Results of Proficiency Test
Xylene (Ortho- / Para-)
October 2020

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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CONTENTS

1 INTRODUCTION

Since 1995 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for Xylene (Ortho- / Para-) once every two years. During the annual proficiency testing program 2020/2021 it was decided to continue the round robin for the analysis of Xylene (Ortho- / Para-) according to the scope of the latest version of ASTM D5471 (Ortho-) and ASTM D5136 (Para-).

In this interlaboratory study 29 laboratories in 19 different countries registered for participation. See appendix 2 for the number of participants per country. In this report the results of the proficiency test on Xylene (Ortho- / Para) are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory. It was decided to send two samples of Xylene: a 0.25L bottle with o-Xylene labelled #20181 and a 0.5L bottle with p-Xylene labelled #20182. The participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

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

2.2 PROTOCOL

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

2.3 CONFIDENTIALITY STATEMENT

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

2.4 SAMPLES

For the first sample a batch of approximately 20L of o-Xylene was purchased from a third party. After homogenization 55 amber glass bottles of 0.25L were filled and labelled #20181. The homogeneity of the subsamples was checked by determination of Density at 20°C in accordance with ASTM D4052 and p-Xylene in accordance with ASTM D7504 on 8 stratified randomly selected subsamples.

	Density at 20°C in kg/L	p-Xylene in %M/M
sample #20181-1	0.87961	0.0841
sample #20181-2	0.87964	0.0837
sample #20181-3	0.87962	0.0840
sample #20181-4	0.87962	0.0837
sample #20181-5	0.87964	0.0839
sample #20181-6	0.87962	0.0849
sample #20181-7	0.87964	0.0839
sample #20181-8	0.87963	0.0842

Table 1: homogeneity test results of subsamples #20181 (o-Xylene)

From the above test results the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibility of the reference test methods in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Density at 20°C in kg/L	p-Xylene in %M/M
r (observed)	0.00003	0.0011
reference test method	ISO12185:96	ASTM D3797:05
0.3 * R (reference test method)	0.00015	0.0011

Table 2: evaluation of the repeatabilities of subsamples #20181 (o-Xylene)

The calculated repeatabilities were in agreement with 0.3 times the corresponding reproducibility of the reference test methods. Therefore, homogeneity of the subsamples was assumed.

For the second sample a batch of approximately 25L of p-Xylene was purchased from a third party. After homogenization 50 amber glass bottles of 0.5L were filled and labelled #20182. The homogeneity of the subsamples was checked by determination of Density at 20°C in accordance with ASTM D4052 and Ortho- & Para-Xylene in accordance with ASTM D7504 on 8 stratified randomly selected subsamples.

	Density at 20°C in kg/L	o-Xylene in %M/M	Purity by GC in %M/M
sample #20182-1	0.86098	0.0342	99.78
sample #20182-2	0.86098	0.0344	99.78
sample #20182-3	0.86097	0.0354	99.77
sample #20182-4	0.86099	0.0351	99.78
sample #20182-5	0.86100	0.0351	99.78
sample #20182-6	0.86100	0.0351	99.78
sample #20182-7	0.86101	0.0348	99.78
sample #20182-8	0.86101	0.0349	99.78

Table 3: homogeneity test results of subsamples #20182 (p-Xylene)

From the above test results the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibility of the reference test methods in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Density at 20°C in kg/L	o-Xylene in %M/M	Purity by GC in %M/M
r (observed)	0.00004	0.0011	0.0099
reference test method	ISO12185:96	ASTM D5917:15	ASTM D5917:15
0.3 * R (ref. test method)	0.00015	0.0133	0.0127

Table 4: evaluation of the repeatabilities of subsamples #20182 (p-Xylene)

The calculated repeatabilities were in agreement with 0.3 times the corresponding reproducibility of the reference test methods. Therefore, homogeneity of the subsamples was assumed.

To each of the participating laboratories one sample labelled #20181 and one sample labelled #20182 were sent on September 9, 2020. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of Ortho- and Para-Xylene packed in amber glass bottles was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6 ANALYZES

The participants were requested to determine on the o-Xylene sample #20181: Purity by GC, m-Xylene, p-Xylene, Ethylbenzene, n-Propylbenzene, iso-Propylbenzene (Cumene), Styrene, Sum of Ethyltoluenes, Toluene, C9 and heavier aromatics and Non-aromatics.
On the p-Xylene sample #20182 it was requested to determine: Appearance, Organic Chloride, Color Pt/Co, Density at 20°C, Distillation (Initial Boiling Point (IBP), 50% recovered, Dry Point (DP) and Distillation Range), Sulfur, Purity by GC, o-Xylene, m-Xylene, Ethylbenzene, Styrene, Toluene, Non-aromatics.

It was explicitly requested to treat the samples as if they were routine samples 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 reference test methods (when applicable) 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 participants 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 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 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.

According to ISO5725 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's test, by G(0.01) or DG(0.01) for the Grubbs' test and by R(0.01) for the Rosner's test. Stragglers are marked by D(0.05) for the Dixon's test, by G(0.05) or DG(0.05) for the Grubbs' test and by R(0.05) for the Rosner's test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

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

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

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported test results are plotted. The corresponding laboratory numbers are on the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve 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. 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, like Horwitz or an estimated reproducibility based on former iis proficiency tests.
When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test result is fit-for-use.

The z-scores were calculated according to:

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

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

Absolute values for z<2 are very common and absolute values for z>3 are very rare.
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 interlaboratory study some problems were encountered with the dispatch of the samples due to the COVID-19 pandemic. Therefore, the final reporting date was extended with one week. When considering the test results of the two samples together one participant reported test results after the final reporting date and five participants did not report any test results. Not all participants were able to report all tests requested.
In total, 24 reporting laboratories submitted 435 numerical test results. Observed were 26 outlying test results, which is 6.0%. In proficiency studies outlier percentages of 3% - 7.5% are quite normal.

Not all 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 SAMPLE AND PER TEST

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

Although ASTM D3797:05 was withdrawn the mentioned precision data in this test method was used for the evaluation of the GC-analysis as the precision data mentioned in ASTM D7504 is very strict. Also, for the evaluation of the GC analysis for para-Xylene it was decided to use the precision data from ASTM D5917:15(2019) because of the very strict precision date from ASTM D7504.

Unfortunately, a suitable reference test method, providing the precision data, is not available for all determinations. For these tests the calculated reproducibility was compared against the estimated reproducibility using the Horwitz equation.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D5917) and an added designation for the year that the test method was adopted or revised (e.g. D5917:15). If applicable, a designation in the parentheses is added to designate the year of reapproval (e.g. D5917:15(2019)). In the test results tables of appendix 1 only the test method number and year of adoption or revision (e.g. D5917:15) will be used.

Sample #20181 o-Xylene

Purity by GC: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D3797:05.

m-Xylene: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D3797:05.

p-Xylene: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D3797:05.

Ethylbenzene: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D3797:05.

n-Propylbenzene: This determination may be problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the estimated reproducibility using the Horwitz equation.

iso-Propylbenzene: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D3797:05.

Styrene: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3797:05.

Sum of Ethyltoluenes: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in full agreement with the estimated reproducibility using the Horwitz equation (based on 3 components).

Toluene: This determination was not problematic. Many of the reporting participants reported a test result below 0.001 %M/M. Therefore, no z-scores were calculated.

C9 and heavier aromatics: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D7504:20.

Non-aromatics: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D3797:05.

Sample #20182 p-Xylene

Appearance: This determination was not problematic. All reporting participants agreed about the appearance of the sample as Pass (Bright & Clear).

Organic chloride: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D5808:20.

Color Pt/Co: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5386:16 and ASTM D1209:05(2019).

Density at 20°C: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ISO12185:96.

Distillation: This determination was not problematic. Eight statistical outliers were observed over three distillation parameters. The calculated reproducibilities of IBP, 50% recovered and DP after rejection of the statistical outliers are in agreement with the requirements of ASTM D850-A:18e1.

Sulfur: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of ASTM D7183:18ae1 and ASTM D5453:19a.

Purity by GC: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5917:15(2019).

o-Xylene: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5917:15(2019).

m-Xylene: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5917:15(2019).

Ethylbenzene: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D5917:15(2019).

Styrene: This determination was not problematic. Almost all reporting participants reported a test result below 0.001 %M/M. Therefore, no z-scores were calculated.

Toluene: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5917:15(2019).

Non-aromatics: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5917:15(2019).

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

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

Parameter	unit	n	average	2.8 * sd	R(target)
Purity by GC	%M/M	20	98.973	0.204	0.423
m-Xylene	%M/M	19	0.381	0.043	0.093
p-Xylene	%M/M	19	0.086	0.021	0.029
Ethylbenzene	%M/M	14	0.0008	0.0004	0.0004
n-Propylbenzene	%M/M	13	0.025	0.008	0.005
iso-Propylbenzene (Cumene)	%M/M	21	0.302	0.045	0.078
Styrene	%M/M	14	0.0063	0.0016	0.0025
Sum of Ethyltoluenes	%M/M	9	0.039	0.014	0.012
Toluene	%M/M	15	<0.001	n.e.	n.e.
C9 and heavier aromatics	%M/M	18	0.372	0.042	1.154
Non-aromatics	%M/M	19	0.190	0.045	0.140

Table 5: reproducibilities of tests on sample #20181 (o-Xylene)

Parameter	unit	n	average	2.8 * sd	R(target)
Appearance		19	Pass	n.a.	n.a.
Organic Chloride	mg/kg	12	0.29	0.55	1.3
Color Pt/Co		20	3.9	1.8	5.2
Density at 20°C	kg/L	20	0.8610	0.0002	0.0005
Initial Boiling Point	°C	15	137.9	0.4	1.0
50% recovered	°C	15	138.3	0.2	0.4
Dry Point	°C	16	138.4	0.1	0.4
Sulfur	mg/kg	16	0.15	0.18	0.14

Parameter	unit	n	average	2.8 * sd	R(target)
Purity by GC	%M/M	20	99.780	0.031	0.042
o-Xylene	%M/M	20	0.035	0.006	0.045
m-Xylene	%M/M	20	0.118	0.031	0.039
Ethylbenzene	%M/M	20	0.042	0.006	0.009
Styrene	%M/M	10	<0.001	n.e.	n.e.
Toluene	%M/M	19	0.0103	0.0016	0.0047
Non-aromatics	%M/M	19	0.0114	0.0046	0.0261

Table 6: reproducibilities of tests on sample #20182 (p-Xylene)

Without further statistical calculations, it can be concluded that for most tests there is a good compliance of the group of participating laboratories with the target reproducibilities. Problematic tests have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE PROFICIENCY TEST OF OCTOBER 2020 WITH PREVIOUS PTS

	October 2020	October 2018	October 2016	October 2014	September 2012
Number of reporting laboratories	24	23	26	29	27
Number of test results	435	375	498	529	471
Number of statistical outliers	26	16	16	29	27
Percentage of statistical outliers	6.0%	4.3%	3.2%	5.5%	5.7%

Table 7: comparison with previous proficiency tests

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

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

Parameter	October 2020	October 2018	October 2016	October 2014	September 2012
Purity by GC	++	++	+	++	+
m-Xylene	++	++	+	++	++
p-Xylene	+	++	+/-	++	++
Ethylbenzene	+/-	+	+	++	++
n-Propylbenzene	-	+	-	+/-	++
iso-Propylbenzene (Cumene)	+	++	-	+	++
Styrene	+	+	+	+	++
Sum of Ethyltoluenes	+/-	-	-	+	+/-
Toluene	n.e.	n.e.	+/-	+/-	++
C9 and heavier aromatics	++	++	++	n.e.	n.e.
Non-aromatics	++	++	+/-	++	++

