Results of Proficiency Test
Natural Gas Analysis
April 2016

Organised by: Institute for Interlaboratory Studies (iis)
Spijkenisse Netherlands

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1 INTRODUCTION

Since 2009, the Institute for Interlaboratory Studies (iis) organizes proficiency tests for the analysis of Natural Gas (composition only) every year. In the annual proficiency testing program of 2015/2016, it was decided to continue the proficiency test for the analysis of Natural Gas.
Because iis has limited gas-handling facilities in place to prepare gas samples, a co-operation with EffecTech (Uttoxeter, United Kingdom) was set up. This company is fully equipped and has experience in the preparation of synthetic natural gas samples for PT purposes. EffecTech maintains an ISO17043 accreditation for the preparation of PT samples in homogeneous and stable batches and an ISO17025 accreditation for the calibration and assignment of reference values for these samples.
In the interlaboratory study for Natural Gas 63 laboratories from 32 different countries registered for participation. See appendix 2 for the number of participants per country. In this report, the results of the proficiency test Natural Gas 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. To optimise the costs for the participating laboratories, it was decided to prepare one natural gas mixture. Samples were divided over a batch of 53 cylinders. The cylinder size is a cost-effective one-litre cylinder. Each cylinder was uniquely numbered. The limited cylinder size is chosen to optimise transport and handling costs.
The analyses of the samples for fit-for-use and homogeneity testing were subcontracted to an accredited laboratory. Participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 QUALITY SYSTEM

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, has implemented a quality system based on ISO/IEC17043:2010. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from participants on the reported data is encouraged and customer's satisfaction is measured on a regular basis by sending out questionnaires.
EffecTech is an accredited provider of proficiency testing schemes under the requirements of ISO/IEC17043:2010 by UKAS (no. 4719).

2.2 PROTOCOL

The protocol followed in the organisation of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of April 2014 (iis-protocol, version 3.3). This protocol is also electronically available through the iis website site 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

In this proficiency test one gas sample was used. The necessary one litre cylinders with artificial natural gas mixture was prepared and tested for homogeneity by EffecTech (Uttoxeter, United Kingdom) in conformance with ISO Guide 35: 2006 and ISO/IEC17043:2010.
One batch of 63 cylinders was prepared (job 16/0038) starting in January, 2016. Each cylinder was uniquely numbered. Every cylinder in the batch was analysed using eight replicate measurements. The within bottle and between bottle variations were then assessed in accordance with ISO Guide 35:2006 (Annex A.1). This procedure showed that the between bottle variations were all small compared to the uncertainties on the reference values on each component. Hence, a single reference value could be safely assigned to the entire batch of samples.
The repeatability values (r) were calculated per component by multiplication of the respective standard deviation by 2.8. Subsequently, the calculated repeatabilities were compared with 0.3 times the reproducibility of the reference method in agreement with the procedure of ISO 13528, Annex B2 in the next table:

Parameter	r (abs, observed) in %mol/mol	0.3xR (abs, ISO6974-3) in %mol/lmol
Methane	0.0063	0.0543
Ethane	0.0036	0.0363
Propane	0.0017	0.0182
iso-Butane	0.0005	0.0054
n-Butane	0.0007	0.0036
Carbon dioxide	0.0011	0.0081
Nitrogen	0.0019	0.0227

Table 1: evaluation of homogeneity test results against ISO6974-3 requirements

From the above table it is clear that all observed repeatabilities are far less than 0.3 times the respective reproducibilities of the reference method ISO6974-3.
Therefore, the homogeneity of the prepared cylinders was assumed.

To each of the participating laboratories one 1L gas cylinder, labelled #16040 was sent on March 16, 2016.

2.5 STABILITY OF THE SAMPLES

EffecTech (Uttoxeter, United Kingdom) declares that the prepared gas cylinders have a shelf life of at least 6 months. This is sufficient for the proficiency testing purposes.

2.6 ANALYSES

The participants were requested to determine on sample #16040: Methane, Ethane, Propane, n-Butane, iso-Butane, Carbon dioxide, Nitrogen, Carbon content, Caloric Value (superior and inferior), Density, Relative Density and Wobbe index.

To get comparable test results a detailed report form, on which the units were prescribed as well as the reference test methods and a letter of instructions were prepared and made available on the data entry portal www.kpmd.co.uk/sgs-iis/. A SDS and a form to confirm receipt of the samples was added to the sample package.

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 reanalysis). Additional or corrected test results are used for data analysis and the original test results are placed under the test 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 Organization, Statistics and Evaluation’ of April 2014 (iis-protocol, version 3.3). For the statistical evaluation the *unrounded* (when available) test results 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 judgment of the normality being either ‘unknown’, ‘OK’, ‘suspect’ or ‘not OK’. After removal of outliers,

this check was repeated. Not all data sets proved to have a normal distribution, in which cases the statistical evaluation of the test results should be used with due care.

In accordance with ISO 5725 the original test results per determination were submitted to Dixon's, Grubbs' and/or Rosner's outlier tests. Outliers are marked by D(0.01) for the Dixon 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 test, by G(0.05) or DG(0.05) for the Grubbs test and by R(0.05) for the Rosner test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value, the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. When the uncertainty passed the evaluation, no remarks are made in the report. However, when the uncertainty failed the evaluation it is mentioned in the report and it will have consequences for the evaluation of the test results.

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

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported 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 an "cross". Accepted data are represented as a triangle. Furthermore, Kernel Density Graphs were made. The Kernel Density Graph is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also a normal Gauss curve was projected over the Kernel Density Graph for reference.

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ISO and ASTM reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation of 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. In some cases, a reproducibility based on former iis proficiency tests could be used.

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

The z-scores were calculated in accordance with:

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

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

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

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

4 EVALUATION

In this proficiency test several problems were encountered with the dispatch of the samples, therefore, it was decided to extend the final reporting date with a week to provide the participants the opportunity to report their test results. Laboratories in Brazil, Colombia, Cote D'Ivoire, Iran and Iraq did receive the samples late or not at all due to several reasons.
Finally, one laboratory reported results after the final reporting date and three participants were not able to report any test results. In total 60 participants reported 691 numerical results. Observed were 50 outlying results, which is 7.2% of the numerical results. In proficiency studies outlier percentages of 3% - 7.5% are quite normal.

4.1 EVALUATION PER TEST

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

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.

Six laboratories reported deviating results on the gas composition values. At least three of the seven test results were statistical outliers for each of the laboratories 446, 551, 593, 1011, 6052 and 7011. As the seven test results are not independent, it was decided not to use any of the reported results of these laboratories for the statistical evaluation. Also the reported results of these six laboratories were excluded for the statistical evaluation of the Caloric Value (sup), Caloric Value (inf), Density, Relative Density and Wobbe index, since these values were calculated from the measured gas composition.

Methane: This determination of this component was problematic. Seven statistical outliers were observed and one test result was excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:00 and/or ASTM D1945:14.

Ethane: This determination of this component was problematic for a number of laboratories. Four statistical outliers were observed and two test results were excluded. The calculated reproducibility after rejection of the suspect data is in full agreement with the requirements of ISO6974-3:00, but not in agreement with the requirements of ASTM D1945:14.

Propane: This determination of this component was problematic depending on the test method used. Four statistical outliers were observed and two test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:00, but in good agreement with the requirements of ASTM D1945:14.

i-Butane: This determination of this component was not problematic. Two statistical outliers were observed and four test results were excluded. However, the calculated reproducibility after rejection of the suspect data is in good agreement with the requirements of ISO6974-3:00 and/or ASTM D1945:14.

n-Butane: This determination of this component was problematic depending on the test method used. One statistical outlier was observed and five test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:00, but in good agreement with the requirements of ASTM D1945:14.

Carbon Dioxide: This determination of this component was problematic depending on the test method used. Three statistical outliers were observed and three test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:00, but in good agreement with the requirements of ASTM D1945:14.

Nitrogen: This determination of this component was problematic. Four statistical outliers were observed and two test results were excluded. The calculated reproducibility after rejection of the suspect data is not at all in agreement with the requirements of ISO6974-3:00 and/or ASTM D1945:14.

Carbon content: This determination of this component was not problematic. One statistical outlier was observed. However, the calculated reproducibility after rejection of the statistical outlier is in good agreement with the requirements of EN15984:11.

Calculated parameters, general remark:

In this PT, the calculated parameters were reported for two combustion temperatures (15 and 25°C) for real gas. The number of participants with test results for 15°C and 25°C varied between 22 and 31.

Caloric Value (Sup.): The calculation at combustion temperature 25°C/metering temperature 0°C may be problematic for a number of laboratories. One statistical outlier was found and two test results were excluded. Six test results were marked as calculation errors. The spread for real gas was small compared to the previously observed spread in iis15S01M.

The calculation at combustion temperature 15°C/metering temperature 15°C may be problematic for a number of laboratories. One statistical outlier was found and one test result was excluded. Eight test results were marked as calculation errors. The spread for real gas was large compared to the previously observed spread in iis15S01M.

Caloric Value (Inf.): The calculation at combustion temperature 25°C/metering temperature 0°C may be problematic for a number of laboratories. One statistical outlier was found and two test results were excluded. The uncertainty (%) for real gas was in agreement with the uncertainty of Caloric Value Superior

The calculation at combustion temperature 15°C/metering temperature 15°C may be problematic for a number of laboratories. Three statistical outliers were found and two test results were excluded. Three test results were probably reported in a different unit. The uncertainty (%) for real gas was large compared to the uncertainty of Caloric Value Superior.

Density: The calculation at combustion temperature 25°C/metering temperature 0°C may be problematic for a number of laboratories. Four statistical outliers were found and one test result was excluded. Six test results were marked as calculation errors. The spread for real gas was much smaller than the previously observed spread in iis15S01M.

The calculation at combustion temperature 15°C/metering temperature 15°C may be problematic for a number of laboratories. Two statistical outliers were found and two test results were excluded. Nine test results were marked as calculation errors. However, the spread for real gas was about equal to the previously observed spread in iis15S01M.

Relative density: The calculation at combustion temperature 25°C/metering temperature 0°C may be problematic for a number of laboratories. Two statistical outliers were found. Three calculation errors were observed. The spread for real gas was smaller than the previously observed spread in iis15S01M.

The calculation at combustion temperature 15°C/metering temperature 15°C may be problematic for a number of laboratories. Five statistical outliers were found. Five calculation errors were observed. The spread for real gas was smaller than the previously observed spread in iis15S01M.

Wobbe index: The calculation at combustion temperature 25°C/metering temperature 0°C may be problematic for a number of laboratories. Two statistical outliers were found and one test result was excluded. Five test results were marked as calculation errors. However, the spread for real gas was smaller than the previously observed spread in iis15S01M.

The calculation at combustion temperature 15°C/metering temperature 15°C may be problematic for a number of laboratories. One statistical outlier was found and one test result was excluded. Eight test results were marked as calculation errors. However, the spread for real gas was smaller than the previously observed spread in iis15S01M.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant reference test method and the reproducibility as found for the group of participating laboratories. The consensus value per component, calculated reproducibilities and reproducibilities derived from ISO6974-3 and ASTM D1945 are compared in the next table.

	unit	n	cons. value	2.8 * sd	R(ISO6974-3)	R(D1945)
Methane	%mol/mol	52	90.497	0.216	0.181	0.150
Ethane	%mol/mol	54	4.032	0.122	0.121	0.100
Propane	%mol/mol	54	2.018	0.075	0.061	0.100
iso-Butane	%mol/mol	54	0.300	0.017	0.018	0.070
n-Butane	%mol/mol	54	0.201	0.015	0.012	0.070
Carbon dioxide	%mol/mol	54	0.446	0.061	0.027	0.070
Nitrogen	%mol/mol	54	2.497	0.196	0.075	0.100
Carbon content	g/100g	7	72.29	0.51	1.59	R(EN15984)

Table 2: Performance of the group in comparison with the target reproducibilities

Without further statistical calculations it can be concluded that for several components there is not a good compliance of the group of participating laboratories with the relevant reference test method. The problematic components have been discussed in paragraph 4.1.

The average results per calculation for the real gas, observed reproducibilities are compared in table 3 and 4.

Combustion temperature 25°C, metering temperature 0°C, real gas				
Property	unit	n	cons. value	2.8 * sd
Caloric Value (Sup)	MJ/m^3	18	41.52	0.14
Caloric Value (Inf)	kJ/100g	5	4705	4
Density	kg/m^3	17	0.7967	0.0013
Relative Density		18	0.6162	0.0010
Wobbe Index	MJ/m^3	17	52.88	0.10

Table 3: Performance of the group for combustion temperature of 25°C, real gas

Combustion temperature 15°C, metering temperature 15°C, real gas				
Property	unit	n	cons. value	2.8 * sd
Caloric Value (Sup)	MJ/m^3	29	39.39	0.14
Caloric Value (Inf)	kJ/100g	7	4727	126
Density	kg/m^3	30	0.7548	0.0032
Relative Density		27	0.6161	0.0013
Wobbe Index	MJ/m^3	29	50.19	0.17

Table 4: Performance of the group for combustion temperature of 15°C, real gas

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

4.3 COMPARISON OF THE PROFICIENCY TEST OF APRIL 2016 WITH PREVIOUS PTS

	April 2016	April 2015	April 2014	April 2013
Total Number of reporting labs	60	47	38	33
Number of results reported	691	533	600	466
Statistical outliers	50	33	38	29
Percentage outliers	7.2%	6.2%	6.5%	6.2%

Table 5: comparison with previous proficiency tests.

In proficiency tests, outlier percentages of 3% - 7.5% are quite normal.

The performance of the determinations of the proficiency tests was compared against the requirements of the respective reference test methods. The conclusions are given the following table:

	2016 ISO6974-3	2016 D1945	2015 ISO6974-3	2015 D1945	2014 ISO6974-3	2014 D1945	2013 ISO6974-3	2013 D1945
Methane	--	--	--	--	--	--	--	--
Ethane	+/-	-	+/-	+	++	+	+	-
Propane	-	++	-	++	-	++	-	++
iso-Butane	+/-	++	+/-	++	++	++	-	++
n-Butane	-	++	+/-	++	+/-	++	--	++
Carbon dioxide	--	+/-	--	++	--	--	--	+/-
Nitrogen	--	--	--	--	--	--	--	--

Table 6: comparison of observed precision with precision of ISO6974-3 / ASTM D1945

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

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

5 DISCUSSION

Many of the observed reproducibilities are larger than the reproducibility requirements of ISO6974-3 and therefore it had to be concluded that no improvement was observed since the 2010 PT for Natural Gas and that the determination of the composition of Natural Gas was still problematic for a significant number of participating laboratories.

The consensus values as determined in this PT are compared with the average values from the homogeneity testing by the supplier EffecTech in the following table.

