Results of Proficiency Test
Naphtha
April 2011

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CONTENTS

Appendices:

1   INTRODUCTION

Since 1994, the Institute for Interlaboratory Studies organizes a proficiency test for the analysis of Naphtha once a year. In the 2011 interlaboratory study on Naphtha, 84 laboratories from 35 different countries have participated. See appendix 2 for the number of participating laboratories per country.
In this report, the results of the Naphtha proficiency tests are presented and discussed.

2   SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test. Sample analyses for fit-for-use and homogeneity testing were subcontracted. In this proficiency test, the participants received, depending on the registration, from one upto eight different samples of Naphtha. Besides the regular naphtha for GC-analysis, an extra sample of Russian Naphtha was added this time to see if the deviating composition does influence the test results of the GC-analysis.

Samples	Amount in mL	Purpose
#11025	1000	For regular analysis
#11026, #11027	100	For GC analysis
#11028, #11029	100	For Mercury
#11030, #11031	100	For Arsenic and Lead
#11032	± 800	For DVPE

table 1: Eight different Naphtha samples used in iis10N01

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 agreement with ISO guide 43 and ILAC-G13:2007, (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie), see www.rva.nl. This ensures 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), which can be downloaded from www.iisnl.com. The participants were asked to report the analytical results using the indicated units on the report form.

2.3   CONFIDENTIALITY STATEMENT

All data present, 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

One drum with approx. 200 litres Naphtha was obtained from a local refinery. Eight different samples were prepared. After homogenisation 118 brown glass bottles of 1 litre were filled (labelled #11025) and 58 brown glass bottles of 1 litre filled with approx. 800 mL Naphtha (labelled #11032). The remaining Naphtha was used as shown in the table below. For sample #11027 a Russian Naphtha was used. After homogenisation, the typical batches were filled in brown glass bottles of 100 mL and labelled.

	Naphtha intake in kg	Spike intake in g	Theoretical conc. in µg/kg
Sample #11026			
Methanol	10.30	1.53	148.0
Methyl tert-butyl ether (MTBE)		1.55	150.4
Sample #11028			
HgCl$_2$ (111.4 mg Hg/L)	15.05	1.35	10.7
Conostan (100 mg Hg/kg)		1.52	10.1
Gascondensate (>1.2 mg/kg)		66.89	5.4
Sample #11029			
HgCl$_2$ (111.4 mg Hg/L)	15.10	1.35	10.6
Conostan (100 mg Hg/kg)		1.53	10.1
Gascondensate (>1.2 mg/kg)		67.11	>5.4
Sample #11030			
Conostan (1000 mg Pb/kg)	12.05	0.87	72.1
Conostan (100 mg As/kg)		4.84	40.2
Sample #11031			
Conostan (1000 mg Pb/kg)	12.05	2.54	211.1
Conostan (100 mg As/kg)		14.48	120.2

table 2: Addition scheme for samples #11026, #11028, #11029, #11030 and #11031

The homogeneity of subsamples #11025 was checked by determination of Density at 15°C in accordance with ASTM D4052:09 on 8 stratified randomly selected samples.

	Density @ 15°C in kg/L		Density @ 15°C in kg/L
sample #11025-1	0.71750	sample #11025-5	0.71759
sample #11025-2	0.71753	sample #11025-6	0.71756
sample #11025-3	0.71759	sample #11025-7	0.71755
sample #11025-4	0.71753	sample #11025-8	0.71756

table 3: homogeneity test results of subsamples #11025

The homogeneity of subsamples #11026 was checked by determination of Density at 15°C in accordance with ASTM D4052:09 and MTBE in accordance with an in-house method on 8 stratified randomly selected samples.

	Density @ 15°C in kg/L	MTBE in mg/kg
sample #11026-1	0.71759	180
sample #11026-2	0.71758	180
sample #11026-3	0.71754	180
sample #11026-4	0.71755	180
sample #11026-5	0.71761	180
sample #11026-6	0.71760	180
sample #11026-7	0.71756	180
sample #11026-8	0.71758	180

table 4: homogeneity test results of subsamples #11026

The homogeneity of subsamples #11027 was checked by determination of Density at 15°C in accordance with ASTM D4052:09 on 8 stratified randomly selected samples.

	Density @ 15°C in kg/L		Density @ 15°C in kg/L
sample #11027-1	0.69375	sample #11027-5	0.69377
sample #11027-2	0.69374	sample #11027-6	0.69379
sample #11027-3	0.69375	sample #11027-7	0.69381
sample #11027-4	0.69376	sample #11027-8	0.69388

table 5: homogeneity test results of subsamples #11027

The homogeneity of the subsamples #11028 and #11029 was checked by determination of Mercury in accordance with an in-house test method on 4 stratified randomly selected samples from each batch.

	Mercury in µg/kg		Mercury in µg/kg
sample #11028-1	143	sample #11029-1	133
sample #11028-2	146	sample #11029-2	128
sample #11028-3	140	sample #11029-3	129
sample #11028-4	142	sample #11029-4	135

table 6: homogeneity test results of subsamples #11028 and #11029

The homogeneity of the subsamples #11030 and #11031 was checked by determination of Lead in accordance with an in-house test method on 4 stratified randomly selected samples from each batch.

	Lead in µg/kg		Lead in µg/kg
sample #11030-1	55	sample #11031-1	190
sample #11030-2	53	sample #11031-2	211
sample #11030-3	56	sample #11031-3	233
sample #11030-4	53	sample #11031-4	180

table 7: homogeneity test results of subsamples #11030 and #11031

The homogeneity of subsamples #11032 was checked by determination of DVPE in accordance with ASTM D5191:07 on 4 stratified randomly selected samples.

	DVPE in psi
sample #11032-1	10.76
sample #11032-2	10.78
sample #11032-3	10.76
sample #11032-4	10.64

table 8: homogeneity test results of subsamples #11032

From the results in tables 3 - 8, the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibilities of the target methods or with 0.3 times the reproducibility calculated using the Horwitz equation in agreement with the procedure of ISO 13528, Annex B2 in the next table;

	Density in kg/L	MTBE in mg/kg	Mercury in µg/kg	Lead in µg/kg	DVPE in psi
r (#11025)	0.00009	--	--	--	--
r (#11026)	0.00007	0	--	--	--
r (#11027)	0.00013	--	--	--	--
r (#11028)	--	--	7	--	--
r (#11029)	--	--	9	--	--
r (#11030)	--	--	--	4.2	--
r (#11031)	--	--	--	13	--
r (#11032)	--	--	--	--	0.18
0.3*R (ref.)	0.00015	11	24 - 26	11 - 35	0.20
reference	D4052:02e1	Horwitz	Horwitz	Horwitz	D5191:07

table 9: repeatabilities of subsamples #11025, #11026, #11027, #11028, #11029, #11030, #11031 and #11032

The repeatabilities of the results of the homogeneity tests for samples #11025, #11026, #11027, #11028, #11029, #11030, #11031 and #11032 are all in agreement with the requirements of standards or with the estimated repeatabilities calculated using the Horwitz equation. Therefore, homogeneity of all prepared subsamples was assumed.

To the participating laboratories, depending on its registration, 1 - 8 brown glass bottles (1*1 litre labelled #11025, 6*100 mL labelled #11026, #11027, #11028, #11029, #11030, #11031 and/or 1*800 mL labelled #11032) were sent on March 17, 2011.

2.5   STABILITY OF THE SAMPLES

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

2.6   ANALYSES

The participants were asked to determine on sample #11025 the following analyses: Colour Saybolt, Copper Corrosion 3hrs @ 50°C, Density @15°C, Distillation (IBP, 50% evaporated and FBP), Mercaptans and Sulphur. On samples #11026 and #11027 the participants were requested to determine PONA / PIONA / PNA (n-Paraffines, i-Paraffines, Olefins, Naphthenes, Aromatics, C_4 & lighter hydrocarbons and Compounds with Boiling Point > 200°C), Methanol, MTBE, Organic Chlorides and Total Oxygenates. On samples #11028 and #11029 the participants were requested to determine Mercury. On samples #11030 and #11031 the participants were requested to determine Arsenic and Lead.
On sample #11032 the participants were requested to determine only TVP / DVPE.

To get comparable results detailed report forms, on which the units were prescribed as well as some of the required standards, were sent together with each set of samples. Also a letter of instructions and a SDS were added to the 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 the appendix 1 of this report. The laboratories are presented by their code numbers.

Directly after deadline, a reminder fax was sent to those laboratories that had not yet reported. 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 (raw data of the) reported results. Additional or corrected results have been used for data analysis and the 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 Organization, 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 conclusions of statistical evaluation should be used with due care.

In accordance with 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. 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 cross. Accepted data are represented as a triangle. Furthermore, Kernel Density Graphs were made. This method is for producing a smooth density approximation to a set of data that avoids some problems associated with histograms (see appendix 3; nr.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. This results in an evaluation independent of the spread of this interlaboratory study.

The target standard deviation was calculated from the literature reproducibility by division with 2.8. The z-scores were calculated according to:

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

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
    | z | > 3   unsatisfactory

4   EVALUATION

In this interlaboratory study, problems with sample despatch were encountered during the execution. Laboratories in Argentine, Brazil, Bulgaria, Côte D'Ivoire, Georgia, India, Iran, Malaysia, Mexico, Nigeria, P.R. of China, Qatar, Russia, Saudi Arabia, Sultanate of Oman, Turkey, U.A.E., U.S.A. and Ukraine received the samples late or not at all due to several problems (i.e. courier, customs clearance).
Most laboratories reported results, but not all laboratories were able to perform all the requested analyses. Finally, in total 72 participants reported 1892 numerical results. Observed were in total 120 outlying results, which is 6.3%. In proficiency studies, outlier percentages of 3 % - 7.5 % are quite normal.

Not all original data sets proved to have a normal distribution. Not normal distributions were found:
On sample #11025 for Colour Saybolt, Density @15°C and Mercaptans; on sample #11026 for n-Paraffins (%M/M), Olefins (%V/V and %M/M), Naphthenes (%V/V) and C1-C4 (%M/M); on sample #11027 for Olefins (%V/V and %M/M), Naphthenes (%V/V) and C1-C4 (%M/M) and on sample #11028 for the Mercury test results.
In these cases, the results of the statistical evaluations should be used with care.

4.1   EVALUATION PER TEST

In this section, the results are discussed per test. The methods, which are used by the various laboratories, are taken into account for explaining the observed differences when possible and applicable. These methods are also listed in the tables together with the original data in appendix 1. The abbreviations, used in these tables, are listed in appendix 3.

Evaluation for sample #11025:

Colour Saybolt: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not at all in agreement with the requirements of ASTM D156:07a.

Copper Corrosion: No problems have been observed. All the reporting participants agreed on a result of 1.

Density @ 15°C: This determination was not problematic. Only one statistical outlier was observed and the calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of ASTM D4052:09 and of the previous version D4052:02e1.

Distillation: For the automated mode: This determination was problematic for a number of laboratories. In total five statistical outliers were observed. The calculated reproducibility of IBP is not in agreement with the requirements of ASTM D86:10a, but the calculated reproducibilities 50% evaporated and FBP do meet the requirements, after rejection of the

statistical outliers.

For the manual mode: This determination was not problematic. No statistical outliers were observed and the calculated reproducibilities for IBP, 50% recovered and FBP are all in good agreement with the respective requirements of ASTM D86:10a.

Mercaptans: This determination was problematic for a number of laboratories. Four statistical outliers were observed. However, the calculated reproducibility, after rejection of the statistical outliers, is in full agreement with the requirements of ASTM D3227:10.

Sulphur: This determination was problematic. Only one statistical outlier was observed. However, the calculated reproducibility, after rejection of the statistical outlier, is not at all in agreement with ASTM D2622:10. When D2622 and D5453 data were evaluated separately, both spreads are not in agreement with the requirements of the respective method. The fact that measurement results of D5453 are in %V/V, that need to be converted to %M/M using the density (and the unclear formulae of D5453), may explain for the relatively large spread of the D5453 test results.

Evaluation for sample #11026:

Org. Chloride: This determination was problematic. No statistical outliers were detected. One false negative result was observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D5808:09a.

Methanol: This determination was very problematic. The sample was spiked with Methanol, therefore the minimal Methanol concentration to be found was known (added amount = 148.0 mg/kg). The laboratories should be able to find at least 116.7 mg/kg [148.0 mg/kg$_{(added\ amount)}$ − 31.3 mg/kg$_{(R\ Horwitz)}$]. However, 7 of 25 laboratories reported lower amounts than 116.7 mg/kg and were rejected prior to data analysis. Furthermore, one statistical outlier and two false negative results were observed. The calculated reproducibility, after rejection of the statistical outliers and false negatives, is not at all in agreement with the strict estimated reproducibility calculated using the Horwitz equation. The average recovery of Methanol (theoretical increment of 148.0 mg Methanol/kg) may be good: "less then 107%" (the actual blank Methanol content is unknown). The variety of test methods used may explain for the relatively large spread.

MTBE: This determination was very problematic. The samples were spiked with MTBE, therefore the minimal MTBE concentration to be found was known (added amount = 150.4 mg/kg). The laboratories should be able to find at least 118.7 mg/kg [150.4 mg/kg$_{(added\ amount)}$ − 31.7 mg/kg$_{(R\ Horwitz)}$].

However, 5 of 36 laboratories reported lower amounts than 118.7 mg/kg and were rejected prior to data analysis. Furthermore, one statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is not at all in agreement with the strict estimated reproducibility calculated using the Horwitz equation. The average recovery of MTBE (theoretical increment of 150.4 mg MTBE/kg) may be good: "less then 99%" (the actual blank MTBE content is unknown). The variety of test methods used may explain for the relatively large spread.

Total Oxygenates: This determination was problematic. Four statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers, is not at all in agreement with the very strict estimated reproducibility, calculated using the Horwitz equation. The variety of test methods used may explain for the relatively large spread.

PONA/PIONA: This determination is only for Aromatics not problematic. For the (n- and i-) Paraffines, Naphthenes and C1-C4, the calculated reproducibilities are not in agreement with the requirements of ASTM D5443:09e1. Regretfully, for Olefins no suitable test method with precision data exists. Most reproducibilities are in agreement with the reproducibilities in previous rounds:

	2011	2010	2009	2008	2007	ASTM
n-paraffines	6.8%	5.1%	3.0%	5.7%	8.8%	2.7%
i-pararaffines	5.4%	4.0%	2.9%	6.8%	4.7%	2.8%
Olefins	271% *)	220% *)	26%	190% *)	150% *)	Unknown
naphthenes	13%	10%	5.9%	9.1%	9.4%	2.5%
aromatics	5.7%	12%	13%	9.2%	11%	15%
C4 lights	27%	38%	49%	110% *)	17%	19%

table 10: Comparison of relative reproducibilities (%M/M) with previous rounds
*) low concentrations

As in previous rounds, in this round robin again many participants did have problems with Naphthenes and C1-C4 lights. Several laboratories reported to have used ASTM D5134, a test method that is in principle only applicable for Naphthas that do not contain any C9+. It is unknown how the amount of the fraction C9+ was treated by the laboratores (divided over the reported test results?). Some other laboratories reported to have used ASTM D6293, a test method that is in principle applicable for gasolines. Also it is remarkable to find that a number of laboratories did not report normalized test results. For one laboratory (974) the sum of n-, i-paraffines, olefines, naphtenes and aromatics was >100%, while for another nine (!) laboratories this sum was <100%. For laboratory 781 the sum was 100% when the reported C1-C4 result was included. This may explain the very low reported test result for naphthenes of the laboratory.

Evaluation for sample #11027:

PONA/PIONA: The determination of this Russian naphtha sample is like sample #11026, only for Aromatics not problematic. For the (n- and i-) Paraffines, Naphthenes and C4 lights, the calculated reproducibilities are not in agreement with the requirements of ASTM D5443:09e1. However, most reproducibilities are in agreement with the reproducibilities found for sample #11026, see table 11. It is remarkable to have to conclude that the difficulty of this determination does not depend strongly of the nature of the product tested.

	#11026	#11027	ASTM
n-paraffines	6.8%	7.3%	2.7%
i-pararaffines	5.4%	4.3%	2.8%
Olefins	271% *)	94% *)	Unknown
naphthenes	13%	9.5%	2.5%
aromatics	5.7%	8.9%	15%
C4 & lighter	27%	27%	19%

table 11: Comparison of relative reproducibilities (%M/M) of #11027 with sample #11026
*) low concentrations

Evaluation for sample #11028 and #11029:

In this proficiency test, it was decided to spike the samples #11028 and #11029 on the same concentration levels for Mercury. However, the bottles of sample #11029 were rinsed with diluted acid (as per UOP938) before use.

Mercury: This determination was problematic for only one laboratory. In total, only two statistical outliers were observed (both from one laboratory). Regretfully, besides the reference test method UOP938:10 (that does not provide reproducibility data, except for method B), no other reference method exists. When the calculated reproducibilities are compared with the estimated reproducibilities calculated using the Horwitz equation, the calculated reproducibilities are both in good agreement. Surprisingly the consensus values found for sample #11028 and #11029 do not differ significantly. This was not expected as test method UOP938 describes the rinsing of all used glassware.

Evaluation for sample #11030 and #11031:
In this proficiency test, it was decided to spike the samples #11030 and #11031 on two different concentration levels of arsenic and lead.

Arsenic: This determination was problematic. Arsenic was spiked in two different and measurable concentration levels (40 and 120 µg/kg). The calculated reproducibilities are, after rejection of the statistical outlier, both not in agreement with the estimated reproducibilities calculated using the Horwitz equation. The low number of results and the variety of test methods used may explain for the relatively large spread. The average recoveries for both samples may be good (#11030: <94% and #11031: <94%)

Lead: This determination was problematic. Lead was spiked in two different and measurable concentration levels (72 and 211 µg/kg). The calculated reproducibilities are both not in agreement with the estimated reproducibilities, calculated using the Horwitz equation. The low number of results and the variety of test methods used may explain the relatively large spread. The average recoveries for both samples are low (#11030: <75% and #11031: <68%). The two laboratories that used strong oxidizing agents (one NaOCl/H_2SO_4 and the other I_2 in toluene) did find much higher recoveries than the other participating laboratories.

Evaluation for sample #11032:

TVP: This determination was not problematic. Only one statistical outlier was observed. The calculated reproducibility, after rejection of the statistical outlier, is in good agreement with the requirements of ASTM D5191:07.

DVPE: The conversion of the measured Total Vapour Pressure to the corresponding Dry Vapour Pressure Equivalent (DVPE) as described in the ASTM D5191:07, showed two statistical outliers. The calculated reproducibility, after rejection of the statistical outliers, is in good agreement with the requirements of ASTM D5191:07.

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 the laboratories that participated.
The reproducibilities derived from literature standards (in casu ASTM standards) and the calculated reproducibilities of the samples (see appendix 1) are compared in the next table.

Parameters	unit	n	average	2.8 * sd	R (lit)
Colour Saybolt		60	25.0	5.5	2.0
Copper Corrosion		58	1(a)	n.a.	n.a.
Density @ 15°C	kg/L	69	0.71748	0.00048	0.00297
Initial Boiling Point (auto)	°C	56	41.84	6.13	5.54
50% evaporated (auto)	°C	55	101.72	1.70	1.88
Final Boiling Point (auto)	°C	52	158.40	4.39	6.78
Initial Boiling Point (manual)	°C	11	42.77	3.62	5.60
50% evaporated (manual)	°C	11	101.00	1.98	4.00
Final Boiling Point (manual)	°C	11	158.05	5.14	7.20
Mercaptans	mg/kg	44	4.49	3.28	3.29
Sulphur	mg/kg	53	10.14	4.33	2.74

table 12: comparison of the observed and target reproducibilities of the samples #11025
Results between brackets were below or near the application range of the method, therefore the results should be
 evaluated with care

Parameters	unit	n	average	2.8 * sd	R (lit)
Organic chlorides as Cl	mg/kg	28	1.38	1.67	1.30
Methanol	mg/kg	17	158.3	82.4	33.1
MTBE	mg/kg	30	149.1	65.3	31.5
Total Oxygenates	%M/M	19	0.0288	0.0139	0.0078
n-Paraffins	%V/V	42	32.69	2.11	0.97
i-Paraffins	%V/V	41	35.56	1.88	1.01
Olefins	%V/V	29	0.13	0.35	n.a.
Naphthenes	%V/V	43	22.61	3.09	0.52
Aromatics	%V/V	41	8.56	0.50	0.82
C_4 & lighter	%V/V	34	1.19	0.32	0.20
Compounds bp > 200 °C	%V/V	11	0.08	0.24	n.a.
n-Paraffins	%M/M	40	30.70	2.08	0.94
i-Paraffins	%M/M	38	33.92	1.82	0.99
Olefins	%M/M	27	0.11	0.31	n.a.
Naphthenes	%M/M	39	24.55	3.06	0.55
Aromatics	%M/M	37	10.43	0.60	0.90
C_4 & lighter	%M/M	34	0.96	0.26	0.17
Compounds bp > 200 °C	%M/M	11	0.09	0.28	n.a.

table 13: comparison of the observed and target reproducibilities of the sample #11026

Parameters	unit	n	average	2.8 * sd	R (lit)
n-Paraffins	%V/V	44	36.06	2.30	1.02
i-Paraffins	%V/V	45	37.87	1.70	1.05
Olefins	%V/V	38	0.25	0.23	n.a.
Naphthenes	%V/V	42	23.03	2.36	0.53
Aromatics	%V/V	41	2.73	0.22	0.46
C_4 & lighter	%V/V	38	4.62	1.29	0.62
Compounds bp > 200 °C	%V/V	13	0.04	0.12	n.a.
n-Paraffins	%M/M	44	34.05	2.49	0.99
i-Paraffins	%M/M	44	36.59	1.59	1.03
Olefins	%M/M	39	0.25	0.23	n.a.
Naphthenes	%M/M	41	25.61	2.41	0.56
Aromatics	%M/M	40	3.45	0.30	0.52
C_4 & lighter	%M/M	36	3.82	1.03	0.53
Compounds bp > 200 °C	%M/M	14	0.06	0.14	n.a.

table 14: comparison of the observed and target reproducibilities of the sample #11027

Parameters	unit	n	average	2.8 * sd	R (lit)
Mercury as Hg #11028	µg/kg	28	83.5	48.0	54.4
Mercury as Hg #11029	µg/kg	28	83.7	40.4	54.5

table 15: comparison of the observed and target reproducibilities of the samples #11028 and #11029

Parameters	unit	n	average	2.8 * sd	R (lit)
Arsenic as As #11030	µg/kg	10	38.0	34.6	27.8
Arsenic as As #11031	µg/kg	11	112.8	99.1	70.2
Lead as Pb #11030	µg/kg	18	54.1	74.9	37.6
Lead as Pb #11031	µg/kg	17	143.2	171.7	85.9

table 16: comparison of the observed and target reproducibilities of the samples #11030 and #11031

Parameters	unit	n	average	2.8 * sd	R (lit)
TVP	psi	33	6.549	0.231	0.302
DVPE	psi	34	5.775	0.228	0.290

table 16: comparison of the observed and target reproducibilities of the sample #11032

Without further statistical calculations, it can be concluded that for many tests there is not a reasonable compliance of the group of participating laboratories with the relevant standards. The problematic tests have been discussed in paragraph 4.1.

