Results of Proficiency Test
PIONA/PNA on Naphtha
April 2021

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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CONTENTS

1 INTRODUCTION

Since 1994 the Institute for Interlaboratory Studies organizes a proficiency test (PT) for the analysis of Naphtha every year. In the annual proficiency testing program of 2020/2021, it was decided to continue the PT on Naphtha, but to prepare separate report for the PT on PIONA/PNA on Naphtha.

In this interlaboratory study 61 laboratories in 27 different countries registered for participation. See appendix 2 for the number of participants per country. In this report the results of the PIONA/PNA analyzes on Naphtha proficiency test are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory.
It was decided to send one sample of Naphtha in a 30mL vial labelled #21036.
The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

A batch of approximately 8L Naphtha was selected. This batch was especially prepared for the GC analyzes. After homogenization 110 amber glass bottles of 30mL were filled and labelled #21036. The homogeneity of the subsamples was checked by determination of Density at 15°C in accordance with ASTM D4052 on 8 stratified randomly selected subsamples.

	Density at 15°C in kg/L
sample #21036-1	0.73492
sample #21036-2	0.73492
sample #21036-3	0.73489
sample #21036-4	0.73488
sample #21036-5	0.73483
sample #21036-6	0.73475
sample #21036-7	0.73487
sample #21036-8	0.73483

Table 1: homogeneity test results of subsamples #21036

From the above test results the repeatability was calculated and compared with 0.3 times the reproducibility of the reference test method in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Density at 15°C in kg/L
r (observed)	0.00016
reference test method	ISO12185:96
0.3 x R (reference test method)	0.00015

Table 2: evaluation of the repeatability of subsamples #21036

The calculated repeatability is in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

To each of the participating laboratories one sample of 30mL was sent on March 10, 2021. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of the Naphtha packed in amber glass bottles was checked. The material was found to be sufficiently stable for the period of the proficiency test.

2.6 ANALYZES

The participants were asked to determine: Acetone, DIPE (Diisopropylether), MEK (Methyl Ethyl Ketone), Methanol, Ethanol, MTBE (Methyl tertiary-Butyl Ether), TAME (tertiary-Amyl Methyl Ether), Total Oxygenates, PIONA GC Determination (Total Paraffins, n-Paraffins, i-Paraffins, Olefins, Naphthenes, Aromatics and C4 and lighter hydrocarbons), PNA GC Determination (Total Paraffins, Total Naphthenes, Total Aromatics and C4 and lighter hydrocarbons) and Detail Hydrocarbon Analysis (DHA) (Pentane, Benzene, Cyclohexane, 2- and 3-Methylpentane, Heptane, Toluene and Octane).

It was explicitly requested to treat the sample as if it was a routine sample and to report the test results using the indicated units on the report form and not to round the test results, but report as much significant figures as possible. It was also requested not to report ‘less than’ test results, which are above the detection limit, because such test results cannot be used for meaningful statistical evaluations.

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

3 RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis/. The reported test results are tabulated per determination in appendix 1 of this report. The laboratories are presented by their code numbers.

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

3.1 STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ of June 2018 (iis-protocol, version 3.5). For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as ‘<…’ or ‘>…’ were not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test, a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either ‘unknown’, ‘OK’, ‘suspect’ or ‘not OK’. After removal of outliers, this check was repeated. If a data set does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.

The assigned value is determined by consensus based on the test results of the group of participants after rejection of the statistical outliers and/or suspect data.

According to ISO13528 all (original received or corrected) results per determination were submitted to outlier tests. In the iis procedure for proficiency tests, outliers are detected prior to calculation of the mean, standard deviation and reproducibility. For small data sets, Dixon (up to 20 test results) or Grubbs (up to 40 test results) outlier tests can be used. For larger data sets (above 20 test results) Rosner’s outlier test can be used. Outliers are marked by D(0.01) for the Dixon’s test, by G(0.01) or DG(0.01) for the Grubbs’ test and by R(0.01) for the Rosner’s test. Stragglers are marked by D(0.05) for the Dixon’s test, by G(0.05) or DG(0.05) for the Grubbs’ test and by R(0.05) for the Rosner’s test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. In this PT, the criterion of ISO13528, paragraph 9.2.1. was met for all evaluated tests, therefore, the uncertainty of all assigned values may be negligible and need not be included in the PT report.

Finally, the reproducibilities were calculated from the standard deviations by multiplying them with a factor of 2.8.

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported test results are plotted. The corresponding laboratory numbers are on the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.
Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve (dotted line) was projected over the Kernel Density Graph (smooth line) for reference. The Gauss curve is calculated from the consensus value and the corresponding standard deviation.

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. ISO reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.

The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used, like Horwitz or an estimated reproducibility based on former iis proficiency tests.

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

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

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

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

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

4 Evaluation

Some problems were encountered with the dispatch of the samples due to COVID-19 pandemic. Therefore, the reporting time on the data entry portal was extended with another week.

Eight participants reported test results after the final reporting date and five other participants did not report any test results. Not all participants were able to report all tests requested.
In total 56 participants reported 1052 numerical test results. Observed were 73 outlying test results, which is 6.9%. In proficiency tests outlier percentages of 3% - 7.5% are quite normal.

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

4.1 EVALUATION PER TEST

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

Unfortunately, a suitable reference test method providing the precision data is not available for all determinations. For the tests that have no available precision data the calculated reproducibility was compared against the estimated reproducibility calculated with the Horwitz equation.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D5443) and an added designation for the year that the test method was adopted or revised (e.g. D5443:14). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D5443:14(2018)). In the results tables of appendix 1 only the method number and year of adoption or revision (e.g. D5443:14) will be used.

Acetone: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the estimated reproducibility calculated with the Horwitz equation, nor with the strict requirements of ASTM D7423:17.

DIPE: This determination may not be problematic. Almost all reporting laboratories agreed on a value less than 10 mg/kg. Therefore, no z-scores were calculated.

MEK: This determination was very problematic. Nine laboratories found values of less than 10 mg/kg while seven laboratories found values of a few hundred mg/kg of MEK. After consulting an expert, it appeared that MEK was not present in the sample. There could be a mix-up with Ethyl Acetate which is very close in the chromatogram and may have reported a false positive test result for MEK.
The remaining nine laboratories agreed on a test value less than 10 mg/kg therefore, no z-scores were calculated.

Methanol: This determination was problematic. Five statistical outliers were observed and one other test result was excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the estimated reproducibility calculated with the Horwitz equation, nor with the strict requirements of ASTM D7423:17.

Ethanol: This determination may not be problematic. Almost all reporting laboratories agreed on a value less than 15 mg/kg. Therefore, no z-scores were calculated.

MTBE: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the estimated reproducibility calculated with the Horwitz equation, but is in agreement with the requirements of ASTM D7423:17.

TAME: This determination was problematic. Four statistical outliers were observed and one other test result was excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the estimated reproducibility calculated with the Horwitz equation, nor with the strict requirements of ASTM D7423:17.

Total Oxygenates: This determination may be problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the estimated reproducibility calculated with the Horwitz equation based on 5 components.

PIONA %V/V

Total Paraffins: This determination was problematic. Five statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D6839:18.

n-Paraffins: This determination was problematic. One statistical outlier was observed and two other test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTM D6839:18.

i-Paraffins: This determination was problematic. Two statistical outliers were observed and one other test result was excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ASTM D6839:18.

Olefins: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D6839:18.

Aromatics: 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 D6839:18.

Naphthenes: This determination was problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D6839:18.

C4 and lighter: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D6839:18.

PIONA %M/M

Total Paraffins: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in good agreement with the estimated reproducibility calculated with the Horwitz equation based on 2 components.

n-Paraffins: This determination was not problematic. No statistical outliers were observed, but one test result was excluded. The calculated reproducibility after rejection of the suspect data is in agreement with the estimated reproducibility calculated with the Horwitz equation based on 2 components.

i-Paraffins: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility calculated with the Horwitz equation based on 2 components.

Olefins: This determination may be problematic. Two statistical outliers were observed. The reproducibility in the test results was very high in comparison with the estimated reproducibility calculated with Horwitz equation based on 2 components. Therefore, no z-scores were calculated.

Aromatics: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility calculated with the Horwitz equation based on 2 components.

Naphthenes: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the estimated reproducibility calculated with the Horwitz equation based on 2 components.

C4 and lighter: This determination may be problematic. No statistical outliers were observed. The reproducibility in the test results was very high in comparison with the Horwitz equation based on 2 components. Therefore, no z-scores were calculated.

PNA %V/V

No precision data is available for the determination of PNA in %V/V. It was decided not to make use of the Horwitz equation as this formula is intended for mass concentrations and not for volume. Therefore, no z-scores were calculated.

PNA %M/M

Total Paraffins: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5443:14(2018).

Total Naphthenes: This determination was problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5443:14(2018).

Total Aromatics: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5443:14(2018).

C4 and lighter: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility calculated with the Horwitz equation based on 2 components.

DHA

Pentane: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D5134:13(2017)

Benzene: This determination was problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirement of ASTM D5134:13(2017).

Cyclohexane: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirement of ASTM D5134:13(2017).

2-Methylpentane: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the estimated reproducibility calculated with the Horwitz equation, nor with the strict requirement of ASTM D5134:13(2017).

3-Methylpentane: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the estimated reproducibility calculated with the Horwitz equation, nor with the strict requirement of ASTM D5134:13(2017).

Heptane: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility calculated with the Horwitz equation, but not with the strict requirement of ASTM D5134:13(2017).

Toluene: This determination was not problematic. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the estimated reproducibility calculated with the Horwitz equation, but not with the strict requirement of ASTM D5134:13(2017).

Octane: This determination was very problematic. The group seems to be divided bimodally. Therefore, no z-scores were calculated.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the reference test method or as declared by the estimated target reproducibility calculated with the Horwitz equation and the reproducibility as found for the group of the participating laboratories. The number of significant test results, the average, the calculated reproducibility (2.8 * standard deviation) and the target reproducibility derived from literature reference test methods (in casu ASTM reference test methods) or estimated calculated with the Horwitz equation are presented in the next tables.

Parameter	unit	n	average	2.8 * sd	R(lit)
Acetone	mg/kg	15	125.3	36.7	27.1
DIPE	mg/kg	14	<10	n.e.	n.e.
MEK	mg/kg	9	<10	n.e.	n.e.
Methanol	mg/kg	12	85.5	35.3	19.6
Ethanol	mg/kg	18	<15	n.e.	n.e.
MTBE	mg/kg	17	1047	182	165
TAME	mg/kg	15	171.5	42.7	35.4
Total Oxygenates	%M/M	13	0.50	0.29	0.14
PIONA					
Total Paraffins	%V/V	38	60.0	1.8	1.6
n-Paraffins	%V/V	41	26.3	2.5	1.6
i-Paraffins	%V/V	40	34.0	2.5	1.6
Olefins	%V/V	40	0.24	0.30	0.38
Aromatics	%V/V	42	6.6	0.8	0.6
Naphthenes	%V/V	40	33.1	2.4	1.6
C4 and lighter	%V/V	35	0.59	0.62	1.35
Total Paraffins	%M/M	41	56.7	2.6	4.9
n-Paraffins	%M/M	42	24.7	2.6	2.4
i-Paraffins	%M/M	41	32.3	2.6	3.0
Olefins	%M/M	40	0.23	0.31	(0.05)
Aromatics	%M/M	41	7.8	0.9	0.9
Naphthenes	%M/M	42	35.1	2.4	3.3
C4 and lighter	%M/M	37	0.47	0.50	(0.08)
PNA					
Total Paraffins	%V/V	14	60.0	0.8	n.a.
Total Naphthenes	%V/V	15	33.3	0.8	n.a.
Total Aromatics	%V/V	15	6.6	0.3	n.a.
C4 and lighter	%V/V	13	0.90	0.13	n.a.
Total Paraffins	%M/M	15	56.7	0.8	1.3

Parameter	unit	n	average	2.8 * sd	R(lit)
Total Naphthenes	%M/M	15	35.4	0.8	0.7
Total Aromatics	%M/M	17	7.8	0.6	0.8
C4 and lighter	%M/M	13	0.70	0.06	0.12
DHA					
Pentane	%M/M	26	3.04	0.44	0.30
Benzene	%M/M	27	0.23	0.04	0.03
Cyclohexane	%M/M	22	2.65	0.24	0.26
2-Methylpentane	%M/M	25	2.75	0.35	0.26
3-Methylpentane	%M/M	25	1.97	0.25	0.20
Heptane	%M/M	23	5.37	0.38	0.47
Toluene	%M/M	25	1.23	0.13	0.13
Octane	%M/M	23	6.07	1.18	(0.43)

Table 3: reproducibilities of tests on sample #21036

Test results between brackets have to be taken with due care.

Without further statistical calculations, it can be concluded that for a number of tests there is a good compliance of the group of participating laboratories with the reference test methods. The problematic tests have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE PROFICIENCY TEST OF APRIL 2021 WITH PREVIOUS PTS

	April 2021	April 2020	April 2019	April 2018	April 2017
Number of reporting laboratories	56	74	93	104	100
Number of test results	1052	1446	1635	1831	1723
Number of statistical outliers	73	130	73	88	84
Percentage of statistical outliers	6.9%	9.0%	4.5%	4.8%	4.9%

Table 4: 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 reference test methods. The conclusions are given in the following table.

Parameter	April 2021	April 2020	April 2019	April 2018	April 2017
Oxygenates	-	-	-	+/-	-
PIONA *)	+/-	+	-	-	-
PNA *)	+	+	n.e.	n.e.	n.e.
DHA	-	-	+	+/-	+

Table 5: comparison determinations against the reference test methods

*) Up till 2019 PIONA and PNA was combined evaluated in the PT

The following performance categories were used:

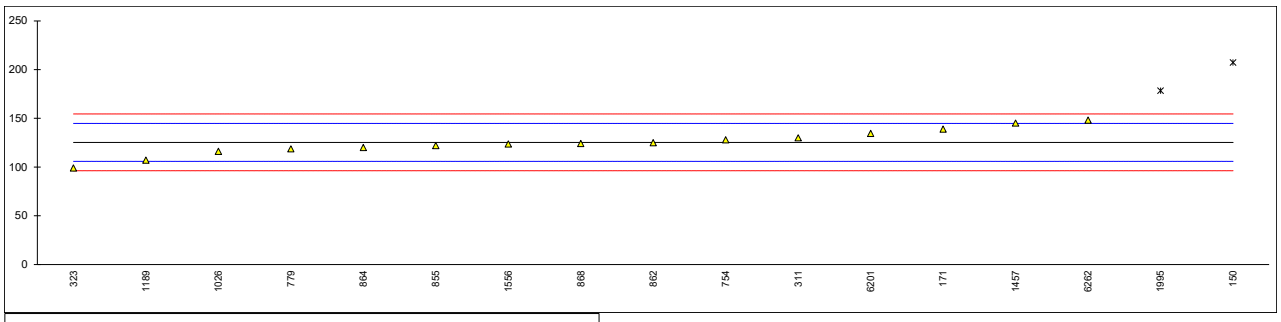
++ : group performed much better than the reference test method
+ : group performed better than the reference test method
+/- : group performance equals the reference test method
- : group performed worse than the reference test method
-- : group performed much worse than the reference test method
n.e.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

APPENDIX 1

Determination of Acetone on sample #21036; results in mg/kg

lab	method	Value	mark	z(targ)	remarks
140		-----		-----	
150	D7423	207.1	G(0.05)	8.44	
171	D7423	138.8		1.39	
311	INH-893	130		0.49	
323	INH-304	99		-2.71	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381	ISO22854-A	<8000		-----	Reported as<0.8%Vol
399		-----		-----	
444		-----		-----	
445		-----		-----	
657		-----		-----	
754	D7423	127.8		0.26	
779	D7423	118.678		-0.68	
781		-----		-----	
785		-----		-----	
798		-----		-----	
824	D7423	>100		-----	
855	INH-024	122		-0.34	
862	D7423	125		-0.03	
864	D7423	120		-0.55	
868	D7423	124		-0.13	
872		-----		-----	
873		-----		-----	
874		-----		-----	
914		-----		-----	
922		-----		-----	
994		-----		-----	
1011		-----		-----	
1012		-----		-----	
1026	D7423	116	C	-0.96	First reported 347
1041		-----		-----	
1062		-----		-----	
1065		-----		-----	
1069		-----		-----	
1081		-----		-----	
1135		-----		-----	
1145		-----		-----	
1189	D7423	107		-1.89	
1191		-----		-----	
1457	D7423	145		2.03	
1556	D7423	123.65		-0.17	
1586		-----		-----	
1656		-----		-----	
1720		-----		-----	
1737		-----		-----	
1776		-----		-----	
1788		-----		-----	
1796		-----		-----	
1823		-----		-----	
1857		-----		-----	
1862		-----		-----	
1949		-----		-----	
1950		-----		-----	
1995	D7423	178.25	C,G(0.05)	5.47	First reported 0
6198		-----		-----	
6200		-----		-----	
6201	D7423	134.5		0.95	
6262	D7423	148.0		2.34	

	normality	OK
	n	15
	outliers	2
	mean (n)	125.295
	st.dev. (n)	13.0904
	R(calc.)	36.653
	st.dev.(Horwitz)	9.6891
	R(Horwitz)	27.130
Compare		
	R(D7423:17)	7.969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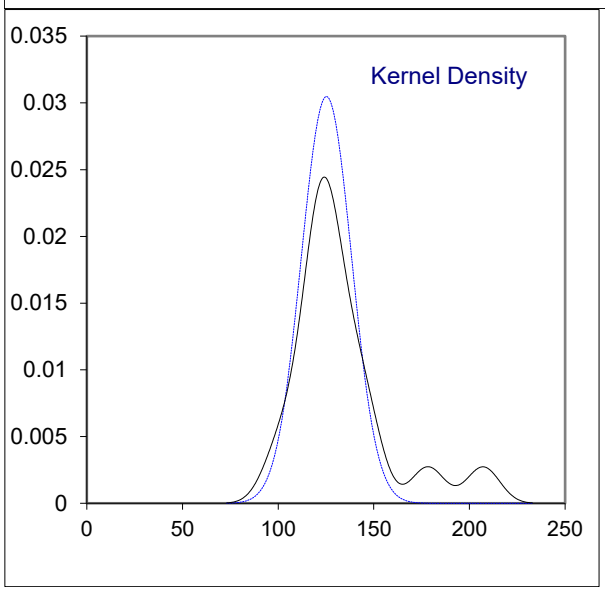
200
150
100
50
0
323
1189
1026
779
864
855
1556
868
862
754
311
6201
171
1457
6262
1995
150


Kernel Density
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
50
100
150
200
250

Determination of DIPE on sample #21036; results in mg/kg

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D7423	915.5		-----	Possibly a false positive test result?
171	D7423	<0.5		-----	
311	INH-893	<1		-----	
323	INH-304	<10		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381	ISO22854-A	<8000		-----	Reported as <0.8%Vol
399		-----		-----	
444		-----		-----	
445		-----		-----	
657		-----		-----	
754		-----		-----	
779	D7423	<5		-----	
781		-----		-----	
785		-----		-----	
798		-----		-----	
824	D7423	1.2		-----	
855	INH-024	<10		-----	
862	D7423	1.2		-----	
864	D7423	<10		-----	
868	D7423	<10		-----	
872		-----		-----	
873		-----		-----	
874		-----		-----	
914		-----		-----	
922		-----		-----	
994		-----		-----	
1011		-----		-----	
1012		-----		-----	
1026		-----		-----	
1041		-----		-----	
1062		-----		-----	
1065		-----		-----	
1069		-----		-----	
1081		-----		-----	
1135		-----		-----	
1145		-----		-----	
1189		-----		-----	
1191		-----		-----	
1457	D7423	1.5		-----	
1556	D7423	1.50		-----	
1586		-----		-----	
1656		-----		-----	
1720		-----		-----	
1737		-----		-----	
1776		-----		-----	
1788		-----		-----	
1796		-----		-----	
1823		-----		-----	
1857		-----		-----	
1862		-----		-----	
1949		-----		-----	
1950		-----		-----	
1995	D7423	0		-----	
6198		-----		-----	
6200		-----		-----	
6201	D7423	<0,5		-----	
6262	D7423	0.0		-----	
	n	14			
	mean (n)	<10			

