Results of Proficiency Test
Natural Gas Analysis
April 2021

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 2009 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Natural Gas every year. During the annual proficiency testing program 2020/2021 it was decided to continue the round robin for the analysis of Natural Gas.
A co-operation with EffecTech (Uttoxeter, United Kingdom) was set up, because iis has limited gas-handling facilities in place to prepare gas samples. EffecTech is fully equipped and has experience in the preparation of synthetic Natural Gas samples for PT purposes.

In this interlaboratory study 76 laboratories from 37 different countries registered for participation. See appendix 2 for the number of participants per country. In this report the results of the Natural Gas 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). To optimize the costs for the participating laboratories it was decided to prepare one Natural Gas mixture. The cylinder size is a cost-effective one-liter cylinder. Each cylinder was uniquely numbered and labelled #21050. The limited cylinder size is chosen to optimize transport and handling costs.

Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 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 for the preparation of PT samples in homogeneous and stable batches under the requirements of ISO/IEC17043:2010 by UKAS (no. 4719). EffecTech maintains also an ISO/IEC17025 accreditation for the calibration and assignment of reference values for these samples.

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 also 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

The necessary one-liter cylinders with artificial natural gas mixture were prepared and tested for homogeneity by EffecTech (Uttoxeter, United Kingdom) in conformance with ISO Guide 35:06 and ISO/IEC17043:10.
One batch of 76 cylinders was prepared (job 21/0180) starting in February 2021. Each cylinder was uniquely numbered and labelled #21050. Every cylinder in the batch was analyzed using replicate measurements. The within bottle and between bottle variations were assessed in accordance with ISO Guide 35:06 (Annex A.1). This evaluation showed that all between bottle variations were small compared to the uncertainties on the reference values on each component.
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 test method in agreement with the procedure of ISO13528, Annex B2 in the next table.

Component	r (abs, observed) in %mol/mol	0.3 x R (abs, ISO6974-3:18) in %mol/mol
Methane	0.0052	0.0653
Ethane	0.0032	0.0460
Propane	0.0008	0.0178
iso-Butane	0.0003	0.0055
n-Butane	0.0006	0.0081
Carbon Dioxide	0.0005	0.0055
Nitrogen	0.0014	0.0293

Table 1: evaluation of homogeneity test results against ISO6974-3 requirements of subsamples #21050

All observed repeatabilities are far less than 0.3 times the respective reproducibilities of the reference test method ISO6974-3:18. Therefore, the homogeneity of the prepared batch was assumed.

To each of the participating laboratories one 1L gas cylinder labelled #21050 was sent on March 24, 2021. An SDS was added to the sample package.

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 ANALYZES

The participants were requested to determine on sample #21050: Methane, Ethane, Propane, iso-Butane, n-Butane, Carbon Dioxide, Nitrogen, Carbon content and for Real Gas conditions for two different combinations of combustion and metering temperature the following properties: Gross (Superior) Caloric Value, Net (Inferior) Caloric Value, Density, Relative Density and Gross Wobbe Index.

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

The target standard deviation was calculated from the target 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 according to:

$z_{(target)}$ = (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:

	$\lvert z \rvert$	< 1	good
1 <	$\lvert z \rvert$	< 2	satisfactory
2 <	$\lvert z \rvert$	< 3	questionable
3 <	$\lvert z \rvert$		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 one week. Finally, eight participants did not report any test results at all and not all laboratories were able to report all the analyses requested.
In total 68 participants reported 798 numerical test results. Observed were 42 outlying test results, which is 5.3% of the numerical test results. In proficiency studies 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 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 explained in appendix 3.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D1945) and an added designation for the year that the test method was adopted or revised (e.g. D1945:14). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D1945:14(2019)). In the results tables of appendix 1 only the method number and year of adoption or revision (e.g. D1945:14) will be used.

Three laboratories (593, 1370 and 1957) reported deviating test results for many gas composition test results. At least three of the seven test results were statistical outliers. As the seven test results are not independent, it was decided to exclude the reported results of these laboratories for the statistical evaluation. Also, the reported test results for the parameters calculated from the measured gas composition were excluded for these three laboratories, when not marked as a statistical outlier, when applicable.
Three laboratories (1081, 1135, 1845) had a deviation for the sum of the composition results (more than 0.1% above or below 100.0%). Since the composition was normalized the test results were excluded for the statistical evaluation, when applicable.

Methane: The determination of this component was problematic. Five statistical outliers were observed and three other test result were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:18 and ASTM D1945:14(2019).

Ethane: The determination of this component was problematic. Two statistical outliers were observed and five other test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:18 and ASTM D1945:14(2019).

Propane: The determination of this component was problematic depending on the test method used. Three statistical outliers were observed and four other test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:18, but it is in agreement with the requirements of ASTM D1945:14(2019).

iso-Butane: The determination of this component was problematic depending on the test method used. Three statistical outliers were observed and four other test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:18, but it is in agreement with the requirements of ASTM D1945:14(2019).

n-Butane: The determination of this component was problematic depending on the test method used. Three statistical outliers were observed and three other test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:18, but it is in agreement with the requirements of ASTM D1945:14(2019).

Carbon Dioxide: The determination of this component may be problematic depending on the test method used. Four statistical outliers were observed and four other test results were excluded. The calculated reproducibility after rejection of the suspect data is not in agreement with the requirements of ISO6974-3:18, but it is in agreement with the requirements of ASTM D1945:14(2019).

Nitrogen: The determination of this component was very problematic. Five statistical outliers were observed and three other test results were excluded. The calculated reproducibility after rejection of the suspect data is not at all in agreement with the requirements of ISO6974-3:18, nor with the requirements of ASTM D1945:14(2019).

Carbon content: The determination of this component was not problematic. No statistical outliers were observed. The calculated reproducibility is in good agreement with the requirements of EN15984:17.

Calculated parameters, general remark:
In this PT, the calculated parameters for Real Gas were reported for two combustion temperatures (15°C and 25°C). The number of reporting participants for 15°C and 25°C varied between 16 and 30. In total thirty-five calculation differences between iis and participants were observed over ten parameters.

Gross (Superior) Caloric Value: The calculation at combustion temperature 25°C/metering temperature 0°C may not be problematic. Two statistical outliers were observed and two other test results were excluded. The reproducibility was somewhat smaller compared to the observed reproducibility in last year's PT: iis20S01M (0.10 vs. 0.14).

The calculation at combustion temperature 15°C/metering temperature 15°C may not be problematic. One statistical outlier was observed and two other test results were excluded. The reproducibility was in line with the observed reproducibility in last year's PT: iis20S01M (0.12 vs. 0.12).

Net (Inferior) Caloric Value: The calculation at combustion temperature 25°C/metering temperature 0°C may be not problematic. Two statistical outliers were observed and one other test result was excluded. The reproducibility was somewhat larger compared to the observed reproducibility in last year's PT: iis20S01M (12 vs. 7).

The calculation at combustion temperature 15°C/metering temperature 15°C may be problematic. No statistical outliers were observed, but four test results were excluded. The reproducibility was large compared to the observed reproducibility in last year's PT: iis20S01M (29 vs. 15).

Density: The calculation at combustion temperature 25°C/metering temperature 0°C may be problematic. Two statistical outliers were observed and one other test result was excluded. The reproducibility was large compared to the observed reproducibility in last year's PT: iis20S01M (0.0029 vs. 0.0012).

The calculation at combustion temperature 15°C/metering temperature 15°C may be problematic. One statistical outlier was observed and two other test result was excluded. The reproducibility was in line with the observed reproducibility of last year's PT: iis20S01M (0.0029 vs. 0.0026).

Relative Density: The calculation at combustion temperature 25°C/metering temperature 0°C may be problematic. One statistical outlier was observed and one other test result was excluded. The reproducibility was large compared to the observed reproducibility in last year's PT: iis20S01M (0.0022 vs. 0.0010).

The calculation at combustion temperature 15°C/metering temperature 15°C may not be problematic. One statistical outlier was observed and two other test results were excluded. The reproducibility was in line with the observed reproducibility of last year's PT: iis20S01M (0.0023 vs. 0.0023).

Gross Wobbe Index: The calculation at combustion temperature 25°C/metering temperature 0°C may not be problematic. Four statistical outliers were observed and one other test result was excluded. The reproducibility was in line with the observed reproducibility in last year's PT: iis20S01M (0.093 vs. 0.101).

The calculation at combustion temperature 15°C/metering temperature 15°C may be problematic. Three statistical outliers were observed and one other test result was excluded. The reproducibility was large compared to the observed reproducibility in last year's PT: iis201M (0.133 vs. 0.056).

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

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

Component	unit	n	average	2.8 * sd	R(ISO6974-3)	R(D1945)
Methane	%mol/mol	60	86.425	0.311	0.218	0.15
Ethane	%mol/mol	61	6.857	0.212	0.154	0.12
Propane	%mol/mol	61	1.805	0.065	0.059	0.10
iso-Butane	%mol/mol	61	0.353	0.028	0.018	0.07
n-Butane	%mol/mol	62	0.603	0.031	0.027	0.07
Carbon Dioxide	%mol/mol	60	0.350	0.036	0.018	0.07
Nitrogen	%mol/mol	59	3.584	0.230	0.097	0.10
Carbon content	g/100g	15	71.47	0.54	2.16	R(EN15984)

Table 2: reproducibilities of the composition of sample #21050

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 values for Real Gas and the corresponding calculated reproducibilities are summarized in tables 3 and 4.

Real Gas, 101.325 kPa, combustion temperature 25°C, metering temperature 0°C				
Parameter	unit	n	average	2.8 * sd
Gross (Superior) Caloric Value	MJ/m^3	26	42.266	0.105
Net (Inferior) Caloric Value	kJ/100g	15	4631.06	12.28
Density	kg/m^3	26	0.8252	0.0029
Relative Density		27	0.6383	0.0022
Gross Wobbe Index	MJ/m^3	24	52.896	0.093

Table 3: performance of the group for combustion temperature of 25°C, Real Gas

Real Gas, 101.325 kPa, combustion temperature 15°C, metering temperature 15°C				
Parameter	unit	n	average	2.8 * sd
Gross (Superior) Caloric Value	MJ/m^3	33	40.084	0.119
Net (Inferior) Caloric Value	kJ/100g	24	4633.51	29.49
Density	kg/m^3	34	0.7817	0.0029
Relative Density		36	0.6379	0.0023
Gross Wobbe Index	MJ/m^3	29	50.188	0.133

Table 4: performance of the group for combustion temperature of 15°C, Real Gas

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	58	58	59	59	56
Number of test results	798	648	698	700	650
Number of statistical outliers	42	33	32	46	41
Percentage of statistical outliers	5.3%	5.1%	4.6%	6.6%	6.3%

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 reference test methods. The conclusions are given the following tables.

Component	2021 ISO6974-3	2020 ISO6974-3	2019 ISO6974-3	2018 ISO6974-3	2017 ISO6974-3
Methane	-	-	+	--	-
Ethane	-	-	+	+/-	+/-
Propane	-	-	+/-	-	-
iso-Butane	-	+/-	-	+	+/-
n-Butane	-	+/-	-	+	+/-
Carbon Dioxide	-	-	-	--	-
Nitrogen	-	--	--	--	--

Table 6: comparison determinations against test method ISO6974-3

Component	2021 D1945	2020 D1945	2019 D1945	2018 D1945	2017 D1945
Methane	-	-	-	--	-
Ethane	-	-	+	-	+
Propane	+	+	+	+/-	++
iso-Butane	++	++	++	++	++
n-Butane	++	++	+	++	++
Carbon Dioxide	+	++	+	+	++
Nitrogen	--	-	-	--	-

Table 7: comparison determinations against test method ASTM D1945

Component	2021 EN15984	2020 EN15984	2019 EN15984	2018 EN15984	2017 EN15984
Carbon content	++	++	++	++	++

Table 8: comparison determination against EN15984

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

The observed reproducibilities for the individual components are not in agreement with the reproducibility requirements of ISO6974-3 and therefore it can be concluded that the group has difficulties with the determination of the composition in this proficiency test.

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

Component	Average values by EffecTech in %mol/mol	Consensus values from participants test results in %mol/mol	Absolute differences in %mol/mol	z-score
Methane	86.4152	86.4248	-0.0096	-0.12
Ethane	6.8387	6.8574	-0.0187	-0.34
Propane	1.8072	1.8046	0.0026	0.12
iso-Butane	0.3509	0.3531	-0.0022	-0.33
n-Butane	0.6028	0.6032	-0.0004	-0.04
Carbon Dioxide	0.3516	0.3499	0.0017	0.26
Nitrogen	3.6337	3.5842	0.0495	1.44

Table 9: comparison of average values of this PT with the values determined by the supplier EffecTech

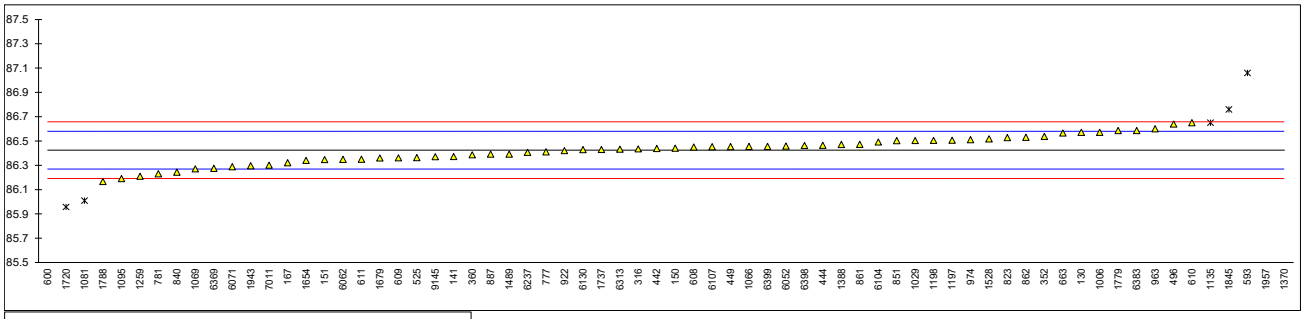
From the comparison in table 9 it is clear that the average values as determined in this PT are all very well in line with the values as determined during the preparation of the gas cylinders.