Parameter	Average values by EffecTech in %mol/mol	Consensus values from participants results in %mol/mol	Absolute differences in %mol/mol
Methane	90.4731	90.4972	0.0241
Ethane	4.0316	4.0315	0.0001
Propane	2.0241	2.0177	0.0064
iso-Butane	0.3011	0.3001	0.0010
n-Butane	0.2024	0.2009	0.0015
Carbon dioxide	0.4491	0.4460	0.0031
Nitrogen	2.5185	2.4974	0.0211

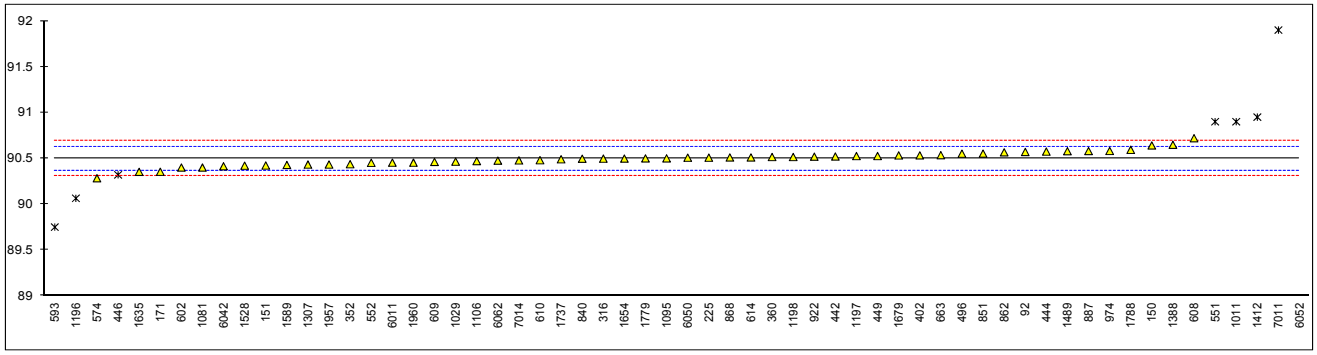
Table 7: comparison of consensus values with values determined by the supplier EffecTech

From the comparison in table 7 it is clear that the consensus values as determined in this PT are all very well in line with the values as determined during the preparation of the gas cylinders.

APPENDIX 1

Determination of Methane on sample #16040; results in %mol/mol

lab	method	value	mark	z(targ)	remarks
92	GPA2286	90.57		1.13	
150	D1945	90.641		2.22	
151	GPA2261	90.422		-1.16	
171	D1945	90.3536		-2.22	
225	D1945	90.508		0.17	
316	ISO6974-3	90.497		0.00	
352	ISO6974-3	90.4364		-0.94	
360	ISO6974-3	90.515		0.28	
402	ISO6975	90.533		0.55	
442	D1945	90.5206		0.36	
444	D1945	90.574		1.19	
446	EN15984	90.320	ex	-2.74	Result excluded, see §4.1
449	D1945	90.5256		0.44	
496	EN15984	90.551		0.83	
551	GPA-2286	90.900	R(0.01)	6.23	
552	D1945	90.4519		-0.70	
574	GPA2286	90.283		-3.31	
593	D1945	89.75	C,R(0.01)	-11.56	First reported 89.9000
602	GPA2261	90.40		-1.50	
608	GPA2261	90.72		3.45	
609	GPA2261	90.4616		-0.55	
610	GPA2261	90.48		-0.27	
614	GPA2261	90.51		0.20	
663	D1945	90.535		0.59	
840	D1945	90.496		-0.02	
851	GPA2261	90.5523		0.85	
862	GPA2261	90.566		1.06	
868	GPA2261	90.51		0.20	
887	D1945	90.58		1.28	
922	GPA2261	90.519		0.34	
963		-----		-----	
974	ISO6974-5	90.5813		1.30	
1011	EN15984	90.90	R(0.01)	6.23	
1029	D1945	90.4642		-0.51	
1081		90.4		-1.50	
1095	EN15984	90.50	C	0.04	First reported 91.025
1106	ISO6976	90.470		-0.42	
1196	GPA2261	90.064	R(0.01)	-6.70	
1197	D1945	90.525		0.43	
1198	D1945	90.515		0.28	
1200		-----		-----	
1307	In house	90.4325		-1.00	
1388	GPA2261	90.648		2.33	
1412	GPA2261	90.95	R(0.01)	7.01	
1489	GPA2261	90.578		1.25	
1528	ISO6975	90.4200	C	-1.19	First reported 90.3200
1589	D1945	90.4280		-1.07	
1635	D1945	90.353		-2.23	
1654	D1945	90.498		0.01	
1679	ISO6974-3	90.532		0.54	
1737	In house	90.49		-0.11	
1779	GPA2261	90.4995		0.04	
1788	D7833	90.5934		1.49	
1892		-----		-----	
1957	GPA2261	90.433		-0.99	
1960	ISO6974	90.4533		-0.68	
6011	D1945	90.45325		-0.68	
6042	ISO6974-3	90.414		-1.29	
6050	ISO6974-3	90.5073		0.16	
6052	D1945	92.4520	R(0.01)	30.24	
6062	ISO6975	90.4754		-0.34	
7011	ISO6974-3	91.9	R(0.01)	21.70	
7014	D1945	90.4777		-0.30	
	normality	suspect			
	n	52			
	outliers	7 (+1 excl)			
	mean (n)	90.4972			
	st.dev. (n)	0.07722			
	R(calc.)	0.2162			
	R(ISO6974-3:00)	0.1810			Compare R(D1945:14) = 0.1500


92
91.5
91
90.5
90
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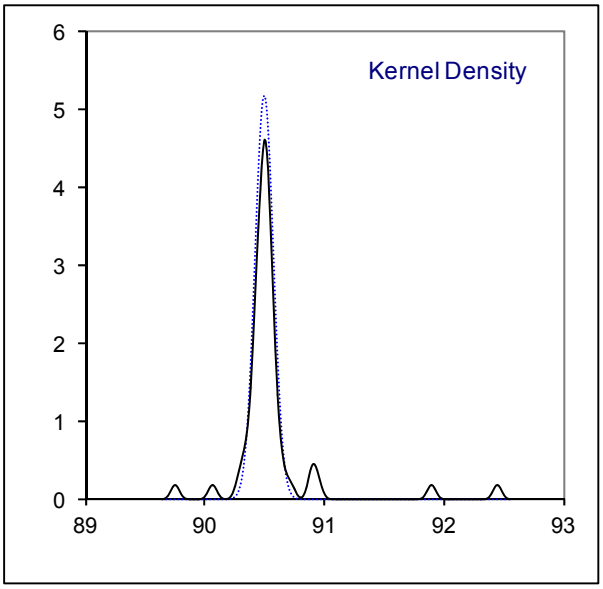
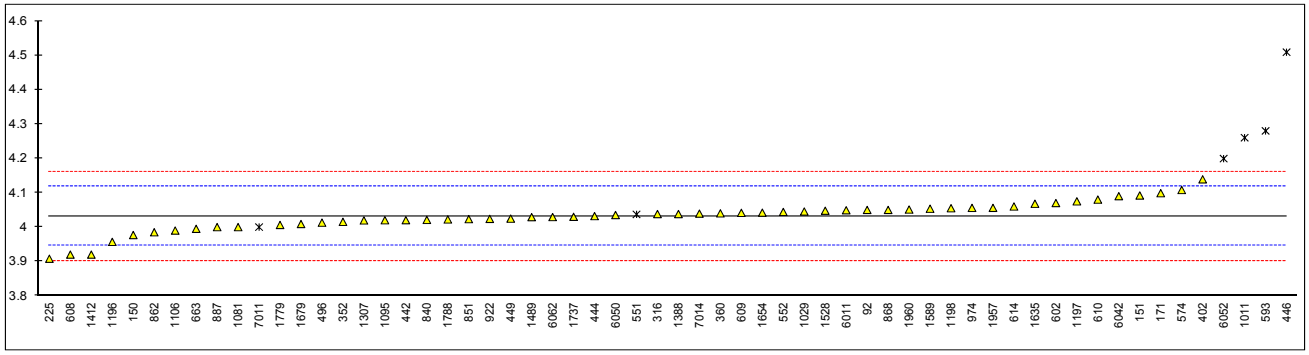
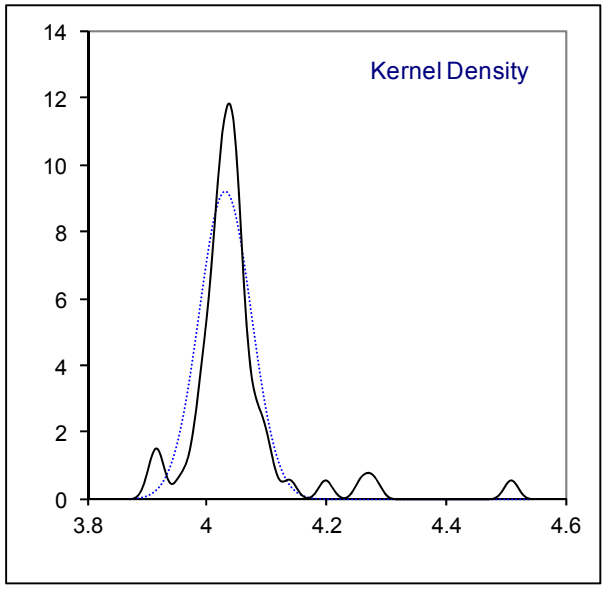

Kernel Density
6
5
4
3
2
1
0
89
90
91
92
93

Determination of Ethane on sample #16040; results in %mol/mol

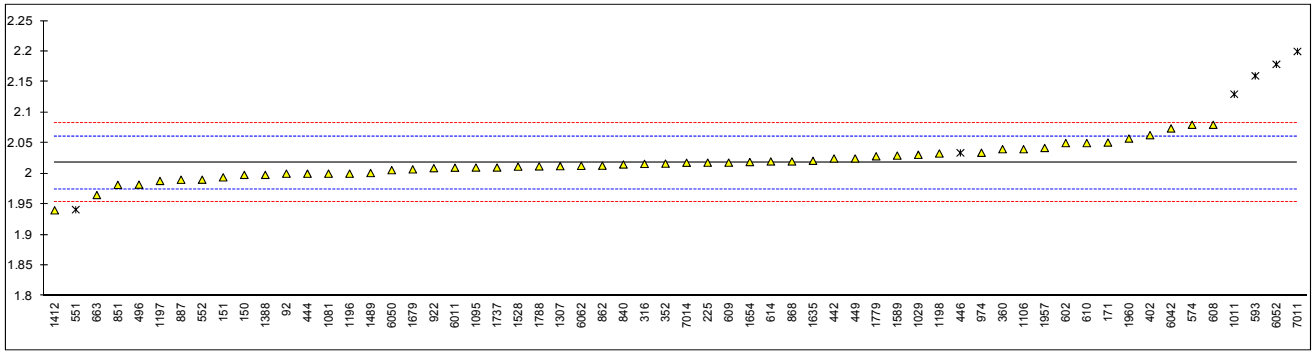
lab	method	value	mark	z(targ)	remarks
92	GPA2286	4.05		0.43	
150	D1945	3.977		-1.26	
151	GPA2261	4.092		1.40	
171	D1945	4.0987		1.55	
225	D1945	3.908	C	-2.86	First reported 3.897
316	ISO6974-3	4.038		0.15	
352	ISO6974-3	4.0154		-0.37	
360	ISO6974-3	4.040		0.20	
402	ISO6975	4.139		2.49	
442	D1945	4.0202		-0.26	
444	D1945	4.032		0.01	
446	EN15984	4.509	R(0.01)	11.05	
449	D1945	4.0247		-0.16	
496	EN15984	4.013		-0.43	
551	GPA-2286	4.037	ex	0.13	Result excluded, see §4.1
552	D1945	4.0441		0.29	
574	GPA2286	4.108		1.77	
593	D1945	4.28	C,R(0.01)	5.75	First reported 4.0200
602	GPA2261	4.07		0.89	
608	GPA2261	3.92		-2.58	
609	GPA2261	4.0415		0.23	
610	GPA2261	4.08		1.12	
614	GPA2261	4.06		0.66	
663	D1945	3.995		-0.85	
840	D1945	4.021		-0.24	
851	GPA2261	4.0232		-0.19	
862	GPA2261	3.985		-1.08	
868	GPA2261	4.05		0.43	
887	D1945	4.00		-0.73	
922	GPA2261	4.024		-0.17	
963		-----		-----	
974	ISO6974-5	4.0559		0.56	
1011	EN15984	4.26	R(0.01)	5.29	
1029	D1945	4.0454		0.32	
1081		4.0		-0.73	
1095	EN15984	4.02	C	-0.27	First reported 4.074
1106	ISO6976	3.990		-0.96	
1196	GPA2261	3.957		-1.73	
1197	D1945	4.075		1.01	
1198	D1945	4.055		0.54	
1200		-----		-----	
1307	In house	4.0194		-0.28	
1388	GPA2261	4.038		0.15	
1412	GPA2261	3.92		-2.58	
1489	GPA2261	4.029		-0.06	
1528	ISO6975	4.047567		0.37	
1589	D1945	4.0535		0.51	
1635	D1945	4.068		0.84	
1654	D1945	4.042		0.24	
1679	ISO6974-3	4.009		-0.52	
1737	In house	4.03		-0.04	
1779	GPA2261	4.0063		-0.58	
1788	D7833	4.0223		-0.21	
1892		-----		-----	
1957	GPA2261	4.056		0.57	
1960	ISO6974	4.0511		0.45	
6011	D1945	4.0491		0.41	
6042	ISO6974-3	4.090		1.35	
6050	ISO6974-3	4.0352		0.08	
6052	D1945	4.1992	R(0.05)	3.88	
6062	ISO6975	4.0292		-0.05	
7011	ISO6974-3	4.0	ex	-0.73	Result excluded, see §4.1
7014	D1945	4.0392		0.18	
	normality	suspect			
	n	54			
	outliers	4 (+2 excl)			
	mean (n)	4.0315			
	st.dev. (n)	0.04342			
	R(calc.)	0.1216			
	R(ISO6974-3:00)	0.1209			Compare R(D1945:14) = 0.1000