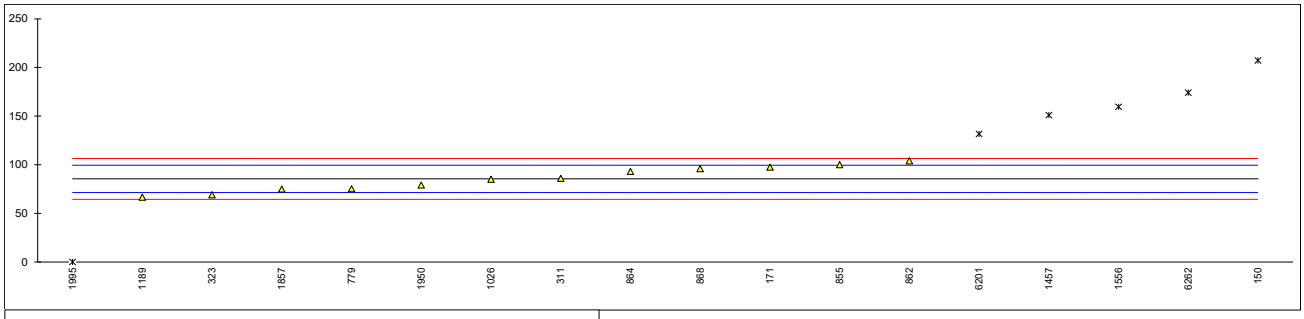
Determination of MEK on sample #21036; results in mg/kg

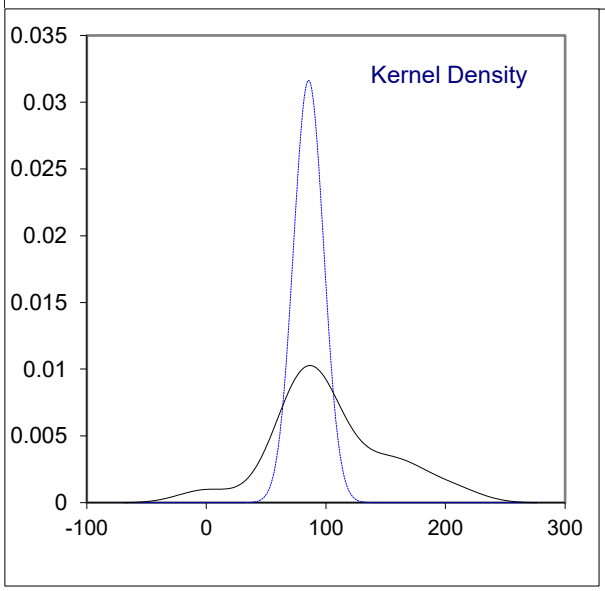
lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D7423	1861.1		-----	Possibly a false positive test result?
171	D7423	<0.5		-----	
311	INH-893	<1		-----	
323	INH-304	<10	C	-----	First reported >200
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381	ISO22854-A	<8000		-----	Reported as <0.8%Vol
399		-----		-----	
444		-----		-----	
445		-----		-----	
657		-----		-----	
754		-----		-----	
779	D7423	<5		-----	
781		-----		-----	
785		-----		-----	
798		-----		-----	
824	D7423	<0.5		-----	
855	INH-024	1999		-----	Possibly a false positive test result?
862	D7423	<10	C	-----	First reported 1985
864	D7423	2018		-----	Possibly a false positive test result?
868	D7423	1966		-----	Possibly a false positive test result?
872		-----		-----	
873		-----		-----	
874		-----		-----	
914		-----		-----	
922		-----		-----	
994		-----		-----	
1011		-----		-----	
1012		-----		-----	
1026	D7423	0		-----	
1041		-----		-----	
1062		-----		-----	
1065		-----		-----	
1069		-----		-----	
1081		-----		-----	
1135		-----		-----	
1145		-----		-----	
1189		-----		-----	
1191		-----		-----	
1457	D7423	0		-----	
1556	D7423	1856.71		-----	Possibly a false positive test result?
1586		-----		-----	
1656		-----		-----	
1720		-----		-----	
1737		-----		-----	
1776		-----		-----	
1788		-----		-----	
1796		-----		-----	
1823		-----		-----	
1857		-----		-----	
1862		-----		-----	
1949		-----		-----	
1950		-----		-----	
1995	D7423	1691.22	C	-----	Possibly a false positive test result? First reported 1758.07
6198		-----		-----	
6200		-----		-----	
6201	D7423	1916	C	-----	Possibly a false positive test result? First reported 1953.6
6262	D7423	<10	C	-----	First reported 2218
	n	9			
	mean (n)	<10			

Determination of Methanol on sample #21036; results in mg/kg

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D7423	207.1	G(0.05)	17.35	
171	D7423	97.5		1.71	
311	INH-893	86		0.07	
323	INH-304	69		-2.36	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381	ISO22854-A	<8000		-----	Reported as <0.8%Vol
399		-----		-----	
444		-----		-----	
445		-----		-----	
657		-----		-----	
754		-----		-----	
779	D7423	75.279	C	-1.46	First reported <5
781		-----		-----	
785		-----		-----	
798		-----		-----	
824	D7423	>100		-----	
855	INH-024	100		2.07	
862	D7423	104		2.64	
864	D7423	93		1.07	
868	D7423	96		1.49	
872		-----		-----	
873		-----		-----	
874		-----		-----	
914		-----		-----	
922		-----		-----	
994		-----		-----	
1011		-----		-----	
1012		-----		-----	
1026	D7423	85	C	-0.08	First reported 437
1041		-----		-----	
1062		-----		-----	
1065		-----		-----	
1069		-----		-----	
1081		-----		-----	
1135		-----		-----	
1145		-----		-----	
1189	D7423	66.6		-2.70	
1191		-----		-----	
1457	D7423	151	G(0.05)	9.35	
1556	D7423	159.62	G(0.05)	10.58	
1586		-----		-----	
1656		-----		-----	
1720		-----		-----	
1737		-----		-----	
1776		-----		-----	
1788		-----		-----	
1796		-----		-----	
1823		-----		-----	
1857	D7754	75		-1.50	
1862		-----		-----	
1949		-----		-----	
1950	D7754	79		-0.93	
1995	D7423	0	ex	-12.21	Test results excluded, zero is not a real result
6198		-----		-----	
6200		-----		-----	
6201	D7423	131.6	G(0.05)	6.58	
6262	D7423	174	G(0.05)	12.63	

	normality	OK
	n	12
	outliers	5 (+1ex)
	mean (n)	85.532
	st.dev. (n)	12.6128
	R(calc.)	35.316
	st.dev.(Horwitz)	7.0054
	R(Horwitz)	19.615
Compare		
	R(D7423:17)	17.321


250
200
150
100
50
0
1995
1189
323
1857
779
1950
1026
311
864
868
171
855
862
6201
1457
1556
6262
150


Kernel Density
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
-100
0
100
200
300

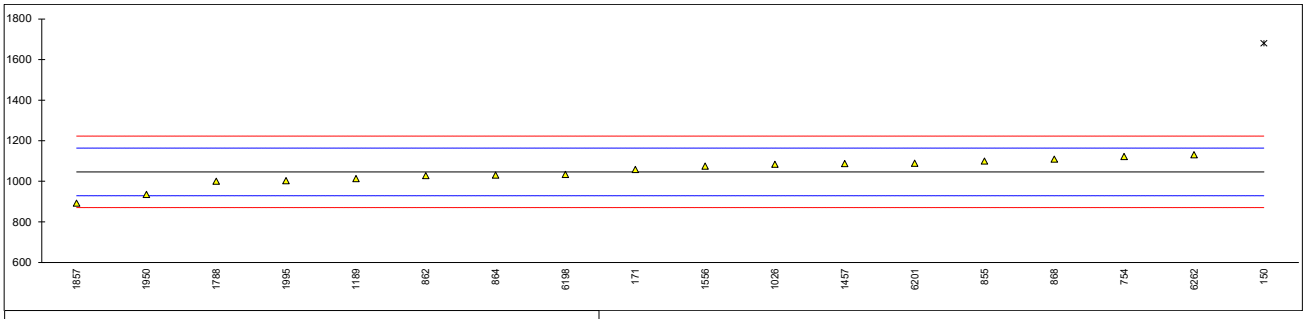
Determination of Ethanol on sample #21036; results in mg/kg

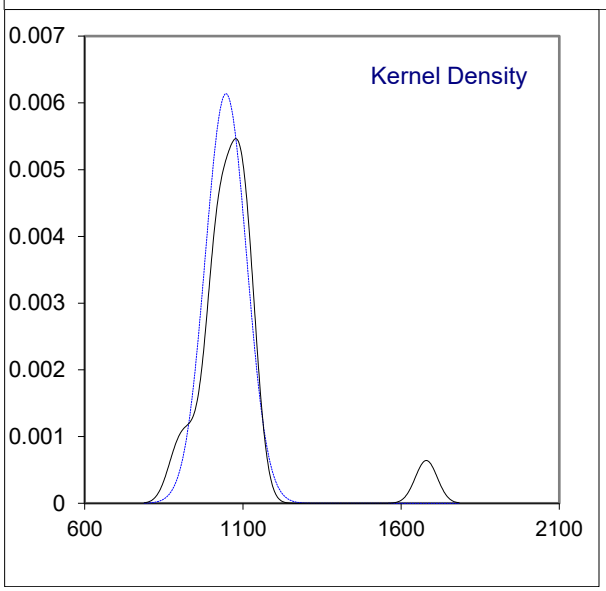
lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D7423	11.1		-----	
171	D7423	3.2		-----	
311	INH-893	<10		-----	
323	INH-304	<5		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381	ISO22854-A	<8000		-----	Reported as <0.8%Vol
399		-----		-----	
444		-----		-----	
445		-----		-----	
657		-----		-----	
754	D7423	6.8		-----	
779	D7423	<5		-----	
781		-----		-----	
785		-----		-----	
798		-----		-----	
824	D7423	4.5		-----	
855	INH-024	<10		-----	
862	D7423	4		-----	
864	D7423	<10		-----	
868	D7423	<10		-----	
872		-----		-----	
873		-----		-----	
874		-----		-----	
914		-----		-----	
922		-----		-----	
994		-----		-----	
1011		-----		-----	
1012		-----		-----	
1026		-----		-----	
1041		-----		-----	
1062		-----		-----	
1065		-----		-----	
1069		-----		-----	
1081		-----		-----	
1135		-----		-----	
1145		-----		-----	
1189	D7423	4.4		-----	
1191		-----		-----	
1457	D7423	0		-----	
1556	D7423	7.93		-----	
1586		-----		-----	
1656		-----		-----	
1720		-----		-----	
1737		-----		-----	
1776		-----		-----	
1788		-----		-----	
1796		-----		-----	
1823		-----		-----	
1857	D7754	10		-----	
1862		-----		-----	
1949		-----		-----	
1950		-----		-----	
1995	D7423	0		-----	
6198		-----		-----	
6200		-----		-----	
6201	D7423	5.6		-----	
6262	D7423	4.4		-----	
	n	18			
	mean (n)	<15			

Determination of MTBE on sample #21036; results in mg/kg

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D7423	1680.0	G(0.01)	10.77	
171	D7423	1058		0.19	
311		-----		-----	
323	INH-304	>200		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360	D7423	> 100		-----	
381	ISO22854-A	<8000		-----	Reported as <0.8%Vol
399		-----		-----	
444		-----		-----	
445		-----		-----	
657		-----		-----	
754	D7423	1122.3		1.29	
779	D7423	>100		-----	
781		-----		-----	
785		-----		-----	
798		-----		-----	
824	D7423	>100		-----	
855	INH-024	1100		0.91	
862	D7423	1028		-0.32	
864	D7423	1031		-0.26	
868	D7423	1109		1.06	
872		-----		-----	
873		-----		-----	
874		-----		-----	
914		-----		-----	
922		-----		-----	
994		-----		-----	
1011		-----		-----	
1012		-----		-----	
1026	D7423	1084	C	0.64	First reported 2104
1041		-----		-----	
1062		-----		-----	
1065		-----		-----	
1069		-----		-----	
1081		-----		-----	
1135		-----		-----	
1145		-----		-----	
1189	D7423	1013		-0.57	
1191		-----		-----	
1457	D7423	1087		0.69	
1556	D7423	1075.09		0.49	
1586		-----		-----	
1656		-----		-----	
1720		-----		-----	
1737		-----		-----	
1776		-----		-----	
1788	D6730	1000		-0.79	
1796		-----		-----	
1823		-----		-----	
1857	D7754	892		-2.63	
1862		-----		-----	
1949		-----		-----	
1950	D7754	935		-1.90	
1995	D7423	1003.23		-0.74	
6198	D7423	1034		-0.21	
6200		-----		-----	
6201	D7423	1088.7		0.72	
6262	D7423	1131		1.44	

	normality	OK
	n	17
	outliers	1
	mean (n)	1046.548
	st.dev. (n)	65.0141
	R(calc.)	182.040
	st.dev.(Horwitz)	58.7977
	R(Horwitz)	164.633
Compare		
	R(D7423:17)	203.130

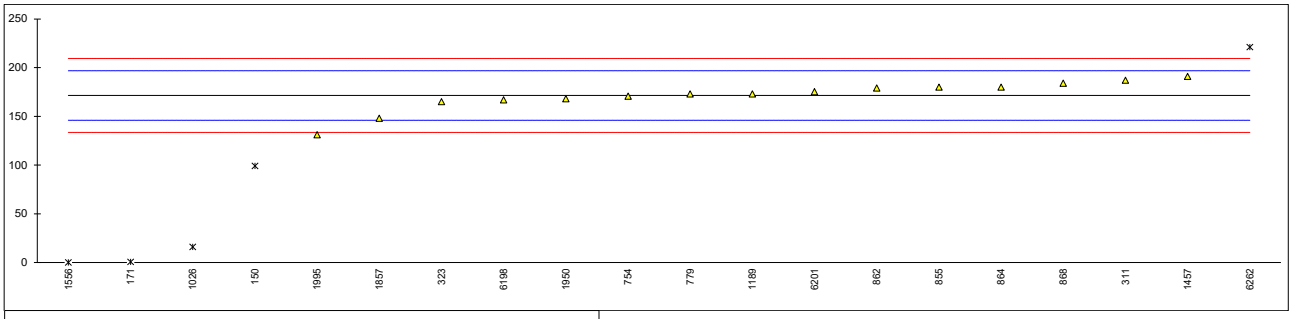

1800
1600
1400
1200
1000
800
600
1857
1950
1788
1995
1189
862
864
6198
171
1556
1026
1457
6201
855
868
754
6262
150

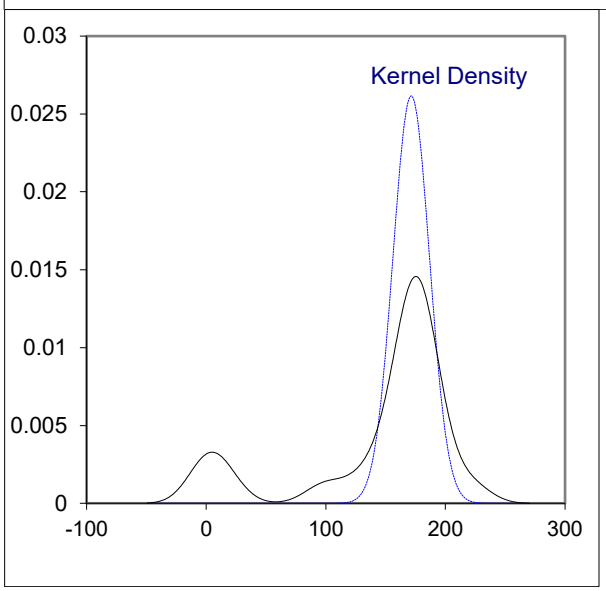

Kernel Density
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
600
1100
1600
2100

Determination of TAME on sample #21036; results in mg/kg

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D7423	99.1	R(0.01)	-5.72	
171	D7423	0.6	R(0.01)	-13.51	
311	INH-893	187		1.23	
323	INH-304	165		-0.51	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381	ISO22854-A	<8000		-----	Reported as <0.8%Vol
399		-----		-----	
444		-----		-----	
445		-----		-----	
657		-----		-----	
754	D7423	170.7		-0.06	
779	D7423	173.0		0.12	
781		-----		-----	
785		-----		-----	
798		-----		-----	
824	D7423	>100		-----	
855	INH-024	180		0.67	
862	D7423	179		0.60	
864	D7423	180		0.67	
868	D7423	184		0.99	
872		-----		-----	
873		-----		-----	
874		-----		-----	
914		-----		-----	
922		-----		-----	
994		-----		-----	
1011		-----		-----	
1012		-----		-----	
1026	D7423	16	C,R(0.01)	-12.29	First reported 307
1041		-----		-----	
1062		-----		-----	
1065		-----		-----	
1069		-----		-----	
1081		-----		-----	
1135		-----		-----	
1145		-----		-----	
1189	D7423	173		0.12	
1191		-----		-----	
1457	D7423	191		1.54	
1556	D7423	0	ex	-13.56	Test result excluded zero not a real test result.
1586		-----		-----	
1656		-----		-----	
1720		-----		-----	
1737		-----		-----	
1776		-----		-----	
1788		-----		-----	
1796		-----		-----	
1823		-----		-----	
1857	D7754	148		-1.86	
1862		-----		-----	
1949		-----		-----	
1950	D7754	168		-0.27	
1995	D7423	131.1		-3.19	
6198	D7423	167		-0.35	
6200		-----		-----	
6201	D7423	175.2		0.30	
6262	D7423	221	R(0.01)	3.92	

	normality	not OK
	n	15
	outliers	4 (+1ex)
	mean (n)	171.467
	st.dev. (n)	15.2491
	R(calc.)	42.697
	st.dev.(Horwitz)	12.6480
	R(Horwitz)	35.414
Compare		
	R(D7423:17)	7.830

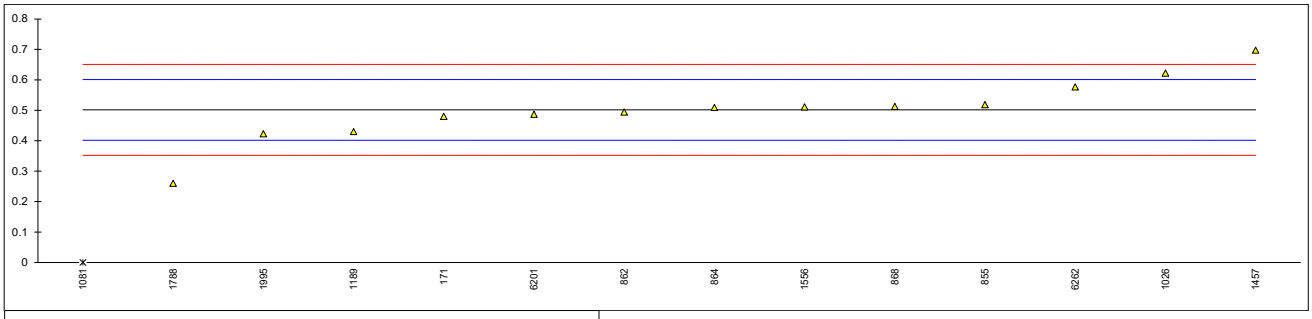

250
200
150
100
50
0
1556
171
1026
150
1995
1857
323
6198
1950
754
779
1189
6201
862
855
864
868
311
1457
6282