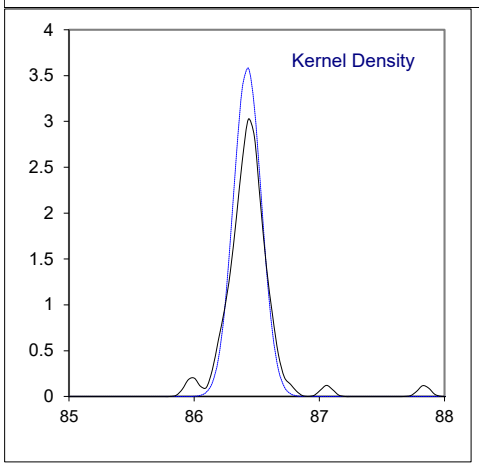
APPENDIX 1

Determination of Methane on sample #21050; results in %mol/mol

lab	method	value	mark	z(targ)	remarks
130		86.5706		1.87	
141	GPA2261	86.371		-0.69	
150	D1945	86.44		0.19	
151	GPA2261	86.34619		-1.01	
167	GPA2286	86.321		-1.33	
225		-----		-----	
316	ISO6974-3	86.4343		0.12	
352	ISO6974-3	86.5374		1.45	
360	ISO6974-3	86.386		-0.50	
442	D1945	86.4379		0.17	
444	D1945	86.4640		0.50	
446		-----		-----	
449	ISO6974-3	86.4534		0.37	
496	EN15984	86.639		2.75	
525	GPA2261	86.3633		-0.79	
529		-----		-----	
552		-----		-----	
593	D1945	87.059	R(0.01)	8.15	
596		-----		-----	
600	GPA2261Mod.	82.45	R(0.01)	-51.10	
608	GPA2261	86.4505		0.33	
609	GPA2261	86.36		-0.83	
610	GPA2286	86.649		2.88	
611	GPA2286	86.35		-0.96	
663	D1945	86.565	C	1.80	First reported 86.705
777	ISO6974-6	86.410		-0.19	
781	GOST31371.7	86.23		-2.50	
823	GPA2261	86.527		1.31	
840	D1945	86.2433		-2.33	
851	GPA2261	86.50183		0.99	
861	GPA2261	86.472		0.61	
862	GPA2261	86.530		1.35	
887	D1945	86.392		-0.42	
922	GPA2261	86.42		-0.06	
963	D1945	86.60	C	2.25	First reported 86.81
974	ISO6974-5	86.5103		1.10	
1006	D1945	86.571		1.88	
1029	D1945	86.5033		1.01	
1066	ISO6974-3	86.455		0.39	
1069	UOP539	86.270	C	-1.99	First reported 88.442
1081	In house	86.009	ex	-5.35	See paragraph 4.1
1095	EN15984	86.19		-3.02	
1135	D1945	86.65	ex	2.89	See paragraph 4.1
1197	D1945	86.5055		1.04	
1198	D1945	86.5040		1.02	
1259	EN15984	86.21	C	-2.76	First reported 86.54
1370	ISO6974-3	94.4	R(0.01)	102.53	
1388	GPA2261	86.470		0.58	
1414		-----		-----	
1489	GPA2261	86.392		-0.42	
1528	UOP539	86.5170		1.18	
1654	D1945	86.340		-1.09	
1679	ISO6974-3	86.359		-0.85	
1720	UOP539	85.957	R(0.01)	-6.01	
1737	In house	86.43		0.07	
1779	GPA2261	86.5851		2.06	
1788		86.1656		-3.33	
1845	EN15984	86.759	ex	4.30	See paragraph 4.1
1943	ISO6974-3	86.2955		-1.66	
1957	GPA2286	87.8367	R(0.01)	18.15	
6052	D1945	86.4574		0.42	
6062	ISO6974-3	86.349		-0.97	
6071	GPA2261	86.288		-1.76	
6104	GPA2261	86.491		0.85	
6107	D1945	86.4522		0.35	
6130	GB/T13610	86.42836		0.05	
6193		-----		-----	
6237	ISO6974-3	86.405		-0.26	
6263		-----		-----	
6313	GPA2286	86.4325		0.10	
6369	ISO17025	86.27512		-1.92	
6383	GPA2261	86.586		2.07	
6398	In house	86.46251		0.48	
6399	In house	86.45530		0.39	
7011	ISO6974-3	86.30		-1.60	

lab	method	value	mark	z(targ)	remarks
9145		86.37		-0.70	
	normality	OK			
	n	60			
	outliers	5 (+3ex)			
	mean (n)	86.4248			
	st.dev. (n)	0.11106			
	R(calc.)	0.3110			
	st.dev.(ISO6974-3:18)	0.07778			
	R(ISO6974-3:18)	0.2178			
Compare					
	R(D1945:14)	0.15			

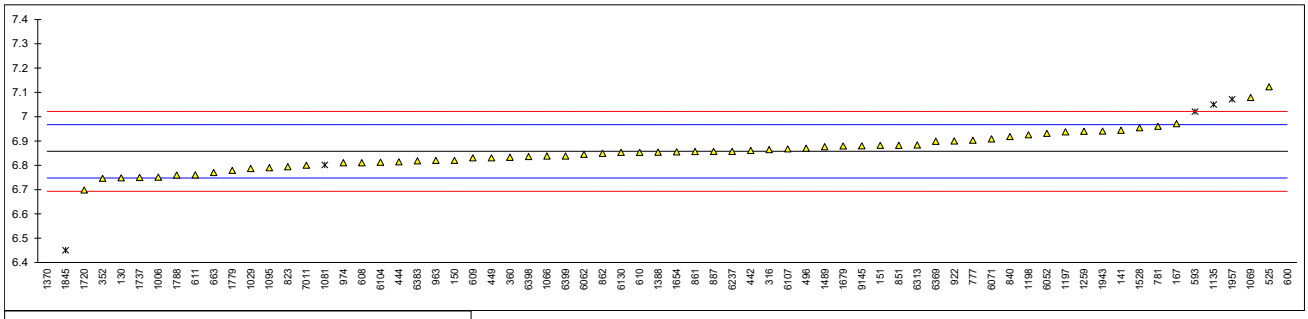


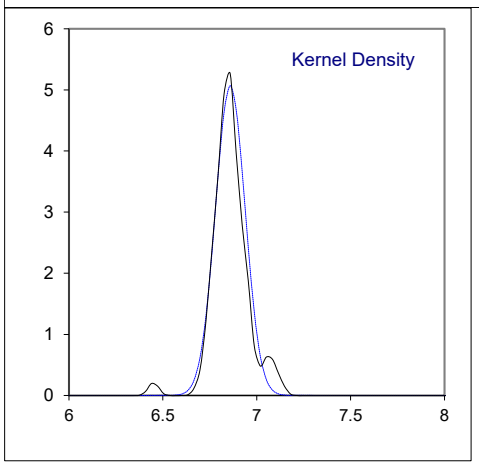


Determination of Ethane on sample #21050; results in %mol/mol

lab	method	value	mark	z(targ)	remarks
130		6.7479		-2.00	
141	GPA2261	6.944		1.58	
150	D1945	6.82		-0.68	
151	GPA2261	6.88164		0.44	
167	GPA2286	6.971		2.07	
225		-----		-----	
316	ISO6974-3	6.8642		0.12	
352	ISO6974-3	6.7464		-2.02	
360	ISO6974-3	6.833		-0.44	
442	D1945	6.8614		0.07	
444	D1945	6.8137		-0.80	
446		-----		-----	
449	ISO6974-3	6.8304		-0.49	
496	EN15984	6.870		0.23	
525	GPA2261	7.1231		4.85	
529		-----		-----	
552		-----		-----	
593	D1945	7.021	ex	2.98	See paragraph 4.1
596		-----		-----	
600	GPA2261Mod.	11.12	R(0.01)	77.73	
608	GPA2261	6.8104		-0.86	
609	GPA2261	6.83		-0.50	
610	GPA2286	6.853		-0.08	
611	GPA2286	6.76		-1.78	
663	D1945	6.770	C	-1.59	First reported 6.665
777	ISO6974-6	6.903		0.83	
781	GOST31371.7	6.96		1.87	
823	GPA2261	6.794		-1.16	
840	D1945	6.9182		1.11	
851	GPA2261	6.8824		0.46	
861	GPA2261	6.856		-0.03	
862	GPA2261	6.849		-0.15	
887	D1945	6.857		-0.01	
922	GPA2261	6.90		0.78	
963	D1945	6.82	C	-0.68	First reported 6.61
974	ISO6974-5	6.8102		-0.86	
1006	D1945	6.751		-1.94	
1029	D1945	6.7865		-1.29	
1066	ISO6974-3	6.838		-0.35	
1069	UOP539	7.079	C	4.04	First reported 6.777
1081	In house	6.801	ex	-1.03	See paragraph 4.1
1095	EN15984	6.79		-1.23	
1135	D1945	7.05	C,ex	3.51	First reported 6.63. See paragraph 4.1
1197	D1945	6.9374		1.46	
1198	D1945	6.9252		1.24	
1259	EN15984	6.94	C	1.51	First reported 6.887
1370	ISO6974-3	3.08	R(0.01)	-68.88	
1388	GPA2261	6.854		-0.06	
1414		-----		-----	
1489	GPA2261	6.876		0.34	
1528	UOP539	6.9542		1.77	
1654	D1945	6.855		-0.04	
1679	ISO6974-3	6.879		0.39	
1720	UOP539	6.698		-2.91	
1737	In house	6.75		-1.96	
1779	GPA2261	6.7792		-1.43	
1788		6.7595		-1.78	
1845	EN15984	6.450	ex	-7.43	See paragraph 4.1
1943	ISO6974-3	6.9403		1.51	
1957	GPA2286	7.0717	ex	3.91	See paragraph 4.1
6052	D1945	6.9313		1.35	
6062	ISO6974-3	6.845		-0.23	
6071	GPA2261	6.908		0.92	
6104	GPA2261	6.812		-0.83	
6107	D1945	6.8672		0.18	
6130	GB/T13610	6.85263		-0.09	
6193		-----		-----	
6237	ISO6974-3	6.857		-0.01	
6263		-----		-----	
6313	GPA2286	6.8833		0.47	
6369	ISO17025	6.89884		0.76	
6383	GPA2261	6.818		-0.72	
6398	In house	6.83587		-0.39	
6399	In house	6.83829		-0.35	
7011	ISO6974-3	6.80		-1.05	

lab	method	value	mark	z(targ)	remarks
9145		6.88		0.41	
	normality	not OK			
	n	61			
	outliers	2 (+5ex)			
	mean (n)	6.8574			
	st.dev. (n)	0.07574			
	R(calc.)	0.2121			
	st.dev.(ISO6974-3:18)	0.05484			
	R(ISO6974-3:18)	0.1535			
Compare					
	R(D1945:14)	0.12			



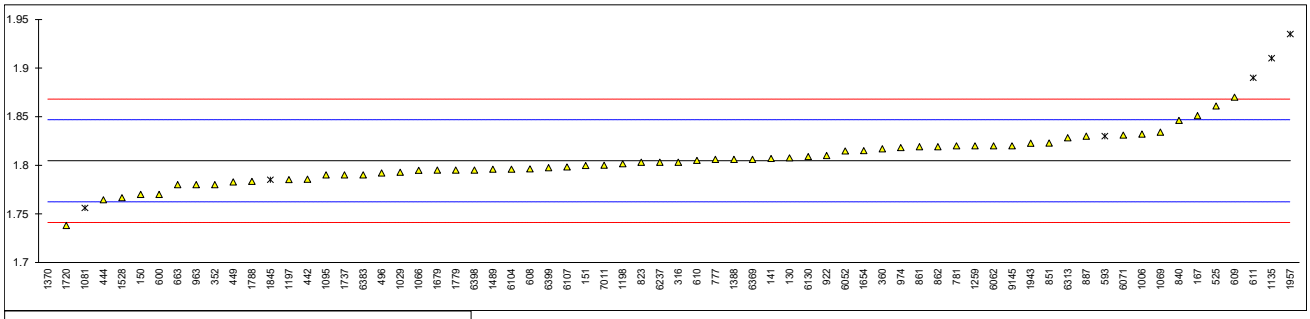


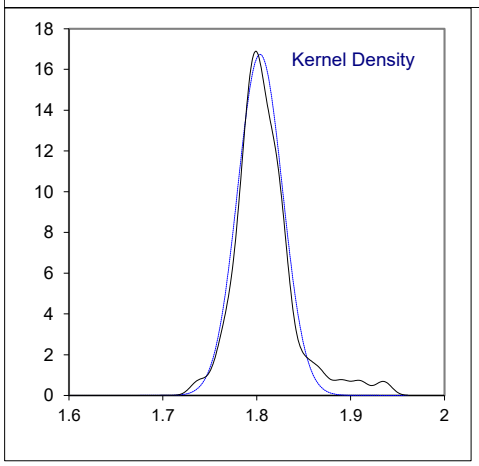
Determination of Propane on sample #21050; results in %mol/mol

