Results of Proficiency Test
Naphtha
April 2014

Organised by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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Report no.: iis14N01

June 2014

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1 INTRODUCTION

Since 1994, the Institute for Interlaboratory Studies organizes a proficiency test for the analysis of Naphtha every year. The interlaboratory study on Naphtha was extended with PTs for the determination for Mercury, Arsenic/Lead and Vapour Pressure.
In the annual proficiency testing program of 2013/2014, it was decided to continue the 4 PTs on Naphtha. In the main PT, 80 laboratories in 32 different countries have participated; in the PT for Mercury, 44 laboratories in 19 different countries have participated; in the PT for Arsenic and Lead, 27 laboratories in 16 different countries have participated and in the PT for Vapour Pressure, 43 laboratories in 20 different countries have participated. See appendix 2 for the number of participants per country. In this report, the results of the 2014 proficiency test 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 six different samples of Naphtha, see table below. As the Arsenic determination was very problematic in previous round robins, it was decided to prepare a synthetic Naphtha with a known amount of Arsenic and Lead. This sample was labelled #14036.

Samples	Amount per bottle in mL	Purpose
#14031	500	For regular analysis
#14032	8	For GC analysis
#14033	500	For Mercury
#14035	500	For Arsenic and Lead
#14036	500	For Arsenic and Lead
#14037	250	For DVPE

table 1: Six different Naphtha samples used in iis14N01

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/IEC 17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentially of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organisation was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of April 2014 (iis-protocol, version 3.3). This protocol can be downloaded via the FAQ page of the iis website http://www.iisnl.com.

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

One drum with approx. 120 litres of old stock Naphtha was used. Out of this batch five different samples were prepared. After homogenisation, 95 brown glass bottles of 0.5 litre (labelled #14031), 100 vials of 8 ml (labelled #14032), 53 brown glass bottles of 0.5 litre (labelled #14033), 36 brown glass bottles of 0.5 liter (labelled #14035) and 57 brown glass bottles of 250ml were filled (labelled #14037).

The homogeneity of subsamples #14031 was checked by determination of Density at 15°C in accordance with ASTM D4052 on 4 stratified randomly selected samples.
The homogeneity of subsamples #14032 was checked by determination of MTBE in accordance with an in house test method on 4 stratified randomly selected samples.
The homogeneity of subsamples #14033 was checked by determination of Mercury in accordance with UOP938 on 4 stratified randomly selected samples. The homogeneity of subsamples #14035 was checked by determination of Lead in accordance with an in house test method on 4 stratified randomly selected samples. The homogeneity of subsamples #14037 was checked by determination of DVPE in accordance with ASTM D5191 on 4 stratified randomly selected samples.

	Density @ 15°C in kg/L		MTBE in mg/kg
sample #14031-1	0.72873	sample #14032-1	13.7
sample #14031-2	0.72875	sample #14032-2	13.8
sample #14031-3	0.72875	sample #14032-3	13.7
sample #14031-4	0.72875	sample #14032-4	14.0

table 2: homogeneity test results of subsamples #14031 and #14032

	Mercury in µg/kg		Lead in µg/kg
sample #14033-1	135	sample #14035-1	55
sample #14033-2	140	sample #14035-2	50
sample #14033-3	146	sample #14035-3	50
sample #14033-4	147	sample #14035-4	50

table 3: homogeneity test results of subsamples #14033 and #14035

	DVPE in psi
sample #14037-1	5.98
sample #14037-2	5.82
sample #14037-3	5.82
sample #14037-4	5.83

table 4: homogeneity test results of subsamples #14037

From the results in tables 2 - 4, 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 (#14031)	0.00003	--	--	--	--
r (#14032)	--	0.4	--	--	--
r (#14033)	--	--	16	--	--
r (#14035)	--	--	--	7.0	--
r (#14037)	--	--	--	--	0.22
0.3*R (ref.)	0.00015	1.2	26	10.8	0.21 *)
reference	D4052:02e1	Horwitz	Horwitz	Horwitz	D5191:13

table 5: repeatabilities of subsamples #14031, #14032, #14033, #14035 and #14037

*) compared with the repeatability

The repeatabilities of the results of the homogeneity tests for samples #14031, #14032, #14033, #14035 and #14037 are all in agreement with the requirements of standards or with the estimated reproducibilities calculated using the Horwitz equation. Therefore, homogeneity of all prepared subsamples was assumed.

Sample #14036 especially prepared for Arsenic and Lead determination, as synthetic Naphtha was prepared with the following ingredients:

Light hydrotreated Naphtha 100/140	64742-49-0	10.5 kg
Petroleum Ether 40/60 (ligroin)	8032-32-4	1.2 kg
Cyclohexane	110-82-7	1.4 kg
Mixed-Xylene	1330-20-7	1.6 kg

table 6: composition of synthetic Naphtha

To this mixture 10.8 g of Lead Conostan standard (1000 ppm Pb) and 4.3 gram of Arsenic Conostan standard (100 ppm As) was added. This would end up in concentrations of respective 750 µg/kg Pb and 31 µg/kg As.
This batch was after homogenisation, divided over 35 amber glass bottles of 0.5 liter and labelled #14036. The homogeneity of subsamples #14036 was checked by determination of Lead in accordance with an in house test method on 4 stratified randomly selected samples.

	Lead in µg/kg
sample #14036-1	470
sample #14036-2	470
sample #14036-3	440
sample #14036-4	470

table 7: homogeneity test results of subsamples #14036

From the results in table 7, the repeatability was calculated and compared with 0.3 times the corresponding reproducibility calculated using the Horwitz equation in agreement with the procedure of ISO 13528, Annex B2 in the next table;

	Lead in µg/kg
r (#14036)	42
0.3*R (ref.)	70
reference	Horwitz

table 8: repeatability of subsamples #14036

The repeatability of the results of the homogeneity tests for sample #14036 is in agreement with the estimated reproducibility calculated using the Horwitz equation. Therefore, homogeneity of the subsamples was assumed.

To the participating laboratories, depending on its registration, one or more of the following samples were sent on March 19, 2014.

Bottle size	Sample id.	Determinations
1 x 0.5 liter	#14031	Regular tests
1 x 0.1 liter	#14032	PIONA/PONA only
1 x 0.5 liter	#14033	Mercury only
2 x 0.5 liter	#14035 & #14036	Arsenic/Lead only
1 x 0.25 liter	#14037	Vapor Pressure only

table 9: bottle sizes, sample identification and determinations

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 #14031 the following analyses: Colour Saybolt (Manual and/or Automated), Copper Corrosion 3hrs @ 50°C, Density @15°C, Distillation (IBP, 50% recovered and FBP), Mercaptans and Sulphur. On sample #14032 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 #14033 the participants were requested to determine Mercury. On samples #14035 and #14036 the participants were requested to determine Arsenic and Lead. On sample #14037 the participants were requested to determine only TVP / DVPE.

To get comparable results a detailed report form, on which the units were prescribed as were prepared and made available for download on the iis website (www.iisnl.com).
A SDS and a form to confirm receipt of the samples were added to the sample package

3 RESULTS

During four weeks after sample despatch, the results of the individual laboratories were gathered. The original data are tabulated per determination in 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 Organisation, Statistics and Evaluation of April 2014’ (iis-protocol, version 3.3). 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 a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either ‘unknown’, ‘OK’, ‘suspect’ or ‘not OK’. After removal of outliers, this check was repeated. Not all data sets proved to have a normal distribution, in which cases the statistical evaluation of the results should be used with due care. In accordance to ISO 5725 (1986 and 1994) the original results per determination

were submitted subsequently to Dixon's, Grubbs and Rosner 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 and by R(0.01) for the Rosner General ESD test (see appendix 3, no.17). Stragglers are marked by D(0.05) for the Dixon test, by G(0.05) or DG(0.05) for the Grubbs test and by R(0.05) for the Rosner General ESD test. Both outliers and stragglers were not included in the calculations of the averages and the standard deviations.

For each assigned value, the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. When the uncertainty passed the evaluation, no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.
Finally, the reproducibilities were calculated from the standard deviations by multiplying them with a factor of 2.8.

3.2 GRAPHICS

In order to visualise the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported 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 is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. In order to visualise the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported 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 is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms (see appendix 3; nos.14 and 15). Also a normal Gauss curve was projected over the Kernel Density Graph.

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.

When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test result is fit-for-use.
The z-scores were calculated in accordance with:

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

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

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

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

4 EVALUATION

In this interlaboratory study, major problems with sample despatch were encountered during the execution. Laboratories in Brazil, Russia, Saudi Arabia and UAE 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 74 participants for sample #14031 and #14032, 35 participants for sample #14033, 21 participants for sample #14035 and sample #14036 and 39 participants for sample #14037 reported in total 1304 numerical results. Observed were in total 49 outlying results, which is 3.8%. 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 #14031 for Colour Saybolt (Manual and Automated), Density @15°C, Distillation Automated (FBP), Distillation manual (50%recovered), Mercaptans, Total Oxygenates and on sample #14032 for Olefins and Aromatics (%V/V and %M/M). 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.

In the iis PT reports, ASTM methods are referred to with a number (e.g. D2086) and an added designation for the year that the method was adopted or revised (e.g. D2086-08). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D2086-08(2013)). In the results tables of Appendix 1 only the method number and year of adoption or revision e.g. D2086-08 will be used.

Evaluation for sample #14031:

Colour Saybolt: This determination was not problematic (both the manual and the automated mode). In total four statistical outliers for the manual mode and one statistical outlier for the automated mode were observed. A number of laboratories did not report conform ASTM D156:12. In total nine participants used the “>” sign and eight participants did not report the plus sign in front of the result. This is not clear in ASTM D6045:12
The calculated reproducibilities for the manual and the automated mode are both in good agreement with the respective requirements of ASTM D156:12 and ASTM D6045:12.

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

Density @ 15°C: This determination was problematic for a number of laboratories. Six statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ISO12185:96.
The current version of ASTM D4052:11 only give reproducibilities being valid for gasolines, distillates, basestocks and lubricating oils. Therefore this 2011 version may not be applicable to Naphtha.

Distillation: For the automated mode: This determination was not problematic. No statistical outliers were observed. The calculated reproducibilities of 50% recovered and Final Boiling Point data are in agreement with the requirements of ASTM D86:12. Regretfully the calculated reproducibility of the Initial Boiling Point data does not meet the requirements.
For the manual mode: This determination was not problematic. No statistical outliers were observed and all calculated reproducibilities are in agreement with the requirements of ASTM D86:12.

Mercaptans: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D3227:13.

Sulphur: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with ASTM D2622:10.
When the test results of the various test techniques were evaluated separately, only the calculated reproducibility of data determined by Energy Dispersive X-ray Fluorescence Spectrometry is in agreement with the precision data of respective test method (ASTM D4294).
The calculated reproducibilities of the data determined by Wavelength Dispersive X-ray Fluorescence Spectrometry and Ultraviolet Fluorenscence did not meet the precision data of the respective test methods. However, the consensus values of the three techniques do not differ significantly from each other.

Evaluation for sample #14032:

Chlorides: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ASTM D5808:09a(2014).

Methanol: This determination may be very problematic at the concentration level of 35 mg/kg. One statistical outlier and three false negative test results were 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 variety of test methods used may explain for the relatively large spread.

MTBE: This determination may be problematic at the concentration level of 13 mg/kg. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the strict estimated reproducibility calculated using the Horwitz equation. The variety of test methods used may explain for the relatively large spread.

Total Oxygenates: This determination may be problematic. Two statistical outliers were observed. The calculated reproducibility, after rejection of the statistical outliers is not in agreement with the strict estimated reproducibility, calculated using the Horwitz equation. The variety of test methods used and the low number of reported results may explain for the relatively large spread. Four laboratories reported test results probably in a deviating unit.

PONA/PIONA: This determination was problematic. In total 22 statistical outliers were observed. None of the calculated reproducibilities, except for Aromatics (%V/V) after excluding the statistical outliers, are in agreement with the requirements of ASTM D5443:04(2009)e1.
The determination of Olefins was problematic. In total three statistical outliers were observed. Both calculated reproducibilities after rejection of the statistical outliers are not in agreement with the requirements of ASTM D6839:13.
Evaluation of the determinations should be used with care as:

- Eight laboratories reported to have used ASTM D5134, ASTM D6729 or ASTM D6730 for the PONA/PIONA determination in %V/V. These ASTM standards do not mention conversion formulae from %M/M to %V/V.
- ASTM D6293:98 was intended for low boiling gasolines only; this test method was withdrawn in 2009 and replaced by D6839.
- ASTM D6839:07 is intended for low boiling gasolines only.

Most observed reproducibilities are in agreement with the reproducibilities in previous rounds:

	2014	2013	2012	2011	2010	2009	ASTM
n-paraffines	8.5%	7.6%	5.7%	6.8%	5.1%	3.0%	3.2%
i-pararaffines	6.0%	5.9%	4.0%	5.4%	4.0%	2.9%	3.1%
Olefins	325% *)	225% *)	259% *)	271% *)	220% *)	26%	250%
naphthenes	3.0%	3.4%	5.9%	13%	10%	5.9%	1.9%
aromatics	12%	13%	8.8%	5.7%	12%	13%	8.9%
C4 & lighters	44%	19%	19%	27%	38%	49%	17%

table 10: Comparison of observed relative target reproducibilities (%M/M)
*) probably to low olefins concentrations.

As in previous rounds, many participating labopratories did have problems with the determination of the Naphthenes. Several laboratories reported to have used ASTM D5134, ASTM D6729, and ASTM D6730. The difference between these tests methods and all others used (ASTM D5443, ASTM 6293 ASTM D6839 and ISO22854) is the performance of the chromatographic system. In the first mentioned methods ASTM D5134, ASTM D6729 and ASTM D6730, the chromatographic system is equipped with a fused silica capillary column, while in other tests methods multiple columns are used with multi dimensional column-coupling and column-switching sytems. All participants that did not use a multiple columns technique, may have encountered problems with the identification of high boiling components. These test results are all located in the left part of graphs and were excluded from the statistical evaluation.

Evaluation for sample #14033:

Mercury: This determination may not be problematic at the concentration level of 116 µg Hg/kg. Only one statistical outlier was observed. Regretfully, besides the reference test method UOP938:10 (that does not provide reproducibility data, except for method B), no other reference method exists. The calculated reproducibility after rejection of the statistical ouitlier is in good agreement with the estimated reproducibility calculated using the Horwitz equation.

Evaluation for sample #14035 and #14036:

Arsenic: This determination was very problematic. Regretfully, all of the reporting laboratories reported a result near or below the detection limit for sample #14035. Therefore no significant conclusions were drawn.
Sample #14036 was spiked with a measurable concentration level (30.8 µg/kg As). Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the estimated reproducibility calculated using the Horwitz equation. The sample was spiked with Arsenic. The minimal Arsenic concentration of sample #14036 to be found was known (added amount = 30.8 µg As/kg). The average recovery of Arsenic (theoretical increment of 29.10 µg As/kg) may be good: “94%”.

The cause for not recovering a concentration in sample #14035 may be explained by the following: According to UOP946, arsenic components may stick to the glass wall under influence of light:

Quote

Collect samples in amber glass bottles, as samples must not be stored exposed to light during shipping and storage. Light promotes the loss of arsenic to the container walls. If amber bottles are not available, wrap clear bottles in dark paper or otherwise protect from exposure to light. Samples should be analyzed as quickly as possible to minimize possible analyte losses.When samples have been stored longer than two weeks, sample from the bottle and determine the arsenic content as described under Extraction. If the whole sample is taken, rinse the bottle with sodiumhypochlorite solution and sulfuric acid as described under Extraction. Use these rinses to perform the sample extraction and proceed with the decomposition and analysis.

Unquote

The complex mixture of components of real Naphtha containing reactive sulphur components like mercaptans, may explain why none of the laboratories reported a result above the detection limt for sample #14035. Due to the absence of any reactive sulphur components in sample #14036, the participating laboratories were obviously able to find a positive test result on As, without interference by the above quoted phenomenon.

Lead: This determination was very problematic. No statistical outliers were observed. Both calculated reproducibilities are not in agreement with the strict estimated reproducibility, calculated using the Horwitz equation.
Sample #14036 was spiked with Lead. The minimal Lead concentration of sample #14036 to be found was known (added amount = 750 µg Pb/kg). The average recovery of Lead (theoretical increment of 750 µg Pb/kg) may be unsatisfactory: “28%”.

Evaluation for sample #14037:

TVP: 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 estimated requirements of ASTM D5191:13.

DVPE: The conversion of the measured Total Vapour Pressure to the corresponding Dry Vapour Pressure Equivalent (DVPE) as described in the ASTM D5191:12, showed no statistical outliers. The calculated reproducibility is in good agreement with the requirements of ASTM D5191:13.

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 (target)
Color Saybolt (manual)		33	29.8	1.0	2.0
Color Saybolt (automated)		20	29.9	0.9	1.2
Copper Corrosion		57	1(1A)	n.a.	n.a.
Density @ 15°C	kg/L	67	0.7287	0.0003	0.0005
Initial Boiling Point (auto)	°C	54	43.36	6.37	5.63
50% recovered (auto)	°C	54	105.87	1.48	1.88
Final Boiling Point (auto)	°C	54	169.36	5.59	6.78
Initial Boiling Point (manual)	°C	10	44.65	3.85	5.60
50% recovered (manual)	°C	10	105.95	2.03	4.16
Final Boiling Point (manual)	°C	10	168.65	4.94	7.20
Mercaptans	mg/kg	52	30.8	6.1	4.4
Sulphur	mg/kg	63	123.4	26.6	20.3

table 11: comparison of the observed and target reproducibilities of the samples #14031

Parameters	unit	n	average	2.8 * sd	R (lit)
Total Chloride	mg/kg	20	2.4	2.3	1.3
Methanol	mg/kg	18	34.9	25.1	9.2
MTBE	mg/kg	24	13.0	5.9	4.0
Total Oxygenates	%M/M	14	0.0050	0.0024	0.0018
n-Paraffins	%V/V	43	28.02	2.29	0.90
i-Paraffins	%V/V	42	30.93	1.70	0.95
Olefins	%V/V	35	0.23	0.72	0.36
Naphthenes	%V/V	29	33.21	1.01	0.63
Aromatics	%V/V	42	8.18	0.75	0.80
C_4 & lighter	%V/V	34	1.35	0.59	0.22
Compounds bp > 200 °C	%V/V	21	0.19	0.30	n.a.
n-Paraffins	%M/M	43	26.03	2.20	0.87
i-Paraffins	%M/M	42	29.26	1.76	0.92
Olefins	%M/M	35	0.23	0.75	0.37
Naphthenes	%M/M	27	35.29	1.06	0.65
Aromatics	%M/M	43	9.88	1.21	0.88
C_4 & lighter	%M/M	34	1.08	0.48	0.18
Compounds bp > 200 °C	%M/M	21	0.22	0.34	n.a.

table 12: comparison of the observed and target reproducibilities of the sample #14032

Parameters	unit	n	average	2.8 * sd	R (lit)
Mercury as Hg #14033	µg/kg	34	116.5	44.5	72.1

table 13: comparison of the observed and target reproducibility of sample #14033

Parameters	unit	n	average	2.8 * sd	R (lit)
Arsenic as As #14035	µg/kg	8	<10	n.a.	n.a.
Arsenic as As #14036	µg/kg	6	29.1	48.3	22.2
Lead as Pb #14035	µg/kg	20	34.5	43.6	25.6
Lead as Pb #14036	µg/kg	20	206.8	274.8	117.4

table 14: comparison of the observed and target reproducibilities of the samples #14035 and #14036

Parameters	unit	n	average	2.8 * sd	R (lit)
TVP	psi	32	5.82	0.30	0.40
DVPE	psi	39	5.07	0.32	0.40

table 15: comparison of the observed and target reproducibilities of the sample #14037

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 2014 WITH PREVIOUS PTS

	April 2014	March 2013	April 2012	April 2011
Number of reporting labs	74	72	71	72
Number of results reported	1304	1339	1147	1892
Statistical outliers	49	101	75	120
Percentage outliers	3.8%	7.5%	6.5%	6.3%

table 16: 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 2014	March 2013	April 2012	April 2011
Colour Saybolt	++	++	++	--
Density @ 15°C	++	+	++	++
Distillation automated	+	+	+	+/-
Distillation manual	++	+	-	++
Mercaptans	--	-	--	+/-
Sulphur	--	+/-	--	--
Total Chloride	--	n.e.	n.e.	n.e.
Methanol	--	--	--	--
Methyl tert-butyl ether (MTBE)	--	-	--	--
Total Oxygenates	--	-	-	--
n-Paraffins	--	--	--	--
i-Paraffins	--	--	--	--
Olefins	--	+	n.e.	n.e.
Naphthenes	--	--	--	--
Aromatics	+	-	+	++
C_4 & lighter	--	-	+/-	--
Mercury	++	+/-	+	++
Arsenic	+/-	--	n.e.	--
Lead	--	--	n.e.	--
Total Vapour Pressure	++	+	--	++
DVPE acc. to D5191	++	+	--	++

table 17: comparison determinations against the standard requirements

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

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

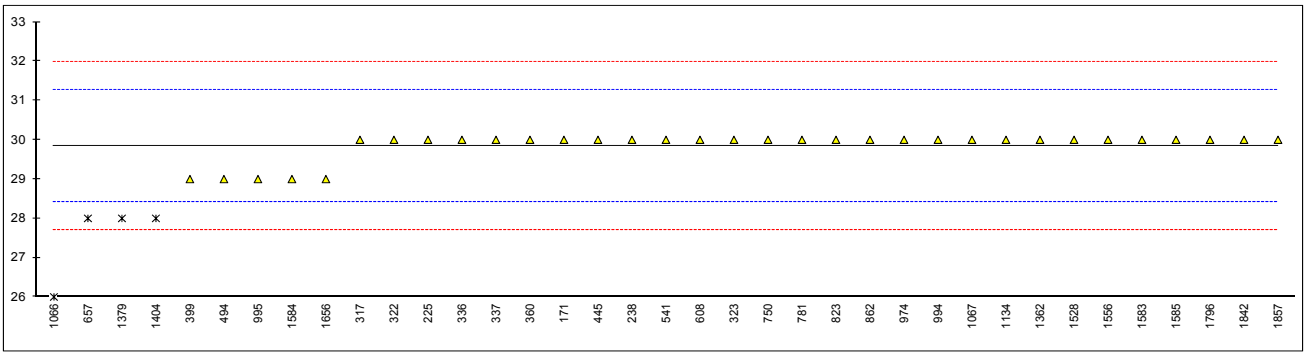
APPENDIX 1

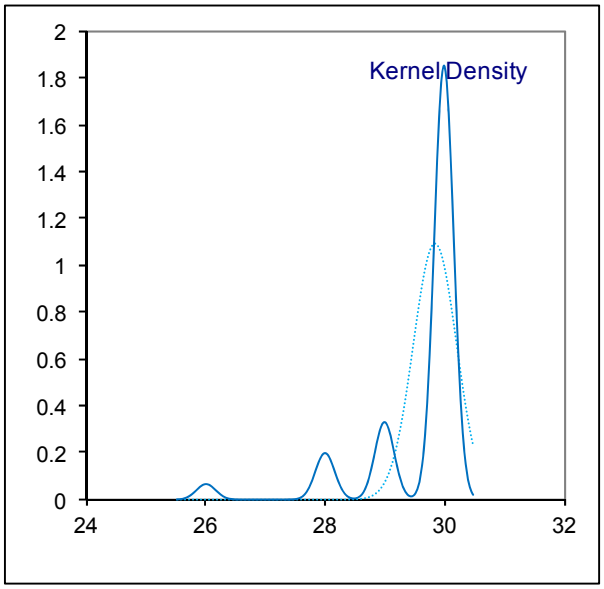
Determination of Color Saybolt (Manual) on sample #14031