4.3   COMPARISON OF THE PROFICIENCY TEST OF APRIL 2011 WITH PREVIOUS PTS

	April 2011	April 2010	April 2009	April 2008
Number of reporting labs	72	75	88	76
Number of results reported	1892	1294	1113	1116
Statistical outliers	120	57	106	98
Percentage outliers	6.3%	4.4%	9.5%	8.8%

table 17: 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	April 2011	April 2010	April 2009	April 2008
Colour Saybolt	--	++	++	++
Density @ 15°C	++	++	++	-
Distillation automated	+/-	+	++	++
Distillation manual	++	++	++	++
Mercaptans	+/-	--	--	++
Sulphur	--	--	--	-
Org. Chloride as Cl	--	(++)*	(++)*	-
Methanol	--	--	--	--
Methyl tert-butyl ether (MTBE)	--	++	--	--
Total Oxygenates	--	--	--	n.e.
n-Paraffins	--	--	--	--
i-Paraffins	--	--	--	--
Naphthenes	--	--	--	--
Aromatics	++	++	+	+
C_4 & lighter	--	--	--	--
Mercury	++	--	n.e.	++
Arsenic	--	++	n.e.	n.e.
Lead	--	--	n.e.	n.e.
Total Vapour Pressure	++	++	+/-	n.e.
DVPE acc. to D5191	++	++	+/-	n.e.

table 18: comparison determinations against the standard requirements
* Results between brackets were below or near the application range of the method, therefore the results should be evaluated with care

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 Colour Saybolt on sample #11025

lab	method	value	mark	z(targ)	remarks
140	D156	29		5.63	
150	D156	26		1.43	
158	D156	22		-4.17	
171	D156	30		7.03	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	D156	23	C	-2.77	First reported 21
317	D156	24		-1.37	
323	D156	29		5.63	
329	D156	28		4.23	
333	D156	25		0.03	
334	D156	24		-1.37	
336	D156	24		-1.37	
337		-----		-----	
360	D156	25		0.03	
371	D156	24		-1.37	
391	D156	24		-1.37	
399	D156	26		1.43	
444	D6045	26		1.43	
445	D156	23		-2.77	
447	D156	26		1.43	
494	D156	25		0.03	
495		-----		-----	
529		-----		-----	
541		-----		-----	
604	D156	24		-1.37	
608	D156	25		0.03	
657	D156	24		-1.37	
704	D156	22		-4.17	
759		-----		-----	
781		-----		-----	
855	D5386	26		1.43	
862	D156	27		2.83	
868	D156	26		1.43	
873	D6045	25		0.03	
875	D6045	25		0.03	
912	D6045	25		0.03	
962		-----		-----	
963	D156	25		0.03	
974	D6045	26		1.43	
994	D6045	28	C	4.23	First reported 30
995		-----		-----	
1011	D156	26		1.43	
1016	D6045	25		0.03	
1038	D6045	25		0.03	
1065		-----		-----	
1066	D156	23		-2.77	
1067	D156	30		7.03	
1080	D156	25		0.03	
1081	D156	26		1.43	
1108	D156	25		0.03	
1138	D156	21		-5.57	
1145	D156	25		0.03	
1161		-----		-----	
1167		-----		-----	
1229	D6045	26		1.43	
1254	D156	22.5		-3.47	
1257		-----		-----	
1276	D156	26		1.43	
1280		-----		-----	
1284		-----		-----	
1307	D6045	24		-1.37	
1357	D156	24		-1.37	
1378		-----		-----	
1404	D156	22		-4.17	
1427	D156	>30		>7.03	
1429	D6045	25		0.03	
1510	D156	21		-5.57	
1603	in house	26		1.43	
1634		-----		-----	
1653		-----		-----	
1656	D156	26		1.43	
1737		-----		-----	

1826	D156	23	-2.77
1855		-----	-----
1858	D156	24	-1.37
1902	D156	24	-1.37
1939	D156	21	-5.57
1948	D156	25	0.03
1949	D156	26	1.43
1950	D156	26	1.43
7001	D156	25	0.03
7009		-----	-----

			Only ASTM D156 data	Only ASTM D6045 data
normality	not OK		not OK	not OK
n	60		47	12
outliers	0		0	0
mean (n)	25.0		24.8	25.5
st.dev. (n)	1.96		2.14	1.00
R(calc.)	5.5		6.0	2.8
R(D156:07a)	2.0		2.0	2.0
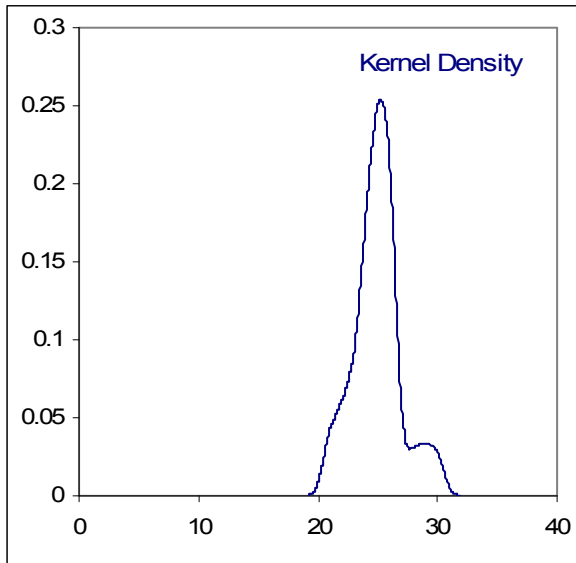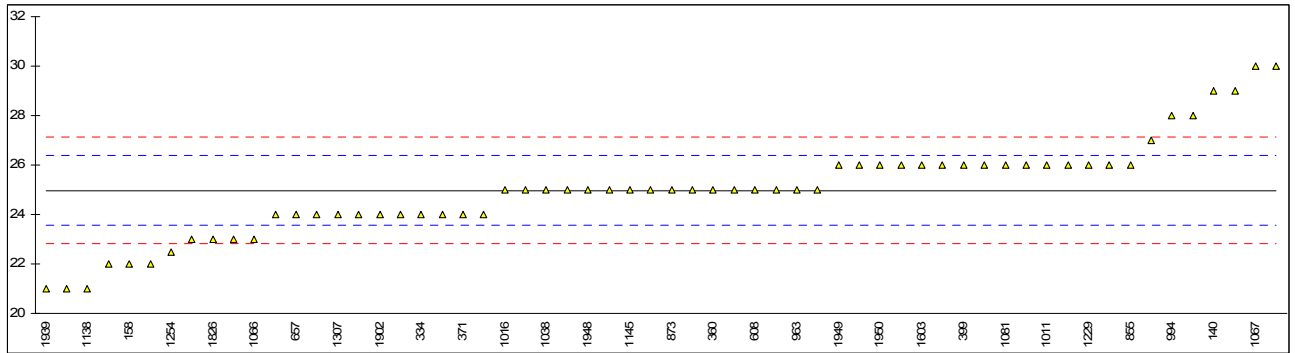
Determination of Copper Corrosion, 3hrs at 50°C on sample #11025

lab	method	value	mark	z(targ)	remarks
140	D130	1a		-----	
150	D130	1a		-----	
158	D130	1a		-----	
171	D130	1a		-----	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	D130	1a		-----	
317	D130	1a		-----	
323	D130	1a		-----	
329		-----		-----	
333		-----		-----	
334	D130	1a		-----	
336		-----		-----	
337		-----		-----	
360	D130	1a		-----	
371	D130	1a		-----	
391	D130	1a		-----	
399	D130	1a		-----	
444		-----		-----	
445	D130	1a		-----	
447	D130	1a		-----	
494	D130	1		-----	
495	D130	1a		-----	
529		-----		-----	
541	D130	1		-----	
604		-----		-----	
608	D130	1a		-----	
657	D130	1a		-----	
704	D130	1a		-----	
759		-----		-----	
781	D130	1a		-----	
855	D130	1a		-----	
862	D130	1a		-----	
868	D130	1a		-----	
873	D130	1a		-----	
875	D130	1a		-----	
912	D130	1a		-----	
962		-----		-----	
963	D130	1a		-----	
974	D130	1a		-----	
994	D130	1a		-----	
995		-----		-----	
1011	D130	1a		-----	
1016	D130	1a		-----	
1038	D130	1a		-----	
1065		-----		-----	
1066	D130	1a		-----	
1067	D130	1a		-----	
1080	D130	1a		-----	
1081	D130	1a		-----	
1108		-----		-----	
1138	D130	1a		-----	
1145		-----		-----	
1161		-----		-----	
1167		-----		-----	
1229	ISO2160	1a		-----	
1254	D130	1a		-----	
1257		-----		-----	
1276	D130	1a		-----	
1280		-----		-----	
1284		-----		-----	
1307	D130	1a		-----	
1357	D130	1a		-----	
1378	D130	1a		-----	
1404	D130	1a		-----	
1427	D130	1a		-----	
1429	D130	1a		-----	
1510	D130	1a		-----	
1603	D130	1a		-----	
1634	D130	1a		-----	
1653		-----		-----	
1656	D130	1a		-----	
1737		-----		-----	

1826	D130	1a	-----
1855		-----	-----
1858	D130	1a	-----
1902	D130	1a	-----
1939	D130	1a	-----
1948	D130	1a	-----
1949	D130	1a	-----
1950	D130	1a	-----
7001		-----	-----
7009		-----	-----

normality	n.a.
n	58
outliers	0
mean (n)	1(a)
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D130:10)	n.a.

Determination of Density @ 15°C on sample #11025; results in kg/L

lab	method	value	mark	z(targ)	remarks
140	D4052	0.718		0.49	
150	D4052	0.7177		0.21	
158	D4052	0.7173		-0.17	
171	D4052	0.7179		0.40	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	D4052	0.7175		0.02	
317	D4052	0.7174		-0.08	
323	D4052	0.7173		-0.17	
329	D4052	0.7175		0.02	
333	D4052	0.7173	C	-0.17	First reported 717.3
334	D4052	0.7175		0.02	
336	D4052	0.7174		-0.08	
337	D4052	0.7176		0.11	
360	D4052	0.7175		0.02	
371	D4052	0.7174		-0.08	
391	D4052	0.7174		-0.08	
399	D4052	0.7171		-0.36	
444	D4052	0.7175		0.02	
445	D4052	0.7174		-0.08	
447	D4052	0.7173		-0.17	
494	D4052	0.7174		-0.08	
495	D4052	0.7174		-0.08	
529		-----		-----	
541	D4052	0.7175		0.02	
604	D4052	0.71760		0.11	
608	D4052	0.7175		0.02	
657	D4052	0.7190	G(0.01)	1.43	
704	D4052	0.7173		-0.17	
759		-----		-----	
781	D4052	0.7175		0.02	
855	D4052	0.71742		-0.06	
862	D4052	0.71744		-0.04	
868	D4052	0.71740		-0.08	
873	D4052	0.7174		-0.08	
875	D4052	0.7175		0.02	
912	D4052	0.7176		0.11	
962		-----		-----	
963	D4052	0.7178		0.30	
974	D4052	0.7176		0.11	
994	D4052	0.7175		0.02	
995		-----		-----	
1011	D4052	0.71782		0.32	
1016	D4052	0.7175		0.02	
1038	D4052	0.7175		0.02	
1065	D4052	0.7178		0.30	
1066	D4052	0.7174		-0.08	
1067	D4052	0.7176		0.11	
1080	D4052	0.7175		0.02	
1081	ISO12185	0.7175	C	0.02	First reported 717.5
1108	D4052	0.7174		-0.08	
1138	D4052	0.7174	C	-0.08	First reported 717.4
1145	D4052	0.7174		-0.08	
1161		-----		-----	
1167		-----		-----	
1229	ISO12185	0.71747		-0.01	
1254	D4052	0.71741		-0.07	
1257		-----		-----	
1276	D4052	0.71723		-0.24	
1280		-----		-----	
1284	D4052	0.71775		0.25	
1307	D4052	0.71737		-0.10	
1357	D4052	0.7171	C	-0.36	First reported 717.1
1378	D4052	0.7174	C	-0.08	First reported 717.4
1404	D4052	0.7176		0.11	
1427	D4052	0.71739		-0.08	
1429	D4052	0.7175		0.02	
1510	D4052	0.7174		-0.08	
1603	in house	0.7175		0.02	
1634	D4052	0.717463	C	-0.02	First reported 717.463
1653		-----		-----	
1656		-----		-----	
1737	D4052	0.7173		-0.17	

1826	D4052	0.7174	-0.08
1855	D4052	0.7175	0.02
1858	D4052	0.71745	-0.03
1902	D4052	0.7180	0.49
1939	D4052	0.7175	0.02
1948	D4052	0.7175	0.02
1949	D4052	0.7173	-0.17
1950	D4052	0.7174	-0.08
7001	D4052	0.7175	0.02
7009		-----	-----

normality	not OK	
n	69	
outliers	1	
mean (n)	0.71748	
st.dev. (n)	0.000170	
R(calc.)	0.00048	
R(D4052:09)	0.00297	Compare R(D4052:02e1) = 0.00050
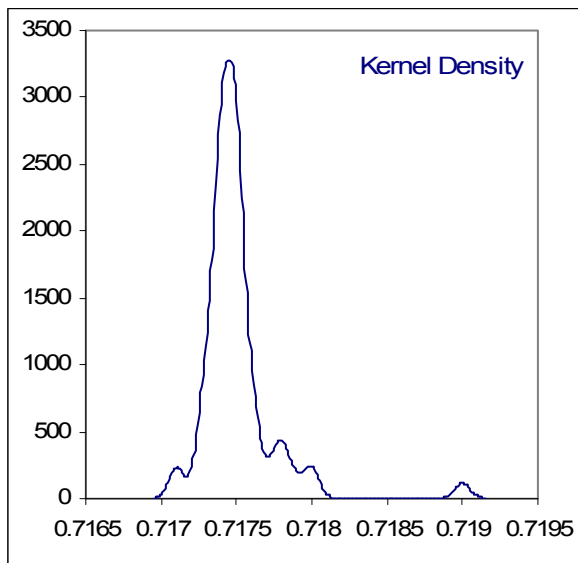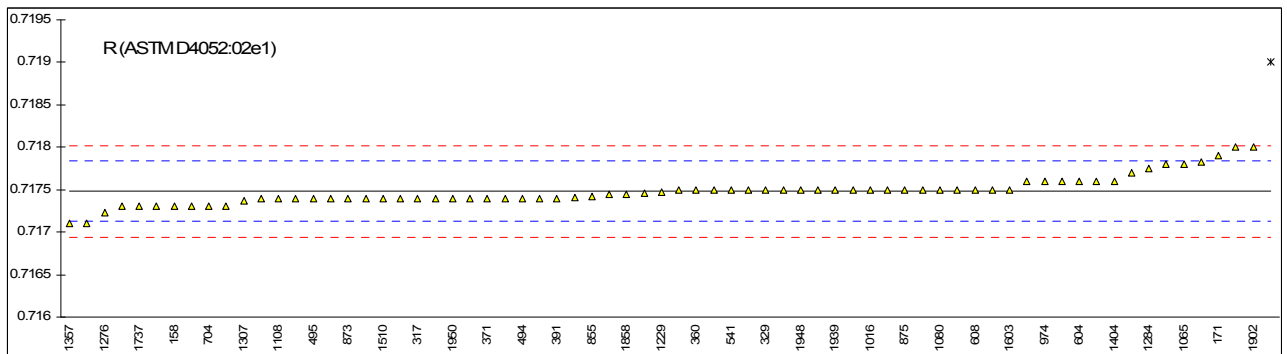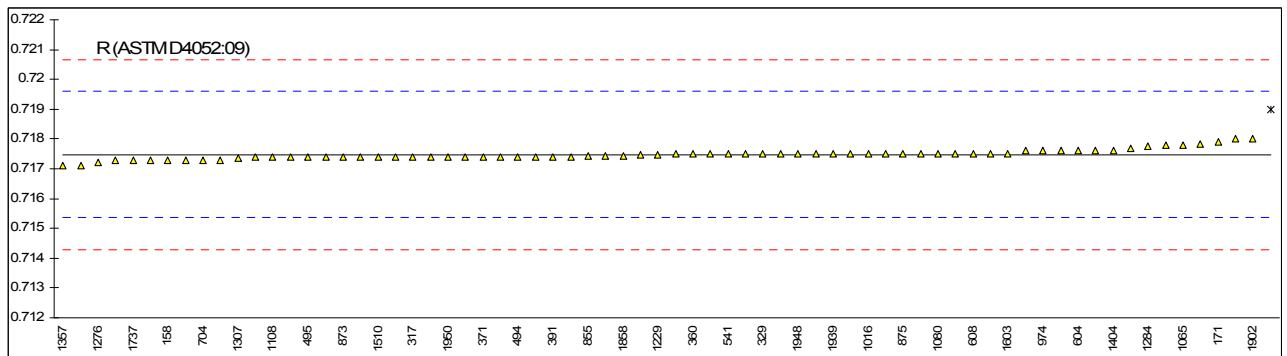
Determination of Distillation (automated mode) on sample #11025; results in °C

lab	method	IBP	mark	z(targ)	50%eva.	Mark	z(targ)	FBP	mark	z(targ)	remarks
140	D86	40.2		-0.83	99.7	G(0.05)	-3.01	156.8		-0.66	
150	D86	46.5		2.36	101.5		-0.33	158.5		0.04	
158	D86	47.2		2.71	101.8		0.11	162.0		1.49	
171	D86	41.9		0.03	102.3		0.86	159.2		0.33	
225		-----		-----	-----		-----	-----		-----	
237		-----		-----	-----		-----	-----		-----	
238		-----		-----	-----		-----	-----		-----	
311	D86	38.3		-1.79	101.4		-0.48	157.6		-0.33	
317	D86	39.3		-1.28	101.3		-0.63	156.9		-0.62	
323	D86	39.0		-1.44	101.0		-1.08	156.5		-0.78	
329	D86	40.0		-0.93	102.0	fr 98.0	0.41	161.5		1.28	
333	D86	40.8		-0.52	101.5		-0.33	158.6		0.08	
334	D86	43.2		0.69	102.2		0.71	159.0		0.25	
336	D86	42.9		0.54	102.3		0.86	159.3		0.37	
337		-----		-----	-----		-----	-----		-----	
360	D86	41.5		-0.17	101.8		0.11	158.2		-0.08	
371	D86	40.9		-0.47	100.6		-1.67	156.1		-0.95	
391	D86	46.6		2.41	100.7		-1.52	146.4	G(0.01)	-4.95	
399	D86	43.2		0.69	100.9		-1.23	146.0	G(0.01)	-5.12	
444		-----		-----	-----		-----	-----		-----	
445	D86	44.3		1.25	102.2		0.71	160.2		0.74	
447	D86	42.2		0.18	102.0		0.41	158.6		0.08	
494	D86	39.9		-0.98	101.7		-0.04	157.6		-0.33	
495	D86	38.5		-1.69	101.2		-0.78	157.5		-0.37	
529		-----		-----	-----		-----	-----		-----	
541		-----		-----	-----		-----	-----		-----	
604	D86	40.0		-0.93	101.8		0.11	158.4		0.00	
608		-----		-----	-----		-----	-----		-----	
657	D86	43.2		0.69	101.9		0.26	158.0		-0.16	
704		-----		-----	-----		-----	-----		-----	
759		-----		-----			-----	-----		-----	
781		-----		-----	-----		-----	-----		-----	
855	D86	41.8		-0.02	103.0		1.90	158.9		0.21	
862	D86	42.5		0.34	102.3		0.86	157.3		-0.45	
868	D86	43.3		0.74	101.4		-0.48	156.7		-0.70	
873	D86	44.0		1.09	102.0		0.41	157.0		-0.58	
875		-----		-----	-----		-----	-----		-----	
912		-----		-----	-----		-----	-----		-----	
962		-----		-----			-----	-----		-----	
963		-----		-----	-----		-----	-----		-----	
974	D86	43.4		0.79	100.9		-1.23	158.8		0.17	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1011		-----		-----	-----		-----	-----		-----	
1016	D86	42.9		0.54	101.7		-0.04	157.7		-0.29	
1038	D86	40.3		-0.78	101.2		-0.78	157.3		-0.45	
1065	D86	42.2		0.18	102.3		0.86	160.4		0.83	
1066	D86	39.2		-1.33	101.9		0.26	157.1		-0.54	
1067	D86	45.4		1.80	101.9		0.26	160.0		0.66	
1080	D86	43.0		0.59	102.1		0.56	158.7		0.12	
1081	D86	43.9		1.04	100.8		-1.38	156.9		-0.62	
1108	D86	43.5		0.84	102.3		0.86	158.0		-0.16	
1138	D86	41.4		-0.22	102.7		1.45	158.6		0.08	
1145	D86	42.2		0.18	100.4		-1.97	158.2		-0.08	
1161		-----		-----	-----		-----	-----		-----	
1167		-----		-----	-----		-----	-----		-----	
1229	ISO3405	38.0		-1.94	100.8		-1.38	159.9		0.62	
1254	D86	40.1		-0.88	101.3		-0.63	156.9		-0.62	
1257		-----		-----	-----		-----	-----		-----	
1276	D86	41.9		0.03	101.4		-0.48	156.3		-0.87	
1280		-----		-----	-----		-----	-----		-----	
1284	D86	40.9		-0.47	102.1		0.56	159.5		0.46	
1307	D86	43.9		1.04	103.2		2.20	158.8		0.17	
1357	D86	40.2		-0.83	102.1		0.56	165	G(0.01)	2.73	
1378	D86	43.3		0.74	102.3		0.86	158.2		-0.08	
1404	ISO3405	43.0		0.59	102.1		0.56	160.4		0.83	
1427	D86	41.1		-0.37	101.4		-0.48	157.7		-0.29	
1429	D86	38.2		-1.84	101.9		0.26	158.2		-0.08	
1510	D86	42.4		0.28	100.5		-1.82	157.9		-0.21	
1603	D86	39.2		-1.33	102.2		0.71	162.9		1.86	
1634	D86	39.9		-0.98	101.6		-0.18	165.7	G(0.05)	3.02	
1653		-----		-----	-----		-----	-----		-----	
1656	D86	43.7		0.94	102.5		1.16	154.6		-1.57	
1737	D86	39.4		-1.23	101.8		0.11	158.3		-0.04	

1826	D86	40.1	-0.88	101.6	-0.18	156.8	-0.66
1855		-----	-----	-----	-----	-----	-----
1858		-----	-----	-----	-----	-----	-----
1902	D86	40.0	-0.93	101.6	-0.18	158.2	-0.08
1939	D86	44.6	1.40	101.3	-0.63	159.9	0.62
1948	D86	40.6	-0.63	102.1	0.56	158.9	0.21
1949		-----	-----	-----	-----	-----	-----
1950		-----	-----	-----	-----	-----	-----
7001	D86	43.8	0.99	102.0	0.41	161.2	1.16
7009		-----	-----	-----	-----	-----	-----
	normality	OK		OK		OK	
	n	56		55		52	
	outliers	0		1		4	
	mean (n)	41.84		101.72		158.40	
	st.dev. (n)	2.190		0.609		1.568	
	R(calc.)	6.13		1.70		4.39	
	R(D86:10a)	5.54		1.88		6.78	
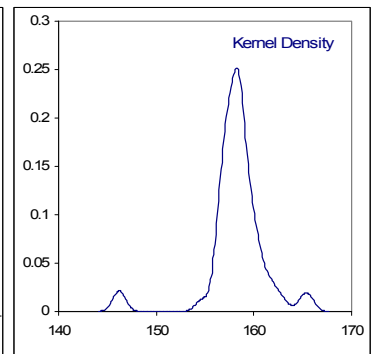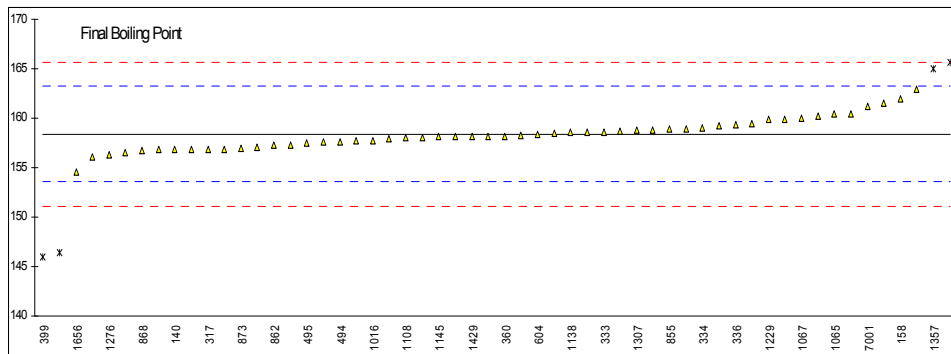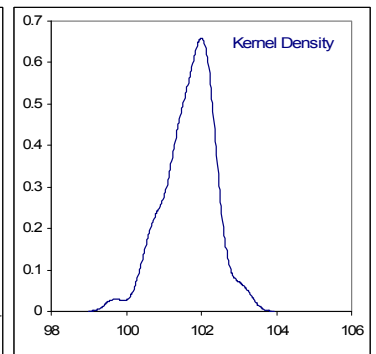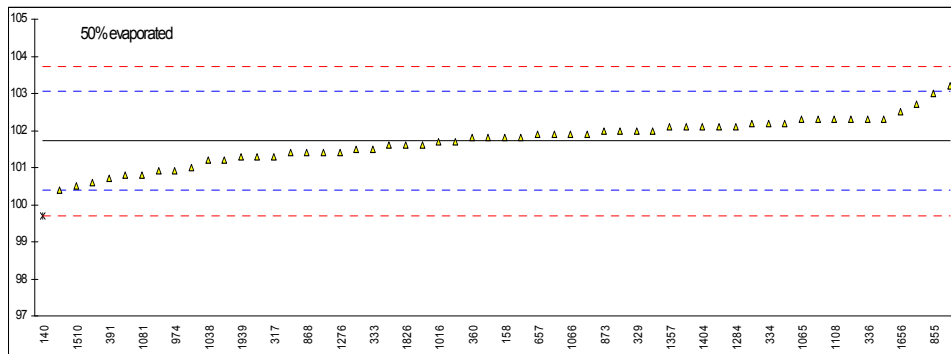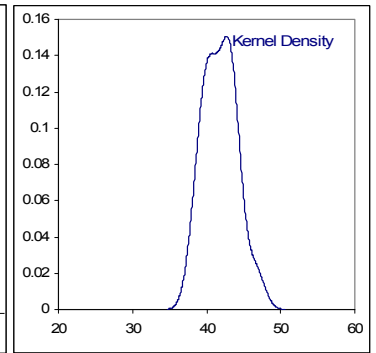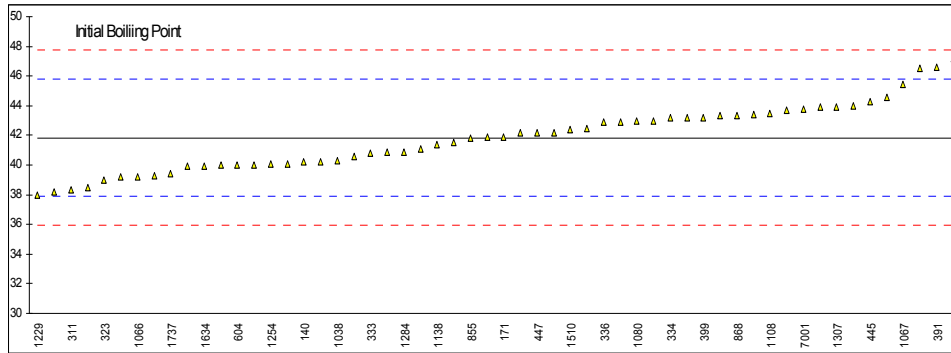
Determination of Distillation (manual mode) on sample #11025; results in °C