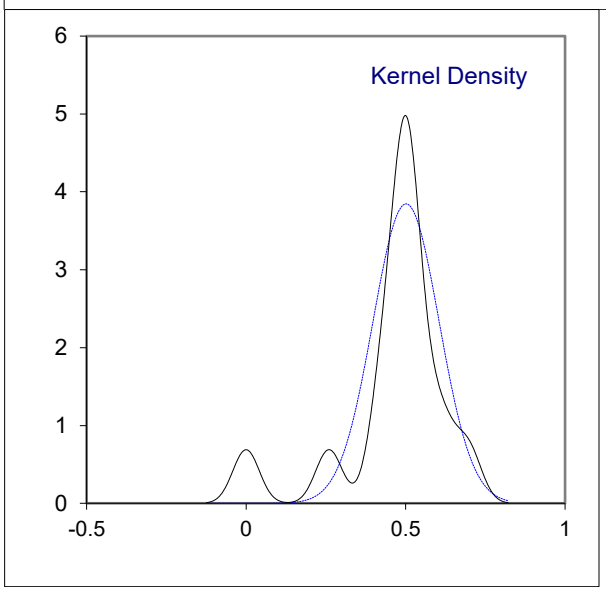

Kernel Density
0.03
0.025
0.02
0.015
0.01
0.005
0
-100
0
100
200
300

Determination of Total Oxygenates on sample #21036; results in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150		-----		-----	
171	D7423	0.48		-0.43	
311		-----		-----	
323	INH-304	>0.0200		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381	ISO22854-A	<0,80		-----	Reported as <0.8%Vol
399		-----		-----	
444		-----		-----	
445		-----		-----	
657		-----		-----	
754		-----		-----	
779		-----		-----	
781		-----		-----	
785		-----		-----	
798		-----		-----	
824		-----		-----	
855	INH-024	0.5181		0.33	
862	D7423	0.494		-0.15	
864	D7423	0.509		0.15	
868	D7423	0.5126		0.22	
872		-----		-----	
873		-----		-----	
874		-----		-----	
914		-----		-----	
922		-----		-----	
994		-----		-----	
1011		-----		-----	
1012		-----		-----	
1026	D7423	0.6216		2.41	
1041		-----		-----	
1062		-----		-----	
1065		-----		-----	
1069		-----		-----	
1081		0.00	G(0.01)	-10.08	
1135		-----		-----	
1145		-----		-----	
1189	D7423	0.4300		-1.44	
1191		-----		-----	
1457	D7423	0.697		3.93	
1556	D7423	0.511		0.19	
1586		-----		-----	
1656		-----		-----	
1720		-----		-----	
1737		-----		-----	
1776		-----		-----	
1788	D6730	0.26		-4.85	
1796		-----		-----	
1823		-----		-----	
1857		-----		-----	
1862		-----		-----	
1949		-----		-----	
1950		-----		-----	
1995	D7423	0.42268	C	-1.58	First reported 0.433828
6198		-----		-----	
6200		-----		-----	
6201	D7423	0.4869	C	-0.29	First reported 4967.9
6262	D7423	0.5768		1.51	

normality	not OK
n	13
outliers	1
mean (n)	0.50151
st.dev. (n)	0.103778
R(calc.)	0.29058
st.dev.(Horwitz 5 comp.)	0.049767
R(Horwitz 5 comp.)	0.13935

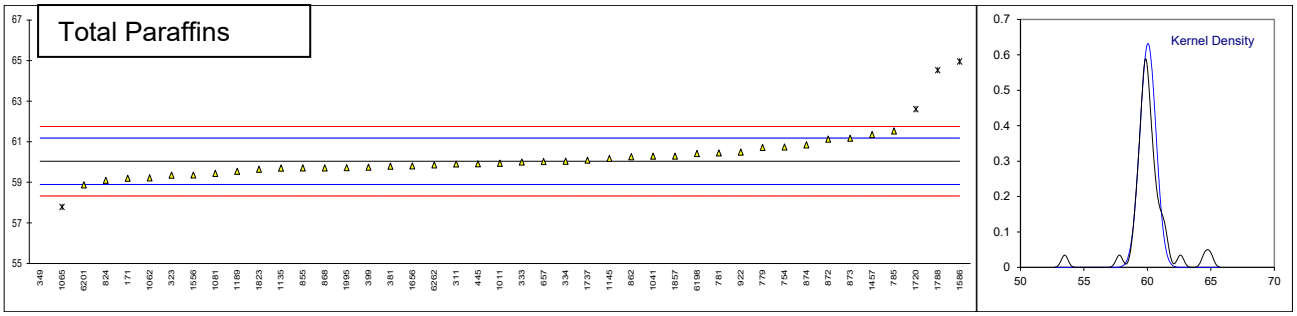

0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1081
1788
1995
1189
171
6201
862
864
1556
868
855
6262
1026
1457

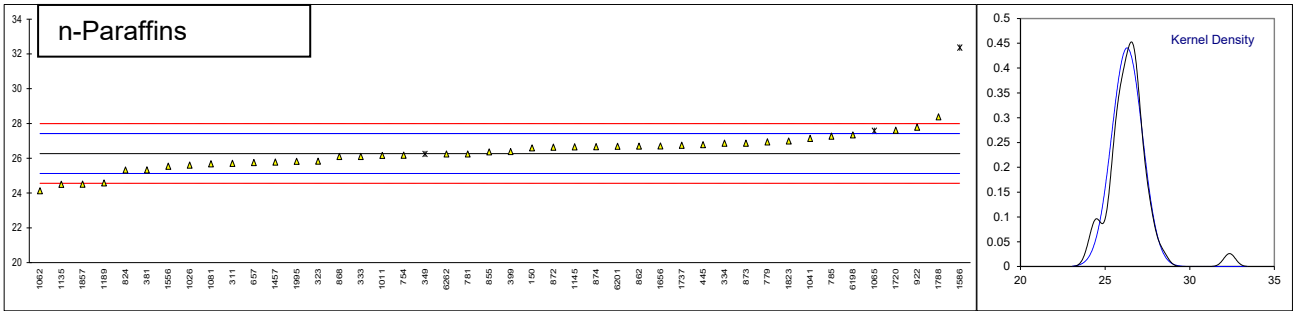

Kernel Density
6
5
4
3
2
1
0
-0.5
0
0.5
1

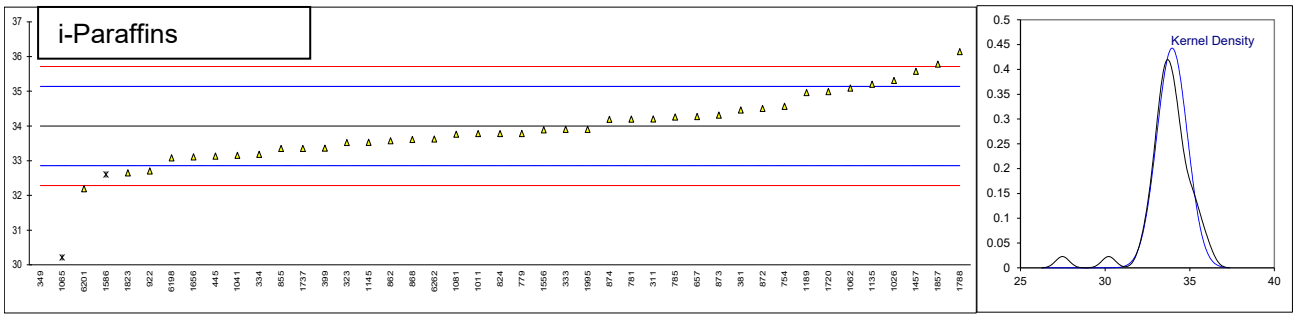
Determination of PIONA - Total Paraffins, n-Paraffins, i-Paraffins on sample #21036; results in %V/V

lab	method	Total P	mark	z(targ)	n-Paraf.	mark	z(targ)	i-Paraf.	mark	z(targ)
140		-----		-----	-----		-----	-----		-----
150	D6730	-----		-----	26.59		0.56	-----		-----
171	D6839	59.2		-1.47	-----		-----	-----		-----
311	D5443Mod.	59.9		-0.24	25.7		-1.00	34.2		0.36
323	D5443	59.35		-1.21	25.83		-0.77	33.52		-0.83
333	D6839	60.0		-0.07	26.1		-0.30	33.9		-0.17
334	ISO22854-A	60.04	C	0.00	26.86	C	1.03	33.18	C	-1.43
349	ISO22854-A	53.48	C,R(0.01)	-11.48	26.24	ex	-0.05	27.48	C,R(0.01)	-11.40
360		-----		-----	-----		-----	-----		-----
381	D6839	59.79	C	-0.44	25.33	C	-1.65	34.46	C	0.81
399	ISO22854-A	59.74		-0.52	26.38		0.19	33.36		-1.11
444		-----		-----	-----		-----	-----		-----
445	D6839	59.91		-0.23	26.78		0.89	33.13		-1.52
657	D6839	60.02		-0.03	25.75		-0.91	34.27		0.48
754	D6729	60.739		1.22	26.176		-0.17	34.563		0.99
779	D6729	60.716	C	1.18	26.934	C	1.16	33.782	C	-0.38
781	D6729	60.445		0.71	26.247		-0.04	34.198		0.35
785	D6729	61.527		2.60	27.272		1.75	34.255		0.45
798		-----		-----	-----		-----	-----		-----
824	D6839	59.10		-1.64	25.32		-1.66	33.78		-0.38
855	D6839	59.71		-0.58	26.36		0.16	33.35		-1.13
862	D6839	60.26		0.39	26.69		0.73	33.57		-0.75
864		-----		-----	-----		-----	-----		-----
868	D6839	59.71		-0.58	26.10		-0.30	33.61		-0.68
872	D6839	61.13		1.91	26.63		0.63	34.50		0.88
873	GOST P52714	61.17		1.98	26.86		1.03	34.31		0.55
874	D6729	60.846		1.41	26.662		0.68	34.187		0.33
914		-----		-----	-----		-----	-----		-----
922	D6730	60.487		0.78	27.784		2.65	32.703		-2.26
994		-----		-----	-----		-----	-----		-----
1011	D5443	59.94		-0.17	26.16		-0.19	33.78		-0.38
1012		-----		-----	-----		-----	-----		-----
1026	ISO22854-A	-----		-----	25.6		-1.17	35.31	C	2.30
1041	D6839	60.29		0.44	27.14		1.52	33.15		-1.48
1062	D6839	59.22		-1.43	24.13		-3.75	35.09		1.91
1065	In house	57.786	R(0.05)	-3.94	27.575	ex	2.28	30.211	R(0.01)	-6.63
1069		-----		-----	-----		-----	-----		-----
1081	ISO22854-A	59.44		-1.05	25.68		-1.03	33.76		-0.41
1135	ISO22854-A	59.7		-0.59	24.5		-3.10	35.2		2.11
1145	D6839	60.18		0.25	26.65		0.66	33.53		-0.82
1189	ISO22854-A	59.54		-0.87	24.58		-2.96	34.96		1.69
1191		-----		-----	-----		-----	-----		-----
1457	D6839	61.35		2.29	25.78		-0.86	35.57		2.75
1556	ISO22854-A	59.36	C	-1.19	25.54		-1.28	33.89	C	-0.19
1586	D6839	64.95	R(0.01)	8.59	32.35	R(0.01)	10.64	32.60	ex	-2.44
1656	D5443	59.81		-0.40	26.70		0.75	33.11		-1.55
1720	D5134	62.60	R(0.05)	4.48	27.61		2.34	34.99		1.74
1737	In house	60.09		0.09	26.74		0.82	33.35		-1.13
1776		-----		-----	-----		-----	-----		-----
1788	D6730	64.52	R(0.01)	7.84	28.38		3.69	36.14		3.75
1796		-----		-----	-----		-----	-----		-----
1823	D6839	59.64		-0.70	26.99		1.26	32.65		-2.36
1857	ISO22854-A	60.29		0.44	24.51		-3.08	35.78		3.12
1862		-----		-----	-----		-----	-----		-----
1949		-----		-----	-----		-----	-----		-----
1950		-----		-----	-----		-----	-----		-----
1995	D5443	59.72		-0.56	25.82		-0.79	33.90		-0.17
6198	D6839	60.42		0.67	27.34		1.87	33.08		-1.60
6200		-----		-----	-----		-----	-----		-----
6201	D6839	58.87		-2.05	26.68		0.72	32.19		-3.16
6262	D6839	59.86		-0.31	26.24		-0.05	33.62		-0.66
	normality	OK			OK			OK		
	n	38			41			40		
	outliers	5			1 (+2ex)			2 (+1ex)		
	mean (n)	60.0397			26.2713			33.9970		
	st.dev. (n)	0.63144			0.90493			0.88546		
	R(calc.)	1.7680			2.5338			2.4793		
	st.dev.(D6839:18)	0.57143			0.57143			0.57143		
	R(D6839:18)	1.6			1.6			1.6		

Lab 334: first reported 54.68, 21.83, 32.85
Lab 349: first reported 42.44, 16.2
Lab 381: first reported 55.68, 21.15, 37.98
Lab 779: first reported 62.440, 26.952, 35.488
Lab 1026: first reported 25.71
Lab 1556: first reported 56.49, 30.95
ex= test result is excluded when two of the three reported test results for paraffins is an outlier.

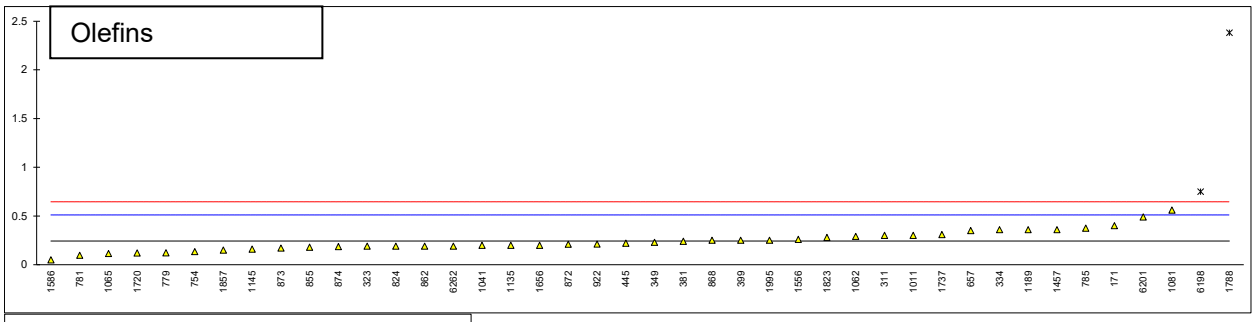

Total Paraffins
Kernel Density

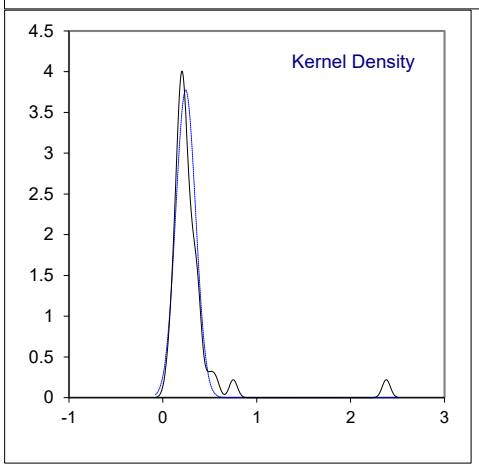

n-Paraffins
Kernel Density


i-Paraffins
Kernel Density

Determination of PIONA - Olefins and Aromatics on sample #21036; results in %V/V

lab	method	Olefins	mark	z(targ)	Aromatics	mark	z(targ)	remarks
140		-----		-----	-----		-----	
150	D6730	-----		-----	7.92	R(0.01)	6.40	
171	D6839	0.4		1.18	6.5		-0.27	
311	D5443Mod.	0.3		0.43	6.5		-0.27	
323	D5443	0.19		-0.39	6.89		1.56	
333	D6839	<1.5		-----	6.1		-2.15	
334	ISO22854-A	0.36	C	0.88	6.27	C	-1.35	First reported 1.14, 8.15
349	ISO22854-A	0.23		-0.09	6.97		1.94	
360		-----		-----	-----		-----	
381	D6839	0.24		-0.02	6.03		-2.48	
399	ISO22854-A	0.25		0.06	6.58		0.10	
444		-----		-----	-----		-----	
445	D6839	0.22		-0.17	6.49		-0.32	
657	D6839	0.35		0.80	6.78		1.04	
754	D6729	0.134		-0.81	6.796		1.12	
779	D6729	0.122		-0.90	6.608	C	0.23	First reported 7.293
781	D6729	0.097		-1.09	6.635		0.36	
785	D6729	0.374		0.98	6.362		-0.92	
798		-----		-----	-----		-----	
824	D6839	0.19		-0.39	6.41		-0.70	
855	D6839	0.18		-0.47	6.24		-1.49	
862	D6839	0.19		-0.39	6.90		1.61	
864		-----		-----	-----		-----	
868	D6839	0.25		0.06	6.47		-0.41	
872	D6839	0.21		-0.24	6.47		-0.41	
873	GOST P52714	0.17		-0.54	6.54		-0.08	
874	D6729	0.185		-0.43	6.590		0.15	
914		-----		-----	-----		-----	
922	D6730	0.211		-0.23	6.273		-1.34	
994		-----		-----	-----		-----	
1011	D5443	0.30		0.43	6.37		-0.88	
1012		-----		-----	-----		-----	
1026	ISO22854-A	<0.01	C	-----	-----		-----	First reported 2.8
1041	D6839	0.20		-0.32	6.59		0.15	
1062	D6839	0.29		0.36	7.27		3.34	
1065	In house	0.114		-0.96	6.772		1.01	
1069		-----		-----	-----		-----	
1081	ISO22854-A	0.56		2.37	6.69		0.62	
1135	ISO22854-A	0.2		-0.32	7.0		2.08	
1145	D6839	0.16		-0.62	5.87		-3.23	
1189	ISO22854-A	0.36		0.88	6.16		-1.87	
1191		-----		-----	-----		-----	
1457	D6839	0.36		0.88	6.60		0.20	
1556	ISO22854-A	0.26		0.13	6.73		0.81	
1586	D6839	0.05		-1.44	5.24	R(0.01)	-6.19	
1656	D5443	0.20		-0.32	6.73		0.81	
1720	D5134	0.12		-0.91	6.78		1.04	
1737	In house	0.31		0.50	6.51		-0.23	
1776		-----		-----	-----		-----	
1788	D6730	2.38	R(0.01)	15.95	6.68		0.57	
1796		-----		-----	-----		-----	
1823	D6839	0.28		0.28	6.64		0.39	
1857	ISO22854-A	0.15		-0.69	6.45		-0.51	
1862		-----		-----	-----		-----	
1949		-----		-----	-----		-----	
1950		-----		-----	-----		-----	
1995	D5443	0.25		0.06	6.51		-0.23	
6198	D6839	0.75	R(0.01)	3.79	6.26		-1.40	
6200		-----		-----	-----		-----	
6201	D6839	0.49		1.85	6.77	C	1.00	First reported 7.58
6262	D6839	0.19		-0.39	6.65		0.43	
	normality	suspect			OK			
	N	40			42			
	outliers	2			2			
	mean (n)	0.2424			6.5580			
	st.dev. (n)	0.10567			0.27400			
	R(calc.)	0.2959			0.7672			
	st.dev.(D6839:18)	0.13399			0.21289			
	R(D6839:18)	0.3752			0.5961			


Olefins
2.5
2
1.5
1
0.5
0
1586 781 1065 1720 779 754 1857 1145 873 855 874 323 824 862 6262 1041 1135 1656 872 922 445 349 381 868 399 1995 1556 1823 1062 311 1011 1737 657 334 1189 1457 785 171 6201 1081 6198 1788


Kernel Density
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3.5
3
2.5
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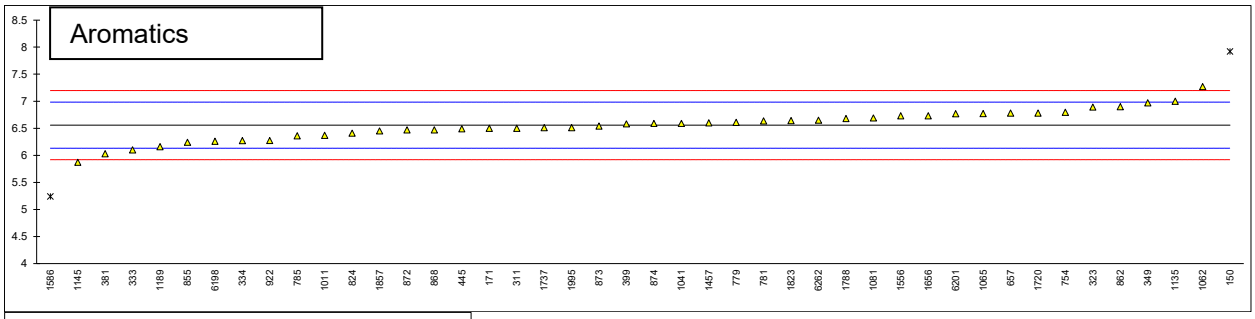
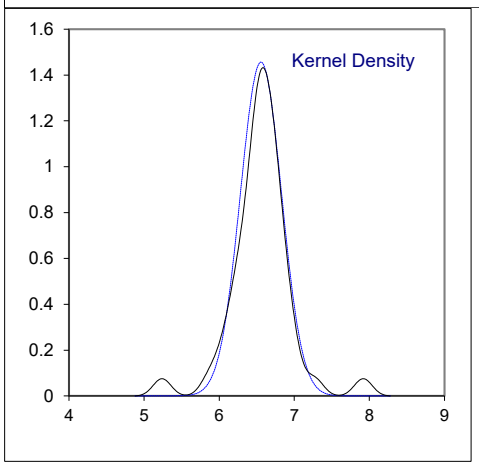
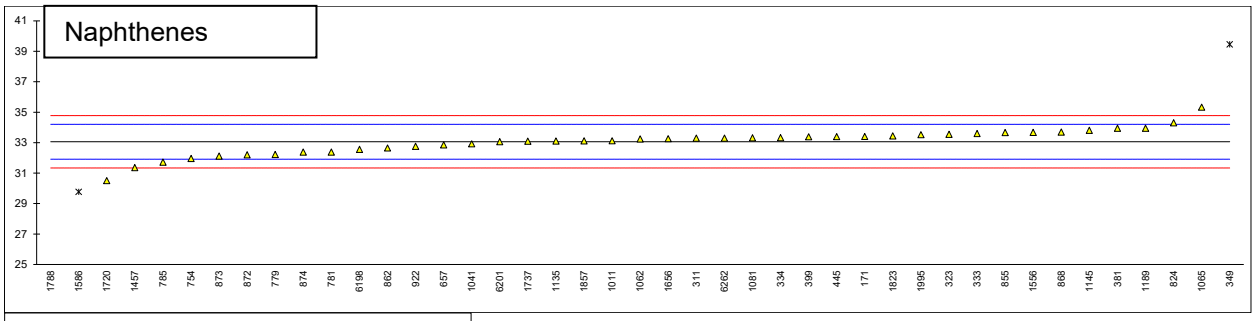
1.5
1
0.5
0
-1 0 1 2 3


