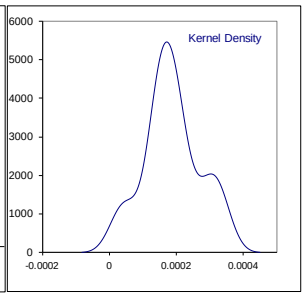
normality	n.a.
n	12
outliers	0
mean (n)	<2
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D3831:12)	n.a.

Determination of Mercaptans as S on sample #13070; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D3227	<0.0003		-----	
62		-----		-----	
120	D3227	<0.0003		-----	
132	D3227	<0.0003		-----	
150	D3227	0.0002		0.12	
158	D3227	0.000152		-0.30	
159	D3227	0.00006		-1.11	
169	D3227	0.0002		0.12	
171	D3227	<0.0003		-----	
193		-----		-----	
311	D3227	<0.0003		-----	
312	UOP163	<0.0003		-----	
334		-----		-----	
338		-----		-----	
340	D3227	<0.0001		-----	
343		-----		-----	
447	D3227	0.00031		1.09	
463		-----		-----	
494	D3227	0.00015		-0.32	
495	D3227	0.0003		1.00	
496	D3227	0.00013		-0.50	
511		-----		-----	
631		-----		-----	
862	D3227	0.00014		-0.41	
1026	D3227	0.000194	C	0.07	reported 1.94%M/M; converted by iis
1033		-----		-----	
1040		-----		-----	
1082		-----		-----	
1124		-----		-----	
1134		-----		-----	
1140		-----		-----	
1161	D3227	0.00034		1.35	
1191	ISO3012	0.000027		-1.40	
1203	UOP163	0.00017		-0.14	
1218		-----		-----	
1229		-----		-----	
1259	D3227	0.00025		0.56	
1346		-----		-----	
1409		-----		-----	
1428	ISO3012	<0.0003		-----	
1457	UOP163	0.00016		-0.23	
1459		-----		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951		-----		-----	
2130	IP342	0.00020		0.12	
2146		-----		-----	

normality	OK
n	16
outliers	0
mean (n)	0.000186
st.dev. (n)	0.00000843
R(calc.)	0.000236
R(D3227:10)	0.000318

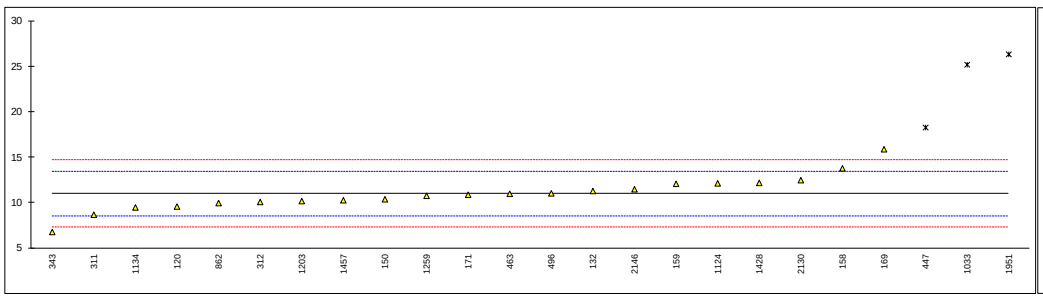


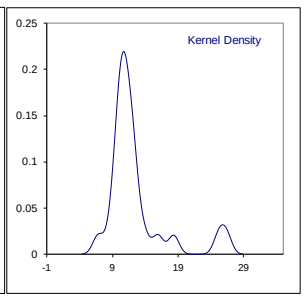


Determination of Olefins by FIA on sample #13070; results in %V/V

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
120	D1319	9.6		-1.13	
132	D1319	11.31		0.26	
150	D1319	10.4		-0.48	
158	D1319	13.8		2.28	
159	D1319	12.1		0.90	
169	D1319	15.9		3.98	
171	D1319	10.9		-0.07	
193		-----		-----	
311	D1319	8.7		-1.85	
312	D1319	10.1		-0.72	
334		-----		-----	
338		-----		-----	
340		-----		-----	
343	D1319	6.8		-3.40	
447	D1319	18.29	G(0.05)	5.92	
463	D1319	11.0		0.01	
494		-----		-----	
495		-----		-----	
496	D1319	11.05		0.05	
511		-----		-----	
631		-----		-----	
862	D1319	9.98		-0.82	
1026		-----		-----	
1033	IP156	25.2	G(0.01)	11.52	
1040		-----		-----	
1082		-----		-----	
1124	EN15553	12.15		0.94	
1134	D1319	9.5		-1.21	
1140		-----		-----	
1161		-----		-----	
1191		-----		-----	
1203	D1319	10.2		-0.64	
1218		-----		-----	
1229		-----		-----	
1259	D1319	10.78		-0.17	
1346		-----		-----	
1409		-----		-----	
1428	EN15553	12.2		0.98	
1457	D1319	10.29		-0.57	
1459		-----		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951	D1319	26.343	G(0.05)	12.45	
2130	D1319	12.5		1.23	
2146	D1319	11.5		0.41	

normality	OK
n	21
outliers	3
mean (n)	10.99
st.dev. (n)	1.857
R(calc.)	5.20
R(D1319:13)	3.45