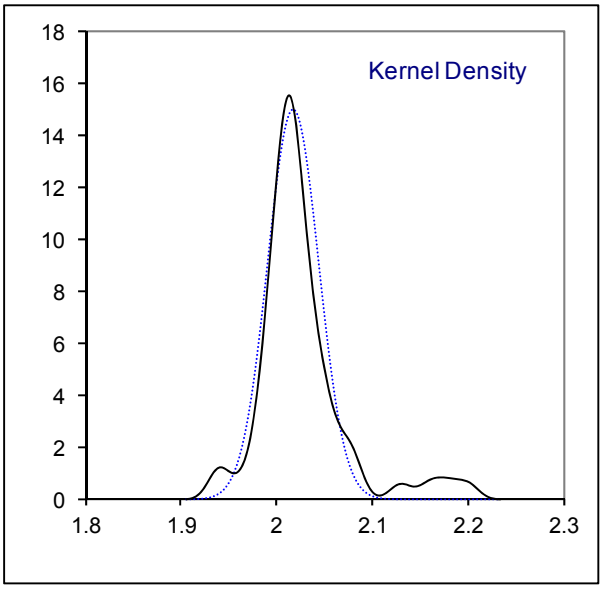

4.6
4.5
4.4
4.3
4.2
4.1
4
3.9
3.8
225 608 1412 1196 150 862 1106 663 887 1081 7011 1779 1679 496 352 1307 1095 442 840 1788 851 922 449 1489 6062 1737 444 6050 551 316 1388 7014 360 609 1654 552 1029 1528 6011 92 868 1960 1589 1198 974 1957 614 1635 602 1197 610 6042 151 171 574 402 6052 1011 593 446


Kernel Density
14
12
10
8
6
4
2
0
3.8
4
4.2
4.4
4.6

Determination of Propane on sample #16040; results in %mol/mol

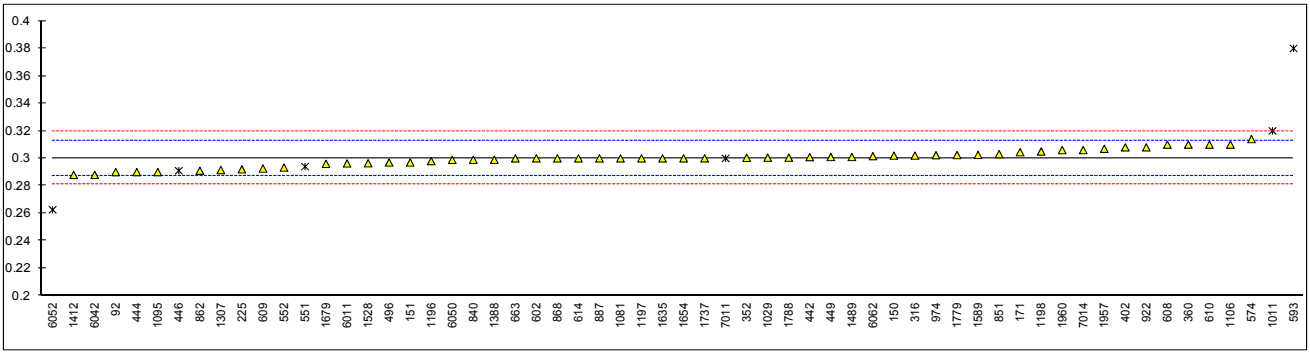
lab	method	value	mark	z(targ)	remarks
92	GPA2286	2.00		-0.82	
150	D1945	1.998		-0.91	
151	GPA2261	1.994		-1.10	
171	D1945	2.0509		1.54	
225	D1945	2.018	C	0.01	First reported 2.267
316	ISO6974-3	2.016		-0.08	
352	ISO6974-3	2.0164		-0.06	
360	ISO6974-3	2.040		1.03	
402	ISO6975	2.063		2.10	
442	D1945	2.0248		0.33	
444	D1945	2.000		-0.82	
446	EN15984	2.034	ex	0.75	Result excluded, see §4.1
449	D1945	2.0248		0.33	
496	EN15984	1.982		-1.65	
551	GPA-2286	1.941	ex	-3.55	Result excluded, see §4.1
552	D1945	1.9901		-1.28	
574	GPA2286	2.080		2.88	
593	D1945	2.16	C,R(0.01)	6.58	First reported 2.0200
602	GPA2261	2.05		1.49	
608	GPA2261	2.08		2.88	
609	GPA2261	2.0180		0.01	
610	GPA2261	2.05		1.49	
614	GPA2261	2.02		0.11	
663	D1945	1.965		-2.44	
840	D1945	2.015		-0.12	
851	GPA2261	1.9816		-1.67	
862	GPA2261	2.013		-0.22	
868	GPA2261	2.02		0.11	
887	D1945	1.99		-1.28	
922	GPA2261	2.009		-0.40	
963		-----		-----	
974	ISO6974-5	2.0342		0.76	
1011	EN15984	2.13	R(0.05)	5.20	
1029	D1945	2.0309		0.61	
1081		2.0		-0.82	
1095	EN15984	2.01	C	-0.36	First reported 2.05
1106	ISO6976	2.040		1.03	
1196	GPA2261	2.000		-0.82	
1197	D1945	1.988		-1.37	
1198	D1945	2.033		0.71	
1200		-----		-----	
1307	In house	2.0123		-0.25	
1388	GPA2261	1.998		-0.91	
1412	GPA2261	1.94		-3.59	
1489	GPA2261	2.001		-0.77	
1528	ISO6975	2.011552		-0.28	
1589	D1945	2.0295		0.55	
1635	D1945	2.021		0.15	
1654	D1945	2.019		0.06	
1679	ISO6974-3	2.007		-0.49	
1737	In house	2.01		-0.36	
1779	GPA2261	2.0284		0.50	
1788	D7833	2.0119		-0.27	
1892		-----		-----	
1957	GPA2261	2.042		1.12	
1960	ISO6974	2.0575		1.84	
6011	D1945	2.00975		-0.37	
6042	ISO6974-3	2.074		2.60	
6050	ISO6974-3	2.0057		-0.55	
6052	D1945	2.1789	R(0.01)	7.46	
6062	ISO6975	2.0128		-0.23	
7011	ISO6974-3	2.2	R(0.01)	8.43	
7014	D1945	2.0179		0.01	
	normality	suspect			
	n	54			
	outliers	4 (+2 excl)			
	mean (n)	2.0177			
	st.dev. (n)	0.02669			
	R(calc.)	0.0747			
	R(ISO6974-3:00)	0.0605			Compare R(D1945:14) = 0.1000

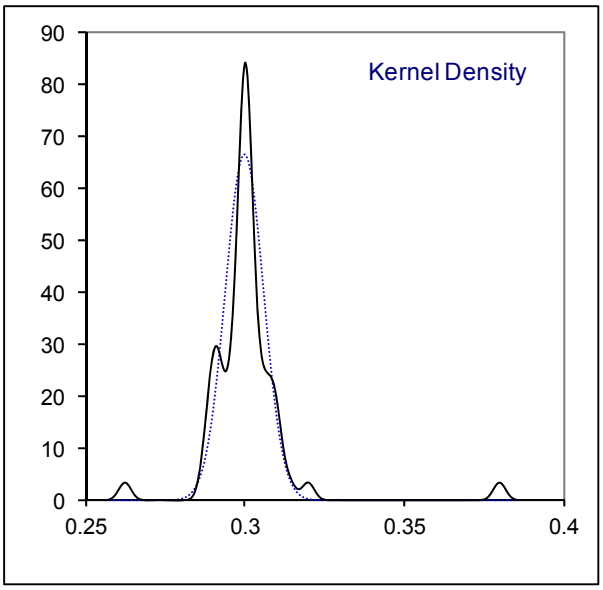

2.25
2.2
2.15
2.1
2.05
2
1.95
1.9
1.85
1.8
1412 551 663 851 496 1197 887 552 151 150 1388 92 444 1081 1196 1489 6050 1679 922 6011 1095 1737 1528 1788 1307 6062 862 840 316 352 7014 225 609 1654 614 868 1635 442 449 1779 1589 1029 1198 446 974 360 1106 1957 602 610 171 1960 402 6042 574 608 1011 593 6052 7011


Kernel Density
18
16
14
12
10
8
6
4
2
0
1.8
1.9
2
2.1
2.2
2.3

Determination of iso-Butane on sample #16040; results in %mol/mol

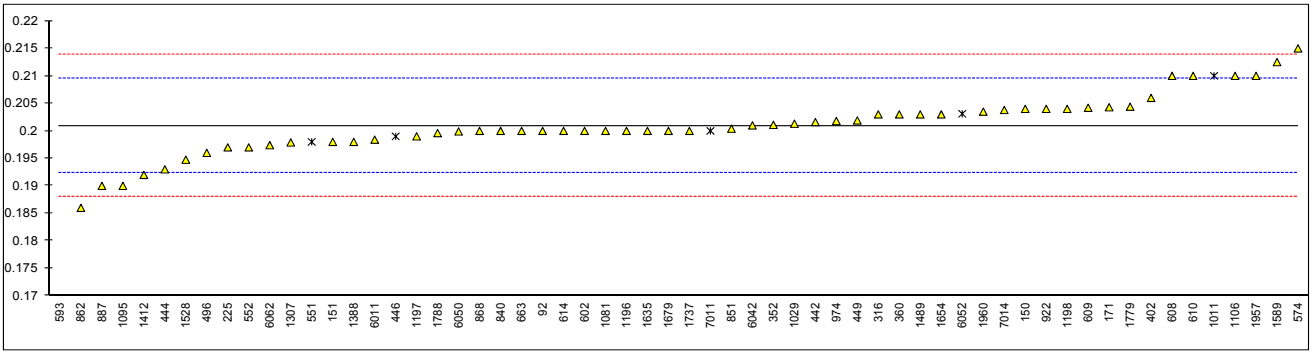
lab	method	value	mark	z(targ)	remarks
92	GPA2286	0.29		-1.56	
150	D1945	0.302		0.30	
151	GPA2261	0.297		-0.47	
171	D1945	0.3045		0.69	
225	D1945	0.292		-1.25	
316	ISO6974-3	0.302		0.30	
352	ISO6974-3	0.3004		0.05	
360	ISO6974-3	0.310		1.55	
402	ISO6975	0.308		1.24	
442	D1945	0.3009		0.13	
444	D1945	0.290		-1.56	
446	EN15984	0.291	ex	-1.41	Result excluded, see §4.1
449	D1945	0.3010		0.15	
496	EN15984	0.297		-0.47	
551	GPA-2286	0.294	ex	-0.94	Result excluded, see §4.1
552	D1945	0.2933		-1.05	
574	GPA2286	0.314		2.17	
593	D1945	0.38	C,R(0.01)	12.43	First reported 0.5800
602	GPA2261	0.30		-0.01	
608	GPA2261	0.31		1.55	
609	GPA2261	0.2926		-1.16	
610	GPA2261	0.31		1.55	
614	GPA2261	0.30		-0.01	
663	D1945	0.300		-0.01	
840	D1945	0.299		-0.16	
851	GPA2261	0.3031		0.47	
862	GPA2261	0.291		-1.41	
868	GPA2261	0.30		-0.01	
887	D1945	0.30		-0.01	
922	GPA2261	0.308		1.24	
963		---		---	
974	ISO6974-5	0.3023		0.35	
1011	EN15984	0.32	ex	3.10	Result excluded, see §4.1
1029	D1945	0.3005		0.07	
1081		0.3		-0.01	
1095	EN15984	0.29	C	-1.56	First reported 0.301
1106	ISO6976	0.310		1.55	
1196	GPA2261	0.298		-0.32	
1197	D1945	0.300		-0.01	
1198	D1945	0.305		0.77	
1200		---		---	
1307	In house	0.2915		-1.33	
1388	GPA2261	0.299		-0.16	
1412	GPA2261	0.288		-1.87	
1489	GPA2261	0.301		0.15	
1528	ISO6975	0.296415		-0.57	
1589	D1945	0.3025		0.38	
1635	D1945	0.300		-0.01	
1654	D1945	0.300		-0.01	
1679	ISO6974-3	0.296		-0.63	
1737	In house	0.30		-0.01	
1779	GPA2261	0.3024		0.37	
1788	D7833	0.3005		0.07	
1892		---		---	
1957	GPA2261	0.307		1.08	
1960	ISO6974	0.3060		0.93	
6011	D1945	0.2963		-0.58	
6042	ISO6974-3	0.288		-1.87	
6050	ISO6974-3	0.2989		-0.18	
6052	D1945	0.2626	R(0.01)	-5.82	
6062	ISO6975	0.3016		0.24	
7011	ISO6974-3	0.3	ex	-0.01	Result excluded, see §4.1
7014	D1945	0.3060		0.93	
	normality	OK			
	n	54			
	outliers	2 (+4 excl)			
	mean (n)	0.3001			
	st.dev. (n)	0.00599			
	R(calc.)	0.0168			
	R(ISO6974-3:00)	0.0180			Compare R(D1945:14) = 0.0700

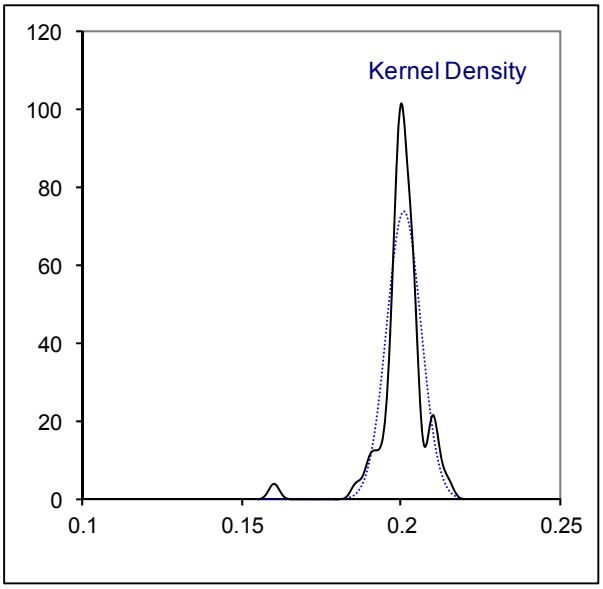

0.4
0.38
0.36
0.34
0.32
0.3
0.28
0.26
0.24
0.22
0.2
6052 1412 6042 92 444 1095 446 862 1307 225 609 552 551 1679 6011 1528 496 151 1196 6050 840 1388 663 602 868 614 887 1081 1197 1635 1654 1737 7011 352 1029 1788 442 449 1489 6062 150 316 974 1779 1589 851 171 1198 1960 7014 1957 402 922 608 360 610 1106 574 1011 593