Table 8: comparison determinations against the reference test methods of sample #20181 (o-Xylene)

Parameter	October 2020	October 2018	October 2016	October 2014	September 2012
Organic Chloride	++	++	++	++	n.e
Color Pt/Co	++	+	-	++	+
Density at 20°C	++	++	++	++	++
Distillation	++	+	+	++	+/-
Sulfur	-	-	-	+/-	n.e.
Purity by GC	+	-	+/-	++	-
o-Xylene	++	++	++	++	++
m-Xylene	+	-	+	+	-
Ethylbenzene	+	+	+	++	++
Styrene	n.e.	n.e.	+/-	++	-
Toluene	++	++	+	++	++
Non-aromatics	++	++	++	++	++

Table 9: comparison determinations against the reference test methods of sample #20182 (p-Xylene)

The following performance categories were used:

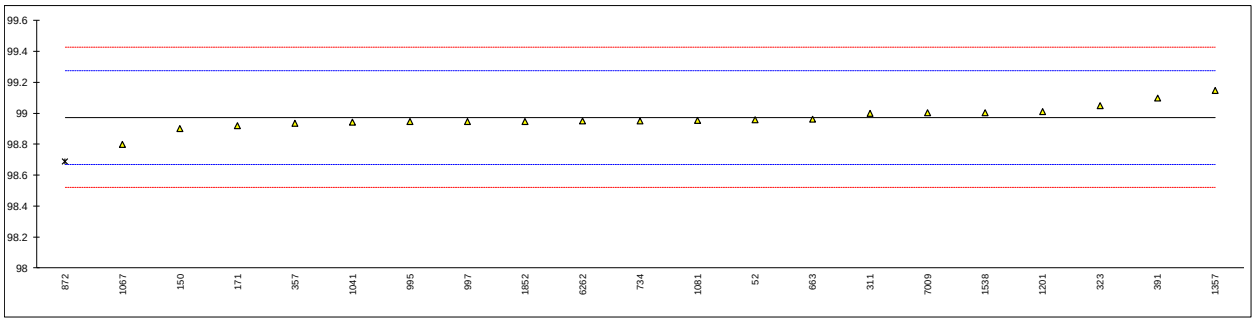
++ : group performed much better than the reference test method
+ : group performed better than the reference test method
+/- : group performance equals the reference test method
- : group performed worse than the reference test method
-- : group performed much worse than the reference test method
n.e.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

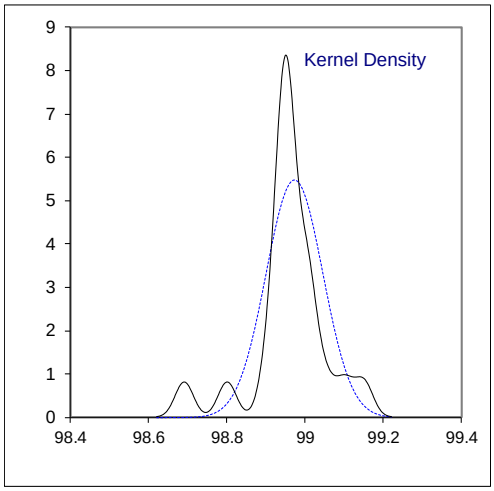
APPENDIX 1

Determination of Purity by GC of o-Xylene sample #20181; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D7504	98.96		-0.08	
150	D7504	98.9031		-0.46	
171	D7504	98.92		-0.35	
311	D7504	99.00		0.18	
323	D7504	99.05		0.51	
357	D7504	98.935		-0.25	
391	D2360	99.10		0.84	
551		-----		-----	
558		-----		-----	
663	D7504	98.964		-0.06	
734	D7504	98.9525		-0.13	
872	D7504	98.6900	R(0.05)	-1.87	
913		-----		-----	
963		-----		-----	
995	D7504	98.9478		-0.16	
997	D7504	98.9478		-0.16	
1041		98.945		-0.18	
1067	In house	98.80		-1.14	
1081	D3797Mod.	98.9565		-0.11	
1201	D3797	99.01		0.25	
1357	D7504	99.15	C	1.18	first reported 99.24
1538	D5134	99.0047		0.21	
1852	D7504	98.949		-0.16	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	98.95		-0.15	
7009	D7504	99.004		0.21	
9008		-----		-----	

normality	not OK
n	20
outliers	1
mean (n)	98.9725
st.dev. (n)	0.07277
R(calc.)	0.2038
st.dev.(D3797:05)	0.15109
R(D3797:05)	0.4230
Compare:	
R(D7504:20)	0.0555

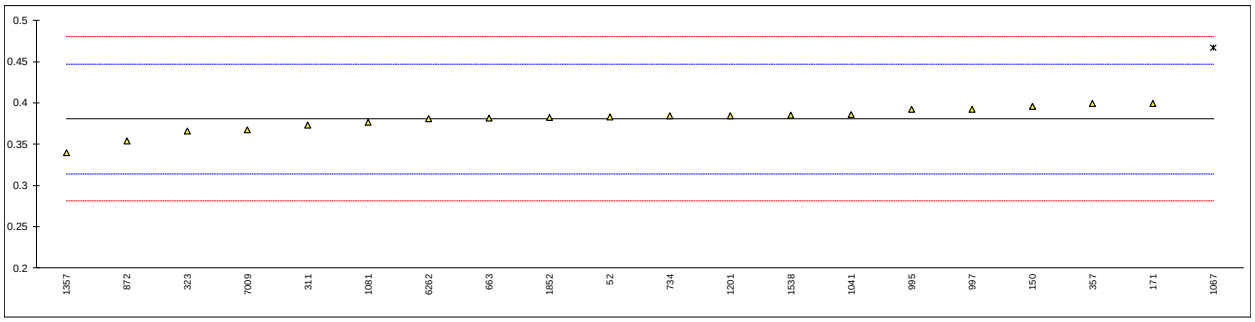


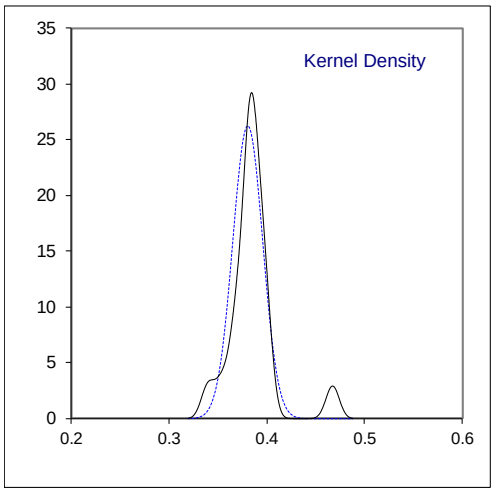


Determination of m-Xylene in o-Xylene sample #20181; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D7504	0.3834		0.08	
150	D7504	0.3964		0.48	
171	D7504	0.40		0.59	
311	D7504	0.3733		-0.22	
323	D7504	0.3664		-0.43	
357	D7504	0.3997		0.58	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D7504	0.38217		0.05	
734	D7504	0.38454		0.12	
872	D7504	0.3540		-0.80	
913		-----		-----	
963		-----		-----	
995	D7504	0.3927		0.37	
997	D7504	0.3927		0.37	
1041		0.386		0.16	
1067	In house	0.467	R(0.01)	2.61	
1081	D3797Mod.	0.377		-0.11	
1201	D3797	0.385		0.13	
1357	D7504	0.34	C	-1.22	first reported 0.29
1538	D7504	0.3858		0.16	
1852	D7504	0.3828		0.07	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	0.3812		0.02	
7009	D7504	0.368		-0.38	
9008		-----		-----	

normality	suspect
n	19
outliers	1
mean (n)	0.3806
st.dev. (n)	0.01523
R(calc.)	0.0426
st.dev.(D3797:05)	0.03315
R(D3797:05)	0.0928
Compare:	
R(D7504:20)	0.0150

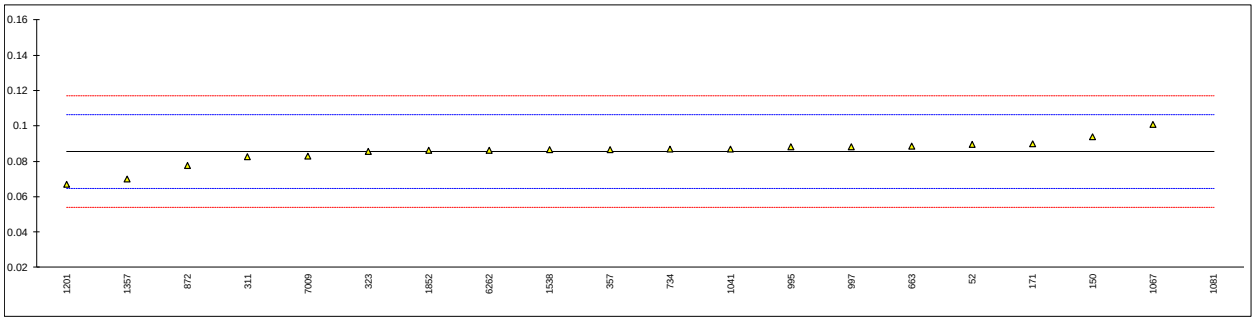


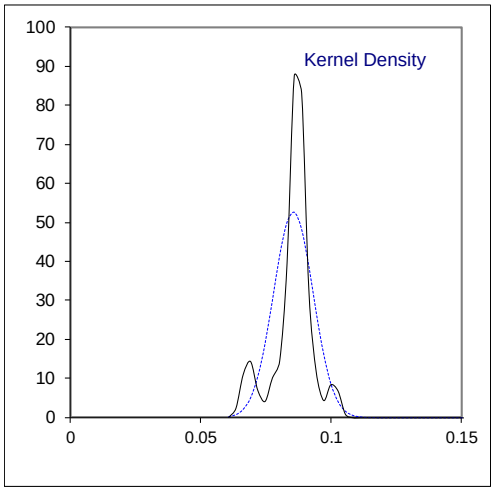


Determination of p-Xylene in o-Xylene sample #20181; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D7504	0.0896		0.39	
150	D7504	0.0938		0.79	
171	D7504	0.09		0.43	
311	D7504	0.0827		-0.27	
323	D7504	0.0857		0.02	
357	D7504	0.0867		0.11	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D7504	0.08854		0.29	
734	D7504	0.08686		0.13	
872	D7504	0.0777		-0.75	
913		-----		-----	
963		-----		-----	
995	D7504	0.0883		0.26	
997	D7504	0.0883		0.26	
1041		0.087		0.14	
1067	In house	0.101		1.47	
1081	D3797Mod.	0.768	R(0.01)	64.99	
1201	D3797	0.067		-1.77	
1357	D7504	0.07	C	-1.48	first reported 0.37
1538	D5134	0.0866		0.10	
1852	D7504	0.0862		0.06	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	0.0862		0.06	
7009	D7504	0.083		-0.24	
9008		-----		-----	

	normality	not OK
	n	19
	outliers	1
	mean (n)	0.0855
	st.dev. (n)	0.00759
	R(calc.)	0.0212
	st.dev.(D3797:05)	0.01050
	R(D3797:05)	0.0294
Compare:		
	R(D7504:20)	0.0049