Aromatics
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
1586 1145 381 333 1189 855 6198 334 922 785 1011 824 1857 872 868 445 171 311 1737 1995 873 399 874 1041 1457 779 781 1823 6262 1788 1081 1556 1656 6201 1065 657 1720 754 323 862 349 1135 1062 150


Kernel Density
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
4 5 6 7 8 9

Determination of PIONA - Naphthenes and C4 and lighter hydrocarbons on sample #21036; results in %V/V

lab	method	Naphthenes	mark	z(targ)	≤C4	mark	z(targ)	remarks
140		-----		-----	-----		-----	
150	D6730	-----		-----	0.61		0.03	
171	D6839	33.4		0.59	0.0		-1.23	
311	D5443Mod.	33.3		0.42	0.65		0.12	
323	D5443	33.55		0.86	0.77		0.37	
333	D6839	33.6		0.94	-----		-----	
334	ISO22854-A	33.33	C	0.47	0.43		-0.34	First reported 36.03
349	ISO22854-A	39.46	C,R(0.01)	11.20	-----		-----	First reported 50.36
360		-----		-----	-----		-----	
381	D6839	33.94	C	1.54	0.54		-0.11	First reported 37.98
399	ISO22854-A	33.38		0.56	0.45		-0.30	
444		-----		-----	-----		-----	
445	D6839	33.39		0.58	0.44		-0.32	
657	D6839	32.85		-0.37	0.79		0.41	
754	D6729	31.963		-1.92	0.705		0.23	
779	D6729	32.225	C	-1.46	0.672		0.16	First reported 29.946
781	D6729	32.381		-1.19	0.707		0.24	
785	D6729	31.716		-2.35	-----		-----	
798		-----		-----	-----		-----	
824	D6839	34.30		2.17	0.12		-0.98	
855	D6839	33.66		1.05	0.72		0.26	
862	D6839	32.65		-0.72	0.82		0.47	
864		-----		-----	-----		-----	
868	D6839	33.69		1.10	0.79		0.41	
872	D6839	32.20		-1.51	-----		-----	
873	GOST P52714	32.12		-1.65	0.70		0.22	
874	D6729	32.379		-1.19	0.712		0.25	
914		-----		-----	-----		-----	
922	D6730	32.754		-0.54	-----		-----	
994		-----		-----	-----		-----	
1011	D5443	33.12		0.10	-----		-----	
1012		-----		-----	-----		-----	
1026		-----		-----	-----		-----	
1041	D6839	32.92		-0.25	0.86		0.55	
1062	D6839	33.24		0.31	0.53		-0.13	
1065	In house	35.328		3.97	0.76		0.35	
1069		-----		-----	-----		-----	
1081	ISO22854-A	33.32		0.45	0.74		0.30	
1135	ISO22854-A	33.1		0.07	0.3		-0.61	
1145	D6839	33.81		1.31	0.16		-0.90	
1189	ISO22854-A	33.94		1.54	0.68		0.18	
1191		-----		-----	-----		-----	
1457	D6839	31.36		-2.98	0.62		0.05	
1556	ISO22854-A	33.67	C	1.07	0.26		-0.69	First reported 36.52
1586	D6839	29.77	R(0.05)	-5.76	-----		-----	
1656	D5443	33.26		0.35	-----		-----	
1720	D5134	30.50		-4.48	0.572		-0.04	
1737	In house	33.09		0.05	0.89		0.61	
1776		-----		-----	-----		-----	
1788	D6730	24.02	R(0.01)	-15.82	0.77		0.37	
1796		-----		-----	-----		-----	
1823	D6839	33.44		0.66	0.62		0.05	
1857	ISO22854-A	33.11		0.09	0.71		0.24	
1862		-----		-----	-----		-----	
1949		-----		-----	-----		-----	
1950		-----		-----	-----		-----	
1995	D5443	33.52		0.80	0.50		-0.19	
6198	D6839	32.56		-0.88	-----		-----	
6200		-----		-----	-----		-----	
6201	D6839	33.06		0.00	0.81		0.45	
6262	D6839	33.30		0.42	0.37		-0.46	
	normality	not OK			OK			
	n	40			35			
	outliers	3			0			
	mean (n)	33.0606			0.5937			
	st.dev. (n)	0.84348			0.21984			
	R(calc.)	2.3617			0.6156			
	st.dev.(D6839:18)	0.57143			0.48214			
	R(D6839:18)	1.6			1.35			


Naphthenes
41
39
37
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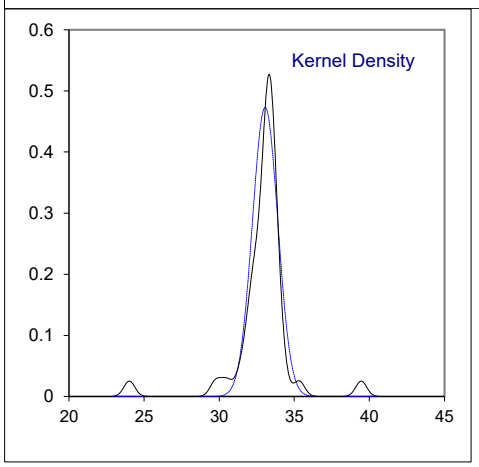
31
29
27
25
1788 1586 1720 1457 785 754 873 872 779 874 781 6198 862 922 657 1041 6201 1737 1135 1857 1011 1062 1656 311 6262 1081 334 399 445 171 1823 1995 323 333 855 1556 868 1145 381 1189 824 1065 349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0.2
0.1
0
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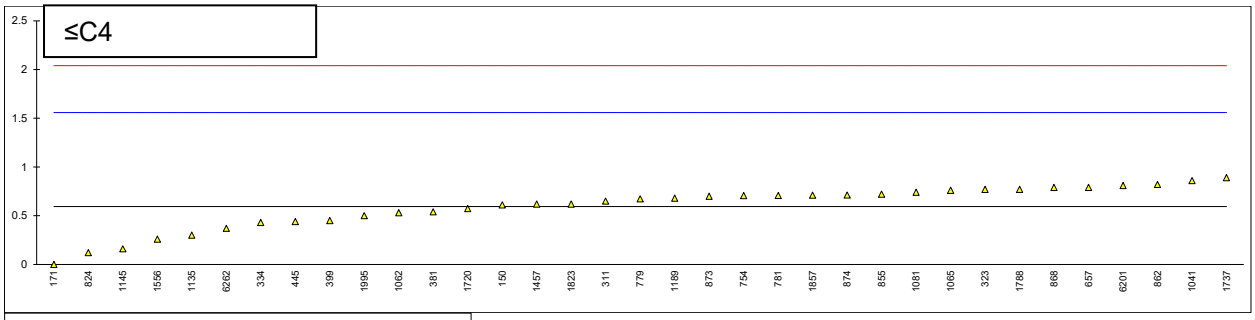
≤C4
2.5
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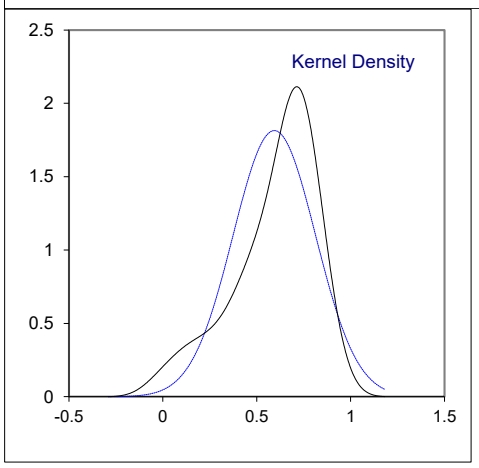
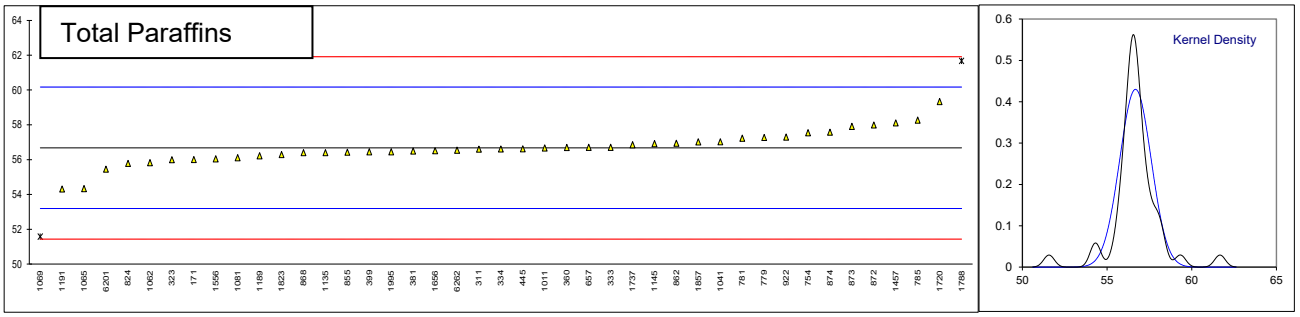
1.5
1
0.5
0
171 824 1145 1556 1135 6262 334 445 399 1995 1062 381 1720 150 1457 1823 311 779 1189 873 754 781 1857 874 855 1081 1065 323 1788 868 657 6201 862 1041 1737

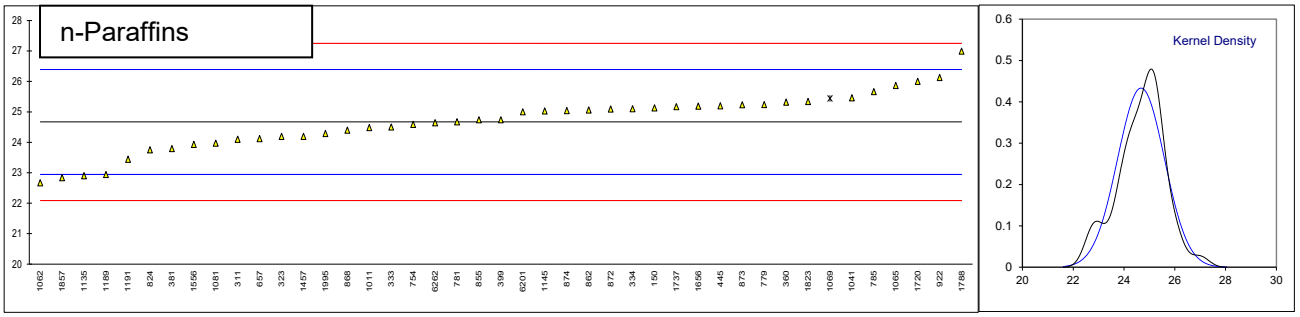

Kernel Density
2.5
2
1.5
1
0.5
0
-0.5 0 0.5 1 1.5

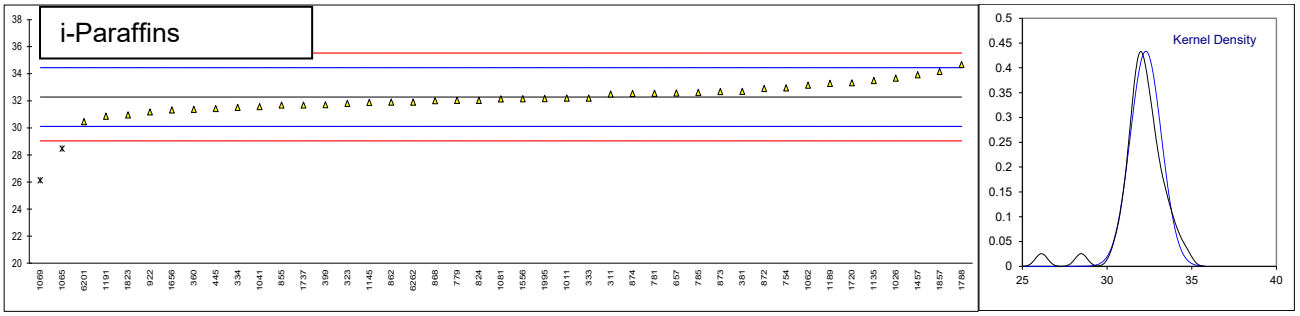
Determination of PIONA - Total Paraffins, n-Paraffins, i-Paraffins on sample #21036; results in %M/M

lab	method	Total P	mark	z(targ)	n-Paraf.	mark	z(targ)	i-Paraf.	mark	z(targ)
140		-----		-----	-----		-----	-----		-----
150	D6730	-----		-----	25.13		0.53	-----		-----
171	D6839	56.0		-0.39	-----		-----	-----		-----
311	D5443Mod.	56.6		-0.04	24.1		-0.66	32.5		0.20
323	D5443	55.99		-0.39	24.19		-0.56	31.80		-0.45
333	D6839	56.7		0.01	24.5		-0.20	32.2		-0.08
334	ISO22854-A	56.61	C	-0.04	25.10	C	0.50	31.51	C	-0.72
349		-----		-----	-----		-----	-----		-----
360	D5443	56.69		0.01	25.32		0.76	31.37		-0.85
381	D6839	56.49	C	-0.11	23.79	C	-1.02	32.70		0.38
399	ISO22854-A	56.45		-0.13	24.74		0.08	31.71		-0.53
444		-----		-----	-----		-----	-----		-----
445	D6839	56.62		-0.03	25.20		0.62	31.42		-0.80
657	D6839	56.70		0.01	24.12		-0.64	32.58		0.27
754	D6729	57.541		0.49	24.586		-0.10	32.955		0.62
779	D6729	57.264	C	0.34	25.237		0.66	32.027	C	-0.24
781	D6729	57.224		0.31	24.670		0.00	32.554		0.25
785	D6729	58.270		0.91	25.664		1.15	32.607		0.30
798		-----		-----	-----		-----	-----		-----
824	D6839	55.78		-0.51	23.75		-1.07	32.03		-0.24
855	D6839	56.42		-0.15	24.74		0.08	31.68		-0.56
862	D6839	56.94		0.15	25.06		0.45	31.90		-0.36
864		-----		-----	-----		-----	-----		-----
868	D6839	56.40		-0.16	24.40		-0.31	32.00		-0.27
872	D6839	57.99		0.75	25.09		0.49	32.90		0.57
873	GOST P52714	57.91		0.71	25.23		0.65	32.68		0.36
874	D6729	57.569		0.51	25.036		0.43	32.534		0.23
914		-----		-----	-----		-----	-----		-----
922	D6730	57.294		0.35	26.125		1.69	31.169		-1.03
994		-----		-----	-----		-----	-----		-----
1011	D5443	56.67		0.00	24.48		-0.22	32.19		-0.09
1012		-----		-----	-----		-----	-----		-----
1026	ISO22854-A	-----		-----	-----		-----	33.68		1.29
1041	D6839	57.02		0.20	25.46		0.92	31.56		-0.67
1062	D6839	55.82		-0.49	22.67		-2.32	33.15		0.80
1065	In house	54.33		-1.34	25.864		1.39	28.466	R(0.01)	-3.53
1069	D5134	51.57	R(0.01)	-2.93	25.44	ex	0.89	26.12	R(0.01)	-5.70
1081	ISO22854-A	56.11		-0.33	23.97		-0.81	32.14		-0.14
1135	ISO22854-A	56.4		-0.16	22.9		-2.05	33.5		1.12
1145	D6839	56.91		0.13	25.03		0.42	31.88		-0.38
1189	ISO22854-A	56.22		-0.26	22.94		-2.01	33.28		0.92
1191	In house	54.3029		-1.36	23.4438		-1.42	30.8591		-1.32
1457	D6839	58.11		0.82	24.19		-0.56	33.92		1.51
1556	ISO22854-A	56.04	C	-0.37	23.93		-0.86	32.15	C	-0.13
1586		-----		-----	-----		-----	-----		-----
1656	D5443	56.51		-0.10	25.19		0.60	31.32		-0.89
1720	D5134	59.33		1.52	26.00		1.54	33.33		0.96
1737	In house	56.85		0.10	25.17		0.58	31.68		-0.56
1776		-----		-----	-----		-----	-----		-----
1788	D6730	61.67	R(0.01)	2.86	26.99		2.69	34.68		2.21
1796		-----		-----	-----		-----	-----		-----
1823	D6839	56.29		-0.22	25.34		0.78	30.95		-1.24
1857	ISO22854-A	57.01		0.19	22.84		-2.12	34.17		1.74
1862		-----		-----	-----		-----	-----		-----
1949		-----		-----	-----		-----	-----		-----
1950		-----		-----	-----		-----	-----		-----
1995	D5443	56.45		-0.13	24.29		-0.44	32.16		-0.12
6198		-----		-----	-----		-----	-----		-----
6200		-----		-----	-----		-----	-----		-----
6201	D6839	55.45		-0.70	25.00		0.38	30.45		-1.70
6262	D6839	56.54		-0.08	24.64		-0.03	31.90		-0.36
	normality	suspect			OK			OK		
	n	41			42			41		
	outliers	2			0 (+1ex)			2		
	mean (n)	56.6784			24.6694			32.2872		
	st.dev. (n)	0.92799			0.92045			0.91998		
	R(calc.)	2.5984			2.5773			2.5760		
	st.dev.(Horwitz 2 com)	1.74613			0.86138			1.08261		
	R(Horwitz 2 comp.)	4.8892			2.4119			3.0313		

Lab 334: first reported 51.08, 20.14, 30.94
Lab 381: first reported 52.17, 19.56
Lab 779: first reported 58.949, 33.672
Lab 1556: first reported 53.12, 29.19
ex= test result is excluded when two of the three reported test results for paraffins is an outlier.