Kernel Density
90
80
70
60
50
40
30
20
10
0
0.25
0.3
0.35
0.4

Determination of n-Butane on sample #16040; results in %mol/mol

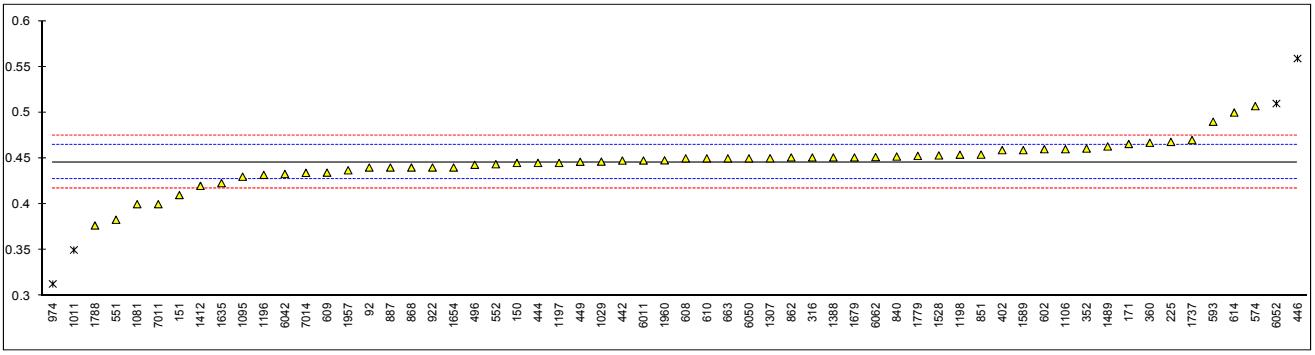
lab	method	value	mark	z(targ)	remarks
92	GPA2286	0.20		-0.22	
150	D1945	0.204		0.71	
151	GPA2261	0.198		-0.68	
171	D1945	0.2043		0.78	
225	D1945	0.197		-0.92	
316	ISO6974-3	0.203		0.48	
352	ISO6974-3	0.2011		0.04	
360	ISO6974-3	0.203		0.48	
402	ISO6975	0.206		1.18	
442	D1945	0.2016		0.15	
444	D1945	0.193		-1.84	
446	EN15984	0.199	ex	-0.45	Result excluded, see §4.1
449	D1945	0.2019		0.22	
496	EN15984	0.196		-1.15	
551	GPA-2286	0.198	ex	-0.68	Result excluded, see §4.1
552	D1945	0.1970		-0.92	
574	GPA2286	0.215		3.27	
593	D1945	0.16	C,R(0.01)	-9.51	First reported 0.1800
602	GPA2261	0.20		-0.22	
608	GPA2261	0.21		2.10	
609	GPA2261	0.2042		0.76	
610	GPA2261	0.21		2.10	
614	GPA2261	0.20		-0.22	
663	D1945	0.200		-0.22	
840	D1945	0.200		-0.22	
851	GPA2261	0.2004		-0.13	
862	GPA2261	0.186		-3.47	
868	GPA2261	0.20		-0.22	
887	D1945	0.19		-2.54	
922	GPA2261	0.204		0.71	
963		-----		-----	
974	ISO6974-5	0.2018		0.20	
1011	EN15984	0.21	ex	2.10	Result excluded, see §4.1
1029	D1945	0.2013		0.08	
1081		0.2		-0.22	
1095	EN15984	0.19	C	-2.54	First reported 0.202
1106	ISO6976	0.210		2.10	
1196	GPA2261	0.200		-0.22	
1197	D1945	0.199		-0.45	
1198	D1945	0.204		0.71	
1200		-----		-----	
1307	In house	0.1979		-0.71	
1388	GPA2261	0.198		-0.68	
1412	GPA2261	0.192		-2.08	
1489	GPA2261	0.203		0.48	
1528	ISO6975	0.194756		-1.44	
1589	D1945	0.2125		2.68	
1635	D1945	0.200		-0.22	
1654	D1945	0.203		0.48	
1679	ISO6974-3	0.200		-0.22	
1737	In house	0.20		-0.22	
1779	GPA2261	0.2044		0.80	
1788	D7833	0.1996		-0.31	
1892		-----		-----	
1957	GPA2261	0.210		2.10	
1960	ISO6974	0.2035		0.59	
6011	D1945	0.1984		-0.59	
6042	ISO6974-3	0.201		0.01	
6050	ISO6974-3	0.1999		-0.24	
6052	D1945	0.2031	ex	0.50	Result excluded, see §4.1
6062	ISO6975	0.1974		-0.82	
7011	ISO6974-3	0.2	ex	-0.22	Result excluded, see §4.1
7014	D1945	0.2038		0.66	
	normality	suspect			
	n	54			
	outliers	1 (+5 excl)			
	mean (n)	0.2009			
	st.dev. (n)	0.00539			
	R(calc.)	0.0151			
	R(ISO6974-3:00)	0.0121			Compare R(D1945:14) = 0.0700

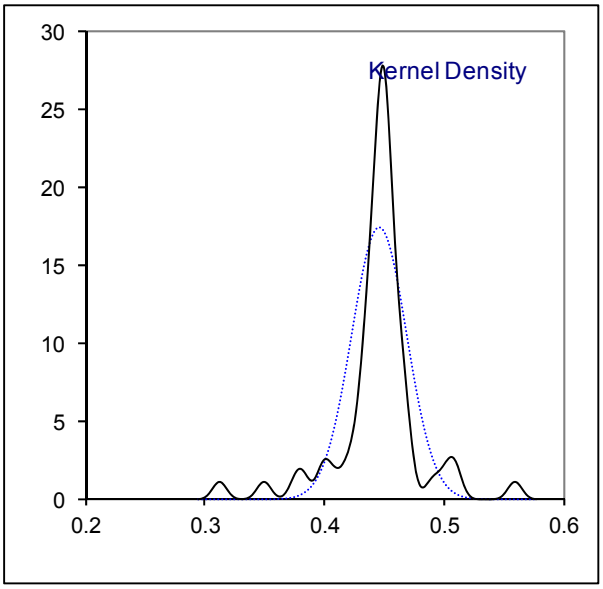

0.22
0.215
0.21
0.205
0.2
0.195
0.19
0.185
0.18
0.175
0.17
593 862 887 1095 1412 444 1528 496 225 552 6062 1307 551 151 1388 6011 446 1197 1788 6050 868 840 663 92 614 602 1081 1196 1635 1679 1737 7011 851 6042 352 1029 442 974 449 316 360 1489 1654 6052 1960 7014 150 922 1198 609 171 1779 402 608 610 1011 1106 1957 1589 574


Kernel Density
120
100
80
60
40
20
0
0.1
0.15
0.2
0.25

Determination of Carbon Dioxide on sample #16040; results in %mol/mol

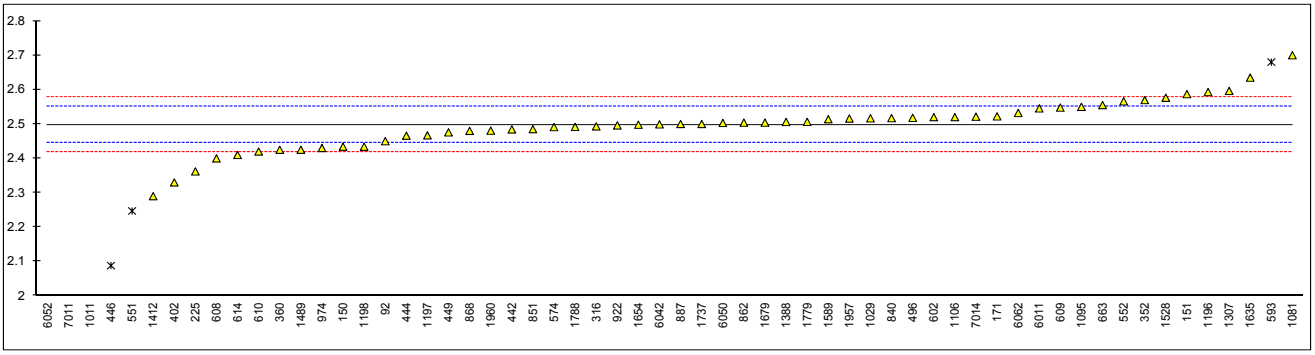
lab	method	value	mark	z(targ)	remarks
92	GPA2286	0.44		-0.62	
150	D1945	0.445		-0.10	
151	GPA2261	0.410		-3.76	
171	D1945	0.4657		2.07	
225	D1945	0.468		2.31	
316	ISO6974-3	0.451		0.53	
352	ISO6974-3	0.4607		1.54	
360	ISO6974-3	0.467		2.20	
402	ISO6975	0.459		1.36	
442	D1945	0.4476		0.17	
444	D1945	0.445		-0.10	
446	EN15984	0.559	R(0.01)	11.83	
449	D1945	0.4463		0.04	
496	EN15984	0.443		-0.31	
551	GPA-2286	0.383		-6.59	
552	D1945	0.4436		-0.25	
574	GPA2286	0.507		6.39	
593	D1945	0.49	C,ex	4.61	First reported 0.4200. Result excluded, see §4.1
602	GPA2261	0.46		1.47	
608	GPA2261	0.45		0.42	
609	GPA2261	0.4344		-1.21	
610	GPA2261	0.45		0.42	
614	GPA2261	0.50		5.65	
663	D1945	0.450		0.42	
840	D1945	0.452		0.63	
851	GPA2261	0.4541		0.85	
862	GPA2261	0.451		0.53	
868	GPA2261	0.44		-0.62	
887	D1945	0.44		-0.62	
922	GPA2261	0.440		-0.62	
963		-----		-----	
974	ISO6974-5	0.3130	C,R(0.01)	-13.91	First reported 0.3943
1011	EN15984	0.35	R(0.05)	-10.04	
1029	D1945	0.4465		0.06	
1081		0.4		-4.81	
1095	EN15984	0.43	C	-1.67	First reported 0.437
1106	ISO6976	0.460		1.47	
1196	GPA2261	0.432		-1.46	
1197	D1945	0.445		-0.10	
1198	D1945	0.454		0.84	
1200		-----		-----	
1307	In house	0.4501		0.43	
1388	GPA2261	0.451		0.53	
1412	GPA2261	0.420		-2.72	
1489	GPA2261	0.463		1.78	
1528	ISO6975	0.453233		0.76	
1589	D1945	0.4590		1.36	
1635	D1945	0.423		-2.40	
1654	D1945	0.440		-0.62	
1679	ISO6974-3	0.451		0.53	
1737	In house	0.47		2.52	
1779	GPA2261	0.4527		0.71	
1788	D7833	0.3768		-7.24	
1892		-----		-----	
1957	GPA2261	0.437		-0.94	
1960	ISO6974	0.4479	C	0.20	First reported 0.6048
6011	D1945	0.4477		0.18	
6042	ISO6974-3	0.433		-1.36	
6050	ISO6974-3	0.4500		0.42	
6052	D1945	0.5098	ex	6.68	Result excluded, see §4.1
6062	ISO6975	0.4514		0.57	
7011	ISO6974-3	0.4	ex	-4.81	Result excluded, see §4.1
7014	D1945	0.4342		-1.23	
	normality	not OK			
	n	54			
	outliers	3 (+3 excl)			
	mean (n)	0.44596			
	st.dev. (n)	0.021628			
	R(calc.)	0.06056			
	R(ISO6974-3:00)	0.02676			Compare R(D1945:14) = 0.0700

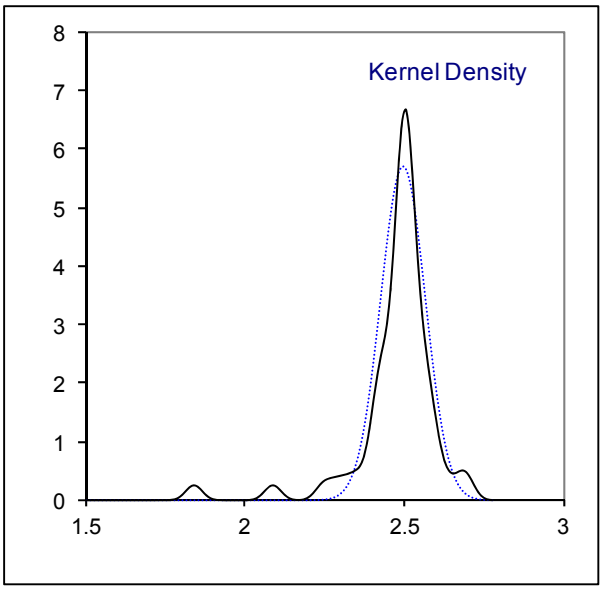

0.6
0.55
0.5
0.45
0.4
0.35
0.3
974 1011 1788 551 1081 7011 151 1412 1635 1095 1196 6042 7014 609 1957 92 887 868 922 1654 496 552 150 444 1197 449 1029 442 6011 1960 608 610 663 6050 1307 862 316 1388 1679 6062 840 1779 1528 1198 851 402 1589 602 1106 352 1489 171 360 225 1737 593 614 574 6052 446


Kernel Density
30
25
20
15
10
5
0
0.2
0.3
0.4
0.5
0.6

Determination of Nitrogen on sample #16040; results in %mol/mol

lab	method	value	mark	z(targ)	remarks
92	GPA2286	2.45		-1.77	
150	D1945	2.434		-2.37	
151	GPA2261	2.587		3.35	
171	D1945	2.5223		0.93	
225	D1945	2.362	C	-5.06	First reported 2.357
316	ISO6974-3	2.493		-0.16	
352	ISO6974-3	2.5696		2.70	
360	ISO6974-3	2.425		-2.71	
402	ISO6975	2.330	C	-6.26	First reported 2.291
442	D1945	2.4843		-0.49	
444	D1945	2.466		-1.17	
446	EN15984	2.088	R(0.01)	-15.30	
449	D1945	2.4757		-0.81	
496	EN15984	2.518		0.77	
551	GPA-2286	2.247	ex	-9.36	Result excluded, see §4.1
552	D1945	2.5660		2.56	
574	GPA2286	2.491		-0.24	
593	D1945	2.68	C,ex	6.82	First reported 2.8800. Result excluded, see §4.1
602	GPA2261	2.52		0.84	
608	GPA2261	2.40	C	-3.64	First reported 2.31
609	GPA2261	2.5478		1.88	
610	GPA2261	2.42		-2.89	
614	GPA2261	2.41		-3.27	
663	D1945	2.555		2.15	
840	D1945	2.517		0.73	
851	GPA2261	2.4852		-0.46	
862	GPA2261	2.504		0.25	
868	GPA2261	2.48		-0.65	
887	D1945	2.50		0.10	
922	GPA2261	2.496		-0.05	
963		-----		-----	
974	ISO6974-5	2.4302		-2.51	
1011	EN15984	1.84	R(0.01)	-24.57	
1029	D1945	2.5166		0.72	
1081		2.7		7.57	
1095	EN15984	2.55	C	1.97	First reported 2.561
1106	ISO6976	2.520		0.84	
1196	GPA2261	2.593		3.57	
1197	D1945	2.467		-1.14	
1198	D1945	2.434		-2.37	
1200		-----		-----	
1307	In house	2.5963		3.70	
1388	GPA2261	2.506		0.32	
1412	GPA2261	2.29		-7.75	
1489	GPA2261	2.425		-2.71	
1528	ISO6975	2.5764	C	2.95	First reported 2.676406
1589	D1945	2.5140		0.62	
1635	D1945	2.635		5.14	
1654	D1945	2.498		0.02	
1679	ISO6974-3	2.504		0.25	
1737	In house	2.50		0.10	
1779	GPA2261	2.5063		0.33	
1788	D7833	2.4914		-0.22	
1892		-----		-----	
1957	GPA2261	2.516		0.70	
1960	ISO6974	2.4807		-0.62	
6011	D1945	2.54545		1.80	
6042	ISO6974-3	2.499		0.06	
6050	ISO6974-3	2.5030		0.21	
6052	D1945	0.1944	R(0.01)	-86.07	
6062	ISO6975	2.5321		1.30	
7011	ISO6974-3	0.9	R(0.01)	-59.70	
7014	D1945	2.5212		0.89	
	normality	suspect			
	n	54			
	outliers	4 (+2 excl)			
	mean (n)	2.4974			
	st.dev. (n)	0.07013			
	R(calc.)	0.1964			
	R(ISO6974-3:00)	0.0749			Compare R(D1945:14) = 0.1000