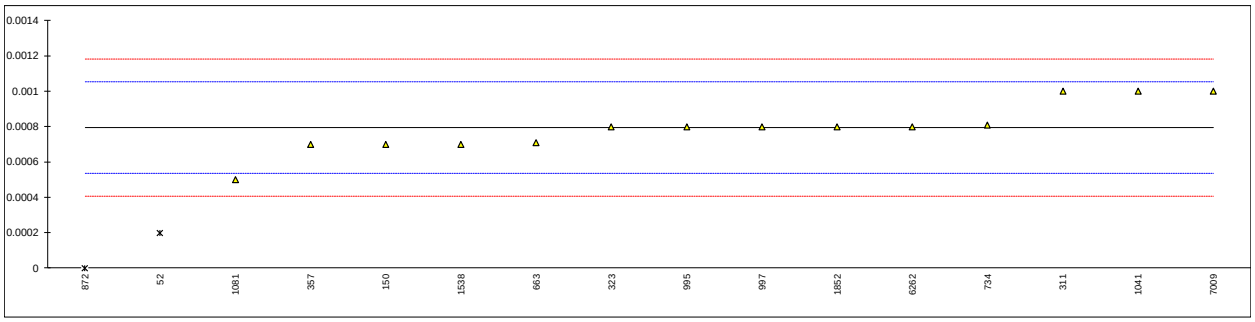
Determination of Ethylbenzene in o-Xylene sample #20181; results in %M/M

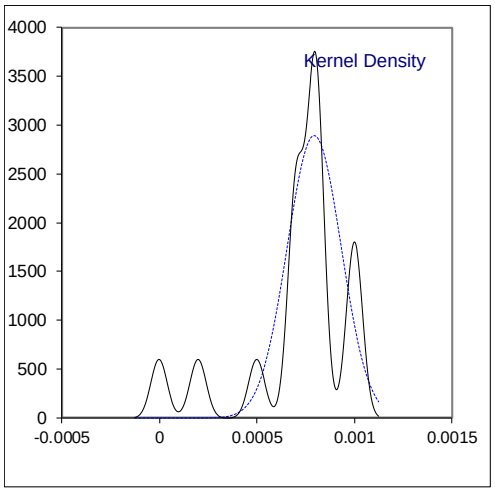
lab	method	value	mark	z(targ)	remarks
52	D7504	0.0002	G(0.05)	-4.61	
150	D7504	0.0007		-0.73	
171	D7504	<0.01		-----	
311	D7504	0.0010		1.60	
323	D7504	0.0008		0.04	
357	D7504	0.0007		-0.73	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D7504	0.00071		-0.65	
734	D7504	0.00081		0.12	
872	D7504	0.0000	G(0.05)	-6.16	
913		-----		-----	
963		-----		-----	
995	D7504	0.0008		0.04	
997	D7504	0.0008		0.04	
1041		0.001		1.60	
1067	In house	< 0.001		-----	
1081	D3797Mod.	0.0005		-2.28	
1201	D3797	<0.001		-----	
1357	D7504	<0.01	C	-----	first reported 0.10
1538	D7504	0.0007		-0.73	
1852	D7504	0.0008		0.04	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	0.0008		0.04	
7009	D7504	0.001		1.60	
9008		-----		-----	

normality	OK
n	14
outliers	2
mean (n)	0.00079
st.dev. (n)	0.000138
R(calc.)	0.00039
st.dev.(D3797:05)	0.000129
R(D3797:05)	0.00036

Compare:

R(D7504:20)	0.00026

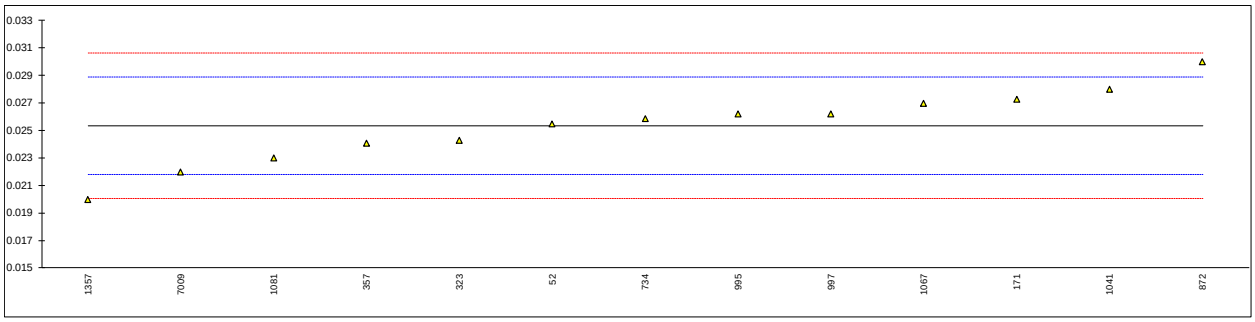


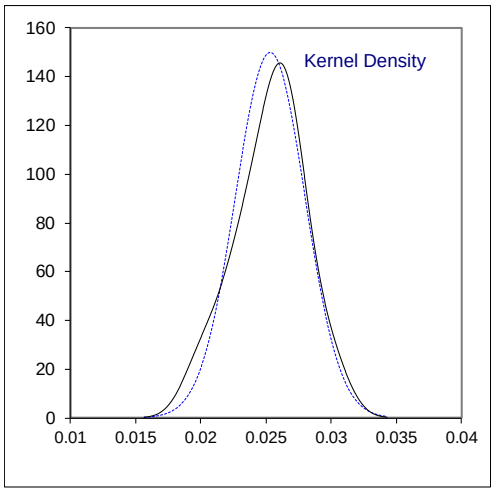


Determination of n-Propylbenzene in o-Xylene sample #20181; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D7504	0.0255		0.09	
150		-----		-----	
171	D7504	0.0273		1.11	
311		-----		-----	
323	D7504	0.0243		-0.59	
357	D7504	0.0241		-0.71	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663		-----		-----	
734	D7504	0.02589		0.31	
872	D7504	0.0300		2.64	
913		-----		-----	
963		-----		-----	
995	D7504	0.0262		0.48	
997	D7504	0.0262		0.48	
1041		0.028		1.51	
1067	In house	0.027		0.94	
1081	D3797Mod.	0.023		-1.33	
1201		-----		-----	
1357	D7504	0.02	C	-3.03	first reported <0.01
1538		-----		-----	
1852		-----		-----	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262		-----	W	-----	test result withdrawn, reported <0.01
7009	D7504	0.022		-1.90	
9008		-----		-----	

normality	OK
n	13
outliers	0
mean (n)	0.0253
st.dev. (n)	0.00266
R(calc.)	0.0075
st.dev.(Horwitz)	0.00176
R(Horwitz)	0.0049

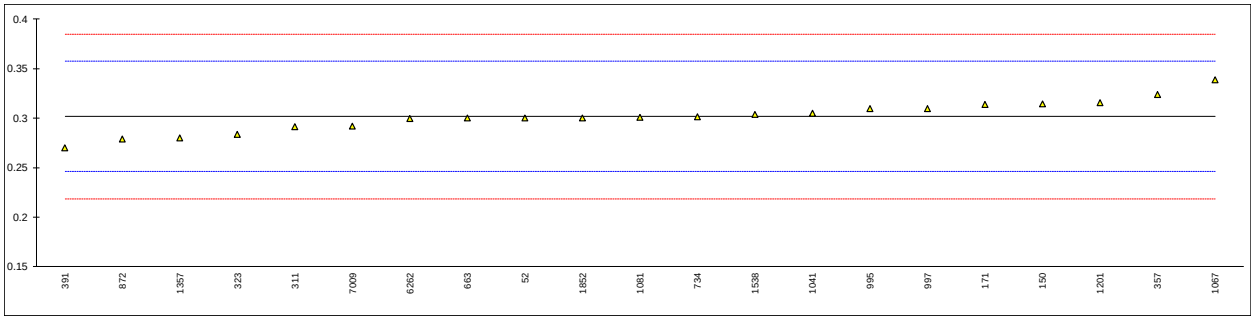


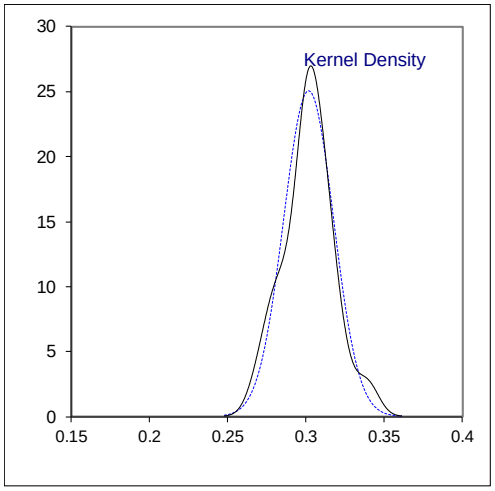


Determination of iso-Propylbenzene (Cumene) in o-Xylene sample #20181; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D7504	0.3004		-0.05	
150	D7504	0.3146		0.46	
171	D7504	0.3142		0.45	
311	D7504	0.2914		-0.37	
323	D7504	0.2836		-0.65	
357	D7504	0.3238		0.80	
391	D2360	0.27		-1.14	
551		-----		-----	
558		-----		-----	
663	D7504	0.30036		-0.05	
734	D7504	0.30179		0.00	
872	D7504	0.2790		-0.82	
913		-----		-----	
963		-----		-----	
995	D7504	0.3096		0.28	
997	D7504	0.3096		0.28	
1041		0.305		0.12	
1067	In house	0.339		1.34	
1081	D3797Mod.	0.301		-0.02	
1201	D3797	0.316		0.52	
1357	D7504	0.28	C	-0.78	first reported <0.01
1538	D7504	0.3038		0.08	
1852	D7504	0.3007		-0.04	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	0.2996		-0.08	
7009	D7504	0.292		-0.35	
9008		-----		-----	

normality	OK
n	21
outliers	0
mean (n)	0.3017
st.dev. (n)	0.01593
R(calc.)	0.0446
st.dev.(D3797:05)	0.02779
R(D3797:05)	0.0778
Compare:	
R(D7504:20)	0.0138

