University of Stuttgart
Germany

Analytische Qualitätssicherung Baden-Württemberg

Proficiency Test 3/19

- TW S1 – sweeteners and benzotriazoles in drinking water -

acesulfam, cyclamate, saccharin, sucralose, 1H-benzotriazole, 4-methyl-1H-benzotriazole, 5-methylbenzotriazole, sum of methyl-1H-benzotriazoles

Final report

provided by
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and

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Stuttgart, in October 2019

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Version of the report	1	

List of contents

1. General 1
2. PT design 1
3. Sample preparation 1
4. Sample distribution 1
5. Analytical methods 2
6. Submission of the results 2
7. Basic principle of evaluation and assessment 3
8. Evaluation 4
9. Explanation for the appendices 4
10. Measurement uncertainty 4
11. Traceable reference values 5
12. Internet 5

Appendix A

ACESULFAM A-1
CYCLAMATE A-7
SACCHARIN A-13
SUCRALOSE A-19
1H-BENZOTRIAZOLE A-25
4-METHYL-1H-BENZOTRIAZOLE A-31
5-METHYL-1H-BENZOTRIAZOLE A-37
∑ BENZOTRIAZOLES A-43

Appendix B

List of contens

Appendix C

ACESULFAM C-1
CYCLAMATE C-10
SACCHARIN C-19
SUCRALOSE C-28
1H-BENZOTRIAZOLE C-37
4-METHYL-1H-BENZOTRIAZOLE C-46
5-METHYL-1H-BENZOTRIAZOLE C-55
∑ BENZOTRIAZOLES C-64

1. General

This PT was provided by AQS Baden-Württemberg in cooperation with IWW Water Center in Mülheim an der Ruhr and with the network “NORMAN” (Network of reference laboratories for monitoring of emerging environmental pollutants). In this round following parameters were to be determined:

- acesulfam
- cyclamate
- saccharin
- sucralose
- 1H-benzotriazole
- 4-methyl-1H-benzotriazole
- 5-methyl-1H-benzotriazole

The PT was executed and evaluated according to the requirements of DIN 38402-A45 and ISO/TS 20612.

2. PT design

Each participant received the following samples:

- 3 samples for the determination of acesulfam, cyclamate, saccharin, sucralose, 1-H-benzotriazole, 4-methyl-1H-benzotriazole, 5-methyl-1H-benzotriazole in 1000-ml glass bottles with ground glass plug. Preservation by adding 40 mg/l sodium azide. The samples also contained acetonitrile as solubility promoter.

3 different concentration levels/batches were produced. All participants received the same samples.

3. Sample preparation

The samples for the determination of the sweeteners and benzotriazoles were based on a real ground water matrix from the northern part of the region Ruhr in North Rhine-Westphalia. The ground water was used without treatment for the sample preparation.
The ground water was spiked with stock solutions and the concentrations covered drinking and ground water relevant ranges.

4. Sample distribution

The samples were dispatched on 09 April 2019 by express service

5. Analytical methods

The participants were free to choose a suitable method, but following limits of quantification were required:

parameter	**limit of quantification [µg/l]**
acesulfam	0,05 µg/l*
cyclamate	0,05 µg/l*
saccharin	0,05 µg/l*
sucralose	0,1 µg/l
1H-benzotriazole	0,05 µg/l
4-methyl-1H-benzotriazol	0,05 µg/l
5-methyl-1H-benzotriazol	0,05 µg/l

*concentration refers to the acid and not to the salt of the respective substance

The participants were informed that the samples had to be analysed in the own laboratory, with own personal and own equipment. Subcontracting of the analysis was not allowed.

The samples had to be analysed in duplicate over the complete method (sample preparation and measurement). The participants were asked to report the results in µg/l with three significant digits.

6. Submission of the results

The deadline for the submission of results was on 29 April 2019.

7. Basic principle of evaluation and assessment

The basic principle of the evaluation and assessment of the PTs from AQS Baden-Württemberg are described in the document „Evaluation of the PTs and information for the report“, which can be downloaded from www.aqsbw.de/pdf/ausw_berichte_v1_en.pdf.