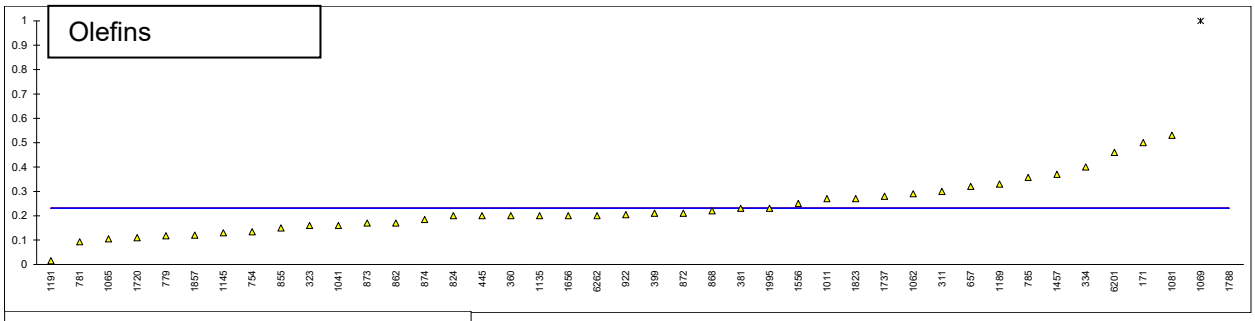

Total Paraffins
Kernel Density

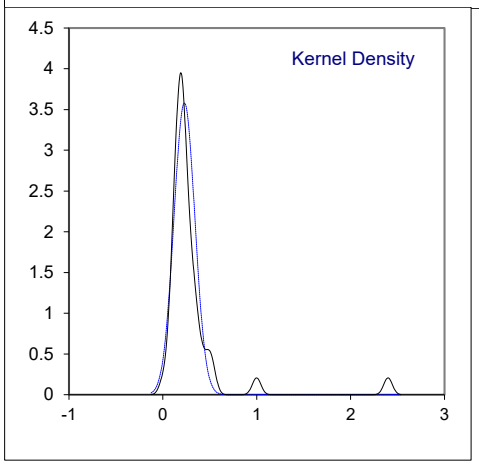

n-Paraffins
Kernel Density

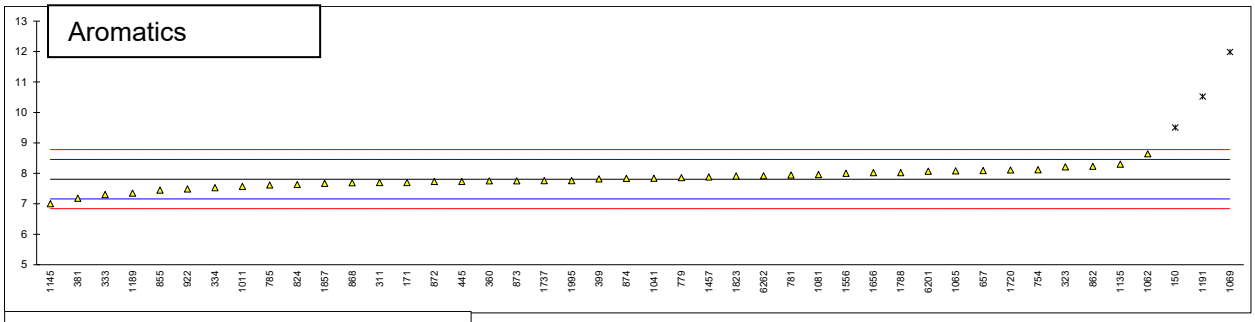

i-Paraffins
Kernel Density

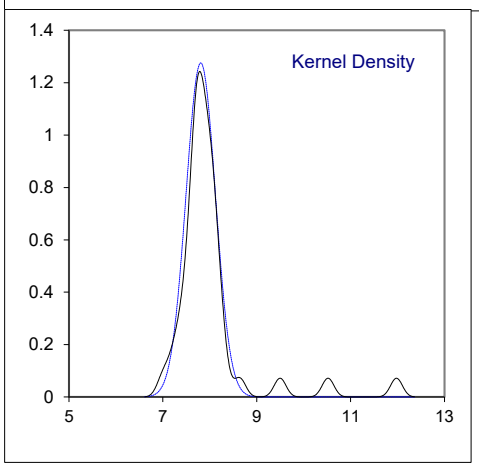
Determination of PIONA - Olefins and Aromatics on sample #21036; results in %M/M

lab	method	Olefins	mark	z(targ)	Aromatic	mark	z(targ)	remarks
140		-----		-----	-----		-----	
150	D6730	-----		-----	9.50	R(0.01)	5.21	
171	D6839	0.5		-----	7.7		-0.34	
311	D5443Mod.	0.3		-----	7.7		-0.34	
323	D5443	0.16		-----	8.21		1.23	
333	D6839	<2		-----	7.3		-1.57	
334	ISO22854-A	0.40	C	-----	7.53	C	-0.86	First reported 1.16, 9.66
349		-----		-----	-----		-----	
360	D5443	0.20		-----	7.75		-0.18	
381	D6839	0.23		-----	7.18		-1.94	
399	ISO22854-A	0.21		-----	7.82		0.03	
444		-----		-----	-----		-----	
445	D6839	0.20		-----	7.73		-0.25	
657	D6839	0.32		-----	8.09		0.86	
754	D6729	0.134		-----	8.118		0.95	
779	D6729	0.118		-----	7.858	C	0.15	First reported 8.762
781	D6729	0.093		-----	7.943		0.41	
785	D6729	0.357		-----	7.616		-0.60	
798		-----		-----	-----		-----	
824	D6839	0.20		-----	7.63		-0.55	
855	D6839	0.15		-----	7.45		-1.11	
862	D6839	0.17		-----	8.23		1.30	
864		-----		-----	-----		-----	
868	D6839	0.22		-----	7.69		-0.37	
872	D6839	0.21		-----	7.73		-0.25	
873	GOST P52714	0.17		-----	7.75		-0.18	
874	D6729	0.184		-----	7.833		0.07	
914		-----		-----	-----		-----	
922	D6730	0.204		-----	7.484		-1.00	
994		-----		-----	-----		-----	
1011	D5443	0.27		-----	7.57		-0.74	
1012		-----		-----	-----		-----	
1026	ISO22854-A	<0.01		-----	-----		-----	
1041	D6839	0.16		-----	7.84		0.09	
1062	D6839	0.29		-----	8.64		2.56	
1065	In house	0.105		-----	8.08		0.83	
1069	D5134	1.00	R(0.01)	-----	11.98	R(0.01)	12.86	
1081	ISO22854-A	0.53		-----	7.96		0.46	
1135	ISO22854-A	0.2		-----	8.3		1.51	
1145	D6839	0.13		-----	7.00		-2.50	
1189	ISO22854-A	0.33		-----	7.35		-1.42	
1191	In house	0.0153		-----	10.5218	R(0.01)	8.36	
1457	D6839	0.37		-----	7.88		0.22	
1556	ISO22854-A	0.25		-----	8.00		0.59	
1586		-----		-----	-----		-----	
1656	D5443	0.20		-----	8.02		0.65	
1720	D5134	0.11		-----	8.11		0.93	
1737	In house	0.28		-----	7.76		-0.15	
1776		-----		-----	-----		-----	
1788	D6730	2.40	R(0.01)	-----	8.02		0.65	
1796		-----		-----	-----		-----	
1823	D6839	0.27		-----	7.91		0.31	
1857	ISO22854-A	0.12		-----	7.67		-0.43	
1862		-----		-----	-----		-----	
1949		-----		-----	-----		-----	
1950		-----		-----	-----		-----	
1995	D5443	0.23		-----	7.76		-0.15	
6198		-----		-----	-----		-----	
6200		-----		-----	-----		-----	
6201	D6839	0.46		-----	8.07	C	0.80	First reported 9.03
6262	D6839	0.20		-----	7.92		0.34	
	normality	OK			OK			
	n	40			41			
	outliers	2			3			
	mean (n)	0.2313			7.8098			
	st.dev. (n)	0.11144			0.31282			
	R(calc.)	0.3120			0.8759			
	st.dev.(Horwitz 2 comp.)	(0.01631)			0.32423			
	R(Horwitz 2 comp.)	(0.0457)			0.9079			


Olefins

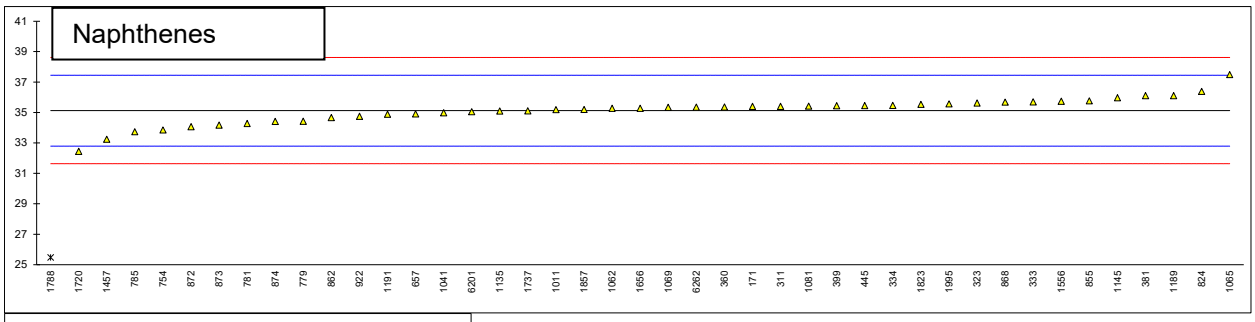

Kernel Density

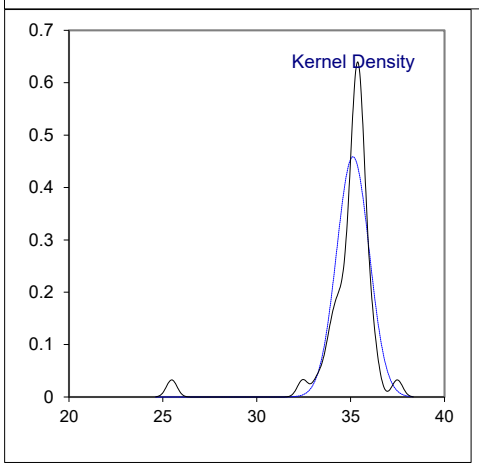

Aromatics

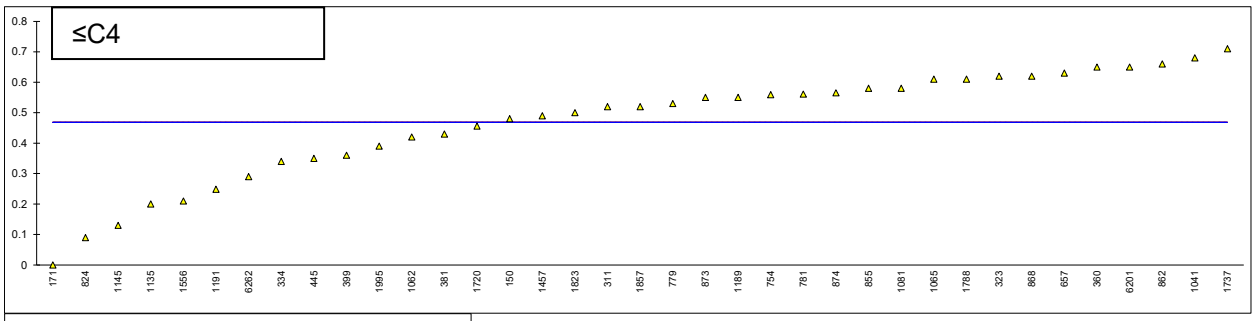

Kernel Density

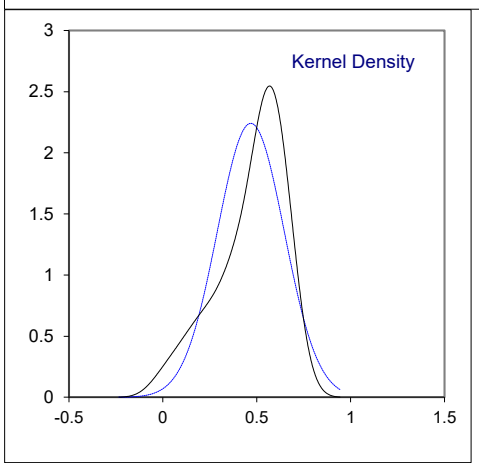
Determination of PIONA - Naphthenes and C4 and lighter hydrocarbons on sample #21036; results in %M/M

lab	method	Naphthenes	mark	z(targ)	≤C4	mark	z(targ)	remarks
140		-----		-----	-----		-----	
150	D6730	-----		-----	0.48		-----	
171	D6839	35.4		0.24	0.0		-----	
311	D5443Mod.	35.4		0.24	0.52		-----	
323	D5443	35.62		0.43	0.62		-----	
333	D6839	35.7		0.50	-----		-----	
334	ISO22854-A	35.46	C	0.29	0.34		-----	First reported 38.09
349		-----		-----	-----		-----	
360	D5443	35.36		0.20	0.65		-----	
381	D6839	36.10	C	0.84	0.43		-----	First reported 40.33
399	ISO22854-A	35.44		0.27	0.36		-----	
444		-----		-----	-----		-----	
445	D6839	35.45		0.28	0.35		-----	
657	D6839	34.90		-0.19	0.63		-----	
754	D6729	33.847		-1.10	0.559		-----	
779	D6729	34.417	C	-0.61	0.530		-----	First reported 32.062
781	D6729	34.278		-0.73	0.561		-----	
785	D6729	33.735		-1.19	-----		-----	
798		-----		-----	-----		-----	
824	D6839	36.38		1.08	0.09		-----	
855	D6839	35.76		0.55	0.58		-----	
862	D6839	34.66		-0.40	0.66		-----	
864		-----		-----	-----		-----	
868	D6839	35.68		0.48	0.62		-----	
872	D6839	34.06		-0.91	-----		-----	
873	GOST P52714	34.17		-0.82	0.55		-----	
874	D6729	34.413		-0.61	0.565		-----	
914		-----		-----	-----		-----	
922	D6730	34.752		-0.32	-----		-----	
994		-----		-----	-----		-----	
1011	D5443	35.18		0.05	-----		-----	
1012		-----		-----	-----		-----	
1026		-----		-----	-----		-----	
1041	D6839	34.98		-0.12	0.68		-----	
1062	D6839	35.27		0.13	0.42		-----	
1065	In house	37.484		2.03	0.61		-----	
1069	D5134	35.34		0.19	<0,01		-----	
1081	ISO22854-A	35.41		0.25	0.58		-----	
1135	ISO22854-A	35.1		-0.02	0.2		-----	
1145	D6839	35.97		0.73	0.13		-----	
1189	ISO22854-A	36.10		0.84	0.55		-----	
1191	In house	34.8862		-0.20	0.2486		-----	
1457	D6839	33.24		-1.62	0.49		-----	
1556	ISO22854-A	35.73	C	0.52	0.21		-----	First reported 38.65
1586		-----		-----	-----		-----	
1656	D5443	35.27		0.13	-----		-----	
1720	D5134	32.45		-2.30	0.456		-----	
1737	In house	35.11		-0.01	0.71		-----	
1776		-----		-----	-----		-----	
1788	D6730	25.47	R(0.01)	-8.30	0.61		-----	
1796		-----		-----	-----		-----	
1823	D6839	35.53		0.35	0.50		-----	
1857	ISO22854-A	35.19		0.06	0.52		-----	
1862		-----		-----	-----		-----	
1949		-----		-----	-----		-----	
1950		-----		-----	-----		-----	
1995	D5443	35.56		0.38	0.39		-----	
6198		-----		-----	-----		-----	
6200		-----		-----	-----		-----	
6201	D6839	35.05		-0.06	0.65		-----	
6262	D6839	35.35		0.19	0.29		-----	
	normality	not OK			OK			
	n	42			37			
	outliers	1			0			
	mean (n)	35.1234			0.4686			
	st.dev. (n)	0.870222			0.17807			
	R(calc.)	2.43662			0.4986			
	st.dev.(Horwitz 2 comp.)	1.162883			(0.03029)			
	R(Horwitz 2 comp.)	3.25607			(0.0848)			


Naphthenes

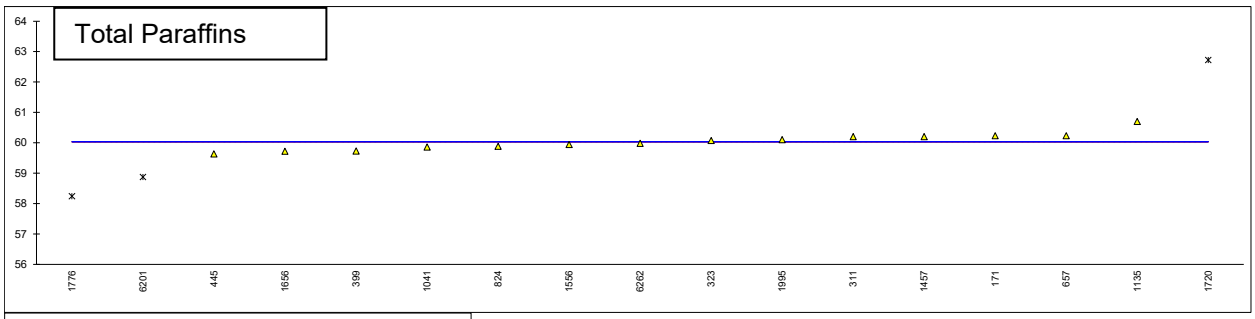

Kernel Density

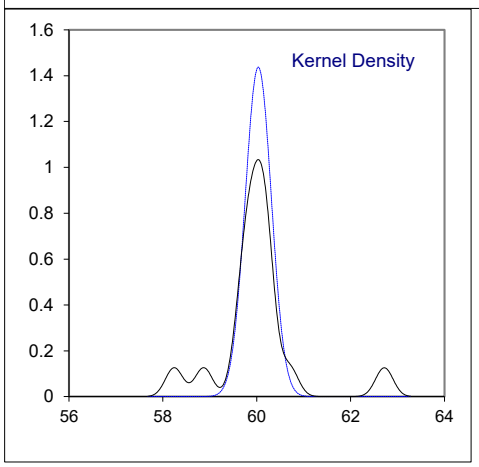

≤C4

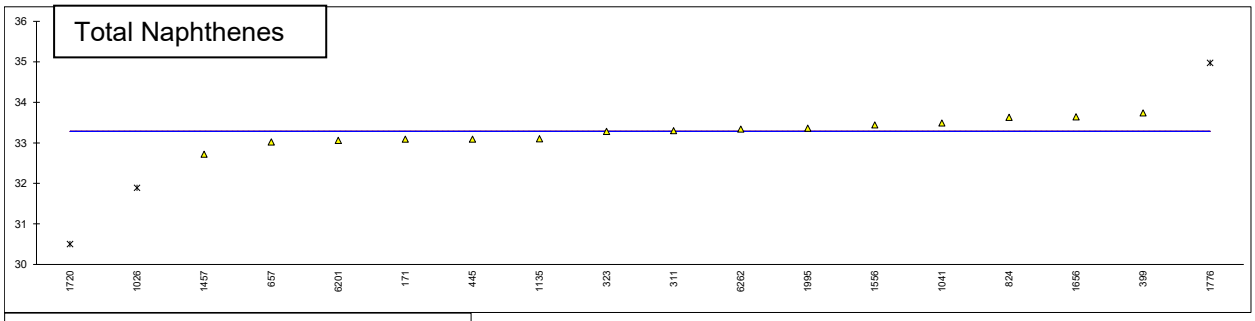

Kernel Density

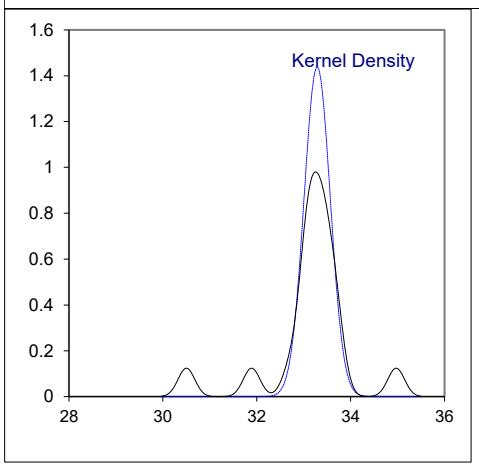
Determination of PNA - Total Paraffins, Total Naphthenes on sample #21036; results in %V/V

lab	method	Total Paraffins	mark	z(targ)	Total Naphthenes	mark	z(targ)	remarks
140		-----		-----	-----		-----	
150		-----		-----	-----		-----	
171	D5443	60.23		-----	33.09		-----	
311	D5443	60.2		-----	33.3		-----	
323	D5443	60.07		-----	33.28		-----	
333		-----		-----	-----		-----	
334		-----		-----	-----		-----	
349		-----		-----	-----		-----	
360		-----		-----	-----		-----	
381		-----		-----	-----		-----	
399	D5443	59.73		-----	33.74		-----	
444		-----		-----	-----		-----	
445	D5443	59.63		-----	33.09		-----	
657	D5443	60.23		-----	33.02		-----	
754		-----		-----	-----		-----	
779		-----		-----	-----		-----	
781		-----		-----	-----		-----	
785		-----		-----	-----		-----	
798		-----		-----	-----		-----	
824	D5443	59.88		-----	33.63		-----	
855		-----		-----	-----		-----	
862		-----		-----	-----		-----	
864		-----		-----	-----		-----	
868		-----		-----	-----		-----	
872		-----		-----	-----		-----	
873		-----		-----	-----		-----	
874		-----		-----	-----		-----	
914		-----		-----	-----		-----	
922		-----		-----	-----		-----	
994		-----		-----	-----		-----	
1011		-----		-----	-----		-----	
1012		-----		-----	-----		-----	
1026	ISO22854-A	-----		-----	31.89	C,G(0.01)	-----	First reported 38.3
1041	D5443	59.86		-----	33.49		-----	
1062		-----		-----	-----		-----	
1065		-----		-----	-----		-----	
1069		-----		-----	-----		-----	
1081		-----		-----	-----		-----	
1135	D6839	60.7		-----	33.1		-----	
1145		-----		-----	-----		-----	
1189		-----		-----	-----		-----	
1191		-----		-----	-----		-----	
1457	ISO22854-A	60.20		-----	32.72		-----	
1556	ISO22854-A	59.94		-----	33.44		-----	
1586		-----		-----	-----		-----	
1656	D5443	59.72		-----	33.64		-----	
1720	D5134	62.72	G(0.01)	-----	30.50	G(0.01)	-----	
1737		-----		-----	-----		-----	
1776	ISO22854-A	58.24	G(0.05)	-----	34.97	G(0.05)	-----	
1788		-----		-----	-----		-----	
1796		-----		-----	-----		-----	
1823		-----		-----	-----		-----	
1857		-----		-----	-----		-----	
1862		-----		-----	-----		-----	
1949		-----		-----	-----		-----	
1950		-----		-----	-----		-----	
1995	D5443	60.10		-----	33.36		-----	
6198		-----		-----	-----		-----	
6200		-----		-----	-----		-----	
6201	D5443	58.87	G(0.05)	-----	33.06		-----	
6262	D5443	59.98		-----	33.34		-----	
	normality	suspect			OK			
	n	14			15			
	outliers	3			3			
	mean (n)	60.0336			33.2867			
	st.dev. (n)	0.27751			0.27740			
	R(calc.)	0.7770			0.7767			
	st.dev.(lit)	n.a.			n.a.			
	R(lit)	n.a.			n.a.			