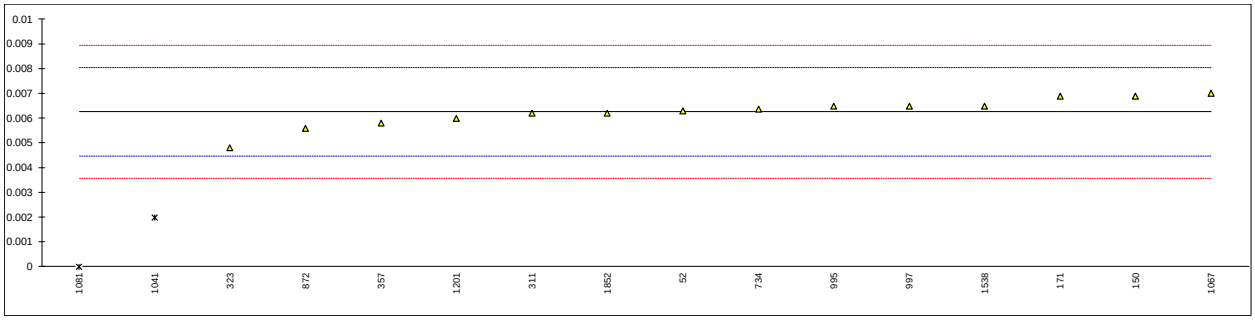


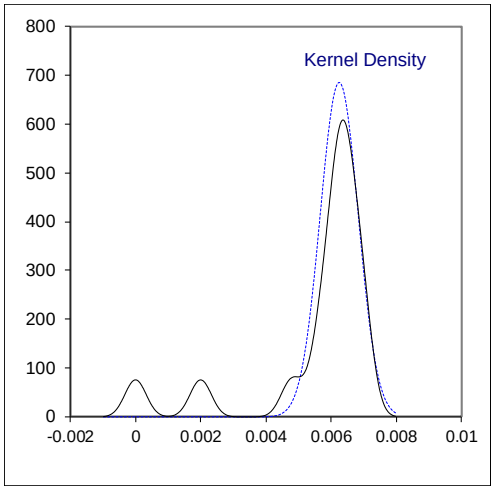


Determination of Styrene in o-Xylene sample #20181; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D7504	0.0063		0.05	
150	D7504	0.0069		0.72	
171	D7504	0.0069		0.72	
311	D7504	0.0062		-0.06	
323	D7504	0.0048		-1.63	
357	D7504	0.0058		-0.51	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663		-----		-----	
734	D7504	0.00636		0.12	
872	D7504	0.0056	C	-0.73	first reported 0.0000
913		-----		-----	
963		-----		-----	
995	D7504	0.0065		0.28	
997	D7504	0.0065		0.28	
1041		0.002	G(0.01)	-4.76	
1067	In house	0.007		0.83	
1081	D3797Mod.	0.0000	G(0.01)	-7.00	
1201	D3797	0.006		-0.28	
1357	D7504	<0.01		-----	
1538	D7504	0.0065		0.28	
1852	D7504	0.0062		-0.06	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	<0.01		-----	
7009	D7504	<0.001		<-5.88	possibly a false negative test result?
9008		-----		-----	

normality	suspect
n	14
outliers	2
mean (n)	0.00625
st.dev. (n)	0.000582
R(calc.)	0.00163
st.dev.(D3797:05)	0.000893
R(D3797:05)	0.00250

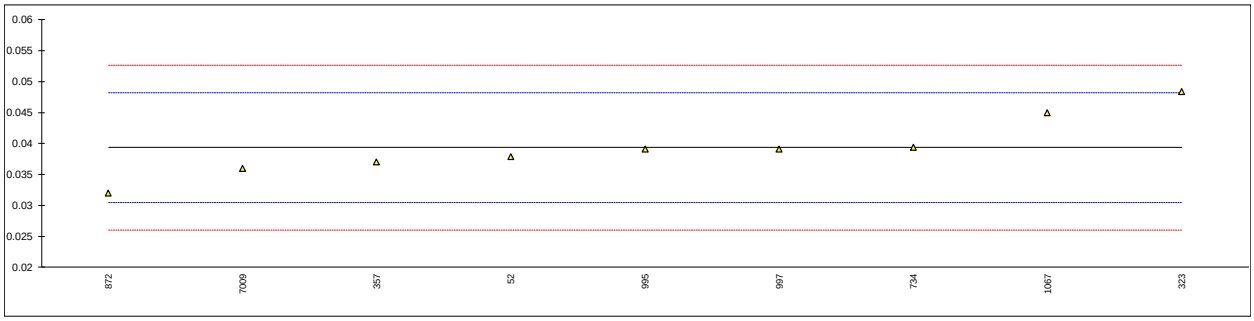


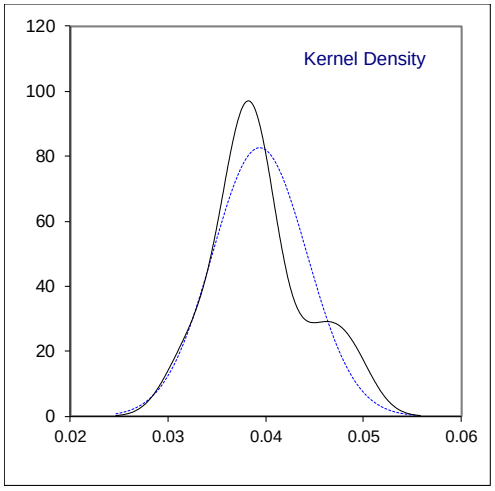


Determination of Sum of Ethyltoluenes in o-Xylene sample #20181; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D7504	0.0379		-0.32	
150		-----		-----	
171		-----		-----	
311		-----		-----	
323	D7504	0.0484		2.04	
357	D7504	0.0371		-0.50	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663		-----		-----	
734	D7504	0.03945		0.03	
872	D7504	0.0320		-1.65	
913		-----		-----	
963		-----		-----	
995	D7504	0.0391		-0.05	
997	D7504	0.0391		-0.05	
1041		-----		-----	
1067	In house	0.045		1.28	
1081		-----		-----	
1201		-----		-----	
1357		-----	W	-----	test result withdrawn, reported <0.01
1538		-----		-----	
1852		-----		-----	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262		-----	W	-----	test result withdrawn, reported <0.01
7009	D7504	0.036		-0.75	
9008		-----		-----	

normality	OK
n	9
outliers	0
mean (n)	0.0393
st.dev. (n)	0.00483
R(calc.)	0.0135
st.dev.(Horwitz, 3 comp.)	0.00444
R(Horwitz, 3 comp.)	0.0124





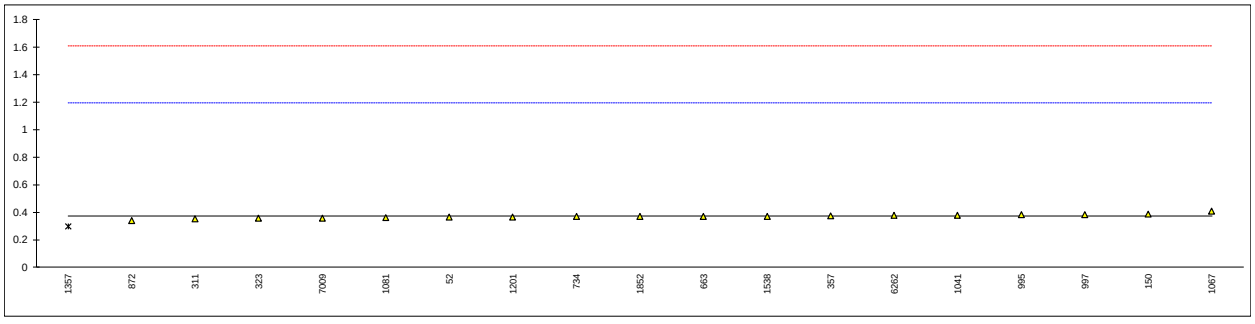
Determination of Toluene in o-Xylene sample #20181; results in %M/M

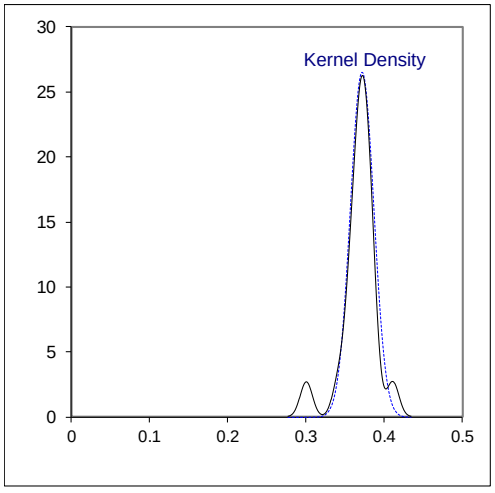
lab	method	value	mark	z(targ)	remarks
52	D7504	<0.0002		-----	
150	D7504	0		-----	
171	D7504	<0.01		-----	
311	D7504	<0.0002		-----	
323	D7504	< 0.0002		-----	
357	D7504	<0,0002		-----	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D7504	<0.0002		-----	
734	D7504	0.00024		-----	
872	D7504	0.0000		-----	
913		-----		-----	
963		-----		-----	
995	D7504	0.0003		-----	
997	D7504	0.0003		-----	
1041		<0,001		-----	
1067	In house	< 0.001		-----	
1081	D3797Mod.	0.00		-----	
1201	D3797	<0.001		-----	
1357	D7504	<0.01		-----	
1538		-----		-----	
1852	D7504	0.0014		-----	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	<0.01		-----	
7009	D7504	<0.001		-----	
9008		-----		-----	
	n	15			
	mean (n)	<0.001			

Determination of C9 and heavier aromatics in o-Xylene sample #20181; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D7504	0.3665		-0.01	
150	D7504	0.3864	C	0.04	first reported 0.0718
171	D7504	<0.002	C	-----	first reported 0.02
311	D7504	0.355		-0.04	
323	D7504	0.3564		-0.04	
357	D7504	0.3750		0.01	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D7504	0.3718	C	0.00	first reported 0.07142
734	D7504	0.37004		0.00	
872	D7504	0.3415	C	-0.07	first reported 0.3470
913		-----		-----	
963		-----		-----	
995	D7504	0.3833		0.03	
997	D7504	0.3833		0.03	
1041		0.379		0.02	
1067	In house	0.411		0.10	
1081	D3797Mod.	0.364		-0.02	
1201	D3797	0.367		-0.01	
1357	D7504	0.30	C,G(0.01)	-0.17	first reported <0.01
1538	D7504	0.3723		0.00	test result includes Cumene
1852	D7504	0.3710		0.00	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	0.3782		0.02	
7009	D7504	0.358		-0.03	
9008		-----		-----	

normality	not OK
n	18
outliers	1
mean (n)	0.3717
st.dev. (n)	0.01507
R(calc.)	0.0422
st.dev.(D7504:20)	0.41217
R(D7504:20)	1.1541





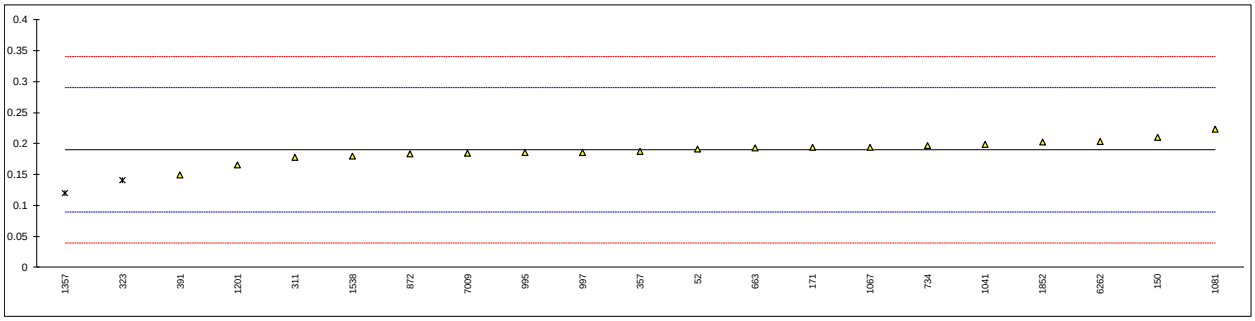
Determination of Non-aromatics in o-Xylene sample #20181; results in %M/M