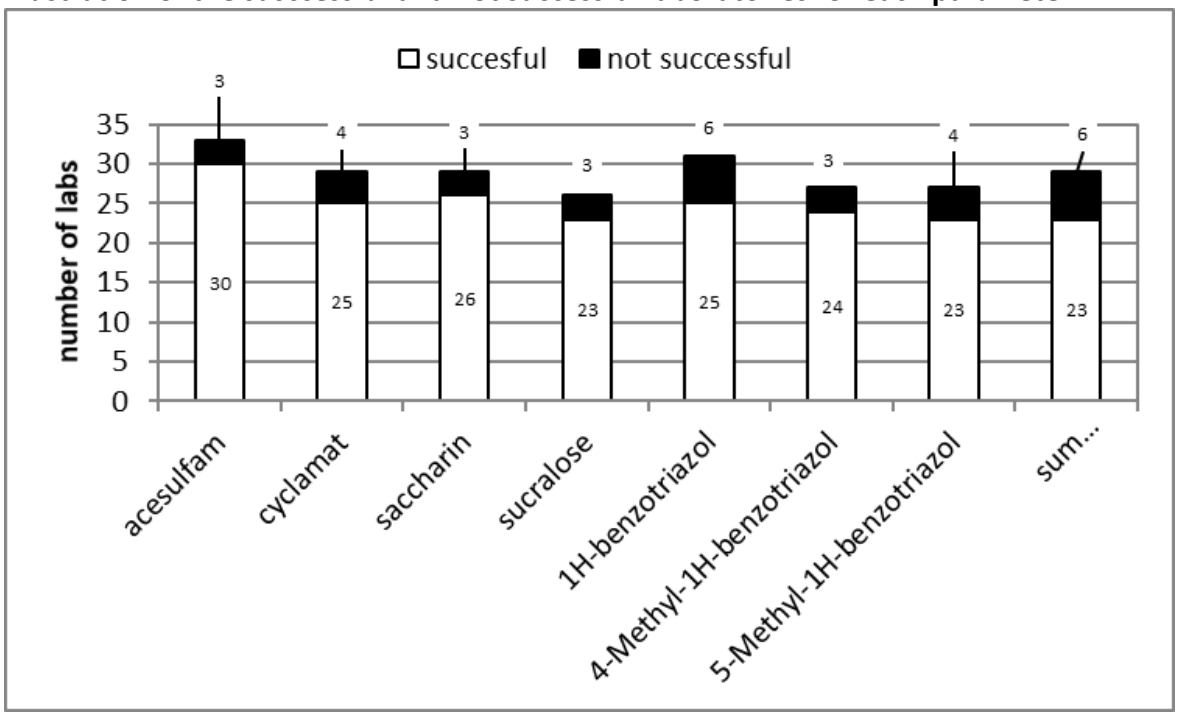
This PT was evaluated as follows:

Assigned value x_{pt}:	Reference value
Standard deviation for proficiency assessment σ_{pt}:	Q method
Upper limit of σ_{pt}:	25 %
Lower limit of σ_{pt}:	5 %
Assessment:	z_U-Score
Classification of the single results:	$\lvert z_u \rvert \leq 2{,}0$ successful $2{,}0 < \lvert z_u \rvert < 3{,}0$ questionable $\lvert z_u \rvert \geq 3{,}0$ unsatisfactory
Parameter assessment:	A parameter was assessed as successful, if more than half of the values were correctly determined (2 out of 3 values are within the tolerance limits).

8. Evaluation

Number of participants:	36 1 laboratory did not report any results
Number of reported values	693
Number of accepted values:	587 (84,7%)

Illustration of the susccessful and not successful laboratories for each parameter



9. Explanation for the appendices

The explanations for the appendices can be found in the document „Evaluation of the PTs and information for the report“, which can be downloaded from www.aqsbw.de/pdf/ausw_berichte_v1_en.pdf.