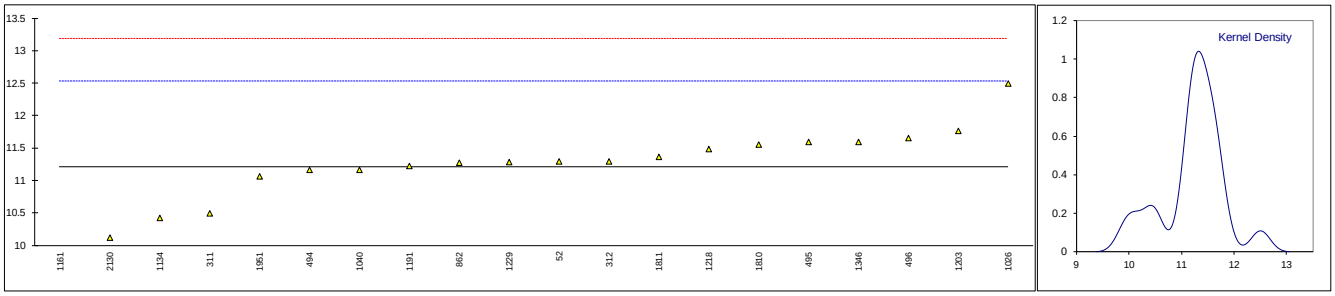




Determination of Olefins by GC on sample #13070; results in %V/V

lab	method	value	mark	z(targ)	remarks
52	INH-14	11.3		0.13	
62		-----		-----	
120		-----		-----	
132		-----		-----	
150		-----		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171		-----		-----	
193		-----		-----	
311	EN22854	10.5		-1.09	
312	ISO22854	11.3		0.13	
334		-----		-----	
338		-----		-----	
340		-----		-----	
343		-----		-----	
447		-----		-----	
463		-----		-----	
494	ISO22854	11.17		-0.07	
495	EN14517	11.6		0.58	
496	EN22854	11.66		0.68	
511		-----		-----	
631		-----		-----	
862	EN14517	11.28		0.10	
1026	D6729	12.5		1.96	
1033		-----		-----	
1040	EN14517	11.17		-0.07	
1082		-----		-----	
1124		-----		-----	
1134	EN14517	10.43		-1.20	
1140		-----		-----	
1161	EN13132	9.93		-1.96	
1191	EN22854	11.23		0.02	
1203	EN22854	11.77		0.84	
1218	ISO22854	11.49		0.42	
1229	EN22854	11.29		0.11	
1259		-----		-----	
1346	ISO22854	11.6		0.58	
1409		-----		-----	
1428		-----		-----	
1457		-----		-----	
1459		-----		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810	EN14517	11.56		0.52	
1811	EN14517	11.37		0.23	
1833		-----		-----	
1951	EN12177	11.07		-0.22	
2130	D6730	10.126		-1.67	
2146		-----		-----	

normality	not OK
n	20
outliers	0
mean (n)	11.217
st.dev. (n)	0.5932
R(calc.)	1.661
R(EN14517:04)	1.831



Determination of Oxidation Stability on sample #13070; results in minutes

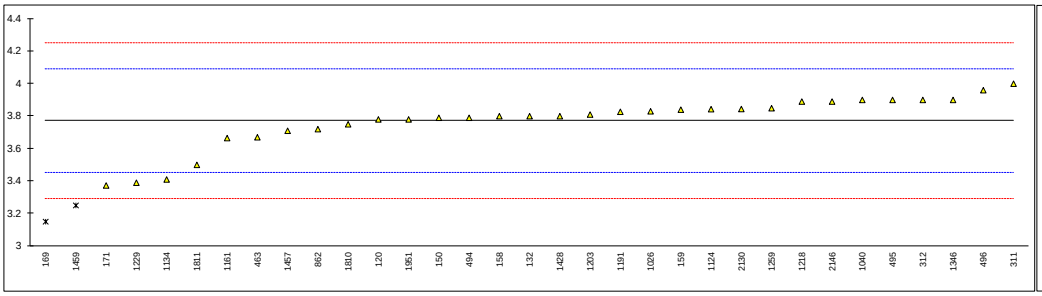
lab	method	value	mark	z(targ)	remarks
52	ISO7536	>900		-----	
62		-----		-----	
120		-----		-----	
132	D525	>1995		-----	
150	D525	>900		-----	
158		-----		-----	
159		-----		-----	
169		-----		-----	
171	D525	>900		-----	
193		-----		-----	
311	ISO7536	>900		-----	
312	D525	>900		-----	
334		-----		-----	
338		-----		-----	
340	ISO7536	>960		-----	
343	ISO7536	>360		-----	
447	ISO7536	>900		-----	
463	D525	>360		-----	
494	ISO7536	>900		-----	
495	ISO7536	>900		-----	
496	ISO7536	>1000		-----	
511	D525	>900		-----	
631		-----		-----	
862	D525	1738		-----	
1026		-----		-----	
1033		-----		-----	
1040		-----		-----	
1082	ISO7536	>1500		-----	
1124	ISO7536	>900		-----	
1134	ISO7536	>900		-----	
1140		-----		-----	
1161	ISO7536	>900		-----	
1191	ISO7536	>1000		-----	
1203	ISO7536	>900		-----	
1218		-----		-----	
1229		-----		-----	
1259		-----		-----	
1346		-----		-----	
1409	ISO7536	>900		-----	
1428	ISO7536	>900		-----	
1457	ISO7536	>900		-----	
1459		-----		-----	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951	ISO7536	>900		-----	
2130	D525	>900		-----	
2146		-----		-----	