lab	method	value	mark	z(targ)	remarks
130		1.8076		0.14	
141	GPA2261	1.807		0.11	
150	D1945	1.77		-1.64	
151	GPA2261	1.79968		-0.24	
167	GPA2286	1.851		2.20	
225		-----		-----	
316	ISO6974-3	1.8031		-0.07	
352	ISO6974-3	1.7800		-1.17	
360	ISO6974-3	1.817		0.59	
442	D1945	1.7856		-0.90	
444	D1945	1.7645		-1.90	
446		-----		-----	
449	ISO6974-3	1.7828		-1.03	
496	EN15984	1.792		-0.60	
525	GPA2261	1.8609		2.66	
529		-----		-----	
552		-----		-----	
593	D1945	1.830	ex	1.20	See paragraph 4.1
596		-----		-----	
600	GPA2261Mod.	1.77		-1.64	
608	GPA2261	1.7962		-0.40	
609	GPA2261	1.87		3.10	
610	GPA2286	1.805		0.02	
611	GPA2286	1.89	R(0.05)	4.04	
663	D1945	1.780	C	-1.17	First reported 1.755
777	ISO6974-6	1.806		0.06	
781	GOST31371.7	1.82		0.73	
823	GPA2261	1.803		-0.08	
840	D1945	1.8461		1.96	
851	GPA2261	1.82282084		0.86	
861	GPA2261	1.819		0.68	
862	GPA2261	1.819		0.68	
887	D1945	1.830		1.20	
922	GPA2261	1.81		0.25	
963	D1945	1.78	C	-1.17	First reported 1.69
974	ISO6974-5	1.8181		0.64	
1006	D1945	1.832		1.30	
1029	D1945	1.7928		-0.56	
1066	ISO6974-3	1.7948		-0.47	
1069	UOP539	1.834	C	1.39	First reported 1.753
1081	In house	1.756	ex	-2.30	See paragraph 4.1
1095	EN15984	1.79		-0.69	
1135	D1945	1.91	C,ex	4.99	First reported 1.73. See paragraph 4.1
1197	D1945	1.7852		-0.92	
1198	D1945	1.8016		-0.14	
1259	EN15984	1.82	C	0.73	First reported 1.57
1370	ISO6974-3	1.43	R(0.01)	-17.75	
1388	GPA2261	1.806		0.06	
1414		-----		-----	
1489	GPA2261	1.796		-0.41	
1528	UOP539	1.7666	C	-1.80	First reported 1.7546
1654	D1945	1.815		0.49	
1679	ISO6974-3	1.795		-0.46	
1720	UOP539	1.738		-3.16	
1737	In house	1.79		-0.69	
1779	GPA2261	1.7950		-0.46	
1788		1.7834		-1.01	
1845	EN15984	1.785	ex	-0.93	See paragraph 4.1
1943	ISO6974-3	1.8227		0.86	
1957	GPA2286	1.9349	R(0.01)	6.17	
6052	D1945	1.8147		0.48	
6062	ISO6974-3	1.820		0.73	
6071	GPA2261	1.831		1.25	
6104	GPA2261	1.796		-0.41	
6107	D1945	1.7982		-0.31	
6130	GB/T13610	1.80889		0.20	
6193		-----		-----	
6237	ISO6974-3	1.803		-0.08	
6263		-----		-----	
6313	GPA2286	1.8283		1.12	
6369	ISO17025	1.80611		0.07	
6383	GPA2261	1.790		-0.69	
6398	In house	1.79506		-0.45	
6399	In house	1.79741		-0.34	
7011	ISO6974-3	1.80		-0.22	

lab	method	value	mark	z(targ)	remarks
9145		1.82		0.73	

	normality	suspect
	n	61
	outliers	3 (+4ex)
	mean (n)	1.8046
	st.dev. (n)	0.02328
	R(calc.)	0.0652
	st.dev.(ISO6974-3:18)	0.02111
	R(ISO6974-3:18)	0.0591
Compare		
	R(D1945:14)	0.10



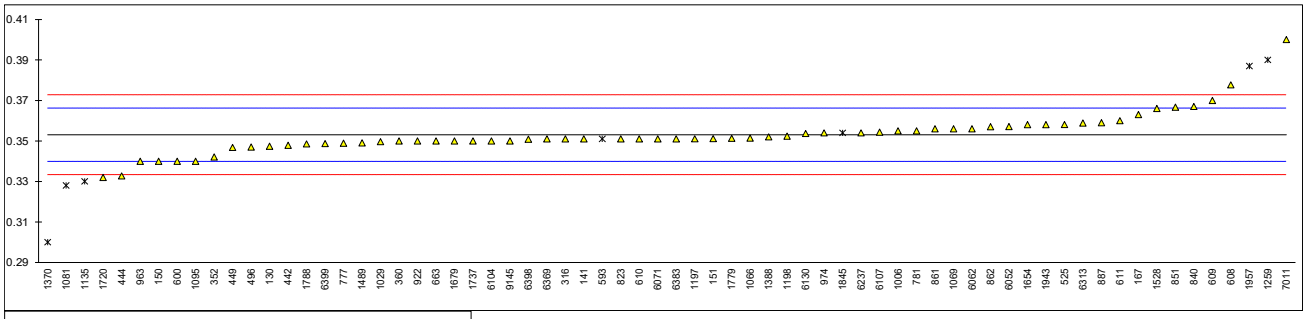


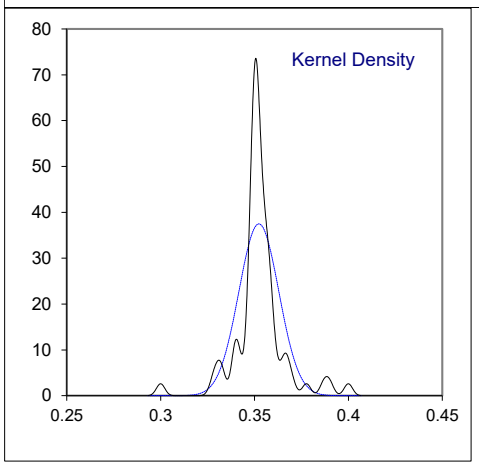
Determination of iso-Butane on sample #21050; results in %mol/mol

lab	method	value	mark	z(targ)	remarks
130		0.3474		-0.86	
141	GPA2261	0.351		-0.32	
150	D1945	0.34		-1.99	
151	GPA2261	0.35111		-0.30	
167	GPA2286	0.363		1.51	
225		-----		-----	
316	ISO6974-3	0.3510		-0.32	
352	ISO6974-3	0.3421		-1.67	
360	ISO6974-3	0.350		-0.47	
442	D1945	0.3479		-0.79	
444	D1945	0.3327		-3.10	
446		-----		-----	
449	ISO6974-3	0.3468		-0.96	
496	EN15984	0.347		-0.92	
525	GPA2261	0.3581		0.76	
529		-----		-----	
552		-----		-----	
593	D1945	0.351	ex	-0.32	See paragraph 4.1
596		-----		-----	
600	GPA2261Mod.	0.34		-1.99	
608	GPA2261	0.3777		3.74	
609	GPA2261	0.37		2.57	
610	GPA2286	0.351		-0.32	
611	GPA2286	0.36		1.05	
663	D1945	0.350	C	-0.47	First reported 0.340
777	ISO6974-6	0.3489		-0.64	
781	GOST31371.7	0.355		0.29	
823	GPA2261	0.351		-0.32	
840	D1945	0.3670		2.12	
851	GPA2261	0.36664576		2.06	
861	GPA2261	0.356		0.44	
862	GPA2261	0.357		0.60	
887	D1945	0.359		0.90	
922	GPA2261	0.35		-0.47	
963	D1945	0.34	C	-1.99	First reported 0.33
974	ISO6974-5	0.3540		0.14	
1006	D1945	0.355		0.29	
1029	D1945	0.3496		-0.53	
1066	ISO6974-3	0.3514		-0.26	
1069	UOP539	0.356	C	0.44	First reported 0.343
1081	In house	0.328	ex	-3.81	See paragraph 4.1
1095	EN15984	0.34		-1.99	
1135	D1945	0.33	ex	-3.51	See paragraph 4.1
1197	D1945	0.3511		-0.30	
1198	D1945	0.3524		-0.10	
1259	EN15984	0.39	C,R(0.05)	5.61	First reported 0.31
1370	ISO6974-3	0.3	R(0.01)	-8.07	
1388	GPA2261	0.352		-0.16	
1414		-----		-----	
1489	GPA2261	0.349		-0.62	
1528	UOP539	0.3660	C	1.96	First reported 0.3860
1654	D1945	0.358		0.75	
1679	ISO6974-3	0.350		-0.47	
1720	UOP539	0.332		-3.21	
1737	In house	0.35		-0.47	
1779	GPA2261	0.3513		-0.27	
1788		0.3485		-0.70	
1845	EN15984	0.354	ex	0.14	See paragraph 4.1
1943	ISO6974-3	0.3580		0.75	
1957	GPA2286	0.3870	R(0.05)	5.16	
6052	D1945	0.3571		0.61	
6062	ISO6974-3	0.356		0.44	
6071	GPA2261	0.351		-0.32	
6104	GPA2261	0.350		-0.47	
6107	D1945	0.3543		0.19	
6130	GB/T13610	0.35366		0.09	
6193		-----		-----	
6237	ISO6974-3	0.354		0.14	
6263		-----		-----	
6313	GPA2286	0.3588		0.87	
6369	ISO17025	0.35097		-0.32	
6383	GPA2261	0.351		-0.32	
6398	In house	0.35084		-0.34	
6399	In house	0.34869		-0.67	
7011	ISO6974-3	0.40		7.13	

lab	method	value	mark	z(targ)	remarks
9145		0.35		-0.47	

	normality	not OK
	n	61
	outliers	3 (+4ex)
	mean (n)	0.3531
	st.dev. (n)	0.01000
	R(calc.)	0.0280
	st.dev.(ISO6974-3:18)	0.00658
	R(ISO6974-3:18)	0.0184
Compare		
	R(D1945:14)	0.07

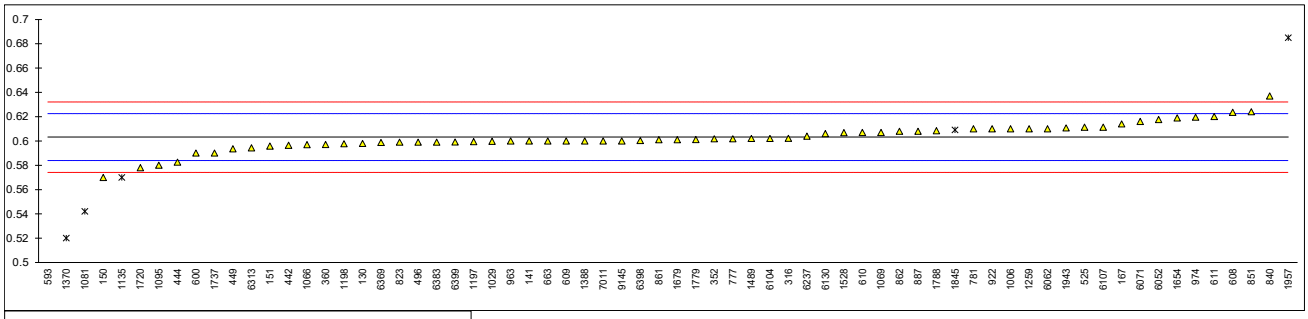


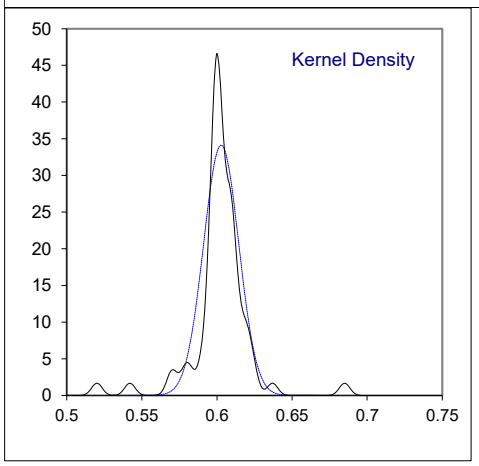


Determination of n-Butane on sample #21050; results in %mol/mol

lab	method	value	mark	z(targ)	remarks
130		0.5979		-0.55	
141	GPA2261	0.600		-0.33	
150	D1945	0.57		-3.44	
151	GPA2261	0.59575		-0.77	
167	GPA2286	0.614		1.12	
225		-----		-----	
316	ISO6974-3	0.6021		-0.11	
352	ISO6974-3	0.6018		-0.14	
360	ISO6974-3	0.597		-0.64	
442	D1945	0.5965		-0.69	
444	D1945	0.5825		-2.14	
446		-----		-----	
449	ISO6974-3	0.5936		-0.99	
496	EN15984	0.599		-0.43	
525	GPA2261	0.6113		0.84	
529		-----		-----	
552		-----		-----	
593	D1945	0.254	R(0.01)	-36.21	
596		-----		-----	
600	GPA2261Mod.	0.59		-1.37	
608	GPA2261	0.6235		2.11	
609	GPA2261	0.60		-0.33	
610	GPA2286	0.607		0.40	
611	GPA2286	0.62		1.75	
663	D1945	0.600	C	-0.33	First reported 0.590
777	ISO6974-6	0.6018		-0.14	
781	GOST31371.7	0.61		0.71	
823	GPA2261	0.599		-0.43	
840	D1945	0.6369		3.50	
851	GPA2261	0.62402842		2.16	
861	GPA2261	0.601		-0.23	
862	GPA2261	0.608		0.50	
887	D1945	0.608		0.50	
922	GPA2261	0.61		0.71	
963	D1945	0.60	C	-0.33	First reported 0.45
974	ISO6974-5	0.6195		1.69	
1006	D1945	0.610		0.71	
1029	D1945	0.5997		-0.36	
1066	ISO6974-3	0.5969		-0.65	
1069	UOP539	0.607	C	0.40	First reported 0.582
1081	In house	0.542	ex	-6.34	See paragraph 4.1
1095	EN15984	0.58		-2.40	
1135	D1945	0.57	C,ex	-3.44	First reported 0.43. See paragraph 4.1
1197	D1945	0.5995		-0.38	
1198	D1945	0.5977		-0.57	
1259	EN15984	0.61	C	0.71	First reported 0.58
1370	ISO6974-3	0.52	R(0.01)	-8.62	
1388	GPA2261	0.600		-0.33	
1414		-----		-----	
1489	GPA2261	0.602		-0.12	
1528	UOP539	0.6068		0.38	
1654	D1945	0.619		1.64	
1679	ISO6974-3	0.601		-0.23	
1720	UOP539	0.578		-2.61	
1737	In house	0.59		-1.37	
1779	GPA2261	0.6012		-0.20	
1788		0.6084		0.54	
1845	EN15984	0.609	ex	0.60	See paragraph 4.1
1943	ISO6974-3	0.6107		0.78	
1957	GPA2286	0.6849	R(0.01)	8.48	
6052	D1945	0.6176		1.50	
6062	ISO6974-3	0.610		0.71	
6071	GPA2261	0.616		1.33	
6104	GPA2261	0.602		-0.12	
6107	D1945	0.6113		0.84	
6130	GB/T13610	0.60597		0.29	
6193		-----		-----	
6237	ISO6974-3	0.604		0.09	
6263		-----		-----	
6313	GPA2286	0.5943		-0.92	
6369	ISO17025	0.59880		-0.45	
6383	GPA2261	0.599		-0.43	
6398	In house	0.60038		-0.29	
6399	In house	0.59911		-0.42	
7011	ISO6974-3	0.60		-0.33	

lab	method	value	mark	z(targ)	remarks
9145		0.60		-0.33	
	normality	suspect			
	n	62			
	outliers	3 (+3ex)			
	mean (n)	0.6032			
	st.dev. (n)	0.01108			
	R(calc.)	0.0310			
	st.dev.(ISO6974-3:18)	0.00964			
	R(ISO6974-3:18)	0.0270			
Compare					
	R(D1945:14)	0.07			