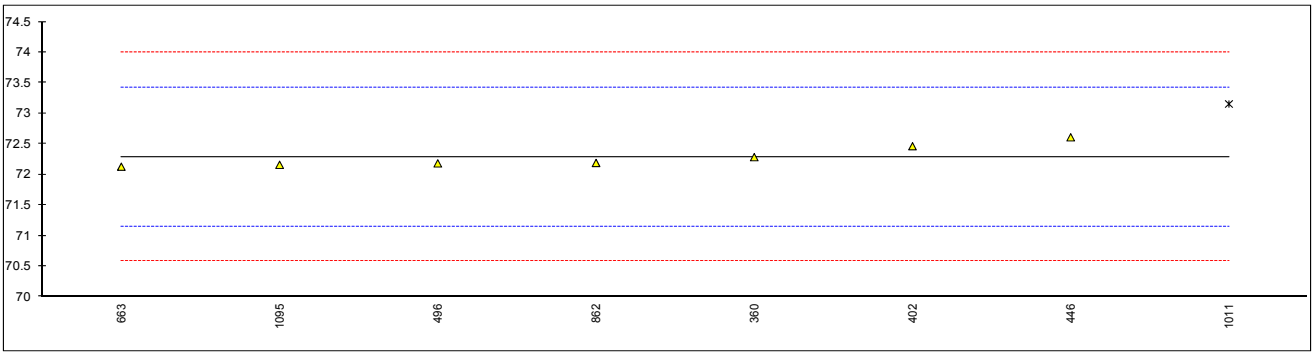

2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2
6052 7011 1011 446 551 1412 402 225 608 614 610 360 1489 974 150 1198 92 444 1197 449 868 1960 442 851 574 1788 316 922 1654 6042 887 1737 6050 862 1679 1388 1779 1589 1957 1029 840 496 602 1106 7014 171 6062 6011 609 1095 663 552 352 1528 151 1196 1307 1635 593 1081

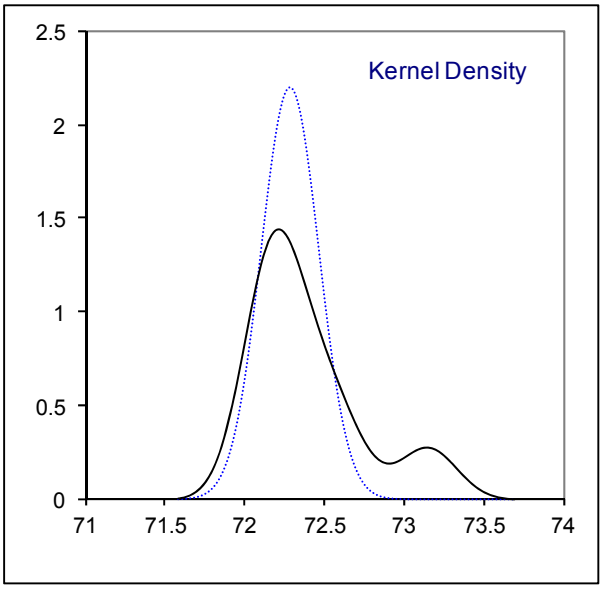

Kernel Density
8
7
6
5
4
3
2
1
0
1.5
2
2.5
3

Determination of Carbon content on sample #16040; results in g/100g

lab	method	value	mark	z(targ)	remarks
92		-----		-----	
150		-----		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360	EN15984	72.2848		-0.01	
402	EN15984	72.4641		0.31	
442		-----		-----	
444		-----		-----	
446	EN15984	72.61		0.57	
449		-----		-----	
496	EN15984	72.183		-0.19	
551		-----		-----	
552		-----		-----	
574		-----		-----	
593		-----		-----	
602		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
614		-----		-----	
663	EN15984	72.129		-0.28	
840		-----		-----	
851		-----		-----	
862	GPA2261	72.19		-0.17	
868		-----		-----	
887		-----		-----	
922		-----		-----	
963		-----		-----	
974		-----		-----	
1011	EN15984	73.155	G(0.05)	1.53	
1029		-----		-----	
1081		-----		-----	
1095	EN15984	72.16		-0.23	
1106		-----		-----	
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388		-----		-----	
1412		-----		-----	
1489		-----		-----	
1528		-----		-----	
1589		-----		-----	
1635		-----		-----	
1654		-----		-----	
1679		-----		-----	
1737		-----		-----	
1779		-----		-----	
1788		-----		-----	
1892		-----		-----	
1957		-----		-----	
1960		-----		-----	
6011		-----		-----	
6042		-----		-----	
6050		-----		-----	
6052		-----		-----	
6062		-----		-----	
7011		-----		-----	
7014		-----		-----	

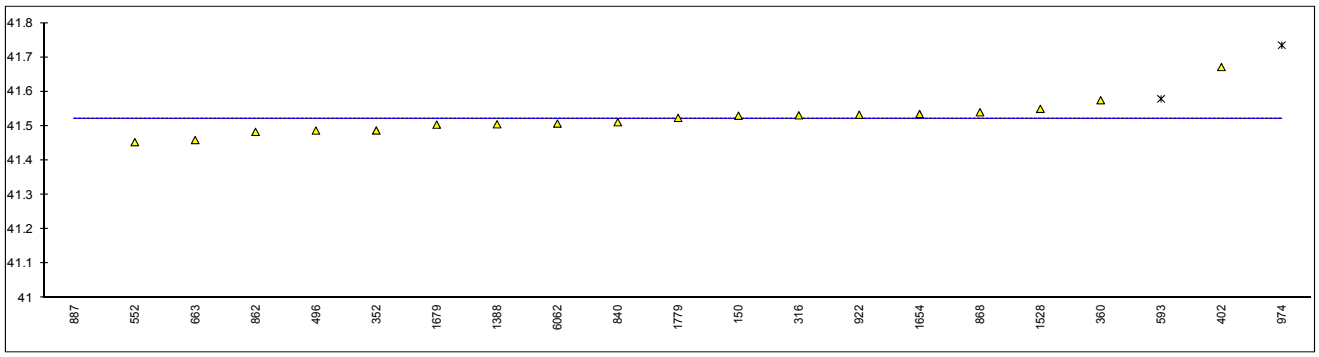
normality	unknown
n	7
outliers	1
mean (n)	72.289
st.dev. (n)	0.1812
R(calc.)	0.507
R(EN15984:11)	1.590

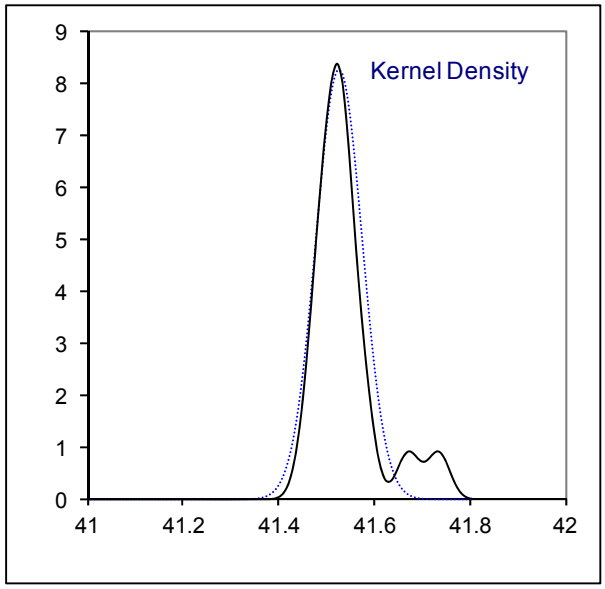

74.5
74
73.5
73
72.5
72
71.5
71
70.5
70
663
1095
496
862
360
402
446
1011


Kernel Density
2.5
2
1.5
1
0.5
0
71
71.5
72
72.5
73
73.5
74

Determination of Caloric Value Superior (101.325 kPa, comb. temp. 25°C, metering temp 0°C) on sample #16040; results in MJ/m^3 (real gas)

lab	method	value	mark	z(targ)	remarks
92		-----		-----	
150	ISO6976	41.530		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316	ISO6976	41.531		-----	
352	ISO6976	41.487		-----	
360	ISO6976	41.575		-----	
402	ISO6976	41.6716	C	-----	First reported 41.6759
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	41.4868		-----	
551		-----		-----	
552	ISO6976	41.453	E	-----	iis calculated 41.474
574		-----		-----	
593	ISO6976	41.579	C,ex,E	-----	First reported 41.601, result excluded, see §4.1, iis calculated 41.592
602		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
614		-----		-----	
663	ISO6976	41.459	C	-----	First reported 41.342
840	ISO6976	41.511		-----	
851		-----		-----	
862	ISO6976	41.483		-----	
868	ISO6976	41.54		-----	
887	D3588	39.30099	C,ex,E	-----	First reported 39.3099, iis calculated 41.493, different temp and press.
922	ISO6976	41.5328		-----	
963		-----		-----	
974	GPA2172	41.735	C,G(0.05),E	-----	First reported 41.703, iis calculated 41.595
1011		-----		-----	
1029		-----		-----	
1081		-----		-----	
1095		-----		-----	
1106		-----		-----	
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388	ISO6976	41.505	E	-----	iis calculated 41.564
1412		-----		-----	
1489		-----		-----	
1528	ISO6976	41.55	E	-----	Iis calculated 41.485
1589		-----		-----	
1635		-----		-----	
1654	ISO6976	41.535		-----	
1679	ISO6976	41.504		-----	
1737		-----		-----	
1779	ISO6976	41.5236		-----	
1788		-----		-----	
1892		-----		-----	
1957		-----		-----	
1960		-----		-----	
6011		-----		-----	
6042		-----		-----	
6050		-----		-----	
6052		-----		-----	
6062	ISO6976	41.507		-----	
7011		-----		-----	
7014		-----		-----	
	normality	not OK			
	n	18			
	outliers	1 (+2 excl)			
	mean (n)	41.5214			
	st.dev. (n)	0.04875			
	R(calc.)	0.1365			Compare R(iis15S01M) = 0.1855

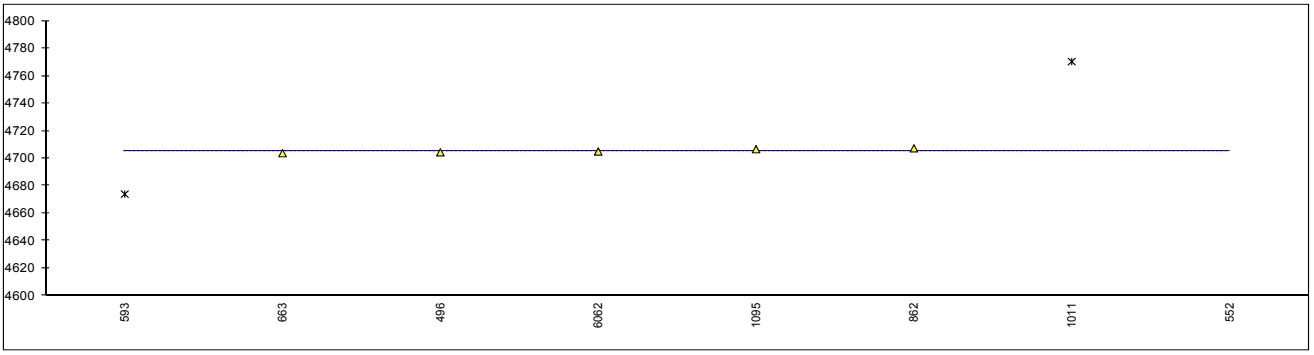

41.8
41.7
41.6
41.5
41.4
41.3
41.2
41.1
41
887
552
663
862
496
352
1679
1388
6062
840
1779
150
316
922
1654
868
1528
360
593
402
974


Kernel Density
9
8
7
6
5
4
3
2
1
0
41
41.2
41.4
41.6
41.8
42

Determination of Caloric Value Inferior (101.325 kPa, comb. temp. 25°C, metering temp 0°C) on sample #16040; results in KJ/100g (real gas)

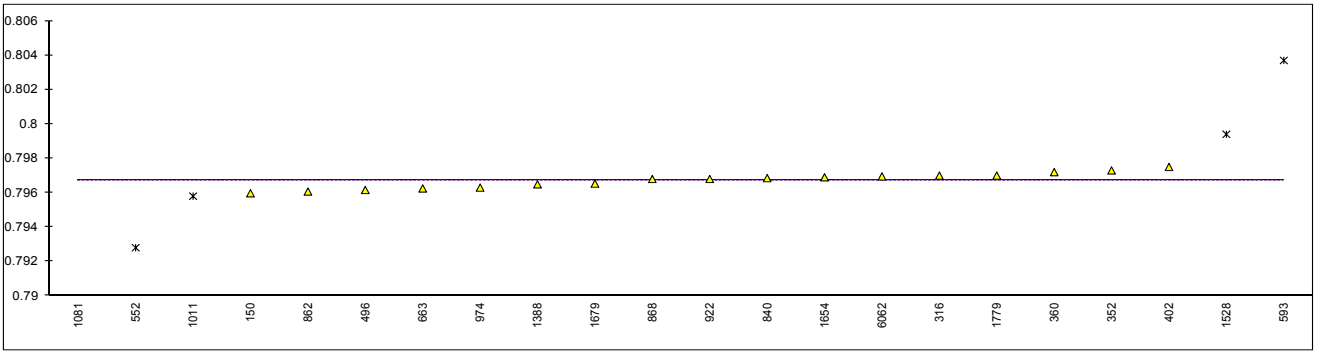
lab	method	value	mark	z(targ)	remarks
92		-----		-----	
150		-----		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360		-----		-----	
402		-----		-----	
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	4704.414		-----	
551		-----		-----	
552	ISO6976	40168	G(0.01)	-----	Different unit?
574		-----		-----	
593	EN15984	4674	C,ex	-----	First reported 4.6788. Result excluded see §4.1
602		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
614		-----		-----	
663	ISO6976	4703.8		-----	
840		-----		-----	
851		-----		-----	
862	ISO6976	4707.323		-----	
868		-----		-----	
887		-----		-----	
922		-----		-----	
963		-----		-----	
974		-----		-----	
1011	EN15984	4770.395	ex	-----	Result excluded see §4.1
1029		-----		-----	
1081		-----		-----	
1095	EN15984	4706.66		-----	
1106		-----		-----	
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388		-----		-----	
1412		-----		-----	
1489		-----		-----	
1528		-----		-----	
1589		-----		-----	
1635		-----		-----	
1654		-----		-----	
1679		-----		-----	
1737		-----		-----	
1779		-----		-----	
1788		-----		-----	
1892		-----		-----	
1957		-----		-----	
1960		-----		-----	
6011		-----		-----	
6042		-----		-----	
6050		-----		-----	
6052		-----		-----	
6062	EN15984	4705		-----	
7011		-----		-----	
7014		-----		-----	