lab	method	IBP	mark	z(targ)	50%eva.	Mark	z(targ)	FBP	mark	z(targ)	remarks
140		-----	-----	-----	-----		-----	-----		-----	
150		-----	-----	-----	-----		-----	-----		-----	
158		-----	-----	-----	-----		-----	-----		-----	
171		-----	-----	-----	-----		-----	-----		-----	
225		-----	-----	-----	-----		-----	-----		-----	
237		-----	-----	-----	-----		-----	-----		-----	
238		-----	-----	-----	-----		-----	-----		-----	
311		-----	-----	-----	-----		-----	-----		-----	
317		-----	-----	-----	-----		-----	-----		-----	
323		-----	-----	-----	-----		-----	-----		-----	
329		-----	-----	-----	-----		-----	-----		-----	
333		-----	-----	-----	-----		-----	-----		-----	
334		-----	-----	-----	-----		-----	-----		-----	
336		-----	-----	-----	-----		-----	-----		-----	
337		-----	-----	-----	-----		-----	-----		-----	
360		-----	-----	-----	-----		-----	-----		-----	
371		-----	-----	-----	-----		-----	-----		-----	
391		-----	-----	-----	-----		-----	-----		-----	
399		-----	-----	-----	-----		-----	-----		-----	
444		-----	-----	-----	-----		-----	-----		-----	
445		-----	-----	-----	-----		-----	-----		-----	
447		-----	-----	-----	-----		-----	-----		-----	
494		-----	-----	-----	-----		-----	-----		-----	
495		-----	-----	-----	-----		-----	-----		-----	
529		-----	-----	-----	-----		-----	-----		-----	
541	D86	41.5		-0.64	101.0		0.00	161.5		1.34	
604		-----	-----	-----	-----		-----	-----		-----	
608	D86	44.0		0.61	100.5		-0.35	159.5		0.57	
657		-----	-----	-----	-----		-----	-----		-----	
704	D86	41.0		-0.89	101.0		0.00	156.5		-0.60	
759		-----	-----	-----	-----		-----	-----		-----	
781	D86	43.0		0.11	100.5		-0.35	156.5		-0.60	
855		-----	-----	-----	-----		-----	-----		-----	
862		-----	-----	-----			-----	-----		-----	
868		-----	-----	-----	-----		-----	-----		-----	
873		-----	-----	-----	-----		-----	-----		-----	
875	D86	42.5		-0.14	101.0		0.00	157.5		-0.21	
912	D86	41.0		-0.89	101.0		0.00	158.0		-0.02	
962		-----	-----	-----	-----		-----	-----		-----	
963	D86	44.5		0.86	102.0		0.70	159.0		0.37	
974		-----	-----	-----	-----		-----	-----		-----	
994	D86	44.5		0.86	99.5		-1.05	155.5		-0.99	
995		-----	-----	-----	-----		-----	-----		-----	
1011		-----	-----	-----	-----		-----	-----		-----	
1016		-----	-----	-----	-----		-----	-----		-----	
1038		-----	-----	-----	-----		-----	-----		-----	
1065		-----	-----	-----	-----		-----	-----		-----	
1066		-----	-----	-----	-----		-----	-----		-----	
1067		-----	-----	-----	-----		-----	-----		-----	
1080		-----	-----	-----	-----		-----	-----		-----	
1081		-----	-----	-----	-----		-----	-----		-----	
1108		-----	-----	-----	-----		-----	-----		-----	
1138		-----	-----	-----	-----		-----	-----		-----	
1145		-----	-----	-----	-----		-----	-----		-----	
1161		-----	-----	-----	-----		-----	-----		-----	
1167		-----	-----	-----	-----		-----	-----		-----	
1229		-----	-----	-----	-----		-----	-----		-----	
1254		-----	-----	-----	-----		-----	-----		-----	
1257		-----	-----	-----	-----		-----	-----		-----	
1276		-----	-----	-----	-----		-----	-----		-----	
1280		-----	-----	-----	-----		-----	-----		-----	
1284		-----	-----	-----	-----		-----	-----		-----	
1307		-----	-----	-----	-----		-----	-----		-----	
1357		-----	-----	-----	-----		-----	-----		-----	
1378		-----	-----	-----	-----		-----	-----		-----	
1404		-----	-----	-----	-----		-----	-----		-----	
1427		-----	-----	-----	-----		-----	-----		-----	
1429		-----	-----	-----	-----		-----	-----		-----	
1510		-----	-----	-----	-----		-----	-----		-----	
1603		-----	-----	-----	-----		-----	-----		-----	
1634		-----	-----	-----	-----		-----	-----		-----	
1653		-----	-----	-----	-----		-----	-----		-----	
1656		-----	-----	-----	-----		-----	-----		-----	
1737		-----	-----	-----	-----		-----	-----		-----	

1826		-----		-----	-----		-----	-----	-----
1855		-----		-----	-----		-----	-----	-----
1858	D86	43.5	0.36	101.0	0.00	159.0		0.37
1902		-----		-----	-----		-----	-----	-----
1939		-----		-----	-----		-----	-----	-----
1948		-----		-----	-----		-----	-----	-----
1949	D86	42.0	-0.39	101.5	0.35	159.5		0.57
1950	D86	43.0	0.11	102.0	0.70	156.0		-0.80
7001		-----		-----	-----		-----	-----	-----
7009		-----		-----	-----		-----	-----	-----

normality	OK	OK	OK	
n	11	11	11	
outliers	0	0	0	
mean (n)	42.77	101.00	158.05	
st.dev. (n)	1.292	0.707	1.836	
R(calc.)	3.62	1.98	5.14	
R(D86:10a)	5.60	4.00	7.20	
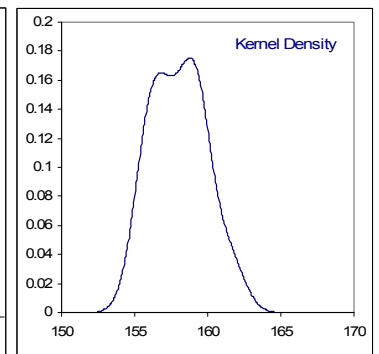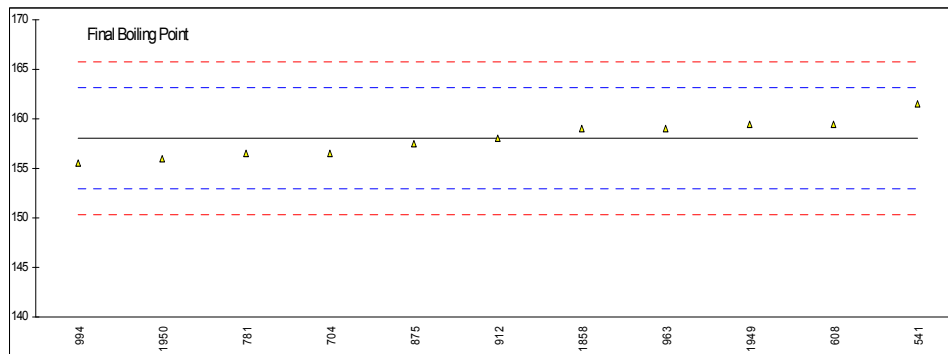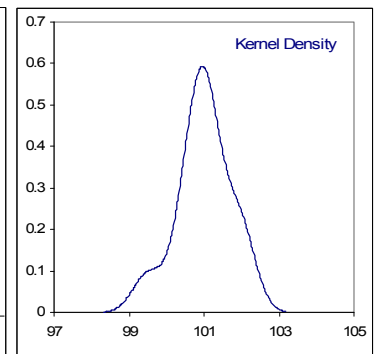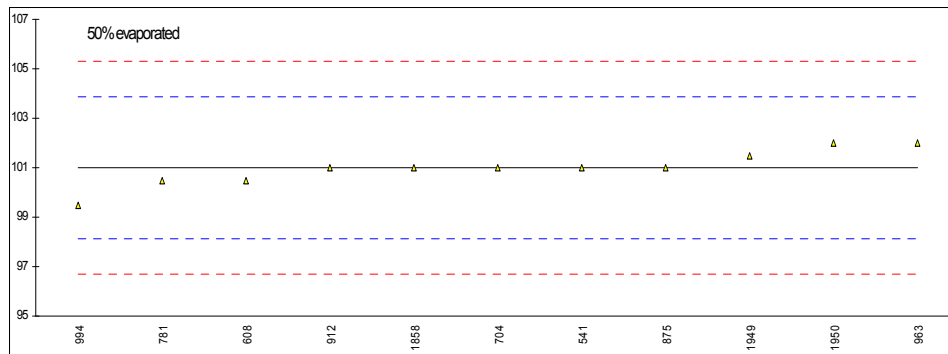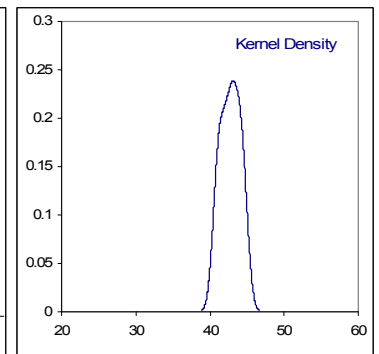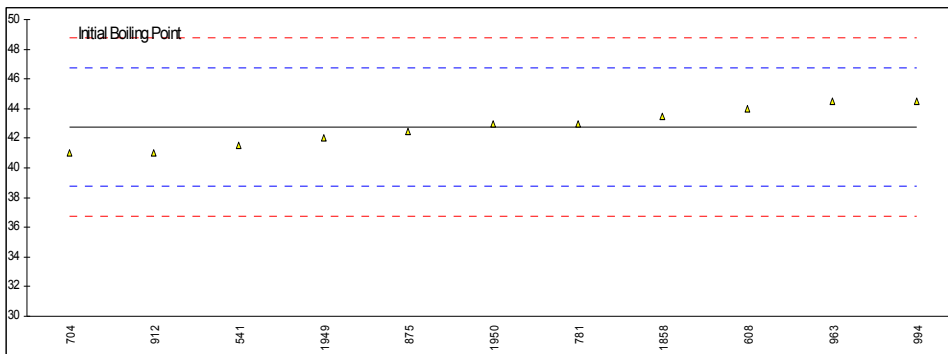
Determination of Mercaptans on sample #11025; results in mg/kg

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D3227	4		-0.42	
158	D3227	4		-0.42	
171	D3227	3.7		-0.67	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	D3227	5		0.44	
317	D3227	7		2.14	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334	D3227	1.08	G(0.05)	-2.90	
336		-----		-----	
337		-----		-----	
360	D3227	4.98		0.42	
371	D3227	4.0		-0.42	
391	D3227	4		-0.42	
399		-----		-----	
444		-----		-----	
445	D3227	4		-0.42	
447	D3227	6		1.29	
494	D3227	3.2		-1.10	
495	D3227	<3		-----	
529		-----		-----	
541		-----		-----	
604		-----		-----	
608		-----		-----	
657	D3227	4.0		-0.42	
704	D3227	4.1		-0.33	
759		-----		-----	
781	UOP163	6.5		1.71	
855	D3227	4.6		0.10	
862	D3227	3.9		-0.50	
868	D3227	4.4		-0.07	
873	D3227	7		2.14	
875	D3227	7.37		2.45	
912		-----		-----	
962		-----		-----	
963	D3227	4		-0.42	
974	D3227	4.365		-0.10	
994	D3227	3.8		-0.59	
995		-----		-----	
1011	D3227	2.2		-1.95	
1016	D3227	3.99		-0.42	
1038	D3227	4		-0.42	
1065		-----		-----	
1066	D3227	4		-0.42	
1067	D3227	3.6		-0.76	
1080		-----		-----	
1081	D3227	<10		-----	
1108	D3227	4.7		0.18	
1138		-----		-----	
1145		-----		-----	
1161		-----		-----	
1167		-----		-----	
1229	ISO3012	3.291		-1.02	
1254	D3227	3.95		-0.46	
1257		-----		-----	
1276	D3227	14.186	G(0.01)	8.26	
1280	UOP163	6.81		1.98	
1284	D3227	3.4		-0.93	
1307	D3227	4.68		0.16	
1357	D3227	4.5		0.01	
1378	D3227	4	C	-0.42	First reported 0.0004
1404	ISO12185	3		-1.27	
1427	D3227	4.281		-0.18	
1429		-----		-----	
1510		-----		-----	
1603	D3227	4.7		0.18	
1634		-----		-----	
1653		-----		-----	
1656	UOP163	<5		-----	
1737		-----		-----	

1826	D3227	8	G(0.01)	2.99
1855		-----		-----
1858	D3227	3		-1.27
1902	D3227	4.3		-0.16
1939	D3227	8.53	G(0.01)	3.44
1948	D3227	6.7308		1.91
1949	D3227	5		0.44
1950	D3227	4		-0.42
7001	D3227	5.41		0.79
7009		-----		-----

normality	not OK
n	44
outliers	4
mean (n)	4.488
st.dev. (n)	1.1715
R(calc.)	3.280
R(D3227:10)	3.288

Kernel Density
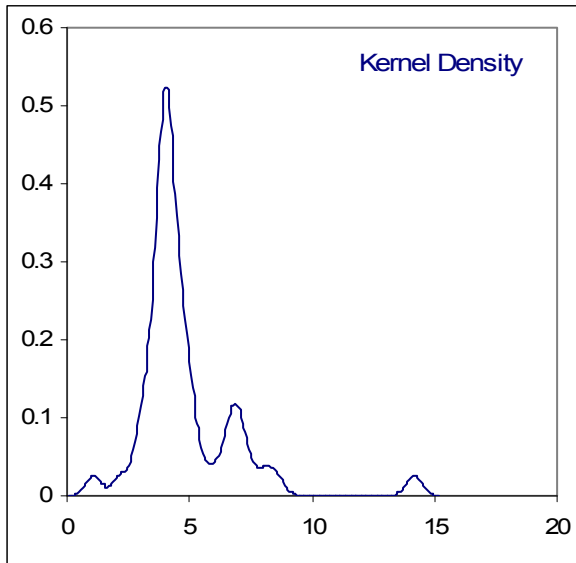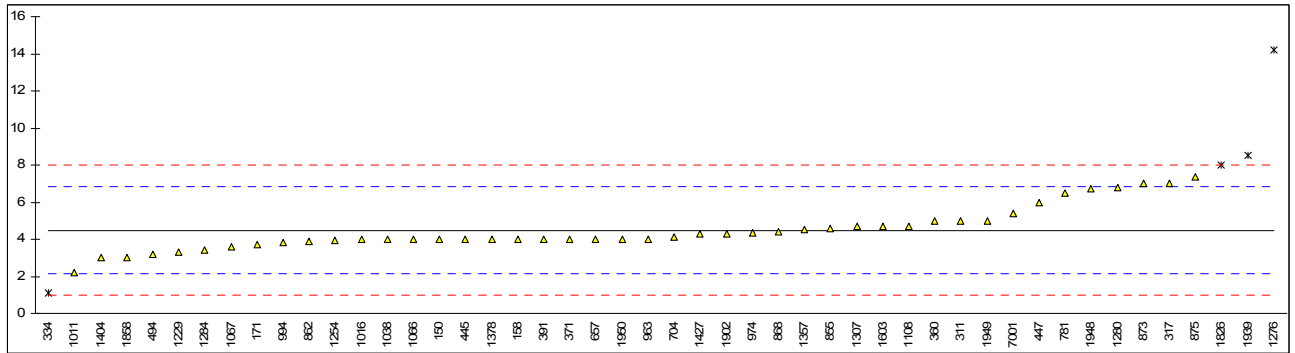
Determination of Sulphur on sample #11025; results in mg/kg

lab	method	value	mark	z(targ)	remarks
140	D2622	13		2.93	
150	D5453	9.1		-1.06	
158	D2622	11		0.88	
171	D2622	11.840		1.74	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311		-----		-----	
317	D2622	13.6		3.54	
323	D2622	11		0.88	
329	D3120	8.0		-2.19	
333		-----		-----	
334	D4294	9.7		-0.45	
336	ISO20846	7.7		-2.50	
337		-----		-----	
360	D5453	8.70		-1.47	
371	D5453	10.5		0.37	
391	D2622	9.7		-0.45	
399	D2622	9.0		-1.16	
444	D5453	10.48		0.35	
445	IP490	10.55		0.42	
447		-----		-----	
494	D5453	9.75		-0.40	
495	D5453	8.1		-2.09	
529		-----		-----	
541	D5453	7		-3.21	
604		-----		-----	
608	D5453	7.07		-3.14	
657	D5453	10.2		0.06	
704	D5453	10.0		-0.14	
759		-----		-----	
781	D5453	9.265		-0.89	
855	D5453	12.4		2.32	
862	D2622	11.6		1.50	
868	D3120	9.1		-1.06	
873	D4294	<150		-----	
875	D5453	8.82		-1.35	
912		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994	D5453	11.86		1.76	
995		-----		-----	
1011	ISO20846	8.63		-1.54	
1016	D2622	11.98		1.89	
1038	D2622	9.5		-0.65	
1065		-----		-----	
1066	D2622	15.3	G(0.05)	5.28	
1067		-----		-----	
1080	D5453	8.87		-1.30	
1081	D4294	10		-0.14	
1108	D5453	9.7		-0.45	
1138		-----		-----	
1145	D5453	9.61		-0.54	
1161		-----		-----	
1167		-----		-----	
1229	ISO20846	8.9		-1.27	
1254	D5453	11.60		1.50	
1257		-----		-----	
1276	D5453	13.1		3.03	
1280	ISO20846	8.29		-1.89	
1284	D2622	9.8		-0.35	
1307	D5453	9.95		-0.19	
1357	D5453	10.1		-0.04	
1378	D5453	10.5		0.37	
1404	ISO20846	9.8		-0.35	
1427	D5453	9.54		-0.61	
1429		-----	W	-----	Result withdrawn
1510		-----		-----	
1603	in house	9.8		-0.35	
1634		-----		-----	
1653		-----		-----	
1656	D5453	9.32		-0.84	
1737		-----		-----	

1826	D2622	10	-0.14
1855		-----	-----
1858	ISO20846	12.55	2.47
1902	D5453	12.1	2.01
1939	D5453	9.96	-0.18
1948	D2622	10.78	0.66
1949	D4294	13.4	3.34
1950	D4294	<17	-----
7001	D5453	10.5	0.37
7009		-----	-----

			Only ASTM D2622 data:	Only ASTM D5453 data:
normality	OK		OK	OK
n	53		13	27
outliers	1		1	0
mean (n)	10.138		10.985	9.929
st.dev. (n)	1.5453		1.3908	1.4489
R(calc.)	4.327		3.894	4.057
R(D2622:10)	2.735		3.277	3.243

Kernel Density
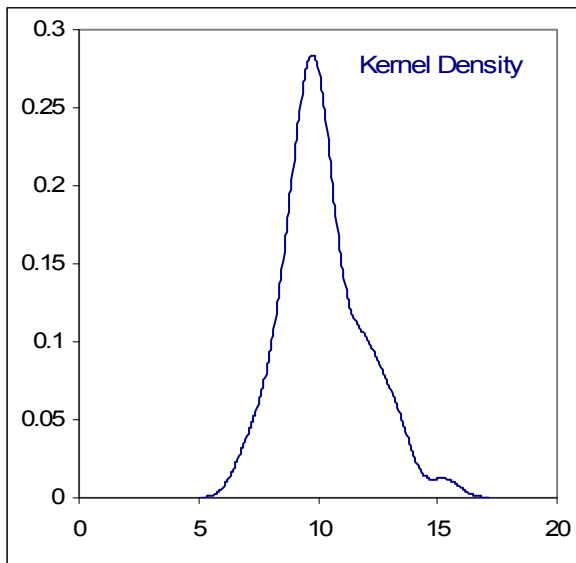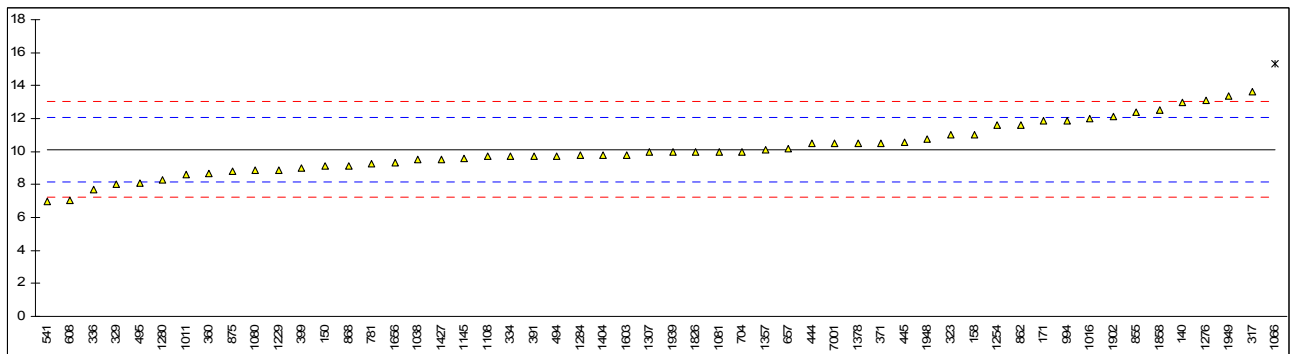
Determination of Organic Chlorides as Cl on sample #11026; results in mg/kg

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150		-----		-----	
158	D5808	1		-0.81	
171	D5808	1.24		-0.29	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	D5808	<2		-----	
317	UOP779	2		1.35	
323	D5808	1		-0.81	
329	UOP779	1		-0.81	
333		-----		-----	
334		-----		-----	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
391		-----		-----	
399		-----		-----	
444	IP510	0.9		-1.02	
445		-----		-----	
447		-----		-----	
494	D5808	2.9		3.29	
495		-----		-----	
529		-----		-----	
541		-----		-----	
604		-----		-----	
608		-----		-----	
657	D5808	1.2		-0.38	
704		-----		-----	
759		-----		-----	
781		-----		-----	
855	D5808	1.2		-0.38	
862	D5808	0.8		-1.24	
868	D5808	1.5		0.27	
873	UOP779	1.9		1.13	
875	UOP779	2.5		2.42	
912		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
995		-----		-----	
1011		-----		-----	
1016		-----		-----	
1038		-----		-----	
1065		-----		-----	
1066	UOP779	1		-0.81	
1067	UOP779	1.7		0.70	
1080		-----		-----	
1081	D5808	1.1		-0.59	
1108		-----		-----	
1138		-----		-----	
1145	D5808	<0.50		<-1.88	False negative?
1161		-----		-----	
1167		-----		-----	
1229		-----		-----	
1254		-----		-----	
1257		-----		-----	
1276	in house	0.20		-2.53	
1280	UOP779	1.46		0.18	
1284		-----		-----	
1307	D5808	0.988		-0.83	
1357		-----		-----	
1378	D4929	1 .55		-----	
1404		-----		-----	
1427	D5808	1.62		0.53	
1429	D5808	1.04		-0.72	
1510		-----		-----	
1603	in house	2.0		1.35	
1634		-----		-----	
1653		-----		-----	
1656		-----		-----	
1737		-----		-----	