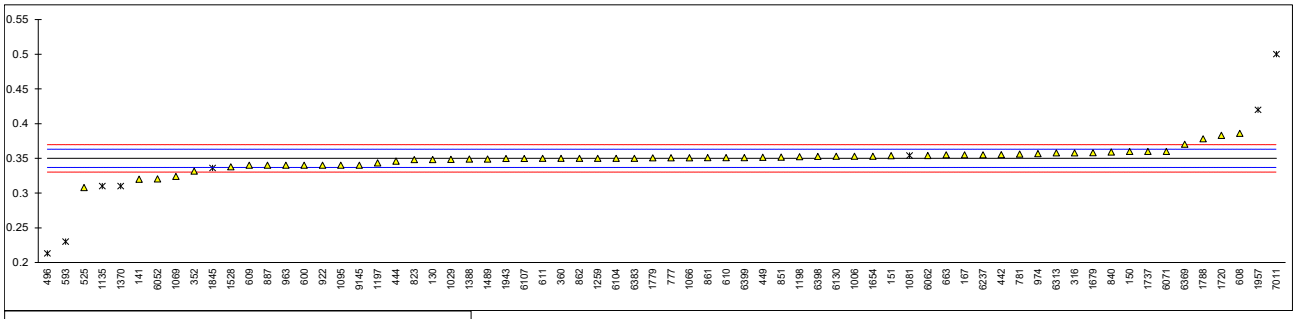


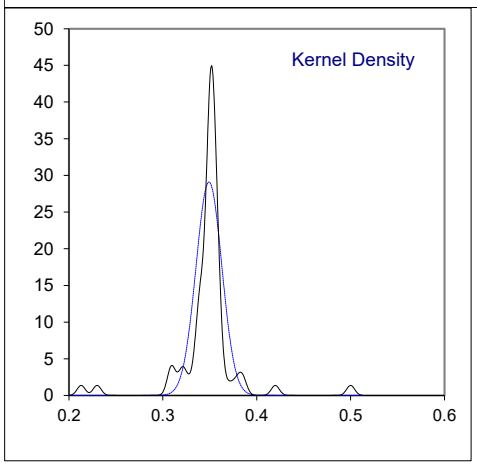
Determination of Carbon Dioxide on sample #21050; results in %mol/mol

lab	method	value	mark	z(targ)	remarks
130		0.3483		-0.25	
141	GPA2261	0.320		-4.58	
150	D1945	0.36		1.54	
151	GPA2261	0.35378		0.59	
167	GPA2286	0.355		0.77	
225		-----		-----	
316	ISO6974-3	0.3578		1.20	
352	ISO6974-3	0.3316		-2.81	
360	ISO6974-3	0.350		0.01	
442	D1945	0.3553		0.82	
444	D1945	0.3460		-0.60	
446		-----		-----	
449	ISO6974-3	0.3515		0.24	
496	EN15984	0.213	R(0.01)	-20.96	
525	GPA2261	0.3078		-6.45	
529		-----		-----	
552		-----		-----	
593	D1945	0.230	R(0.01)	-18.36	
596		-----		-----	
600	GPA2261Mod.	0.34		-1.52	
608	GPA2261	0.3859		5.50	
609	GPA2261	0.34		-1.52	
610	GPA2286	0.351		0.16	
611	GPA2286	0.35		0.01	
663	D1945	0.355	C	0.77	First reported 0.350
777	ISO6974-6	0.3508		0.13	
781	GOST31371.7	0.356		0.93	
823	GPA2261	0.348		-0.30	
840	D1945	0.3590		1.39	
851	GPA2261	0.35159		0.25	
861	GPA2261	0.351		0.16	
862	GPA2261	0.350		0.01	
887	D1945	0.340		-1.52	
922	GPA2261	0.34		-1.52	
963	D1945	0.34	C	-1.52	First reported 0.29
974	ISO6974-5	0.3567		1.03	
1006	D1945	0.353		0.47	
1029	D1945	0.3485		-0.22	
1066	ISO6974-3	0.3509		0.15	
1069	UOP539	0.324	C	-3.97	First reported 0.340
1081	In house	0.354	ex	0.62	See paragraph 4.1
1095	EN15984	0.34		-1.52	
1135	D1945	0.31	C,ex	-6.11	First reported 0.32.See paragraph 4.1
1197	D1945	0.3434		-1.00	
1198	D1945	0.3524		0.38	
1259	EN15984	0.35		0.01	
1370	ISO6974-3	0.31	ex	-6.11	See paragraph 4.1
1388	GPA2261	0.349		-0.14	
1414		-----		-----	
1489	GPA2261	0.349		-0.14	
1528	UOP539	0.3378		-1.86	
1654	D1945	0.353		0.47	
1679	ISO6974-3	0.358		1.23	
1720	UOP539	0.383		5.06	
1737	In house	0.36		1.54	
1779	GPA2261	0.3507		0.12	
1788		0.3780		4.29	
1845	EN15984	0.336	ex	-2.13	See paragraph 4.1
1943	ISO6974-3	0.3497		-0.04	
1957	GPA2286	0.4198	R(0.01)	10.69	
6052	D1945	0.3204		-4.52	
6062	ISO6974-3	0.354		0.62	
6071	GPA2261	0.360		1.54	
6104	GPA2261	0.350		0.01	
6107	D1945	0.3498		-0.02	
6130	GB/T13610	0.35286		0.45	
6193		-----		-----	
6237	ISO6974-3	0.355		0.77	
6263		-----		-----	
6313	GPA2286	0.3577		1.19	
6369	ISO17025	0.37038		3.13	
6383	GPA2261	0.350		0.01	
6398	In house	0.35269		0.42	
6399	In house	0.35103		0.17	
7011	ISO6974-3	0.50	R(0.01)	22.97	

lab	method	value	mark	z(targ)	remarks
9145		0.34		-1.52	

	normality	not OK
	n	60
	outliers	4 (+4ex)
	mean (n)	0.3499
	st.dev. (n)	0.01295
	R(calc.)	0.0363
	st.dev.(ISO6974-3:18)	0.00653
	R(ISO6974-3:18)	0.0183
Compare		
	R(D1945:14)	0.07



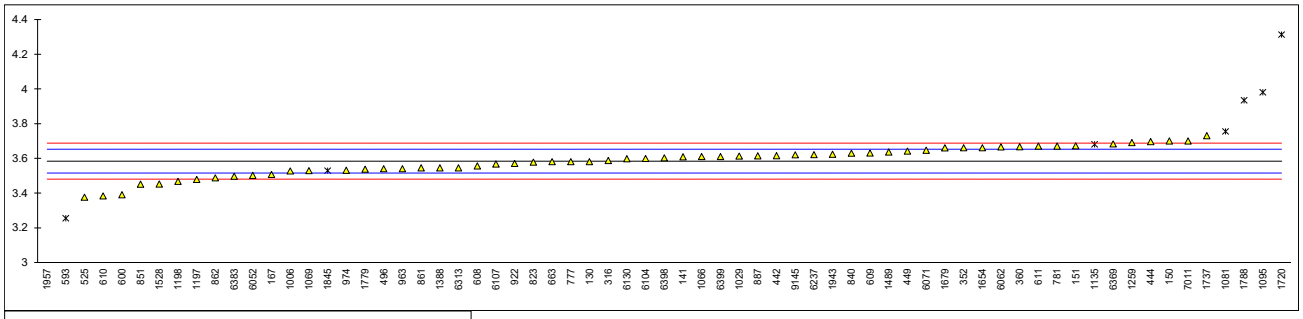


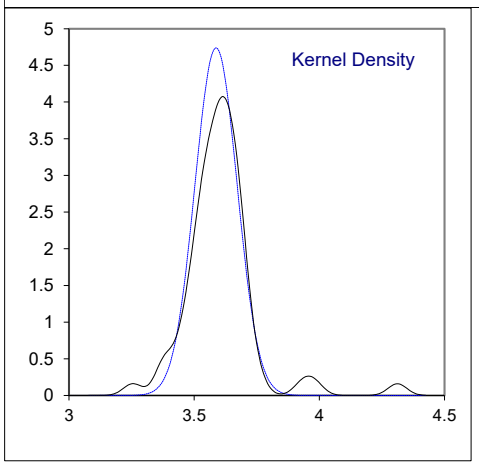
Determination of Nitrogen on sample #21050; results in %mol/mol

lab	method	value	mark	z(targ)	remarks
130		3.5803		-0.11	
141	GPA2261	3.608		0.69	
150	D1945	3.70		3.36	
151	GPA2261	3.67185		2.54	
167	GPA2286	3.507		-2.24	
225		-----		-----	
316	ISO6974-3	3.5874		0.09	
352	ISO6974-3	3.6607		2.22	
360	ISO6974-3	3.667		2.40	
442	D1945	3.6154		0.90	
444	D1945	3.6967		3.26	
446		-----		-----	
449	ISO6974-3	3.6415		1.66	
496	EN15984	3.540		-1.28	
525	GPA2261	3.3757		-6.05	
529		-----		-----	
552		-----		-----	
593	D1945	3.255	R(0.05)	-9.55	
596		-----		-----	
600	GPA2261Mod.	3.39		-5.63	
608	GPA2261	3.5558		-0.82	
609	GPA2261	3.63		1.33	
610	GPA2286	3.383		-5.83	
611	GPA2286	3.67		2.49	
663	D1945	3.580	C	-0.12	First reported 3.595
777	ISO6974-6	3.580		-0.12	
781	GOST31371.7	3.67		2.49	
823	GPA2261	3.578		-0.18	
840	D1945	3.6295		1.31	
851	GPA2261	3.45068		-3.87	
861	GPA2261	3.545		-1.14	
862	GPA2261	3.487		-2.82	
887	D1945	3.614		0.86	
922	GPA2261	3.57		-0.41	
963	D1945	3.54	C	-1.28	First reported 3.79
974	ISO6974-5	3.5312		-1.54	
1006	D1945	3.527		-1.66	
1029	D1945	3.6123		0.81	
1066	ISO6974-3	3.61		0.75	
1069	UOP539	3.529	C	-1.60	First reported 3.534
1081	In house	3.755	ex	4.95	See paragraph 4.1
1095	EN15984	3.98	R(0.05)	11.48	
1135	D1945	3.68	C,ex	2.78	First reported 3.84. See paragraph 4.1
1197	D1945	3.4778		-3.09	
1198	D1945	3.4666		-3.41	
1259	EN15984	3.69	C	3.07	First reported 3.77
1370		-----		-----	
1388	GPA2261	3.545		-1.14	
1414		-----		-----	
1489	GPA2261	3.636		1.50	
1528	UOP539	3.4516		-3.85	
1654	D1945	3.661		2.23	
1679	ISO6974-3	3.660		2.20	
1720	UOP539	4.312	R(0.01)	21.11	
1737	In house	3.73		4.23	
1779	GPA2261	3.5375		-1.35	
1788		3.9343	R(0.05)	10.15	
1845	EN15984	3.529	ex	-1.60	See paragraph 4.1
1943	ISO6974-3	3.6232		1.13	
1957	GPA2286	1.6649	R(0.01)	-55.66	
6052	D1945	3.5016		-2.40	
6062	ISO6974-3	3.666		2.37	
6071	GPA2261	3.646		1.79	
6104	GPA2261	3.599		0.43	
6107	D1945	3.5670		-0.50	
6130	GB/T13610	3.59763		0.39	
6193		-----		-----	
6237	ISO6974-3	3.621		1.07	
6263		-----		-----	
6313	GPA2286	3.5451		-1.13	
6369	ISO17025	3.68251		2.85	
6383	GPA2261	3.497		-2.53	
6398	In house	3.60264		0.53	
6399	In house	3.61017		0.75	
7011	ISO6974-3	3.70		3.36	

lab	method	value	mark	z(targ)	remarks
9145		3.62		1.04	

	normality	OK
	n	59
	outliers	5 (+3ex)
	mean (n)	3.5842
	st.dev. (n)	0.08218
	R(calc.)	0.2301
	st.dev.(ISO6974-3:18)	0.03448
	R(ISO6974-3:18)	0.0966
Compare		
	R(D1945:14)	0.10