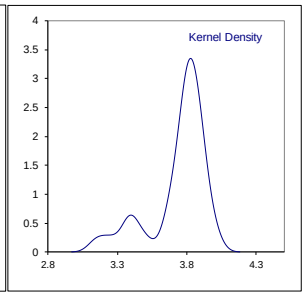
normality	not OK
n	24
outliers	0
mean (n)	>900
st.dev. (n)	n.a.
R(calc.)	n.a.
R(ISO7536:96)	n.a.

Determination of Oxygen content on sample #13070; results in %M/M

lab	method	value	mark	z(targ)	remarks
52		-----		-----	
62		-----		-----	
120	D4815	3.78		0.05	
132	D5599	3.8		0.18	
150	D5599	3.79		0.12	
158	D5599	3.80		0.18	
159	D5599	3.84		0.43	
169	D4815	3.15	DG(0.05)	-3.90	
171	D5599	3.373		-2.50	
193		-----		-----	
311	EN22854	4.0		1.44	
312	ISO22854	3.9		0.81	
334		-----		-----	
338		-----		-----	
340		-----		-----	
343	EN13132	>3.7		-----	
447		-----		-----	
463	EN13132	3.67		-0.64	
494	ISO22854	3.79		0.12	
495	EN14517	3.9		0.81	
496	EN22854	3.960		1.18	
511		-----		-----	
631		-----		-----	
862	EN14517	3.72		-0.32	
1026	EN13132	3.83		0.37	
1033		-----		-----	
1040	EN14517	3.9		0.81	
1082		-----		-----	
1124	EN13132	3.843		0.45	
1134	EN14517	3.41		-2.27	
1140		-----		-----	
1161	EN14517	3.665		-0.67	
1191	EN1601	3.827		0.35	
1203	EN22854	3.81		0.24	
1218	EN22854	3.89		0.74	
1229	EN22854	3.39		-2.39	
1259	EN13132	3.849		0.49	
1346	ISO22854	3.90		0.81	
1409		-----		-----	
1428	EN13132	3.80		0.18	
1457	EN1601	3.71		-0.38	
1459	in house	3.25	DG(0.05)	-3.27	
1634		-----		-----	
1706		-----		-----	
1727		-----		-----	
1810	EN14517	3.75		-0.13	
1811	EN14517	3.50	C	-1.70	first reported 3.31
1833		-----		-----	
1951	EN12177	3.78		0.05	
2130	D6730	3.844		0.46	
2146	EN13132	3.89		0.74	

normality	not OK
n	31
outliers	2
mean (n)	3.771
st.dev. (n)	0.1583
R(calc.)	0.443
R(EN14517:05)	0.446