1826	D5808	0.99	-0.83
1855		-----	-----
1858	UOP779	1.49	0.25
1902	D5808	1.48	0.23
1939	D4929	0.38	-2.14
1948		-----	-----
1949		-----	-----
1950	IP510	2.1	1.56
7001	D5808	1.8	0.92
7009		-----	-----

normality	OK
n	28
outliers	0
mean (n)	1.375
st.dev. (n)	0.5970
R(calc.)	1.671
R(D5808:09a)	1.300

Application range ASTM D5808 = 1 - 25 mg/kg

Kernel Density
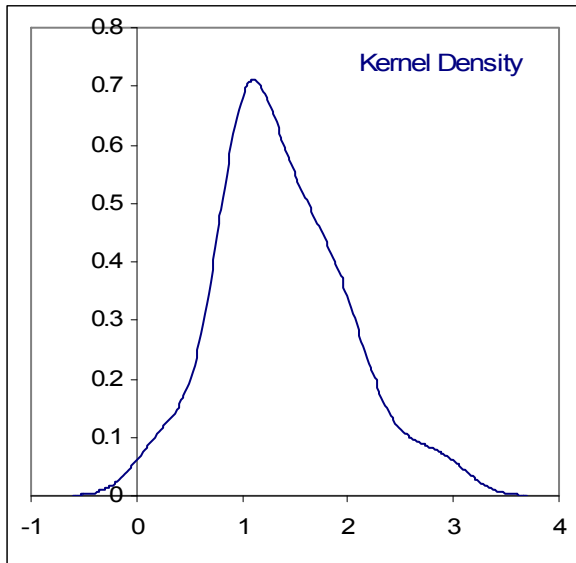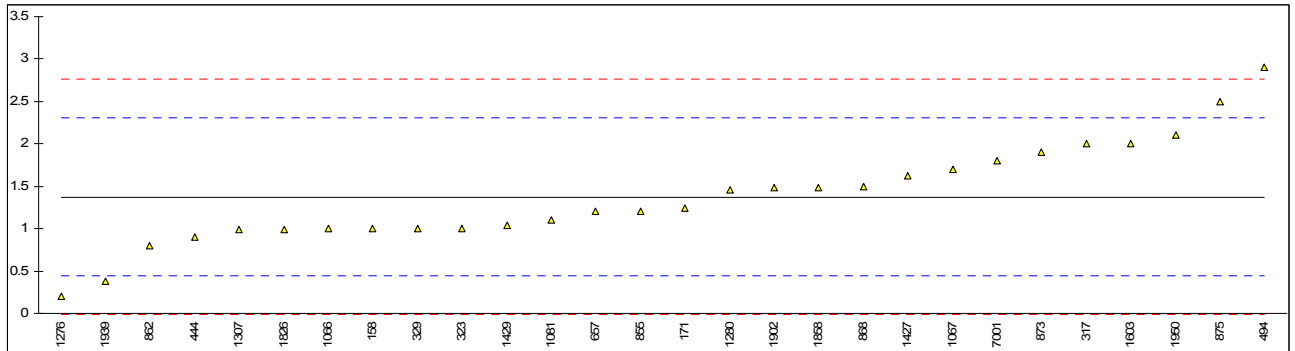
Determination of Methanol on sample #11026; result in mg/kg

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150		-----		-----	
158		-----		-----	
171	UOP960	187.5		2.47	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	INH-403	210		4.38	
317	INH-200	111	ex	-4.00	Result excluded, see §4.1
323	INH-304	118		-3.41	
329		-----		-----	
333		-----		-----	
334		-----		-----	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
391		-----		-----	
399		-----		-----	
444	INH-008	56.2	ex	-8.64	Result excluded, see §4.1
445	INH-060	163.8		0.47	
447		-----		-----	
494		-----		-----	
495		-----		-----	
529		-----		-----	
541		-----		-----	
604		-----		-----	
608		-----		-----	
657	INH-130	149.17		-0.77	
704		-----		-----	
759		-----		-----	
781		-----		-----	
855	INH-024	160.1		0.15	
862	INH-024	145.2		-1.11	
868	INH-024	157.2		-0.09	
873		-----		-----	
875		-----		-----	
912		-----		-----	
962		-----		-----	
963	D7423	134.7		-1.99	
974	INH-01	101.85	ex	-4.77	Result excluded, see §4.1
994		-----		-----	
995		-----		-----	
1011	INH-030	147.1		-0.95	
1016		-----		-----	
1038		-----		-----	
1065		-----		-----	
1066	in house	145		-1.12	
1067		-----		-----	
1080	INH-M3	<50		<-9.16	False negative?
1081	in house	95	ex	-5.35	Result excluded, see §4.1
1108		-----		-----	
1138	in house	123		-2.98	
1145	D4815	405.92	G(0.01)	20.96	
1161		-----		-----	
1167		-----		-----	
1229		-----		-----	
1254		-----		-----	
1257		-----		-----	
1276	in house	119.3		-3.30	
1280		-----		-----	
1284		-----		-----	
1307	in house	182.3		2.03	
1357		-----		-----	
1378		-----		-----	
1404	in house	187.4		2.47	
1427		-----		-----	
1429		-----		-----	
1510		-----		-----	
1603		-----		-----	
1634		-----		-----	
1653		-----		-----	
1656	IP466Mod.	215		4.80	
1737	in house	114.6	ex	-3.70	Result excluded, see §4.1

1826	in house	145.8		-1.06	
1855		-----		-----	
1858		-----		-----	
1902		-----		-----	
1939	in house	0.287	ex	-13.37	Result excluded, see §4.1
1948		1.83	C,ex	-13.24	First reported 2.4, result excluded, see §4.1
1949	IP466	<100		<-4.93	False negative?
1950		-----		-----	
7001		-----		-----	
7009		-----		-----	

			Spike:		
normality	OK				
n	17				
outliers	1		Spike:		
mean (n)	158.27		148.0		Recovery <107%
st.dev. (n)	29.432				
R(calc.)	82.41				
R(Horwitz)	33.09				

Kernel Density
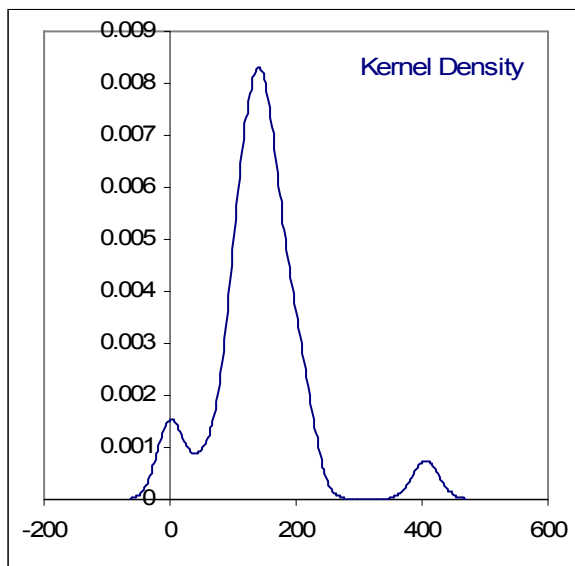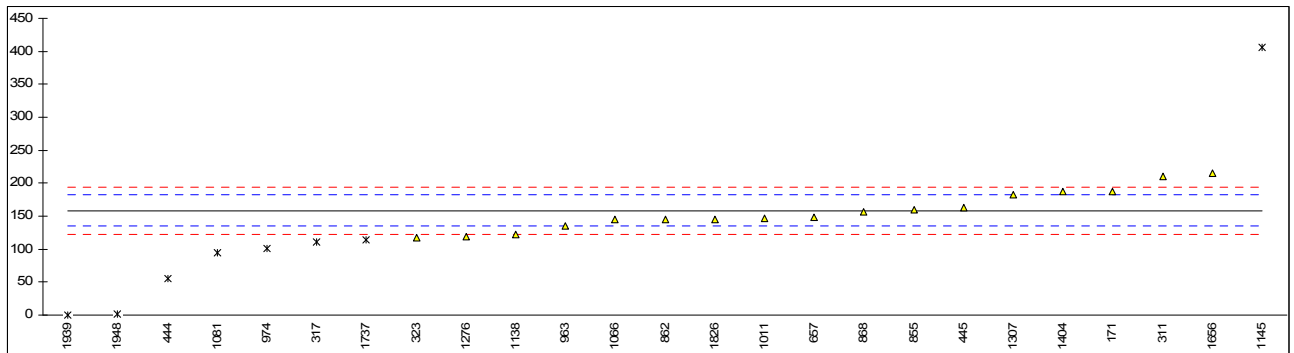
Determination of MTBE on sample #11026; result in mg/kg

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150		-----		-----	
158		-----		-----	
171	UOP960	151.9		0.25	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	INH-403	190		3.64	
317	INH-200	141		-0.72	
323	INH-304	136		-1.17	
329		-----		-----	
333		-----		-----	
334		-----		-----	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
391		-----		-----	
399		-----		-----	
444	INH-008	132.8		-1.45	
445	INH-060	137.8		-1.01	
447		-----		-----	
494		-----		-----	
495		-----		-----	
529		-----		-----	
541		-----		-----	
604		-----		-----	
608		-----		-----	
657	INH-130	156.64		0.67	
704		-----		-----	
759		-----		-----	
781		-----		-----	
855	INH-024	164.8		1.40	
862	INH-024	169.5		1.81	
868	INH-024	156.7		0.67	
873	INH-52714	128	C	-1.88	First reported 64
875	INH-52531	128		-1.88	
912		-----		-----	
962		-----		-----	
963	D7423	158.3		0.82	
974	INH-01	142.39		-0.60	
994		-----		-----	
995		-----		-----	
1011	INH-030	152.0		0.26	
1016		-----		-----	
1038		-----		-----	
1065	D6293	54	ex	-8.47	Result excluded, see §4.1
1066	in house	181		2.84	
1067		-----		-----	
1080	INH-M3	100	ex	-4.37	Result excluded, see §4.1
1081	in house	106	ex	-3.84	Result excluded, see §4.1
1108		-----		-----	
1138	in house	157		0.70	
1145	D4815	151.53		0.21	
1161		-----		-----	
1167		-----		-----	
1229		-----		-----	
1254		-----		-----	
1257		-----		-----	
1276	in house	124.7		-2.17	
1280		-----		-----	
1284		-----		-----	
1307	in house	155.9		0.60	
1357		-----		-----	
1378	in house	1900	G(0.01)	155.86	
1404	in house	230.1		7.21	
1427	in house	146.32		-0.25	
1429		-----		-----	
1510		-----		-----	
1603	in house	160		0.97	
1634		-----		-----	
1653		-----		-----	
1656	IP466Mod.	125		-2.15	
1737	in house	143.9		-0.46	

1826	in house	128.1		-1.87	
1855		-----		-----	
1858	INH-91	122.3		-2.39	
1902	in house	157		0.70	
1939	in house	83.158	ex	-5.87	Result excluded, see §4.1
1948	D6293	0.132	C,ex	-13.26	First reported 7.7, Result excluded, see §4.1
1949	IP466	120		-2.59	
1950	INH-91	125		-2.15	
7001		-----		-----	
7009		-----		-----	

normality	OK		
n	30		
outliers	1	Spike:	
mean (n)	149.12	150.4	Recovery <99%
st.dev. (n)	23.334		
R(calc.)	65.33		
R(Horwitz)	31.45		
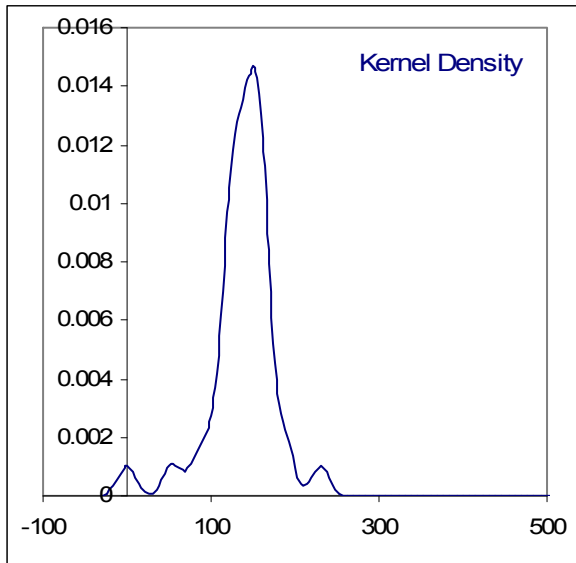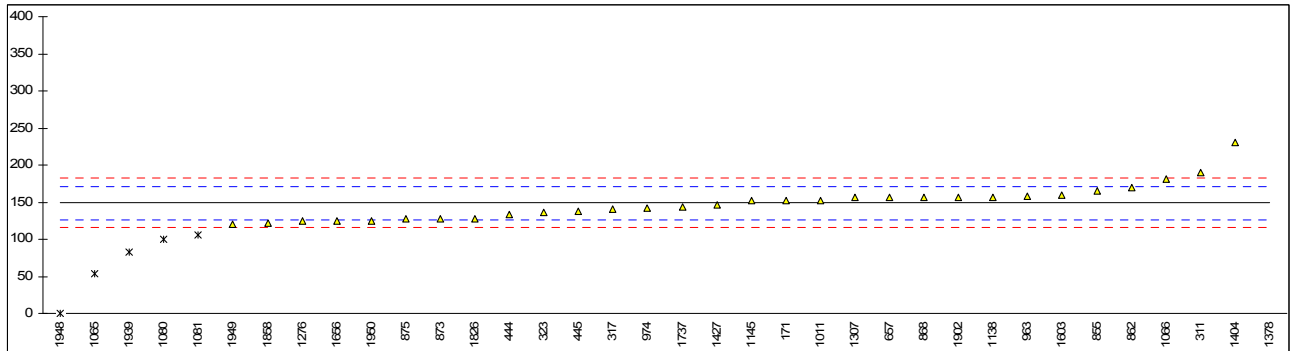
Determination of DIPE, TAME, MEK and Acetone on sample #11026; result in mg/kg

lab	method	DIPE	mark	z(targ)	TAME	mark	z(targ)	MEK	mark	z(targ)	Aceton	mark	z(targ)
140		-----		-----	-----		-----	-----		-----	-----		-----
150		-----		-----	-----		-----	-----		-----	-----		-----
158		-----		-----	-----		-----	-----		-----	-----		-----
171	UOP960	<10		-----	<10		-----	<10		-----	<10		-----
225		-----		-----	-----		-----	-----		-----	-----		-----
237		-----		-----	-----		-----	-----		-----	-----		-----
238		-----		-----	-----		-----	-----		-----	-----		-----
311	INH-403	<1		-----	<1		-----	<1		-----	<1		-----
317	INH-200	<5		-----	<5		-----	<5		-----	<5		-----
323	INH-304	<2		-----	<2		-----	-----		-----	-----		-----
329		-----		-----	-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----	-----		-----
336		-----		-----	-----		-----	-----		-----	-----		-----
337		-----		-----	-----		-----	-----		-----	-----		-----
360		-----		-----	-----		-----	-----		-----	-----		-----
371		-----		-----	-----		-----	-----		-----	-----		-----
391		-----		-----	-----		-----	-----		-----	-----		-----
399		-----		-----	-----		-----	-----		-----	-----		-----
444				-----	<3.5		-----	-----		-----	0.3		-----
445	INH-060	<5		-----	<5		-----	-----		-----	-----		-----
447		-----		-----	-----		-----	-----		-----	-----		-----
494		-----		-----	-----		-----	-----		-----	-----		-----
495		-----		-----	-----		-----	-----		-----	-----		-----
529		-----		-----	-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----	-----		-----
604		-----		-----	-----		-----	-----		-----	-----		-----
608		-----		-----	-----		-----	-----		-----	-----		-----
657	INH-130	<0.1		-----	<0.1		-----	0.39		-----	0.07		-----
704		-----		-----	-----		-----	-----		-----	-----		-----
759		-----		-----	-----		-----	-----		-----	-----		-----
781		-----		-----	-----		-----	-----		-----	-----		-----
855	INH-024	<10		-----	<10		-----	<10		-----	<10		-----
862	INH-024	<10		-----	<10		-----	<10		-----	<10		-----
868	INH-024	<1		-----	<1		-----	<1		-----	<1		-----
873		-----		-----	-----		-----	-----		-----	-----		-----
875		-----		-----	-----		-----	-----		-----	-----		-----
912		-----		-----	-----		-----	-----		-----	-----		-----
962		-----		-----	-----		-----	-----		-----	-----		-----
963	D7423	<0,5		-----	<0,5		-----	<0,5		-----	<0,5		-----
974		-----		-----	-----		-----	-----		-----	-----		-----
994		-----		-----	-----		-----	-----		-----	-----		-----
995		-----		-----	-----		-----	-----		-----	-----		-----
1011		-----		-----	-----		-----	-----		-----	-----		-----
1016		-----		-----	-----		-----	-----		-----	-----		-----
1038		-----		-----	-----		-----	-----		-----	-----		-----
1065		-----		-----	-----		-----	-----		-----	-----		-----
1066	in house	10		-----	<5		-----	-----		-----	-----		-----
1067		-----		-----	-----		-----	-----		-----	-----		-----
1080	INH-M3	<100		-----	<100		-----	-----		-----	-----		-----
1081	in house	0		-----	0		-----	0		-----	0		-----
1108		-----		-----	-----		-----	-----		-----	-----		-----
1138	in house	<1		-----	<1		-----	<1		-----	<1		-----
1145		-----		-----	<1.00		-----	-----		-----	<1.00		-----
1161		-----		-----	-----		-----	-----		-----	-----		-----
1167		-----		-----	-----		-----	-----		-----	-----		-----
1229		-----		-----	-----		-----	-----		-----	-----		-----
1254		-----		-----	-----		-----	-----		-----	-----		-----
1257		-----		-----	-----		-----	-----		-----	-----		-----
1276	in house	<1		-----	<1		-----	<1		-----	<1		-----
1280		-----		-----	-----		-----	-----		-----	-----		-----
1284		-----		-----	-----		-----	-----		-----	-----		-----
1307	in house	<1		-----	<1		-----	<1		-----	<1		-----
1357		-----		-----	-----		-----	-----		-----	-----		-----
1378		-----		-----	-----		-----	-----		-----	-----		-----
1404		-----		-----	-----		-----	-----		-----	-----		-----
1427		-----		-----	-----		-----	-----		-----	-----		-----
1429		-----		-----	-----		-----	-----		-----	-----		-----
1510		-----		-----	-----		-----	-----		-----	-----		-----
1603		-----		-----	-----		-----	-----		-----	-----		-----
1634		-----		-----	-----		-----	-----		-----	-----		-----
1653		-----		-----	-----		-----	-----		-----	-----		-----
1656	IP466Mod.	<5		-----	<5		-----	-----		-----	-----		-----
1737	in house	<0.5		-----	<0.5		-----	<0.5		-----	<0.5		-----

1826	in house	0.3	-----	0		-----	-----		-----	0.4	-----
1855		-----	-----	-----		-----	-----		-----	-----	-----
1858		-----	-----	-----		-----	-----		-----	-----	-----
1902	in house	<1	-----	<1		-----	<1		-----	-----	-----
1939	in house	0.01	-----	0.02		-----	0.04		-----	0.01	-----
1948	D6293	<1	-----	440	fp	-----	<1		-----	2.7	fp	-----
1949	IP526	<100	-----	<500		-----	-----		-----	<100	-----
1950		-----	-----	-----		-----	-----		-----	-----	-----
7001		-----	-----	-----		-----	-----		-----	-----	-----
7009		-----	-----	-----		-----	-----		-----	-----	-----
	normality	n.a.		n.a.			n.a.			n.a.	
	n	4		4			3			6	
	outliers	0		0			0			0	
	mean (n)	n.a.		n.a.			n.a.			n.a.	
	st.dev. (n)	n.a.		n.a.			n.a.			n.a.	
	R(calc.)	n.a.		n.a.			n.a.			n.a.	
	R(Horwitz)	n.a.		n.a.			n.a.			n.a.	

fp = false positive result

Determination of Total Oxygenates on sample #11026; result in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150		-----		-----	
158		-----		-----	
171	UOP960	0.03		0.43	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	INH-403	0.0400		4.03	
317	INH-200	0.025		-1.37	
323		-----		-----	
329		-----		-----	
333		-----		-----	
334		-----		-----	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
391		-----		-----	
399		-----		-----	
444		-----		-----	
445		-----		-----	
447		-----		-----	
494		-----		-----	
495		-----		-----	
529		-----		-----	
541		-----		-----	
604		-----		-----	
608		-----		-----	
657	INH-130	0.03068		0.68	
704		-----		-----	
759		-----		-----	
781		-----		-----	
855	INH-024	0.032		1.15	
862	INH-024	0.031		0.79	
868	INH-024	0.03157		1.00	
873		-----		-----	
875		-----		-----	
912		-----		-----	
962		-----		-----	
963	D7423	0.0293	C	0.18	First reported 293
974	INH-01	0.0244		-1.58	
994		-----		-----	
995		-----		-----	
1011		-----		-----	
1016		-----		-----	
1038		-----		-----	
1065		-----		-----	
1066		-----		-----	
1067		-----		-----	
1080	INH-M3	0.03		0.43	
1081	in house	0	G(0.05)	-10.36	
1108		-----		-----	
1138	in house	0.0280	C	-0.29	First reported 280
1145	D4815	0.05574	CG(0.01)	9.70	First reported 557.34
1161		-----		-----	
1167		-----		-----	
1229		-----		-----	
1254		-----		-----	
1257		-----		-----	
1276	D4815	0.0243		-1.62	
1280		-----		-----	
1284		-----		-----	
1307	in house	0.0339	C	1.84	First reported 339
1357		-----		-----	
1378	in house	0.25	G(0.01)	79.61	
1404	in house	0.4179	C,G(0.01)	140.04	First reported 417.9
1427		-----		-----	
1429		-----		-----	
1510		-----		-----	
1603		-----		-----	
1634		-----		-----	
1653		-----		-----	
1656	IP466Mod.	0.034	C	1.87	First reported 340
1737	in house	0.026		-1.01	

1826	in house	0.0278	-0.36
1855		-----	-----
1858		-----	-----
1902	in house	0.03	0.43
1939	in house	0.0192	-3.45
1948	D6293	0.02	-3.17
1949	D6293	<0.05	<7.61
1950		-----	-----
7001		-----	-----
7009		-----	-----

| normality	OK
n	19
outliers	4
mean (n)	0.0288
st.dev. (n)	0.00496
R(calc.)	0.0139
R(Horwitz)	0.0078