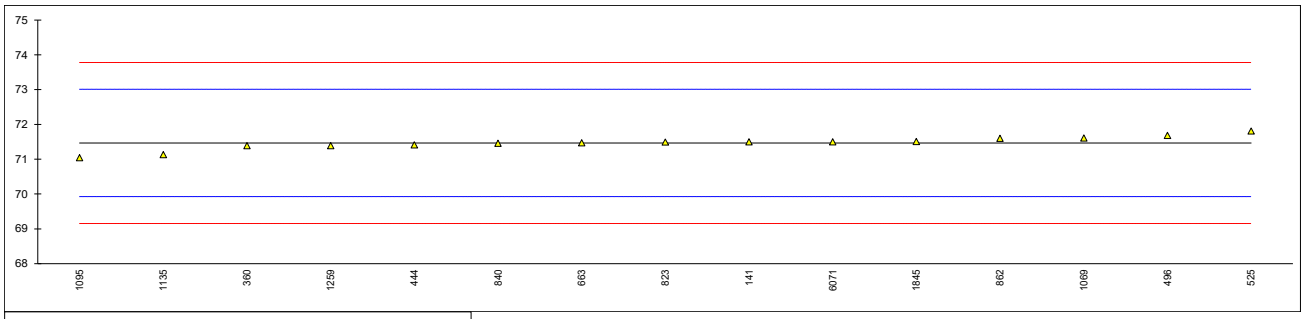


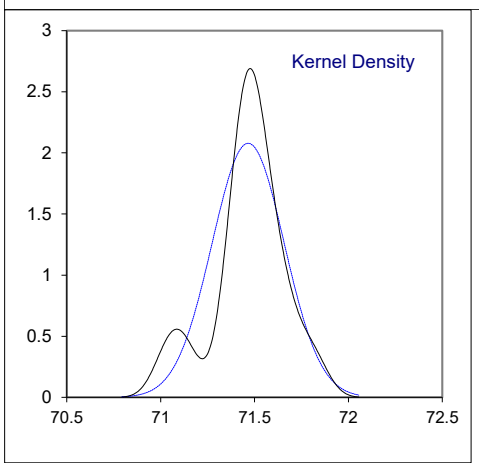
Determination of Carbon content on sample #21050; results in g/100g

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	EN15984	71.500		0.04	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360	EN15984	71.39		-0.10	
442		-----		-----	
444	EN15984	71.41		-0.07	
446		-----		-----	
449		-----		-----	
496	EN15984	71.681		0.28	
525	EN15984	71.8085		0.44	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	EN15984	71.47		0.01	
777		-----		-----	
781		-----		-----	
823	EN15984	71.49		0.03	
840	EN15984	71.456		-0.01	
851		-----		-----	
861		-----		-----	
862	GPA2261	71.60		0.17	
887		-----		-----	
922		-----		-----	
963		-----		-----	
974		-----		-----	
1006		-----		-----	
1029		-----		-----	
1066		-----		-----	
1069	EN15984	71.61	C	0.19	First reported 71.41
1081		-----		-----	
1095	EN15984	71.04		-0.55	
1135	EN15984	71.13		-0.44	
1197		-----		-----	
1198		-----		-----	
1259	EN15984	71.39	C	-0.10	First reported 71.23
1370		-----		-----	
1388		-----		-----	
1414		-----		-----	
1489		-----		-----	
1528		-----		-----	
1654		-----		-----	
1679		-----		-----	
1720		-----		-----	
1737		-----		-----	
1779		-----		-----	
1788		-----		-----	
1845	EN15984	71.509		0.06	
1943		-----		-----	
1957		-----		-----	
6052		-----		-----	
6062		-----		-----	
6071	EN15984	71.50		0.04	
6104		-----		-----	
6107		-----		-----	
6130		-----		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313		-----		-----	
6369		-----		-----	
6383		-----		-----	
6398		-----		-----	
6399		-----		-----	
7011		-----		-----	

lab	method	value	mark	z(targ)	remarks
9145		-----		-----	

normality	suspect
n	15
outliers	0
mean (n)	71.466
st.dev. (n)	0.1920
R(calc.)	0.538
st.dev.(EN15984:17)	0.7714
R(EN15984:17)	2.16



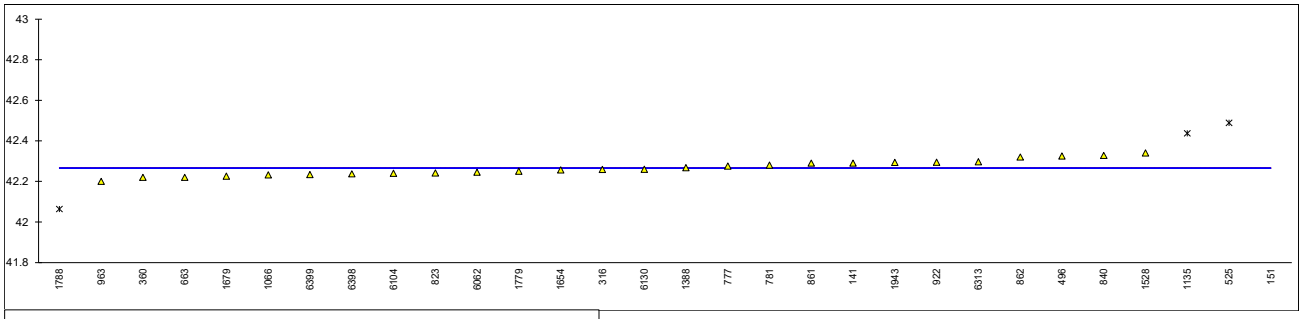


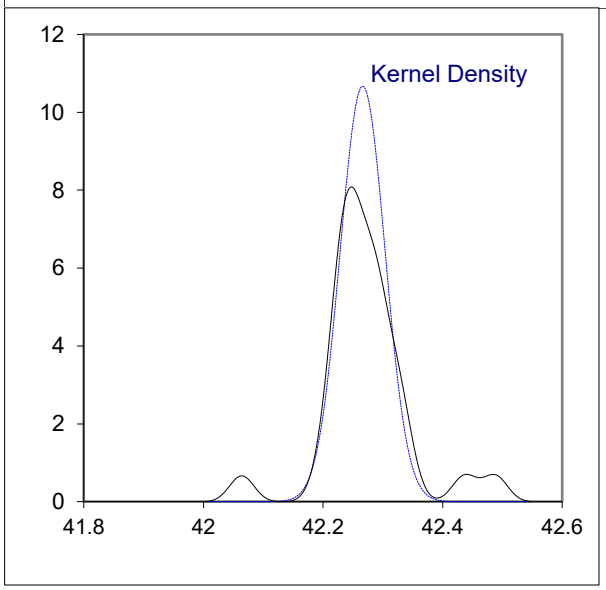
Determination of Gross (Superior) Caloric Value (Real Gas, 101.325 kPa, combustion temperature 25°C, metering temperature 0°C) on sample #21050; results in MJ/m^3

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	42.29		-----	
150		-----		-----	
151	ISO6976	1075.2	ex	-----	Test result excluded, reported possibly a different unit.
167		-----		-----	
225		-----		-----	
316	ISO6976	42.2590		-----	
352		-----		-----	
360	ISO6976	42.22		-----	
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	42.3247		-----	
525	ISO6976	42.488	G(0.05)	-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	ISO6976	42.22	C	-----	First reported 42.15
777	ISO6976	42.2760		-----	
781	GOST31369	42.28		-----	
823	ISO6976	42.242		-----	
840	ISO6976	42.3277		-----	
851		-----		-----	
861	ISO6976	42.29		-----	
862	ISO6976	42.32		-----	
887		-----		-----	
922	ISO6976	42.2943		-----	
963	ISO6976	42.20	C, E	-----	First reported 41.94. iis calc 42.251
974		-----		-----	
1006		-----		-----	
1029		-----		-----	
1066	ISO6976	42.232		-----	
1069		-----		-----	
1081		-----		-----	
1095		-----		-----	
1135	ISO6976	42.437	ex, C, E	-----	Test result excluded see §4.1. First reported 42.51. iis calc 42.511
1197		-----		-----	
1198		-----		-----	
1259		-----		-----	
1370		-----		-----	
1388	ISO6976	42.268		-----	
1414		-----		-----	
1489		-----		-----	
1528	ISO6976	42.34		-----	
1654	ISO6976	42.257		-----	
1679	ISO6976	42.2258		-----	
1720		-----		-----	
1737		-----		-----	
1779	ISO6976	42.2502		-----	
1788	ISO6976	42.064	G(0.01)	-----	
1845		-----		-----	
1943	ISO6976	42.293957		-----	
1957		-----		-----	
6052		-----		-----	
6062	ISO6976	42.245		-----	
6071		-----		-----	
6104	ISO6976	42.2400		-----	
6107		-----		-----	
6130	ISO6976	42.26002		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	42.2970		-----	
6369		-----		-----	
6383		-----		-----	
6398	In house	42.237		-----	
6399	In house	42.234		-----	
7011		-----		-----	

lab	method	value	mark	z(targ)	remarks
9145		-----		-----	

	normality	OK
	n	26
	outliers	2 (+2ex)
	mean (n)	42.26629
	st.dev. (n)	0.037401
	R(calc.)	0.10472
Compare		
	R(iis20S01M)	0.1386



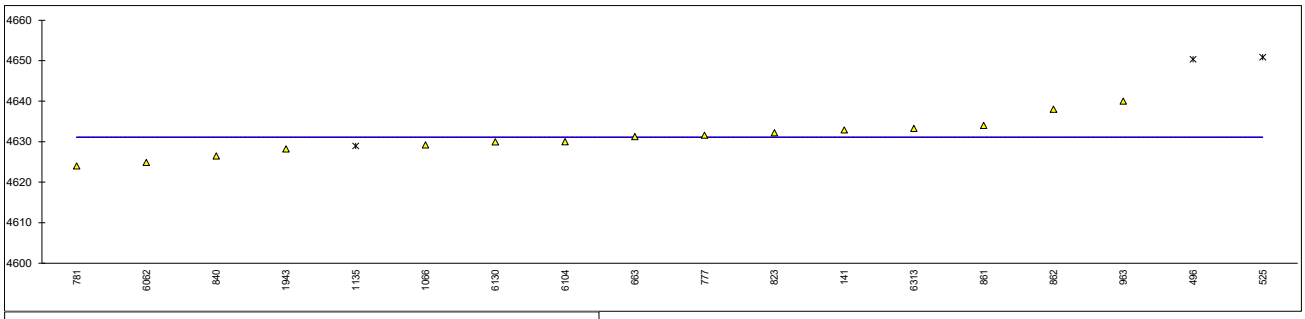


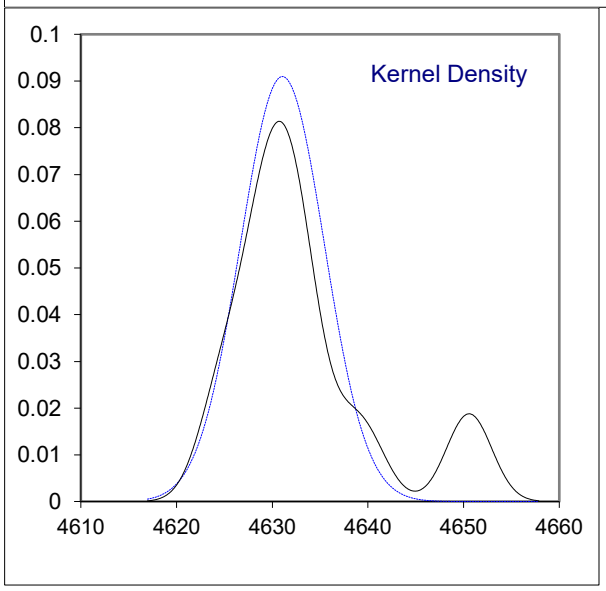
Determination of Net (Inferior) Caloric Value (Real Gas, 101.325 kPa, combustion temperature 25°C, metering temperature 0°C) on sample #21050; results in kJ/100g

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	4632.88		-----	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360		-----		-----	
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	4650.342	DG(0.01)	-----	
525	ISO6976	4650.825	DG(0.01)	-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	ISO6976	4631.25		-----	
777	ISO6976	4631.57		-----	
781	GOST31369	4624	C	-----	First reported 38.23 MJ/m3
823	ISO6976	4632.2		-----	
840	ISO6976	4626.48	C	-----	First reported 4612.47
851		-----		-----	
861	ISO6976	4634		-----	
862	ISO6976	4638		-----	
887		-----		-----	
922		-----		-----	
963	ISO6976	4640	C ,E	-----	First reported 4625. Iis calc 4635.97
974		-----		-----	
1006		-----		-----	
1029		-----		-----	
1066	ISO6976	4629.2		-----	
1069		-----		-----	
1081		-----		-----	
1095		-----		-----	
1135	ISO6976	4628.95	ex, C, E	-----	Test result excluded see §4.1. First reported 4617.30. iis calc 4630.129
1197		-----		-----	
1198		-----		-----	
1259		-----		-----	
1370		-----		-----	
1388		-----		-----	
1414		-----		-----	
1489		-----		-----	
1528		-----		-----	
1654		-----		-----	
1679		-----		-----	
1720		-----		-----	
1737		-----		-----	
1779		-----		-----	
1788		-----	W	-----	Test result withdrawn, reported 38.036 MJ/m3
1845		-----		-----	
1943	ISO6976	4628.228		-----	
1957		-----		-----	
6052		-----		-----	
6062	ISO6976	4624.87		-----	
6071		-----		-----	
6104	ISO6976	4630		-----	
6107		-----		-----	
6130	ISO6976	4629.9503		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	4633.261		-----	
6369		-----		-----	
6383		-----		-----	
6398		-----		-----	
6399		-----		-----	
7011		-----		-----	

lab	method	value	mark	z(targ)	remarks
9145		-----		-----	

	normality	OK
	n	15
	outliers	2 (+1 ex)
	mean (n)	4631.060
	st.dev. (n)	4.3871
	R(calc.)	12.284
Compare		
	R(iis20S01M)	7.027