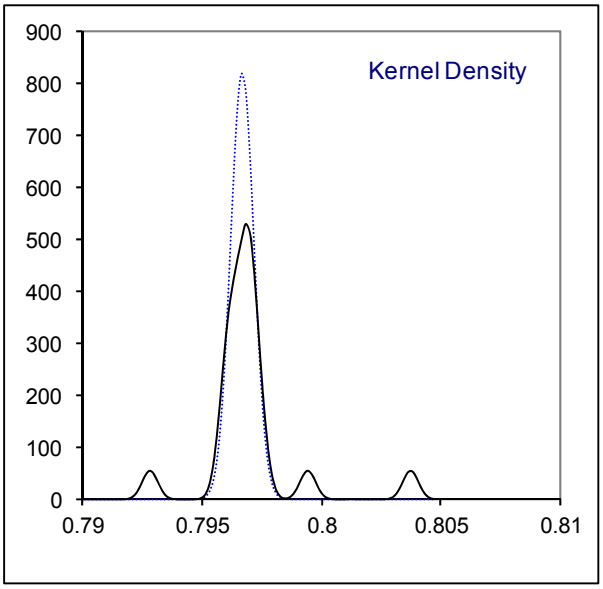
normality	unknown
n	5
outliers	1 (+2 excl)
mean (n)	4705.440
st.dev. (n)	1.4976
R(calc.)	4.193


4800
4780
4760
4740
4720
4700
4680
4660
4640
4620
4600
593
663
496
6062
1095
862
1011
552

Determination of Density (101.325 kPa, comb. 25°C, metering temp. 0°C) on sample #16040; results in kg/m^3 (real gas)

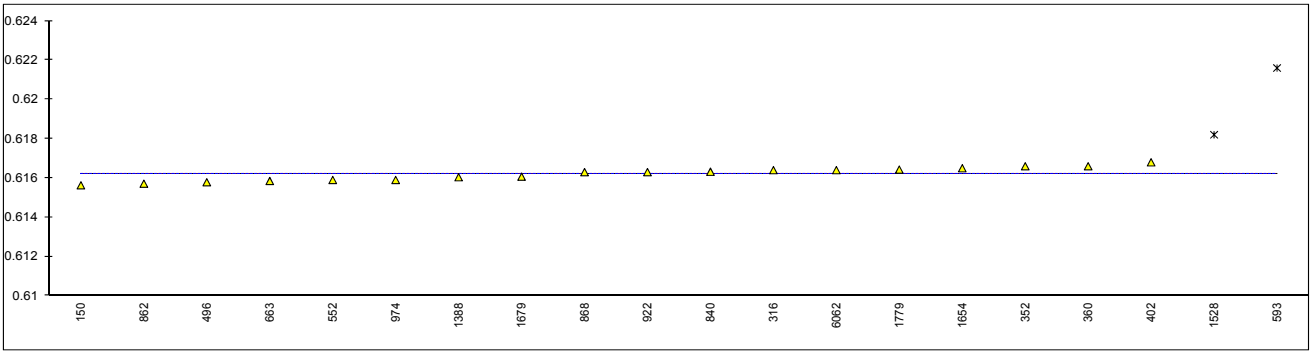
lab	method	value	mark	z(targ)	remarks
92		-----		-----	
150	ISO6976	0.79597		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316	ISO6976	0.7970		-----	
352	ISO6976	0.7973		-----	
360	ISO6976	0.7972		-----	
402	ISO6976	0.7975		-----	
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	0.796161		-----	
551		-----		-----	
552	ISO6976	0.7928	R(0.01),E	-----	iis calculated 0.79657
574		-----		-----	
593	ISO6976	0.8037	C,R(0.01),E	-----	First reported 0.8034, iis calculated 0.80172
602		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
614		-----		-----	
663	ISO6976	0.79625		-----	
840	ISO6976	0.79685		-----	
851		-----		-----	
862	ISO6976	0.79607		-----	
868	ISO6976	0.7968		-----	
887		-----		-----	
922	ISO6976	0.7968		-----	
963		-----		-----	
974	GPA2172	0.7963	E	-----	iis calculated 0.79462
1011	D3588	0.7958	ex	-----	Result excluded see §4.1
1029		-----		-----	
1081		0.7589	R(0.01), E	-----	iis calculated 0.79687
1095		-----	W	-----	Result withdrawn reported 0.7554
1106		-----		-----	
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388	ISO6976	0.79649	E	-----	iis calculated 0.79763
1412		-----		-----	
1489		-----		-----	
1528	ISO6976	0.7994	C,R(0.01),E	-----	First reported 0.7575, iis calculated 0.79716
1589		-----		-----	
1635		-----		-----	
1654	ISO6976	0.7969		-----	
1679	ISO6976	0.79653		-----	
1737		-----		-----	
1779	ISO6976	0.79700		-----	
1788		-----		-----	
1892		-----		-----	
1957		-----		-----	
1960		-----		-----	
6011		-----		-----	
6042		-----		-----	
6050		-----		-----	
6052		-----		-----	
6062	ISO6976	0.79695		-----	
7011		-----		-----	
7014		-----		-----	
	normality	OK			
	n	17			
	outliers	4 (+1 excl)			
	mean (n)	0.79671			
	st.dev. (n)	0.000449			
	R(calc.)	0.00126			Compare R(iis15S01M) = 0.0047

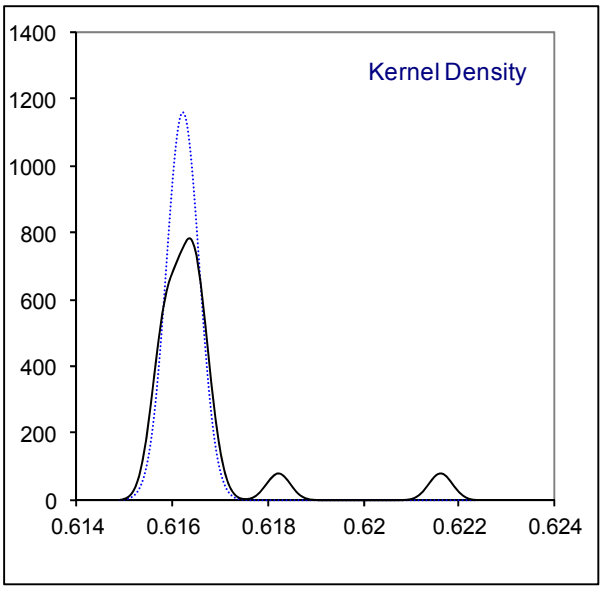

0.806
0.804
0.802
0.8
0.798
0.796
0.794
0.792
0.79
1081
552
1011
150
862
496
663
974
1388
1679
868
922
840
1654
6062
316
1779
360
352
402
1528
593


Kernel Density
900
800
700
600
500
400
300
200
100
0
0.79
0.795
0.8
0.805
0.81

Determination of Relative Density (101.325 kPa, comb. temp. 25°C, metering temp. 0°C) on sample #16040; results have no unit (real gas)

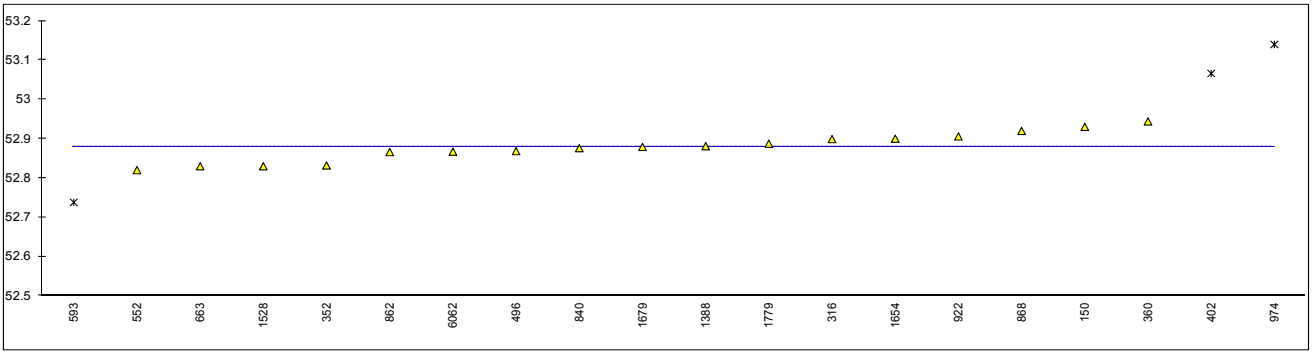
lab	method	value	mark	z(targ)	remarks
92		-----		-----	
150	ISO6976	0.61563		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316	ISO6976	0.6164		-----	
352	ISO6976	0.6166		-----	
360	ISO6976	0.6166		-----	
402	ISO6976	0.6168		-----	
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	0.615784		-----	
551		-----		-----	
552	ISO6976	0.6159		-----	
574		-----		-----	
593	ISO6976	0.6216	C,R(0.01),E	-----	First reported 0.6214, iis calculated 0.62008
602		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
614		-----		-----	
663	ISO6976	0.61585		-----	
840	ISO6976	0.61632		-----	
851		-----		-----	
862	ISO6976	0.61571		-----	
868	ISO6976	0.6163		-----	
887		-----		-----	
922	ISO6976	0.6163		-----	
963		-----		-----	
974	GPA2172	0.6159	E	-----	Iis calculated 0.61459
1011		-----		-----	
1029		-----		-----	
1081		-----		-----	
1095		-----		-----	
1106		-----		-----	
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388	ISO6976	0.61604		-----	
1412		-----		-----	
1489		-----		-----	
1528	ISO6976	0.6182	R(0.01),E	-----	Iis calculated 0.61655
1589		-----		-----	
1635		-----		-----	
1654	ISO6976	0.6165		-----	
1679	ISO6976	0.61607		-----	
1737		-----		-----	
1779	ISO6976	0.61643		-----	
1788		-----		-----	
1892		-----		-----	
1957		-----		-----	
1960		-----		-----	
6011		-----		-----	
6042		-----		-----	
6050		-----		-----	
6052		-----		-----	
6062	ISO6976	0.6164		-----	
7011		-----		-----	
7014		-----		-----	
	normality	OK			
	n	18			
	outliers	2			
	mean (n)	0.61620			
	st.dev. (n)	0.000345			
	R(calc.)	0.00097			Compare R(iis15S01M) = 0.0038

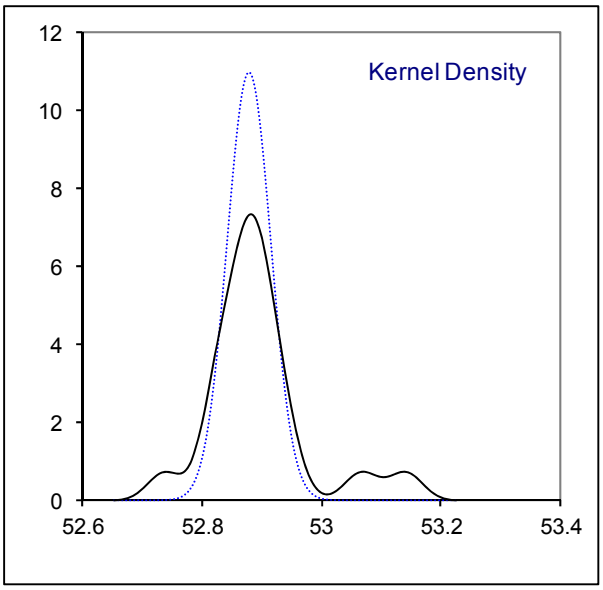

0.624
0.622
0.62
0.618
0.616
0.614
0.612
0.61
150
862
496
663
552
974
1388
1679
868
922
840
316
6062
1779
1654
352
360
402
1528
593


Kernel Density
1400
1200
1000
800
600
400
200
0
0.614
0.616
0.618
0.62
0.622
0.624

Determination of Wobbe Index (101.325 kPa , combustion temp. 25°C, metering temp. 0°C) on sample #16040; results in MJ/m^3 (real gas)

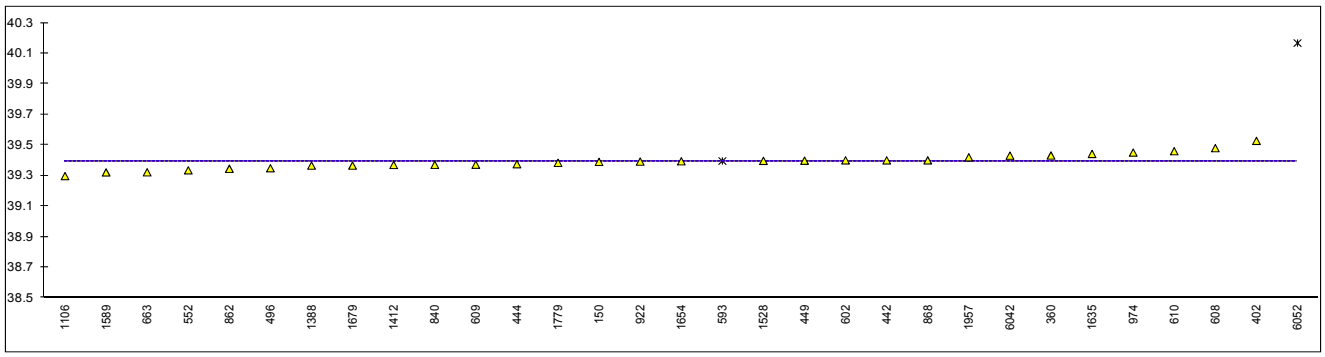
lab	method	value	mark	z(targ)	remarks
92		-----		-----	
150	ISO6976	52.9302		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316	ISO6976	52.899		-----	
352	ISO6976	52.832		-----	
360	ISO6976	52.944		-----	
402	ISO6976	53.0661	G(0.01),E	-----	iis calculated 50.0528
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	52.8684		-----	
551		-----		-----	
552	ISO6976	52.820	E	-----	iis calculated 52.8374
574		-----		-----	
593	ISO6976	52.738	C,ex,E	-----	First reported 52.775. Result excluded see §4.1, iis calc. 52.8182
602		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
614		-----		-----	
663	ISO6976	52.830		-----	
840	ISO6976	52.876		-----	
851		-----		-----	
862	ISO6976	52.866		-----	
868	ISO6976	52.92		-----	
887		-----		-----	
922	ISO6976	52.9059		-----	
963		-----		-----	
974	GPA2172	53.14	G(0.05),E	-----	iis calculated 53.0573
1011		-----		-----	
1029		-----		-----	
1081		-----		-----	
1095		-----	W	-----	Result withdrawn reported 50.17
1106		-----		-----	
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388	ISO6976	52.881	E	-----	iis calculated 52.9197
1412		-----		-----	
1489		-----		-----	
1528	ISO6976	52.83		-----	
1589		-----		-----	
1635		-----		-----	
1654	ISO6976	52.900		-----	
1679	ISO6976	52.879		-----	
1737		-----		-----	
1779	ISO6976	52.8875		-----	
1788		-----		-----	
1892		-----		-----	
1957		-----		-----	
1960		-----		-----	
6011		-----		-----	
6042		-----		-----	
6050		-----		-----	
6052		-----		-----	
6062	ISO6976	52.867		-----	
7011		-----		-----	
7014		-----		-----	
	normality	OK			
	n	17			
	outliers	2 (+1 excl)			
	mean (n)	52.8786			
	st.dev. (n)	0.03631			
	R(calc.)	0.1017			Compare R(iis15S01M) = 0.2175