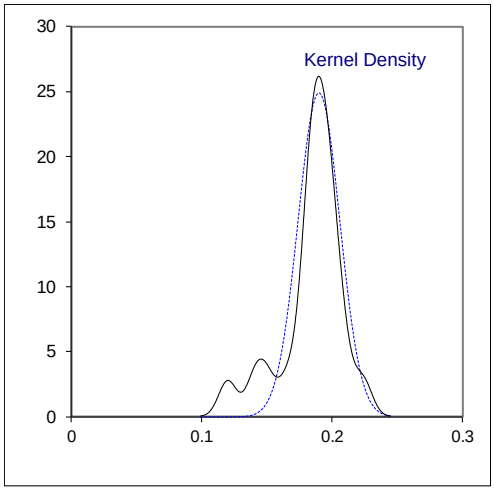
lab	method	value	mark	z(targ)	remarks
52	D7504	0.1914		0.03	
150	D7504	0.2102		0.40	
171	D7504	0.1940		0.08	
311	D7504	0.178		-0.24	
323	D7504	0.1407	DG(0.05)	-0.98	
357	D7504	0.1875		-0.05	
391	D2360	0.15		-0.80	
551		-----		-----	
558		-----		-----	
663	D7504	0.19306		0.06	
734	D7504	0.19724		0.14	
872	D7504	0.1840		-0.12	
913		-----		-----	
963		-----		-----	
995	D7504	0.1857		-0.09	
997	D7504	0.1857		-0.09	
1041		0.199		0.18	
1067	In house	0.194	C	0.08	first reported 0.046
1081	D3797Mod.	0.224		0.68	
1201	D3797	0.166		-0.48	
1357	D7504	0.12	C,DG(0.05)	-1.40	first reported <0.01
1538	D7504	0.1801		-0.20	
1852	D7504	0.2031		0.26	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	0.2035		0.27	
7009	D7504	0.185		-0.10	
9008		-----		-----	

normality	suspect
n	19
outliers	2
mean (n)	0.1901
st.dev. (n)	0.01602
R(calc.)	0.0448
st.dev.(D3797:05)	0.05014
R(D3797:05)	0.1404

Compare:

R(D7504:20)	0.0220





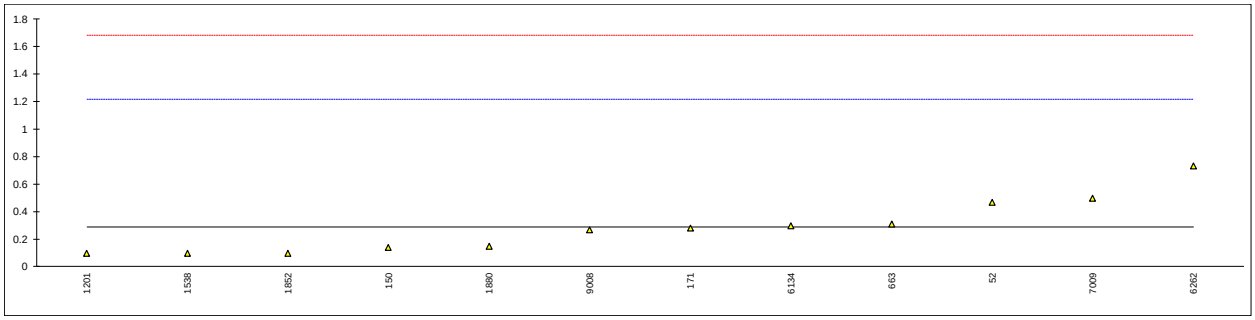
Determination of Appearance of p-Xylene sample #20182;

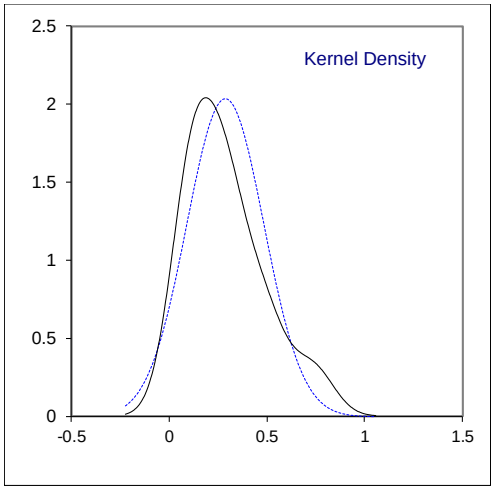
lab	method	value	mark	z(targ)	remarks
52	D4176	Pass		-----	
150	E2680	Pass		-----	
171	Visual	Clear and free from suspended matter		-----	
311	E2680	pass		-----	
323	Visual	C&B		-----	
357	E2680	Pass		-----	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	Visual	Pass		-----	
734	E2680	pass		-----	
872		-----		-----	
913		-----		-----	
963		-----		-----	
995	E2680	Pass		-----	
997	E2680	PASS C&B		-----	
1041		-----		-----	
1067	Visual	Clear and Bright		-----	
1081	In house	C/B		-----	
1201	Visual	Bright and Clear		-----	
1357	Visual	Pass		-----	
1538		-----		-----	
1852		-----		-----	
1880	D4176	Pass		-----	
2459		-----		-----	
6134	Visual	CLEAR &BRIGHT		-----	
6262	Visual	Pass		-----	
7009	Visual	Pass		-----	
9008	Visual	Clear liquid		-----	
	n	19			
	mean (n)	Pass (Bright & Clear)			

Determination of Organic Chloride in p-Xylene sample #20182; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D7536	0.47		0.39	
150	D7359	0.14		-0.32	
171	D5808	0.28		-0.02	
311	D5808	<1		-----	
323	D5808	< 1		-----	
357	D5808	< 0.2		-----	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D5808	0.31		0.05	
734		-----		-----	
872		-----		-----	
913		-----		-----	
963		-----		-----	
995		-----		-----	
997		-----		-----	
1041		-----		-----	
1067	UOP779	< 1.0		-----	
1081	D5808	<0.5		-----	
1201	D5808	0.1		-0.40	
1357	D5808	<0.2		-----	
1538	D5808	0.10		-0.40	
1852	DIN51408-2	0.1		-0.40	
1880	D7359	0.15		-0.30	
2459		-----		-----	
6134	D5808	0.2985		0.02	
6262	UOP779	0.732		0.96	
7009	D7536	0.5		0.46	
9008	D5808	0.27		-0.04	

normality	suspect
n	12
outliers	0
mean (n)	0.288
st.dev. (n)	0.1961
R(calc.)	0.549
st.dev.(D5808:20)	0.4643
R(D5808:20)	1.3

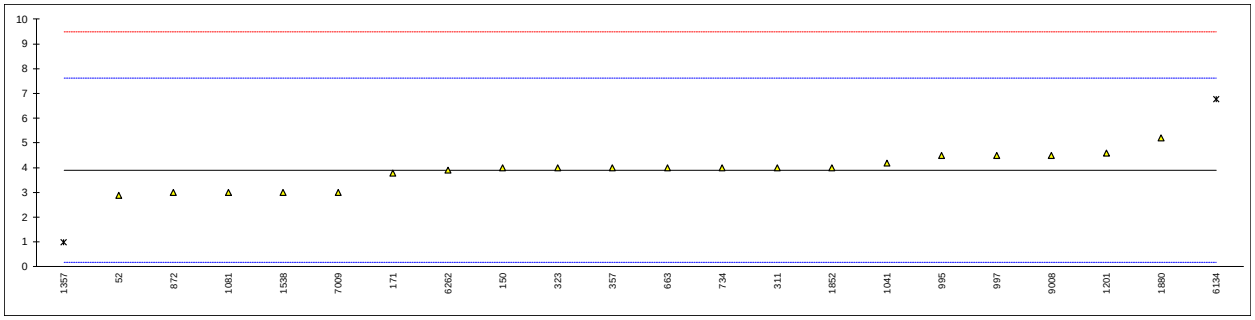


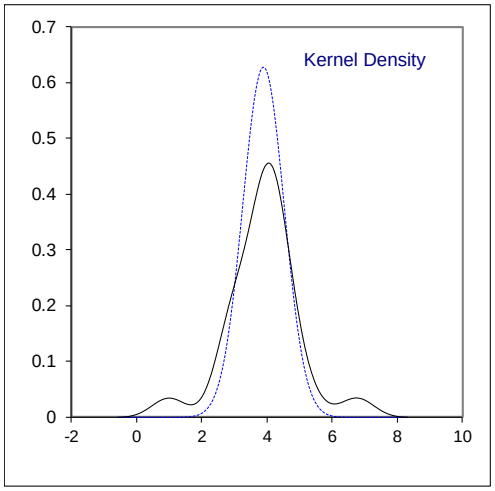


Determination of Color Pt/Co of p-Xylene sample #20182;

lab	method	value	mark	z(targ)	remarks
52	D5386	2.9		-0.54	
150	D5386	4		0.05	
171	D5386	3.8		-0.06	
311	D5386	4		0.05	
323	D5386	4		0.05	
357	D5386	4		0.05	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D5386	4		0.05	
734	D1209	4		0.05	
872	D1209	3		-0.49	
913		-----		-----	
963		-----		-----	
995	D5386	4.5		0.32	
997	D1209	4.5		0.32	
1041		4.2		0.16	
1067	D1209	< 5		-----	
1081	D5386	3		-0.49	
1201	D5386	4.6		0.37	
1357	D1209	1.0	R(0.01)	-1.56	
1538	D1209	3		-0.49	
1852	ISO6271	4		0.05	
1880	D5386	5.20		0.70	
2459		-----		-----	
6134	D1209	6.78	R(0.01)	1.55	
6262	D5386	3.9		0.00	
7009	D1209	3		-0.49	
9008	D5386	4.5		0.32	

	normality	OK
	n	20
	outliers	2
	mean (n)	3.90
	st.dev. (n)	0.635
	R(calc.)	1.78
	st.dev.(D5386:16)	1.858
	R(D5386:16)	5.20
Compare:		
	R(D1209:05)	7

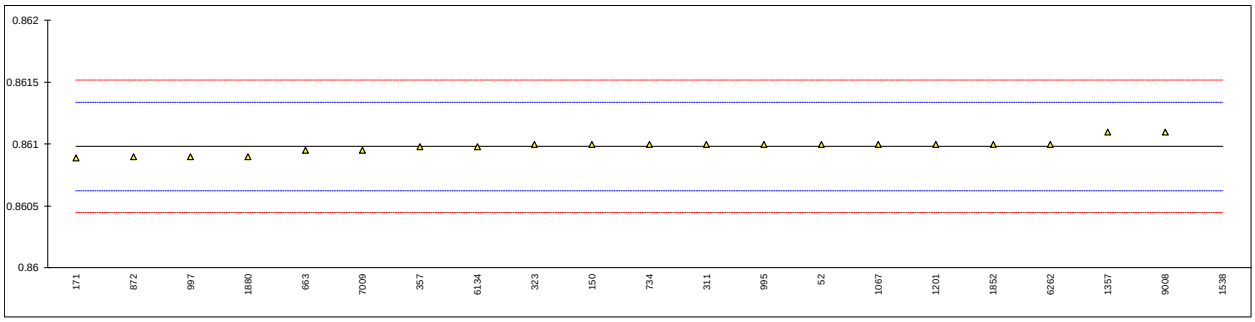


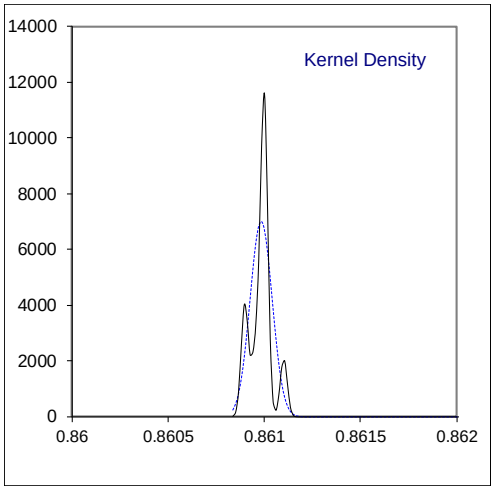


Determination of Density at 20°C of p-Xylene sample #20182; results in kg/L

lab	method	value	mark	z(targ)	remarks
52	D4052	0.8610		0.10	
150	D4052	0.8610		0.10	
171	ISO12185	0.86089		-0.52	
311	D4052	0.8610		0.10	
323	D4052	0.8610		0.10	
357	D4052	0.86098		-0.01	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D4052	0.86095		-0.18	
734	D4052	0.8610		0.10	
872	ISO12185	0.8609	C	-0.46	first reported 860.9 kg/L
913		-----		-----	
963		-----		-----	
995	ISO12185	0.8610		0.10	
997	D4052	0.8609		-0.46	
1041		-----		-----	
1067	D4052	0.8610		0.10	
1081		-----		-----	
1201	D4052	0.8610		0.10	
1357	D4052	0.8611		0.66	
1538	ISO12185	0.8646	C,R(0.01)	20.26	first reported 864.6 kg/L
1852	ISO12185	0.8610		0.10	
1880	D4052	0.8609		-0.46	
2459		-----		-----	
6134	D4052	0.86098		-0.01	
6262	D4052	0.8610		0.10	
7009	D4052	0.86095		-0.18	
9008	D4052	0.8611		0.66	

normality	OK
n	20
outliers	1
mean (n)	0.86098
st.dev. (n)	0.000057
R(calc.)	0.00016
st.dev.(ISO12185:96)	0.000179
R(ISO12185:96)	0.0005