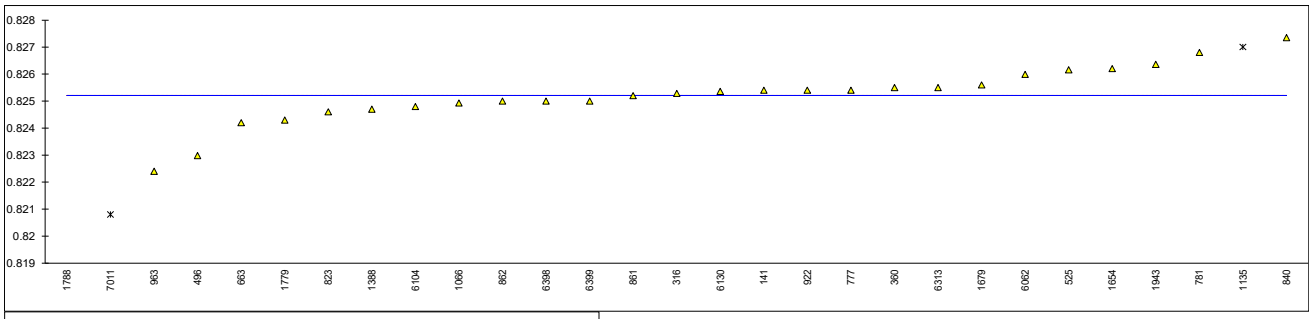


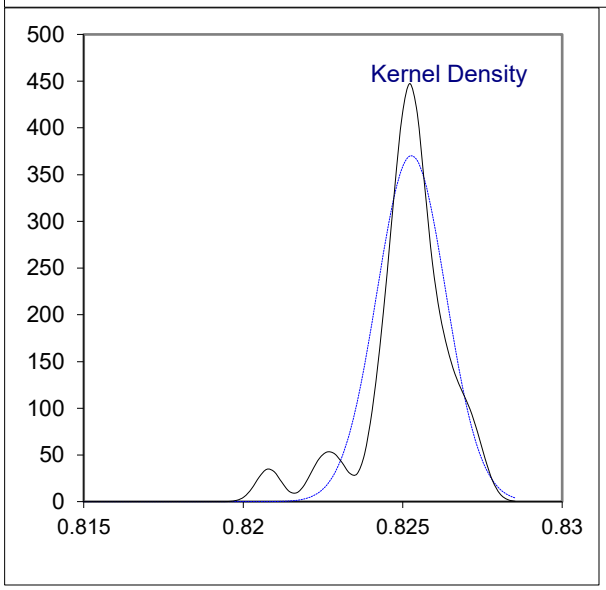


Determination of Density (Real Gas, 101.325 kPa, combustion temperature 25°C, metering temperature 0°C) on sample #21050; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	0.8254		-----	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316	ISO6976	0.82528		-----	
352		-----		-----	
360	ISO6976	0.8255		-----	
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	0.822981		-----	
525	ISO6976	0.82616		-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	ISO6976	0.8242	C	-----	First reported 0.8229
777	ISO6976	0.8254		-----	
781	GOST31369	0.8268		-----	
823	ISO6976	0.8246		-----	
840	ISO6976	0.82735		-----	
851		-----		-----	
861	ISO6976	0.8252		-----	
862	ISO6976	0.8250		-----	
887		-----		-----	
922	ISO6976	0.8254		-----	
963	ISO6976	0.8224	C, E	-----	First reported 0.8200. iis calc 0.82409
974		-----		-----	
1006		-----		-----	
1029		-----		-----	
1066	ISO6976	0.82493		-----	
1069		-----		-----	
1081		-----		-----	
1095		-----		-----	
1135	ISO6976	0.8270	ex, C, E	-----	Test result exclude see §4.1. First reported 0.8307, iis calc 0.83027
1197		-----		-----	
1198		-----		-----	
1259		-----		-----	
1370		-----		-----	
1388	ISO6976	0.8247		-----	
1414		-----		-----	
1489		-----		-----	
1528		-----		-----	
1654	ISO6976	0.8262		-----	
1679	ISO6976	0.82560		-----	
1720		-----		-----	
1737		-----		-----	
1779	ISO6976	0.8243		-----	
1788	ISO6976	0.76952	R(0.01), E	-----	iis calc 0.82634
1845		-----		-----	
1943	ISO6976	0.82636		-----	
1957		-----		-----	
6052		-----		-----	
6062	ISO6976	0.82599		-----	
6071		-----		-----	
6104	ISO6976	0.8248		-----	
6107		-----		-----	
6130	ISO6976	0.825358		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	0.8255		-----	
6369		-----		-----	
6383		-----		-----	
6398	In house	0.825		-----	
6399	In house	0.825		-----	
7011	ISO6976	0.8208	R(0.05), E	-----	iis calc 0.82879

lab	method	value	mark	z(targ)	remarks
9145		-----		-----	
	normality	suspect			
	n	26			
	outliers	2 (+1ex)			
	mean (n)	0.82521			
	st.dev. (n)	0.001041			
	R(calc.)	0.00292			
Compare					
	R(iis20S01M)	0.00118			

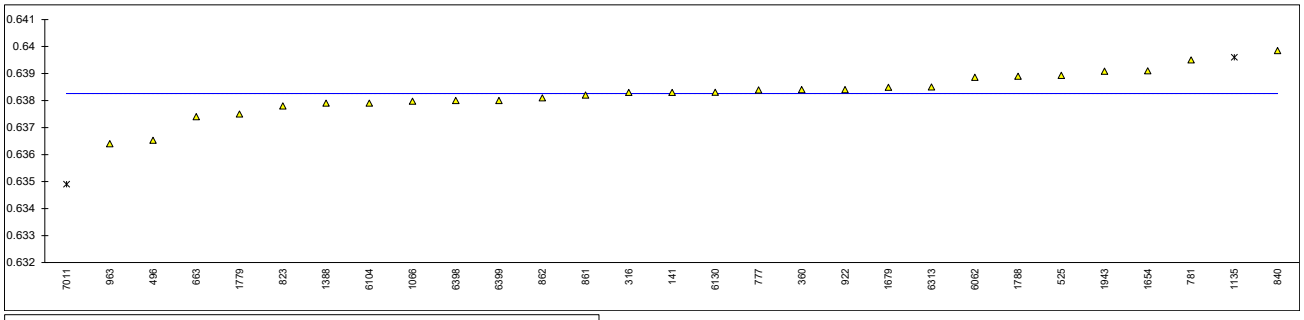


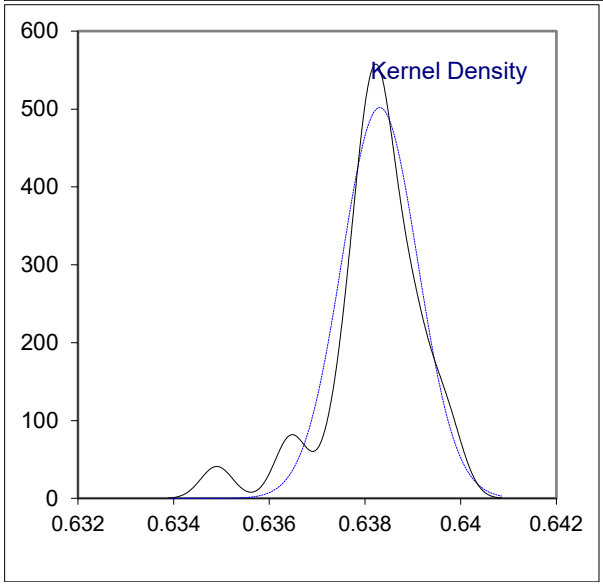


Determination of Relative Density (Real Gas, 101.325 kPa, combustion temperature 25°C, metering temperature 0°C) on sample #21050; results have no unit

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	0.6383		-----	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316	ISO6976	0.63830		-----	
352		-----		-----	
360	ISO6976	0.6384		-----	
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	0.636527		-----	
525	ISO6976	0.63893		-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	ISO6976	0.6374	C	-----	First reported 0.6364
777	ISO6976	0.63839		-----	
781	GOST31369	0.6395		-----	
823	ISO6976	0.6378		-----	
840	ISO6976	0.63985		-----	
851		-----		-----	
861	ISO6976	0.6382		-----	
862	ISO6976	0.6381		-----	
887		-----		-----	
922	ISO6976	0.6384		-----	
963	ISO6976	0.6364	C	-----	First reported 0.6345
974		-----		-----	
1006		-----		-----	
1029		-----		-----	
1066	ISO6976	0.63797		-----	
1069		-----		-----	
1081		-----		-----	
1095		-----		-----	
1135	ISO6976	0.6396	ex, C, E	-----	Test result excluded see §4.1. First reported 0.6424. iis calc 0.64210
1197		-----		-----	
1198		-----		-----	
1259		-----		-----	
1370		-----		-----	
1388	ISO6976	0.6379		-----	
1414		-----		-----	
1489		-----		-----	
1528		-----		-----	
1654	ISO6976	0.6391		-----	
1679	ISO6976	0.63849		-----	
1720		-----		-----	
1737		-----		-----	
1779	ISO6976	0.6375		-----	
1788	ISO6976	0.63890		-----	
1845		-----		-----	
1943	ISO6976	0.63908		-----	
1957		-----		-----	
6052		-----		-----	
6062	ISO6976	0.63886		-----	
6071		-----		-----	
6104	ISO6976	0.6379		-----	
6107		-----		-----	
6130	ISO6976	0.638305		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	0.6385		-----	
6369		-----		-----	
6383		-----		-----	
6398	In house	0.638		-----	
6399	In house	0.638		-----	
7011	ISO6976	0.6349	R(0.01), E	-----	iis calc 0.64096

lab	method	value	mark	z(targ)	remarks
9145		-----		-----	
	normality	suspect			
	n	27			
	outliers	1 (+1ex)			
	mean (n)	0.63826			
	st.dev. (n)	0.000768			
	R(calc.)	0.00215			
Compare					
	R(iis20S01M)	0.00099			



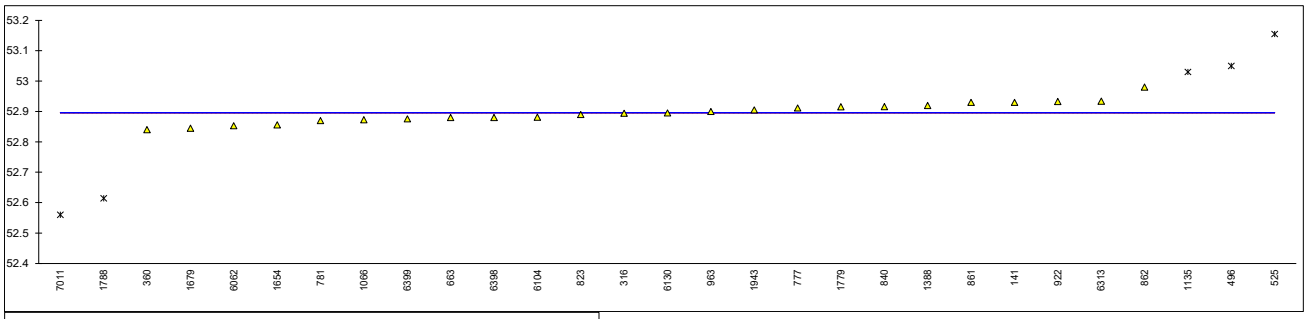


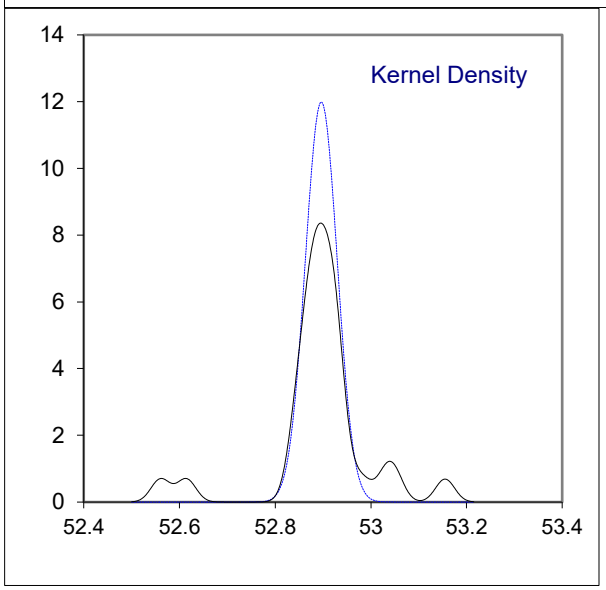
Determination of Gross Wobbe Index (Real Gas, 101.325 kPa, combustion temperature 25°C, metering temperature 0°C) on sample #21050; results in MJ/m^3

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	52.93		-----	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316	ISO6976	52.8940		-----	
352		-----		-----	
360	ISO6976	52.84		-----	
442		-----		-----	
444		-----		-----	
446		-----		-----	
449		-----		-----	
496	DIN51857	53.0500	R(0.01)	-----	
525	ISO6976	53.155	R(0.01)	-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	ISO6976	52.88		-----	
777	ISO6976	52.9114		-----	
781	GOST31369	52.87		-----	
823	ISO6976	52.89		-----	
840	ISO6976	52.916		-----	
851		-----		-----	
861	ISO6976	52.93		-----	
862	ISO6976	52.98		-----	
887		-----		-----	
922	ISO6976	52.9329		-----	
963	ISO6976	52.90	C, E	-----	First reported 52.66. iis calc 52.9241
974		-----		-----	
1006		-----		-----	
1029		-----		-----	
1066	ISO6976	52.873		-----	
1069		-----		-----	
1081		-----		-----	
1095		-----		-----	
1135	ISO6976	53.03	ex, E	-----	Test result excluded see §4.1. iis calc 53.0512
1197		-----		-----	
1198		-----		-----	
1259		-----		-----	
1370		-----		-----	
1388	ISO6976	52.92		-----	
1414		-----		-----	
1489		-----		-----	
1528		-----		-----	
1654	ISO6976	52.856		-----	
1679	ISO6976	52.8446		-----	
1720		-----		-----	
1737		-----		-----	
1779	ISO6976	52.9152		-----	
1788	ISO6976	52.614	R(0.01)	-----	
1845		-----		-----	
1943	ISO6976	52.905486		-----	
1957		-----		-----	
6052		-----		-----	
6062	ISO6976	52.853		-----	
6071		-----		-----	
6104	ISO6976	52.8810		-----	
6107		-----		-----	
6130	ISO6976	52.89512		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	52.934		-----	
6369		-----		-----	
6383		-----		-----	
6398	In house	52.880		-----	
6399	In house	52.876		-----	
7011	ISO6976	52.56	R(0.01), E	-----	iis calc 52.7288

lab	method	value	mark	z(targ)	remarks
9145		-----		-----	

	normality	OK
	n	24
	outliers	4 (+1ex)
	mean (n)	52.8962
	st.dev. (n)	0.03328
	R(calc.)	0.0932
Compare		
	R(iis20S01M)	0.1013