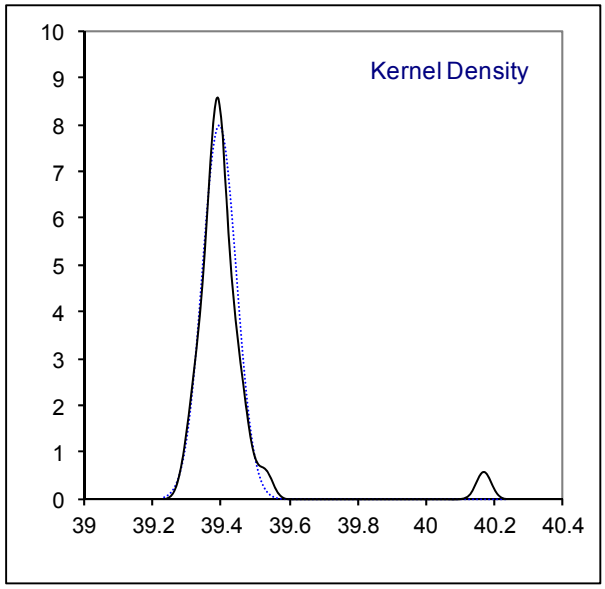

53.2
53.1
53
52.9
52.8
52.7
52.6
52.5
593
552
663
1528
352
862
6062
496
840
1679
1388
1779
316
1654
922
868
150
360
402
974


Kernel Density
12
10
8
6
4
2
0
52.6
52.8
53
53.2
53.4

Determination of Caloric Value Superior (101.325 kPa, comb. temp. 15°C, metering temp 15°C) on sample #16040; results in MJ/m^3 (real gas)

lab	method	value	mark	z(targ)	remarks
92		-----		-----	
150	ISO6976	39.390		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360	ISO6976	39.432		-----	
402	ISO6976	39.5275	C	-----	First reported 41.7035
442	ISO6976	39.40		-----	
444	ISO6976	39.375		-----	
446		-----		-----	
449	ISO6976	39.398		-----	
496	DIN51857	39.3486		-----	
551		-----		-----	
552	ISO6976	39.335		-----	
574		-----		-----	
593	ISO6976	39.396	C,ex,E	-----	First reported 39.416, iis calculated 39.448
602	ISO6976	39.40		-----	
608	ISO6976	39.48		-----	
609	ISO6976	39.3718		-----	
610	ISO6976	39.46		-----	
614		-----		-----	
663	ISO6976	39.322	C	-----	First reported 39.230. Result excluded see §4.1
840	ISO6976	39.371		-----	
851		-----		-----	
862	ISO6976	39.345		-----	
868	ISO6976	39.40		-----	
887		-----		-----	
922	ISO6976	39.3921		-----	
963		-----		-----	
974	GPA2172	39.451		-----	
1011		-----		-----	
1029		-----		-----	
1081		-----		-----	
1095		-----		-----	
1106	ISO6976	39.2971806	E	-----	iis calculated 39.390
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388	ISO6976	39.366	E	-----	iis calculated 39.422
1412	ISO6976	39.37	E	-----	iis calculated 39.382
1489		-----		-----	
1528	ISO6976	39.397	E	-----	iis calculated 39.347
1589	D3588	39.3212	E	-----	iis calculated 39.400
1635	ISO6976	39.442	E	-----	iis calculated 39.355
1654	ISO6976	39.394		-----	
1679	ISO6976	39.366		-----	
1737		-----		-----	
1779	ISO6976	39.3837		-----	
1788		-----		-----	
1892		-----		-----	
1957	ISO6976	39.42		-----	
1960		-----		-----	
6011		-----		-----	
6042	ISO6976	39.431		-----	
6050		-----		-----	
6052	D3588	40.168	R(0.01),E	-----	iis calculated 40.346
6062		-----		-----	
7011		-----		-----	
7014		-----		-----	
	normality	OK			
	n	29			
	outliers	1 (+1 excl)			
	mean (n)	39.3927			
	st.dev. (n)	0.05005			
	R(calc.)	0.1402			Compare R(iis15S01M) = 0.1018

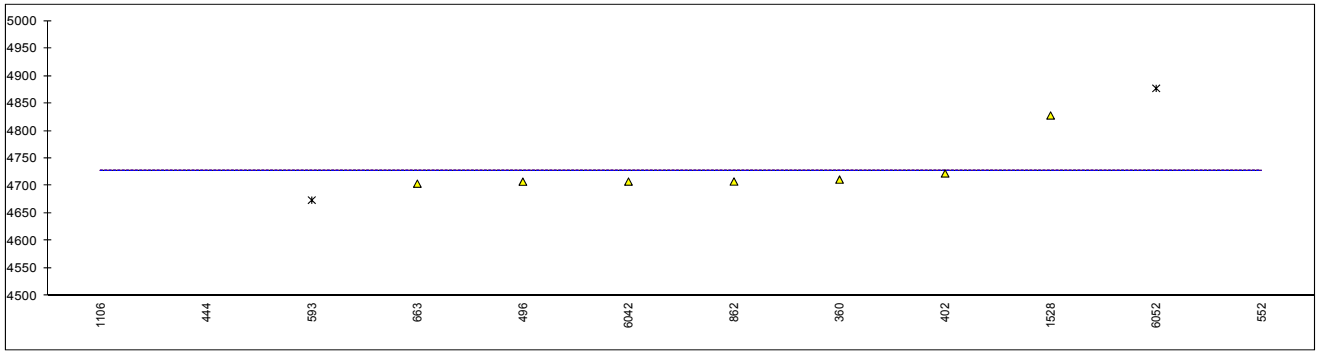

40.3
40.1
39.9
39.7
39.5
39.3
39.1
38.9
38.7
38.5
1106
1589
663
552
862
496
1388
1679
1412
840
609
444
1779
150
922
1654
593
1528
449
602
442
868
1957
6042
360
1635
974
610
608
402
6052

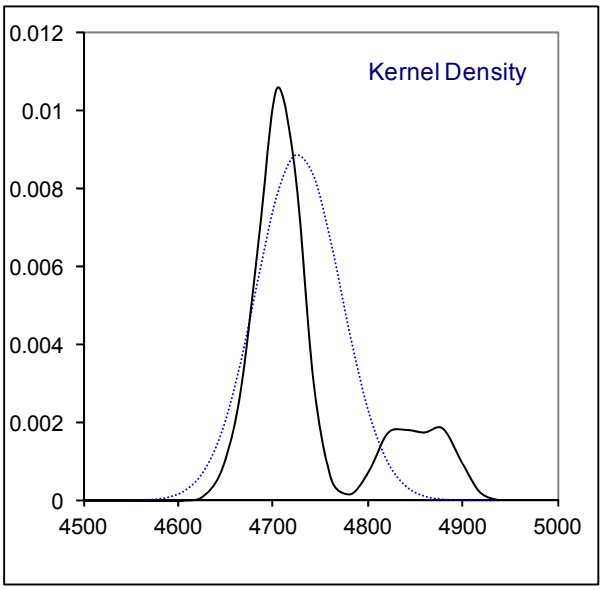

Kernel Density
10
9
8
7
6
5
4
3
2
1
0
39
39.2
39.4
39.6
39.8
40
40.2
40.4

Determination of Caloric Value Inferior (101.325 kPa, comb. temp. 15°C, metering temp 15°C) on sample #16040; results in KJ/100g (real gas)

lab	method	value	mark	z(targ)	remarks
92		-----		-----	
150		-----		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360	EN15984	4711.453	C	-----	First reported 7411.453
402	EN15984	4722.57		-----	
442		-----		-----	
444	ISO6976	35.538	DG(0.01)	-----	Reported probably in different unit MJ/m^3
446		-----		-----	
449		-----		-----	
496	DIN51857	4707.685		-----	
551		-----		-----	
552	ISO6976	35503	G(0.01)	-----	Reported probably in different unit KJ/m^3
574		-----		-----	
593	EN15984	4674	C,ex	-----	First reported 5.1781. Result excluded see §4.1
602		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
614		-----		-----	
663	EN15984	4704.02		-----	
840		-----		-----	
851		-----		-----	
862	ISO6976	4707.941		-----	
868		-----		-----	
887		-----		-----	
922		-----		-----	
963		-----		-----	
974		-----		-----	
1011		-----		-----	
1029		-----		-----	
1081		-----		-----	
1095		-----		-----	
1106	ISO6976	35.4697153	DG(0.01)	-----	Reported probably in different unit MJ/m^3
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388		-----		-----	
1412		-----		-----	
1489		-----		-----	
1528	ISO6975	4828		-----	
1589		-----		-----	
1635		-----		-----	
1654		-----		-----	
1679		-----		-----	
1737		-----		-----	
1779		-----		-----	
1788		-----		-----	
1892		-----		-----	
1957		-----		-----	
1960		-----		-----	
6011		-----		-----	
6042		4707.804	C	-----	First reported 35.591
6050		-----		-----	
6052	D3588	4877.342	ex	-----	Result excluded see §4.1
6062		-----		-----	
7011		-----		-----	
7014		-----		-----	

normality	not OK
n	7
outliers	3 (+2 excl)
mean (n)	4727.07
st.dev. (n)	44.898
R(calc.)	125.72

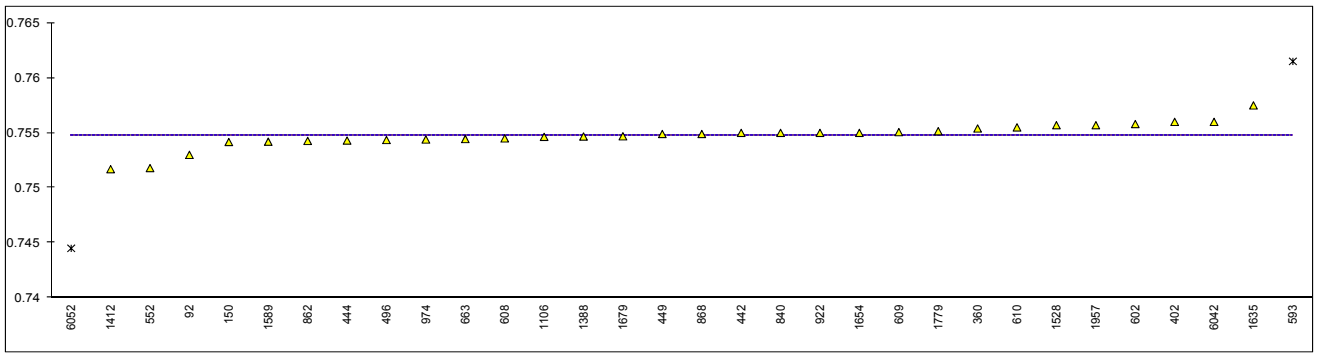

5000
4950
4900
4850
4800
4750
4700
4650
4600
4550
4500
1106
444
593
663
496
6042
862
360
402
1528
6052
552

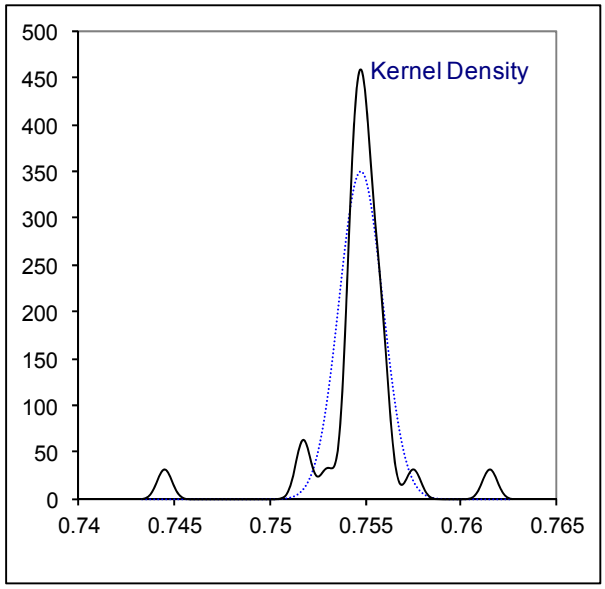

Kernel Density
0.012
0.01
0.008
0.006
0.004
0.002
0
4500
4600
4700
4800
4900
5000