Total Paraffins
64
63
62
61
60
59
58
57
56
1776
6201
445
1656
399
1041
824
1556
6262
323
1995
311
1457
171
657
1135
1720

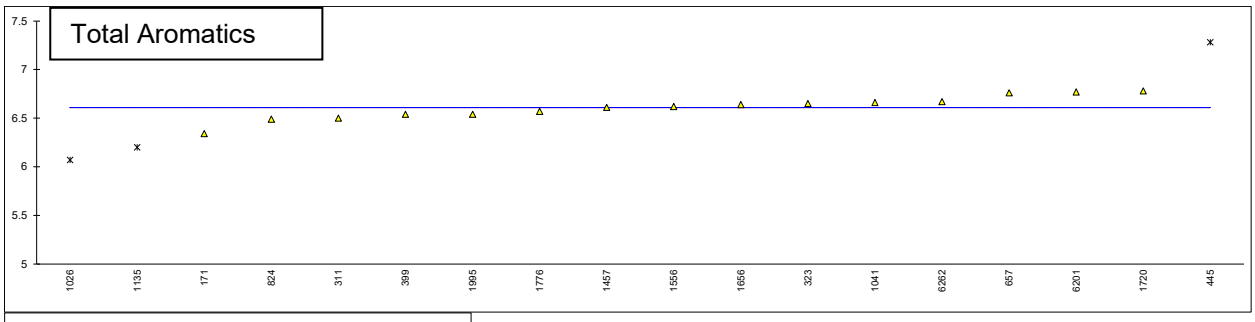

Kernel Density
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
56
58
60
62
64

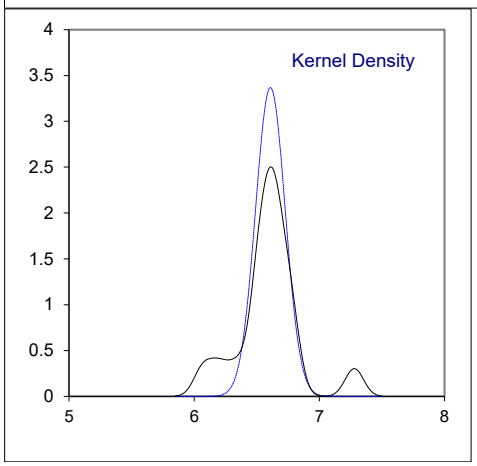

Total Naphthenes
36
35
34
33
32
31
30
1720
1026
1457
657
6201
171
445
1135
323
311
6262
1995
1556
1041
824
1656
399
1776

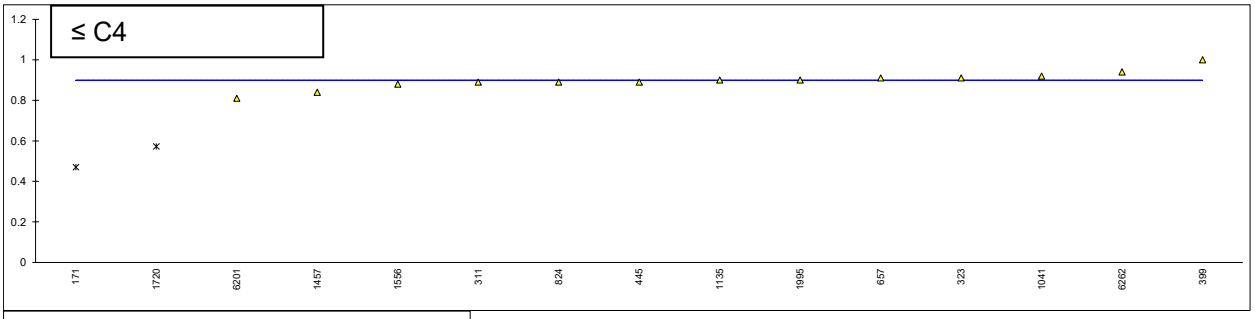

Kernel Density
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
28
30
32
34
36

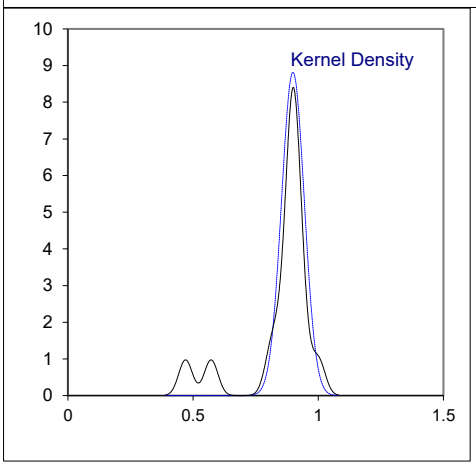
Determination of PNA - Total Aromatics and C4 and lighter hydrocarbons on sample #21036; results in %V/V

lab	method	Total Aromatics	mark	z(targ)	≤ C4	mark	z(targ)	remarks
140		-----		-----	-----		-----	
150		-----		-----	-----		-----	
171	D5443	6.34		-----	0.47	G(0.01)	-----	
311	D5443	6.5		-----	0.89		-----	
323	D5443	6.65		-----	0.91		-----	
333		-----		-----	-----		-----	
334		-----		-----	-----		-----	
349		-----		-----	-----		-----	
360		-----		-----	-----		-----	
381		-----		-----	-----		-----	
399	D5443	6.54		-----	1.00		-----	
444		-----		-----	-----		-----	
445	D5443	7.28	G(0.05)	-----	0.89		-----	
657	D5443	6.76		-----	0.91		-----	
754		-----		-----	-----		-----	
779		-----		-----	-----		-----	
781		-----		-----	-----		-----	
785		-----		-----	-----		-----	
798		-----		-----	-----		-----	
824	D5443	6.49		-----	0.89		-----	
855		-----		-----	-----		-----	
862		-----		-----	-----		-----	
864		-----		-----	-----		-----	
868		-----		-----	-----		-----	
872		-----		-----	-----		-----	
873		-----		-----	-----		-----	
874		-----		-----	-----		-----	
914		-----		-----	-----		-----	
922		-----		-----	-----		-----	
994		-----		-----	-----		-----	
1011		-----		-----	-----		-----	
1012		-----		-----	-----		-----	
1026	ISO22854-A	6.07	C,DG(0.05)	-----	-----		-----	First reported 7.2
1041	D5443	6.66		-----	0.92		-----	
1062		-----		-----	-----		-----	
1065		-----		-----	-----		-----	
1069		-----		-----	-----		-----	
1081		-----		-----	-----		-----	
1135	D6839	6.2	DG(0.05)	-----	0.9		-----	
1145		-----		-----	-----		-----	
1189		-----		-----	-----		-----	
1191		-----		-----	-----		-----	
1457	ISO22854-A	6.61		-----	0.84		-----	
1556	ISO22854-A	6.62		-----	0.88		-----	
1586		-----		-----	-----		-----	
1656	D5443	6.64		-----	-----		-----	
1720	D5134	6.78		-----	0.572	G(0.01)	-----	
1737		-----		-----	-----		-----	
1776	ISO22854-A	6.57		-----	-----		-----	
1788		-----		-----	-----		-----	
1796		-----		-----	-----		-----	
1823		-----		-----	-----		-----	
1857		-----		-----	-----		-----	
1862		-----		-----	-----		-----	
1949		-----		-----	-----		-----	
1950		-----		-----	-----		-----	
1995	D5443	6.54		-----	0.90		-----	
6198		-----		-----	-----		-----	
6200		-----		-----	-----		-----	
6201	D5443	6.77	C	-----	0.81		-----	First reported 7.58
6262	D5443	6.67		-----	0.94		-----	
	normality	OK			not OK			
	n	15			13			
	outliers	3			2			
	mean (n)	6.6093			0.8985			
	st.dev. (n)	0.11847			0.04525			
	R(calc.)	0.3317			0.1267			
	st.dev.(lit)	n.a.			n.a.			
	R(lit)	n.a.			n.a.			


Total Aromatics
7.5
7
6.5
6
5.5
5
1026
1135
171
824
311
399
1995
1776
1457
1556
1656
323
1041
6262
657
6201
1720
445

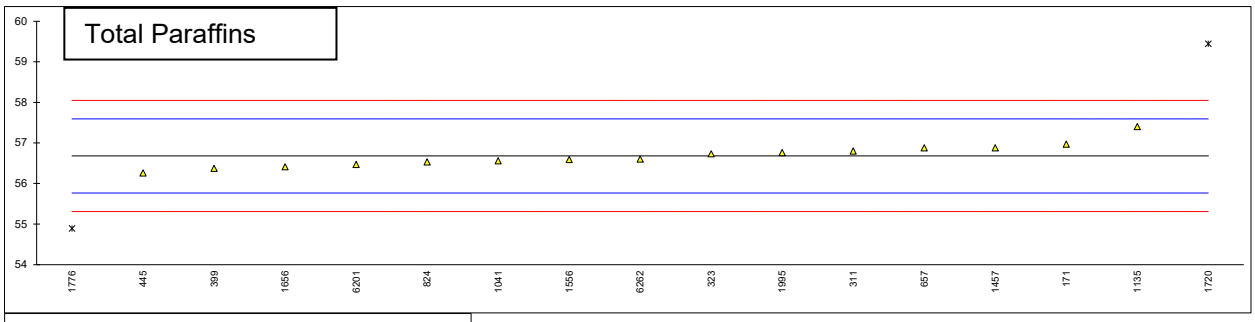

Kernel Density
4
3.5
3
2.5
2
1.5
1
0.5
0
5
6
7
8

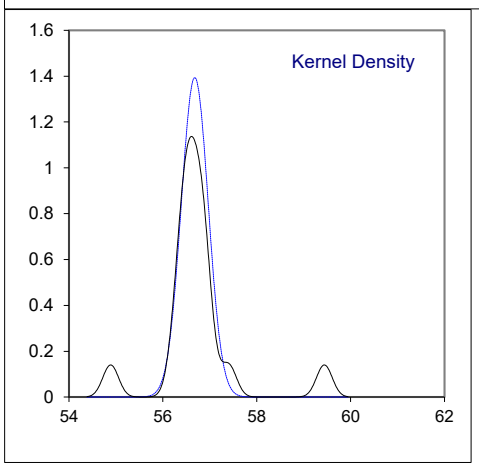

≤ C4
1.2
1
0.8
0.6
0.4
0.2
0
171
1720
6201
1457
1556
311
824
445
1135
1995
657
323
1041
6262
399

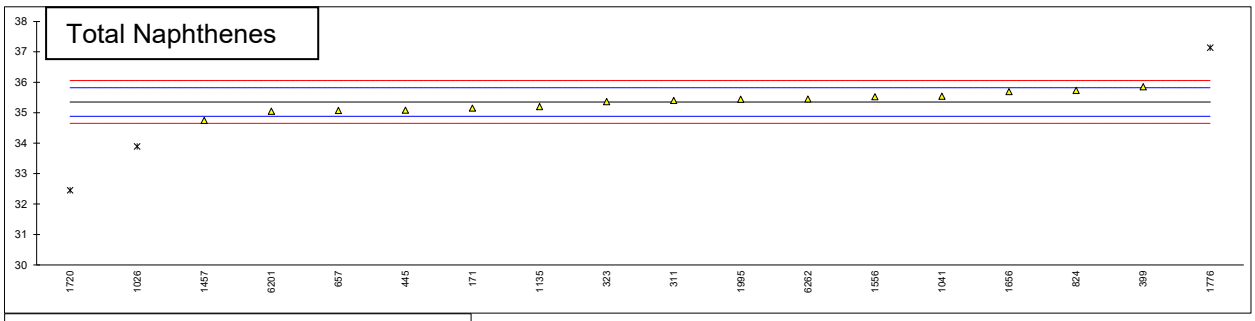

Kernel Density
10
9
8
7
6
5
4
3
2
1
0
0
0.5
1
1.5

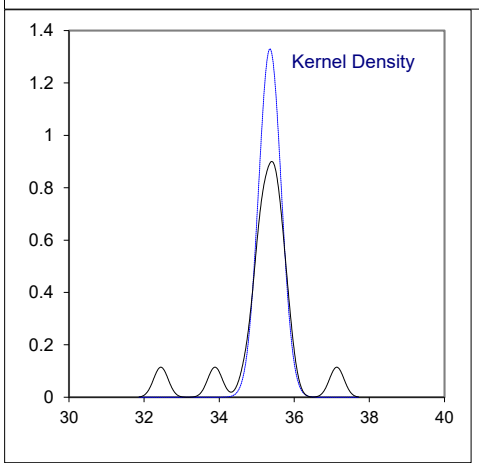
Determination of PNA - Total Paraffins, Total Naphthenes on sample #21036; results in %M/M

lab	method	Total Paraffins	mark	z(targ)	Total Naphthenes	mark	z(targ)	remarks
140		-----		-----	-----		-----	
150		-----		-----	-----		-----	
171	D5443	56.97		0.63	35.15		-0.86	
311	D5443	56.8		0.26	35.4		0.21	
323	D5443	56.73		0.11	35.36		0.03	
333		-----		-----	-----		-----	
334		-----		-----	-----		-----	
349		-----		-----	-----		-----	
360		-----		-----	-----		-----	
381		-----		-----	-----		-----	
399	D5443	56.37		-0.68	35.85		2.13	
444		-----		-----	-----		-----	
445	D5443	56.26		-0.92	35.08		-1.16	
657	D5443	56.88		0.44	35.07		-1.21	
754		-----		-----	-----		-----	
779		-----		-----	-----		-----	
781		-----		-----	-----		-----	
785		-----		-----	-----		-----	
798		-----		-----	-----		-----	
824	D5443	56.53		-0.33	35.73		1.62	
855		-----		-----	-----		-----	
862		-----		-----	-----		-----	
864		-----		-----	-----		-----	
868		-----		-----	-----		-----	
872		-----		-----	-----		-----	
873		-----		-----	-----		-----	
874		-----		-----	-----		-----	
914		-----		-----	-----		-----	
922		-----		-----	-----		-----	
994		-----		-----	-----		-----	
1011		-----		-----	-----		-----	
1012		-----		-----	-----		-----	
1026	ISO22854-A	-----		-----	33.89	G(0.01)	-6.26	
1041	D5443	56.56		-0.26	35.54		0.80	
1062		-----		-----	-----		-----	
1065		-----		-----	-----		-----	
1069		-----		-----	-----		-----	
1081		-----		-----	-----		-----	
1135	D6839	57.4		1.57	35.2		-0.65	
1145		-----		-----	-----		-----	
1189		-----		-----	-----		-----	
1191		-----		-----	-----		-----	
1457	ISO22854-A	56.88		0.44	34.75		-2.58	
1556	ISO22854-A	56.59		-0.20	35.52		0.72	
1586		-----		-----	-----		-----	
1656	D5443	56.41		-0.59	35.69		1.45	
1720	D5134	59.44	G(0.01)	6.04	32.45	G(0.01)	-12.42	
1737		-----		-----	-----		-----	
1776	ISO22854-A	54.89	G(0.01)	-3.92	37.13	G(0.01)	7.61	
1788		-----		-----	-----		-----	
1796		-----		-----	-----		-----	
1823		-----		-----	-----		-----	
1857		-----		-----	-----		-----	
1862		-----		-----	-----		-----	
1949		-----		-----	-----		-----	
1950		-----		-----	-----		-----	
1995	D5443	56.76		0.17	35.44		0.38	
6198		-----		-----	-----		-----	
6200		-----		-----	-----		-----	
6201	D5443	56.47	C	-0.46	35.05		-1.29	First reported 55.45
6262	D5443	56.60		-0.18	35.45		0.42	
	normality	suspect			OK			
	n	15			15			
	outliers	2			3			
	mean (n)	56.6807			35.3520			
	st.dev. (n)	0.28619			0.29993			
	R(calc.)	0.8013			0.8398			
	st.dev.(D5443:14)	0.45710			0.23358			
	R(D5443:14)	1.2799			0.6540			


Total Paraffins
60
59
58
57
56
55
54
1776
445
399
1656
6201
824
1041
1556
6262
323
1995
311
657
1457
171
1135
1720

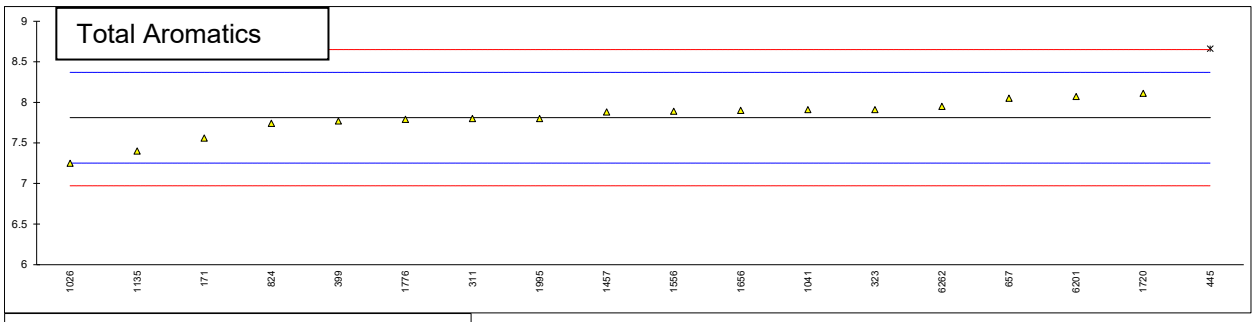

Kernel Density
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
54
56
58
60
62

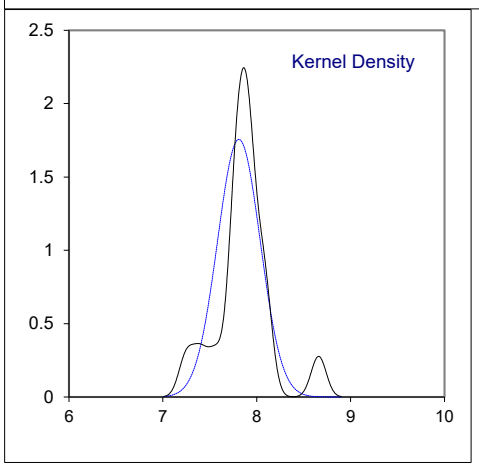

Total Naphthenes
38
37
36
35
34
33
32
31
30
1720
1026
1457
6201
657
445
171
1135
323
311
1995
6262
1556
1041
1656
824
399
1776