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171	D156	+30		0.21	
225	D156	+30		0.21	
237		-----		-----	
238	D156	+30		0.21	
311		-----		-----	
317	D156	+30		0.21	
322	D156	+30		0.21	
323	D156	30		0.21	
333		-----		-----	
334		-----		-----	
336	D156	+30		0.21	
337	D156	+30		0.21	
360	D156	30		0.21	
371		-----		-----	
399	D156	+29		-1.19	
444		-----		-----	
445	D156	+30		0.21	
494	D156	29		-1.19	
529		-----		-----	
541	D156	+30		0.21	
608	D156	+30		0.21	
657	D156	+28	R(0.01)	-2.59	
750	D156	+30		0.21	
753		-----		-----	
754		-----		-----	
759		-----		-----	
781	D156	+30		0.21	
784		-----		-----	
785		-----		-----	
823	D156	+30		0.21	
855		-----		-----	
862	D156	+30		0.21	
868		-----		-----	
873		-----		-----	
875		-----		-----	
962		-----		-----	
963		-----		-----	
974	D156	+30		0.21	
994	D156	+30		0.21	
995	D156	+29		-1.19	
1016		-----		-----	
1062		-----		-----	
1065		-----		-----	
1066	D156	+26	R(0.01)	-5.39	
1067	D156	+30		0.21	
1081		-----		-----	
1095	D156	>30		>0.21	
1107		-----		-----	
1134	D156	30		0.21	
1145		-----		-----	
1167		-----		-----	
1200		-----		-----	
1201		-----		-----	
1257		-----		-----	
1264		-----		-----	
1291		-----		-----	
1362	D156	+30		0.21	
1379	D156	+28	R(0.01)	-2.59	
1404	D153	28	R(0.01)	-2.59	
1429		-----		-----	
1528	D156	+30		0.21	
1556	D156	+30		0.21	
1583	D156	+30		0.21	
1584	D156	+29		-1.19	
1585	D156	+30		0.21	
1603		-----		-----	
1656	D156	29		-1.19	
1677	D156	>+30		>0.21	
1737		-----		-----	
1788		-----		-----	
1796	D156	+30		0.21	
1810		-----		-----	
1823		-----		-----	
1842	D156	+30		0.21	

1857	D156	+30	0.21
1948		-----	-----
9057		-----	-----
9058		-----	-----
9061		-----	-----

normality	not OK
n	33
outliers	4
mean (n)	29.8
st.dev. (n)	0.36
R(calc.)	1.0
R(D156:12)	2.0



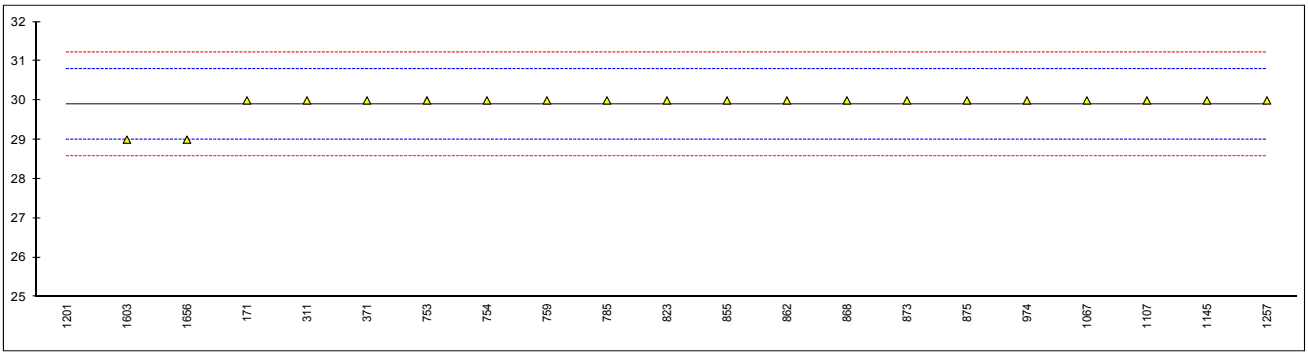


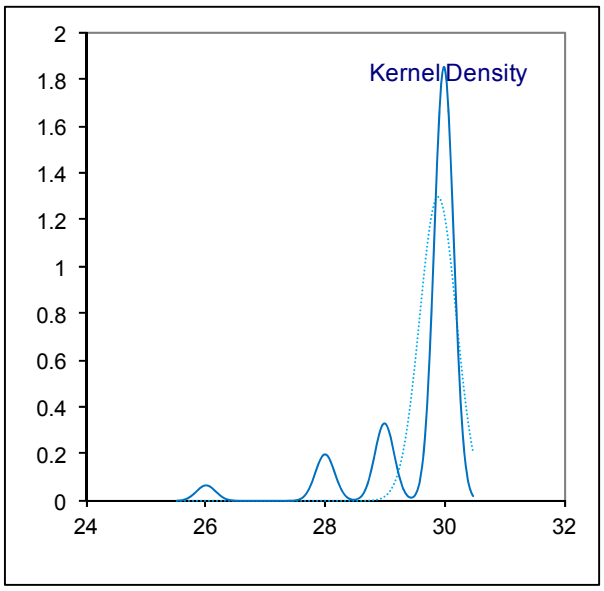
Determination of Color Saybolt (Automated) on sample #14031

lab	method	value	mark	z(targ)	remarks
150	D6045	>+30		>0.23	
171	D6045	30		0.23	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	D6045	+30		0.23	
317		-----		-----	
322		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371	D6045	+30		0.23	
399		-----		-----	
444	D6045	>+30		>0.23	
445		-----		-----	
494		-----		-----	
529		-----		-----	
541	D6045	>30		>0.23	
608		-----		-----	
657		-----		-----	
750		-----		-----	
753	D6045	+30		0.23	
754	D6045	+30		0.23	
759	D6045	+30		0.23	
781		-----		0.23	
784		-----		-----	
785	D6045	+30		0.23	
823	D6045	+30		0.23	
855	D6045	+30		0.23	
862	D6045	+30		0.23	
868	D6045	+30		0.23	
873	D6045	+30		0.23	
875	D6045	30		0.23	
962		-----		-----	
963		-----		-----	
974	D6045	+30		0.23	
994		-----		-----	
995		-----		-----	
1016	D6045	>+30		>0.23	
1062		-----		-----	
1065		-----		-----	
1066		-----		-----	
1067	D6045	+30		0.23	
1081	D6045	>30		>0.23	
1095	D6045	>30		>0.23	
1107	D6045	+30		0.23	
1134		-----		-----	
1145	D6045	+30		0.23	
1167	D6045	>+30		>0.23	
1200		-----		-----	
1201	D6045	+22	G(0.01)	-17.84	
1257	D6045	+30		0.23	
1264		-----		-----	
1291		-----		-----	
1362		-----		-----	
1379		-----		-----	
1404		-----		-----	
1429	D6045	>+30		>0.23	
1528		-----		-----	
1556		-----		-----	
1583		-----		-----	
1584		-----		-----	
1585		-----		-----	
1603	IN HOUSE	29		-2.03	
1656	D5386	29		-2.03	
1677	D6045	>+30		>0.23	
1737		-----		-----	
1788		-----		-----	
1796		-----		-----	
1810		-----		-----	
1823		-----		-----	
1842		-----		-----	

1857		-----	-----
1948	D6045	>+30	>0.23
9057		-----	-----
9058		-----	-----
9061		-----	-----

normality	not OK
n	20
outliers	1
mean (n)	29.9
st.dev. (n)	0.31
R(calc.)	0.9
R(D6045:12)	1.2





Determination of Copper Corrosion, 3hrs at 50°C on sample #14031

lab	method	value	mark	z(targ)	remarks
150	D130	1A		-----	
171	D130	1A		-----	
225	D130	1A		-----	
237		-----		-----	
238	D130	1A		-----	
311	D130	1A		-----	
317	D130	1A		-----	
322		-----		-----	
323	D130	1A		-----	
333	D130	1A		-----	
334		-----		-----	
336		-----		-----	
337	D130	1A		-----	
360	D130	1A		-----	
371	D130	1A		-----	
399	D130	1A		-----	
444		-----		-----	
445	D130	1A		-----	
494	D130	1A		-----	
529	D130	1A		-----	
541	D130	1A		-----	
608	D130	1A		-----	
657	D130	1A		-----	
750	D130	1A		-----	
753	D130	1A		-----	
754	D130	1A		-----	
759		-----		-----	
781	D130	1A		-----	
784		-----		-----	
785	D130	1A		-----	
823	D130	1A		-----	
855	D130	1A		-----	
862	D130	1A		-----	
868	D130	1A		-----	
873	D130	1A		-----	
875	D130	1A		-----	
962		-----		-----	
963		-----		-----	
974	D130	1A		-----	
994	D130	1A		-----	
995	D130	1A		-----	
1016	D130	1A		-----	
1062		-----		-----	
1065		-----		-----	
1066	D130	1A		-----	
1067	D130	1A		-----	
1081	D130	1B		-----	
1095	D130	1A		-----	
1107	D130	1A		-----	
1134	D130	1A		-----	
1145		-----		-----	
1167	ISO2160	1A		-----	
1200		-----		-----	
1201	D130	1A		-----	
1257	D130	1A		-----	
1264		-----		-----	
1291		-----		-----	
1362	D130	1A		-----	
1379		-----		-----	
1404	D130	1A		-----	
1429	D130	1A		-----	
1528	D130	1A		-----	
1556	ISO2160	1		-----	
1583		-----		-----	
1584	D130	1A		-----	
1585	D130	1A		-----	
1603	IN HOUSE	1A		-----	
1656	D130	1A		-----	
1677	D130	1A		-----	
1737		-----		-----	
1788	D130	1A		-----	
1796	D130	1A		-----	
1810		-----		-----	
1823		-----		-----	
1842	IP154	1A		-----	

1857	D130	1A	-----
1948	D130	1A	-----
9057		-----	-----
9058		-----	-----
9061		-----	-----

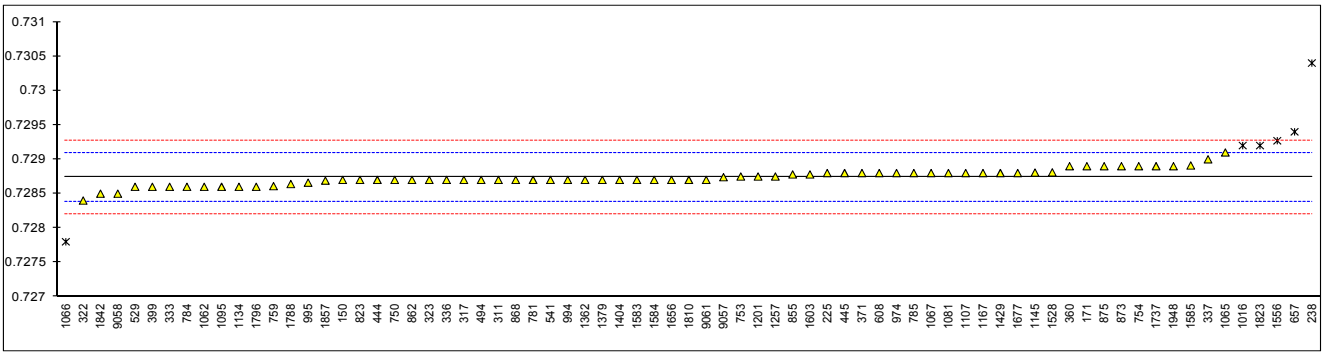
normality	n.a.
n	57
outliers	n.a.
mean (n)	1(1A)
st.dev. (n)	n.a.
R(calc.)	n.a.
R(D130:12)	n.a.

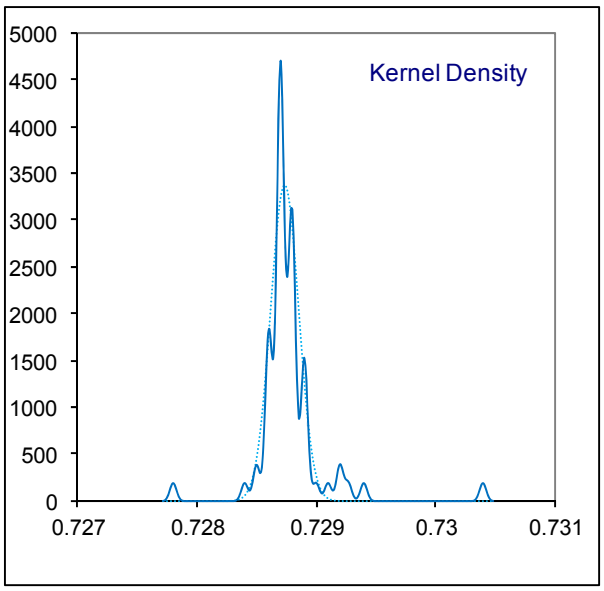
Determination of Density @ 15°C on sample #14031; results in kg/L

lab	method	value	mark	z(targ)	remarks
150	ISO12185	0.7287		-0.20	
171	D4052	0.7289		0.92	
225	D4052	0.7288		0.36	
237		-----		-----	
238	D4052	0.7304	C,R(0.01)	9.32	
311	ISO12185	0.7287		-0.20	
317	D4052	0.7287		-0.20	
322	ISO12185	0.7284		-1.88	
323	D4052	0.7287		-0.20	
333	ISO12185	0.7286		-0.76	
334		-----		-----	
336	ISO12185	0.7287		-0.20	
337	ISO12185	0.7290		1.48	
360	ISO12185	0.7289		0.92	
371	ISO12185	0.7288		0.36	
399	ISO12185	0.7286		-0.76	
444	D4052	0.7287		-0.20	
445	ISO12185	0.7288		0.36	
494	ISO12185	0.7287		-0.20	
529	D4052	0.7286		-0.76	
541	ISO12185	0.7287		-0.20	
608	D4052	0.7288		0.36	
657	D4052	0.7294	R(0.01)	3.72	
750	D4052	0.7287		-0.20	
753	ISO12185	0.72875		0.08	
754	D4052	0.7289		0.92	
759	ISO12185	0.72861		-0.71	
781	ISO12185	0.7287		-0.20	
784	ISO12185	0.7286		-0.76	
785	D4052	0.7288		0.36	
823	ISO12185	0.7287		-0.20	
855	D4052	0.72878		0.25	
862	ISO12185	0.7287		-0.20	
868	D4052	0.72870		-0.20	
873	ISO12185	0.7289		0.92	
875	D4052	0.7289		0.92	
962		-----		-----	
963		-----		-----	
974	D4052	0.7288		0.36	
994	D4052	0.7287		-0.20	
995	D4052	0.72866		-0.43	
1016	ISO12185	0.7292	R(0.05)	2.60	
1062	ISO12185	0.7286	C	-0.76	First reported 728.6
1065	D4052	0.7291		2.04	
1066	ISO12185	0.7278	R(0.01)	-5.24	
1067	ISO12185	0.7288		0.36	
1081	ISO12185	0.7288		0.36	
1095	ISO12185	0.7286		-0.76	
1107	D4052	0.7288		0.36	
1134	D4052	0.7286		-0.76	
1145	D4052	0.728807		0.40	
1167	ISO12185	0.7288		0.36	
1200		-----		-----	
1201	ISO12185	0.72875		0.08	
1257	D4052	0.72875		0.08	
1264		-----		-----	
1291		-----		-----	
1362	ISO12185	0.7287		-0.20	
1379	D4052	0.7287		-0.20	
1404	ISO12185	0.7287	C	-0.20	First reported 728.7 (unit error, kg/m3 instead of kg/l)
1429	D4052	0.7288		0.36	
1528	ISO12185	0.72881		0.41	
1556	ISO12185	0.72927	R(0.05)	2.99	
1583	ISO12185	0.7287		-0.20	
1584	ISO12185	0.7287		-0.20	
1585	ISO12185	0.72891		0.97	
1603	IN HOUSE	0.72878		0.25	
1656	ISO12185	0.7287		-0.20	
1677	D4052	0.7288		0.36	
1737	D4052	0.7289		0.92	
1788	D4052	0.72864		-0.54	
1796	ISO12185	0.72860		-0.76	
1810	ISO12185	0.7287	C	-0.20	First reported 728.7 (unit error, kg/m3 instead of kg/l)
1823	D4052	0.7292	R(0.05)	2.60	
1842	IP365	0.7285		-1.32	

1857	ISO12185	0.72869	-0.26
1948	ISO12185	0.7289	0.92
9057	D5002	0.72874	0.02
9058	D5002	0.7285	-1.32
9061	ISO12185	0.7287	-0.20

normality	suspect
n	67
outliers	6
mean (n)	0.72874
st.dev. (n)	0.000118
R(calc.)	0.00033
R(ISO12185:96)	0.00050



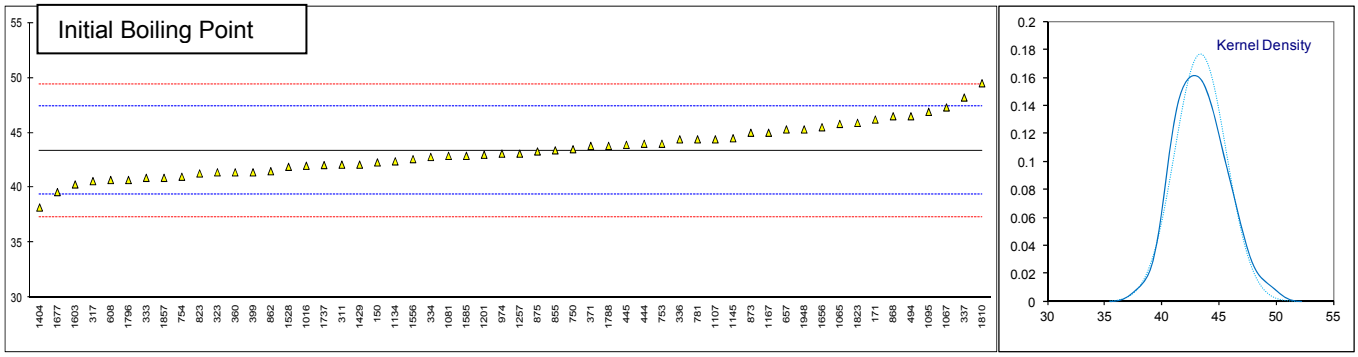


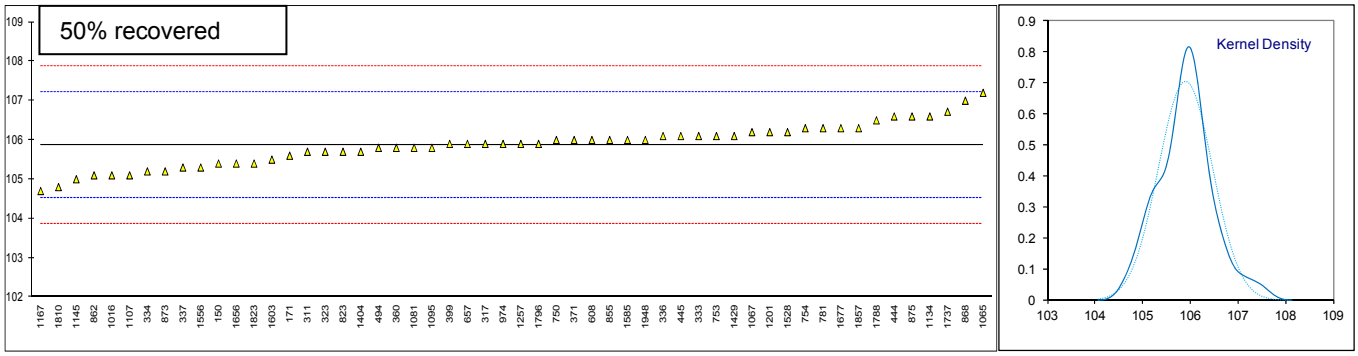
Determination of Distillation (automated mode) on sample #14031; results in °C