Kernel Density
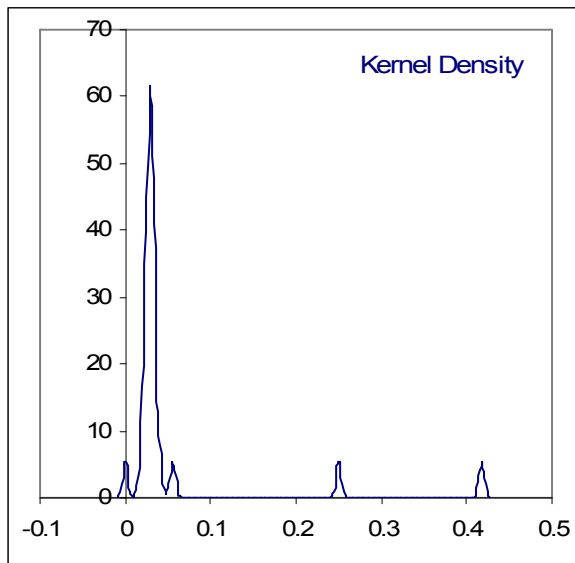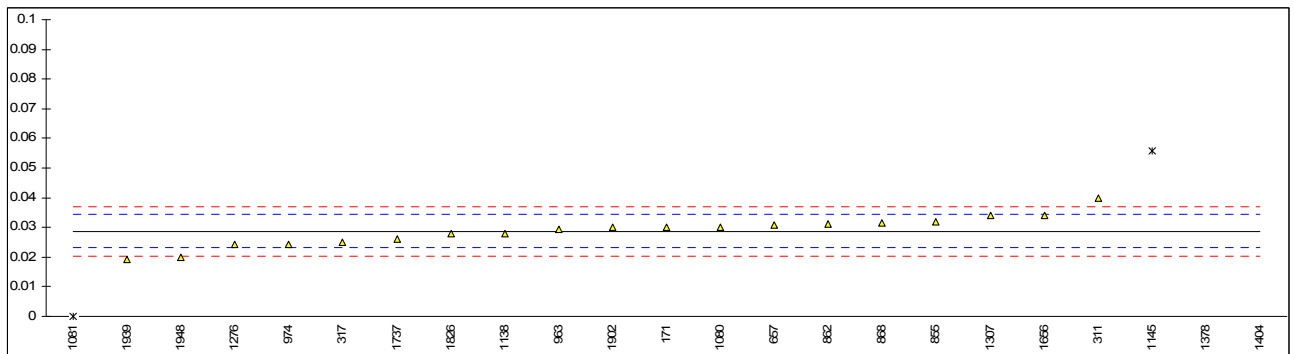
PONA/PIONA/PNA determination on sample #11026; results in %V/V

lab	method	n-paraf	mark	z(targ)	i-paraf	mark	z(targ)	Olefins	mark	z(targ)	Naphth.	Mark	z(targ)
140	D5134	32.406		-0.82	34.078		-4.09	0.136		-----	22.862		1.40
150	D5443mod	33.06		1.06	35.75		0.52	0.01	false -?	-----	22.50		-0.54
158	D5134	33.05		1.03	35.67		0.30	0.82	DG(5)	-----	19.15	G(5)	-18.48
171	D5134	33.034		0.99	35.061		-1.38	0.066		-----	22.911		1.66
225		-----		-----	-----		-----	-----		-----	-----		-----
237													
238		-----		-----	-----		-----	-----		-----	-----		-----
311	D5443	32.2		-1.42	35.7		0.39	<0.1		-----	23.5		4.81
317	D5443	32.34		-1.01	35.92		0.99	<0.05		-----	23.25		3.47
323	D5443	32.69		-0.01	35.18		-1.05	<0.10		-----	23.61		5.40
329		-----		-----	-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----	-----		-----
336		-----		-----	-----		-----	-----		-----	-----		-----
337		-----		-----	-----		-----	-----		-----	-----		-----
360	D6730	33.570		2.53	36.328		2.12	0.266		-----	21.188		-7.57
371		-----		-----	-----		-----	-----		-----	-----		-----
391		-----		-----	-----		-----	-----		-----	-----		-----
399		-----		-----	-----		-----	-----		-----	-----		-----
444		-----		-----	-----		-----	-----		-----	-----		-----
445	D5443	32.96		0.77	34.95		-1.69	<0.1		-----	23.33		3.90
447		-----		-----	-----		-----	-----		-----	-----		-----
494	D6839	32.56		-0.38	35.70		0.39	0.02		-----	23.17		3.04
495	D6839	31.96		-2.11	35.86		0.83	<0.01	false -?	-----	23.50		4.81
529		-----		-----	-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----	-----		-----
604		-----		-----	-----		-----	-----		-----	-----		-----
608	D6730	33.0251		0.96	36.5662		2.78	0.2152		-----	21.0327		-8.40
657	D6293	31.84		-2.45	36.02		1.27	0.03		-----	23.37		4.12
704		-----		-----	-----		-----	-----		-----	-----		-----
759		-----		-----	-----		-----	-----		-----	-----		-----
781	INH-52714	33.48		2.27	36.85		3.56	0.08		-----	20.21	C	-12.80
855	D6293	32.56	C	-0.38	35.37	C	-0.53	<0.1		-----	23.51	C	4.86
862	D6293	32.07		-1.79	35.52		-0.11	0.02		-----	23.76		6.20
868	D6293	32.53		-0.47	35.28		-0.77	<0.1		-----	23.61		5.40
873	INH-52714	33.84		3.31	35.91		0.97	0.06		-----	22.10		-2.68
875	INH-52714	33.78	C	3.13	35.31		-0.69	0.16		-----	21.37	C	-6.59
912		-----		-----	-----		-----	-----		-----	-----		-----
962		-----		-----	-----		-----	-----		-----	-----		-----
963	D6730	33.286		1.71	35.515		-0.12	0.895	DG(5)	-----	20.223		-12.73
974	D5443	31.81		-2.54	38.50	DG(5)	8.12	0.10		-----	21.59		-5.42
994		-----		-----	-----		-----	-----		-----	-----		-----
995		-----		-----	-----		-----	-----		-----	-----		-----
1011	D5443	32.005		-1.98	35.495		-0.18	0.020		-----	23.900		6.95
1016		-----		-----	-----		-----	-----		-----	-----		-----
1038	D5443	32.29		-1.16	36.18		1.71	-----		-----	23.00		2.13
1065	D5443	31.8		-2.57	37.2		4.53	0.3		-----	22.1		-2.68
1066	D5443	31.87		-2.37	35.39		-0.47	0.10		-----	23.06		2.46
1067		-----		-----	-----		-----	-----		-----	-----		-----
1080	INH-M3	32.54		-0.44	35.07		-1.35	0.35		-----	23.50		4.81
1081	In house	32.2		-1.42	37.5	DG(5)	5.36	0.07	C	-----	21.7		-4.83
1108	D5443	32.4		-0.84	35.5		-0.17	0.12		-----	23.7		5.88
1138	D5443	29.77	DG(5)	-8.42	38.41	DG(5)	7.87	<0.05		-----	23.26		3.53
1145	D6293	32.19		-1.45	35.60		0.11	<0.01	false -?	-----	23.08		2.56
1161		-----		-----	-----		-----	-----		-----	-----		-----
1167		-----		-----	-----		-----	-----		-----	-----		-----
1229	ISO22854	33.03		0.97	34.84		-1.99	0.03		-----	23.56		5.13
1254		-----		-----	-----		-----	-----		-----	-----		-----
1257		-----		-----	-----		-----	-----		-----	-----		-----
1276	D5134	33.948		3.62	35.226		-0.92	0.362		-----	20.871		-9.27
1280		-----		-----	-----		-----	-----		-----	-----		-----
1284		-----		-----	-----		-----	-----		-----	-----		-----
1307	In house	33.695		2.89	34.790		-2.13	0.765	G(1)	-----	21.530		-5.74
1357		-----		-----	-----		-----	-----		-----	-----		-----
1378		-----		-----	-----		-----	-----		-----	-----		-----
1404	D5443	33.2		1.46	34.56		-2.76	0.37		-----	22.29		-1.67
1427	D6293	33.95		3.62	35.00		-1.55	<0.1		-----	22.43		-0.92
1429		-----		-----	-----		-----	-----		-----	-----		-----
1510	D5443	34.21		4.37	34.81		-2.07	0.4		-----	21.55		-5.63
1603		-----		-----	-----		-----	-----		-----	-----		-----
1634		-----		-----	-----		-----	-----		-----	-----		-----
1653		-----		-----	-----		-----	-----		-----	-----		-----
1656	D5443	31.75		-2.71	34.81		-2.07	<0.1		-----	24.78	G(5)	11.66
1737	In house	31.45		-3.58	36.35		2.18	0.15		-----	23.73		6.04

1826	D6839	29.56	DG(5)	-9.02	38.03	DG(5)	6.82	0.05		-----	23.8	6.42
1855		-----		-----	-----		-----	-----		-----	-----	-----
1858	D5134mod	32.660		-0.09	36.923		3.76	0.014		-----	21.875	-3.89
1902	D5443	31.76		-2.68	35.63		0.19	0.14		-----	23.95	7.22
1939	In house	35.750	G(5)	8.81	34.492		-2.95	0.770	G(5)	-----	20.348	-12.07
1948	D5443	31.85		-2.43	35.80		0.66	0.09		-----	23.21	3.26
1949	D5443	32.21		-1.39	35.76		0.55	0.03		-----	23.38	4.17
1950	D5134mod	34.00		3.77	36.00		1.22	<0.01	false -?	-----	21.44	-6.22
7001		-----		-----	-----		-----	-----		-----	-----	-----
7009		-----		-----	-----		-----	-----		-----	-----	-----

normality	OK	OK	not OK	not OK
n	42	41	29	43
outliers	3	4	4	2
mean (n)	32.692	35.560	0.130	22.601
st.dev. (n)	0.7530	0.6705	0.1231	1.1023
R(calc.)	2.108	1.877	0.345	3.086
R(D5443:09e1)	0.972	1.014	n.a.	0.523

Corrections I:	n-Paraffines	i-Paraffines	Olefins	Naphthenes
Lab 781				First reported 21.26
Lab 855	First reported 29.60	First reported 37.81		First reported 23.95
Lab 875	First reported 35.44			First reported 20.78
Lab 974		First reported 38.12		
Lab 1081			First reported 0.7	

	Only D5443	Only D5443		Only D5443
normality	OK	OK		OK
n	17	16		17
outliers	1	2		1
mean (n)	32.377	35.540		23.011
st.dev. (n)	0.6667	0.6342		0.7462
R(calc.)	1.867	1.776		2.089
R(D5443:09e1)	0.967	1.013		0.528
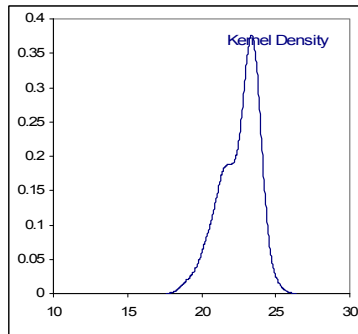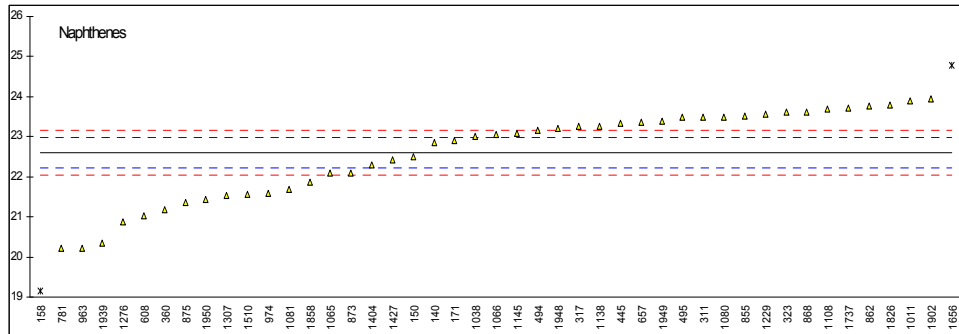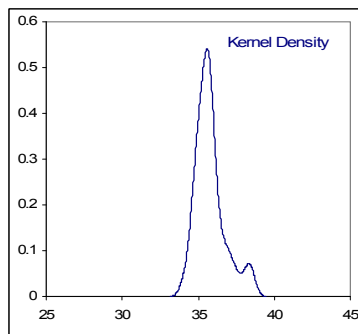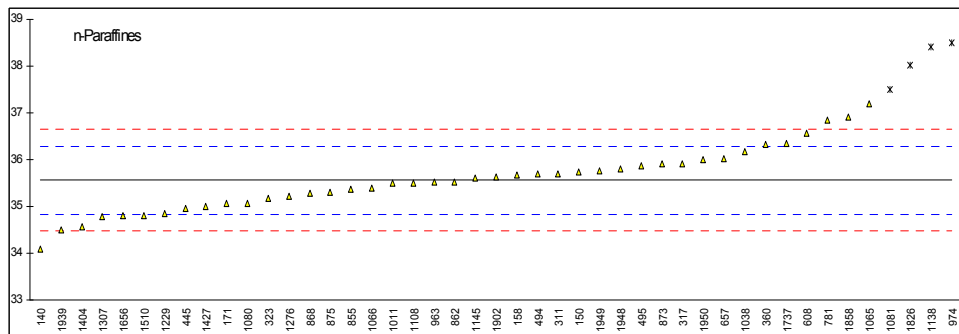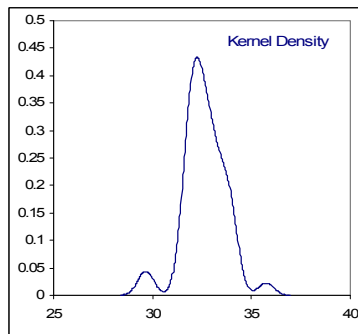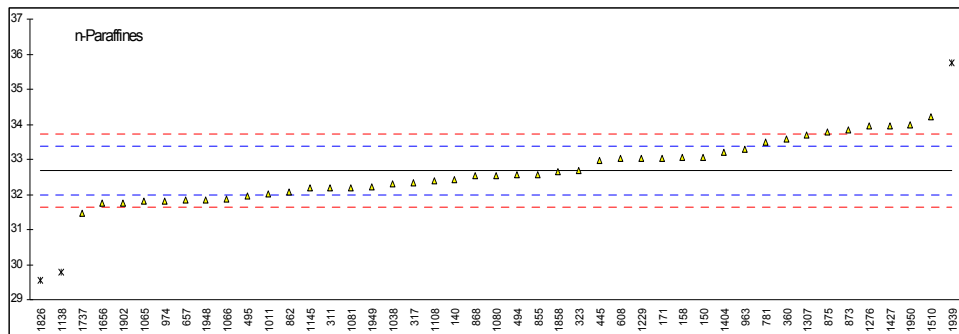
PONA/PIONA/PNA determination on sample #11026; results in %V/V (continued)

lab	method	Aromat.	mark	z(targ)	C4 lights	mark	z(targ)	highers	mark	z(targ)	remarks
140	D5134	10.519	G(1)	6.68	1.144		-0.71	-----		-----	
150	D5443mod	8.68		0.40	-----		-----	-----		-----	
158	D5134	8.82		0.88	1.32		1.79	-----		-----	
171	D5134	8.927		1.24	1.295		1.43	-----		-----	
225		-----		-----	-----		-----	-----		-----	
237		-----		-----	-----		-----	-----		-----	
238		-----		-----	-----		-----	-----		-----	
311	D5443	8.6		0.12	1.2		0.09	<0.1		-----	
317	D5443	8.42		-0.49	1.08		-1.61	<0.05		-----	
323	D5443	8.51		-0.18	1.15		-0.62	<0.05		-----	
329		-----		-----	-----		-----	-----		-----	
333		-----		-----	-----		-----	-----		-----	
334		-----		-----	-----		-----	-----		-----	
336		-----		-----	-----		-----	-----		-----	
337		-----		-----	-----		-----	-----		-----	
360	D6730	8.647		0.28	1.291		1.38	0.034		-----	
371		-----		-----	-----		-----	-----		-----	
391		-----		-----	-----		-----	-----		-----	
399		-----		-----	-----		-----	-----		-----	
444		-----		-----	-----		-----	-----		-----	
445	D5443	8.69		0.43	1.28		1.22	<0.1		-----	
447		-----		-----	-----		-----	-----		-----	
494	D6839	8.55		-0.05	1.25		0.79	<0.1		-----	
495	D6839	8.64		0.26	1.03		-2.32	<0.1		-----	
529		-----		-----	-----		-----	-----		-----	
541	D6730	8.52	C	-0.15	-----		-----	-----		-----	
604		-----		-----	-----		-----	-----		-----	
608	D6730	8.6138		0.17	1.2408		0.66	0.0164		-----	
657	D6293	8.76		0.67	1.19	C	-0.06	<0.1		-----	
704		-----		-----	-----		-----	-----		-----	
759		-----		-----	-----		-----	-----		-----	
781	INH-52714	8.33		-0.80	1.17		-0.34	-----		-----	
855	D6293	8.53	C	-0.12	1.20	C	0.09	<0.1		-----	
862	D6293	8.63		0.23	1.11		-1.19	<0.1		-----	
868	D6293	8.57		0.02	0.99		-2.89	<0.1		-----	
873	INH-52714	8.09		-1.62	-----		-----	-----		-----	
875	INH-52714	8.31		-0.87	-----		-----	-----		-----	
912		-----		-----	-----		-----	-----		-----	
962		-----		-----	-----		-----	-----		-----	
963	D6730	9.440	G(5)	2.99	1.292		1.39	<0,001		-----	
974	D5443	8.38		-0.63	1.17		-0.34	<0.01		-----	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1011	D5443	8.575		0.04	0.755	DG(1)	-6.22	<0.01		-----	
1016		-----		-----	-----		-----	-----		-----	
1038	D5443	8.53		-0.12	-----		-----	0.00		-----	
1065	D5443	8.4		-0.56	-----		-----	-----		-----	
1066	D5443	9.21	G(5)	2.21	1.05		-2.04	0.26		-----	
1067		-----		-----	-----		-----	-----		-----	
1080	INH-M3	8.52		-0.15	1.28		1.22	0.17		-----	
1081	In house	8.58	C	0.06	1.07	C	-1.76	-----		-----	
1108	D5443	8.31		-0.87	1.33		1.93	0.07		-----	
1138	D5443	8.57		0.02	1.23		0.51	-----		-----	
1145	D6293	8.78		0.74	0.76	DG(1)	-6.15	<0.01		-----	
1161		-----		-----	-----		-----	-----		-----	
1167		-----		-----	-----		-----	-----		-----	
1229	ISO22854	8.55		-0.05	1.24		0.65	<0.05		-----	
1254		-----		-----	-----		-----	-----		-----	
1257		-----		-----	-----		-----	-----		-----	
1276	D5134	9.352	G(5)	2.69	0.004	G(1)	-16.86	-----		-----	
1280		-----		-----	-----		-----	-----		-----	
1284		-----		-----	-----		-----	-----		-----	
1307	In house	8.890		1.11	-----		-----	-----		-----	
1357		-----		-----	-----		-----	-----		-----	
1378		-----		-----	-----		-----	-----		-----	
1404	D5443	9.58	G(5)	3.47	1.27		1.08	-----		-----	
1427	D6293	8.59		0.09	1.24		0.65	0.02		-----	
1429		-----		-----	-----		-----	-----		-----	
1510	D5443	8.96		1.35	1.21		0.23	0.07		-----	
1603		-----		-----	-----		-----	-----		-----	
1634		-----		-----	-----		-----	-----		-----	
1653		-----		-----	-----		-----	-----		-----	
1656	D5443	8.65		0.29	0.34	G(1)	-12.10	<0.1		-----	
1737	In house	8.32		-0.83	1.31		1.64	-----		-----	

1826	D6839	8.55	-0.05	1.17		-0.34	0	-----
1855		-----	-----	-----		-----	-----	-----
1858	D5134mod	8.303	-0.89	1.341		2.08	-----	-----
1902	D5443	8.52	-0.15	0.91	C	-4.02	-----	-----
1939	In house	8.640	0.26	1.708	G(5)	7.28	-----	-----
1948	D5443	8.62	0.19	1.30		1.50	0.08	-----
1949	D5443	8.62	0.19	0.93		-3.74	0.18	-----
1950	D5134mod	8.42	-0.49	1.31		1.64	-----	-----
7001		-----	-----	-----		-----	-----	-----
7009		-----	-----	-----		-----	-----	-----

normality	OK		OK		OK
n	41		34		11
outliers	5		5		0
mean (n)	8.564		1.194		0.082
st.dev. (n)	0.1779		0.1150		0.0856
R(calc.)	0.498		0.322		0.240
R(D5443:09e1)	0.819		0.198		n.a.

Corrections (C):	aromatics	C4 lights	Highers
Lab 541	First reported 7.83		
Lab 657		First reported 1.19	
Lab 855	First reported 8.64	First reported 0.90	
Lab 1081	First reported 85.8	First reported 10.7	
Lab 1902		First reported 0.61	
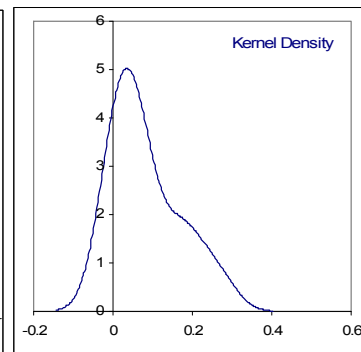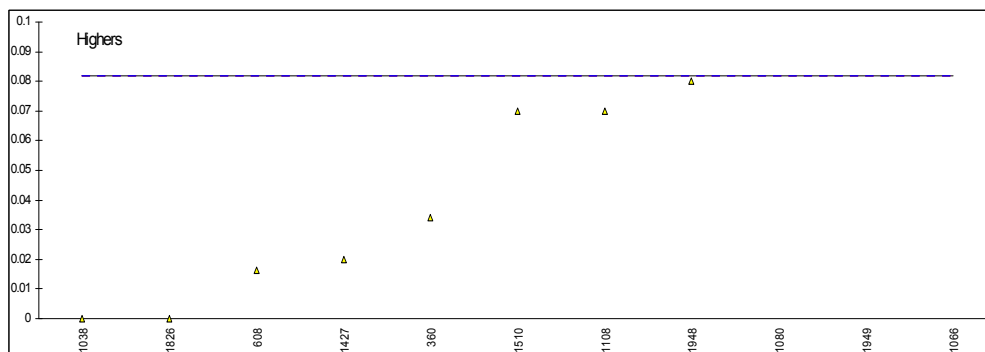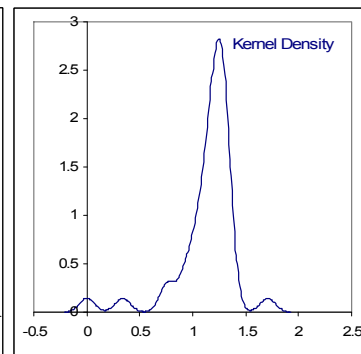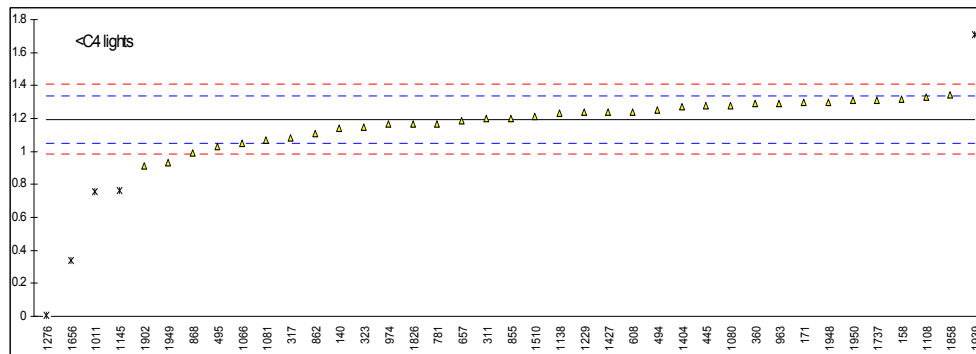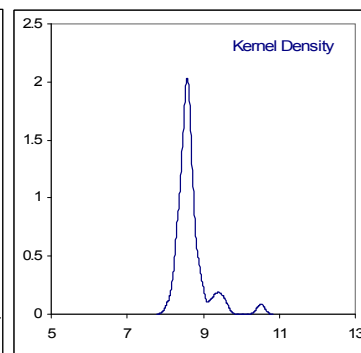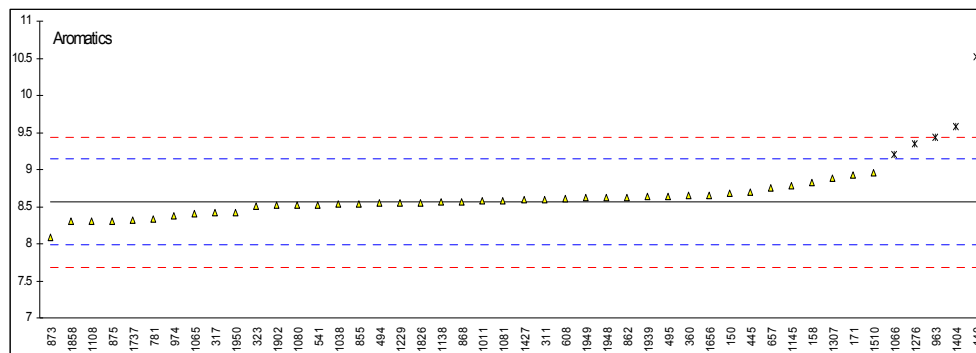
PONA/PIONA/PNA determination on sample #11026; results in %M/M