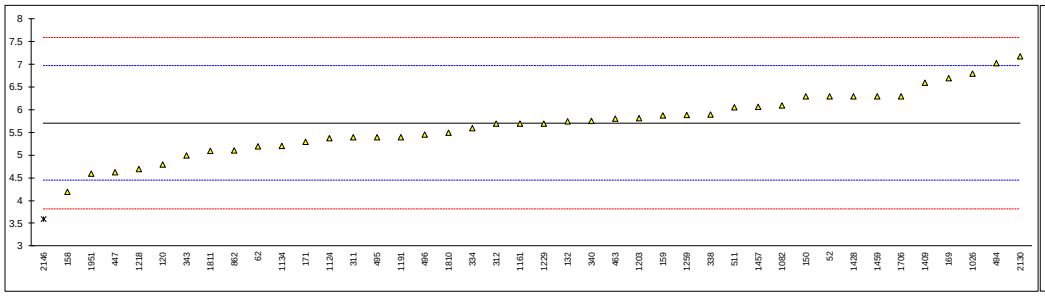


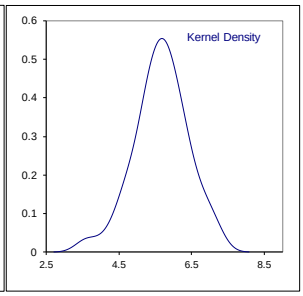


Determination of Sulphur on sample #13070; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D5453	6.3		0.95	
62	D5453	5.2	C	-0.81	first reported 3.2
120	D2622	4.8		-1.44	
132	D2622	5.75		0.07	
150	D5453	6.3		0.95	
158	D5453	4.2		-2.40	
159	D5453	5.88		0.28	
169	D5453	6.70		1.58	
171	D5453	5.3		-0.65	
193		-----		-----	
311	ISO20846	5.4		-0.49	
312	D5453	5.7		-0.01	
334	ISO20846	5.6		-0.17	
338	ISO20846	5.9	C	0.31	first reported 3.6
340	ISO20846	5.76		0.09	
343	ISO20846	5.0		-1.12	
447	IP490	4.63		-1.71	
463	D5453	5.81		0.17	
494	ISO20846	7.03		2.11	
495	ISO20846	5.4		-0.49	
496	ISO20846	5.46		-0.39	
511	D5453	6.06		0.56	
631		-----		-----	
862	ISO20846	5.11		-0.95	
1026	ISO20846	6.8		1.74	
1033		-----		-----	
1040		-----		-----	
1082	D7039	6.1		0.63	
1124	ISO20846	5.38		-0.52	
1134	ISO20846	5.21		-0.79	
1140		-----		-----	
1161	ISO20846	5.7		-0.01	
1191	ISO20846	5.4		-0.49	
1203	ISO20846	5.82		0.18	
1218	ISO20884	4.7		-1.60	
1229	ISO20846	5.7		-0.01	
1259	ISO20846	5.89		0.29	
1346		-----		-----	
1409	ISO20846	6.6		1.42	
1428	ISO20846	6.3		0.95	
1457	ISO20846	6.07		0.58	
1459	in house	6.3		0.95	
1634		-----		-----	
1706	ISO20884	6.3		0.95	
1727		-----		-----	
1810	ISO20846	5.5		-0.33	
1811	ISO20846	5.1		-0.96	
1833		-----		-----	
1951	IP497	4.6		-1.76	
2130	ISO20846	7.18		2.35	
2146	ISO8754	3.6	ex	-3.35	method not technically equivalent

normality	OK
n	41
outliers	0 (1 ex)
mean (n)	5.71
st.dev. (n)	0.672
R(calc.)	1.88
R(ISO20846:11)	1.76

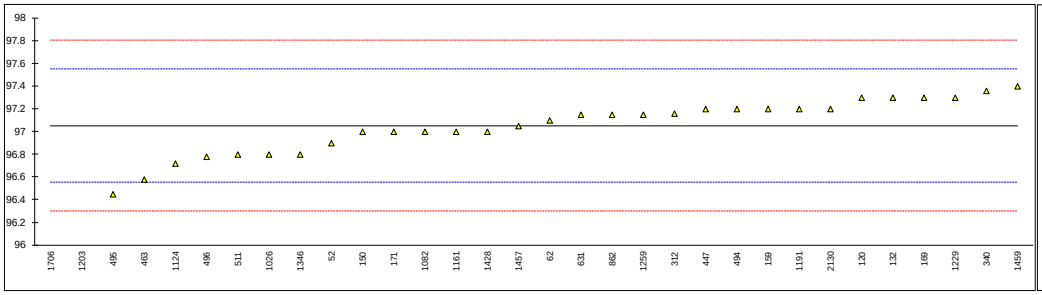


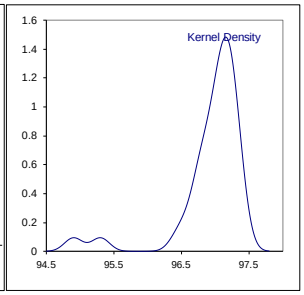


Determination of RON on sample #13070

lab	method	value	mark	z(targ)	remarks
52	ISO5164	96.9		-0.61	
62	D2699	97.1		0.19	
120	D2699	97.3		0.99	
132	D2699	97.3		0.99	
150	D2699	97.0		-0.21	
158		-----		-----	
159	D2699	97.2		0.59	
169	D2699	97.3		0.99	
171	D2699	97.0		-0.21	
193		-----		-----	
311		-----		-----	
312	D2699	97.16		0.43	
334		-----		-----	
338		-----		-----	
340	ISO5163	97.36		1.23	
343		-----		-----	
447	ISO5164	97.2		0.59	
463	D2699	96.58		-1.89	
494	ISO5164	97.20		0.59	
495	ISO5164	96.45		-2.41	
496	D2699	96.78		-1.09	
511	D2699	96.8		-1.01	
631	D2699	97.15		0.39	
862	D2699	97.15		0.39	
1026	ISO5164	96.8		-1.01	
1033		-----		-----	
1040		-----		-----	
1082	ISO5164	97.0		-0.21	
1124	ISO5164	96.72		-1.33	
1134		-----		-----	
1140		-----		-----	
1161	ISO5164	97.0		-0.21	
1191	ISO5164	97.2		0.59	
1203	in house	95.3	G(0.01)	-7.01	
1218		-----		-----	
1229	ISO5164	97.3		0.99	
1259	ISO5164	97.15		0.39	
1346	ISO5164	96.8		-1.01	
1409		-----		-----	
1428	D2699	97.0		-0.21	
1457	D2699	97.05		-0.01	
1459	in house	97.4		1.39	
1634		-----		-----	
1706	in house	94.9	G(0.01)	-8.61	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951		-----		-----	
2130	ISO5164	97.2		0.59	
2146		-----		-----	

normality	OK
n	30
outliers	2
mean (n)	97.05
st.dev. (n)	0.236
R(calc.)	0.66
R(ISO5164:05)	0.70