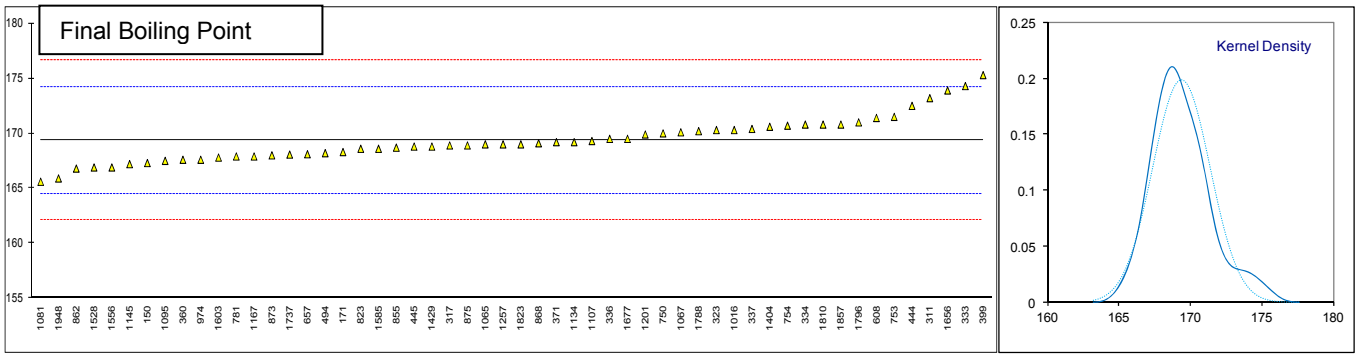
lab	method	IBP	mark	z(targ)	50%rec.	mark	z(targ)	FBP	mark	z(targ)	Remarks
150	D86-A	42.3	C	-0.53	105.4	C	-0.70	167.3	C	-0.85	
171	D86-A	46.2		1.41	105.6		-0.40	168.3		-0.44	
225		-----		-----	-----		-----	-----		-----	
237		-----		-----	-----		-----	-----		-----	
238		-----		-----	-----		-----	-----		-----	
311	D86-A	42.1	C	-0.63	105.7		-0.25	173.2		1.58	
317	D86-A	40.6		-1.37	105.9		0.04	168.9		-0.19	
322		-----		-----	-----		-----	-----		-----	
323	D86-A	41.4		-0.98	105.7		-0.25	170.3		0.39	
333	D86-A	40.9		-1.22	106.1		0.34	174.3		2.04	
334	D86-A	42.8		-0.28	105.2		-1.00	170.8		0.59	
336	D86-A	44.4		0.52	106.1		0.34	169.5		0.06	
337	D86-A	48.2		2.41	105.3		-0.85	170.4		0.43	
360	D86-A	41.4		-0.98	105.8		-0.11	167.6		-0.73	
371	D86-A	43.8		0.22	106.0		0.19	169.2		-0.07	
399	D86-A	41.4		-0.98	105.9		0.04	175.3		2.45	
444	D86-A	44.0		0.32	106.6		1.09	172.5		1.29	
445	D86-A	43.9		0.27	106.1		0.34	168.8		-0.23	
494	D86-A	46.5		1.56	105.8		-0.11	168.2		-0.48	
529		-----		-----	-----		-----	-----		-----	
541		-----		-----	-----		-----	-----		-----	
608	D86-A	40.7		-1.32	106.0		0.19	171.4		0.84	
657	D86-A	45.3		0.97	105.9		0.04	168.1		-0.52	
750	D86-A	43.5		0.07	106.0		0.19	170.0		0.26	
753	D86-A	44.0		0.32	106.1		0.34	171.5		0.88	
754	D86-A	41.0		-1.17	106.3		0.64	170.7		0.55	
759		-----		-----	-----		-----	-----		-----	
781	D86-A	44.4		0.52	106.3		0.64	167.9		-0.60	
784		-----		-----	-----		-----	-----		-----	
785		-----		-----	-----		-----	-----		-----	
823	D86-A	41.3		-1.03	105.7		-0.25	168.6	C	-0.32	
855	D86-A	43.4		0.02	106.0		0.19	168.7		-0.27	
862	D86-A	41.5		-0.93	105.1		-1.15	166.8		-1.06	
868	D86-A	46.5		1.56	107.0		1.68	169.1		-0.11	
873	D86-A	45.0		0.82	105.2		-1.00	168.0		-0.56	
875	D86-A	43.3		-0.03	106.6		1.09	168.9		-0.19	
962		-----		-----	-----		-----	-----		-----	
963		-----		-----	-----		-----	-----		-----	
974	D86-A	43.1		-0.13	105.9		0.04	167.6		-0.73	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1016	D86-A	42.0		-0.68	105.1		-1.15	170.3		0.39	
1062		-----		-----	-----		-----	-----		-----	
1065	D86-A	45.8		1.21	107.2		1.98	169.0		-0.15	
1066		-----		-----	-----		-----	-----		-----	
1067	D86-A	47.3		1.96	106.2		0.49	170.1		0.30	
1081	D86-A	42.9		-0.23	105.8		-0.11	165.6		-1.55	
1095	D86-A	46.9		1.76	105.8		-0.11	167.5		-0.77	
1107	D86-A	44.4		0.52	105.1		-1.15	169.3		-0.03	
1134	D86-A	42.4		-0.48	106.6		1.09	169.2		-0.07	
1145	D86-A	44.5		0.57	105.0		-1.30	167.2		-0.89	
1167	ISO3405-A	45.0		0.82	104.7		-1.74	167.9		-0.60	
1200		-----		-----	-----		-----	-----		-----	
1201	D86-A	43.0		-0.18	106.2		0.49	169.9		0.22	
1257	D86-A	43.1		-0.13	105.9		0.04	169.0		-0.15	
1264		-----		-----	-----		-----	-----		-----	
1291		-----		-----	-----		-----	-----		-----	
1362		-----		-----	-----		-----	-----		-----	
1379		-----		-----	-----		-----	-----		-----	
1404	D86-A	38.2		-2.57	105.7		-0.25	170.6		0.51	
1429	D86-A	42.1		-0.63	106.1		0.34	168.8		-0.23	
1528	D86-A	41.9		-0.73	106.2		0.49	166.9		-1.02	
1556	ISO3405-A	42.6		-0.38	105.3		-0.85	166.9		-1.02	
1583		-----		-----	-----		-----	-----		-----	
1584		-----		-----	-----		-----	-----		-----	
1585	D86-A	42.9		-0.23	106.0		0.19	168.6		-0.32	
1603	IN HOUSE-A	40.3		-1.52	105.5		-0.55	167.8		-0.65	
1656	D86-A	45.5		1.06	105.4		-0.70	173.9		1.87	
1677	D86-A	39.6		-1.87	106.3		0.64	169.5		0.06	
1737	D86-A	42.06		-0.65	106.72		1.26	168.07		-0.53	
1788	D86-A	43.8		0.22	106.5		0.94	170.2		0.35	
1796	D86-A	40.7		-1.32	105.9		0.04	171.0		0.68	
1810	D86-A	49.5		3.06	104.8		-1.59	170.8		0.59	
1823	D86-A	45.9		1.26	105.4		-0.70	169.0		-0.15	
1842		-----		-----	-----		-----	-----		-----	

1857	D86-A	40.9	-1.22	106.3	0.64	170.8	0.59
1948	D86-A	45.3	0.97	106.0	0.19	165.9	-1.43
9057		-----	-----	-----	-----	-----	-----
9058		-----	-----	-----	-----	-----	-----
9061		-----	-----	-----	-----	-----	-----
	normality	OK		OK		suspect	
	n	54		54		54	
	outliers	0		0		0	
	mean (n)	43.36		105.87		169.36	
	st.dev. (n)	2.275		0.529		1.998	
	R(calc.)	6.37		1.48		5.59	
	R(D86:12)	5.63		1.88		6.78	

Lab 150: first reported 108.1/221.7/333.1
Lab 311: first reported 31.4
Lab 823: first reported 175.8





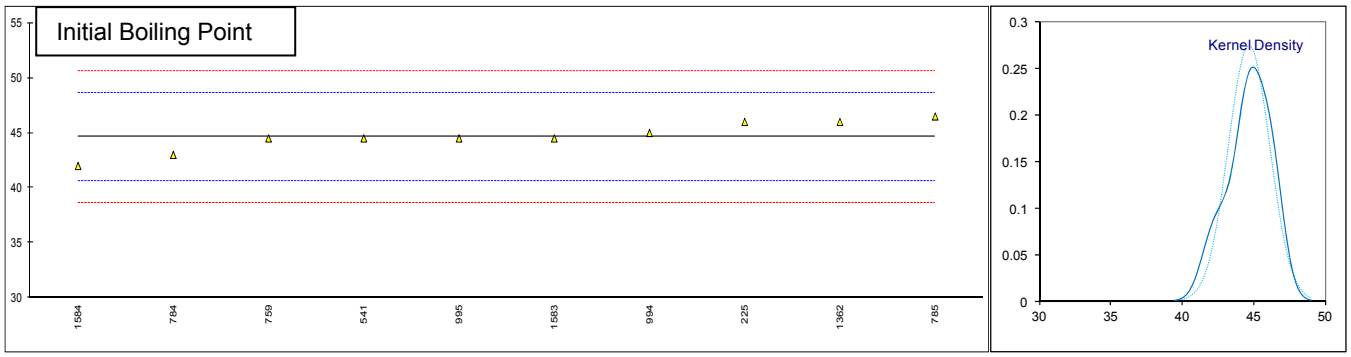


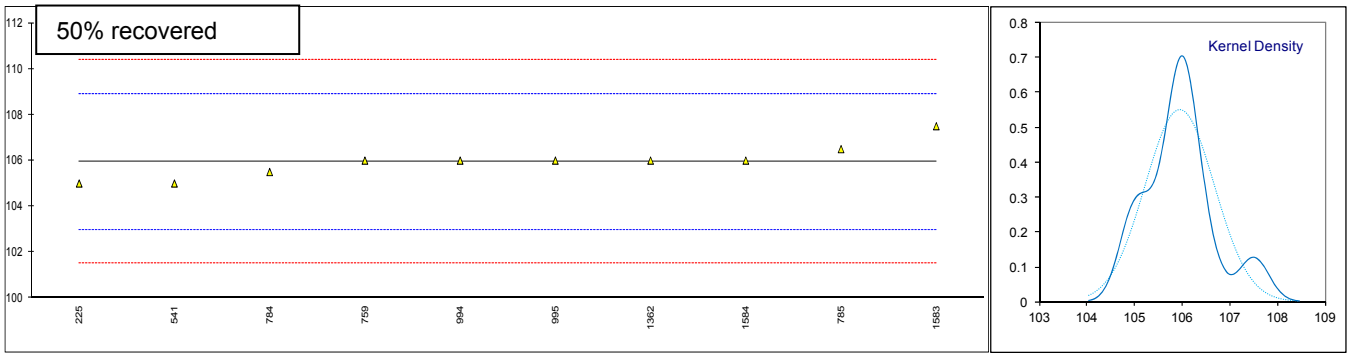
Determination of Distillation (manual mode) on sample #14031; results in °C

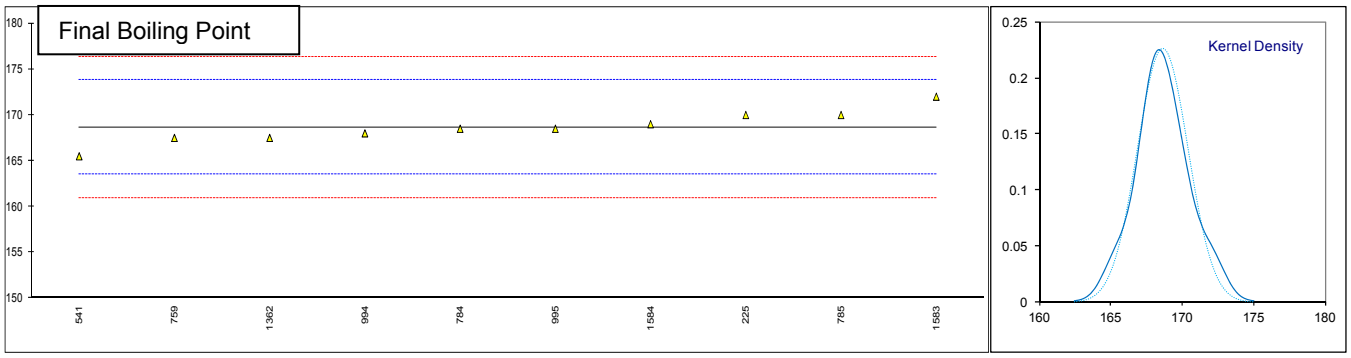
lab	method	IBP	mark	z(targ)	50%rec.	mark	z(targ)	FBP	mark	z(targ)	remarks
150		-----		-----	-----		-----	-----		-----	
171		-----		-----	-----		-----	-----		-----	
225	D86-M	46.0		0.67	105.0		-0.64	170.0		0.53	
237		-----		-----	-----		-----	-----		-----	
238		-----		-----	-----		-----	-----		-----	
311		-----		-----	-----		-----	-----		-----	
317		-----		-----	-----		-----	-----		-----	
322		-----		-----	-----		-----	-----		-----	
323		-----		-----	-----		-----	-----		-----	
333		-----		-----	-----		-----	-----		-----	
334		-----		-----	-----		-----	-----		-----	
336		-----		-----	-----		-----	-----		-----	
337		-----		-----	-----		-----	-----		-----	
360		-----		-----	-----		-----	-----		-----	
371		-----		-----	-----		-----	-----		-----	
399		-----		-----	-----		-----	-----		-----	
444		-----		-----	-----		-----	-----		-----	
445		-----		-----	-----		-----	-----		-----	
494		-----		-----	-----		-----	-----		-----	
529		-----		-----	-----		-----	-----		-----	
541	D86-M	44.5		-0.08	105		-0.64	165.5		-1.22	
608		-----		-----	-----		-----	-----		-----	
657		-----		-----	-----		-----	-----		-----	
750		-----		-----	-----		-----	-----		-----	
753		-----		-----	-----		-----	-----		-----	
754		-----		-----	-----		-----	-----		-----	
759	D86-M	44.5		-0.08	106.0		0.03	167.5		-0.45	
781		-----		-----	-----		-----	-----		-----	
784	D86-M	43.0		-0.83	105.5		-0.30	168.5		-0.06	
785	D86-M	46.5		0.92	106.5		0.37	170.0		0.53	
823		-----		-----	-----		-----	-----		-----	
855		-----		-----	-----		-----	-----		-----	
862		-----		-----	-----		-----	-----		-----	
868		-----		-----	-----		-----	-----		-----	
873		-----		-----	-----		-----	-----		-----	
875		-----		-----	-----		-----	-----		-----	
962		-----		-----	-----		-----	-----		-----	
963		-----		-----	-----		-----	-----		-----	
974		-----		-----	-----		-----	-----		-----	
994	D86-M	45.0		0.17	106.0		0.03	168.0		-0.25	
995	D86-M	44.5		-0.08	106.0		0.03	168.5		-0.06	
1016		-----		-----	-----		-----	-----		-----	
1062		-----		-----	-----		-----	-----		-----	
1065		-----		-----	-----		-----	-----		-----	
1066		-----		-----	-----		-----	-----		-----	
1067		-----		-----	-----		-----	-----		-----	
1081		-----		-----	-----		-----	-----		-----	
1095		-----		-----	-----		-----	-----		-----	
1107		-----		-----	-----		-----	-----		-----	
1134		-----		-----	-----		-----	-----		-----	
1145		-----		-----	-----		-----	-----		-----	
1167		-----		-----	-----		-----	-----		-----	
1200		-----		-----	-----		-----	-----		-----	
1201		-----		-----	-----		-----	-----		-----	
1257		-----		-----	-----		-----	-----		-----	
1264		-----		-----	-----		-----	-----		-----	
1291		-----		-----	-----		-----	-----		-----	
1362	D86-M	46.00	C	0.67	106.00		0.03	167.50		-0.45	
1379		-----		-----	-----		-----	-----		-----	
1404		-----		-----	-----		-----	-----		-----	
1429		-----		-----	-----		-----	-----		-----	
1528		-----		-----	-----		-----	-----		-----	
1556		-----		-----	-----		-----	-----		-----	
1583	D86-M	44.5		-0.08	107.5		1.04	172		1.30	
1584	D86-M	42.0		-1.33	106.0		0.03	169.0		0.14	
1585		-----		-----	-----		-----	-----		-----	
1603		-----		-----	-----		-----	-----		-----	
1656		-----		-----	-----		-----	-----		-----	
1677		-----		-----	-----		-----	-----		-----	
1737		-----		-----	-----		-----	-----		-----	
1788		-----		-----	-----		-----	-----		-----	
1796		-----		-----	-----		-----	-----		-----	
1810		-----		-----	-----		-----	-----		-----	
1823		-----		-----	-----		-----	-----		-----	

1842		-----	-----	-----	-----	-----
1857		-----	-----	-----	-----	-----
1948		-----	-----	-----	-----	-----
9057		-----	-----	-----	-----	-----
9058		-----	-----	-----	-----	-----
9061		-----	-----	-----	-----	-----
	normality	OK	suspect		OK	
	n	10	10		10	
	outliers	0	0		0	
	mean (n)	44.65	105.95		168.65	
	st.dev. (n)	1.375	0.725		1.765	
	R(calc.)	3.85	2.03		4.94	
	R(D86:12)	5.60	4.16		7.20	

Lab 1362: first reported 50.50





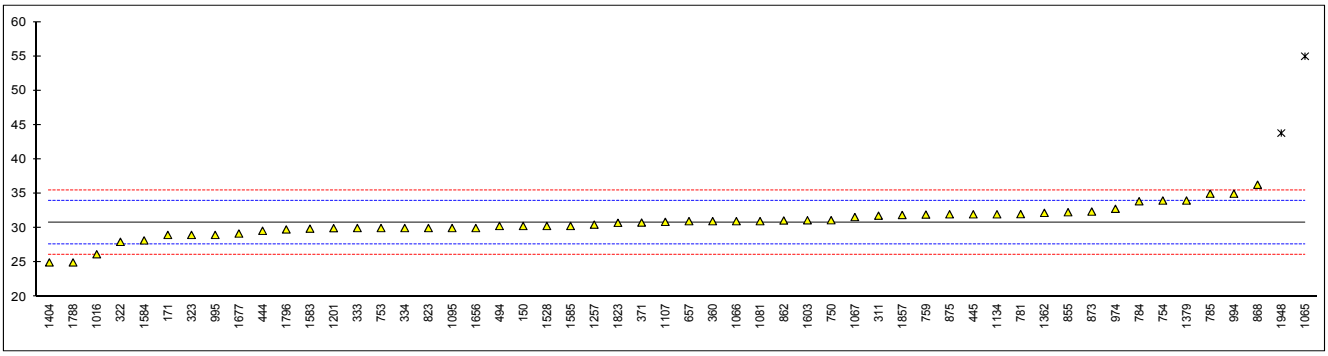


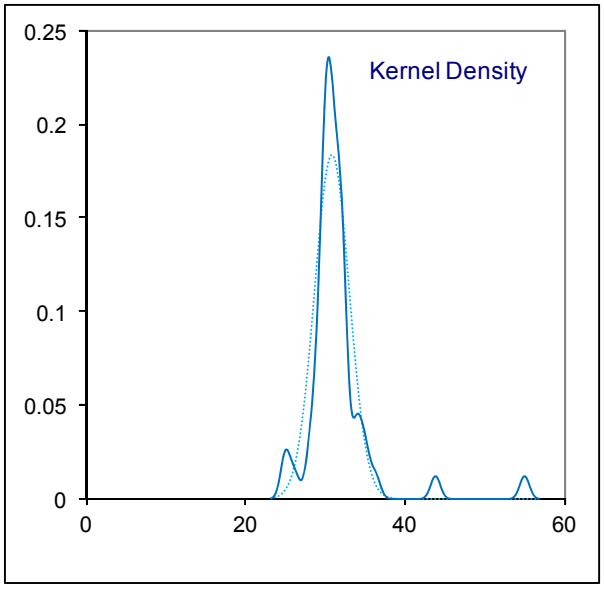
Determination of Mercaptans on sample #14031; results in mg/kg

lab	method	value	mark	z(targ)	remarks
150	D3227	30.3		-0.33	
171	D3227	29		-1.16	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	UOP163	31.8		0.62	
317		-----		-----	
322	UOP163	28		-1.80	
323	UOP163	29		-1.16	
333	D3227	30		-0.52	
334	D3227	30		-0.52	
336		-----		-----	
337		-----	W	-----	Reported 102.5
360	D3227	31.0		0.12	
371	D3227	30.8		-0.01	
399		-----		-----	
444	UOP163	29.6		-0.78	
445	D3227	32		0.75	
494	D3227	30.3		-0.33	
529		-----		-----	
541		-----		-----	
608		-----		-----	
657	D3227	31		0.12	
750	D3227	31.14		0.20	
753	UOP163	30.0		-0.52	
754	UOP163	34.0		2.03	
759	UOP163	31.96		0.73	
781	D86	32.02		0.77	
784	D3227	33.9		1.96	
785	UOP163	35		2.66	
823	D3227	30		-0.52	
855	D3227	32.3		0.94	
862	D3227	31.1		0.18	
868	D3227	36.3		3.49	
873	UOP163	32.4		1.01	
875	D3227	32		0.75	
962		-----		-----	
963		-----		-----	
974	D3227	32.8		1.26	
994	UOP163	35	C	2.66	First reported 25
995	D3227	29.0		-1.16	
1016	D3227	26.19		-2.95	
1062		-----		-----	
1065	D3227	55	R(0.01)	15.41	
1066	D3227	31		0.12	
1067	D3227	31.6		0.50	
1081	D3227	31		0.12	
1095	D3227	30		-0.52	
1107	D3227	30.9		0.05	
1134	IP342	32		0.75	
1145		-----		-----	
1167		-----		-----	
1200		-----		-----	
1201	D3227	29.98		-0.53	
1257	D3227	30.5		-0.20	
1264		-----		-----	
1291		-----		-----	
1362	UOP163	32.211		0.89	
1379	D3227	34		2.03	
1404	D3227	25	C	-3.71	First reported 62
1429		-----		-----	
1528	D3227	30.3		-0.33	
1556	UOP163	<1.0		<-19.00	False negative result?
1583	UOP163	29.91		-0.58	
1584	UOP163	28.2		-1.67	
1585	D3227	30.3		-0.33	
1603	IN HOUSE	31.13		0.20	
1656	IP342	30	C	-0.52	First reported 39.2
1677	UOP163	29.2		-1.03	
1737		-----		-----	
1788	D3227	25		-3.71	
1796	UOP163	29.8		-0.65	
1810		-----		-----	
1823	UOP163	30.76		-0.04	
1842		-----		-----	