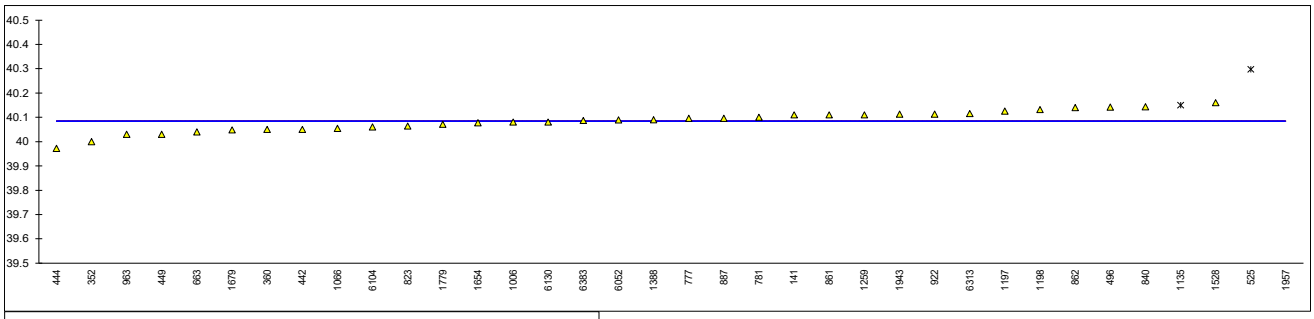


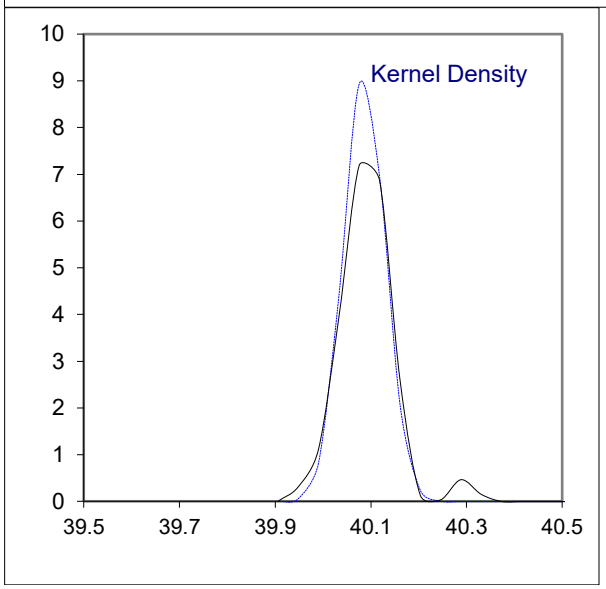


Determination of Gross (Superior) Caloric Value (Real Gas, 101.325 kPa, combustion temperature 15°C, metering temperature 15°C) on sample #21050; results in MJ/m^3

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	40.11		-----	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316		-----		-----	
352	ISO6976	40.00		-----	
360	ISO6976	40.05		-----	
442	ISO6976	40.05		-----	
444	ISO6976	39.972		-----	
446		-----		-----	
449	ISO6976	40.03		-----	
496	DIN51857	40.1417		-----	
525	ISO6976	40.297	R(0.01)	-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	ISO6976	40.04		-----	
777	ISO6976	40.0958		-----	
781	GOST31369	40.10		-----	
823	ISO6976	40.064		-----	
840	ISO6976	40.1432		-----	
851		-----		-----	
861	ISO6976	40.11		-----	
862	ISO6976	40.14		-----	
887	ISO6976	40.096		-----	
922	ISO6976	40.1128		-----	
963	ISO6976	40.03	C, E	-----	First reported 39.78. iis calc 40.072
974		-----		-----	
1006	ISO6976	40.08	E	-----	iis calc 40.095
1029		-----		-----	
1066	ISO6976	40.054		-----	
1069		-----		-----	
1081		-----		-----	
1095		-----		-----	
1135	ISO6976	40.15	ex, C, E	-----	Test result excluded see §4.1. First reported 39.70. iis calc 40.15
1197	ISO6976	40.125400		-----	
1198	ISO6976	40.13174		-----	
1259	ISO6976	40.11	C	-----	First reported 39.4
1370		-----		-----	
1388	ISO6976	40.09		-----	
1414		-----		-----	
1489		-----		-----	
1528	ISO6976	40.16		-----	
1654	ISO6976	40.077		-----	
1679	ISO6976	40.0480		-----	
1720		-----		-----	
1737		-----		-----	
1779	ISO6976	40.0714		-----	
1788		-----		-----	
1845		-----		-----	
1943	ISO6976	40.112620		-----	
1957	GPA2286	50.69	ex	-----	Test result excluded see §4.1. iis calc 41.017
6052	D3588	40.089	E	-----	iis calc 40.168
6062		-----		-----	
6071		-----		-----	
6104	ISO6976	40.0600		-----	
6107		-----		-----	
6130	GB/T11062	40.08048		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	40.1153		-----	
6369		-----		-----	
6383	ISO6976	40.087		-----	
6398		-----		-----	
6399		-----		-----	
7011		-----		-----	

lab	method	value	mark	z(targ)	remarks
9145		-----		-----	
	normality	OK			
	n	33			
	outliers	1 (+2ex)			
	mean (n)	40.08417			
	st.dev. (n)	0.042607			
	R(calc.)	0.11930			
Compare					
	R(iis20S01M)	0.1216			

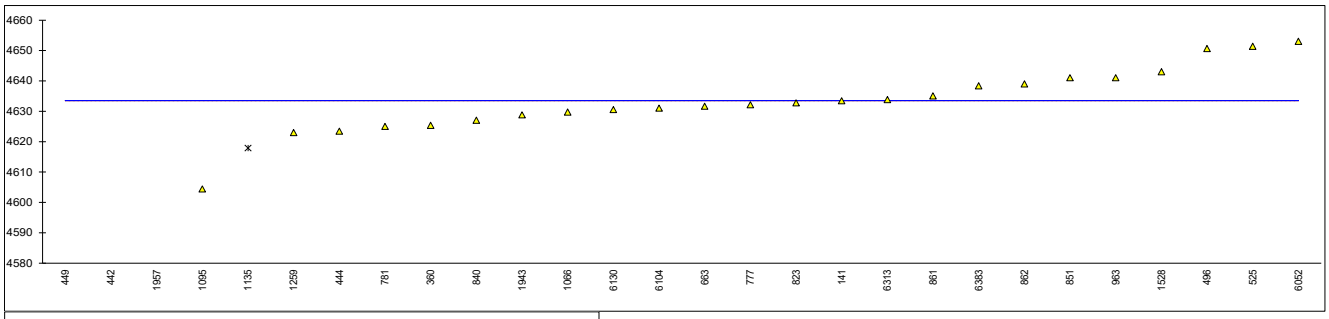


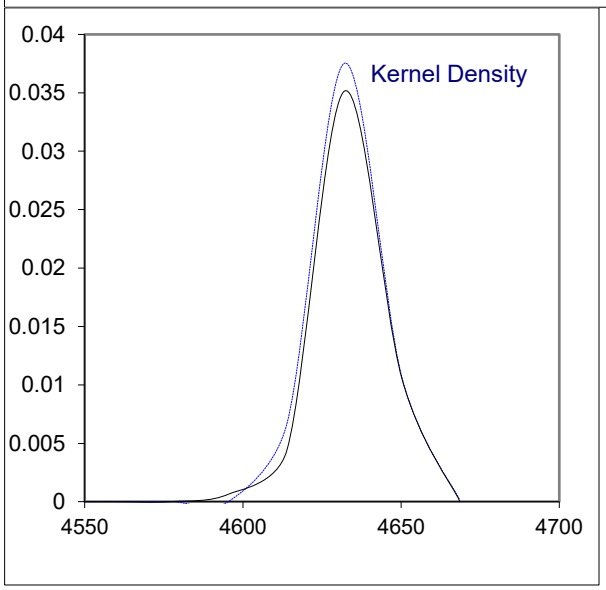


Determination of Net (Inferior) Caloric Value (Real Gas, 101.325 kPa, combustion temperature 15°C, metering temperature 15°C) on sample #21050; results in kJ/100g

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	4633.43		-----	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316		-----		-----	
352		-----		-----	
360	EN15984	4625.36		-----	
442		36.18	ex	-----	Test result excluded, reported in a different unit (MJ/m3)
444	EN15984	4623.41	E	-----	iis calc 4624.411
446		-----		-----	
449	ISO6976	36.16	ex	-----	Test result excluded, reported in a different unit (MJ/m3). iis calc 4627.64
496	DIN51857	4650.642		-----	
525	ISO6976	4651.381		-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	EN15984	4631.62		-----	
777	ISO6976	4632.14		-----	
781	GOST31369	4625	C	-----	First reported 36.23 MJ/m3
823	ISO6976	4632.75		-----	
840	ISO6976	4627.04	C	-----	First reported 4615.50
851	ISO6976	4641		-----	
861	ISO6976	4635		-----	
862	ISO6976	4639		-----	
887		-----		-----	
922		-----		-----	
963	ISO6976	4641	C, E	-----	First reported 4625. iis calc 4636.518
974		-----		-----	
1006		-----		-----	
1029		-----		-----	
1066	ISO6976	4629.7		-----	
1069		-----		-----	
1081		-----		-----	
1095	EN15984	4604.39		-----	
1135	ISO6976	4617.88	ex, E	-----	Test result exclude see §4.1. iis calc 4630.683
1197		-----		-----	
1198		-----		-----	
1259	ISO6976	4622.99	C	-----	First reported 4618.83
1370		-----		-----	
1388		-----		-----	
1414		-----		-----	
1489		-----		-----	
1528	ISO6976	4643.00	C	-----	First reported 4644.0
1654		-----		-----	
1679		-----		-----	
1720		-----		-----	
1737		-----		-----	
1779		-----		-----	
1788		-----		-----	
1845		-----		-----	
1943	ISO6976	4628.781		-----	
1957	GPA2286	45.75	ex, E	-----	Test result excluded see §4.1. iis calc 4764.543
6052	D3588	4653	E	-----	iis calc 4641.065
6062		-----		-----	
6071		-----		-----	
6104	ISO6976	4631		-----	
6107		-----		-----	
6130	GB/T11062	4630.5033		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	4633.798		-----	
6369		-----		-----	
6383	ISO6976	4638.368		-----	
6398		-----		-----	
6399		-----		-----	
7011		-----		-----	

lab	method	value	mark	z(targ)	remarks
9145		-----		-----	
	normality	suspect			
	n	24			
	outliers	0 (+4ex)			
	mean (n)	4633.513			
	st.dev. (n)	10.5308			
	R(calc.)	29.486			
Compare					
	R(iis20S01M)	15.126			



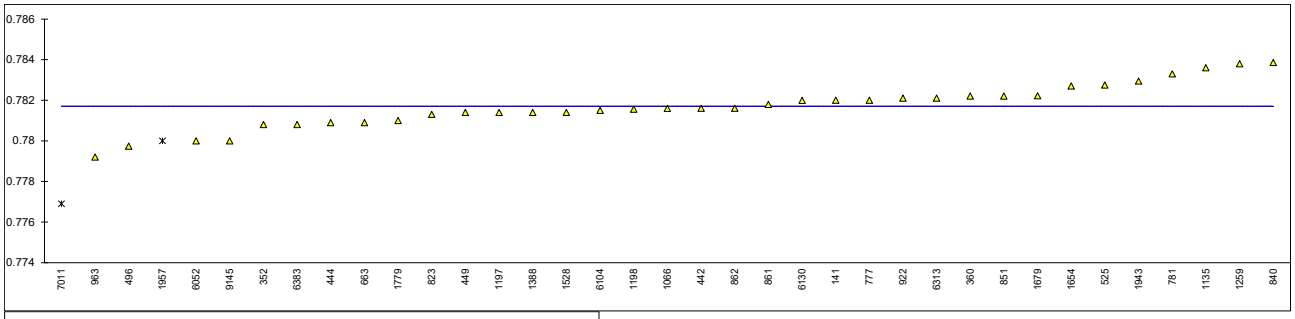


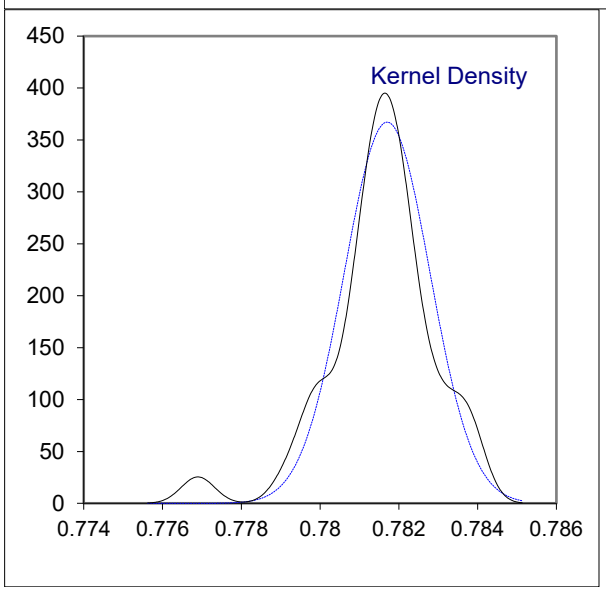
Determination of Density (Real Gas, 101.325 kPa, combustion temperature 15°C, metering temperature 15°C) on sample #21050; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	0.7820		-----	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316		-----		-----	
352	ISO6976	0.7808		-----	
360	ISO6976	0.7822		-----	
442	ISO6976	0.7816		-----	
444	ISO6976	0.7809		-----	
446		-----		-----	
449	ISO6976	0.7814		-----	
496	DIN51857	0.779740		-----	
525	ISO6976	0.78275		-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	ISO6976	0.7809	C	-----	First reported 0.7796
777	ISO6976	0.7820		-----	
781	GOST31369	0.7833		-----	
823	ISO6976	0.7813		-----	
840	ISO6976	0.78386		-----	
851	ISO6976	0.7822		-----	
861	ISO6976	0.7818		-----	
862	ISO6976	0.7816		-----	
887		-----		-----	
922	ISO6976	0.7821		-----	
963	ISO6976	0.7792	C, E	-----	First reported 0.7769. iis calc 0.78079
974		-----		-----	
1006		-----		-----	
1029		-----		-----	
1066	ISO6976	0.78159		-----	
1069		-----		-----	
1081		-----		-----	
1095		-----		-----	
1135	ISO6976	0.7836	ex, C, E	-----	Test result excluded see §4.1. First reported 0.7765. iis calc 0.78664
1197	ISO6976	0.7814		-----	
1198	ISO6976	0.78156		-----	
1259	ISO6976	0.7838	C	-----	First reported 0.779
1370		-----		-----	
1388	ISO6976	0.7814		-----	
1414		-----		-----	
1489		-----		-----	
1528	ISO6976	0.7814		-----	
1654	ISO6976	0.7827		-----	
1679	ISO6976	0.78222		-----	
1720		-----		-----	
1737		-----		-----	
1779	ISO6976	0.7810		-----	
1788		-----		-----	
1845		-----		-----	
1943	ISO6976	0.78294		-----	
1957	GPA2286	0.78	ex, E	-----	Test result excluded see §4.1. iis calc 0.77786
6052	D3588	0.7800	E	-----	iis calc 0.78194
6062		-----		-----	
6071		-----		-----	
6104	ISO6976	0.7815		-----	
6107		-----		-----	
6130	GB/T11062	0.781995		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	0.7821		-----	
6369		-----		-----	
6383	ISO6976	0.7808		-----	
6398		-----		-----	
6399		-----		-----	
7011	ISO6976	0.7769	R(0.01), E	-----	iis calc 0.78525

lab	method	value	mark	z(targ)	remarks
9145		0.780	E	-----	iis calc 0.78194

	normality	OK
	n	34
	outliers	1 (+2ex)
	mean (n)	0.78165
	st.dev. (n)	0.001051
	R(calc.)	0.00294
Compare		
	R(iis20S01M)	0.00265