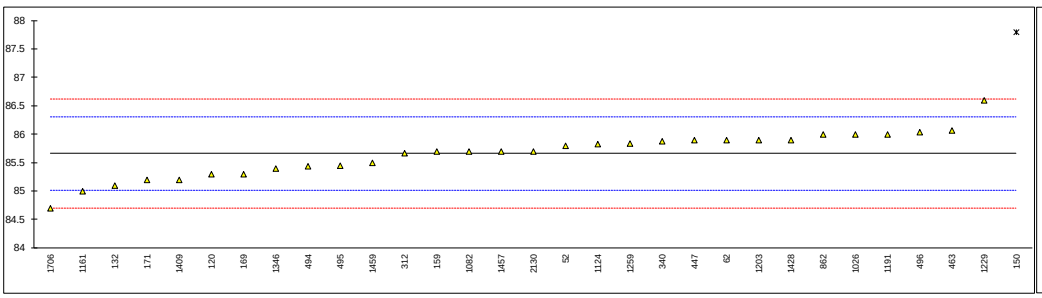


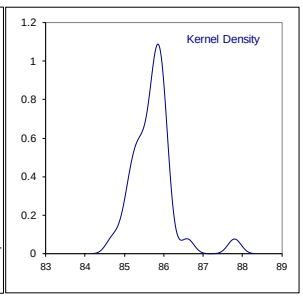


Determination of MON on sample #13070

lab	method	value	mark	z(targ)	remarks
52	ISO5163	85.8		0.44	
62	D2700	85.9		0.75	
120	D2700	85.3		-1.11	
132	D2700	85.1		-1.73	
150	D2700	87.8	G(0.01)	6.67	
158		-----		-----	
159	D2700	85.7		0.13	
169	D2700	85.3		-1.11	
171	D2700	85.2		-1.42	
193		-----		-----	
311		-----		-----	
312	D2700	85.67		0.04	
334		-----		-----	
338		-----		-----	
340	ISO5163	85.88		0.69	
343		-----		-----	
447	ISO5163	85.9		0.75	
463	D2700	86.07		1.28	
494	ISO5163	85.44		-0.68	
495	ISO5163	85.45		-0.65	
496	D2700	86.04		1.19	
511		-----		-----	
631		-----		-----	
862	D2700	86.00		1.07	
1026	ISO5163	86.0		1.07	
1033		-----		-----	
1040		-----		-----	
1082	ISO5163	85.7		0.13	
1124	ISO5163	85.83		0.54	
1134		-----		-----	
1140		-----		-----	
1161	ISO5163	85.0		-2.05	
1191	ISO5163	86.0		1.07	
1203	in house	85.9		0.75	
1218		-----		-----	
1229	ISO5164	86.6		2.93	
1259	ISO5163	85.84		0.57	
1346	ISO5163	85.4		-0.80	
1409	ISO5163	85.2		-1.42	
1428	D2700	85.9		0.75	
1457	D2700	85.70		0.13	
1459	in house	85.5		-0.49	
1634		-----		-----	
1706	in house	84.7		-2.98	
1727		-----		-----	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951		-----		-----	
2130	ISO5163	85.7		0.13	
2146		-----		-----	

normality	OK
n	30
outliers	1
mean (n)	85.66
st.dev. (n)	0.3916
R(calc.)	1.097
R(ISO5163:05)	0.900