1857	UOP163	31.9		0.69
1948	D3227	43.82	R(0.01)	8.28
9057		-----		-----
9058		-----		-----
9061		-----		-----

normality	suspect
n	52
outliers	2
mean (n)	30.819
st.dev. (n)	2.1744
R(calc.)	6.088
R(D3227:13)	4.394



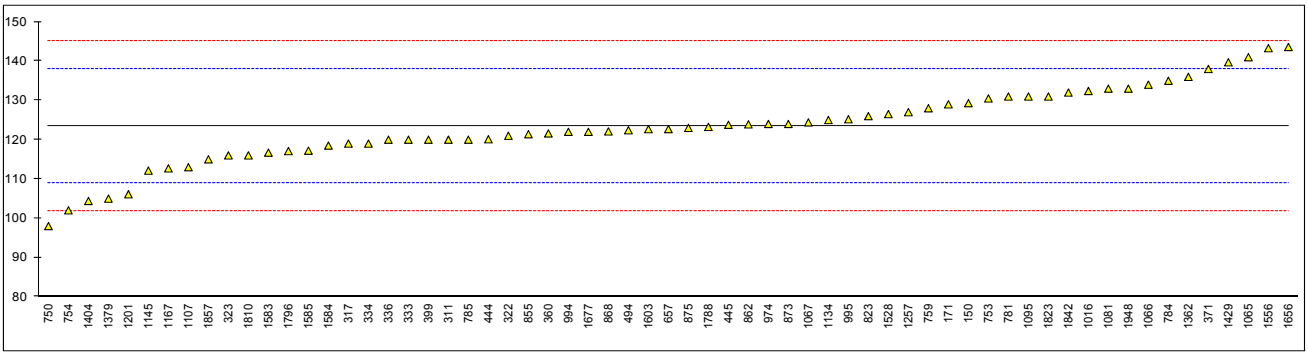


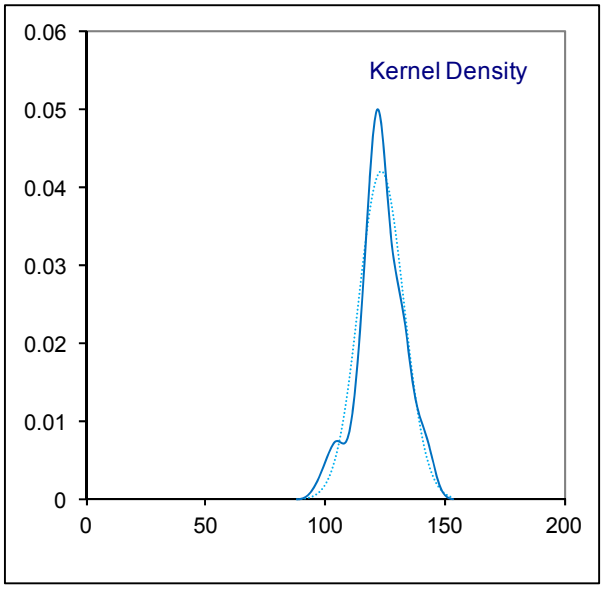
Determination of Sulphur on sample #14031; results in mg/kg

lab	method	value	mark	z(targ)	remarks
150	D2622	129.3		0.82	
171	D2622	129		0.78	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	D2622	120		-0.47	
317	D2622	119		-0.60	
322	D5453	121		-0.33	
323	D5453	116		-1.02	
333	D2622	120		-0.47	
334	D5453	119		-0.60	
336	D4294	120		-0.47	
337		-----		-----	
360	D4294	121.6		-0.25	
371	D5453	138		2.02	
399	D2622	120		-0.47	
444	D5453	120.1		-0.45	
445	D2622	123.8		0.06	
494	D5453	122.4		-0.13	
529		-----		-----	
541		-----		-----	
608		-----		-----	
657	D5453	122.7		-0.09	
750	D3120	98		-3.51	
753	D4294	130.5		0.98	
754	D5453	102.01		-2.95	
759	D4294	128		0.64	
781	D4294	131		1.05	
784	D4294	135		1.61	
785	D4294	120		-0.47	
823	D5453	126	C	0.36	First reported 158
855	D5453	121.4		-0.27	
862	D2622	123.9		0.07	
868	D5453	122.1		-0.18	
873	D4294	124		0.09	
875	D5453	123		-0.05	
962		-----		-----	
963		-----		-----	
974	D4294	124		0.09	
994	D4294	122		-0.19	
995	D4294	125.2		0.25	
1016	D2622	132.4		1.25	
1062		-----		-----	
1065	IP336	141		2.43	
1066	D2622	134		1.47	
1067	D2622	124.4		0.14	
1081	D4294	133		1.33	
1095	D2622	131		1.05	
1107	D5453	113.0		-1.43	
1134	D5453	125		0.22	
1145	D5453	112.1302		-1.55	
1167	ISO20846	112.7		-1.47	
1200		-----		-----	
1201	D2622	106.1		-2.39	
1257	D4294	127		0.50	
1264		-----		-----	
1291		-----		-----	
1362	D4294	136		1.74	
1379	D4294	105		-2.54	
1404	ISO20846	104.4		-2.62	
1429	D5453	139.7		2.25	
1528	D2622	126.5		0.43	
1556	ISO20884	143.3		2.75	
1583	D2622	116.7		-0.92	
1584	D4294	118.5		-0.67	
1585	D4294	117.2		-0.85	
1603	IN HOUSE	122.67		-0.10	
1656	D5453	143.6		2.79	
1677	D5453	122		-0.19	
1737		-----		-----	
1788	D5453	123.25		-0.02	
1796	D4294	117.1		-0.87	
1810	D6667	116.0	C	-1.02	First reported 156.0
1823	D4294	131.0		1.05	
1842	D2622	132		1.19	

1857	D4294	115	-1.16
1948	D2622	133.00	1.33
9057		-----	-----
9058		-----	-----
9061		-----	-----

		Only WD XRF	Only ED XRF	Only UV F
normality	OK	suspect	OK	OK
n	63	18	21	21
outliers	0	0	0	0
mean (n)	123.376	125.800	124.862	121.404
st.dev. (n)	9.4974	8.3489	8.3485	10.2001
R(calc.)	26.593	23.377	23.376	28.560
R(D2622:10)	20.270	20.589	43.078	21.202



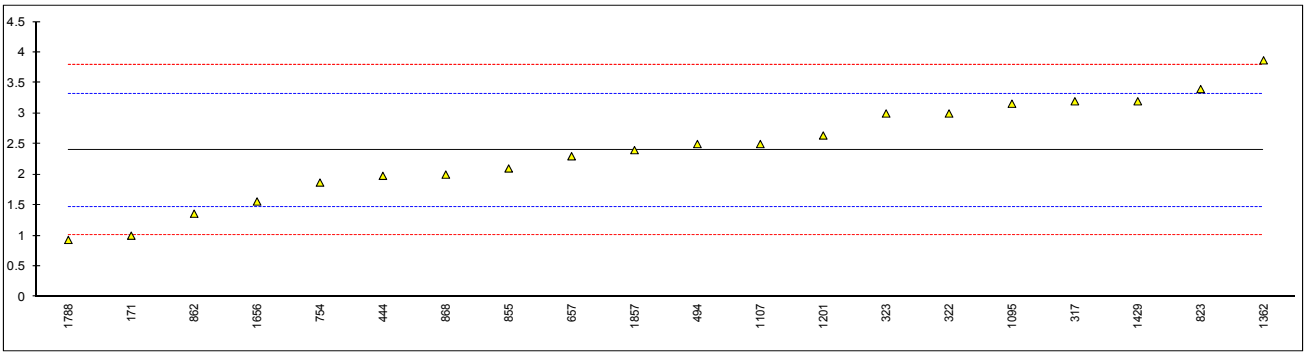


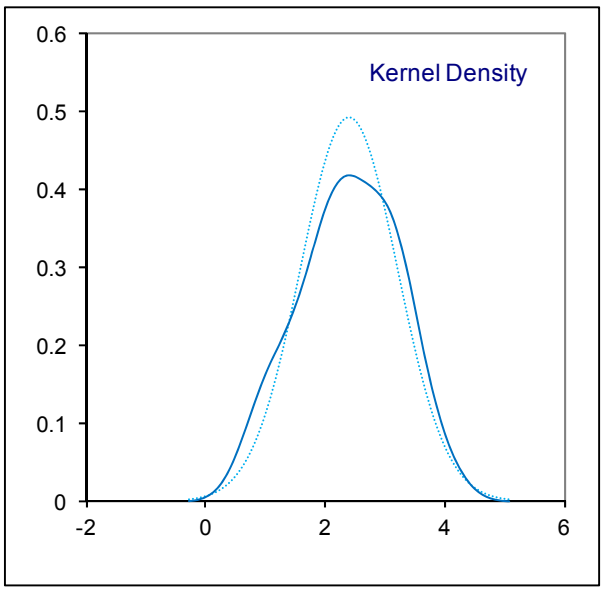
Determination of Chlorides on sample #14032; result in mg/kg

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171	D5808	1		-3.01	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311		-----		-----	
317	UOP779	3.2		1.73	
322	D5808	3		1.30	
323	D5808	3		1.30	
333		-----		-----	
334		-----		-----	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
399		-----		-----	
444	IP510	1.98		-0.90	
445	IP510	<2		-----	
494	D5808	2.5		0.22	
529		-----		-----	
541		-----		-----	
608		-----		-----	
657	D5808	2.3		-0.21	
750		-----		-----	
753		-----		-----	
754	GOST 779	1.87		-1.14	
759		-----		-----	
781		-----		-----	
784		-----		-----	
785		-----		-----	
823	D5808	3.4		2.16	
855	D5808	2.1		-0.64	
862	D5808	1.36		-2.24	
868	D5808	2.0		-0.86	
873		-----		-----	
875		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
995		-----		-----	
1016		-----		-----	
1062		-----		-----	
1065		-----		-----	
1066		-----		-----	
1067		-----		-----	
1081		-----		-----	
1095	UOP779	3.16		1.64	
1107	UOP779	2.5		0.22	
1134		-----		-----	
1145		-----		-----	
1167		-----		-----	
1200		-----		-----	
1201	D5808	2.64		0.52	
1257		-----		-----	
1264		-----		-----	
1291		-----		-----	
1362	D5808	3.87		3.17	
1379		-----		-----	
1404		-----		-----	
1429	D5808	3.2		1.73	
1528		-----		-----	
1556		-----		-----	
1583		-----		-----	
1584		-----		-----	
1585		-----		-----	
1603		-----		-----	
1656	D7359	1.56		-1.81	
1677		-----		-----	
1737		-----		-----	
1788	D5808	0.93049		-3.16	
1796		-----		-----	
1810		-----		-----	
1823		-----		-----	
1842		-----		-----	

1857	UOP779	2.4	0.00
1948		-----	-----
9057		-----	-----
9058		-----	-----
9061		-----	-----

normality	OK
n	20
outliers	0
mean (n)	2.399
st.dev. (n)	0.8092
R(calc.)	2.266
R(D5808:09)	1.300



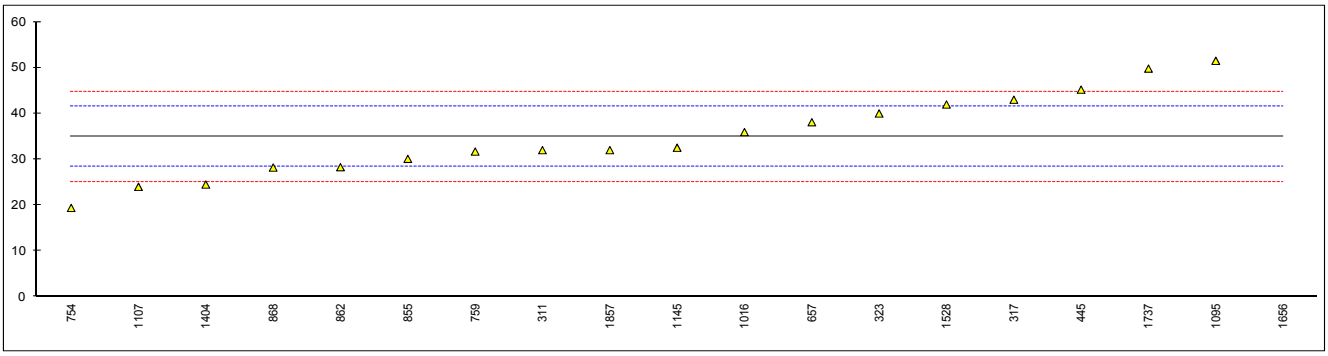


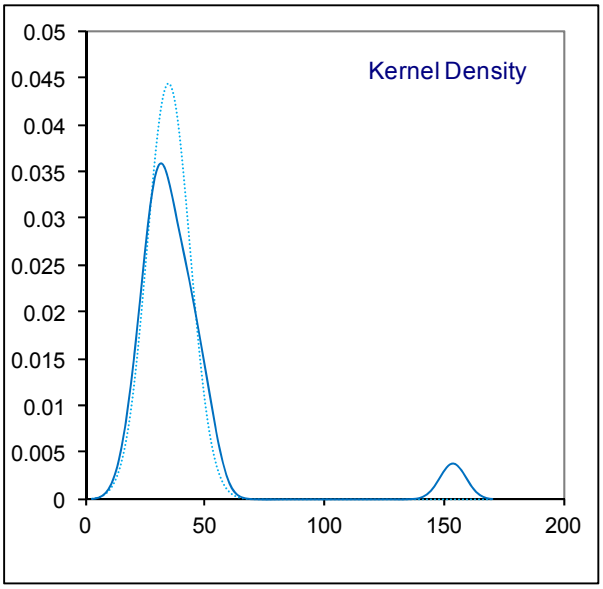
Determination of Methanol on sample #14032; result in mg/kg

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	INH-403	32	C	-0.89	First reported <10
317	INH-200	43		2.48	
322		-----		-----	
323	LOWOX	40		1.56	
333		-----		-----	
334		-----		-----	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
399		-----		-----	
444	In house	<3		<-9.75	False negative result?
445	LOWOX	45.2		3.15	
494		-----		-----	
529		-----		-----	
541		-----		-----	
608		-----		-----	
657	INH130	38.1		0.98	
750		-----		-----	
753		-----		-----	
754	D7423	19.39		-4.74	
759	D7423	31.69		-0.98	
781		-----		-----	
784		-----		-----	
785		-----		-----	
823		-----		-----	
855	INH-024	30.1		-1.47	
862	INH-024	28.28		-2.02	
868	INH-024	28.2		-2.05	
873		-----		-----	
875		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
995		-----		-----	
1016	In house	35.944		0.32	
1062		-----		-----	
1065		-----		-----	
1066		-----		-----	
1067		-----		-----	
1081		-----		-----	
1095	Oxytracer	51.5	C	5.07	First reported <1
1107	LOWOX	24		-3.33	
1134		-----		-----	
1145	D4815	32.5250		-0.73	
1167		-----		-----	
1200		-----		-----	
1201		-----		-----	
1257		-----		-----	
1264		-----		-----	
1291		-----		-----	
1362		-----		-----	
1379		-----		-----	
1404	LOWOX	24.5		-3.18	
1429		-----		-----	
1528		41.96		2.16	
1556		-----		-----	
1583		-----		-----	
1584		-----		-----	
1585		-----		-----	
1603	In house	<10		<-7.61	False negative result?
1656	IP466	154	G(0.01)	36.41	
1677		-----		-----	
1737	LOWOX	49.8		4.55	
1788		-----		-----	
1796		-----		-----	
1810		-----		-----	
1823		-----		-----	
1842		-----		-----	

1857	D7754	32	-0.89	
1948		<1	<-10.36	False negative result?
9057		-----	-----	
9058		-----	-----	
9061		-----	-----	

normality	OK
n	18
outliers	1
mean (n)	34.899
st.dev. (n)	8.9722
R(calc.)	25.122
R(Horwitz)	9.160



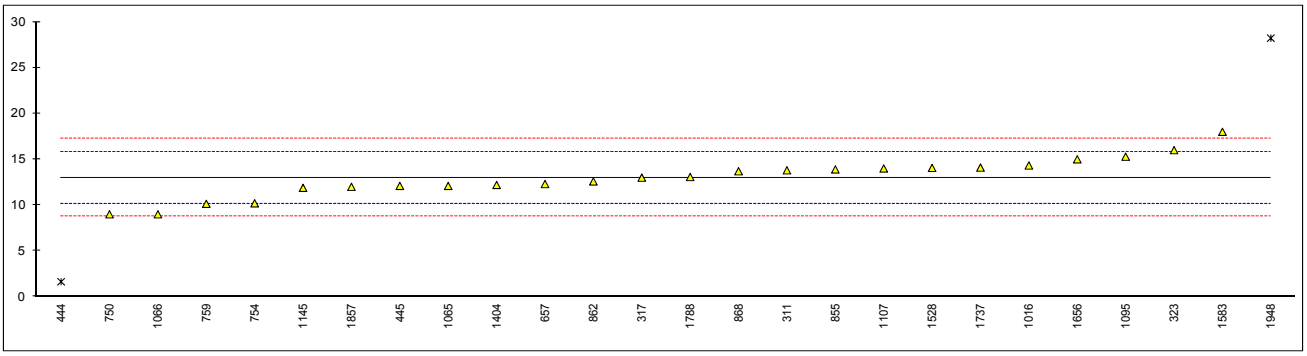


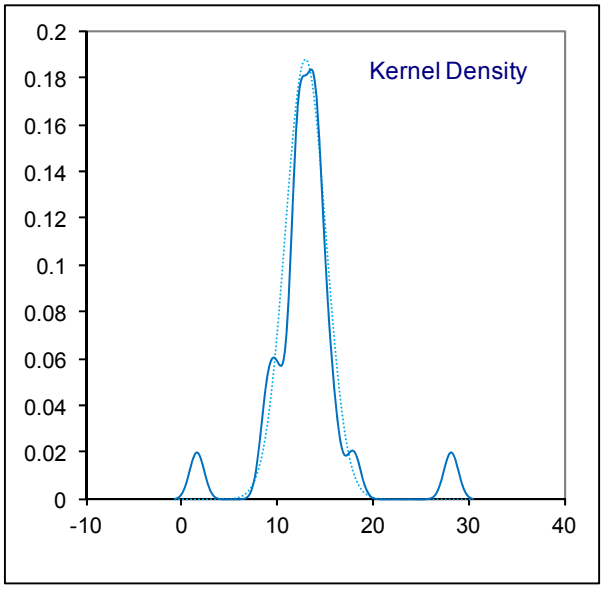
Determination of MTBE on sample #14032; result in mg/kg

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	INH-403	13.8		0.57	
317	INH-200	13		0.01	
322		-----		-----	
323	LOWOX	16		2.13	
333		-----		-----	
334		-----		-----	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
399		-----		-----	
444	IN HOUSE	1.64	R(0.01)	-8.03	
445	LOWOX	12.1		-0.63	
494		-----		-----	
529		-----		-----	
541		-----		-----	
608		-----		-----	
657	INH130	12.3		-0.49	
750		9		-2.82	
753		-----		-----	
754	D7423	10.20		-1.97	
759	D7423	10.14		-2.02	
781		-----		-----	
784		-----		-----	
785		-----		-----	
823		-----		-----	
855	INH-024	13.9		0.64	
862	INH-024	12.59		-0.28	
868	INH-024	13.7		0.50	
873		-----		-----	
875		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
995		-----		-----	
1016	In house	14.327		0.95	
1062		-----		-----	
1065	LOWOX	12.1		-0.63	
1066		9		-2.82	
1067		-----		-----	
1081		-----		-----	
1095	Oxytracer	15.29		1.63	
1107	LOWOX	14		0.71	
1134		-----		-----	
1145	D4815	11.8899		-0.78	
1167		-----		-----	
1200		-----		-----	
1201		-----		-----	
1257		-----		-----	
1264		-----		-----	
1291		-----		-----	
1362		-----		-----	
1379		-----		-----	
1404	LOWOX	12.2		-0.56	
1429		-----		-----	
1528		14.06		0.76	
1556		-----		-----	
1583	IP PM BG-91	18		3.55	
1584		-----		-----	
1585		-----		-----	
1603	In house	<10		<-2.12	
1656	IP466	15		1.42	
1677		-----		-----	
1737	LOWOX	14.1		0.79	
1788	D7423	13.07		0.06	
1796		-----		-----	
1810		-----		-----	
1823		-----		-----	
1842		-----		-----	

1857	D7754	12		-0.70
1948		28.22	R(0.01)	10.78
9057		-----		-----
9058		-----		-----
9061		-----		-----

normality	OK
n	24
outliers	2
mean (n)	12.990
st.dev. (n)	2.1208
R(calc.)	5.938
R(Horwitz)	3.956