lab	method	n-paraf	mark	z(targ)	i-paraf	mark	z(targ)	Olefins	mark	z(targ)	Naphth.	mark	z(targ)
140	D5134	30.320		-1.14	32.281	G(5)	-4.65	0.133		-----	24.477		-0.36
150	D5134	31.03		0.97	34.06		0.39	0.01		-----	24.31		-1.22
158	D5134	31.10		1.18	34.10		0.50	0.84	DG(1)	-----	20.70	G(5)	-19.77
171	D5134	30.991		0.86	33.364		-1.58	0.065		-----	24.693		0.75
225		-----		-----	-----		-----	-----		-----	-----		-----
237													
238		-----		-----	-----		-----	-----		-----	-----		-----
311	D5443	30.2		-1.50	34.0		0.22	<0.1		-----	25.4		4.38
317	D5443	30.30		-1.20	34.22		0.84	<0.05		-----	25.13		2.99
323	D5443	30.67		-0.10	33.49		-1.23	<0.10		-----	25.47		4.74
329		-----		-----	-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----	-----		-----
336		-----		-----	-----		-----	-----		-----	-----		-----
337		-----		-----	-----		-----	-----		-----	-----		-----
360	D6730	31.574		2.59	34.729		2.28	0.265		-----	22.857		-8.68
371		-----		-----	-----		-----	-----		-----	-----		-----
391		-----		-----	-----		-----	-----		-----	-----		-----
399		-----		-----	-----		-----	-----		-----	-----		-----
444		-----		-----	-----		-----	-----		-----	-----		-----
445	D5443	30.89		0.56	33.26		-1.88	<0.1		-----	25.19		3.30
447		-----		-----	-----		-----	-----		-----	-----		-----
494	D6839	30.50		-0.60	34.03		0.30	0.02		-----	25.03		2.48
495	D6839	29.92		-2.33	34.15		0.64	<0.01	false -?	-----	25.37		4.23
529		-----		-----	-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----	-----		-----
604		-----		-----	-----		-----	-----		-----	-----		-----
608	D6730	31.0859		1.14	34.9506		2.90	0.2120		-----	22.6844		-9.57
657	D6293	29.88		-2.45	34.24		0.89	0.03		-----	25.21		3.41
704		-----		-----	-----		-----	-----		-----	-----		-----
759		-----		-----	-----		-----	-----		-----	-----		-----
781	INH-52714	31.59		2.64	35.32		3.95	0.08		-----	22.15	C	-12.32
855	D6293	30.50	C	-0.60	33.66	C	-0.75	<0.1		-----	25.43	C	4.54
862	D6293	30.06		-1.91	33.83		-0.26	0.02		-----	25.59		5.36
868	D6293	30.51		-0.57	33.54		-1.08	<0.1		-----	25.50		4.90
873	INH-52714	31.90		3.56	34.40		1.35	0.06		-----	23.75		-4.10
875	INH-52714	31.85	C	3.41	33.71		-0.60	0.17		-----	22.62	C	-9.90
912		-----		-----	-----		-----	-----		-----	-----		-----
962		-----		-----	-----		-----	-----		-----	-----		-----
963	D6730	31.307		1.79	33.851		-0.21	0.882	DG(1)	-----	21.792	G(5)	-14.15
974	D5443	29.89		-2.42	36.95	DG(5)	8.56	0.11		-----	23.22		-6.82
994		-----		-----	-----		-----	-----		-----	-----		-----
995		-----		-----	-----		-----	-----		-----	-----		-----
1011	D5443	29.990		-2.12	33.755		-0.48	0.020		-----	25.805		6.46
1016		-----		-----	-----		-----	-----		-----	-----		-----
1038		-----		-----	-----		-----	-----		-----	-----		-----
1065		-----		-----	-----		-----	-----		-----	-----		-----
1066	D5443	29.82		-2.63	33.66		-0.75	0.10		-----	24.80		1.30
1067		-----		-----	-----		-----	-----		-----	-----		-----
1080	INH-M3	30.52		-0.54	33.32		-1.71	0.33		-----	25.42		4.48
1081	In house	30.3		-1.20	35.7		5.02	0.06	C	-----	23.5		-5.38
1108	D5443	30.3		-1.20	33.9		-0.07	0.11		-----	25.6		5.41
1138	D5443	27.65	G(1)	-9.08	36.77	DG(5)	8.05	<0.05		-----	25.15		3.10
1145	D6293	30.22		-1.44	34.25		0.92	<0.01	false -?	-----	24.85		1.56
1161		-----		-----	-----		-----	-----		-----	-----		-----
1167		-----		-----	-----		-----	-----		-----	-----		-----
1229	ISO22854	30.97		0.79	33.12		-2.27	0.02		-----	25.47		4.74
1254		-----		-----	-----		-----	-----		-----	-----		-----
1257		-----		-----	-----		-----	-----		-----	-----		-----
1276	D5134	31.939		3.67	33.575		-0.99	0.370		-----	22.472		-10.66
1280		-----		-----	-----		-----	-----		-----	-----		-----
1284		-----		-----	-----		-----	-----		-----	-----		-----
1307	In house	31.670		2.87	33.085		-2.37	0.79	G(1)	-----	23.225		-6.79
1357		-----		-----	-----		-----	-----		-----	-----		-----
1378		-----		-----	-----		-----	-----		-----	-----		-----
1404	D5443	31.12		1.24	32.83		-3.09	0.37		-----	24.01		-2.76
1427	D6293	31.96		3.74	33.31		-1.74	<0.1		-----	24.23		-1.63
1429		-----		-----	-----		-----	-----		-----	-----		-----
1510		-----		-----	-----		-----	-----		-----	-----		-----
1603	in house	30.52		-0.54	32.92		-2.84	0.01		-----	25.13		2.99
1634		-----		-----	-----		-----	-----		-----	-----		-----
1653		-----		-----	-----		-----	-----		-----	-----		-----
1656	D5443	29.76		-2.80	32.96		-2.73	<0.1		-----	26.78	G(5)	11.47
1737	In house	29.48		-3.64	34.65		2.05	0.15		-----	25.58		5.31

1826	D6839	27.52	G(5)	-9.46	36.38	G(5)	6.95	0.05		-----	25.63	5.56
1855		-----		-----	-----		-----	-----		-----	-----	-----
1858	D5134mod	31.663		2.85	34.769		2.39	0.013		-----	23.305	-6.38
1902	D5443	29.81		-2.66	33.90		-0.07	0.14		-----	25.78	6.33
1939		-----		-----	-----		-----	-----		-----	-----	-----
1948	D5443	29.79		-2.71	34.06		0.39	0.09		-----	24.94	2.02
1949	D5443	30.18		-1.56	34.04		0.33	0.03		-----	25.25	3.61
1950	D5134mod	32.05		4.00	34.39		1.32	<0.01	false -?	-----	23.11	-7.38
7001		-----		-----	-----		-----	-----		-----	-----	-----
7009		-----		-----	-----		-----	-----		-----	-----	-----

normality	not OK	OK	not OK	not OK
n	40	38	27	39
outliers	2	4	3	3
mean (n)	30.703	33.924	0.113	24.547
st.dev. (n)	0.7418	0.6493	0.1094	1.0935
R(calc.)	2.077	1.818	0.306	3.062
R(D5443:09e1)	0.942	0.990	Unknown	0.545

Corrections (C):	n-Paraffines	i-Paraffines	Olefins	Naphthenes
Lab 781				First reported 22.79
Lab 855	First reported 27.51	First reported 36.07		First reported 25.91
Lab 875	First reported 33.48			First reported 22.46
Lab 974		First reported 36.56		
Lab 1081			First reported 0.6	

PONA/PIONA/PNA determination on sample #11026; results in %M/M (continued)

lab	method	Aromat.	Mark	z(targ)	C4 lights	mark	z(targ)	highers	mark	z(targ)	remarks
140	D5134	12.789	G(1)	7.30	0.910		-0.91	-----		-----	
150	D5134	10.60		0.52	-----		-----	-----		-----	
158	D5134	10.80		1.14	1.06		1.64	-----		-----	
171	D5134	10.888		1.42	1.036		1.24	-----		-----	
225		-----		-----	-----		-----	-----		-----	
237								-----		-----	
238		-----		-----	-----		-----	-----		-----	
311	D5443	10.4		-0.10	1.0		0.62	<0.1		-----	
317	D5443	10.26		-0.53	0.87		-1.59	<0.05		-----	
323	D5443	10.36		-0.22	0.93		-0.57	<0.05		-----	
329		-----		-----	-----		-----	-----		-----	
333		-----		-----	-----		-----	-----		-----	
334		-----		-----	-----		-----	-----		-----	
336		-----		-----	-----		-----	-----		-----	
337		-----		-----	-----		-----	-----		-----	
360	D6730	10.574		0.44	1.037		1.25	0.041		-----	
371		-----		-----	-----		-----	-----		-----	
391		-----		-----	-----		-----	-----		-----	
399		-----		-----	-----		-----	-----		-----	
444		-----		-----	-----		-----	-----		-----	
445	D5443	10.58		0.46	1.01		0.79	<0.1		-----	
447		-----		-----	-----		-----	-----		-----	
494	D6839	10.42		-0.03	1.00		0.62	<0.1		-----	
495	D6839	10.51		0.24	0.83		-2.27	<0.1		-----	
529		-----		-----	-----		-----	-----		-----	
541	D6730	10.53	C	0.31	-----		-----	-----		-----	
604		-----		-----	-----		-----	-----		-----	
608	D6730	10.5283		0.30	0.9954		0.55	0.0200		-----	
657	D6293	10.64		0.65	0.94	C	-0.40	<0.1		-----	
704		-----		-----	-----		-----	-----		-----	
759		-----		-----	-----		-----	-----		-----	
781	INH-52714	10.21		-0.68	0.94		-0.40	-----		-----	
855	D6293	10.39	C	-0.13	0.96	C	-0.06	<0.1		-----	
862	D6293	10.5		0.21	0.91		-0.91	<0.1		-----	
868	D6293	10.43		0.00	0.80		-2.78	<0.1		-----	
873	INH-52714	9.89		-1.67	-----		-----	-----		-----	
875	INH-52714	10.18		-0.78	-----		-----	-----		-----	
912		-----		-----	-----		-----	-----		-----	
962		-----		-----	-----		-----	-----		-----	
963	D6730	11.529	DG(5)	3.40	1.039		1.29	<0.001		-----	
974	D5443	10.22		-0.65	0.95		-0.23	0.00		-----	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1011	D5443	10.430		0.00	0.610	DG(5)	-6.01	<0.01		-----	
1016		-----		-----	-----		-----	-----		-----	
1038		-----		-----	-----		-----	-----		-----	
1065		-----		-----	-----		-----	-----		-----	
1066	D5443	11.20	G(5)	2.38	0.85		-1.93	0.30		-----	
1067		-----		-----	-----		-----	-----		-----	
1080	INH-M3	10.38		-0.16	1.03		1.13	0.18		-----	
1081	In house	10.5		0.21	0.86	C	-1.76	-----		-----	
1108	D5443	10.1		-1.02	1.05		1.47	0.08		-----	
1138	D5443	10.43		0.00	0.99		0.45	-----		-----	
1145	D6293	10.69		0.80	0.62	DG(5)	-5.84	<0.01		-----	
1161		-----		-----	-----		-----	-----		-----	
1167		-----		-----	-----		-----	-----		-----	
1229	ISO22854	10.41		-0.06	0.99		0.45	0.60	G(1)	-----	
1254		-----		-----	-----		-----	-----		-----	
1257		-----		-----	-----		-----	-----		-----	
1276	D5134	11.391	DG(1)	2.97	0.003	G(1)	-16.33	-----		-----	
1280		-----		-----	-----		-----	-----		-----	
1284		-----		-----	-----		-----	-----		-----	
1307	In house	10.860		1.33	-----		-----	-----		-----	
1357		-----		-----	-----		-----	-----		-----	
1378		-----		-----	-----		-----	-----		-----	
1404	D5443	11.67	DG(5)	3.84	1.02		0.96	-----		-----	
1427	D6293	10.48		0.15	1.00		0.62	0.03		-----	
1429		-----		-----	-----		-----	-----		-----	
1510		-----		-----	-----		-----	-----		-----	
1603	in house	11.40	DG(1)	3.00	1.04		1.30	0		-----	
1634		-----		-----	-----		-----	-----		-----	
1653		-----		-----	-----		-----	-----		-----	
1656	D5443	10.51		0.24	0.27	G(1)	-11.79	<0.1		-----	
1737	In house	10.14		-0.90	1.06		1.64	-----		-----	

1826	D6839	10.41	-0.06	0.95		-0.23	0	-----
1855		-----	-----	-----		-----	-----	-----
1858	D5134mod	10.025	-1.26	1.064		1.71	-----	-----
1902	D5443	10.37	-0.19	0.73	C	-3.97	-----	-----
1939		-----	-----	-----		-----	-----	-----
1948	D5443	10.50	0.21	1.1		2.32	0.09	-----
1949	D5443	10.49	0.18	0.74		-3.80	0.19	-----
1950	D5134mod	10.31	-0.37	1.06		1.64	-----	-----
7001		-----	-----	-----		-----	-----	-----
7009		-----	-----	-----		-----	-----	-----
	normality	OK		not OK			OK	
	n	37		34			11	
	outliers	6		4			1	
	mean (n)	10.431		0.963			0.085	
	st.dev. (n)	0.2128		0.0941			0.0986	
	R(calc.)	0.596		0.263			0.276	
	R(D5443:09e1)	0.904		0.165			n.a.	

Corrections I:	aromatics	C4 lights	Highers
Lab 541	First reported 9.64		
Lab 657		First reported 0.94	
Lab 855	First reported 10.51	First reported 0.72	
Lab 1081		First reported 8.6	
Lab 1902		First reported 0.5	

PONA/PIONA/PNA determination on sample #11027; results in %V/V

lab	method	n-paraf	mark	z(targ)	i-paraf	mark	z(targ)	Olefins	mark	z(targ)	Naphth.	Mark	z(targ)
140	D5134	35.880		-0.49	37.366		-1.34	0.232		-----	23.070		0.23
150		-----		-----	-----		-----	-----		-----	-----		-----
158	D5134	36.82		2.09	37.93		0.17	0.57	G(5)	-----	21.54		-7.89
171	D5443	36.46		1.10	37.52		-0.93	0.24		-----	22.94		-0.46
225		-----		-----	-----		-----	-----		-----	-----		-----
237		-----		-----	-----		-----	-----		-----	-----		-----
238		-----		-----	-----		-----	-----		-----	-----		-----
311	D5443	35.8		-0.71	37.9		0.09	0.3		-----	23.4		1.98
317	D5443	35.36		-1.92	38.29		1.13	0.24		-----	23.40		1.98
323	D5443	36.08		0.06	37.56		-0.82	0.22		-----	23.47		2.35
329		-----		-----	-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----	-----		-----
336		-----		-----	-----		-----	-----		-----	-----		-----
337		-----		-----	-----		-----	-----		-----	-----		-----
360	D6730	36.907		2.33	38.034		0.45	0.350		-----	21.879		-6.09
371		-----		-----	-----		-----	-----		-----	-----		-----
391		-----		-----	-----		-----	-----		-----	-----		-----
399		-----		-----	-----		-----	-----		-----	-----		-----
444		-----		-----	-----		-----	-----		-----	-----		-----
445	D5443	36.27		0.58	37.20		-1.78	<0.1	false – ?	-----	23.42		2.08
447		-----		-----	-----		-----	-----		-----	-----		-----
494	D6839	36.18		0.33	37.74		-0.34	0.24		-----	23.16	C	0.71
495	D6839	35.19		-2.38	38.11		0.65	0.24		-----	23.54		2.72
529		-----		-----	-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----	-----		-----
604		-----		-----	-----		-----	-----		-----	-----		-----
608	D6730	36.5668		1.39	38.2496		1.03	0.3288		-----	21.6518		-7.30
657	D6293	34.97	C	-2.99	38.99		3.01	0.24		-----	23.92		4.74
704		-----		-----	-----		-----	-----		-----	-----		-----
759		-----		-----	-----		-----	-----		-----	-----		-----
781	INH-52714	37.08		2.80	38.44		1.54	0.17		-----	20.84	C, G(5)	-11.60
855	D6293	36.24	C	0.50	37.47	C	-1.06	0.26	C	-----	23.37	C	1.82
862	D6293	35.65		-1.12	37.64		-0.61	0.24		-----	23.75		3.83
868	D6293	35.85		-0.57	37.82		-0.12	0.24		-----	23.36		1.77
873	INH-52714	37.43		3.76	38.10		0.63	0.06		-----	21.48	C	-8.21
875	INH-52714	37.19	C	3.10	37.34		-1.41	0.25		-----	20.58	C, G(5)	-12.98
912		-----		-----	-----		-----	-----		-----	-----		-----
962		-----		-----	-----		-----	-----		-----	-----		-----
963	D6730	36.801		2.04	38.728		2.31	0.815	G(5)	-----	20.338	G(5)	-14.26
974	D5443	35.23		-2.27	38.82		2.55	0.31		-----	22.90		-0.67
994		-----		-----	-----		-----	-----		-----	-----		-----
995		-----		-----	-----		-----	-----		-----	-----		-----
1011	D5443	34.825		-3.38	38.200		0.89	0.230		-----	24.015		5.24
1016	ISO22854	35.45		-1.67	37.90		0.09	0.22		-----	23.75		3.83
1038	D5443	35.86		-0.55	38.33		1.24	-----		-----	23.11		0.44
1065	D5443	36.572		1.41	36.889		-2.62	0.091		-----	23.752		3.85
1066	D5443	35.29		-2.11	37.80		-0.18	0.25		-----	23.42		2.08
1067		-----		-----	-----		-----	-----		-----	-----		-----
1080	INH-M3	36.21		0.41	37.20		-1.78	0.60	DG(5)	-----	23.19		0.86
1081	In house	35.3		-2.08	36.7		-3.12	2.1	G(1)	-----	23		-0.14
1108	D5443	36.1		0.11	37.6		-0.71	0.26		-----	23.3		1.45
1138	D5443	35.15		-2.49	38.79		2.47	0.23		-----	23.20		0.92
1145	D6293	34.90		-3.18	38.55		1.83	0.24		-----	23.54		2.72
1161		-----		-----	-----		-----	-----		-----	-----		-----
1167		-----		-----	-----		-----	-----		-----	-----		-----
1229	ISO22854	36.16		0.28	37.35		-1.38	0.27		-----	23.51		2.56
1254		-----		-----	-----		-----	-----		-----	-----		-----
1257		-----		-----	-----		-----	-----		-----	-----		-----
1276	D5134	37.706		4.52	36.887		-2.62	0.279		-----	22.053		-5.17
1280		-----		-----	-----		-----	-----		-----	-----		-----
1284		-----		-----	-----		-----	-----		-----	-----		-----
1307	D5443	36.79		2.01	37.80		-0.18	0.62	DG(5)	-----	21.50		-8.10
1357		-----		-----	-----		-----	-----		-----	-----		-----
1378	In house	35.68		-1.04	37.29		-1.54	0.37		-----	23.91		4.68
1404	D5443	36.6		1.48	37.3		-1.52	0.43		-----	22.64		-2.05
1427	D6293	37.03		2.66	37.48		-1.03	0.11		-----	22.70		-1.73
1429		-----		-----	-----		-----	-----		-----	-----		-----
1510	D5443	37.41		3.71	37.54		-0.87	0.4		-----	21.70		-7.04
1603		-----		-----	-----		-----	-----		-----	-----		-----
1634		-----		-----	-----		-----	-----		-----	-----		-----
1653		-----		-----	-----		-----	-----		-----	-----		-----
1656	D5443	33.55	G(5)	-6.88	38.98		2.98	0.25		-----	24.42		7.39
1737	In house	34.57		-4.08	38.94		2.87	0.35		-----	23.34		1.66

Lab	Method	n-Paraffins			i-Paraffins			Olefins			Naphthenes		
1826	D6839	35.02		-2.85	36.28	G(5)	-4.25	0.24		-----	25.77	G(5)	14.55
1855		-----		-----	-----		-----	-----		-----	-----		-----
1858	D5134mod	36.522		1.27	38.209		0.92	0.133		-----	22.311		-3.80
1902	D5443	35.84	C	-0.60	38.39		1.40	0.39		-----	24.34		6.96
1939	In house	38.839	G(5)	7.63	36.643		-3.27	0.791	G(1)	-----	21.015		-10.67
1948	D5443	34.95		-3.04	38.28		1.11	0.25		-----	23.44		2.19
1949	D5443	35.33		-2.00	37.98		0.30	0.26		-----	23.68		3.46
1950	D5134mod	37.37		3.60	37.70		-0.44	0.10		-----	22.05		-5.18
7001		-----		-----	-----		-----	-----		-----	-----		-----
7009		-----		-----	-----		-----	-----		-----	-----		-----
	normality	OK			OK			not OK			not OK		
	n	44			45			38			42		
	outliers	2			1			6			4		
	mean (n)	36.059			37.866			0.250			23.027		
	st.dev. (n)	0.8219			0.6076			0.0822			0.8419		
	R(calc.)	2.301			1.701			0.230			2.357		
	R(D5443:09e1)	1.021			1.046			unknown			0.528		

Corrections I:	n-Paraffines	i-Paraffines	Olefins	Naphthenes
Lab 494				First reported 25.84
Lab 657		First reported 33.97		
Lab 781				First reported 21.70
Lab 855	First reported 34.27	First reported 39.22	First reported 0.24	First reported 23.55
Lab 873				First reported 21.78
Lab 875	First reported 38.08			First reported 21.62
Lab 1902	First reported 34.17			
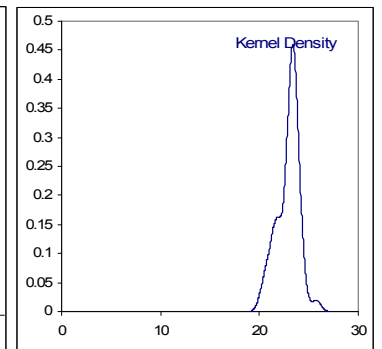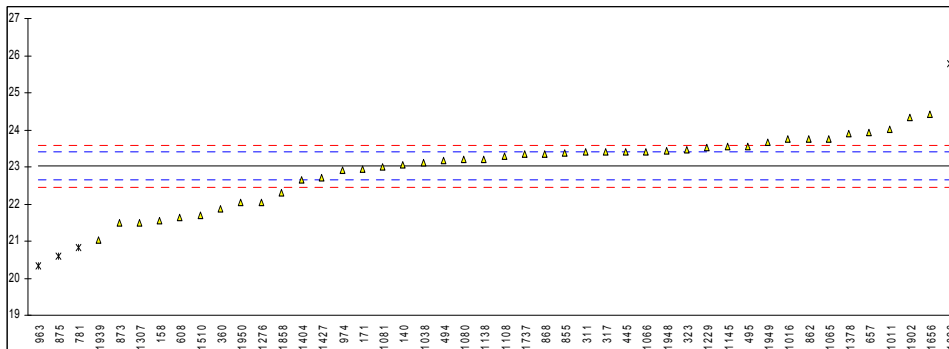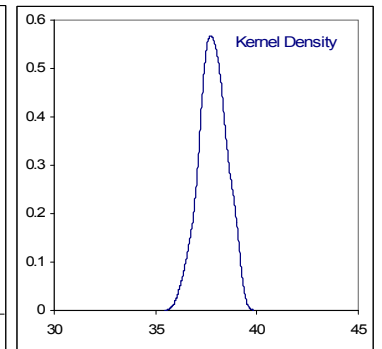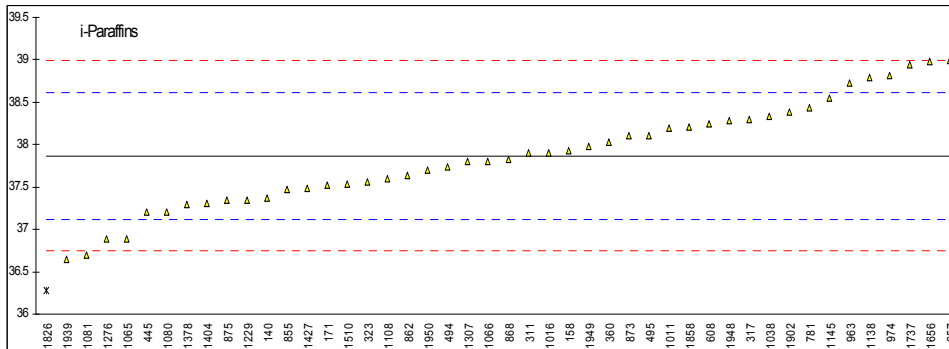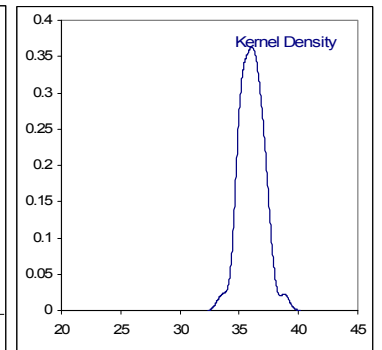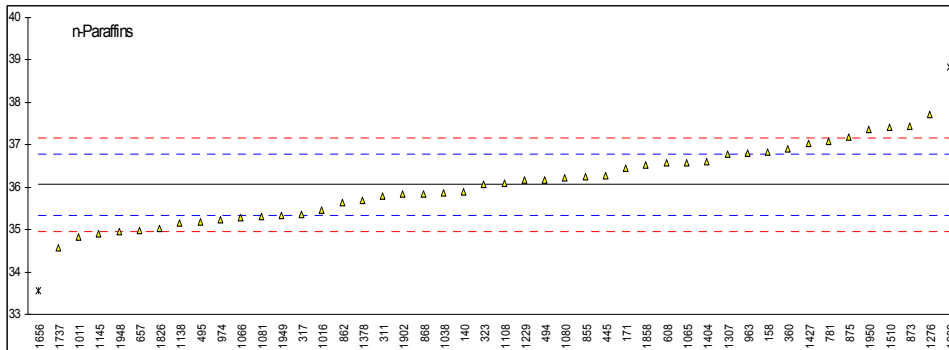
PONA/PIONA/PNA determination on sample #11027; results in %V/V (continued)