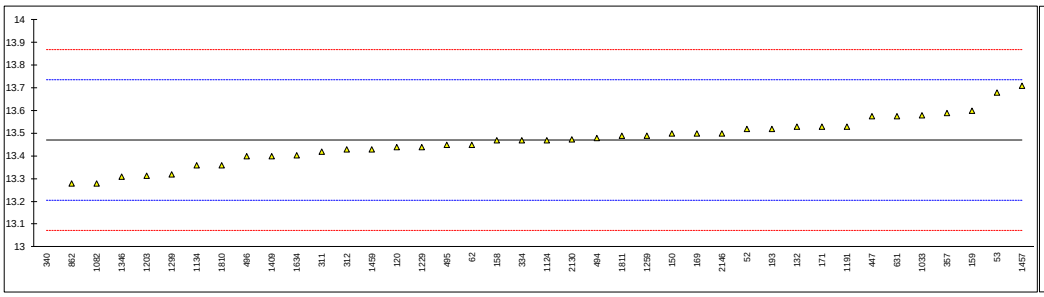


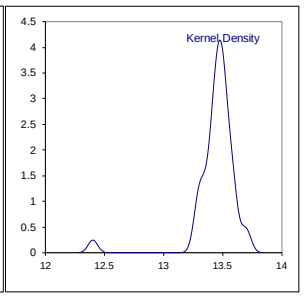


Determination of Total Vapour Pressure on sample #13071; results in psi

lab	method	value	mark	z(targ)	remarks
52	D5191	13.52	C	0.39	first reported 12.50
53	D5191	13.68		1.59	
62	D5191	13.45		-0.14	
120	D5191	13.44		-0.22	
132	D5191	13.53		0.46	
150	D5191	13.50		0.24	
158	D5191	13.47		0.01	
159	D5191	13.60		0.99	
169	D5191	13.50		0.24	
171	D5191	13.53		0.46	
193	D5191	13.52		0.39	
311	D5191	13.42		-0.37	
312	D5191	13.43		-0.29	
334	D5191	13.47		0.01	
340	EN13016	12.40	G(0.01)	-8.05	
357	D5191	13.59		0.91	
447	D5191	13.576		0.81	
494	D5191	13.48		0.09	
495	D5191	13.45	C	-0.14	first reported 12.430
496	D5191	13.40		-0.52	
631	D5191	13.576		0.81	
862	D5191	13.28		-1.42	
1026		-----		-----	
1033	IP394	13.58		0.84	
1082	EN13016	13.28		-1.42	
1124	D5191	13.47	C	0.01	first reported 12.65
1134	D5191	13.36		-0.82	
1191	EN13016	13.53		0.46	
1203	EN13016	13.314		-1.16	
1218		-----		-----	
1229	EN13016	13.44	C	-0.22	first reported 12.69
1259	EN13016	13.4902		0.16	
1299	D5191	13.32		-1.12	
1346	D6378	13.31		-1.19	
1409	ISO3016	13.4		-0.52	
1428		-----		-----	
1457	D5191	13.71		1.82	
1459	D5191	13.43		-0.29	
1634	D5191	13.404		-0.49	
1810	D5191	13.36		-0.82	
1811	D5191	13.49		0.16	
1833		-----		-----	
1951		-----		-----	
2130	D5191	13.474		0.04	
2146	EN13016	13.500		0.24	

normality	OK
n	39
outliers	1
mean (n)	13.469
st.dev. (n)	0.0998
R(calc.)	0.279
R(D5191:12)	0.372

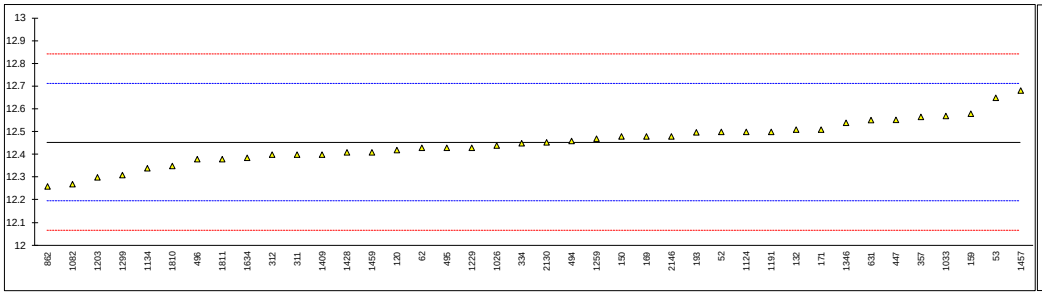


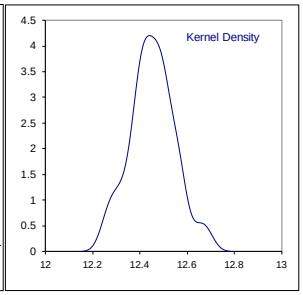


Determination of DVPE (ASTM D5191 calculation) on sample #13071; results in psi

lab	method	value	mark	z(targ)	remarks
52	D5191	12.50	C	0.36	first reported 11.51
53	D5191	12.65		1.52	
62	D5191	12.43		-0.18	
120	D5191	12.42		-0.26	
132	D5191	12.51		0.44	
150	D5191	12.48		0.21	
158		-----		-----	
159	D5191	12.58		0.98	
169	D5191	12.48		0.21	
171	D5191	12.51		0.44	
193	D5191	12.498		0.35	
311	D5191	12.40		-0.41	
312	D5191	12.40		-0.41	
334	D5191	12.45		-0.03	
340		-----		-----	
357	D5191	12.566		0.87	
447	D5191	12.553		0.77	
494	D5191	12.46		0.05	
495	D5191	12.43		-0.18	
496	D5191	12.38		-0.57	
631	D5191	12.552		0.76	
862	D5191	12.26		-1.50	
1026	D5191	12.44		-0.10	
1033	IP394	12.57		0.90	
1082	D5191	12.27		-1.42	
1124	D5191	12.50		0.36	
1134	D5191	12.34		-0.88	
1191	D5191	12.50		0.36	
1203	D5191	12.300		-1.19	
1218		-----		-----	
1229	D5191	12.43		-0.18	
1259	EN13016	12.4701		0.13	
1299	D5191	12.31		-1.11	
1346	D6378	12.54		0.67	
1409	ISO3016	12.4		-0.41	
1428	D5191	12.41		-0.34	
1457	D5191	12.682		1.77	
1459	D5191	12.41		-0.34	
1634	D5191	12.386		-0.52	
1810	D5191	12.35		-0.80	
1811	D5191	12.38		-0.57	
1833		-----		-----	
1951		-----		-----	
2130	D5191	12.454		0.01	
2146	EN13016	12.480		0.21	