Determination of Other Oxygenates on sample #14032; result in mg/kg

lab	method	DIPE	mark	TAME	mark	MEK	mark	Acetone	mark
150		-----		-----		-----		-----	
171		-----		-----		-----		-----	
225		-----		-----		-----		-----	
237		-----		-----		-----		-----	
238		-----		-----		-----		-----	
311	INH-403	<1		<1		2.1		<10	
317	INH-200	<1		<1		2		1	
322		-----		-----		-----		-----	
323	LOWOX	<2		<2		-----		<2	
333		-----		-----		-----		-----	
334		-----		-----		-----		-----	
336		-----		-----		-----		-----	
337		-----		-----		-----		-----	
360		-----		-----		-----		-----	
371		-----		-----		-----		-----	
399		-----		-----		-----		-----	
444	In house	-----		<3		-----		4.9	
445	LOWOX	<5		<5		-----		-----	
494		-----		-----		-----		-----	
529		-----		-----		-----		-----	
541		-----		-----		-----		-----	
608		-----		-----		-----		-----	
657	INH130	<0.1		0.1		1.9		0.8	
750		-----		-----		-----		-----	
753		-----		-----		-----		-----	
754	D7423	<0.5		2.82		<0.5		<0.5	
759	D7423	<0.5		2.68		<0.5		<0.5	
781		-----		-----		-----		-----	
784		-----		-----		-----		-----	
785		-----		-----		-----		-----	
823		-----		-----		-----		-----	
855	INH-024	<1		<1		1.8		<1	
862	INH-024	<1		<1		1.28		<1	
868	INH-024	<1		<1		2.2		<1	
873		-----		-----		-----		-----	
875		-----		-----		-----		-----	
962		-----		-----		-----		-----	
963		-----		-----		-----		-----	
974		-----		-----		-----		-----	
994		-----		-----		-----		-----	
995		-----		-----		-----		-----	
1016		-----		-----		-----		-----	
1062		-----		-----		-----		-----	
1065		-----		-----		-----		-----	
1066		<5		<5		<5		-----	
1067		-----		-----		-----		-----	
1081		-----		-----		-----		-----	
1095	Oxytracer	<1		<1		2.2	C	0.74	C
1107	LOWOX	<1		<1		2		<1	
1134		-----		-----		-----		-----	
1145	D4815	-----		0.1629		-----		0.6133	
1167		-----		-----		-----		-----	
1200		-----		-----		-----		-----	
1201		-----		-----		-----		-----	
1257		-----		-----		-----		-----	
1264		-----		-----		-----		-----	
1291		-----		-----		-----		-----	
1362		-----		-----		-----		-----	
1379		-----		-----		-----		-----	
1404	LOWOX	<1		<1		1.8		0.6	
1429		-----		-----		-----		-----	
1528		-----		-----		-----		-----	
1556		-----		-----		-----		-----	
1583		-----		-----		-----		-----	
1584		-----		-----		-----		-----	
1585		-----		-----		-----		-----	
1603	In house	<10		<10		<10		<10	
1656	IP466	-----		<5		-----		-----	
1677		-----		-----		-----		-----	
1737	LOWOX	<0.5		<0.5		2.2		0.6	
1788		-----		-----		-----		-----	
1796		-----		-----		-----		-----	
1810		-----		-----		-----		-----	
1823		-----		-----		-----		-----	
1842		-----		-----		-----		-----	

1857		-----	-----		-----	-----
1948		5.28	109.1	false +	55.83 false +	<1
9057		-----	-----		-----	-----
9058		-----	-----		-----	-----
9061		-----	-----		-----	-----
	normality	unknown	unknown		unknown	unknown
	n	17	19		14	17
	outliers	n.a.	1		1	n.a.
	mean (n)	<10	<10		<10	<10
	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.

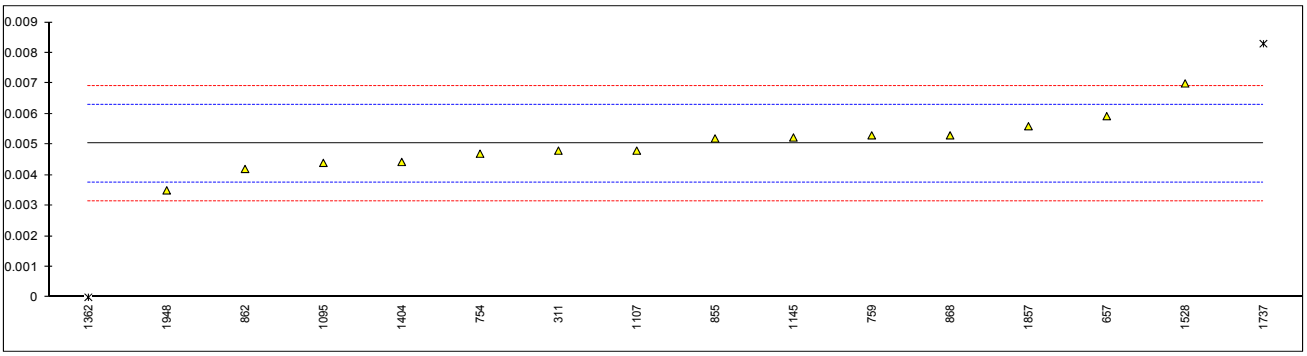
Lab 1095: first reported 0.25, 16.60

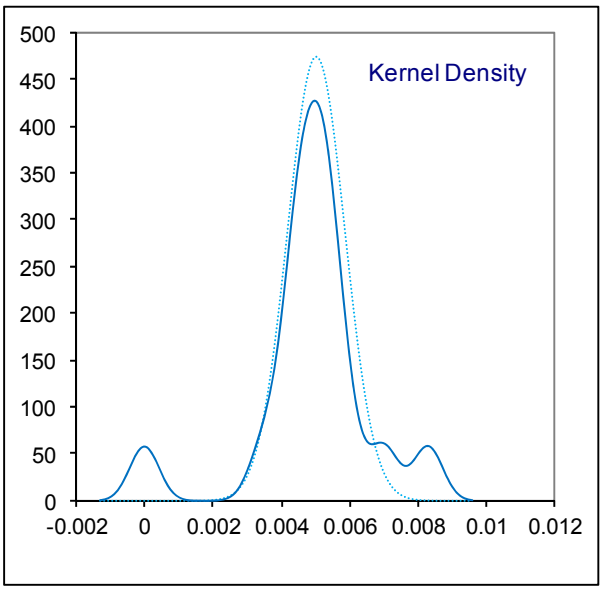
Determination of Total Oxygenates on sample #14032; result in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	INH-403	0.0048		-0.36	
317	INH-200	<0.01		-----	
322		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
399		-----		-----	
444		-----		-----	
445		-----		-----	
494		-----		-----	
529		-----		-----	
541		-----		-----	
608		-----		-----	
657	INH130	0.00593	C	1.43	First reported 59.3 (unit error, reported mg/kg instead of %M/M)
750		-----		-----	
753		-----		-----	
754	D7423	0.0047		-0.52	
759	D7423	0.0053		0.43	
781		-----		-----	
784		-----		-----	
785		-----		-----	
823		-----		-----	
855	INH-024	0.0052		0.27	
862	INH-024	0.0042		-1.31	
868	INH-024	0.0053		0.43	
873		-----		-----	
875		-----		-----	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
995		-----		-----	
1016		-----		-----	
1062		-----		-----	
1065		-----		-----	
1066		-----		-----	
1067		-----		-----	
1081		-----		-----	
1095	Oxytracer	0.004399		-1.00	
1107	LOWOX	0.0048	C	-0.36	First reported 48 (unit error mg/kg instead of %M/M)
1134		-----		-----	
1145	D4815	0.00523132	C	0.32	First reported 52.3132 (unit error mg/kg instead of %M/M)
1167		-----		-----	
1200		-----		-----	
1201		-----		-----	
1257		-----		-----	
1264		-----		-----	
1291		-----		-----	
1362	D6293	0.0	G(0.05)	-7.97	
1379		-----		-----	
1404	LOWOX	0.00443		-0.95	
1429		-----		-----	
1528		0.007		3.13	
1556		-----		-----	
1583		-----		-----	
1584		-----		-----	
1585		-----		-----	
1603	In house	<0.0010	C	-----	Reported 10 (unit error mg/kg instead of %M/M?), false negative result
1656		-----		-----	
1677		-----		-----	
1737	LOWOX	0.0083	G(0.05)	5.19	
1788		-----		-----	
1796		-----		-----	
1810		-----		-----	
1823		-----		-----	
1842		-----		-----	

1857	D7754	0.0056	C	0.91
1948		0.0035		-2.42
9057		-----		-----
9058		-----		-----
9061		-----		-----

normality	suspect
n	14
outliers	2
mean (n)	0.00503
st.dev. (n)	0.000843
R(calc.)	0.00236
R(Horwitz in % n=2)	0.00177



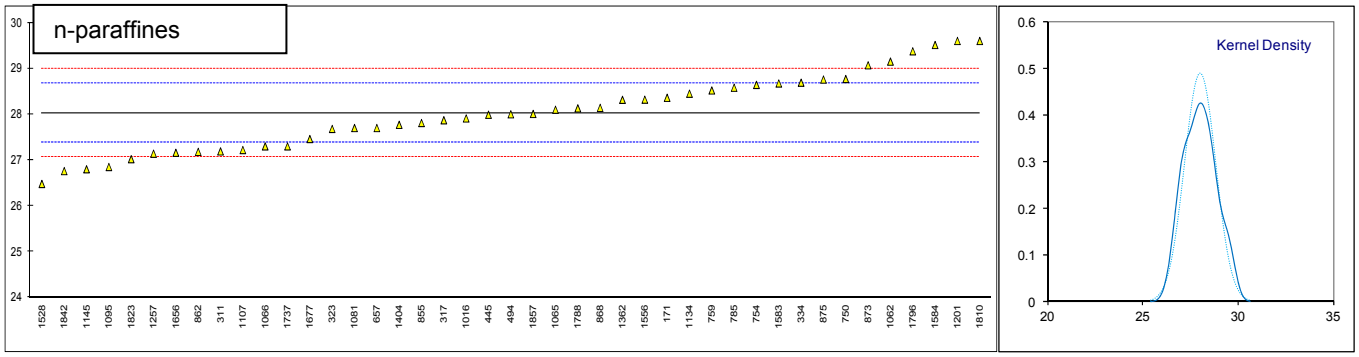


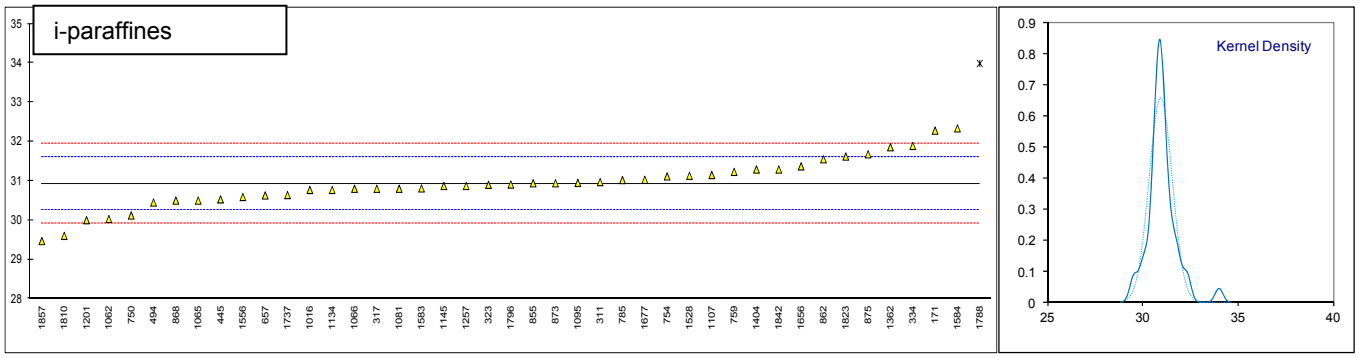
PONA/PIONA/PNA determination on sample #14032; results in %V/V

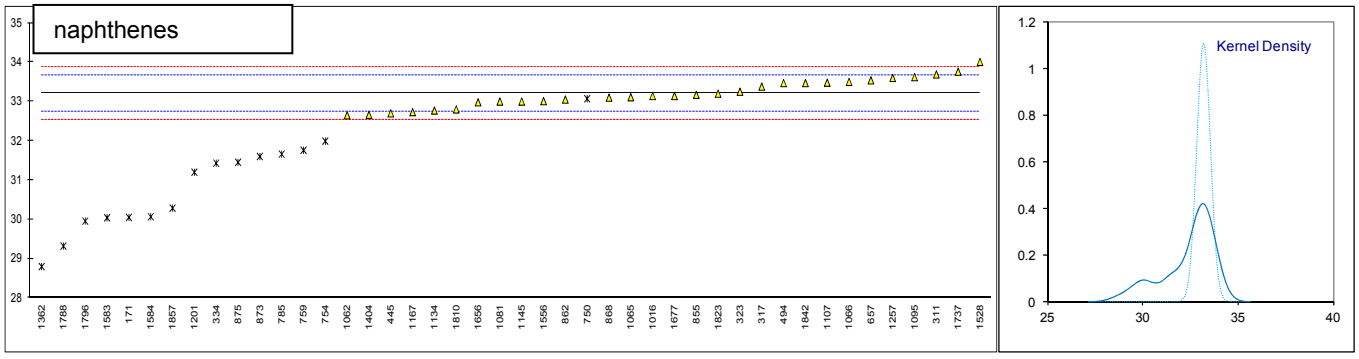
lab	method	n-paraf	mark	z(targ)	i-paraf	mark	z(targ)	Naphth.	mark	z(targ)	remarks
150		-----		-----	-----		-----	-----		-----	
171	D6729	28.36		1.04	32.28		4.00	30.05	ex	-13.94	See §4.1
225		-----		-----	-----		-----	-----		-----	
237		-----		-----	-----		-----	-----		-----	
238		-----		-----	-----		-----	-----		-----	
311	D5443	27.19		-2.60	30.97		0.12	33.69		2.14	
317	D5443	27.87		-0.48	30.80		-0.38	33.38		0.77	
322		-----		-----	-----		-----	-----		-----	
323	D5443	27.68		-1.07	30.90		-0.08	33.25		0.19	
333		-----		-----	-----		-----	-----		-----	
334	D5134	28.69		2.07	31.89		2.85	31.43	ex	-7.85	See §4.1
336		-----		-----	-----		-----	-----		-----	
337		-----		-----	-----		-----	-----		-----	
360		-----		-----	-----		-----	-----		-----	
371		-----		-----	-----		-----	-----		-----	
399		-----		-----	-----		-----	-----		-----	
444		-----		-----	-----		-----	-----		-----	
445	D5443	27.99		-0.11	30.53		-1.18	32.70		-2.24	
494	D6839	28.00		-0.08	30.45		-1.42	33.47		1.17	
529		-----		-----	-----		-----	-----		-----	
541		-----		-----	-----		-----	-----		-----	
608		-----		-----	-----		-----	-----		-----	
657	D5443	27.70		-1.01	30.63		-0.88	33.54		1.47	
750	D5134	28.77		2.32	30.12		-2.39	33.07	ex	-0.60	See §4.1
753		-----		-----	-----		-----	-----		-----	
754	D6729	28.642		1.92	31.114		0.55	31.992	ex	-5.36	See §4.1
759	GOST 52714	28.52		1.54	31.23		0.89	31.76	ex	-6.39	See §4.1
781		-----		-----	-----		-----	-----		-----	
784		-----		-----	-----		-----	-----		-----	
785	GOST 52714	28.58		1.73	31.02		0.27	31.66	ex	-6.83	See §4.1
823		-----		-----	-----		-----	-----		-----	
855	D6839	27.81		-0.67	30.94		0.03	33.17		-0.16	
862	D6839	27.18		-2.63	31.55		1.84	33.05		-0.69	
868	D6839	28.14		0.36	30.50		-1.27	33.10		-0.47	
873	D6729	29.07		3.25	30.94		0.03	31.60	ex	-7.10	See §4.1
875	GOST 52714	28.758		2.28	31.676		2.21	31.453	ex	-7.74	See §4.1
962		-----		-----	-----		-----	-----		-----	
963		-----		-----	-----		-----	-----		-----	
974		-----		-----	-----		-----	-----		-----	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1016	ISO22854	27.91		-0.36	30.77		-0.47	33.14		-0.29	
1062	D5443	29.15		3.50	30.03		-2.66	32.65		-2.46	
1065	D6839	28.1		0.23	30.5		-1.27	33.11		-0.42	
1066	D5443	27.3	C	-2.25	30.8	C	-0.38	33.5		1.30	
1067		-----		-----	-----		-----	-----		-----	
1081	In house	27.7		-1.01	30.8		-0.38	33.0		-0.91	
1095	PIONA	26.85		-3.65	30.95		0.06	33.62		1.83	
1107	D5443	27.22		-2.50	31.15		0.66	33.48		1.21	
1134	D6839	28.45		1.32	30.77		-0.47	32.77		-1.93	
1145	D6293	26.80		-3.81	30.87		-0.17	33.00		-0.91	
1167		-----		-----	-----		-----	32.73		-2.10	
1200		-----		-----	-----		-----	-----		-----	
1201	D5443	29.6		4.90	30.0		-2.75	31.2	R(0.01)	-8.86	
1257	D5443	27.14		-2.75	30.87		-0.17	33.6		1.74	
1264		-----		-----	-----		-----	-----		-----	
1291		-----		-----	-----		-----	-----		-----	
1362	GOST 52714	28.316		0.91	31.857	C	2.75	28.797	Cex	-19.48	See §4.1
1379		-----		-----	-----		-----	-----		-----	
1404	D5443	27.77		-0.79	31.29		1.07	32.66		-2.41	
1429		-----		-----	-----		-----	-----		-----	
1528	D5443	26.48		-4.81	31.13		0.60	34.01		3.55	
1556	ISO22854	28.32		0.92	30.59		-1.00	33.01		-0.87	
1583	D6729	28.673		2.02	30.808		-0.36	30.040	ex	-13.99	See §4.1
1584	D5134	29.512		4.63	32.338		4.17	30.066	ex	-13.87	See §4.1
1585		-----		-----	-----		-----	-----		-----	
1603		-----		-----	-----		-----	-----		-----	
1656	D5443	27.16		-2.69	31.37		1.31	32.98		-1.00	
1677	D6839	27.46		-1.76	31.03		0.30	33.14		-0.29	
1737	PIONA	27.30		-2.25	30.64		-0.85	33.76		2.45	
1788	D6839	28.13	C	0.33	33.99	C,R(0.01)	9.07	29.32	C,R(0.01)	-17.17	
1796	D6729Mod.	29.375		4.20	30.909		-0.06	29.956	ex	-14.36	See §4.1
1810	D6839	29.6		4.90	29.6		-3.93	32.8		-1.79	
1823	D6839	27.02		-3.13	31.62		2.05	33.20		-0.03	
1842	ISO22854	26.76		-3.93	31.29		1.07	33.47		1.17	

1857	D6729Mod.	28.007	-0.05	29.469	-4.32	30.286	ex	-12.90	See §4.1
1948		-----	-----	-----	-----	-----		-----	
9057		-----	-----	-----	-----	-----		-----	
9058		-----	-----	-----	-----	-----		-----	
9061		-----	-----	-----	-----	-----		-----	
	normality	OK		OK		OK			
	n	43		42		29			
	outliers	0		1		2	+13 excl.		
	mean (n)	28.024		30.928		33.206			
	st.dev. (n)	0.8173		0.6068		0.3602			
	R(calc.)	2.288		1.699		1.009			
	R(D5443:04)	0.900		0.945		0.634			

Lab 1066: first reported 25.3, 29.1
Lab 1362: first reported 32.99, 28.63
Lab 1788: first reported 27.71, 34.43, 28.84





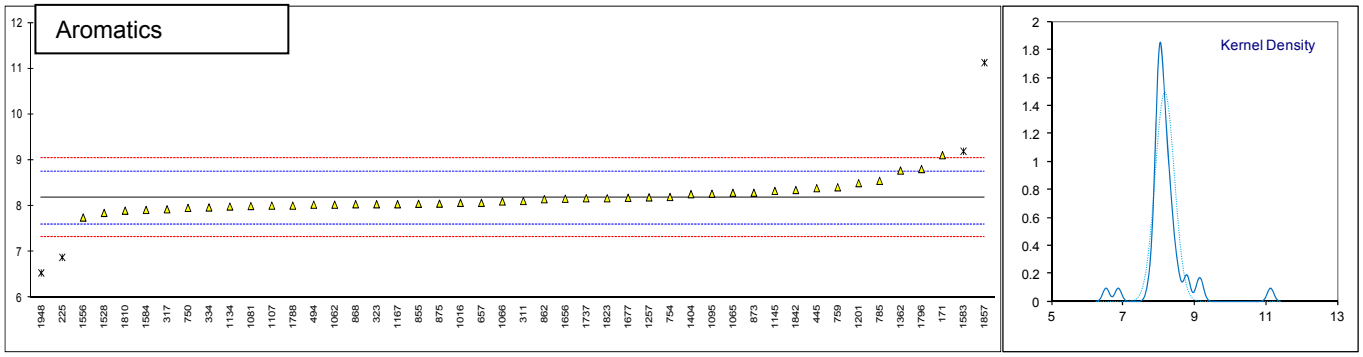


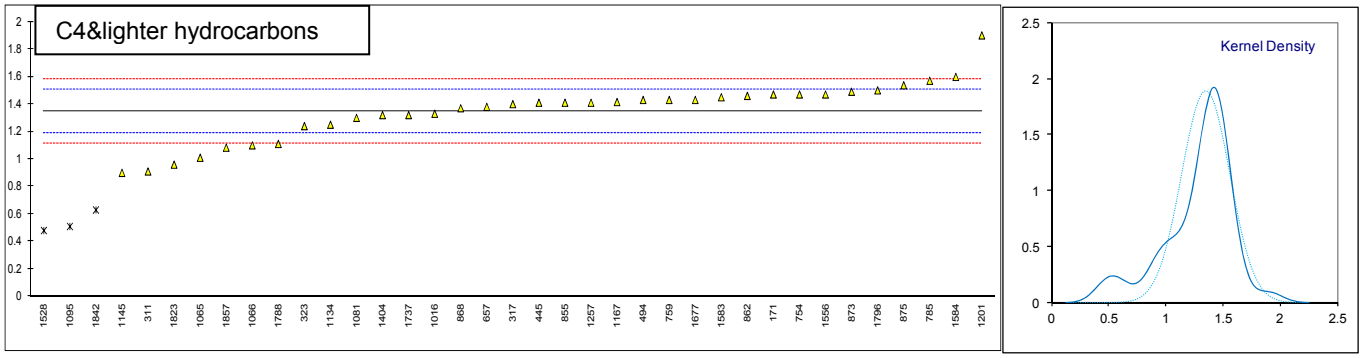
PONA/PIONA/PNA determination on sample #14032; results in %V/V (continued)