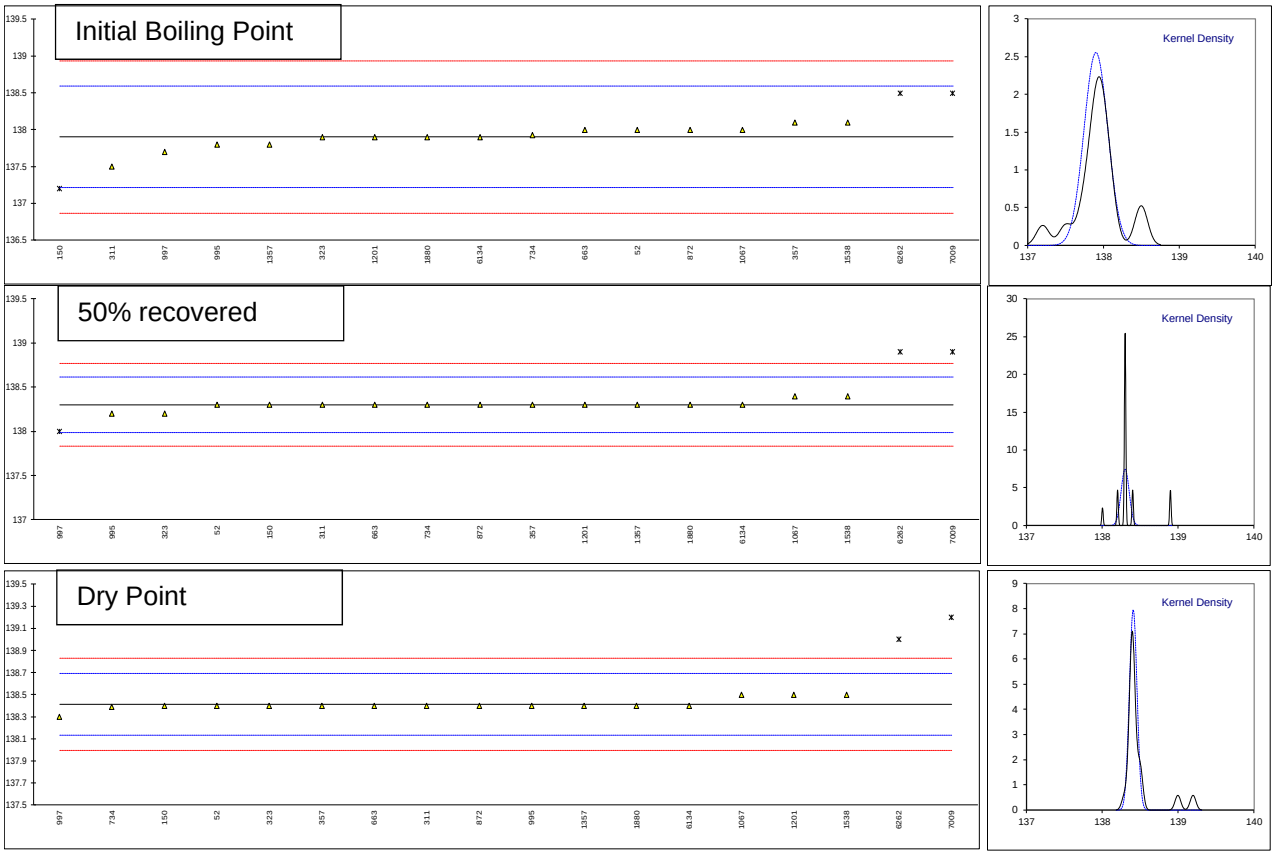




Determination of Distillation of p-Xylene sample #20182; results in °C

lab	method	IBP	mark	z(targ)	50%rec	mark	z(targ)	DP	mark	z(targ)	range
52	D850-automated	138.0		0.28	138.3		0.00	138.4		-0.09	0.4
150	D850-automated	137.2	D(0.05)	-2.04	138.3		0.00	138.4		-0.09	1.2
171		-----		-----	-----		-----	-----		-----	-----
311	D850-automated	137.5		-1.17	138.3		0.00	138.4		-0.09	0.9
323	D850-automated	137.9		-0.01	138.2		-0.64	138.4		-0.09	0.5
357		138.1		0.58	138.3		0.00	138.4		-0.09	0.3
391		-----		-----	-----		-----	-----		-----	-----
551		-----		-----	-----		-----	-----		-----	-----
558		-----		-----	-----		-----	-----		-----	-----
663	D850-automated	138.0		0.28	138.3		0.00	138.4		-0.09	0.4
734	D850-automated	137.93		0.08	138.30		0.00	138.39		-0.16	0.46
872	D850-manual	138.0		0.28	138.3		0.00	138.4		-0.09	0.4
913		-----		-----	-----		-----	-----		-----	-----
963		-----		-----	-----		-----	-----		-----	-----
995	D850-manual	137.8		-0.30	138.2		-0.64	138.4		-0.09	0.5
997	D850-manual	137.7		-0.59	138.0	D(0.01)	-1.91	138.3		-0.80	0.6
1041		-----		-----	-----		-----	-----		-----	-----
1067	D850-automated	138.0		0.28	138.4		0.64	138.5		0.63	0.5
1081		-----		-----	-----		-----	-----		-----	-----
1201	D850-automated	137.9		-0.01	138.3		0.00	138.5		0.63	0.6
1357	D850-automated	137.8	C	-0.30	138.3	C	0.00	138.4	C	-0.09	0.6
1538	D850-automated	138.1		0.58	138.4		0.64	138.5		0.63	0.4
1852		-----		-----	-----		-----	-----		-----	-----
1880	D850-automated	137.9		-0.01	138.3		0.00	138.4		-0.09	0.5
2459		-----		-----	-----		-----	-----		-----	-----
6134	D850-automated	137.9		-0.01	138.3		0.00	138.4		-0.09	0.5
6262	D850-automated	138.5	D(0.05)	1.74	138.9	D(0.01)	3.83	139.0	D(0.01)	4.22	0.5
7009	D850	138.5	D(0.05)	1.74	138.9	D(0.01)	3.83	139.2	D(0.01)	5.66	0.7
9008		-----		-----	-----		-----	-----		-----	-----
	normality	not OK			suspect			suspect			
	n	15			15			16			
	outliers	3			3			2			
	mean (n)	137.90			138.30			138.41			
	st.dev. (n)	0.156			0.053			0.050			
	R(calc.)	0.44			0.15			0.14			
	st.dev.(D850-A:18e1)	0.344			0.157			0.139			
	R(D850-A:18e1)	0.96			0.44			0.39			

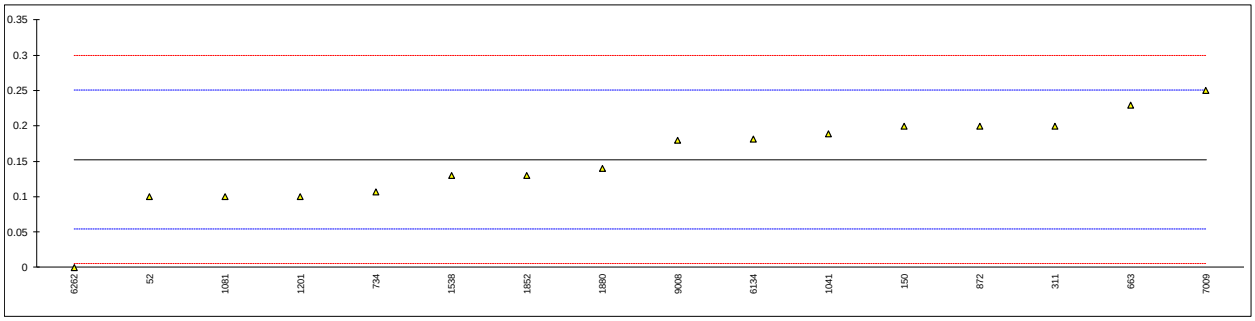
Lab 1357 first reported 137.2 for IBP, 137.8 for 50% recovered and 137.8 for Dry Point

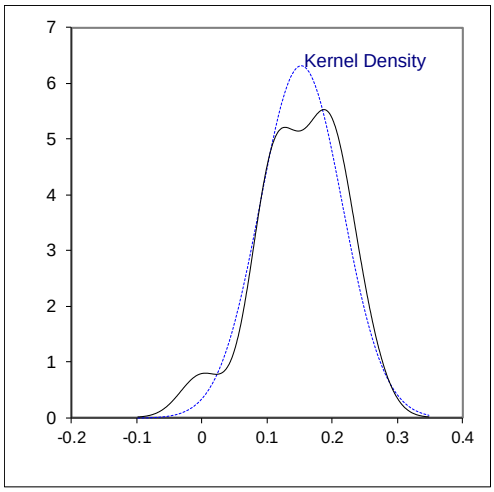


Determination of Sulfur in p-Xylene sample #20182; results in mg/kg

lab	method	value	mark	z(targ)	remarks
52	D7183	0.10		-1.07	
150	D7183	0.2		0.97	
171		-----		-----	
311	D7183	0.20		0.97	
323	D5453	< 1		-----	
357	D5453	< 1		-----	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D5453	0.23		1.58	
734	D7183	0.107		-0.92	
872	D5453	0.2		0.97	
913		-----		-----	
963		-----		-----	
995		-----		-----	
997		-----		-----	
1041	D5453	0.189		0.75	
1067	D5453	< 0.5		-----	
1081	D7183	0.10		-1.07	
1201	D5453	0.1		-1.07	
1357	D5453	<0.2		-----	
1538	D7183	0.13		-0.46	
1852	ISO20846	0.13		-0.46	
1880	D5453	0.14		-0.25	
2459		-----		-----	
6134	D5453	0.1812		0.59	
6262	D5453	0.0		-3.11	
7009	D5453	0.25		1.99	
9008	D5453	0.18		0.56	

	normality	OK
	n	16
	outliers	0
	mean (n)	0.152
	st.dev. (n)	0.0632
	R(calc.)	0.177
	st.dev.(D7183:18ae1)	0.0490
	R(D7183:18ae1)	0.137
Compare:		
	R(D5453:19a)	0.141