lab	method	Aromat.	mark	z(targ)	C4 lights	mark	z(targ)	highers	mark	z(targ)	remarks
140	D5134	3.452	G(1)	4.37	4.570		-0.21	-----		-----	
150		-----		-----	-----		-----	-----		-----	
158	D5134	2.85		0.73	5.13		2.30	-----		-----	
171	D5443	2.82		0.54	4.99		1.68	0.02		-----	
225		-----		-----	-----		-----	-----		-----	
237				-----	-----		-----	-----		-----	
238		-----		-----	-----		-----	-----		-----	
311	D5443	2.7		-0.18	4.5		-0.52	<0.1		-----	
317	D5443	2.68		-0.30	4.00		-2.77	<0.05		-----	
323	D5443	2.67		-0.36	4.40		-0.97	<0.05		-----	
329				-----	-----		-----	-----		-----	
333		-----		-----	-----		-----	-----		-----	
334		-----		-----	-----		-----	-----		-----	
336		-----		-----	-----		-----	-----		-----	
337		-----		-----	-----		-----	-----		-----	
360	D6730	2.828		0.59	5.022		1.82	0.024		-----	
371		-----		-----	-----		-----	-----		-----	
391		-----		-----	-----		-----	-----		-----	
399		-----		-----	-----		-----	-----		-----	
444		-----		-----	-----		-----	-----		-----	
445	D5443	2.80		0.42	4.43		-0.84	<0.1		-----	
447		-----		-----	-----		-----	-----		-----	
494	D6839	2.68		-0.30	4.67		0.24	<0.1		-----	
495	D6839	2.79		0.36	3.85		-3.44	<0.1		-----	
529		-----		-----	-----		-----	-----		-----	
541	D6730	2.52		-1.27	-----		-----	-----		-----	
604		-----		-----	-----		-----	-----		-----	
608	D6730	2.8234		0.57	4.9685		1.58	0.0108		-----	
657	D6293	2.85		0.73	4.63	C	0.06	0.04		-----	
704		-----		-----	-----		-----	-----		-----	
759		-----		-----	-----		-----	-----		-----	
781	INH-52714	2.61		-0.73	4.03		-2.63	-----		-----	
855	D6293	2.66	C	-0.42	4.54	C	-0.34	<0.1		-----	
862	D6293	2.72		-0.06	4.35		-1.20	<0.1		-----	
868	D6293	2.68		-0.30	4.29		-1.47	<0.1		-----	
873	INH-52714	2.63		-0.61	-----		-----	-----		-----	
875	INH-52714	2.71		-0.12	-----		-----	-----		-----	
912		-----		-----	-----		-----	-----		-----	
962		-----		-----	-----		-----	-----		-----	
963	D6730	3.043	DG(1)	1.89	5.076		2.06	<0,001		-----	
974	D5443	2.74		0.06	4.49		-0.57	<0.01		-----	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1011	D5443	2.730		0.00	2.900	DG(1)	-7.70	<0.01		-----	
1016	ISO22854	2.68		-0.30	3.74		-3.93	<0.1		-----	
1038	D5443	2.71		-0.12	-----		-----	0.00		-----	
1065	D5443	2.696		-0.21	5.04		1.90	0		-----	
1066	D5443	3.13	DG(5)	2.42	3.79		-3.71	0.11		-----	
1067		-----		-----	-----		-----	-----		-----	
1080	INH-M3	2.80		0.42	4.88		1.18	0.06		-----	
1081	In house	2.1	G(1)	-3.81	4.8		0.82	-----		-----	
1108	D5443	2.72		-0.06	5.06		1.99	0.10		-----	
1138	D5443	2.63		-0.61	4.56		-0.25	-----		-----	
1145	D6293	2.79		0.36	2.84	DG(1)	-7.97	<0.01		-----	
1161		-----		-----	-----		-----	-----		-----	
1167		-----		-----	-----		-----	-----		-----	
1229	ISO22854	2.71		-0.12	4.65		0.15	<0.05		-----	
1254		-----		-----	-----		-----	-----		-----	
1257		-----		-----	-----		-----	-----		-----	
1276	D5134	3.068	DG(5)	2.05	1.004	G(1)	-16.21	-----		-----	
1280		-----		-----	-----		-----	-----		-----	
1284		-----		-----	-----		-----	-----		-----	
1307	D5443	2.82		0.54	-----		-----	-----		-----	
1357		-----		-----	-----		-----	-----		-----	
1378	In house	2.75		0.12	4.43		-0.84	-----		-----	
1404	D5443	3.05	DG(1)	1.94	4.94		1.45	-----		-----	
1427	D6293	2.68		-0.30	4.67		0.24	<0.1		-----	
1429		-----		-----	-----		-----	-----		-----	
1510	D5443	2.90		1.03	4.50		-0.52	0.05		-----	
1603		-----		-----	-----		-----	-----		-----	
1634		-----		-----	-----		-----	-----		-----	
1653		-----		-----	-----		-----	-----		-----	
1656	D5443	2.79		0.36	1.52	G(1)	-13.90	<0.1		-----	
1737	In house	2.80		0.42	5.09		2.13	-----		-----	

1826	D6839	2.69	-0.24	4.38		-1.06	0	-----
1855		-----	-----	-----		-----	-----	-----
1858	D5134mod	2.610	-0.73	5.313		3.13	-----	-----
1902	D5443	2.71	-0.12	4.38	C	-1.06	-----	-----
1939	In house	2.712	-0.11	5.576		4.31	-----	-----
1948	D5443	2.74	0.06	5.04		1.90	0.05	-----
1949	D5443	2.76	0.18	3.55		-4.79	0.11	-----
1950	D5134mod	2.74	0.06	5.10		2.17	-----	-----
7001		-----	-----	-----		-----	-----	-----
7009		-----	-----	-----		-----	-----	-----

	normality	OK		OK		OK	
	n	41		38		13	
	outliers	6		4		0	
	mean (n)	2.730		4.616		0.044	
	st.dev. (n)	0.0773		0.4620		0.0409	
	R(calc.)	0.216		1.294		0.115	
	R(D5443:09e1)	0.463		0.624		n.a.	

Corrections (C):	aromatics	C4 lights	Highers
Lab 657		First reported 2.5	
Lab 855	First reported 2.73	First reported 3.36	
Lab 1902		First reported 2.3	
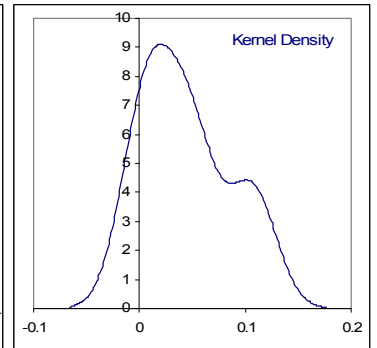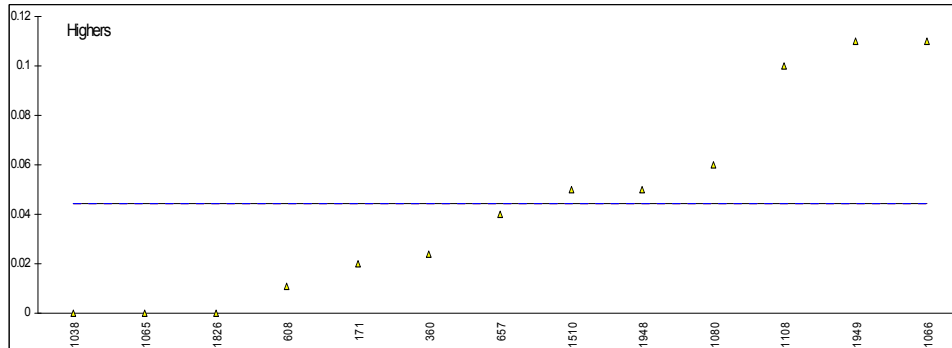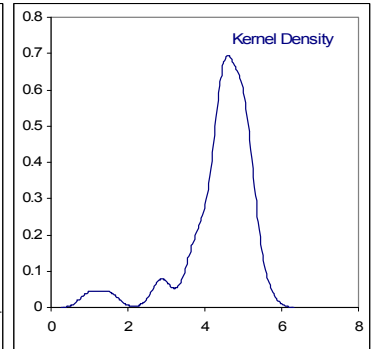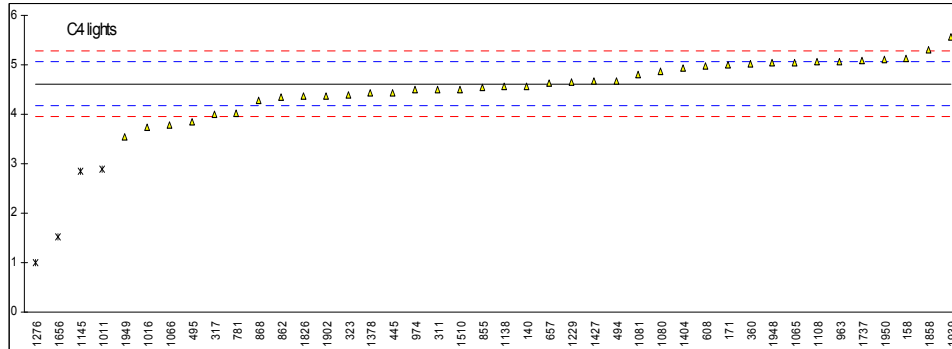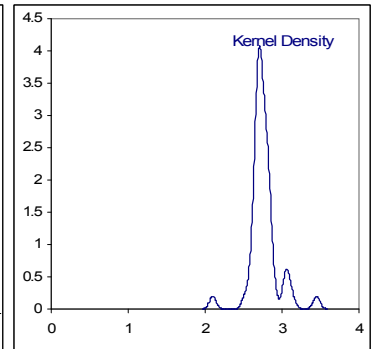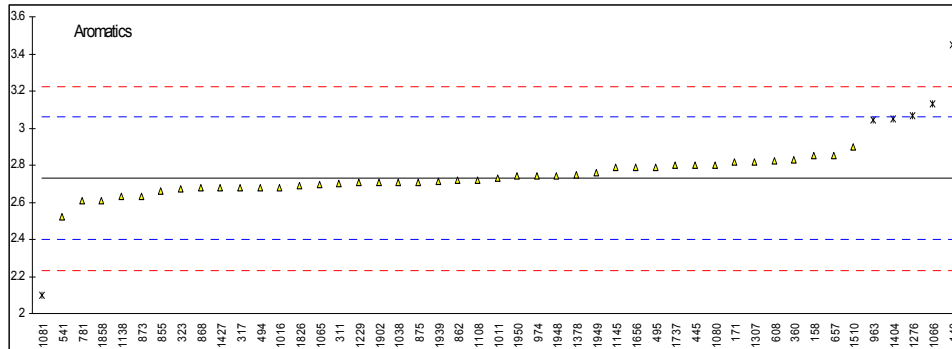
PONA/PIONA/PNA determination on sample #11027; results in %M/M

lab	method	n-paraf	mark	z(targ)	i-paraf	mark	z(targ)	Olefins	mark	z(targ)	Naphth.	mark	z(targ)
140	D5134	33.858		-0.53	36.061		-1.44	0.235		-----	25.484		-0.65
150	D5134	34.63		1.64	37.11		1.42	0.27		-----	24.40		-6.10
158	D5134	34.83		2.21	36.77		0.49	0.57	G(5)	-----	23.92		-8.51
171	D5443	34.34		0.83	36.18		-1.12	0.24		-----	25.63		0.09
225		-----		-----	-----		-----	-----		-----	-----		-----
237		-----		-----	-----		-----	-----		-----	-----		-----
238		-----		-----	-----		-----	-----		-----	-----		-----
311	D5443	33.8		-0.70	36.6		0.03	0.3		-----	26.1		2.45
317	D5443	33.40		-1.83	36.93		0.93	0.24		-----	26.02		2.05
323	D5443	34.11		0.18	36.28		-0.84	0.21		-----	26.03		2.10
329		-----		-----	-----		-----	-----		-----	-----		-----
333		-----		-----	-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----	-----		-----
336		-----		-----	-----		-----	-----		-----	-----		-----
337		-----		-----	-----		-----	-----		-----	-----		-----
360	D6730	34.915		2.45	36.864		0.75	0.357		-----	24.279		-6.71
371		-----		-----	-----		-----	-----		-----	-----		-----
391		-----		-----	-----		-----	-----		-----	-----		-----
399		-----		-----	-----		-----	-----		-----	-----		-----
444		-----		-----	-----		-----	-----		-----	-----		-----
445	D5443	34.26		0.60	35.84		-2.04	<0.1	false-?	-----	26.02		2.05
447		-----		-----	-----		-----	-----		-----	-----		-----
494	D6839	34.14		0.26	36.45		-0.38	0.24		-----	25.79		0.89
495	D6839	33.24		-2.28	36.71		0.33	0.24		-----	26.14		2.65
529		-----		-----	-----		-----	-----		-----	-----		-----
541		-----		-----	-----		-----	-----		-----	-----		-----
604		-----		-----	-----		-----	-----		-----	-----		-----
608	D6730	34.5981		1.55	37.0754		1.32	0.3354		-----	24.0293		-7.96
657	D6293	32.22		-5.16	37.40		2.21	0.24		-----	26.51		4.51
704		-----		-----	-----		-----	-----		-----	-----		-----
759		-----		-----	-----		-----	-----		-----	-----		-----
781	INH-52714	35.23		3.34	37.38		2.15	0.17		-----	23.23	C,G(5)	-11.98
855	D6293	34.23	C	0.52	36.12	C	-1.28	0.25	C	-----	26.04	C	2.15
862	D6293	33.70		-0.98	36.37		-0.60	0.23		-----	26.27		3.31
868	D6293	33.89		-0.44	36.44		-0.41	0.24		-----	25.99		1.90
873	INH-52714	35.49		4.07	36.97		1.03	0.04		-----	23.99	C	-8.16
875	INH-52714	35.32	C	3.59	36.16		-1.17	0.26		-----	22.82	C,G(5)	-14.05
912		-----		-----	-----		-----	-----		-----	-----		-----
962		-----		-----	-----		-----	-----		-----	-----		-----
963	D6730	34.857		2.29	37.572		2.67	0.824	G(1)	-----	22.607	G(5)	-15.12
974	D5443	33.25		-2.25	37.68		2.97	0.31		-----	25.31		-1.52
994		-----		-----	-----		-----	-----		-----	-----		-----
995		-----		-----	-----		-----	-----		-----	-----		-----
1011	D5443	32.955		-3.08	36.715		0.34	0.240		-----	26.655		5.24
1016	ISO22854	33.50		-1.54	36.50		-0.24	0.22		-----	26.40		3.96
1038		-----		-----	-----		-----	-----		-----	-----		-----
1065	D5443	34.646		1.69	35.505		-2.95	0.089		-----	26.358		3.75
1066	D5443	33.34		-2.00	36.48		-0.30	0.25		-----	25.86		1.24
1067		-----		-----	-----		-----	-----		-----	-----		-----
1080	INH-M3	34.13		0.23	35.85		-2.01	0.60	G(5)	-----	25.87		1.29
1081	In house	33.4		-1.83	35.6		-2.70	2.0	G(1)	-----	25.5		-0.57
1108	D5443	34.0		-0.13	36.3		-0.79	0.26		-----	26.0		1.95
1138	D5443	33.07		-2.76	37.53		2.56	0.23		-----	25.84		1.14
1145	D6293	33.08		-2.73	37.20		1.66	0.24		-----	25.99		1.90
1161		-----		-----	-----		-----	-----		-----	-----		-----
1167		-----		-----	-----		-----	-----		-----	-----		-----
1229	ISO22854	34.13		0.23	36.01		-1.58	0.27		-----	26.17		2.80
1254		-----		-----	-----		-----	-----		-----	-----		-----
1257		-----		-----	-----		-----	-----		-----	-----		-----
1276	D5134	35.602		4.39	35.834		-2.06	0.288		-----	24.401		-6.09
1280		-----		-----	-----		-----	-----		-----	-----		-----
1284		-----		-----	-----		-----	-----		-----	-----		-----
1307	In house	34.80		2.12	36.59		0.00	0.65	G(5)	-----	23.86		-8.82
1357		-----		-----	-----		-----	-----		-----	-----		-----
1378	In house	33.71		-0.95	35.99		-1.63	0.37		-----	26.47		4.31
1404	D5443	34.57		1.48	36.04		-1.50	0.44		-----	25.12		-2.48
1427	D6293	35.08		2.92	36.16		-1.17	0.11		-----	25.27		-1.72
1429		-----		-----	-----		-----	-----		-----	-----		-----
1510		-----		-----	-----		-----	-----		-----	-----		-----
1603	in house	34.71		1.87	36.25		-0.93	0.16		-----	25.34		-1.37
1634		-----		-----	-----		-----	-----		-----	-----		-----
1653		-----		-----	-----		-----	-----		-----	-----		-----
1656	D5443	31.85	G(5)	-6.20	37.34		2.04	0.25		-----	27.06		7.28
1737	In house	32.55		-4.23	37.66		2.91	0.36		-----	25.89		1.39

1826	D6839	32.96	-3.07	34.87	G(5)	-4.68	0.23	-----	28.55	G(5)	14.77
1855		-----	-----	-----		-----	-----	-----	-----		-----
1858	D5134mod	35.310	3.56	36.552		-0.10	0.132	-----	24.506		-5.57
1902	D5443	32.41	-4.62	36.95		0.98	0.40	-----	26.84		6.17
1939		-----	-----	-----		-----	-----	-----	-----		-----
1948	D5443	33.01	-2.93	36.85		0.71	0.26	-----	26.01		2.00
1949	D5443	33.39	-1.86	36.57		-0.05	0.26	-----	26.31		3.51
1950	D5134mod	35.42	3.87	36.52		-0.19	0.10	-----	24.45		-5.85
7001		-----	-----	-----		-----	-----	-----	-----		-----
7009		-----	-----	-----		-----	-----	-----	-----		-----
	normality	OK		OK			not OK		not OK		
	n	44		44			39		41		
	outliers	1		1			5		4		
	mean (n)	34.047		36.590			0.245		25.613		
	st.dev. (n)	0.8876		0.5662			0.0822		0.8609		
	R(calc.)	2.485		1.585			0.230		2.410		
	R(D5443:09e1)	0.992		1.028			unknown		0.557		

Corrections (C):	n-Paraffines	i-Paraffines	Olefins	Naphthenes
Lab 781				First reported 23.91
Lab 855	First reported 32.31	First reported 37.85	First reported 0.24	First reported 26.17
Lab 873				First reported 24.17
Lab 875	First reported 36.14			First reported 24.01

PONA/PIONA/PNA determination on sample #11027; results in %M/M (continued)

lab	method	Aromat.	mark	z(targ)	C4 lights	mark	z(targ)	highers	mark	z(targ)	remarks
140	D5134	4.362	G(1)	4.91	3.757		-0.34	-----		-----	
150	D5134	3.59		0.76	-----		-----	-----		-----	
158	D5134	3.61		0.86	4.25		2.26	-----		-----	
171	D5443	3.57		0.65	4.13		1.63	0.04		-----	
225		-----		-----	-----		-----	-----		-----	
237										-----	
238		-----		-----	-----		-----	-----		-----	
311	D5443	3.4		-0.27	3.7		-0.64	<0.1		-----	
317	D5443	3.37		-0.43	3.34		-2.54	0.05		-----	
323	D5443	3.37		-0.43	3.68		-0.75	<0.05		-----	
329		-----		-----	-----		-----	-----		-----	
333		-----		-----	-----		-----	-----		-----	
334		-----		-----	-----		-----	-----		-----	
336		-----		-----	-----		-----	-----		-----	
337		-----		-----	-----		-----	-----		-----	
360	D6730	3.582		0.71	4.156		1.76	0.030		-----	
371		-----		-----	-----		-----	-----		-----	
391		-----		-----	-----		-----	-----		-----	
399		-----		-----	-----		-----	-----		-----	
444		-----		-----	-----		-----	-----		-----	
445	D5443	3.52		0.38	3.69		-0.69	0.11		-----	
447		-----		-----	-----		-----	-----		-----	
494	D6839	3.38		-0.38	3.87		0.26	<0.1		-----	
495	D6839	3.51		0.32	3.21		-3.22	<0.1		-----	
529		-----		-----	-----		-----	-----		-----	
541	D6730	3.18		-1.45	-----		-----	-----		-----	
604		-----		-----	-----		-----	-----		-----	
608	D6730	3.5751		0.68	4.1097		1.52	0.013		-----	
657	D6293	3.58		0.70	2.05	DG(5)	-9.34	0.05		-----	
704		-----		-----	-----		-----	-----		-----	
759		-----		-----	-----		-----	-----		-----	
781	INH-52714	3.30		-0.81	3.27		-2.91	-----		-----	
855	D6293	3.36	C	-0.48	3.76	C	-0.32	<0.1		-----	
862	D6293	3.43		-0.11	3.65		-0.90	<0.1		-----	
868	D6293	3.38		-0.38	3.58		-1.27	<0.1		-----	
873	INH-52714	3.33		-0.64	-----		-----	-----		-----	
875	INH-52714	3.43		-0.11	-----		-----	-----		-----	
912		-----		-----	-----		-----	-----		-----	
962		-----		-----	-----		-----	-----		-----	
963	D6730	3.854	DG(5)	2.18	4.206		2.03	<0,001		-----	
974	D6293	3.45		0.00	3.74		-0.43	<0.001		-----	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1011	D5443	3.425		-0.13	2.395	G(5)	-7.52	<0.01		-----	
1016	ISO22854	3.38		-0.38	3.10		-3.80	<0.01		-----	
1038		-----		-----	-----		-----	-----		-----	
1065	D5443	3.403		-0.25	4.21		2.05	0		-----	
1066	D5443	3.93	G(5)	2.59	3.17		-3.43	0.14		-----	
1067		-----		-----	-----		-----	-----		-----	
1080	INH-M3	3.55		0.54	4.07		1.31	0.07		-----	
1081	In house	2.7	G(5)	-4.04	4.1		1.47	-----		-----	
1108	D5443	3.42		-0.16	4.14		1.68	0.13		-----	
1138	D5443	3.33		-0.64	3.78		-0.22	-----		-----	
1145	D6293	3.51		0.32	2.37	DG(5)	-7.65	<0.01		-----	
1161		-----		-----	-----		-----	-----		-----	
1167		-----		-----	-----		-----	-----		-----	
1229	ISO22854	3.43		-0.11	3.86		0.20	<0.05		-----	
1254		-----		-----	-----		-----	-----		-----	
1257		-----		-----	-----		-----	-----		-----	
1276	D5134	3.866	DG(5)	2.24	0.807	G(1)	-15.89	-----		-----	
1280		-----		-----	-----		-----	-----		-----	
1284		-----		-----	-----		-----	-----		-----	
1307	In house	3.57		0.65	-----		-----	-----		-----	
1357		-----		-----	-----		-----	-----		-----	
1378	In house	3.46		0.06	3.72		-0.54	-----		-----	
1404	D5443	3.85	G(5)	2.16	4.05		1.20	-----		-----	
1427	D6293	3.38		-0.38	3.90		0.41	<0.1		-----	
1429		-----		-----	-----		-----	-----		-----	
1510		-----		-----	-----		-----	-----		-----	
1603	in house	3.70		1.35	4.14		1.68	0		-----	
1634		-----		-----	-----		-----	-----		-----	
1653		-----		-----	-----		-----	-----		-----	
1656	D5443	3.50		0.27	1.22	G(1)	-13.71	<0.1		-----	
1737	In house	3.54		0.49	4.20		1.99	-----		-----	

1826	D6839	3.38	-0.38	3.67		-0.80	0	-----
1855		-----	-----	-----		-----	-----	-----
1858	D5134mod	3.271	-0.96	4.348		2.77	-----	-----
1902	D5443	3.40	-0.27	3.69	C	-0.69	-----	-----
1939		-----	-----	-----		-----	-----	-----
1948	D5443	3.48	0.16	4.13		1.63	0.05	-----
1949	D5443	3.47	0.11	2.93		-4.70	0.12	-----
1950	D5134mod	3.47	0.11	4.27		2.36	-----	-----
7001		-----	-----	-----		-----	-----	-----
7009		-----	-----	-----		-----	-----	-----

normality	OK		not OK	OK
n	40		36	14
outliers	6		5	0
mean (n)	3.450		3.822	0.057
st.dev. (n)	0.1053		0.3684	0.0496
R(calc.)	0.295		1.032	0.139
R(D5443:09e1)	0.520		0.531	n.a.