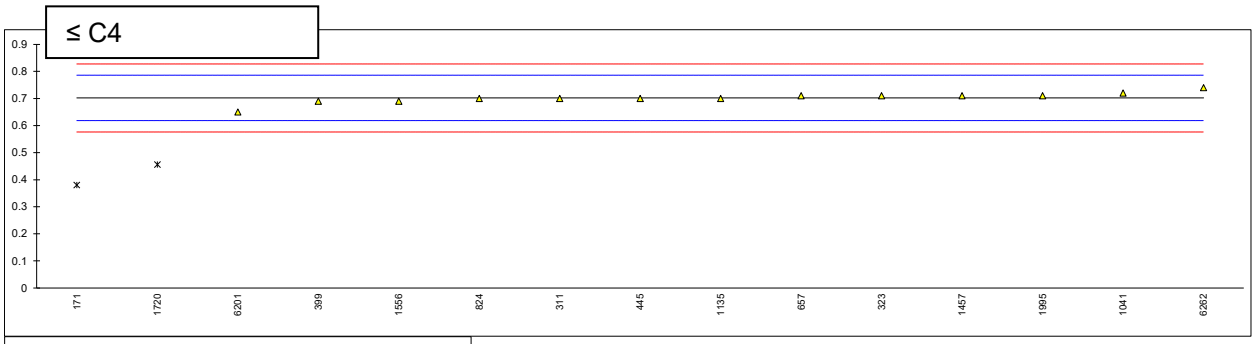

Kernel Density
1.4
1.2
1
0.8
0.6
0.4
0.2
0
30
32
34
36
38
40

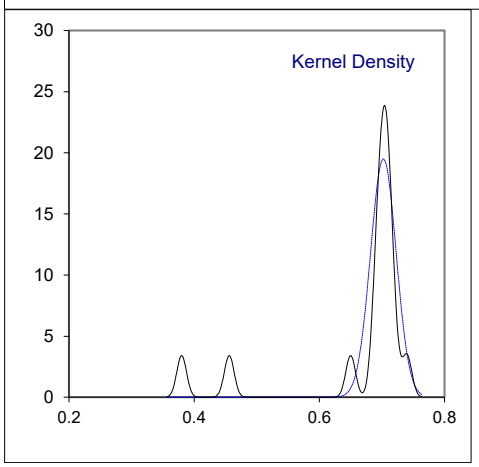
Determination of PNA - Total Aromatics and C4 and lighter hydrocarbons on sample #21036; results in %M/M

lab	method	Total Aromatics	mark	z(targ)	≤ C4	mark	z(targ)	remarks
140		-----		-----	-----		-----	
150		-----		-----	-----		-----	
171	D5443	7.56		-0.90	0.38	G(0.01)	-7.69	
311	D5443	7.8		-0.04	0.70		-0.06	
323	D5443	7.91		0.36	0.71		0.18	
333		-----		-----	-----		-----	
334		-----		-----	-----		-----	
349		-----		-----	-----		-----	
360		-----		-----	-----		-----	
381		-----		-----	-----		-----	
399	D5443	7.77		-0.15	0.69		-0.29	
444		-----		-----	-----		-----	
445	D5443	8.66	G(0.05)	3.04	0.70		-0.06	
657	D5443	8.05		0.86	0.71		0.18	
754		-----		-----	-----		-----	
779		-----		-----	-----		-----	
781		-----		-----	-----		-----	
785		-----		-----	-----		-----	
798		-----		-----	-----		-----	
824	D5443	7.74		-0.25	0.70		-0.06	
855		-----		-----	-----		-----	
862		-----		-----	-----		-----	
864		-----		-----	-----		-----	
868		-----		-----	-----		-----	
872		-----		-----	-----		-----	
873		-----		-----	-----		-----	
874		-----		-----	-----		-----	
914		-----		-----	-----		-----	
922		-----		-----	-----		-----	
994		-----		-----	-----		-----	
1011		-----		-----	-----		-----	
1012		-----		-----	-----		-----	
1026	ISO22854-A	7.25		-2.01	-----		-----	
1041	D5443	7.91		0.36	0.72		0.42	
1062		-----		-----	-----		-----	
1065		-----		-----	-----		-----	
1069		-----		-----	-----		-----	
1081		-----		-----	-----		-----	
1135	D6839	7.4		-1.47	0.7		-0.06	
1145		-----		-----	-----		-----	
1189		-----		-----	-----		-----	
1191		-----		-----	-----		-----	
1457	ISO22854-A	7.88		0.25	0.71		0.18	
1556	ISO22854-A	7.89		0.28	0.69		-0.29	
1586		-----		-----	-----		-----	
1656	D5443	7.90		0.32	-----		-----	
1720	D5134	8.11		1.07	0.456	G(0.01)	-5.88	
1737		-----		-----	-----		-----	
1776	ISO22854-A	7.79		-0.07	-----		-----	
1788		-----		-----	-----		-----	
1796		-----		-----	-----		-----	
1823		-----		-----	-----		-----	
1857		-----		-----	-----		-----	
1862		-----		-----	-----		-----	
1949		-----		-----	-----		-----	
1950		-----		-----	-----		-----	
1995	D5443	7.80		-0.04	0.71		0.18	
6198		-----		-----	-----		-----	
6200		-----		-----	-----		-----	
6201	D5443	8.07	C	0.93	0.65		-1.25	First reported 9.03
6262	D5443	7.95		0.50	0.74		0.90	
	normality	suspect			not OK			
	n	17			13			
	outliers	1			2			
	mean (n)	7.8106			0.7023			
	st.dev. (n)	0.22714			0.02048			
	R(calc.)	0.6360			0.0573			
	st.dev.(D5443:14)	0.27947			0.04190			
	R(D5443:14)	0.7825			0.1173	R(Horwitz 2comp)		


Total Aromatics
9
8.5
8
7.5
7
6.5
6
1026
1135
171
824
399
1776
311
1995
1457
1556
1656
1041
323
6262
657
6201
1720
445


Kernel Density
2.5
2
1.5
1
0.5
0
6
7
8
9
10

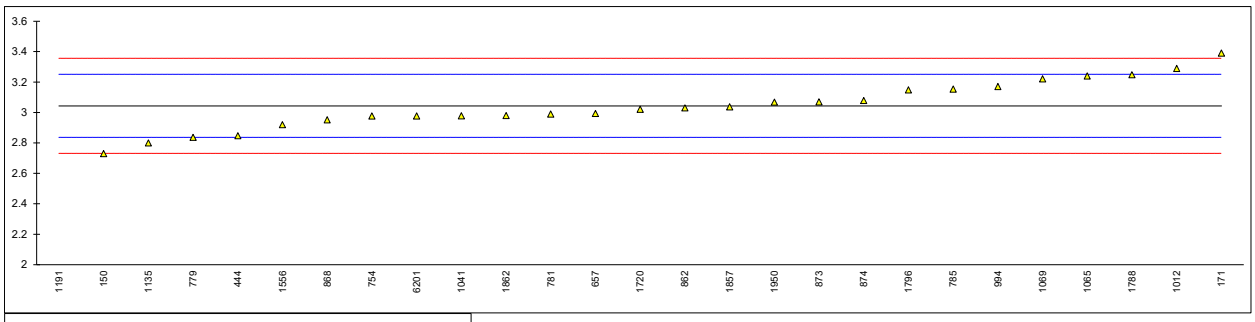

≤ C4
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
171
1720
6201
399
1556
824
311
445
1135
657
323
1457
1995
1041
6262

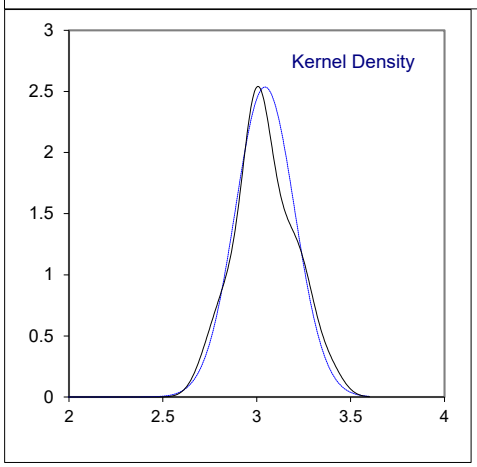

Kernel Density
30
25
20
15
10
5
0
0.2
0.4
0.6
0.8

Determination of Pentane on sample #21036; results in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D5134	2.73		-2.98	
171	D5134	3.39		3.28	
311		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381		-----		-----	
399		-----		-----	
444	D5134	2.8473		-1.86	
445		-----		-----	
657	D6730	2.9927		-0.49	
754	D6729	2.977		-0.63	
779	D6729	2.836		-1.97	
781	D6729	2.989		-0.52	
785	D6729	3.154		1.04	
798		-----		-----	
824		-----		-----	
855		-----		-----	
862	D5134	3.03		-0.13	
864		-----		-----	
868	D6729	2.9517		-0.87	
872		-----		-----	
873	GOST P52714	3.07		0.25	
874	D6729	3.078		0.32	
914		-----		-----	
922		-----		-----	
994	D5134	3.17		1.20	
1011		-----		-----	
1012		3.2888		2.32	
1026		-----		-----	
1041	D5134	2.978		-0.62	
1062		-----		-----	
1065	In house	3.24		1.86	
1069	D5134	3.22		1.67	
1081		-----		-----	
1135	D5134	2.80		-2.31	
1145		-----		-----	
1189		-----		-----	
1191	In house	1.3127	R(0.01)	-16.42	
1457		-----		-----	
1556	D6729	2.92		-1.18	
1586		-----		-----	
1656		-----		-----	
1720	D5134	3.021		-0.22	
1737		-----		-----	
1776		-----		-----	
1788		3.247		1.93	
1796	D5134	3.148		0.99	
1823		-----		-----	
1857	D5134	3.037		-0.07	
1862	D5134	2.980		-0.61	
1949		-----		-----	
1950	D5134 mod.	3.068		0.23	
1995		-----		-----	
6198		-----		-----	
6200		-----		-----	
6201	D6730	2.977		-0.63	
6262		-----		-----	

	normality	OK
	n	26
	outliers	1
	mean (n)	3.0439
	st.dev. (n)	0.15739
	R(calc.)	0.4407
	st.dev.(D5134:13)	0.10541
	R(D5134:13)	0.2951
Compare		
	R(Horwitz)	0.2883

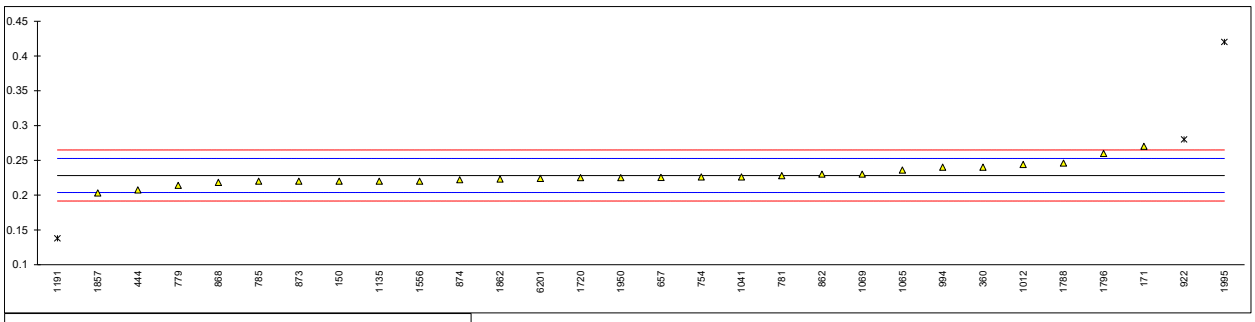

3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
1191
150
1135
779
444
1556
868
754
6201
1041
1862
781
657
1720
862
1857
1950
873
874
1796
785
994
1069
1065
1788
1012
171

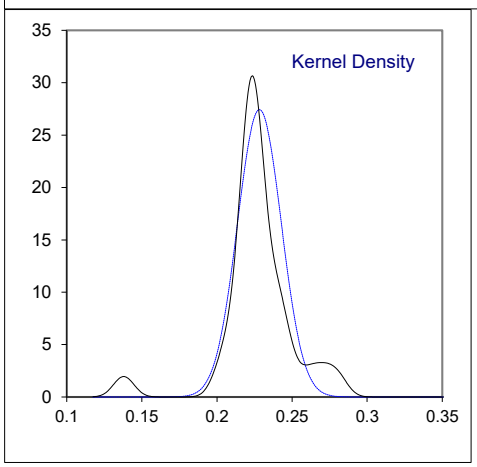

Kernel Density
3
2.5
2
1.5
1
0.5
0
2
2.5
3
3.5
4

Determination of Benzene on sample #21036; results in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D5134	0.22		-0.68	
171	D5134	0.27		3.42	
311		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360	D5134	0.24		0.96	
381		-----		-----	
399		-----		-----	
444	D5134	0.2074		-1.71	
445		-----		-----	
657	D6730	0.2255		-0.23	
754	D6729	0.226		-0.19	
779	D6729	0.214		-1.17	
781	D6729	0.228		-0.02	
785	D6729	0.220		-0.68	
798		-----		-----	
824		-----		-----	
855		-----		-----	
862	D5134	0.23		0.14	
864		-----		-----	
868	D6729	0.2182		-0.82	
872		-----		-----	
873	GOST P52714	0.22		-0.68	
874	D6729	0.222		-0.51	
914		-----		-----	
922	D6730	0.28	R(0.05)	4.24	
994	D5134	0.24		0.96	
1011		-----		-----	
1012		0.2441		1.30	
1026		-----		-----	
1041	D5134	0.226		-0.19	
1062		-----		-----	
1065	In house	0.236		0.63	
1069	D5134	0.23		0.14	
1081		-----		-----	
1135	D5134	0.22		-0.68	
1145		-----		-----	
1189		-----		-----	
1191	In house	0.1379	R(0.01)	-7.40	
1457		-----		-----	
1556	D6729	0.22		-0.68	
1586		-----		-----	
1656		-----		-----	
1720	D5134	0.225		-0.27	
1737		-----		-----	
1776		-----		-----	
1788		0.246		1.45	
1796	D5134	0.260		2.60	
1823		-----		-----	
1857	D5134	0.203		-2.07	
1862	D5134	0.223		-0.43	
1949		-----		-----	
1950	D5134 mod.	0.225		-0.27	
1995	D7423	0.42	R(0.01)	15.70	
6198		-----		-----	
6200		-----		-----	
6201	D6730	0.224		-0.35	
6262		-----		-----	

	normality	not OK
	n	27
	outliers	3
	mean (n)	0.2283
	st.dev. (n)	0.01454
	R(calc.)	0.0407
	st.dev.(D5134:13)	0.01221
	R(D5134:13)	0.0342
Compare		
	R(Horwitz)	0.0319

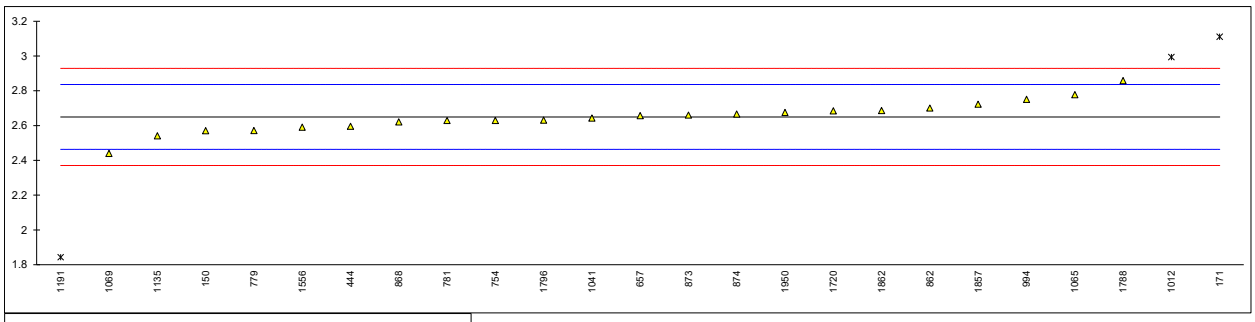

0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
1191
1857
444
779
868
785
873
150
1135
1556
874
1862
6201
1720
1950
657
754
1041
781
862
1069
1065
994
360
1012
1788
1796
171
922
1995

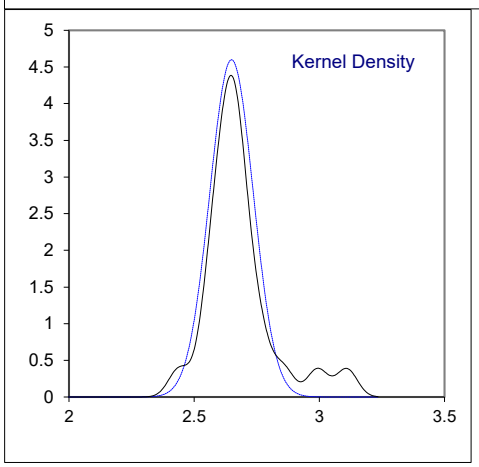

Kernel Density
35
30
25
20
15
10
5
0
0.1
0.15
0.2
0.25
0.3
0.35

Determination of Cyclohexane on sample #21036; results in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D5134	2.57		-0.86	
171	D5134	3.11	R(0.05)	4.95	
311		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381		-----		-----	
399		-----		-----	
444	D5134	2.5951		-0.59	
445		-----		-----	
657	D6730	2.6560		0.07	
754	D6729	2.629		-0.22	
779	D6729	2.571		-0.85	
781	D6729	2.628		-0.23	
785		-----		-----	
798		-----		-----	
824		-----		-----	
855		-----		-----	
862	D5134	2.70		0.54	
864		-----		-----	
868	D6729	2.6209		-0.31	
872		-----		-----	
873	GOST P52714	2.66		0.11	
874	D6729	2.666		0.18	
914		-----		-----	
922		-----		-----	
994	D5134	2.75		1.08	
1011		-----		-----	
1012		2.9932	R(0.05)	3.69	
1026		-----		-----	
1041	D5134	2.643		-0.07	
1062		-----		-----	
1065	In house	2.777		1.37	
1069	D5134	2.44		-2.25	
1081		-----		-----	
1135	D5134	2.54		-1.18	
1145		-----		-----	
1189		-----		-----	
1191	In house	1.8432	R(0.01)	-8.67	
1457		-----		-----	
1556	D6729	2.59		-0.64	
1586		-----		-----	
1656		-----		-----	
1720	D5134	2.684		0.37	
1737		-----		-----	
1776		-----		-----	
1788		2.858		2.24	
1796	D5134	2.631		-0.20	
1823		-----		-----	
1857	D5134	2.722		0.78	
1862	D5134	2.686		0.39	
1949		-----		-----	
1950	D5134 mod.	2.675		0.27	
1995		-----		-----	
6198		-----		-----	
6200		-----		-----	
6201		-----		-----	
6262		-----		-----	

	normality	suspect
	n	22
	outliers	3
	mean (n)	2.6496
	st.dev. (n)	0.08679
	R(calc.)	0.2430
	st.dev.(D5134:13)	0.09302
	R(D5134:13)	0.2604
Compare		
	R(Horwitz)	0.2563

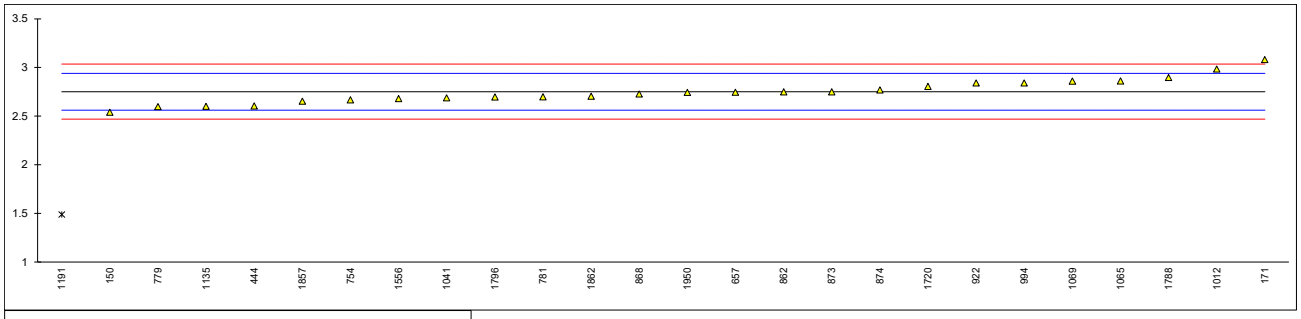

3.2
3
2.8
2.6
2.4
2.2
2
1.8
1191
1069
1135
150
779
1556
444
868
781
754
1796
1041
657
873
874
1950
1720
1862
862
1857
994
1065
1788
1012
171

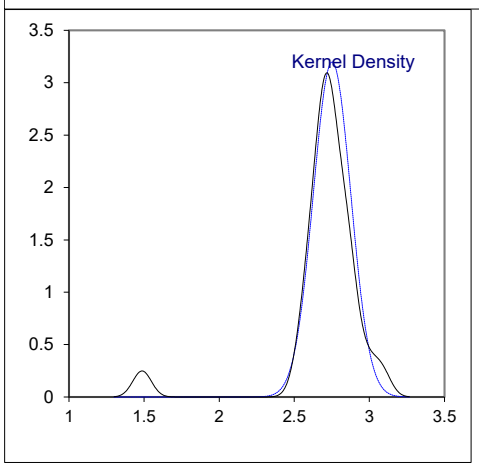

Kernel Density
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2
2.5
3
3.5

Determination of 2-Methylpentane on sample #21036; results in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D5134	2.54		-2.24	
171	D5134	3.08		3.48	
311		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381		-----		-----	
399		-----		-----	
444	D5134	2.6050		-1.55	
445		-----		-----	
657	D6730	2.7450		-0.07	
754	D6729	2.667		-0.89	
779	D6729	2.597		-1.63	
781	D6729	2.699		-0.55	
785		-----		-----	
798		-----		-----	
824		-----		-----	
855		-----		-----	
862	D5134	2.75		-0.02	
864		-----		-----	
868	D6729	2.7265		-0.26	
872		-----		-----	
873	GOST P52714	2.75		-0.02	
874	D6729	2.770		0.20	
914		-----		-----	
922	D6730	2.84		0.94	
994	D5134	2.84		0.94	
1011		-----		-----	
1012		2.9840		2.46	
1026		-----		-----	
1041	D5134	2.688		-0.67	
1062		-----		-----	
1065	In house	2.862		1.17	
1069	D5134	2.86		1.15	
1081		-----		-----	
1135	D5134	2.60		-1.60	
1145		-----		-----	
1189		-----		-----	
1191	In house	1.4873	R(0.01)	-13.38	
1457		-----		-----	
1556	D6729	2.68		-0.76	
1586		-----		-----	
1656		-----		-----	
1720	D5134	2.806		0.58	
1737		-----		-----	
1776		-----		-----	
1788		2.897		1.54	
1796	D5134	2.697		-0.58	
1823		-----		-----	
1857	D5134	2.653		-1.04	
1862	D5134	2.705		-0.49	
1949		-----		-----	
1950	D5134 mod.	2.744		-0.08	
1995		-----		-----	
6198		-----		-----	
6200		-----		-----	
6201		-----		-----	
6262		-----		-----	

	normality	OK
	n	25
	outliers	1
	mean (n)	2.7514
	st.dev. (n)	0.12479
	R(calc.)	0.3494
	st.dev.(Horwitz)	0.09451
	R(Horwitz)	0.2646
Compare		
	R(D5134:13)	0.0935