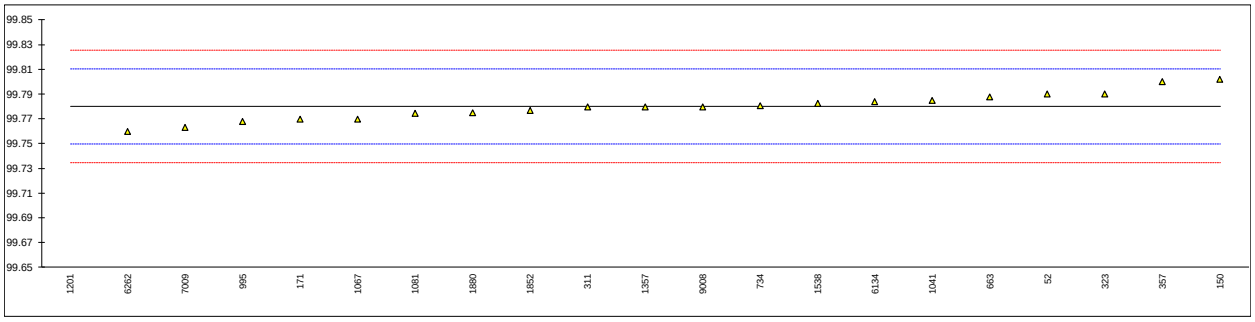


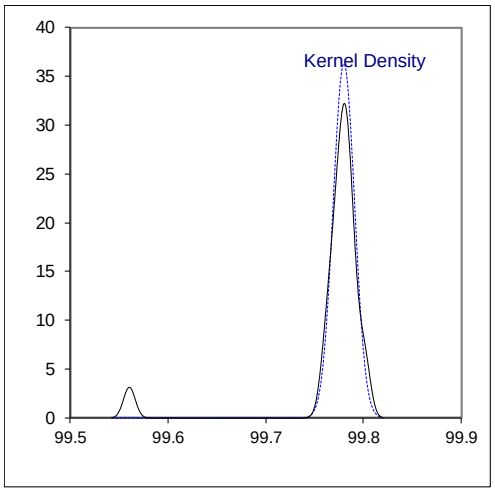


Determination of Purity by GC in p-Xylene sample #20182; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5917	99.79		0.66	
150	D7504	99.8019		1.45	
171	D7504	99.77		-0.66	
311	D7504	99.78		0.00	
323	D5917	99.79		0.66	
357	D5917	99.80		1.32	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D5917	99.788		0.53	
734	D5917	99.7808		0.05	
872		-----		-----	
913		-----		-----	
963		-----		-----	
995	D5917	99.7679		-0.80	
997		-----		-----	
1041		99.785		0.33	
1067	In house	99.77		-0.66	
1081	D3798	99.7744		-0.37	
1201	D5917	99.56	C,R(0.01)	-14.53	first reported 99.85
1357	D5917	99.78		0.00	
1538	D7504	99.7827		0.18	
1852	D7504	99.777		-0.20	
1880	D3798	99.775		-0.33	
2459		-----		-----	
6134	UOP720	99.7841		0.27	
6262	D7504	99.76	C	-1.32	first reported 99.59
7009	D7504	99.763		-1.12	
9008	UOP720	99.78		0.00	

normality	OK
n	20
outliers	1
mean (n)	99.7800
st.dev. (n)	0.01099
R(calc.)	0.0308
st.dev.(D5917:15)	0.01514
R(D5917:15)	0.0424
Compare:	
R(D7504:20)	0.0173

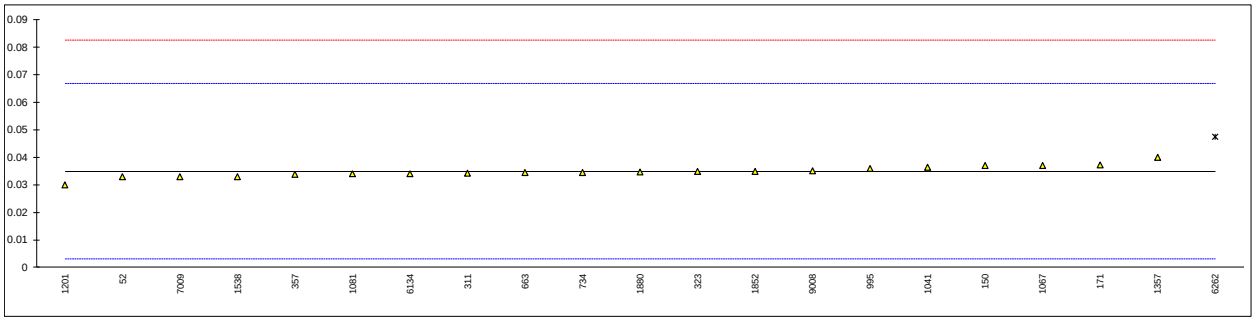


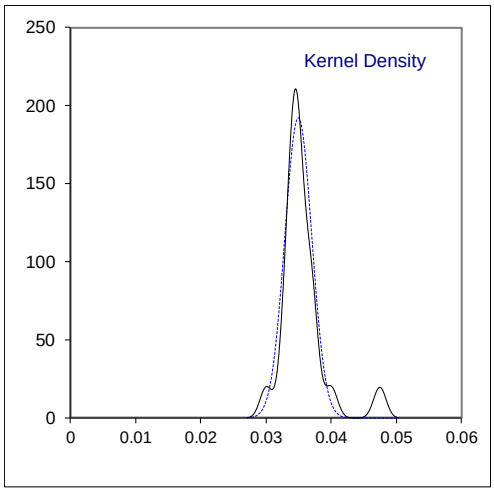


Determination of o-Xylene in p-Xylene sample #20182; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5917	0.033		-0.12	
150	D7504	0.0370		0.13	
171	D7504	0.0374		0.15	
311	D7504	0.0344		-0.03	
323	D5917	0.035		0.00	
357	D5917	0.034		-0.06	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D5917	0.0345		-0.03	
734	D5917	0.0346		-0.02	
872		-----		-----	
913		-----		-----	
963		-----		-----	
995	D5917	0.0360		0.07	
997		-----		-----	
1041		0.0365		0.10	
1067	In house	0.037		0.13	
1081	D3798	0.0342		-0.05	
1201	D5917	0.030		-0.31	
1357	D5917	0.04		0.32	
1538	D5134	0.0331		-0.12	
1852	D7504	0.0350		0.00	
1880	D3798	0.0347		-0.02	
2459		-----		-----	
6134	UOP720	0.0342		-0.05	
6262	D7504	0.0475	R(0.01)	0.79	
7009	D7504	0.033		-0.12	
9008	UOP720	0.0352		0.02	

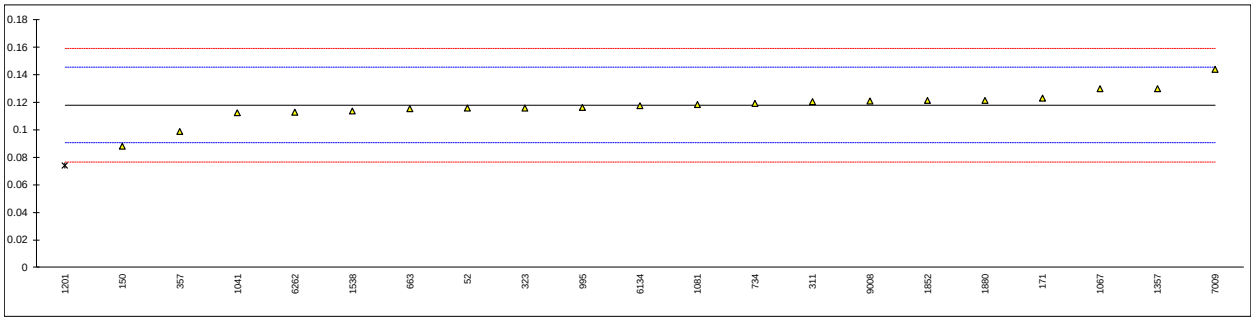
normality	suspect
n	20
outliers	1
mean (n)	0.03494
st.dev. (n)	0.002074
R(calc.)	0.00581
st.dev.(D5917:15)	0.015914
R(D5917:15)	0.04456
Compare:	
R(D7504:20)	0.00283

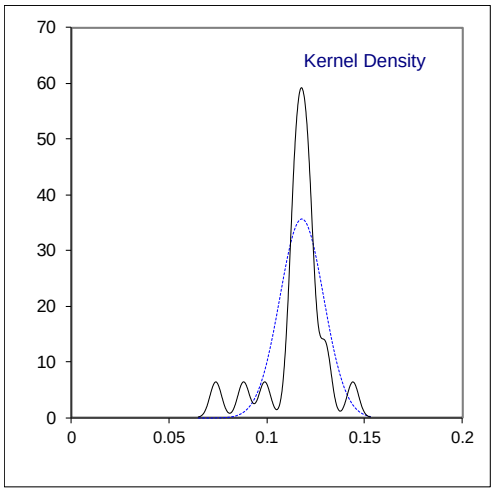




Determination of m-Xylene in p-Xylene sample #20182; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5917	0.116		-0.14	
150	D7504	0.0882		-2.16	
171	D7504	0.1234		0.40	
311	D7504	0.1207		0.20	
323	D5917	0.116		-0.14	
357	D5917	0.099		-1.38	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D5917	0.1154		-0.18	
734	D5917	0.1195		0.12	
872		-----		-----	
913		-----		-----	
963		-----		-----	
995	D5917	0.1166		-0.10	
997		-----		-----	
1041		0.1125		-0.39	
1067	In house	0.130		0.88	
1081	D3798	0.1185		0.04	
1201	D5917	0.074	R(0.05)	-3.19	
1357	D5917	0.13		0.88	
1538	D7504	0.1140		-0.28	
1852	D7504	0.1215		0.26	
1880	D3798	0.1217		0.28	
2459		-----		-----	
6134	UOP720	0.1175		-0.03	
6262	D7504	0.1129	C	-0.36	first reported 0.2875
7009	D7504	0.144		1.90	
9008	UOP720	0.1209		0.22	
	normality	not OK			
	n	20			
	outliers	1			
	mean (n)	0.1179			
	st.dev. (n)	0.01118			
	R(calc.)	0.0313			
	st.dev.(D5917:15)	0.01375			
	R(D5917:15)	0.0385			
Compare:					
	R(D7504:20)	0.0156			