Determination of Density (101.325 kPa, combustion temp. 15°C, metering temp. 15°C) on sample #16040; results in kg/m^3 (real gas)

lab	method	value	mark	z(targ)	remarks
92		0.753	E	-----	iis calculated 0.75436
150	ISO6976	0.75417		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360	ISO6976	0.7554		-----	
402	ISO6976	0.7560	C	-----	First reported 0.7971
442	ISO6976	0.7550		-----	
444	ISO6976	0.7543	C	-----	First reported 0.6155
446		-----		-----	
449	ISO6976	0.7549		-----	
496	DIN51857	0.754353		-----	
551		-----		-----	
552	ISO6976	0.7518	E	-----	iis calculated 0.75474
574		-----		-----	
593	ISO6976	0.7615	C,R(0.01),E	-----	First reported 0.7612, iis calculated 0.75962
602	ISO6976	0.7558		-----	
608	ISO6976	0.7545	E	-----	iis calculated 0.75556
609	ISO6976	0.75507		-----	
610	ISO6976	0.7555		-----	
614		-----		-----	
663	ISO6976	0.75444		-----	
840	ISO6976	0.75500		-----	
851		-----		-----	
862	ISO6976	0.75427		-----	
868	ISO6976	0.7549		-----	
887		-----		-----	
922	ISO6976	0.7550		-----	
963		-----		-----	
974	GPA2172	0.7544	E	-----	iis calculated 0.75289
1011		-----		-----	
1029		-----		-----	
1081		-----		-----	
1095		-----		-----	
1106	GPA2286	0.754637		-----	
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388	ISO6976	0.75467	E	-----	iis calculated 0.75574
1412	ISO6976	0.7517		-----	
1489		-----		-----	
1528	ISO6976	0.7557		-----	
1589	D3588	0.7542	E	-----	iis calculated 0.75572
1635	ISO6976	0.7575	E	-----	iis calculated 0.75563
1654	ISO6976	0.7550		-----	
1679	ISO6976	0.75469		-----	
1737		-----		-----	
1779	ISO6976	0.75515		-----	
1788		-----		-----	
1892		-----		-----	
1957	ISO6976	0.7557		-----	
1960		-----		-----	
6011		-----		-----	
6042	ISO6976	0.756		-----	
6050		-----		-----	
6052	D3588	0.7445	R(0.01),E	-----	iis calculated 0.74638
6062		-----		-----	
7011		-----		-----	
7014		-----		-----	

	normality	not OK	
	n	30	
	outliers	2	
	mean (n)	0.75476	
	st.dev. (n)	0.001141	
	R(calc.)	0.00319	Compare R(iis15S01M) = 0.0027

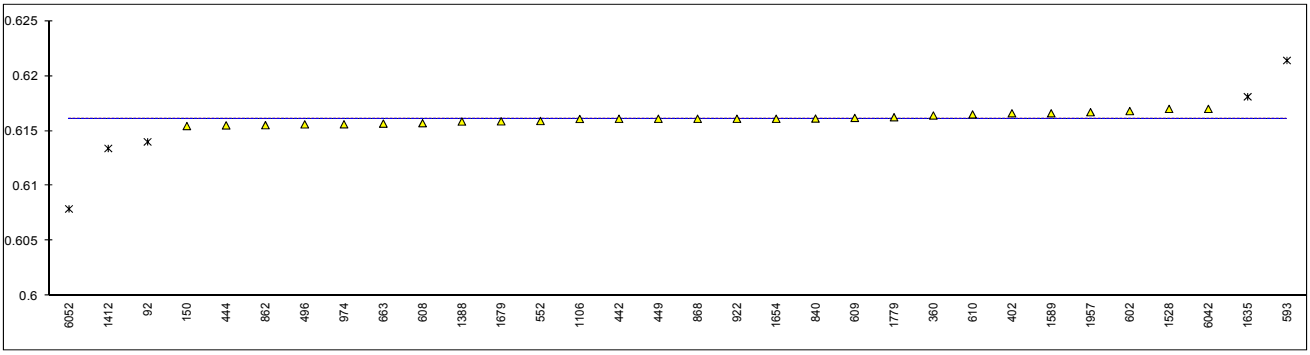

0.765
0.76
0.755
0.75
0.745
0.74
6052
1412
552
92
150
1589
862
444
496
974
663
608
1106
1388
1679
449
868
442
840
922
1654
609
1779
360
610
1528
1957
602
402
6042
1635
593

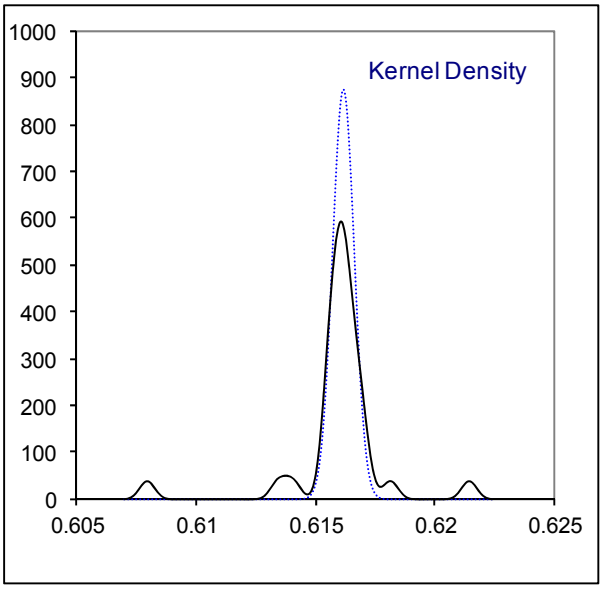

Kernel Density
500
450
400
350
300
250
200
150
100
50
0
0.74
0.745
0.75
0.755
0.76
0.765

Determination of Relative Density (101.325 kPa, comb. temp. 15°C, metering temp. 15°C) on sample #16040; results have no unit (real gas)

lab	method	value	mark	z(targ)	remarks
92		0.614	R(0.01),E	-----	iis calculated 0.6156
150	ISO6976	0.61544		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360	ISO6976	0.6164		-----	
402	ISO6976	0.6166		-----	
442	ISO6976	0.6161		-----	
444	ISO6976	0.6155	C	-----	First reported 0.7543
446		-----		-----	
449	ISO6976	0.6161		-----	
496	DIN51857	0.615593		-----	
551		-----		-----	
552	ISO6976	0.6159		-----	
574		-----		-----	
593	ISO6976	0.6214	C,R(0.01),E	-----	First reported 0.6212, iis calculated 0.61989
602	ISO6976	0.6168		-----	
608	ISO6976	0.6157		-----	
609	ISO6976	0.61618		-----	
610	ISO6976	0.6165		-----	
614		-----		-----	
663	ISO6976	0.61566		-----	
840	ISO6976	0.61612		-----	
851		-----		-----	
862	ISO6976	0.61552		-----	
868	ISO6976	0.6161		-----	
887		-----		-----	
922	ISO6976	0.6161		-----	
963		-----		-----	
974	GPA2172	0.6156	E	-----	iis calculated 0.6144
1011		-----		-----	
1029		-----		-----	
1081		-----		-----	
1095		-----		-----	
1106	GPA2286	0.61608304		-----	
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388	ISO6976	0.61585		-----	
1412	ISO6976	0.6134	R(0.01)	-----	
1489		-----		-----	
1528	ISO6976	0.6170		-----	
1589	D3588	0.6166		-----	
1635	ISO6976	0.6181	R(0.01),E	-----	iis calculated 0.61663
1654	ISO6976	0.6161		-----	
1679	ISO6976	0.61587		-----	
1737		-----		-----	
1779	ISO6976	0.61624		-----	
1788		-----		-----	
1892		-----		-----	
1957	ISO6976	0.6167		-----	
1960		-----		-----	
6011		-----		-----	
6042	ISO6976	0.617		-----	
6050		-----		-----	
6052	D3588	0.6079	R(0.01),E	-----	iis calculated 0.60909
6062		-----		-----	
7011		-----		-----	
7014		-----		-----	

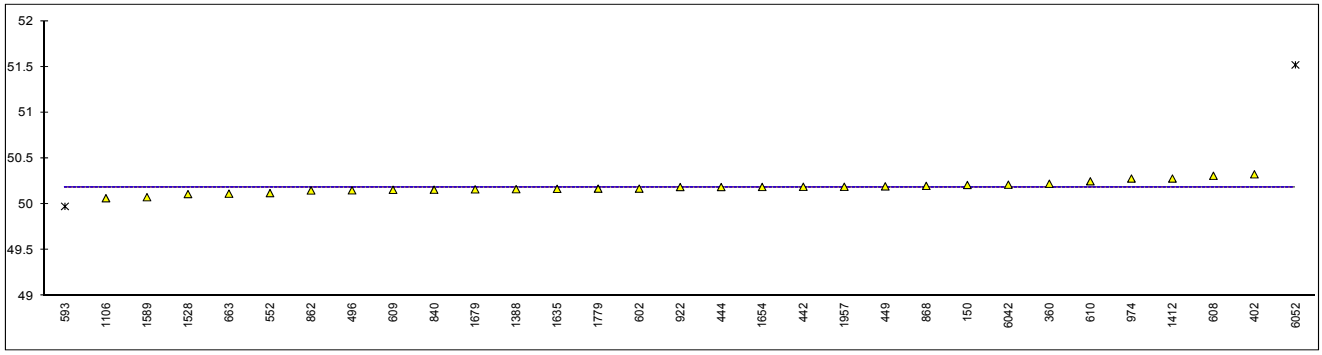
normality	OK	
n	27	
outliers	5	
mean (n)	0.61612	
st.dev. (n)	0.000455	
R(calc.)	0.00127	Compare R(iis15S01M) = 0.0033

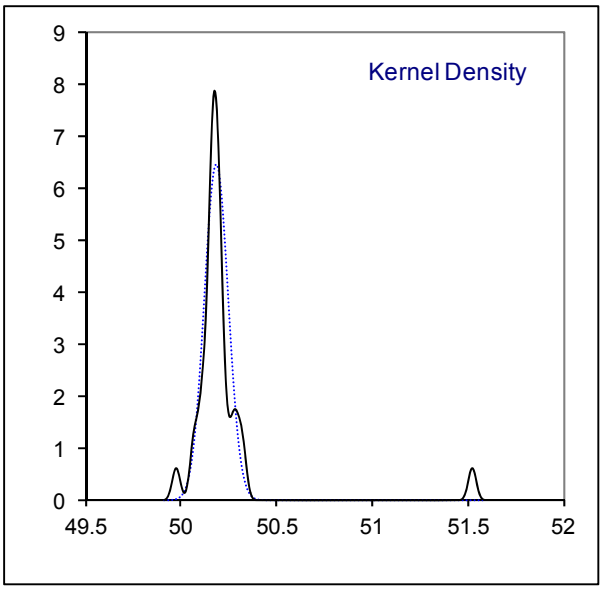

0.625
0.62
0.615
0.61
0.605
0.6
6052
1412
92
150
444
862
496
974
663
608
1388
1679
552
1106
442
449
868
922
1654
840
609
1779
360
610
402
1589
1957
602
1528
6042
1635
593


Kernel Density
1000
900
800
700
600
500
400
300
200
100
0
0.605
0.61
0.615
0.62
0.625

Determination of Wobbe Index (101.325 kPa, combustion temp. 15°C, metering temp. 15°C) on sample #16040; results in MJ/m^3

lab	method	value	mark	z(targ)	remarks
92		-----		-----	
150	ISO6976	50.2100		-----	
151		-----		-----	
171		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360	ISO6976	50.223		-----	
402	ISO6976	50.3261	C	-----	First reported 53.1089
442	ISO6976	50.19		-----	
444	ISO6976	50.187		-----	
446		-----		-----	
449	ISO6976	50.1946		-----	
496	DIN51857	50.1513		-----	
551		-----		-----	
552	ISO6976	50.121		-----	
574		-----		-----	
593	ISO6976	49.976	C,ex,E	-----	First reported 50.012, result excluded see §4.1, iis calc. 50.1035
602	ISO6976	50.17		-----	
608	ISO6976	50.31	E	-----	iis calculated 50.2740
609	ISO6976	50.1571		-----	
610	ISO6976	50.25		-----	
614		-----		-----	
663	ISO6976	50.115		-----	
840	ISO6976	50.158		-----	
851		-----		-----	
862	ISO6976	50.150		-----	
868	ISO6976	50.20		-----	
887		-----		-----	
922	ISO6976	50.1869		-----	
963		-----		-----	
974	GPA2172	50.28	E	-----	iis calculated 50.3305
1011		-----		-----	
1029		-----		-----	
1081		-----		-----	
1095		-----		-----	
1106	GPA2286	50.0652	E	-----	iis calculated 50.1627
1196		-----		-----	
1197		-----		-----	
1198		-----		-----	
1200		-----		-----	
1307		-----		-----	
1388	ISO6976	50.164	E	-----	iis calculated 50.1983
1412	ISO6976	50.28		-----	
1489		-----		-----	
1528	ISO6976	50.11		-----	
1589	D3588	50.0763	E	-----	iis calculated 50.1719
1635	ISO6976	50.167	E	-----	iis calculated 50.1173
1654	ISO6976	50.1880		-----	
1679	ISO6976	50.162		-----	
1737		-----		-----	
1779	ISO6976	50.1698		-----	
1788		-----		-----	
1892		-----		-----	
1957	ISO6976	50.19		-----	
1960		-----		-----	
6011		-----		-----	
6042	ISO6976	50.213		-----	
6050		-----		-----	
6052	Calculation	51.520	R(0.01),E	-----	iis calculated 51.6960
6062		-----		-----	
7011		-----		-----	
7014		-----		-----	
	normality	OK			
	n	29			
	outliers	1 (+1 excl)			
	mean (n)	50.1850			
	st.dev. (n)	0.06195			
	R(calc.)	0.1735			Compare R(iis15S01M) = 0.2158


52
51.5
51
50.5
50
49.5
49
593
1106
1589
1528
663
552
862
496
609
840
1679
1388
1635
1779
602
922
444
1654
442
1957
449
868
150
6042
360
610
974
1412
608
402
6052


Kernel Density
9
8
7
6
5
4
3
2
1
0
49.5
50
50.5
51
51.5
52

APPENDIX 2

Number of participants in the Natural Gas PT

2 labs in AUSTRALIA
1 lab in AZERBAIJAN
1 lab in BELGIUM
2 labs in BRAZIL
1 lab in BRUNEI
1 lab in BULGARIA
1 lab in CANADA
6 labs in CHINA, People's Republic
1 lab in COLOMBIA
1 lab in COTE D'IVOIRE
1 lab in CROATIA
1 lab in ECUADOR
1 lab in FRANCE
2 labs in GERMANY
1 lab in HONG KONG
2 labs in IRAN
1 lab in IRAQ
9 labs in MALAYSIA
2 labs in NETHERLANDS
2 labs in PAKISTAN
4 labs in PORTUGAL
2 labs in ROMANIA
2 labs in SAUDI ARABIA
1 lab in SERBIA
1 lab in SOLVAKIA
1 lab in TAIWAN
2 labs in THAILAND
1 lab in TURKEY
2 labs in UNITED ARAB EMIRATES
4 labs in UNITED KINGDOM
3 labs in UNITED STATES OF AMERICA
1 lab in VIETNAM

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 outlier test
R(0.05)	= straggler in Rosner outlier test
E	= probably an error in calculations
U	= test result probably reported in a different unit
W	= test result withdrawn on request of participant
ex	= test result excluded from calculations
n.a.	= not applicable
n.d.	= not detected
fr.	= first reported
SDS	= Safety Data Sheet

Literature:

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