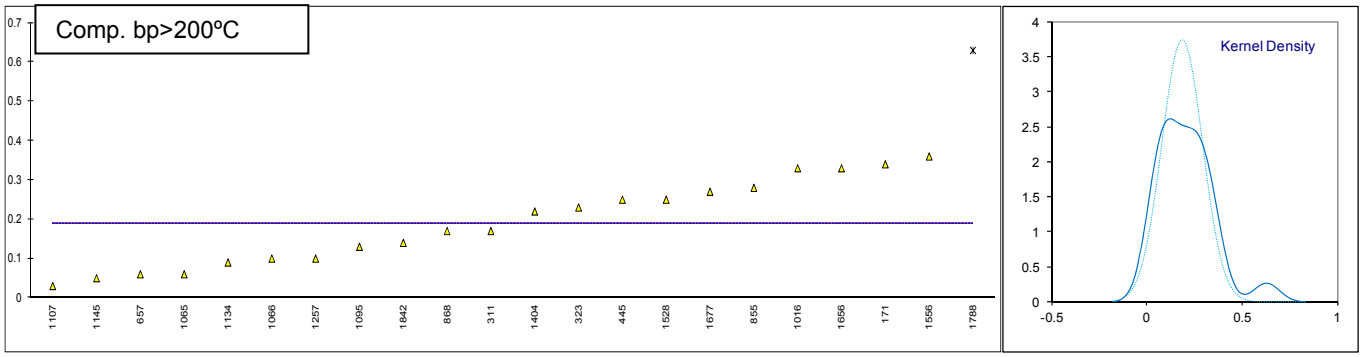
lab	method	Aromat.	Mark	z(targ)	C4&lighters	mark	z(targ)	bp>200	mark	z(targ)	remarks
150		-----		-----	-----		-----	-----		-----	
171	D6729	9.11		3.26	1.47		1.56	0.34		-----	
225	D1319	6.88	R(0.01)	-4.54	-----		-----	-----		-----	
237		-----		-----	-----		-----	-----		-----	
238		-----		-----	-----		-----	-----		-----	
311	D5443	8.11		-0.24	0.91		-5.62	0.17		-----	
317	D5443	7.93		-0.87	1.40		0.67	<0.05		-----	
322		-----		-----	-----		-----	-----		-----	
323	D5443	8.04		-0.48	1.24		-1.39	0.23		-----	
333		-----		-----	-----		-----	-----		-----	
334	D5134	7.97		-0.73	-----		-----	-----		-----	
336		-----		-----	-----		-----	-----		-----	
337		-----		-----	-----		-----	-----		-----	
360		-----		-----	-----		-----	-----		-----	
371		-----		-----	-----		-----	-----		-----	
399		-----		-----	-----		-----	-----		-----	
444		-----		-----	-----		-----	-----		-----	
445	D5443	8.39		0.74	1.41		0.79	0.25		-----	
494	D6839	8.03		-0.52	1.43		1.05	-----		-----	
529		-----		-----	-----		-----	-----		-----	
541		-----		-----	-----		-----	-----		-----	
608		-----		-----	-----		-----	-----		-----	
657	D5443	8.07		-0.38	1.38		0.41	0.06		-----	
750	D5134	7.96		-0.76	-----		-----	-----		-----	
753		-----		-----	-----		-----	-----		-----	
754	D6729	8.198		0.07	1.470		1.56	-----		-----	
759	GOST 52714	8.41		0.81	1.43		1.05	-----		-----	
781		-----		-----	-----		-----	-----		-----	
784		-----		-----	-----		-----	-----		-----	
785	GOST 52714	8.55		1.30	1.57		2.85	-----		-----	
823		-----		-----	-----		-----	-----		-----	
855	D6839	8.05		-0.45	1.41		0.79	0.28		-----	
862	D6839	8.15		-0.10	1.46		1.44	-----		-----	
868	D6839	8.04		-0.48	1.37		0.28	0.17		-----	
873	D6729	8.29		0.39	1.49		1.82	-----		-----	
875	GOST 52714	8.053		-0.44	1.537		2.42	-----		-----	
962		-----		-----	-----		-----	-----		-----	
963		-----		-----	-----		-----	-----		-----	
974		-----		-----	-----		-----	-----		-----	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1016	ISO22854	8.07		-0.38	1.33		-0.23	0.33		-----	
1062	D5443	8.03		-0.52	-----		-----	-----		-----	
1065	D6839	8.29		0.39	1.01		-4.34	0.06		-----	
1066	D5443	8.1	C	-0.27	1.1		-3.18	0.1		-----	
1067		-----		-----	-----		-----	-----		-----	
1081	In house	8.0		-0.62	1.3		-0.62	-----		-----	
1095	ISO22854	8.27		0.32	0.51	DG(0.05)	-10.75	0.13		-----	
1107	D5443	8.01		-0.59	<0.1		-----	0.03		-----	
1134	D6839	7.99		-0.66	1.25		-1.26	0.09		-----	
1145	D6293	8.33		0.53	0.90		-5.75	0.05		-----	
1167	ISO22854	8.04		-0.48	1.415		0.86	-----		-----	
1200		-----		-----	-----		-----	-----		-----	
1201	D5443	8.5		1.13	1.9		7.08	<0.1		-----	
1257	D5443	8.19		0.04	1.41		0.79	0.1		-----	
1264		-----		-----	-----		-----	-----		-----	
1291		-----		-----	-----		-----	-----		-----	
1362	GOST 52714	8.775		2.09	-----		-----	-----		-----	
1379		-----		-----	-----		-----	-----		-----	
1404	D5443	8.26		0.29	1.32		-0.36	0.22		-----	
1429		-----		-----	-----		-----	-----		-----	
1528	D5443	7.85		-1.15	0.48	DG(0.05)	-11.13	0.25		-----	
1556	ISO22854	7.75		-1.50	1.47		1.56	0.36	C	-----	
1583	D6729	9.195	R(0.01)	3.56	1.450		1.31	-----		-----	
1584	D5134	7.916		-0.92	1.598		3.21	-----		-----	
1585		-----		-----	-----		-----	-----		-----	
1603		-----		-----	-----		-----	-----		-----	
1656	D5443	8.16		-0.06	-----		-----	0.33		-----	
1677	D6839	8.18		0.01	1.43		1.05	0.27		-----	
1737	PIONA	8.17		-0.03	1.32		-0.36	-----		-----	
1788	D6839	8.01	C	-0.59	1.11	C	-3.05	0.63	C,R(0.05)	-----	
1796	D6729Mod.	8.808		2.20	1.500		1.95	<0.001		-----	
1810	D6839	7.9		-0.97	-----		-----	-----		-----	
1823	D6839	8.17		-0.03	0.96		-4.98	<0.01		-----	
1842	ISO22854	8.35		0.60	0.63	G(0.05)	-9.21	0.14		-----	

1857	D6729Mod.	11.128	R(0.01)	10.32	1.083	-3.40	<0.001	-----
1948	D5443	6.54	R(0.01)	-5.73	-----	-----	-----	-----
9057		-----		-----	-----	-----	-----	-----
9058		-----		-----	-----	-----	-----	-----
9061		-----		-----	-----	-----	-----	-----
	normality	not OK			OK		OK	
	n	42			34		21	
	outliers	4			3		1	
	mean (n)	8.178			1.348		0.189	
	st.dev. (n)	0.2676			0.2114		0.1065	
	R(calc.)	0.749			0.592		0.298	
	R(D5443:04)	0.801			0.219		n.a.	

Lab 1066: first reported 9.7
Lab 1556: first reported 1.33
Lab 1788: first reported 8.08, 0.83, 0.93





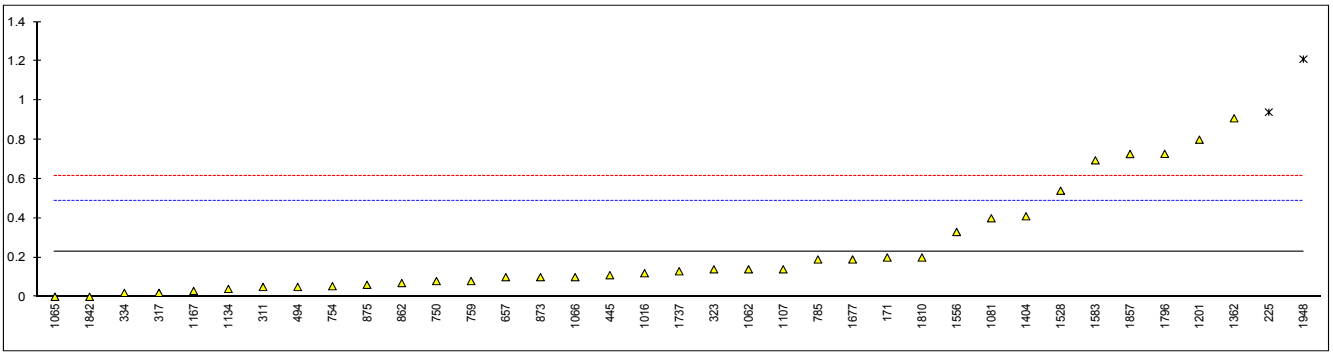


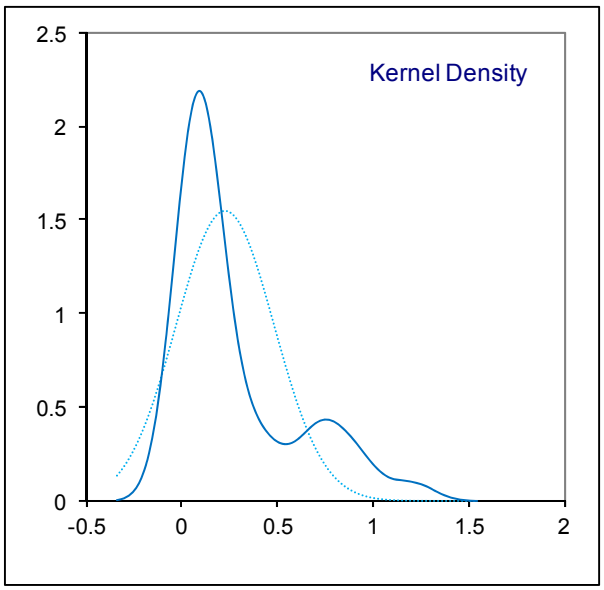
PONA/PIONA/PNA determination on sample #14032; results in %V/V (continued)

lab	method	olefins	mark	z(targ)	remarks
150		-----		-----	
171	D6729	0.200		-0.21	
225	D1319	0.94	DG(0.05)	5.48	
237		-----		-----	
238		-----		-----	
311	D6839	0.05		-1.36	
317	D5443	0.02		-1.59	
322		-----		-----	
323	D5443	0.14		-0.67	
333		-----		-----	
334	D5134	0.02		-1.59	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
399		-----		-----	
444		-----		-----	
445	D5443	0.11		-0.90	
494	D6839	0.05		-1.36	
529		-----		-----	
541		-----		-----	
608		-----		-----	
657	D6839	0.10		-0.98	
750	D5134	0.08		-1.13	
753		-----		-----	
754	D6729	0.054		-1.33	
759	GOST 52714	0.08		-1.13	
781		-----		-----	
784		-----		-----	
785	GOST 52714	0.19		-0.29	
823		-----		-----	
855	D6839	<0.1		-----	
862	D6839	0.07		-1.21	
868	D6839	<0.1		-----	
873	D6729	0.10		-0.98	
875	GOST 52714	0.0608		-1.28	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
995		-----		-----	
1016	ISO22854	0.12		-0.82	
1062	D6839	0.14		-0.67	
1065	D6839	0		-1.75	
1066	D6839	0.1		-0.98	
1067		-----		-----	
1081	In house	0.4		1.33	
1095	ISO22854	<1.5		-----	
1107	D5443	0.14		-0.67	
1134	D6839	0.04		-1.44	
1145		-----		-----	
1167	ISO22854	0.03		-1.52	
1200		-----		-----	
1201	D6839	0.8		4.40	
1257	D5443	<0.10		-----	
1264		-----		-----	
1291		-----		-----	
1362	GOST 52714	0.909	C	5.24	First reported 1.084
1379		-----		-----	
1404	D6730	0.41	C	1.41	First reported 0.95
1429		-----		-----	
1528	D5443	0.54		2.40	
1556	ISO22854	0.33		0.79	
1583	D6729	0.695		3.60	
1584	D5134	<0.01		-----	
1585		-----		-----	
1603		-----		-----	
1656	D5443	<0.1		-----	
1677	D6839	0.19		-0.29	
1737	PIONA	0.13		-0.75	
1788	D6839	<0.01		-----	
1796	D6729Mod.	0.728		3.85	
1810	D6839	0.20		-0.21	
1823	D6839	<0.01		-----	
1842	ISO22854	0		-1.75	

1857	D6729Mod.	0.727		3.84
1948	D6839	1.21	DG(0.05)	7.56
9057		-----		-----
9058		-----		-----
9061		-----		-----

normality	suspect
n	35
outliers	2
mean (n)	0.227
st.dev. (n)	0.2570
R(calc.)	0.720
R(D6839:07)	0.364



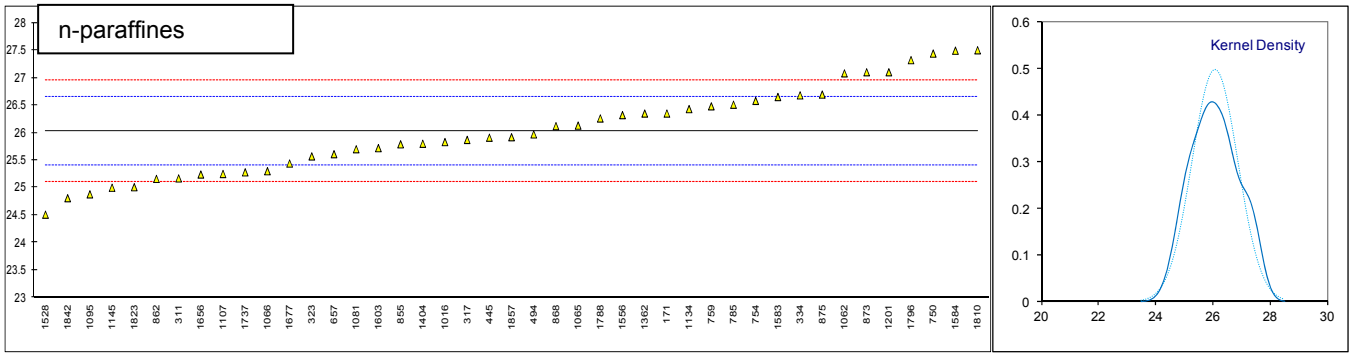


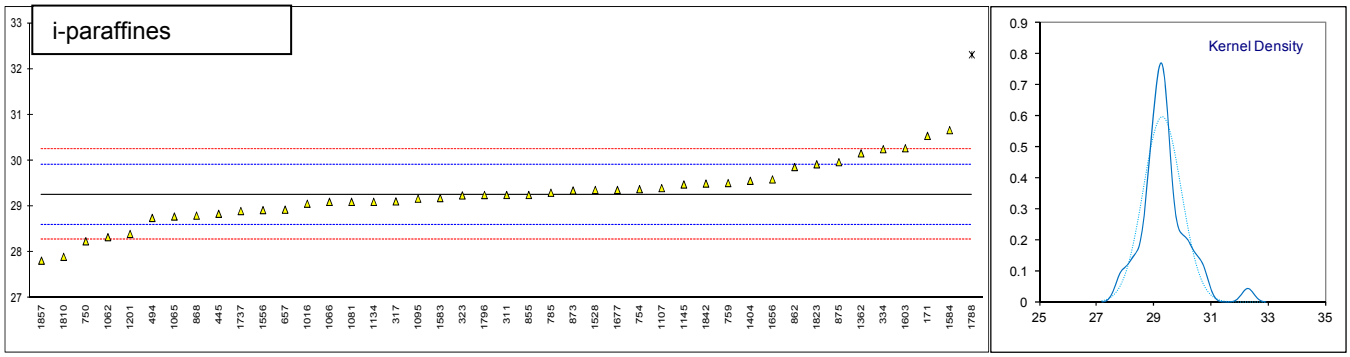
PONA/PIONA/PNA determination on sample #14032; results in %M/M

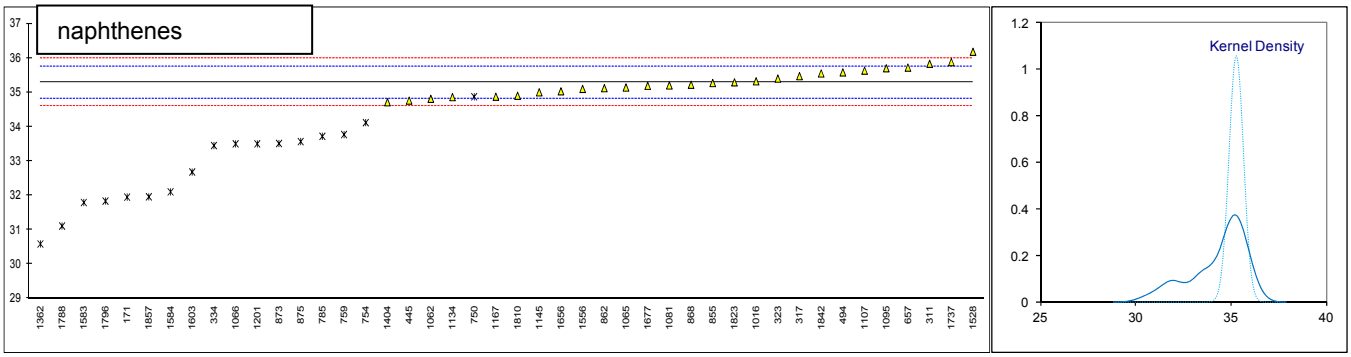
lab	method	n-paraf	mark	z(targ)	i-paraf	mark	z(targ)	Naphth.	mark	z(targ)	Remarks
150		-----		-----	-----		-----	-----		-----	
171	D6729	26.35		1.03	30.54		3.90	31.95	ex	-14.30	See §4.1
225		-----		-----	-----		-----	-----		-----	
237		-----		-----	-----		-----	-----		-----	
238		-----		-----	-----		-----	-----		-----	
311	D5443	25.17		-2.78	29.25		-0.02	35.83		2.33	
317	D5443	25.87		-0.52	29.11		-0.45	35.47		0.79	
322		-----		-----	-----		-----	-----		-----	
323	D5443	25.57		-1.49	29.24		-0.05	35.40		0.49	
333		-----		-----	-----		-----	-----		-----	
334	D5134	26.68		2.10	30.25		3.02	33.45	ex	-7.87	See §4.1
336		-----		-----	-----		-----	-----		-----	
337		-----		-----	-----		-----	-----		-----	
360		-----		-----	-----		-----	-----		-----	
371		-----		-----	-----		-----	-----		-----	
399		-----		-----	-----		-----	-----		-----	
444		-----		-----	-----		-----	-----		-----	
445	D5443	25.91		-0.39	28.84		-1.27	34.76		-2.26	
494	D6839	25.97		-0.20	28.75		-1.55	35.58		1.26	
529		-----		-----	-----		-----	-----		-----	
541		-----		-----	-----		-----	-----		-----	
608		-----		-----	-----		-----	-----		-----	
657	D5443	25.61		-1.36	28.93		-1.00	35.72		1.86	
750	D5134	27.44		4.55	28.24		-3.10	34.87	ex	-1.78	See §4.1
753		-----		-----	-----		-----	-----		-----	
754	D6729	26.579		1.77	29.376		0.36	34.118	ex	-5.01	See §4.1
759	GOST 52714	26.48		1.45	29.51		0.77	33.77	ex	-6.50	See §4.1
781		-----		-----	-----		-----	-----		-----	
784		-----		-----	-----		-----	-----		-----	
785	GOST 52714	26.51		1.55	29.30		0.13	33.72	ex	-6.71	See §4.1
823		-----		-----	-----		-----	-----		-----	
855	D6839	25.79		-0.78	29.25		-0.02	35.27		-0.07	
862	D6839	25.16		-2.81	29.86		1.83	35.12		-0.71	
868	D6839	26.12		0.29	28.80		-1.39	35.22		-0.28	
873	D6729	27.1		3.45	29.35		0.28	33.51	ex	-7.61	See §4.1
875	GOST 52714	26.694		2.14	29.966		2.16	33.566	ex	-7.37	See §4.1
962		-----		-----	-----		-----	-----		-----	
963		-----		-----	-----		-----	-----		-----	
974		-----		-----	-----		-----	-----		-----	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1016	ISO22854	25.83		-0.65	29.06		-0.60	35.32		0.14	
1062	D5443	27.08		3.39	28.33		-2.83	34.81		-2.04	
1065	D6839	26.13		0.32	28.78		-1.46	35.14		-0.63	
1066	D5443	25.3	C	-2.36	29.1	C	-0.48	33.5	R(0.01)	-7.65	
1067		-----		-----	-----		-----	-----		-----	
1081	In house	25.7		-1.07	29.1		-0.48	35.2		-0.37	
1095	PIONA	24.88		-3.71	29.17		-0.27	35.70		1.77	
1107	D5443	25.25		-2.52	29.40		0.43	35.63		1.47	
1134	D6839	26.43		1.29	29.10		-0.48	34.86		-1.83	
1145	D6293	25.00		-3.33	29.48		0.68	35.00		-1.23	
1167		-----		-----	-----		-----	34.872		-1.78	
1200		-----		-----	-----		-----	-----		-----	
1201	D5443	27.1		3.45	28.4		-2.61	33.5	R(0.01)	-7.65	
1257		-----		-----	-----		-----	-----		-----	
1264		-----		-----	-----		-----	-----		-----	
1291		-----		-----	-----		-----	-----		-----	
1362	GOST 52714	26.349		1.03	30.159	C	2.74	30.588	C,ex	-20.13	See §4.1
1379		-----		-----	-----		-----	-----		-----	
1404	D5443	25.80		-0.74	29.56		0.92	34.71		-2.47	
1429		-----		-----	-----		-----	-----		-----	
1528	D5443	24.51		-4.91	29.36		0.31	36.18		3.83	
1556	ISO22854	26.32		0.93	28.92		-1.03	35.10		-0.80	
1583	D6729	26.650		2.00	29.182		-0.23	31.794	ex	-14.97	See §4.1
1584	D5134	27.492		4.72	30.665		4.28	32.103	ex	-13.64	See §4.1
1585		-----		-----	-----		-----	-----		-----	
1603	In house	25.72		-1.00	30.27		3.08	32.68	R(0.01)	-11.17	
1656	D5443	25.24		-2.55	29.59		1.01	35.03		-1.10	
1677	D6839	25.44		-1.91	29.36		0.31	35.19		-0.41	
1737	PIONA	25.28		-2.42	28.90		-1.09	35.88		2.54	
1788	D6839	26.26	C	0.74	32.31	C,R(0.01)	9.29	31.11	C,R(0.01)	-17.90	
1796	D6729Mod.	27.320		4.16	29.249		-0.03	31.836	ex	-14.79	See §4.1
1810	D6839	27.5		4.74	27.9		-4.13	34.9		-1.66	
1823	D6839	25.01		-3.30	29.92		2.02	35.29		0.02	
1842	ISO22854	24.81		-3.94	29.50		0.74	35.55		1.13	