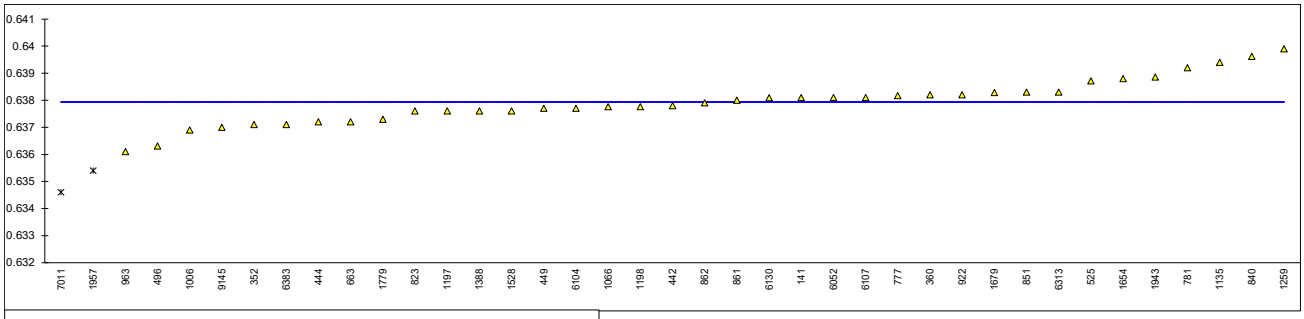


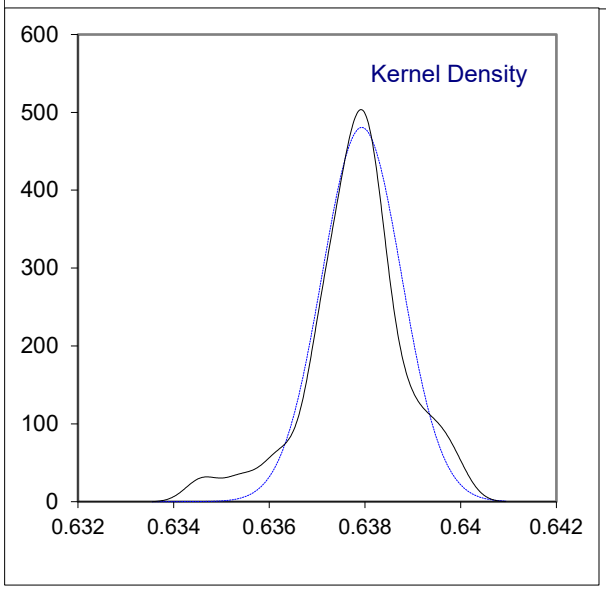
Determination of Relative Density (Real Gas, 101.325 kPa, combustion temperature 15°C, metering temperature 15°C) on sample #21050; results have no unit

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	0.6381		-----	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316		-----		-----	
352	ISO6976	0.6371		-----	
360	ISO6976	0.6382		-----	
442	ISO6976	0.6378		-----	
444	ISO6976	0.6372		-----	
446		-----		-----	
449	ISO6976	0.6377		-----	
496	DIN51857	0.636310		-----	
525	ISO6976	0.63871		-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	ISO6976	0.6372	C	-----	First reported 0.6362
777	ISO6976	0.63817		-----	
781	GOST31369	0.6392		-----	
823	ISO6976	0.6376		-----	
840	ISO6976	0.63962		-----	
851	ISO6976	0.6383		-----	
861	ISO6976	0.6380		-----	
862	ISO6976	0.6379		-----	
887		-----		-----	
922	ISO6976	0.6382		-----	
963	ISO6976	0.6361	C, E	-----	First reported 0.6343. iis calc 0.63711
974		-----		-----	
1006	ISO6976	0.6369		-----	
1029		-----		-----	
1066	ISO6976	0.63776		-----	
1069		-----		-----	
1081		-----		-----	
1095		-----		-----	
1135	ISO6976	0.6394	ex, C, E	-----	Test result excluded see §4.1. First reported 0.6336. iis calc 0.64188
1197	ISO6976	0.6376		-----	
1198	ISO6976	0.63776		-----	
1259	ISO6976	0.6399	C	-----	First reported 0.636
1370		-----		-----	
1388	ISO6976	0.6376		-----	
1414		-----		-----	
1489		-----		-----	
1528	ISO6976	0.6376		-----	
1654	ISO6976	0.6388		-----	
1679	ISO6976	0.63828		-----	
1720		-----		-----	
1737		-----		-----	
1779	ISO6976	0.6373		-----	
1788		-----		-----	
1845		-----		-----	
1943	ISO6976	0.63886		-----	
1957	GPA2286	0.6354	ex	-----	Test results excluded, see §4.1.
6052	D3588	0.6381		-----	
6062		-----		-----	
6071		-----		-----	
6104	ISO6976	0.6377		-----	
6107	D3588	0.6381		-----	
6130	GB/T11062	0.638093		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	0.6383		-----	
6369		-----		-----	
6383	ISO6976	0.6371		-----	
6398		-----		-----	
6399		-----		-----	
7011	ISO6976	0.6346	R(0.05), E	-----	iis calc 0.64075

lab	method	value	mark	z(targ)	remarks
9145		0.637	E	-----	iis calc 0.63805

	normality	OK
	n	36
	outliers	1 (+2ex)
	mean (n)	0.63789
	st.dev. (n)	0.000804
	R(calc.)	0.00225
Compare		
	R(iis20S01M)	0.00227



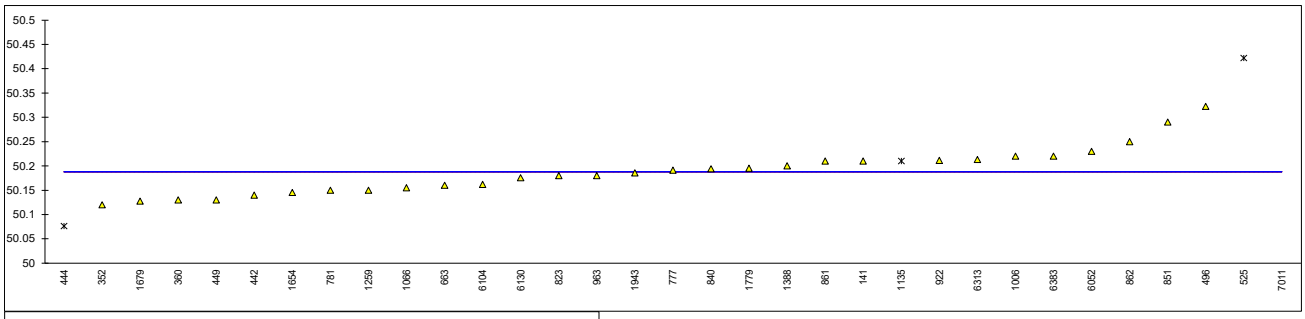


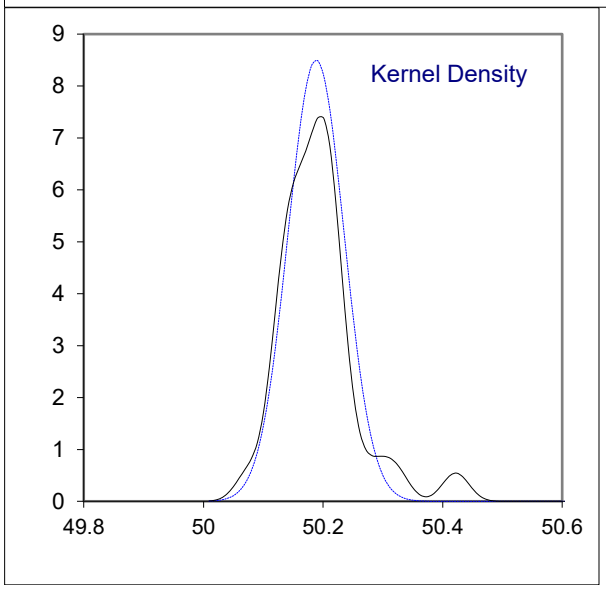
Determination of Gross Wobbe Index (Real Gas, 101.325 kPa, combustion temperature 15°C, metering temperature 15°C) on sample #21050; results in MJ/m^3

lab	method	value	mark	z(targ)	remarks
130		-----		-----	
141	ISO6976	50.21		-----	
150		-----		-----	
151		-----		-----	
167		-----		-----	
225		-----		-----	
316		-----		-----	
352	ISO6976	50.12		-----	
360	ISO6976	50.13		-----	
442	ISO6976	50.14		-----	
444	ISO6976	50.076	R(0.01)	-----	
446		-----		-----	
449	ISO6976	50.13		-----	
496	DIN51857	50.3224		-----	
525	ISO6976	50.422	R(0.01)	-----	
529		-----		-----	
552		-----		-----	
593		-----		-----	
596		-----		-----	
600		-----		-----	
608		-----		-----	
609		-----		-----	
610		-----		-----	
611		-----		-----	
663	ISO6976	50.16	C	-----	First reported 50.12
777	ISO6976	50.1914		-----	
781	GOST31369	50.15		-----	
823	ISO6976	50.18		-----	
840	ISO6976	50.194		-----	
851	ISO6976	50.29		-----	
861	ISO6976	50.21		-----	
862	ISO6976	50.25		-----	
887		-----		-----	
922	ISO6976	50.2113		-----	
963	ISO6976	50.18	C, E	-----	First reported 49.95. iis calc 50.2039
974		-----		-----	
1006	ISO6976	50.22		-----	
1029		-----		-----	
1066	ISO6976	50.155		-----	
1069		-----		-----	
1081		-----		-----	
1095		-----		-----	
1135	ISO6976	50.21	ex, C, E	-----	Test result excluded see §4.1 First reported 49.87. iis calc 50.3243
1197		-----		-----	
1198		-----		-----	
1259	ISO6976	50.15	C	-----	First reported 49.48
1370		-----		-----	
1388	ISO6976	50.20		-----	
1414		-----		-----	
1489		-----		-----	
1528		-----		-----	
1654	ISO6976	50.1453		-----	
1679	ISO6976	50.1275		-----	
1720		-----		-----	
1737		-----		-----	
1779	ISO6976	50.1951		-----	
1788		-----		-----	
1845		-----		-----	
1943	ISO6976	50.185491		-----	
1957		-----		-----	
6052	D3588	50.23	E	-----	iis calc 50.2866
6062		-----		-----	
6071		-----		-----	
6104	ISO6976	50.1620		-----	
6107		-----		-----	
6130	GB/T11062	50.17542		-----	
6193		-----		-----	
6237		-----		-----	
6263		-----		-----	
6313	ISO6976	50.213		-----	
6369		-----		-----	
6383	ISO6976	50.22		-----	
6398		-----		-----	
6399		-----		-----	
7011	ISO6976	52.52	R(0.01), E	-----	iis calc 50.0185

lab	method	value	mark	z(targ)	remarks
9145		-----		-----	

	normality	suspect
	n	29
	outliers	3 (+1ex)
	mean (n)	50.1879
	st.dev. (n)	0.04757
	R(calc.)	0.1332
Compare		
	R(iis20S01M)	0.0563





APPENDIX 2

Number of participants per country

1 lab in BELGIUM
1 lab in BRAZIL
1 lab in BULGARIA
1 lab in CANADA
9 labs in CHINA, People's Republic
1 lab in COTE D'IVOIRE
1 lab in CROATIA
1 lab in DENMARK
1 lab in ECUADOR
1 lab in FINLAND
1 lab in FRANCE
2 labs in GERMANY
2 labs in HONG KONG
1 lab in INDONESIA
1 lab in IRAN, Islamic Republic of
1 lab in LATVIA
10 labs in MALAYSIA
2 labs in MEXICO
3 labs in NETHERLANDS
1 lab in OMAN
1 lab in PAKISTAN
2 labs in POLAND
3 labs in PORTUGAL
1 lab in ROMANIA
2 labs in RUSSIAN FEDERATION
2 labs in SAUDI ARABIA
2 labs in SLOVAKIA
1 lab in SOUTH KOREA
1 lab in SUDAN
1 lab in SWEDEN
2 labs in TAIWAN
2 labs in THAILAND
1 lab in TURKEY
2 labs in UNITED ARAB EMIRATES
5 labs in UNITED KINGDOM
5 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'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 the statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported
SDS	= Safety Data Sheet

Literature

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7 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
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11 W. Horwitz and R. Albert, J. AOAC Int, 79.3, 589-621, (1996)
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