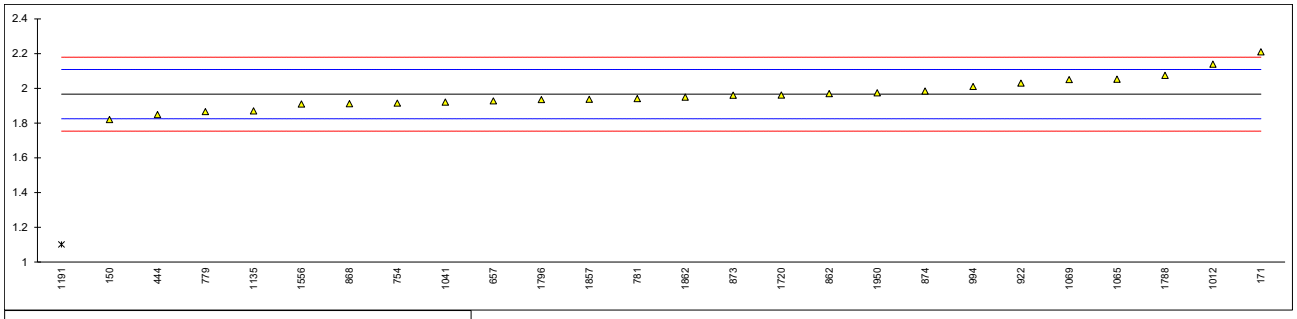

3.5
3
2.5
2
1.5
1
1191
150
779
1135
444
1857
754
1556
1041
1796
781
1862
868
1950
657
862
873
874
1720
922
994
1069
1065
1788
1012
171

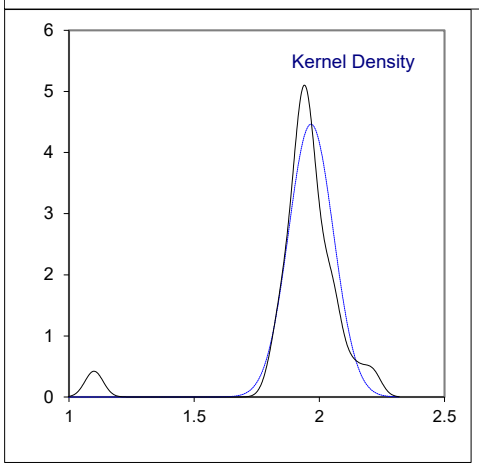

Kernel Density
3.5
3
2.5
2
1.5
1
0.5
0
1
1.5
2
2.5
3
3.5

Determination of 3-Methylpentane on sample #21036; results in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D5134	1.82		-2.06	
171	D5134	2.21		3.42	
311		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381		-----		-----	
399		-----		-----	
444	D5134	1.8483		-1.67	
445		-----		-----	
657	D6730	1.9271		-0.56	
754	D6729	1.915		-0.73	
779	D6729	1.866		-1.42	
781	D6729	1.941		-0.36	
785		-----		-----	
798		-----		-----	
824		-----		-----	
855		-----		-----	
862	D5134	1.97		0.05	
864		-----		-----	
868	D6729	1.9113		-0.78	
872		-----		-----	
873	GOST P52714	1.96		-0.09	
874	D6729	1.984		0.24	
914		-----		-----	
922	D6730	2.03		0.89	
994	D5134	2.01		0.61	
1011		-----		-----	
1012		2.1388		2.42	
1026		-----		-----	
1041	D5134	1.921		-0.64	
1062		-----		-----	
1065	In house	2.053		1.22	
1069	D5134	2.05		1.17	
1081		-----		-----	
1135	D5134	1.87		-1.36	
1145		-----		-----	
1189		-----		-----	
1191	In house	1.1002	R(0.01)	-12.19	
1457		-----		-----	
1556	D6729	1.91		-0.80	
1586		-----		-----	
1656		-----		-----	
1720	D5134	1.961		-0.08	
1737		-----		-----	
1776		-----		-----	
1788		2.075		1.52	
1796	D5134	1.935		-0.45	
1823		-----		-----	
1857	D5134	1.937		-0.42	
1862	D5134	1.949		-0.25	
1949		-----		-----	
1950	D5134 mod.	1.974		0.10	
1995		-----		-----	
6198		-----		-----	
6200		-----		-----	
6201		-----		-----	
6262		-----		-----	

	normality	suspect
	n	25
	outliers	1
	mean (n)	1.9667
	st.dev. (n)	0.08939
	R(calc.)	0.2503
	st.dev.(Horwitz)	0.07105
	R(Horwitz)	0.1989
Compare		
	R(D5134:13)	0.0669

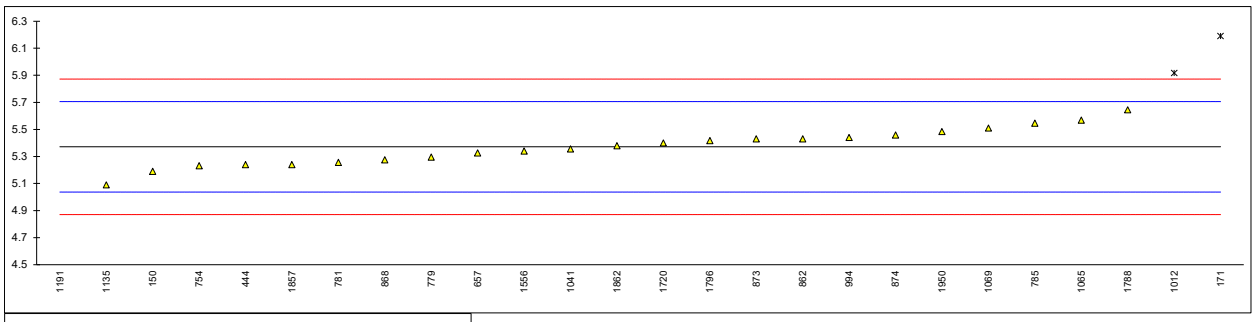

2.4
2.2
2
1.8
1.6
1.4
1.2
1
1191
150
444
779
1135
1556
868
754
1041
657
1796
1857
781
1862
873
1720
862
1950
874
994
922
1069
1065
1788
1012
171

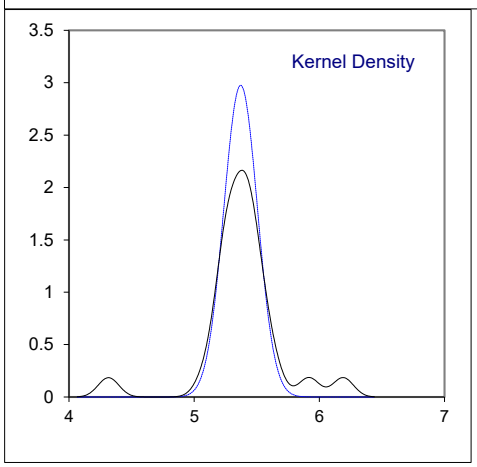

Kernel Density
6
5
4
3
2
1
0
1
1.5
2
2.5

Determination of Heptane on sample #21036; results in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D5134	5.19		-1.09	
171	D5134	6.19	R(0.01)	4.91	
311		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381		-----		-----	
399		-----		-----	
444	D5134	5.2397		-0.79	
445		-----		-----	
657	D6730	5.3257		-0.27	
754	D6729	5.231		-0.84	
779	D6729	5.295		-0.46	
781	D6729	5.256		-0.69	
785	D6729	5.545		1.04	
798		-----		-----	
824		-----		-----	
855		-----		-----	
862	D5134	5.43		0.35	
864		-----		-----	
868	D6729	5.2740		-0.58	
872		-----		-----	
873	GOST P52714	5.43		0.35	
874	D6729	5.458		0.52	
914		-----		-----	
922		-----		-----	
994	D5134	5.44		0.41	
1011		-----		-----	
1012		5.9170	R(0.05)	3.27	
1026		-----		-----	
1041	D5134	5.355		-0.10	
1062		-----		-----	
1065	In house	5.568		1.18	
1069	D5134	5.51		0.83	
1081		-----		-----	
1135	D5134	5.09		-1.69	
1145		-----		-----	
1189		-----		-----	
1191	In house	4.3158	R(0.01)	-6.33	
1457		-----		-----	
1556	D6729	5.34		-0.19	
1586		-----		-----	
1656		-----		-----	
1720	D5134	5.400		0.17	
1737		-----		-----	
1776		-----		-----	
1788		5.645		1.64	
1796	D5134	5.417		0.27	
1823		-----		-----	
1857	D5134	5.240		-0.79	
1862	D5134	5.379		0.05	
1949		-----		-----	
1950	D5134 mod.	5.483		0.67	
1995		-----		-----	
6198		-----		-----	
6200		-----		-----	
6201		-----		-----	
6262		-----		-----	

	normality	OK
	n	23
	outliers	3
	mean (n)	5.3714
	st.dev. (n)	0.13412
	R(calc.)	0.3755
	st.dev.(Horwitz)	0.16682
	R(Horwitz)	0.4671
Compare		
	R(D5134:13)	0.0695

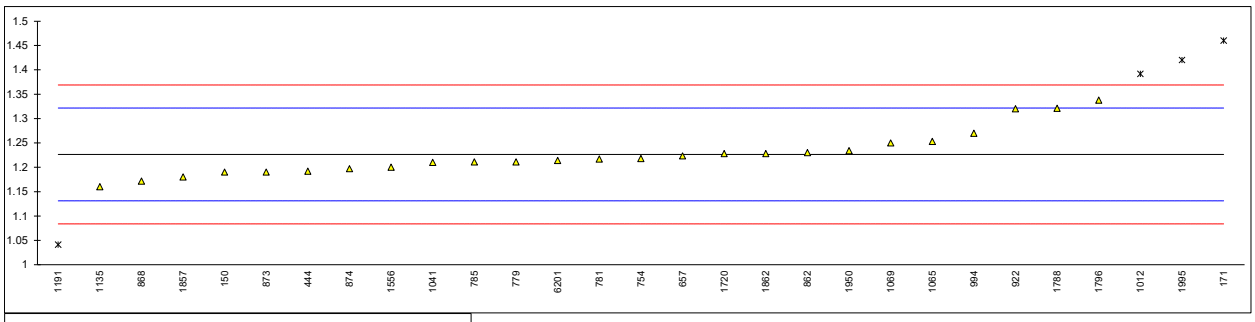

6.3
6.1
5.9
5.7
5.5
5.3
5.1
4.9
4.7
4.5
1191
1135
150
754
444
1857
781
868
779
657
1556
1041
1862
1720
1796
873
862
994
874
1950
1069
785
1065
1788
1012
171

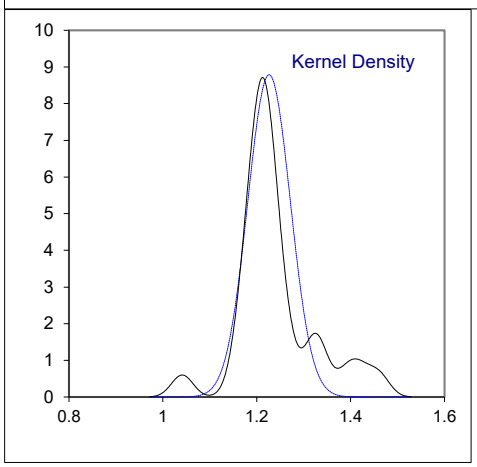

Kernel Density
3.5
3
2.5
2
1.5
1
0.5
0
4
5
6
7

Determination of Toluene on sample #21036; results in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D5134	1.19		-0.76	
171	D5134	1.46	R(0.05)	4.91	
311		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381		-----		-----	
399		-----		-----	
444	D5134	1.1919		-0.72	
445		-----		-----	
657	D6730	1.2233		-0.06	
754	D6729	1.218		-0.17	
779	D6729	1.211		-0.32	
781	D6729	1.217		-0.19	
785	D6729	1.211		-0.32	
798		-----		-----	
824		-----		-----	
855		-----		-----	
862	D5134	1.23		0.08	
864		-----		-----	
868	D6729	1.1715		-1.15	
872		-----		-----	
873	GOST P52714	1.19		-0.76	
874	D6729	1.197		-0.62	
914		-----		-----	
922	D6730	1.32		1.97	
994	D5134	1.27		0.92	
1011		-----		-----	
1012		1.3915	R(0.05)	3.47	
1026		-----		-----	
1041	D5134	1.210		-0.34	
1062		-----		-----	
1065	In house	1.253		0.56	
1069	D5134	1.25		0.50	
1081		-----		-----	
1135	D5134	1.16		-1.39	
1145		-----		-----	
1189		-----		-----	
1191	In house	1.0411	R(0.05)	-3.89	
1457		-----		-----	
1556	D6729	1.20		-0.55	
1586		-----		-----	
1656		-----		-----	
1720	D5134	1.228		0.04	
1737		-----		-----	
1776		-----		-----	
1788		1.321		1.99	
1796	D5134	1.338		2.35	
1823		-----		-----	
1857	D5134	1.180		-0.97	
1862	D5134	1.228		0.04	
1949		-----		-----	
1950	D5134 mod.	1.234		0.16	
1995	D7423	1.42	R(0.05)	4.07	
6198		-----		-----	
6200		-----		-----	
6201	D6730	1.214		-0.26	
6262		-----		-----	

	normality	not OK
	n	25
	outliers	4
	mean (n)	1.2263
	st.dev. (n)	0.04539
	R(calc.)	0.1271
	st.dev.(Horwitz)	0.04757
	R(Horwitz)	0.1332
Compare		
	R(D5134:13)	0.0380


1.5
1.45
1.4
1.35
1.3
1.25
1.2
1.15
1.1
1.05
1
1191
1135
868
1857
150
873
444
874
1556
1041
785
779
6201
781
754
657
1720
1862
862
1950
1069
1065
994
922
1788
1796
1012
1995
171


Kernel Density
10
9
8
7
6
5
4
3
2
1
0
0.8
1
1.2
1.4
1.6

Determination of Octane on sample #21036; results in %M/M

lab	method	value	mark	z(targ)	remarks
140		-----		-----	
150	D5134	6.30		-----	
171	D5134	6.53		-----	
311		-----		-----	
323		-----		-----	
333		-----		-----	
334		-----		-----	
349		-----		-----	
360		-----		-----	
381		-----		-----	
399		-----		-----	
444	D5134	5.6751		-----	
445		-----		-----	
657	D6730	6.1917		-----	
754	D6729	5.499		-----	
779	D6729	6.091		-----	
781	D6729	5.476		-----	
785	D6729	5.754		-----	
798		-----		-----	
824		-----		-----	
855		-----		-----	
862	D5134	6.61		-----	
864		-----		-----	
868	D6729	6.2222		-----	
872		-----		-----	
873	GOST P52714	5.62		-----	
874	D6729	5.633		-----	
914		-----		-----	
922		-----		-----	
994		-----		-----	
1011		-----		-----	
1012		6.9341		-----	
1026		-----		-----	
1041	D5134	6.376		-----	
1062		-----		-----	
1065	In house	5.747		-----	
1069	D5134	5.64		-----	
1081		-----		-----	
1135	D5134	5.63		-----	
1145		-----		-----	
1189		-----		-----	
1191	In house	6.0802		-----	
1457		-----		-----	
1556	D6729	6.39		-----	
1586		-----		-----	
1656		-----		-----	
1720		-----		-----	
1737		-----		-----	
1776		-----		-----	
1788		6.635		-----	
1796	D5134	5.899		-----	
1823		-----		-----	
1857	D5134	6.443		-----	
1862		-----		-----	
1949		-----		-----	
1950	D5134 mod.	6.325		-----	
1995		-----		-----	
6198		-----		-----	
6200		-----		-----	
6201		-----		-----	
6262		-----		-----	

	normality	OK
	n	23
	outliers	0
	mean (n)	6.0740
	st.dev. (n)	0.42107
	R(calc.)	1.1790
	st.dev.(D5134:13)	(0.15185)
	R(D5134:13)	(0.4252)
Compare		
	R(Horwitz)	(0.5185)

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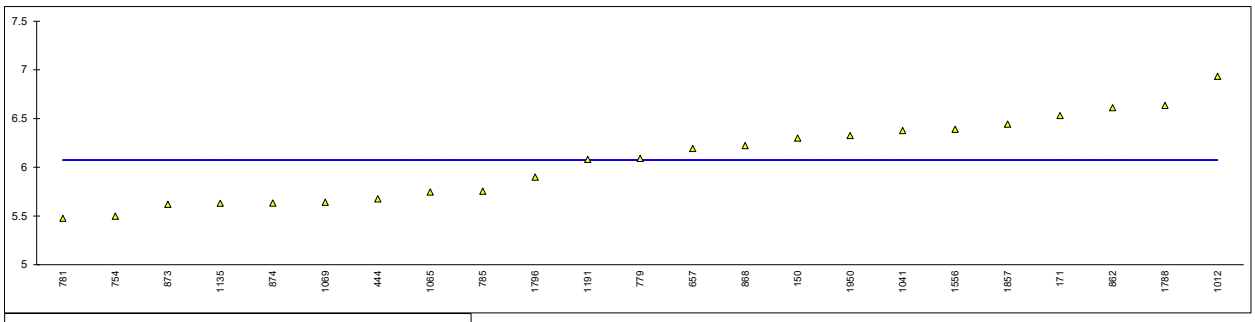
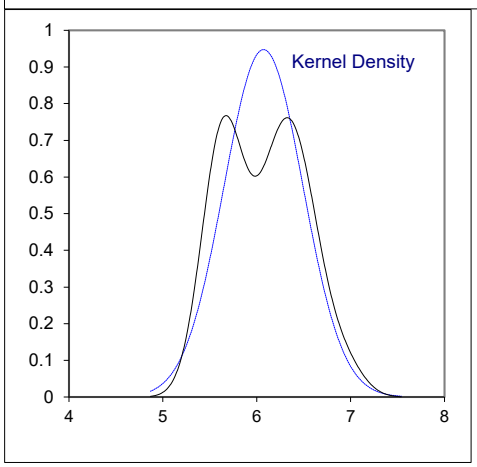

7.5
7
6.5
6
5.5
5
781
754
873
1135
874
1069
444
1065
785
1796
1191
779
657
868
150
1950
1041
1556
1857
171
862
1788
1012


Kernel Density
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
4
5
6
7
8

APPENDIX 2

Number of participants per country

1 lab in AUSTRALIA
1 lab in AZERBAIJAN
4 labs in BELGIUM
1 lab in BULGARIA
6 labs in CHINA, People's Republic
1 lab in EGYPT
2 labs in FINLAND
3 labs in FRANCE
1 lab in GERMANY
1 lab in INDIA
1 lab in ISRAEL
1 lab in ITALY
1 lab in MALTA
6 labs in NETHERLANDS
1 lab in NIGERIA
1 lab in PAKISTAN
2 labs in PORTUGAL
13 labs in RUSSIAN FEDERATION
1 lab in SERBIA
1 lab in SINGAPORE
1 lab in SOUTH KOREA
1 lab in SPAIN
1 lab in SUDAN
2 labs in SWEDEN
1 lab in THAILAND
3 labs in UNITED KINGDOM
3 labs in UNITED STATES OF AMERICA

APPENDIX 3

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's outlier test
E	= calculation difference between reported test result and result calculated by iis
W	= test result withdrawn on request of participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
SDS	= Safety Data Sheet

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