Corrections (C):	aromatics	C4 lights	Highers
Lab 855	First reported 3.44	First reported 2.78	
Lab 1902		First reported 1.92	

Determination of Mercury content as Hg on sample #11028 and #11029; results in µg/kg

| lab	method	#11028	mark	z(targ)	#11029	mark	z(targ)	remarks
150		-----		-----	-----		-----	
311	UOP938	115		1.62	92		0.43	
317	INH-027	80		-0.18	119		1.81	
323	INH-072	90		0.33	82		-0.09	
333	UOP938	93		0.49	89		0.27	
444	UOP938	105.5		1.13	97.9		0.73	
608		-----		-----	-----		-----	
609	UOP938	90.4885		0.36	96.6810		0.67	
657	UOP938	85.8		0.12	76.1		-0.39	
781	INH-001	42.3		-2.12	85.98		0.12	
855	UOP938	98.3		0.76	96.6		0.66	
862	UOP938	96.2		0.65	94.0		0.53	
868	UOP938	73.1		-0.54	66.8		-0.87	
873	EPA7473	105		1.11	100		0.84	
875		-----		-----	-----		-----	
912		-----		-----	-----		-----	
963	D3223Mod	63.997		-1.01	70.720		-0.67	
974	UOP938	60.92		-1.16	68.57		-0.78	
1038		-----		-----	-----		-----	
1067		-----		-----	-----		-----	
1081	In house	70		-0.70	70		-0.70	
1138		-----		-----	-----		-----	
1145	UOP938	96.41		0.66	97.47		0.71	
1200	UOP938	76.1517		-0.38	72.3817		-0.58	
1307	UOP938	89.44		0.30	83.79		0.00	
1404	In house	70		-0.70	92		0.43	
1427	In house	3.45	G(0.01)	-4.12	2.60	G(0.01)	-4.17	
1429	INH-02	95		0.59	83.5		-0.01	
1603	In house	91		0.38	84		0.01	
1800	In house	83.8		0.01	75.9		-0.40	
1826		47		-1.88	65		-0.96	
1855	In house	90		0.33	83		-0.04	
1858		-----		-----	-----		-----	
1902	UOP938	91.9		0.43	85.6		0.10	
1939	ICP	63		-1.06	45		-1.99	
1949	AAS	85.7		0.11	93.0		0.48	
1950	EPA7473	90		0.33	78		-0.29	
	normality	not OK			OK			
	n	28			28			
	outliers	1			1			
	mean (n)	83.54			83.71			
	st.dev. (n)	17.143			14.409			
	R(calc.)	48.00			40.35			
	R(Horwitz)	54.38			54.48		Compare (UOP938B:10) = 7.85	
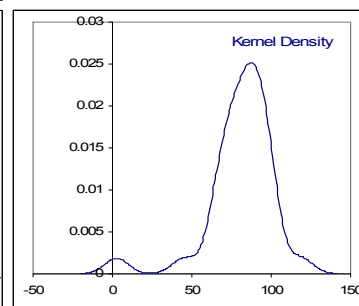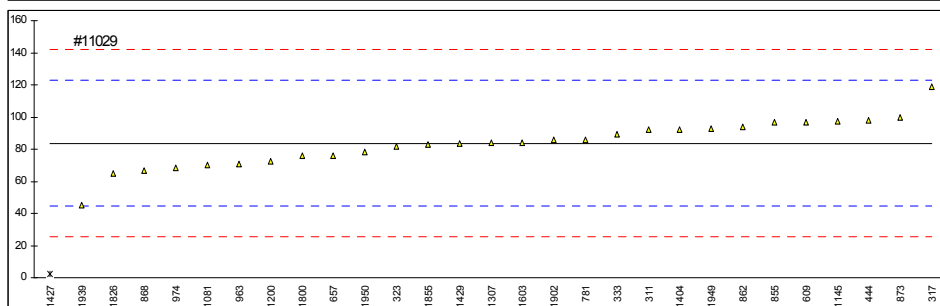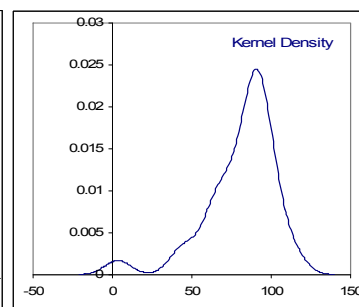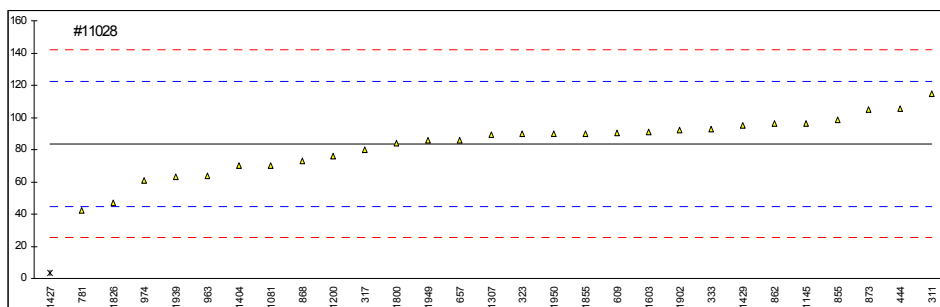
Determinations of Arsenic content as As on sample #11030 and #11031; results in µg/kg

lab	method	#11030	mark	z(targ)	#11031	mark	z(targ)	remarks
150	INH-594	32		-0.60	89		-0.95	
171	In house	56		1.82	128		0.61	
311		-----		-----	-----		-----	
323	INH-018	47		0.91	143		1.21	
444		-----		-----	-----		-----	
781		-----		-----	-----		-----	
855		-----		-----	-----		-----	
862		-----		-----	-----		-----	
868		-----		-----	-----		-----	
873		-----		-----	-----		-----	
875		-----		-----	-----		-----	
912		-----		-----	-----		-----	
963	UOP946	42		0.41	158		1.80	
1067		5.8	G(0.05)	-3.24	122.6		0.39	
1081		49		1.11	145		1.29	
1138		-----		-----	-----		-----	
1145	INH-9312	19.6		-1.85	70.1		-1.70	
1280	In house	41.56		0.36	135.67		0.91	
1404		-----		-----	-----		-----	
1427		-----		-----	-----		-----	
1826		27		-1.10	65		-1.91	
1858		-----		-----	-----		-----	
1902		-----		-----	-----		-----	
1939	In house	21.1		-1.70	59.2		-2.14	
1949	UOP946	44.3		0.64	124.9		0.48	
1950		-----		-----	-----		-----	

|							
normality	OK			OK			
n	10			11			
outliers	1	Spike:		0	Spike:		Recoveries <94 and <94%
mean (n)	37.96	40.17		112.77	120.18		
st.dev. (n)	12.363			35.406			
R(calc.)	34.62			99.14			
R(Horwitz)	27.82			70.17			
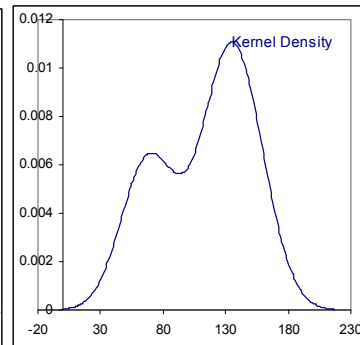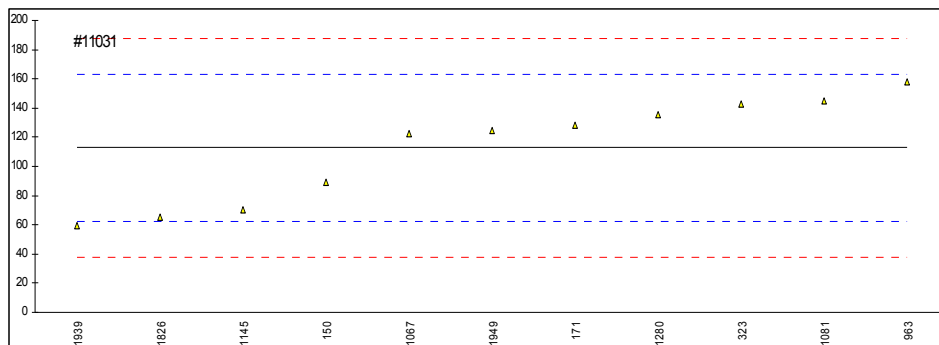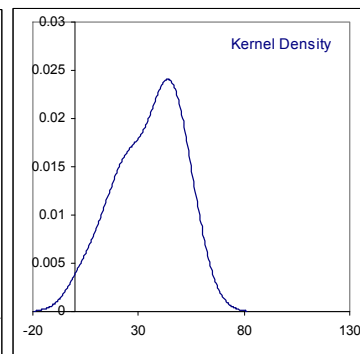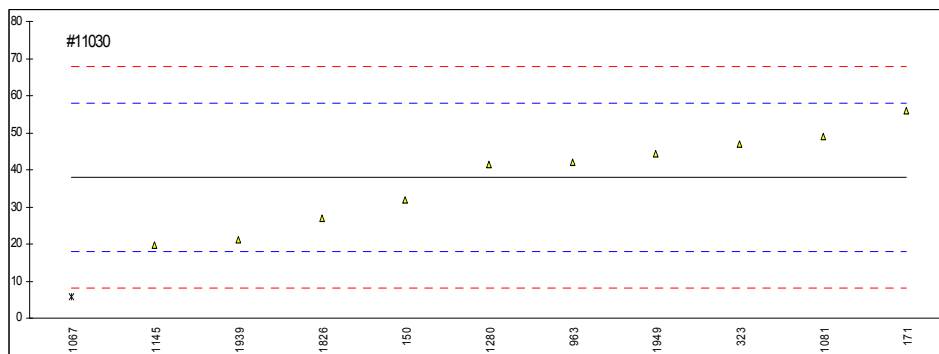
Determinations of Lead content as Pb on sample #11030 and #11031; results in µg/kg

lab	method	#11030	mark	z(targ)	#11031	mark	z(targ)	remarks
150	INH-594	21		-2.47	80		-2.06	
171	In house	83		2.15	247		3.38	
311		-----		-----	-----		-----	
323	INH-018	55		0.06	188		1.46	
444	UOP952	84.7		2.28	174		1.00	
781	UOP952	38.2		-1.19	120.2		-0.75	
855		-----		-----	-----		-----	
862	UOP952	93.0		2.89	136	C	-0.23	First reported 273
868	UOP952	40.2		-1.04	126		-0.56	
873	UOP952	44		-0.75	96		-1.54	
875	UOP952	35		-1.42	105		-1.24	
912		-----		-----	-----		-----	
963	IP224	65		0.81	195		1.69	
1067		-----		-----	-----		-----	
1081	In house	16		-2.84	68		-2.45	
1138		-----		-----	-----		-----	
1145	INH-9406	38.2		-1.19	88.3		-1.79	
1280	In house	65.6		0.85	199.48		1.83	
1404	IP224	46.9		-0.54	-----		-----	
1427		-----		-----	-----		-----	
1826		45		-0.68	119		-0.79	
1858		-----		-----	-----		-----	
1902		-----		-----	-----		-----	
1939	In house	48.2		-0.44	139.1		-0.13	
1949	In house	120.3		4.93	277.7		4.38	
1950	In house	35		-1.42	75		-2.22	
	normality	OK			OK			
	n	18			17			
	outliers	0	Spike:		0	Spike:		Recoveries <75 and <68%
	mean (n)	54.13	72.14		143.16	211.11		
	st.dev. (n)	26.752			61.315			
	R(calc.)	74.91			171.68			
	R(Horwitz)	37.61			85.94			
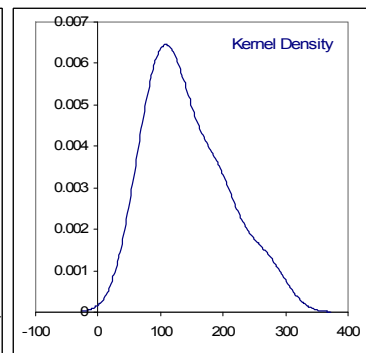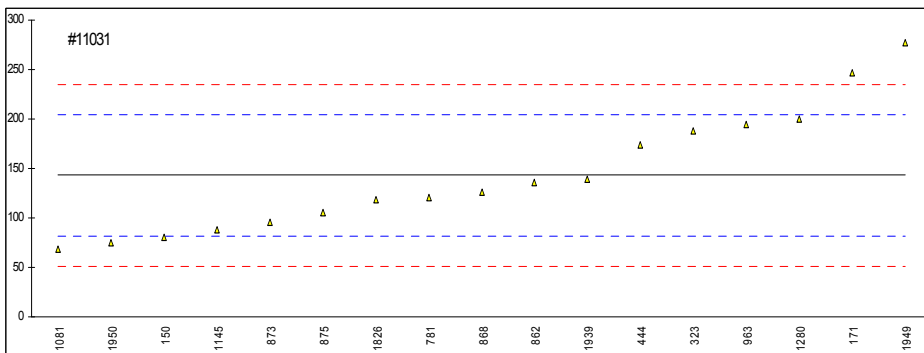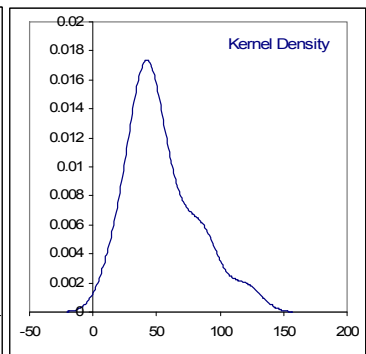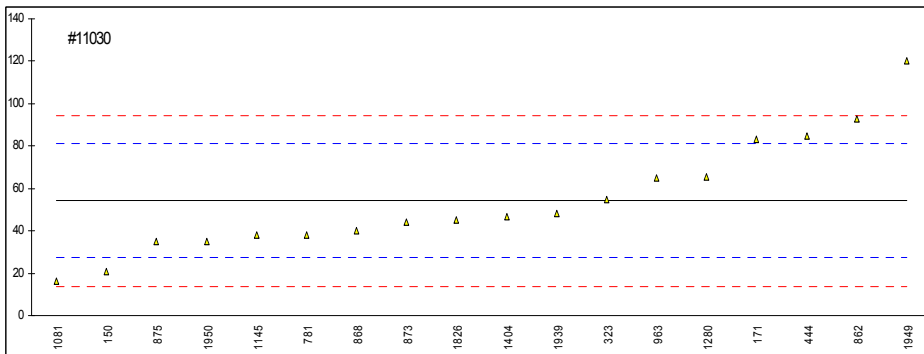
Determination of Total Vapour Pressure on sample #11032; results in psi

lab	method	value	mark	z(targ)	remarks
140	D5191	6.54		-0.08	
150	D5191	6.47		-0.73	
158		6.60		0.48	
171	D5191	6.56		0.10	
225		-----		-----	
237		-----		-----	
311	D5191	6.51		-0.36	
317	D5191	6.56		0.10	
323	D5191	6.58		0.29	
360		-----		-----	
371	D5191	6.46		-0.82	
391		6.53		-0.17	
399	D5191	6.74		1.77	
445	IP394	6.53		-0.17	
447	D5191	6.54		-0.08	
494	D5191	6.628		0.73	
495		6.51		-0.36	
657	D5191	6.60		0.48	
704	D5191	6.455		-0.87	
759		-----		-----	
855	D5191	6.580		0.29	
862	D5191	6.400		-1.38	
868	D5191	6.439		-1.02	
974	D5191	6.57	C	0.20	First reported 6.94
1038		-----		-----	
1065	D5191	6.69		1.31	
1067	D5191	6.555		0.06	
1080		-----		-----	
1081	D5191	6.63		0.75	Reported 45.7 kPa
1108	D5191	6.47		-0.73	
1161		-----		-----	
1167		-----		-----	
1284	D5191	6.55		0.01	
1307	D5191	6.54		-0.08	
1378	D5191	6.399		-1.39	
1427	D5191	6.49		-0.55	
1510	D5191	6.53		-0.17	
1634	EN13016	6.580		0.29	
1826		-----		-----	
1858		-----		-----	
1902	D5191	7.16	G(0.01)	5.67	
1939	D5191	6.53		-0.17	
1949	D5191	6.585		0.34	
1950	D5191	6.76		1.96	

normality	OK	
n	33	
outliers	1	
mean (n)	6.549	
st.dev. (n)	0.0825	
R(calc.)	0.231	
R(D5191:07)	0.302	
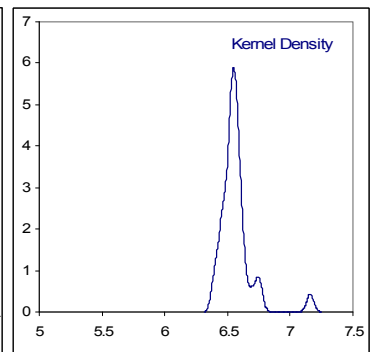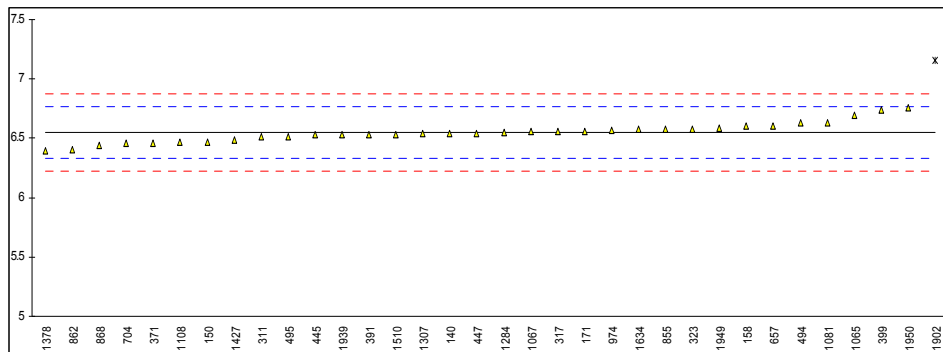
Determination of DVPE acc. D5191 on sample #11032; results in psi

lab	method	value	mark	z(targ)	remarks
140	D5191	5.7631		-0.12	
150	D5191	5.69		-0.81	
158		5.82		0.43	
171	D5191	5.78		0.04	
225		-----		-----	
237		-----		-----	
311	D5191	5.73		-0.43	
317	D5191	5.79		0.14	
323	D5191	5.80		0.24	
360		-----		-----	
371	D5191	5.69		-0.81	
391		5.45	G(0.05)	-3.10	
399	D5191	5.96		1.76	
445	IP394	5.74		-0.34	
447	D5191	5.76		-0.15	
494	D5191	5.845		0.66	
495		5.74		-0.34	
657	D5191	5.82		0.43	
704	D5191	5.681		-0.90	
759		-----		-----	
855	D5191	5.900		1.19	
862	D5191	5.640		-1.29	
868	D5191	5.666		-1.04	
974	D5191	5.79	C	0.14	First reported 6.1491
1038	D5191	5.778		0.03	
1065	D5191	5.90		1.19	
1067	D5191	5.773		-0.02	
1080		-----		-----	
1081	D5191	5.86	C	0.81	Reported 40.4 as kPa
1108	D5191	5.69		-0.81	
1161		-----		-----	
1167		-----		-----	
1284	D5191	5.77		-0.05	
1307	D5191	5.76		-0.15	
1378	D5191	5.627		-1.41	
1427	D5191	5.72		-0.53	
1510	D5191	5.75		-0.24	
1634	EN13016	5.802		0.25	
1826	D5191	5.79		0.14	
1858		-----		-----	
1902	D5191	6.37	G(0.01)	5.67	
1939	D5191	5.753		-0.21	
1949	D5191	5.802		0.25	
1950	D5191	5.98		1.95	

normality	OK
n	34
outliers	2
mean (n)	5.775
st.dev. (n)	0.0813
R(calc.)	0.228
R(D5191:07)	0.290
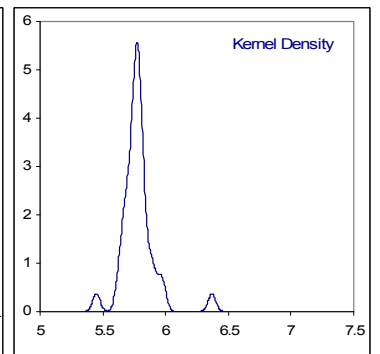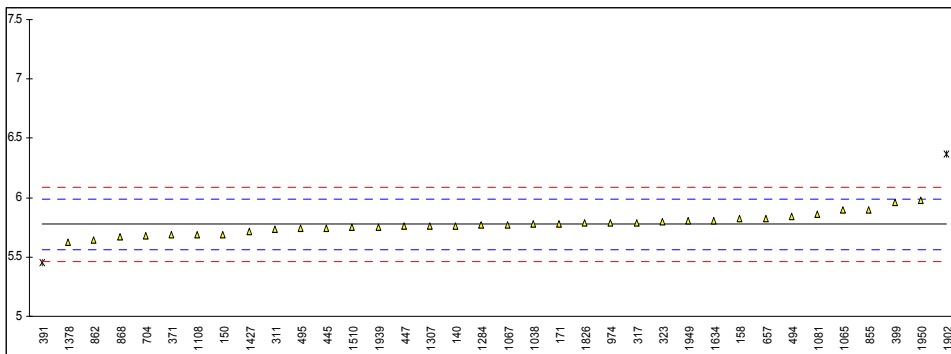
APPENDIX 2
Number of participants per country

1 laboratory in	ARGENTINA
1 laboratory in	AUSTRALIA
1 laboratory in	AZERBAIJAN
3 laboratories in	BELGIUM
1 laboratory in	BRAZIL
2 laboratories in	BULGARIA
1 laboratory in	CÔTE D'IVOIRE
1 laboratory in	FINLAND
6 laboratories in	FRANCE
1 laboratory in	GEORGIA
3 laboratories in	GERMANY
2 laboratories in	GREECE
1 laboratory in	HUNGARY
2 laboratories in	INDIA
2 laboratories in	IRAN
1 laboratory in	ISRAEL
2 laboratories in	ITALY
2 laboratories in	LATVIA
2 laboratories in	MALAYSIA
1 laboratory in	MEXICO
2 laboratories in	NIGERIA
3 laboratories in	P.R. of CHINA
3 laboratories in	PORTUGAL
1 laboratory in	QATAR
7 laboratories in	RUSSIA
2 laboratories in	SAUDI ARABIA
2 laboratories in	SINGAPORE
1 laboratory in	SULTANATE OF OMAN
1 laboratory in	THAILAND
8 laboratories in	THE NETHERLANDS
4 laboratories in	TURKEY
2 laboratories in	U.A.E.
4 laboratories in	U.S.A.
1 laboratory in	UKRAINE
7 laboratories in	UNITED KINGDOM

APPENDIX 3

Abbreviations:

C			= corrected 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
fr			= first reported
ex			= excluded from calculations
w			= withdrawn on request participant
E			= error in calculations
S			= scope of the reported method is not applicable
U			= reported in a deviating unit
n.a.			= not applicable
SDS			= Safety Data Sheet
RSD			= Relative Standard Deviation

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3.		ASTM E178-02
4.		ASTM E1301-03
5.		ISO 5725-86
6.		ISO 5725, parts 1-6, 1994
7.		ISO13528-05
8.		M. Thompson and R. Wood, J. AOAC Int, <u>76</u>, 926, (1993)
9.		W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
10.		IP 367/84
11.		DIN 38402 T41/42
12.		P.L. Davies, First reported Z. Anal. Chem, <u>331</u>, 513, (1988)
13.		J.N. Miller, Analyst, <u>118</u>, 455, (1993)
14.		Analytical Methods Committee Technical brief, No4 January 2001.
15.		The Royal Society of Chemistry 2002, Analyst 2002, 127 page 1359-1364, P.J. Lowthian and M. Thompson (see http://www.rsc.org/suppdata/an/b2/b205600n/).