1857	D6729Mod.	25.919	-0.36	27.817	-4.39	31.958	ex	-14.26	See §4.1
1948		-----	-----	-----	-----	-----		-----	
9057		-----	-----	-----	-----	-----		-----	
9058		-----	-----	-----	-----	-----		-----	
9061		-----	-----	-----	-----	-----		-----	
	normality	OK		OK		OK			
	n	43		42		27			
	outliers	0		1		4	+ 13 excl.		
	mean (n)	26.031		29.258		35.286			
	st.dev. (n)	0.7874		0.6268		0.3782			
	R(calc.)	2.205		1.755		1.059			
	R(D5443:04)	0.867		0.920		0.653			

Lab 1066: first reported 27.3, 30.8
Lab 1362: first reported 31.320, 30.424
Lab 1788: first reported 25.89, 32.88, 30.53





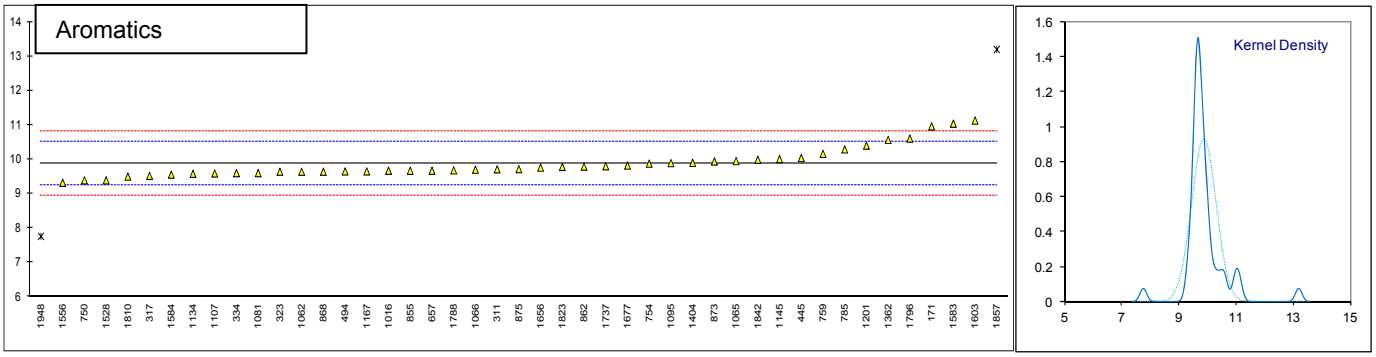


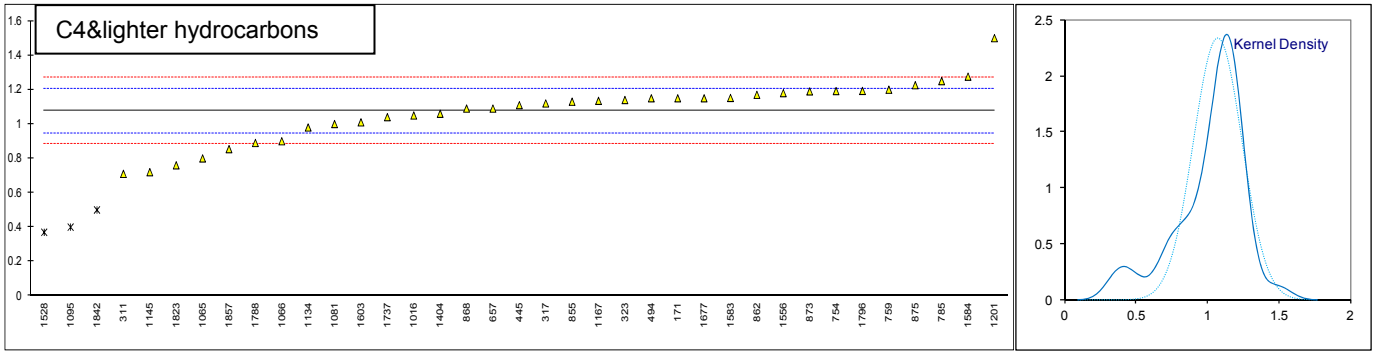
PONA/PIONA/PNA determination on sample #14032; results in %M/M (continued)

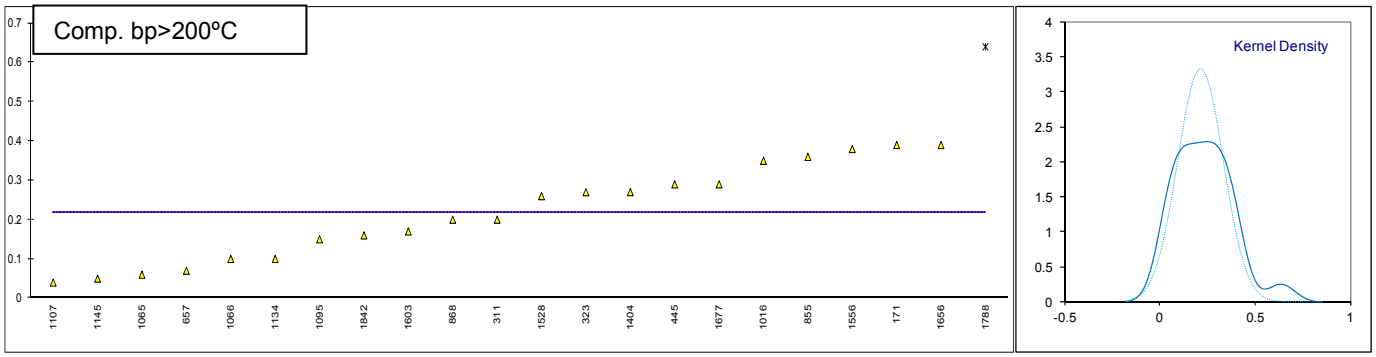
lab	method	Aromat.	Mark	z(targ)	C4& lighters	mark	z(targ)	bp>200	mark	z(targ)	remarks
150		-----		-----	-----		-----	-----		-----	
171	D6729	10.96		3.44	1.15		1.15	0.39		-----	
225		-----		-----	-----		-----	-----		-----	
237		-----		-----	-----		-----	-----		-----	
238		-----		-----	-----		-----	-----		-----	
311	D5443	9.71		-0.54	0.71		-5.66	0.20		-----	
317	D5443	9.52		-1.14	1.12		0.69	<0.05		-----	
322		-----		-----	-----		-----	-----		-----	
323	D5443	9.64		-0.76	1.14		1.00	0.27		-----	
333		-----		-----	-----		-----	-----		-----	
334	D5134	9.60		-0.89	-----		-----	-----		-----	
336		-----		-----	-----		-----	-----		-----	
337		-----		-----	-----		-----	-----		-----	
360		-----		-----	-----		-----	-----		-----	
371		-----		-----	-----		-----	-----		-----	
399		-----		-----	-----		-----	-----		-----	
444		-----		-----	-----		-----	-----		-----	
445	D5443	10.04		0.51	1.11		0.53	0.29		-----	
494	D6839	9.65		-0.73	1.15		1.15	-----		-----	
529		-----		-----	-----		-----	-----		-----	
541		-----		-----	-----		-----	-----		-----	
608		-----		-----	-----		-----	-----		-----	
657	D5443	9.67		-0.66	1.09		0.22	0.07		-----	
750	D5134	9.39		-1.55	-----		-----	-----		-----	
753		-----		-----	-----		-----	-----		-----	
754	D6729	9.875		-0.01	1.192		1.80	-----		-----	
759	GOST 52714	10.16		0.90	1.20		1.93	-----		-----	
781		-----		-----	-----		-----	-----		-----	
784		-----		-----	-----		-----	-----		-----	
785	GOST 52714	10.29		1.31	1.25		2.70	-----		-----	
823		-----		-----	-----		-----	-----		-----	
855	D6839	9.67		-0.66	1.13		0.84	0.36		-----	
862	D6839	9.79		-0.28	1.17		1.46	-----		-----	
868	D6839	9.64		-0.76	1.09		0.22	0.20		-----	
873	D6729	9.94		0.20	1.19		1.77	-----		-----	
875	GOST 52714	9.715		-0.52	1.226		2.33	-----		-----	
962		-----		-----	-----		-----	-----		-----	
963		-----		-----	-----		-----	-----		-----	
974		-----		-----	-----		-----	-----		-----	
994		-----		-----	-----		-----	-----		-----	
995		-----		-----	-----		-----	-----		-----	
1016	ISO22854	9.67		-0.66	1.05		-0.40	0.35		-----	
1062	D5443	9.64		-0.76	-----		-----	-----		-----	
1065	D6839	9.95		0.23	0.8		-4.27	0.06		-----	
1066	D5443	9.7	C	-0.57	0.9		-2.72	0.1		-----	
1067		-----		-----	-----		-----	-----		-----	
1081	In house	9.6		-0.89	1.0		-1.17	-----		-----	
1095	ISO22854	9.89		0.04	0.40	DG(0.05)	-10.46	0.15		-----	
1107	D5443	9.59		-0.92	<0.1		-----	0.04		-----	
1134	D6839	9.58		-0.95	0.98		-1.48	0.10		-----	
1145	D6293	10.01		0.42	0.72		-5.50	0.05		-----	
1167	ISO22854	9.65		-0.73	1.135		0.92	-----		-----	
1200		-----		-----	-----		-----	-----		-----	
1201	D5443	10.4		1.66	1.5		6.57	<0.1		-----	
1257		-----		-----	-----		-----	-----		-----	
1264		-----		-----	-----		-----	-----		-----	
1291		-----		-----	-----		-----	-----		-----	
1362	GOST 52714	10.566		2.19	-----		-----	-----		-----	
1379		-----		-----	-----		-----	-----		-----	
1404	D5443	9.90		0.07	1.06		-0.24	0.27		-----	
1429		-----		-----	-----		-----	-----		-----	
1528	D5443	9.39		-1.55	0.37	DG(0.05)	-10.92	0.26		-----	
1556	ISO22854	9.32		-1.78	1.18		1.62	0.38	C	-----	
1583	D6729	11.039		3.69	1.152		1.18	-----		-----	
1584	D5134	9.557		-1.02	1.276		3.10	-----		-----	
1585		-----		-----	-----		-----	-----		-----	
1603	D5443	11.13		3.98	1.01		-1.01	0.17		-----	
1656	D5443	9.76		-0.38	-----		-----	0.39		-----	
1677	D6839	9.82		-0.19	1.15		1.15	0.29		-----	
1737	PIONA	9.80		-0.25	1.04		-0.55	-----		-----	
1788	D6839	9.68	C	-0.63	0.89	C	-2.87	0.64	C,G(0.05)	-----	
1796	D6729Mod.	10.606		2.31	1.193		1.82	<0.001		-----	
1810	D6839	9.5		-1.20	-----		-----	-----		-----	
1823	D6839	9.78		-0.31	0.76		-4.89	<0.01		-----	
1842	ISO22854	9.99		0.35	0.50	G(0.05)	-8.91	0.16		-----	

1857	D6729Mod.	13.196	R(0.01)	10.55	0.854	-3.43	<0.001	-----
1948	D5443	7.76	R(0.01)	-6.74	-----	-----	-----	-----
9057		-----		-----	-----	-----	-----	-----
9058		-----		-----	-----	-----	-----	-----
9061		-----		-----	-----	-----	-----	-----
	normality	not OK			OK		OK	
	n	43			34		21	
	outliers	2			3		1	
	mean (n)	9.879			1.076		0.217	
	st.dev. (n)	0.4292			0.1703		0.1196	
	R(calc.)	1.202			0.477		0.335	
	R(D5443:04)	0.880			0.181		n.a.	

Lab 1066: first reported 8.1
Lab 1556: first reported 1.42
Lab 1788: first reported 9.74, 0.67, 0.95





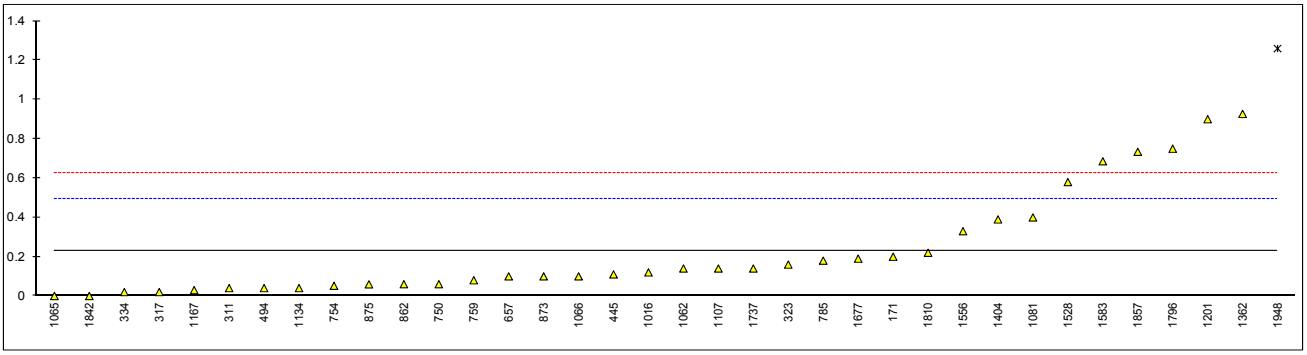


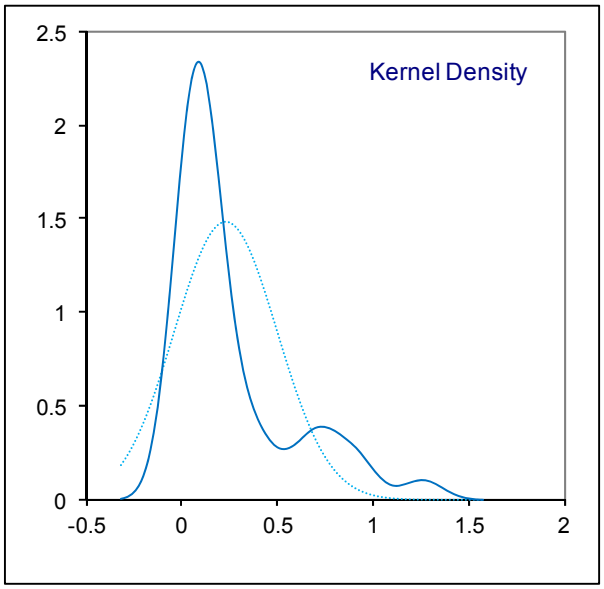
PONA/PIONA/PNA determination on sample #14032; results in %M/M (continued)

lab	method	olefins	mark	z(targ)	remarks
150		-----		-----	
171	D6729	0.20		-0.24	
225		-----		-----	
237		-----		-----	
238		-----		-----	
311	D6839	0.04		-1.46	
317	D5443	0.02		-1.61	
322		-----		-----	
323	D5443	0.16		-0.54	
333		-----		-----	
334	D5134	0.02		-1.61	
336		-----		-----	
337		-----		-----	
360		-----		-----	
371		-----		-----	
399		-----		-----	
444		-----		-----	
445	D5443	0.11		-0.93	
494	D6839	0.04		-1.46	
529		-----		-----	
541		-----		-----	
608		-----		-----	
657	D6839	0.10		-1.00	
750	D5134	0.06		-1.31	
753		-----		-----	
754	D6729	0.052		-1.37	
759	GOST 52714	0.08		-1.15	
781		-----		-----	
784		-----		-----	
785	GOST 52714	0.18		-0.39	
823		-----		-----	
855	D6839	<0.1		-----	
862	D6839	0.06		-1.31	
868	D6839	<0.1		-----	
873	D6729	0.1		-1.00	
875	GOST 52714	0.0594		-1.31	
962		-----		-----	
963		-----		-----	
974		-----		-----	
994		-----		-----	
995		-----		-----	
1016	ISO22854	0.12		-0.85	
1062	D6839	0.14		-0.70	
1065	D6839	0		-1.76	
1066	D6839	0.1		-1.00	
1067		-----		-----	
1081	In house	0.4		1.29	
1095	ISO22854	<0.1		-----	
1107	D5443	0.14		-0.70	
1134	D6839	0.04		-1.46	
1145		-----		-----	
1167	ISO22854	0.03		-1.54	
1200		-----		-----	
1201	D6839	0.9		5.10	
1257		-----		-----	
1264		-----		-----	
1291		-----		-----	
1362	GOST 52714	0.927	C	5.30	First reported 1.112
1379		-----		-----	
1404	D6730	0.39	C	1.21	First reported 0.92
1429		-----		-----	
1528	D5443	0.58		2.66	
1556	ISO22854	0.33		0.75	
1583	D6729	0.686		3.47	
1584	D5134	<0.01		-----	
1585		-----		-----	
1603	In house	<0.01		-----	
1656	D5443	<0.1		-----	
1677	D6839	0.19		-0.32	
1737	PIONA	0.14		-0.70	
1788	D6839	<0.01		-----	
1796	D6729Mod.	0.750		3.95	
1810		0.22		-0.09	
1823	D6839	<0.01		-----	
1842	ISO22854	0		-1.76	

1857	D6729Mod.	0.734		3.83
1948	D6839	1.26	R(0.05)	7.84
9057		-----		-----
9058		-----		-----
9061		-----		-----

normality	not OK
n	35
outliers	1
mean (n)	0.231
st.dev. (n)	0.2684
R(calc.)	0.751
R(D6839:13)	0.367



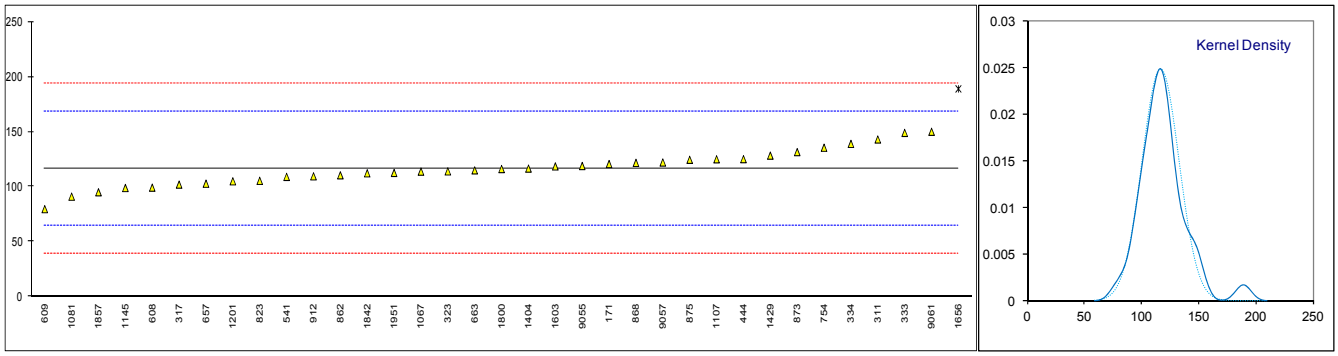


Determination of Mercury content as Hg on sample #14033; results in µg/kg

lab	method	value	mark	z(targ)	remarks	Sample treat.	Calib. Quant.	Quant. Method
150		-----		-----				
171	UOP938	120.66		0.16		Direct meas.	Anorg. Std.	AFS
311	UOP938	143		1.03		diluted	Anorg. Std.	Pyro.Hg
317	INH-003	102		-0.56		Destruction	Anorg.Std.	AFS
323	UOP938	114		-0.10		Direct meas.	Anorg.Std.	AFS
333		149		1.26		Direct meas.	Anorg.Std.	AAS
334	INH-09003	139		0.87				
444	UOP938	125.1		0.33		Direct meas.	Anorg.Std.	AAS
541	EPA7473	109		-0.29		Direct meas.	Anorg.Std.	AA by DMA
608	UOP938	99.2		-0.67		Direct meas.	Anorg.Std.	CV-AAS
609	UOP938	79.6857	C	-1.43	First reported 57.793	Direct meas.	Anorg.Std.	AAS
657	UOP938	102.8		-0.53		Direct meas.	Anorg.Std.	CV-AAS
663	UOP938	114.9343		-0.06		Direct meas.	Anorg.Std.	AFS
754	UOP938	135.5		0.74		Destruction	Anorg.Std.	AAS
823	UOP938	105.4		-0.43		Direct meas.	Anorg.Std.	AAS
862	UOP938	110.4		-0.24		Direct meas.	Anorg.Std.	CV-AAS
868	UOP938	121.7		0.20		Direct meas.	Anorg.Std.	CV-AAS
873	UOP938	131.5		0.58		Destruction	Anorg.Std.	--
875	IH	124.54		0.31		Direct meas.	Org.Std.	DMA-80
912	In house	109.5		-0.27		Acid extract.	Anorg.Std.	Hg-hydride
963		-----		-----				
974		-----		-----				
1067	DMA80	113.8		-0.10		Molec. sieve	Org.Std.	DMA80
1081	In house	91		-0.99		--	--	AFS
1107	AAS	125		0.33		destruction	Anorg.Std.	Hg-hydride
1134		-----		-----				
1145	UOP938	98.8831		-0.68		Direct meas.	Anorg.Std.	Hg analyzer
1200		-----		-----				
1201	Cold Vapour	105		-0.45		Destruction	Anorg+org.	Hg-hydride
1257		-----		-----				
1264		-----		-----				
1291		-----		-----				
1397		-----		-----				
1404	UOP938	116.5178		0.00		Direct meas.	Anorg.Std.	Combustion
1429	In house	128.298		0.46		Destruction	Anorg.Std.	AAS
1603	In house	118.5		0.08		Direct meas.	Anorg.Std.	AAS
1656	UOP938	189	R(0.01)	2.81		--	Anorg.Std.	Au amalgam
1800	AAS	116.12		-0.01		Direct meas.	Anorg.Std.	CV-AAS
1842	UOP938	112.25		-0.16		Direct meas.	Anorg.Std.	AAS
1857	ICP	95		-0.83		Extraction Br	Std. addition	ICP
1951	UOP938	112.60989		-0.15		Destruction	Org.Std.	Hg-analyzer
9055		118.9		0.09		Direct meas.	--	Hg analyzer
9057		122.1		0.22		Lumex	Anorg.Std.	Lumex
9061	EPA200	150		1.30		--	--	--