normality	OK
n	40
outliers	0
mean (n)	12.453
st.dev. (n)	0.09432
R(calc.)	0.264
R(D5191:12)	0.362

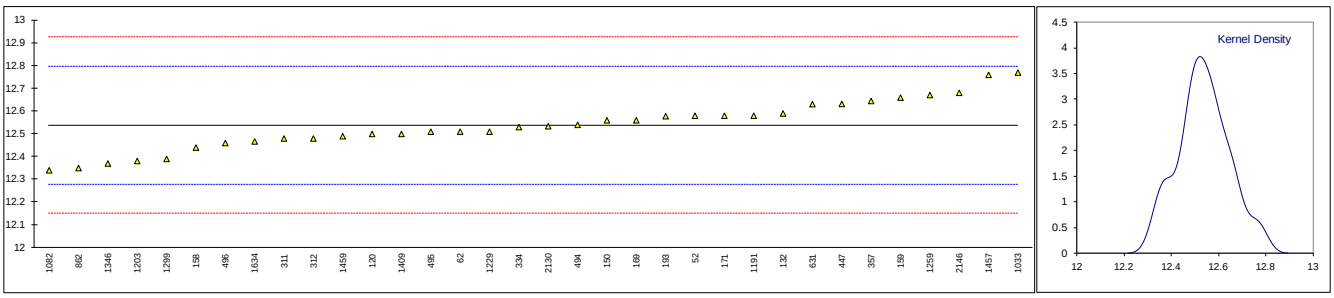




Determination of DVPE (EPA calculation) on sample #13071; results in psi

lab	method	value	mark	z(targ)	remarks
52	D5191	12.58	C	0.33	first reported 11.60
53		-----		-----	
62	D5191	12.51		-0.21	
120	D5191	12.50		-0.29	
132	D5191	12.59		0.41	
150	D5191	12.56		0.18	
158	D5191	12.44		-0.75	
159	D5191	12.66		0.95	
169	D5191	12.56		0.18	
171	D5191	12.58		0.33	
193	D5191	12.578		0.32	
311	D5191	12.48		-0.44	
312	D5191	12.48		-0.44	
334	D5191	12.53		-0.05	
340		-----		-----	
357	D5191	12.645		0.83	
447	D5191	12.632		0.73	
494	D5191	12.54		0.02	
495	D5191	12.51		-0.21	
496	D5191	12.46		-0.60	
631	D5191	12.631		0.73	
862	D5191	12.35		-1.45	
1026		-----		-----	
1033	IP394	12.77		1.80	
1082	D5191	12.34		-1.52	
1124		-----		-----	
1134		-----		-----	
1191	D5191	12.58		0.33	
1203	D5191	12.381		-1.21	
1218		-----		-----	
1229	D5191	12.51	C	-0.21	first reported 11.78
1259	EN13016	12.6711		1.04	
1299	D5191	12.39		-1.14	
1346	D6378	12.37		-1.29	
1409	ISO3016	12.5		-0.29	
1428		-----		-----	
1457	D5191	12.760		1.72	
1459	D5191	12.49		-0.36	
1634	D5191	12.467		-0.54	
1810		-----		-----	
1811		-----		-----	
1833		-----		-----	
1951		-----		-----	
2130	D5191	12.534		-0.02	
2146	EN13016	12.681		1.11	

normality	OK
n	34
outliers	0
mean (n)	12.537
st.dev. (n)	0.1073
R(calc.)	0.300
R(D5191:12)	0.362



APPENDIX 2:

Z-scores of Distillation

lab	IBP	10%eva	50%eva	90%eva	FBP	%vol@70°C	%vol@100°C	%vol@150°C
52	-0.53	-1.18	-0.60	-1.24	-1.40	-----	-----	-----
62	0.52	-0.65	0.00	0.45	-0.41	-1.95	0.51	0.19
120	-0.12	-0.39	0.60	-0.51	0.50	-0.60	0.25	0.19
132	0.17	-0.13	-0.45	-0.14	-0.12	0.85	0.76	0.62
150	1.28	0.84	-0.30	-0.73	1.62	0.23	-0.38	-0.24
158	-0.42	-0.05	-0.74	-0.35	0.25	-----	-----	-0.45
159	-0.53	-0.13	0.30	0.30	0.50	-2.05	0.38	-1.10
169	-1.05	0.57	1.94	0.59	-0.57	-----	-----	-----
171	0.23	0.31	-0.30	0.30	-0.20	0.13	-0.38	-0.45
193	-----	-----	-----	-----	-----	-----	-----	-----
311	0.00	-0.65	-1.79	-0.43	-0.53	0.75	0.00	0.84
312	0.05	-0.21	-1.34	0.23	0.75	0.34	-0.64	-0.02
334	-1.29	0.31	-0.89	-1.17	-0.86	-0.08	-0.76	1.70
338	-----	-----	-----	-----	-----	-----	-----	-----
340	0.75	0.66	0.89	0.23	-0.41	-0.29	-0.64	-0.67
343	-----	-----	-----	-----	-----	-----	-----	-----
447	-0.06	-1.44	-0.30	0.30	0.46	-0.60	0.00	-2.39
463	2.27	0.84	-1.19	-0.51	-0.28	-0.39	-----	0.41
494	0.00	-0.39	-0.60	-0.07	-0.61	0.13	0.51	-0.24
495	0.11	-0.30	0.00	-0.51	0.25	0.34	0.25	0.84
496	-----	-----	-----	-----	-----	-----	-----	-----
511	0.81	0.49	2.23	1.69	-0.16	-1.43	-1.40	-5.84
631	1.39	1.89	1.79	1.55	2.32	-----	-----	-----
862	-2.33	0.57	1.19	0.01	-0.45	-0.29	-0.13	0.41
1026	-0.47	0.14	-0.30	-0.65	-0.03	0.03	0.25	0.84
1033	1.45	0.14	-1.04	0.67	-0.70	-0.08	-0.51	-10.15
1040	-----	-----	-----	-----	-----	-----	-----	-----
1082	-1.46	-0.56	-0.30	0.23	-0.61	1.17	-0.13	-0.24
1124	-0.35	-1.09	0.00	0.23	0.25	1.58	-0.51	-0.89
1134	-0.88	1.19	1.79	4.70	0.30	1.06	0.38	-0.24
1140	-----	-----	-----	-----	-----	-----	-----	-----
1161	-----	-----	-----	-----	-----	-----	-----	-----
1191	-0.41	-0.13	-0.60	0.37	-0.57	0.23	0.00	-0.02
1203	0.93	0.49	-0.15	0.08	1.70	0.44	-0.13	0.19
1218	-----	-----	-----	-----	-----	-----	-----	-----
1229	-1.05	-1.70	-1.79	-0.73	-1.64	1.89	1.27	0.84
1259	0.35	1.01	0.89	2.87	0.01	0.54	0.51	-0.02
1346	1.22	0.31	-0.15	-0.07	0.17	-0.29	-0.13	0.41
1409	0.35	-0.13	1.04	-0.21	0.87	-0.39	-0.76	-0.02
1428	0.52	0.14	0.60	0.01	1.29	-0.60	-0.38	-0.02
1457	-0.30	-0.48	0.30	-0.51	0.34	0.65	0.00	0.62
1459	-1.11	-0.65	-1.64	-0.43	-1.40	1.37	0.38	-0.02
1634	-0.94	-0.56	0.45	0.08	-1.15	-2.05	1.27	-0.89
1706	-0.94	0.66	1.04	-0.36	-1.69	-0.49	0.64	0.41
1727	-----	-----	-----	-----	-----	-----	-----	-----
1810	1.10	0.75	0.15	0.45	-0.53	-1.12	-0.89	-1.32
1811	-0.24	0.57	0.00	0.59	-0.82	-0.29	1.15	-0.45
1833	-----	-----	-----	-----	-----	-----	-----	-----
1951	0.40	-0.39	-0.74	0.08	1.00	1.17	0.13	1.70
2130	-0.30	-0.21	0.45	0.01	1.87	-0.39	-0.64	-0.02
2146	0.87	-0.48	-0.45	0.23	0.67	0.44	-0.25	-0.45

APPENDIX 3

Number of participants per country

2 labs in AUSTRIA
8 labs in BELGIUM
4 labs in CANADA
4 labs in CROATIA
2 labs in CZECH REPUBLIC
6 labs in FINLAND
1 lab in FRANCE
4 labs in GERMANY
1 lab in HUNGARY
1 lab in IRELAND
1 lab in LATVIA
4 labs in P.R. of CHINA
1 lab in PERU
3 labs in PHILIPPINES
2 labs in PORTUGAL
1 lab in SPAIN
1 lab in SWEDEN
1 lab in THE NETHERLANDS
1 lab in TURKEY
1 lab in U.S.A.
2 labs in UNITED KINGDOM

APPENDIX 4

Abbreviations:

C	= final result after checking of first reported suspect 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
ex	= excluded from calculations
E	= error in calculations
n.a.	= not applicable
n.e.	= not evaluated
W	= withdrawn
fr.	= first reported
U	= reported in different unit
SDS	= Safety Data Sheet

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