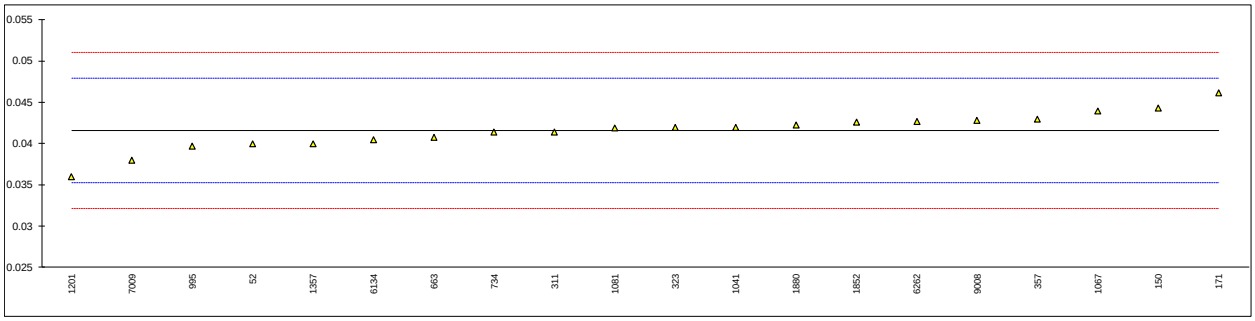


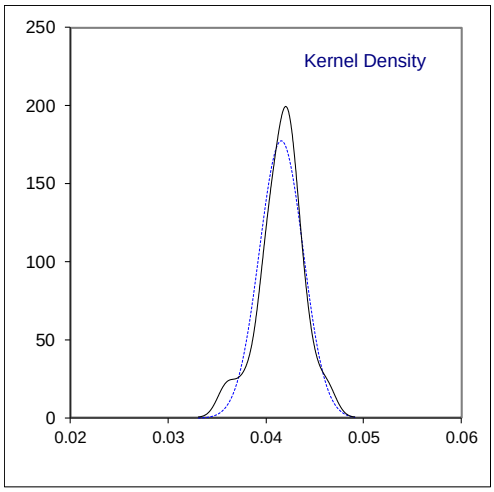


Determination of Ethylbenzene in p-Xylene sample #20182; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5917	0.040		-0.50	
150	D7504	0.0443		0.86	
171	D7504	0.0462		1.46	
311	D7504	0.0414		-0.06	
323	D5917	0.042		0.13	
357	D5917	0.043		0.45	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D5917	0.0408		-0.25	
734	D5917	0.0414		-0.06	
872		-----		-----	
913		-----		-----	
963		-----		-----	
995	D5917	0.0397		-0.60	
997		-----		-----	
1041		0.042		0.13	
1067	In house	0.044		0.77	
1081	D3798	0.0419		0.10	
1201	D5917	0.036		-1.77	
1357	D5917	0.04		-0.50	
1538		-----		-----	
1852	D7504	0.0426		0.32	
1880	D3798	0.0423		0.23	
2459		-----		-----	
6134	UOP720	0.0405		-0.34	
6262	D7504	0.0427		0.35	
7009	D7504	0.038		-1.13	
9008	UOP720	0.0428		0.39	

	normality	suspect
	n	20
	outliers	0
	mean (n)	0.0416
	st.dev. (n)	0.00224
	R(calc.)	0.0063
	st.dev.(D5917:15)	0.00316
	R(D5917:15)	0.0088
Compare:		
	R(D7504:20)	0.0050





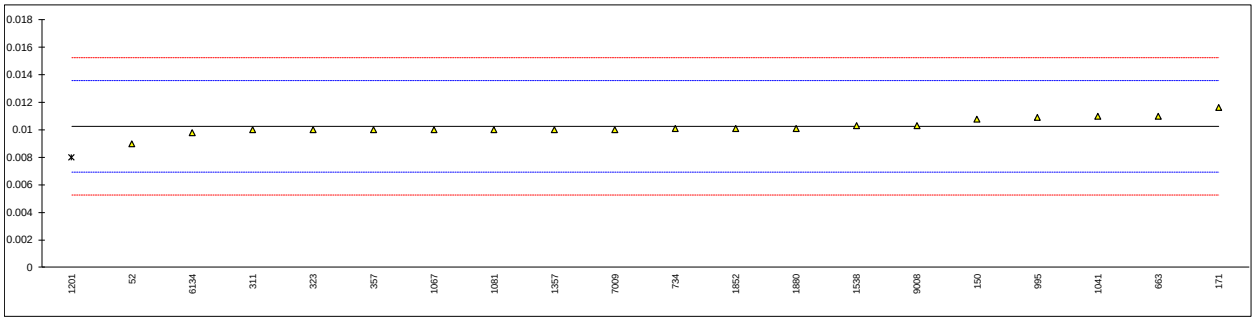
Determination of Styrene in p-Xylene sample #20182; results in %M/M

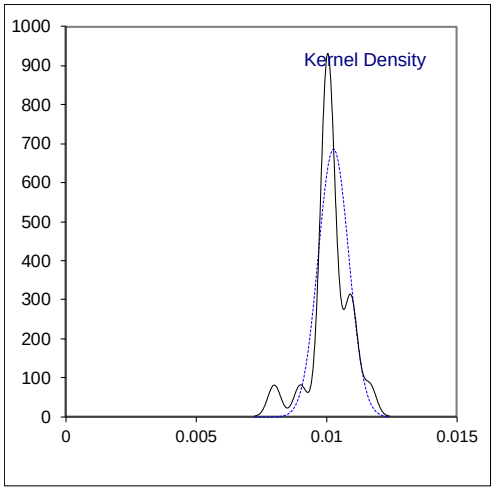
lab	method	value	mark	z(targ)	remarks
52		-----		-----	
150	D7504	0		-----	
171	D7504	<0.01		-----	
311	D7504	0.0004		-----	
323	D5917	< 0.001		-----	
357	D5917	< 0,001		-----	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663		-----		-----	
734	D7504	0.00016		-----	
872		-----		-----	
913		-----		-----	
963		-----		-----	
995	D5917	0.0002		-----	
997		-----		-----	
1041		<0,01		-----	
1067	In house	< 0.001		-----	
1081		-----		-----	
1201	D5917	<0.001		-----	
1357	D5917	n.a		-----	
1538		-----		-----	
1852	D7504	<0,0002		-----	
1880		-----		-----	
2459		-----		-----	
6134		-----		-----	
6262	D7504	<0.01		-----	
7009	D7504	<0.001		-----	
9008		-----		-----	
	n	10			
	mean (n)	<0.001			

Determination of Toluene in p-Xylene sample #20182; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5917	0.009		-0.76	
150	D7504	0.0108		0.32	
171	D7504	0.01165	C	0.83	first reported 0.0165
311	D7504	0.0100		-0.16	
323	D5917	0.010		-0.16	
357	D5917	0.010		-0.16	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D5917	0.0110		0.44	
734	D5917	0.0101		-0.10	
872		-----		-----	
913		-----		-----	
963		-----		-----	
995	D5917	0.0109		0.38	
997		-----		-----	
1041		0.011		0.44	
1067	In house	0.010		-0.16	
1081	D3798	0.010		-0.16	
1201	D5917	0.008	R(0.05)	-1.36	
1357	D5917	0.01		-0.16	
1538	D5134	0.0103		0.02	
1852	D7504	0.0101		-0.10	
1880	D3798	0.0101		-0.10	
2459		-----		-----	
6134	UOP720	0.0098		-0.28	
6262	D7504	<0.01		-----	
7009	D7504	0.010		-0.16	
9008	UOP720	0.0103		0.02	

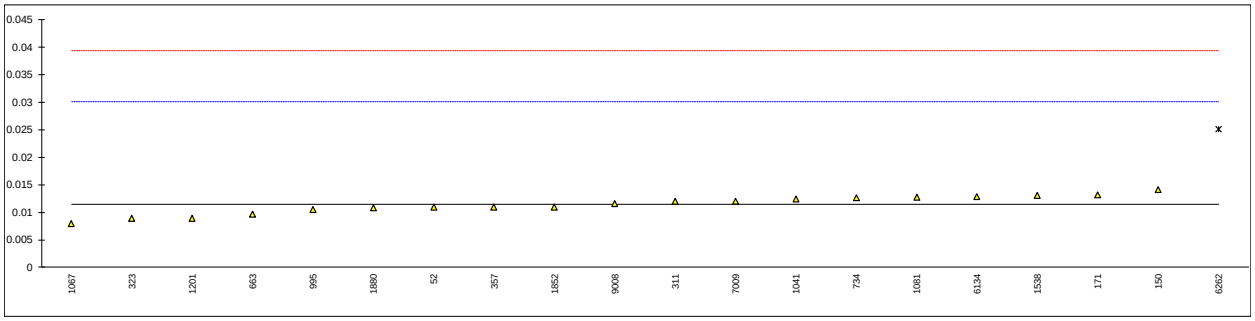
	normality	suspect
	n	19
	outliers	1
	mean (n)	0.01027
	st.dev. (n)	0.000581
	R(calc.)	0.00163
	st.dev.(D5917:15)	0.001660
	R(D5917:15)	0.00465
Compare:		
	R(D7504:20)	0.00087

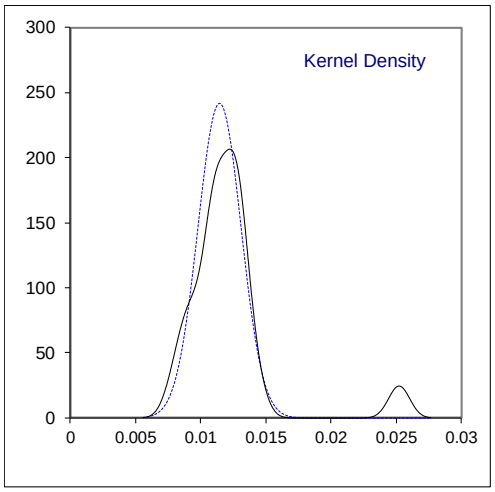




Determination of Non-aromatics in p-Xylene sample #20182; results in %M/M

lab	method	value	mark	z(targ)	remarks
52	D5917	0.011		-0.05	
150	D7504	0.0142		0.30	
171	D7504	0.0132		0.19	
311	D7504	0.0120		0.06	
323	D5917	0.009		-0.26	
357	D5917	0.011		-0.05	
391		-----		-----	
551		-----		-----	
558		-----		-----	
663	D5917	0.0097		-0.19	
734	D5917	0.0127		0.14	
872		-----		-----	
913		-----		-----	
963		-----		-----	
995	D5917	0.0106		-0.09	
997		-----		-----	
1041		0.0125		0.11	
1067	In house	0.008		-0.37	
1081	D3798	0.0128		0.15	
1201	D5917	0.009		-0.26	
1357	D5917	<0.01		-----	
1538	D7504	0.0131		0.18	
1852	D7504	0.0110		-0.05	
1880	D3798	0.0109		-0.06	
2459		-----		-----	
6134	UOP720	0.0129		0.16	
6262	D7504	0.0252	R(0.01)	1.48	
7009	D7504	0.012		0.06	
9008	UOP720	0.0116		0.02	
	normality	OK			
	n	19			
	outliers	1			
	mean (n)	0.01143			
	st.dev. (n)	0.001653			
	R(calc.)	0.00463			
	st.dev.(D5917:15)	0.009314			
	R(D5917:15)	0.02608			
Compare:					
	R(D7504:20)	0.01821			





APPENDIX 2

Number of participants per country

2 labs in	BELGIUM
2 labs in	BRAZIL
1 lab in	CANADA
1 lab in	FINLAND
2 labs in	GEORGIA
2 labs in	GERMANY
2 labs in	INDIA
1 lab in	IRAN, Islamic Republic of
1 lab in	ITALY
1 lab in	KAZAKHSTAN
2 labs in	KUWAIT
4 labs in	NETHERLANDS
1 lab in	OMAN
1 lab in	PAKISTAN
1 lab in	POLAND
1 lab in	RUSSIAN FEDERATION
1 lab in	SAUDI ARABIA
1 lab in	THAILAND
2 labs in	UNITED STATES OF AMERICA

APPENDIX 3

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01)	= outlier in Grubbs' outlier test
G(0.05)	= straggler in Grubbs' outlier test
DG(0.01)	= outlier in Double Grubbs' outlier test
DG(0.05)	= straggler in Double Grubbs' outlier test
R(0.01)	= outlier in Rosner's outlier test
R(0.05)	= straggler in Rosner's outlier test
E	= possibly an error in calculations
W	= test result withdrawn on request of participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported

Literature

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