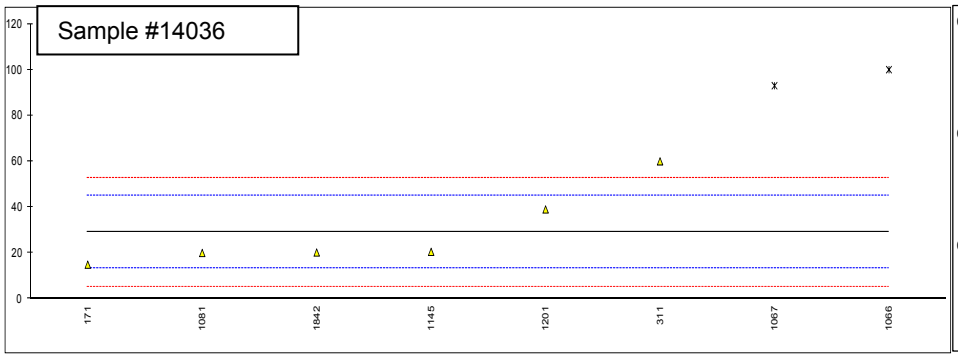
normality	OK
n	34
outliers	1
mean (n)	116.50
st.dev. (n)	15.889
R(calc.)	44.49
R(Horwitz)	72.13

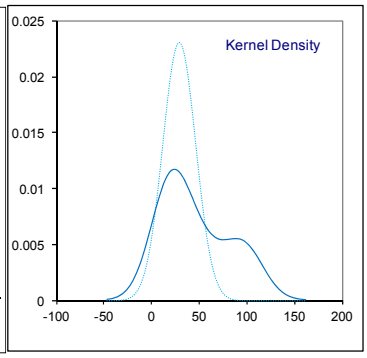
Compare R(UOP938-10, appendix B) = 10.94



Determinations of Arsenic content as As on sample #14035 and #14036; results in µg/kg

lab	Method	#14035	mark	z(targ)	#14036	mark	z(targ)	remarks
150		-----		-----	-----		-----	
171	INH-014	<5		-----	14.9		-1.79	
311	INH-006	<10		-----	60		3.90	
323		-----		-----	-----		-----	
444		-----		-----	-----		-----	
445		-----		-----	-----		-----	
754		-----		-----	-----		-----	
823		-----		-----	-----		-----	
855		-----		-----	-----		-----	
862		-----		-----	-----		-----	
868		-----		-----	-----		-----	
873		-----		-----	-----		-----	
875		-----		-----	-----		-----	
963		-----		-----	-----		-----	
1066		3		-----	100	G(0.05)	8.94	
1067		5		-----	93	G(0.05)	8.06	
1081	UOP296	<10		-----	20		-1.15	
1107		-----		-----	-----		-----	
1134		-----		-----	-----		-----	
1145	INH-9312	1.5724		-----	20.4945		-1.09	
1201	ICP	<5		-----	39		1.25	
1257		-----		-----	-----		-----	
1404		-----		-----	-----		-----	
1583		-----		-----	-----		-----	
1584		-----		-----	-----		-----	
1842	INH-15	<1		-----	20.21		-1.12	
1857		-----		-----	-----		-----	
	normality	n.a.			n.a.			
	n	8			6			
	outliers	0			2			Spike:
	mean (n)	<10			29.10			30.77
	st.dev. (n)	n.a.			17.265			
	R(calc.)	n.a.			48.34			
	R(Horwitz)	n.a.			22.20			



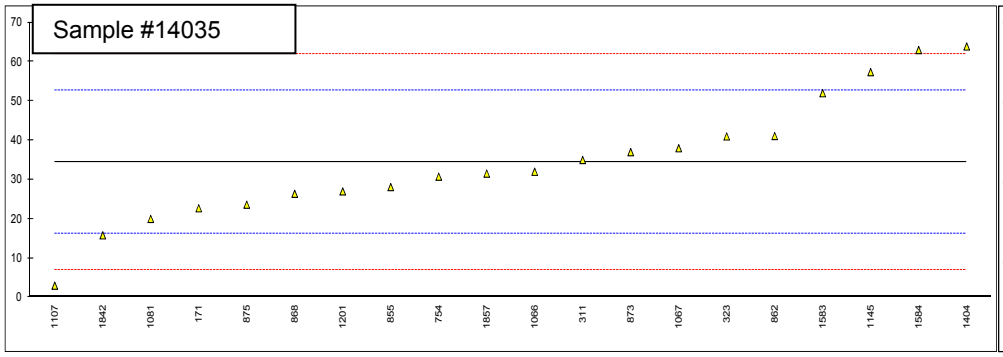


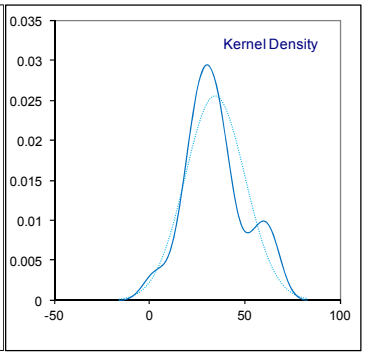
Analytical details (reporting laboratories)

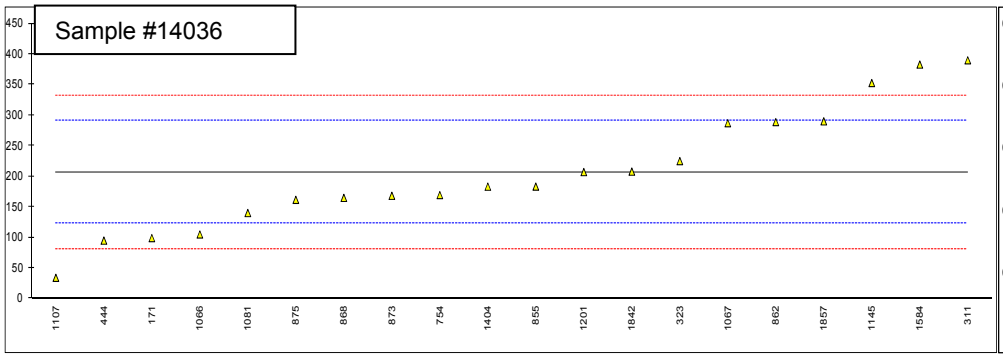
lab	Method step 1	MethodStep 2	Calibration
171	--	--	External
311	100g sample extraction with HNO3	Bottle wash with Sodium hypochlorite For determination summation results of both steps	External
1066	--	--	--
1067	--	--	--
1081	--	--	--
1145	Direct injection AAS	--	External
1201	Destruction with HCl/HNO3	--	Ext + Int. std.
1857	--	--	--

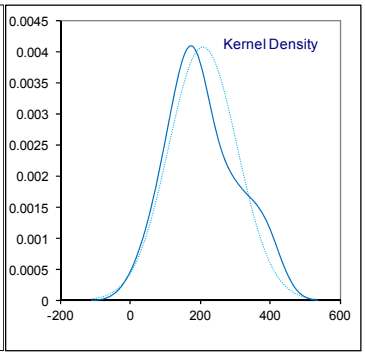
Determinations of Lead content as Pb on sample #14035 and #14036; results in µg/kg

lab	Method	#14035	mark	z(targ)	#14036	mark	z(targ)	remarks
150		-----		-----	-----		-----	
171	INH-014	22.72		-1.28	99		-2.57	
311	INH-003	35		0.06	390		4.37	
323	INH-02	41		0.71	225		0.44	
444	UOP952	<10		<-2.67	94.9		-2.67	
445		-----		-----	-----		-----	
754	UOP952	30.75		-0.41	169.40		-0.89	
823		-----		-----	-----		-----	
855	INH-0242	28.1		-0.70	183.3		-0.56	
862	UOP952	41.1		0.72	288.9		1.96	
868	UOP952	26.4		-0.88	164.8		-1.00	
873	UOP952	37		0.28	168.2		-0.92	
875	UOP952	23.63		-1.18	161.6		-1.08	
963		-----		-----	-----		-----	
1066		32		-0.27	105		-2.43	
1067		38		0.39	287		1.91	
1081	AAS	20		-1.58	140		-1.59	
1107	AAS	3		-3.44	34		-4.12	
1134		-----		-----	-----		-----	
1145	INH-9406	57.3735		2.50	352.8057		3.48	
1201	ICP	27		-0.82	207		0.01	
1257		-----		-----	-----		-----	
1404	IP224	63.9		3.22	183.2		-0.56	
1583		52		1.92	-----		-----	
1584	INH-19	63		3.12	383		4.20	
1842	INH-15	15.815		-2.04	207.8		0.02	
1857	INH-19	31.54		-0.32	290.13		1.99	
	normality	OK			OK			
	n	20			20			
	outliers	0			0		Spike	
	mean (n)	34.47			206.75		750	
	st.dev. (n)	15.578			98.143			
	R(calc.)	43.62			274.80			
	R(Horwitz)	25.63			117.43			









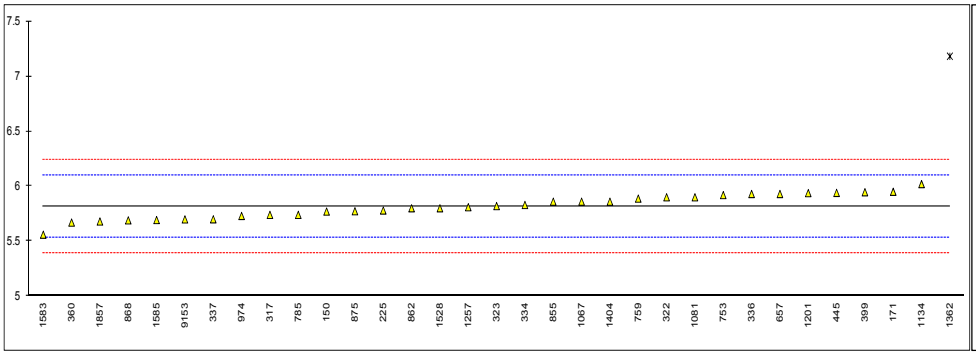
Analytical details (reporting laboratories)

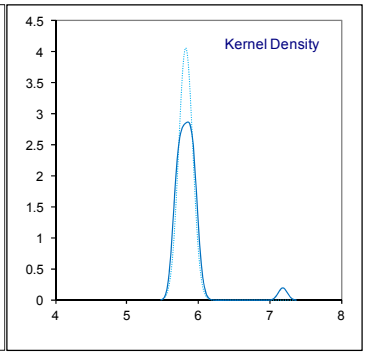
lab	Preparation	Method	Calibration
171	--	--	External
311	10ml + 50 ml solvent + iodine	AAS Oven	External
323	20-45 ml sample iodine/Aliquat	--	External
444	10ml sample extracted with Iodine and HNO3	--	External
855	50 ml sample, extracted with HNO3	--	External
862	10ml sample + iodine + 50ml HNO3	--	External
868	50 ml sample, extracted with HNO3	--	External
1067	2 – 4 gram sample	--	External
1107	10 µl direct injection	--	AAS-GF
1145	Direct injection AAS	--	External
1201	Destruction with HCl/HNO3	--	Ext + Int. std.
1404	Sample + iodine + buffer	Colorimetrically	External
1857	--	--	--

Determination of Total Vapour Pressure on sample #14037; results in psi

lab	method	value	mark	z(targ)	remarks
150	D5191	5.77		-0.33	
171	D5191	5.95		0.93	
225	D5191	5.78		-0.26	
237		-----		-----	
238		-----		-----	
317	D5191	5.74		-0.54	
322	D5191	5.9		0.58	
323	D5191	5.82		0.02	
334	D5191	5.83	C	0.09	Reported result in kPa, 40.4 (recalculated by iis)
336	D5191	5.93		0.79	
337	D5191	5.6999		-0.82	
360	D5191	5.67		-1.03	
399	D5191	5.946		0.91	
445	D5191	5.94	C	0.86	First reported result in kPa, 41.0
657	D5191	5.93		0.79	
753	D5191	5.920		0.72	
759	D5191	5.888		0.50	
781		-----		-----	
784		-----		-----	
785	D5191	5.74		-0.54	
855	D5191	5.86		0.30	
862	D5191	5.80		-0.12	
868	D5191	5.69		-0.89	
873		-----		-----	
875	D5191	5.773		-0.30	
974	D5191	5.73		-0.61	
1065		-----		-----	
1067	D5191	5.86		0.30	
1081	D5191	5.90		0.58	
1134	D5191	6.02		1.42	
1145		-----		-----	
1201	D5191	5.938		0.85	
1257	D5191	5.81		-0.05	
1362	D5191	7.182	C,R(0.01)	9.56	First reported 7.208
1404	D5191	5.86		0.30	
1528	D5191	5.800		-0.12	
1583	D5191	5.56		-1.80	
1585	D5191	5.693		-0.86	
1857	D5191	5.68		-0.96	
9054		-----		-----	
9058		-----		-----	
9061		-----		-----	First reported 5.32
9153	D5191	5.699		-0.82	

normality	OK
n	32
outliers	1
mean (n)	5.816
st.dev. (n)	0.1073
R(calc.)	0.301
R(D5191:13)	0.400

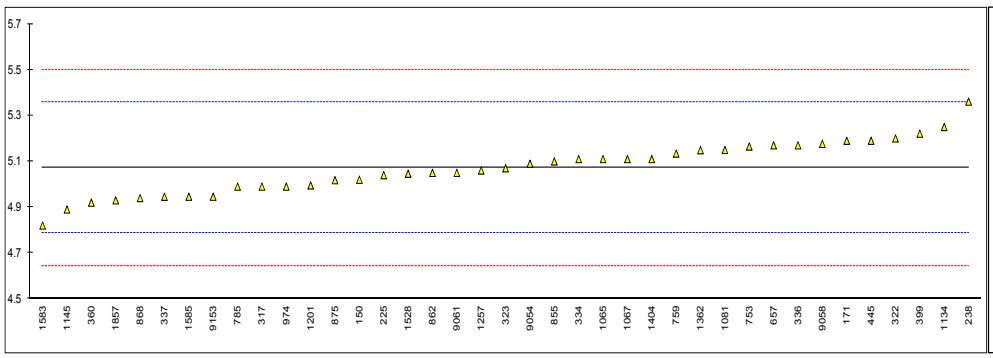


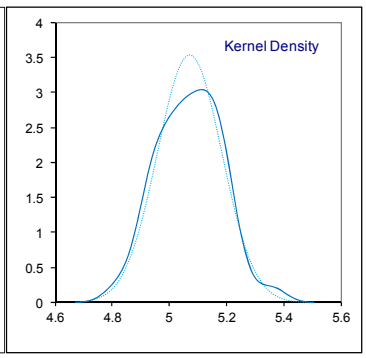


Determination of DVPE acc. D5191 on sample #14037; results in psi

lab	method	value	mark	z(targ)	remarks
150	D5191	5.02		-0.36	
171	D5191	5.19		0.83	
225	D5191	5.04		-0.22	
237		-----		-----	
238	D5191	5.361		2.02	
317	D5191	4.99		-0.57	
322	D5191	5.2		0.90	
323	D5191	5.07		-0.01	
334	D5191	5.11		0.27	Reported result in kPa, 35.2 (recalculated by iis)
336	D5191	5.17		0.69	
337	D5191	4.9457		-0.89	
360	D5191	4.92		-1.06	
399	D5191	5.221		1.04	
445	D5191	5.19	C	0.83	First reported result in kPa, 35.8
657	D5191	5.17		0.69	
753	D5191	5.165		0.65	
759	D5191	5.134		0.43	
781		-----		-----	
784		-----		-----	
785	D5191	4.99		-0.57	
855	D5191	5.10		0.20	
862	D5191	5.05		-0.15	
868	D5191	4.94		-0.92	
873		-----		-----	
875	D5191	5.018		-0.38	
974	D5191	4.99		-0.57	
1065	D5191	5.11		0.27	
1067	D5191	5.11		0.27	
1081	D5191	5.15		0.55	
1134	D5191	5.25		1.25	
1145	D5191	4.89		-1.27	
1201	D5191	4.995		-0.54	
1257	D5191	5.06		-0.08	
1362	D5191	5.149		0.54	
1404	D5191	5.11		0.27	
1528	D5191	5.046		-0.18	
1583	D5191	4.82		-1.76	
1585	D5191	4.946		-0.88	
1857	D5191	4.93		-0.99	
9054	D5191	5.09		0.13	
9058	D5191	5.1765		0.73	
9061	D5191	5.05	C	-0.15	First reported 5.32
9153	D5191	4.946		-0.88	

normality	OK
n	39
outliers	0
mean (n)	5.072
st.dev. (n)	0.1127
R(calc.)	0.316
R(D5191:13)	0.400





APPENDIX 2

Number of participants per country

iis14N01

1 lab in	ARGENTINA
1 lab in	AZERBAIJAN
3 labs in	BELGIUM
1 lab in	BRAZIL
1 lab in	BULGARIA
1 lab in	CÔTE D'IVOIRE
1 lab in	CZECH REPUBLIC
1 lab in	ESTONIA
6 labs in	FRANCE
2 labs in	GEORGIA
2 labs in	GERMANY
1 lab in	ISRAEL
1 lab in	ITALY
1 lab in	LATVIA
1 lab in	MALAYSIA
1 lab in	MEXICO
2 labs in	NIGERIA
1 lab in	NORWAY
4 labs in	P.R. of CHINA
2 labs in	PORTUGAL
1 lab in	ROMANIA
15 labs in	RUSSIA
3 labs in	SAUDI ARABIA
1 lab in	SINGAPORE
1 lab in	SOUTH KOREA
1 lab in	SWEDEN
1 lab in	THAILAND
10 labs in	THE NETHERLANDS
2 labs in	TURKEY
2 labs in	U.A.E.
2 labs in	U.S.A.
6 labs in	UNITED KINGDOM

iis14N01Hg

1 lab in	ARGENTINA
2 labs in	BELGIUM
1 lab in	BRAZIL
1 lab in	CROATIA
3 labs in	FRANCE
1 lab in	GERMANY
1 lab in	INDIA
2 labs in	MALAYSIA
1 lab in	NORWAY
2 labs in	P.R. of CHINA
4 labs in	RUSSIA
3 labs in	SAUDI ARABIA
1 lab in	SINGAPORE
1 lab in	SOUTH KOREA
2 labs in	THAILAND
6 labs in	THE NETHERLANDS
3 labs in	U.A.E.
2 labs in	U.S.A.
8 labs in	UNITED KINGDOM

iis14N01AsPb

2 labs in	BELGIUM
1 lab in	FRANCE
3 labs in	P.R. of CHINA
6 labs in	RUSSIA
1 lab in	SAUDI ARABIA
1 lab in	SOUTH KOREA
1 lab in	THAILAND
5 labs in	THE NETHERLANDS
1 lab in	U.A.E.
2 labs in	U.S.A.
4 labs in	UNITED KINGDOM

iis14N01DVPE

1 lab in	BELGIUM
1 lab in	BULGARIA
1 lab in	CÔTE D'IVOIRE
4 labs in	FRANCE
1 lab in	ISRAEL
1 lab in	ITALY
2 labs in	NIGERIA
1 lab in	NORWAY
3 labs in	P.R. of CHINA
1 lab in	ROMANIA
11 labs in	RUSSIA
1 lab in	SINGAPORE
1 lab in	THAILAND
6 labs in	THE NETHERLANDS
2 labs in	U.A.E.
2 labs in	U.S.A.
4 labs 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
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's 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
n.e.	= not evaluated
SDS	= Safety Data Sheet
RSD	= Relative Standard Deviation

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