10. Measurement uncertainty

General:

Number of labs with valid values	35
Number of labs with valid values and reported measurement uncertainties	15 (42,9%)
Number of valid values	693
Number of valid values with measurement uncertainties	294 (42,2%)

Measurement uncertainties against the accreditation status

Accreditation status of the values	Number of values	Number of values with measurement uncertainty
accredited	501	288 (57,5%)
not accredited	60	0 (0%)
not specified	132	6 (4,5%)

Interpretation of the reported measurement uncertainties:
If measurement uncertainties are underestimated values assessed as “satisfactory” in the PT ($|z_U| \leq 2$), will have a large ζ-score. $|\zeta| > 2$ means that the “own” requirements (defined in terms of estimated uncertainty) are not fulfilled.

Number of values with reported measurement uncertainty having a $|z_U| \leq 2{,}0$	250
Number of values with a magnitude of ζ-scores > 2 The own requirements of the laboratory are not fulfilled and the estimation of the measurement uncertainty is too low	39 (15,6%)

11. Traceable reference values

The explanations about traceable reference values can be found in the document „Evaluation of the PTs and information for the report“, which can be downloaded from www.aqsbw.de/pdf/ausw_berichte_v1_en.pdf

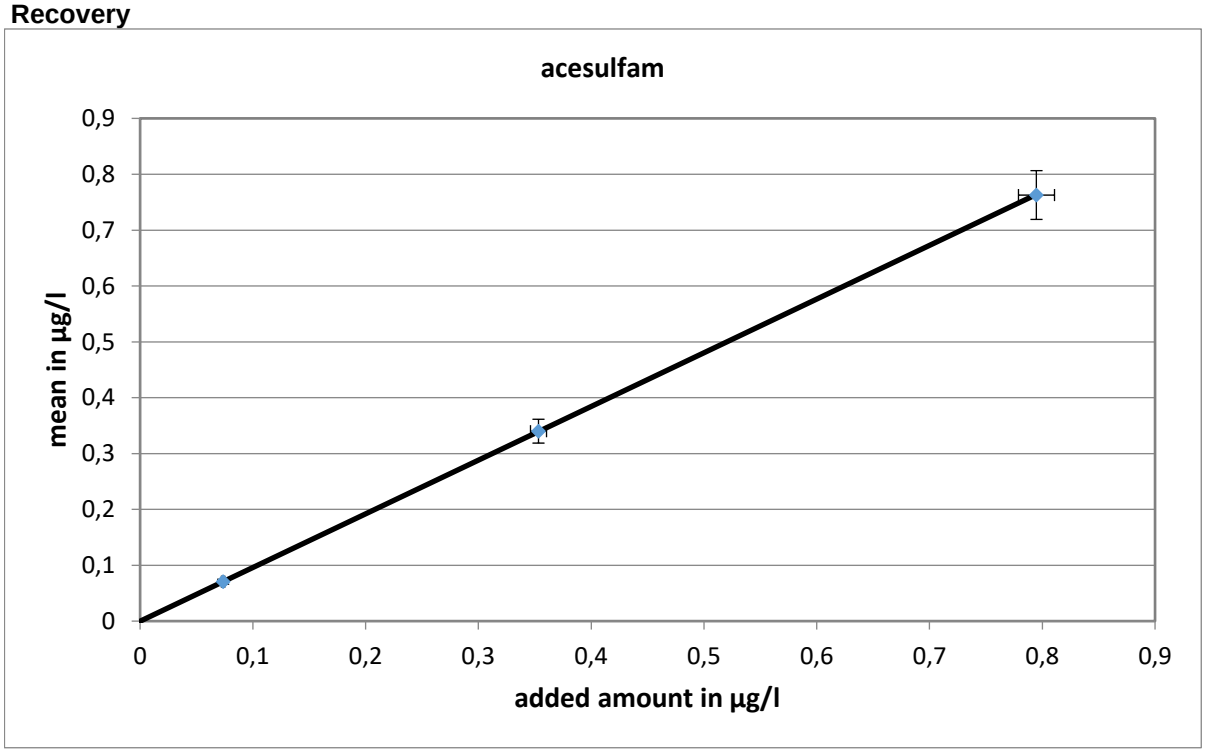
12. Internet

The report is available on the following webpage: http://www.aqsbw/pdf/report319.pdf

acesulfam

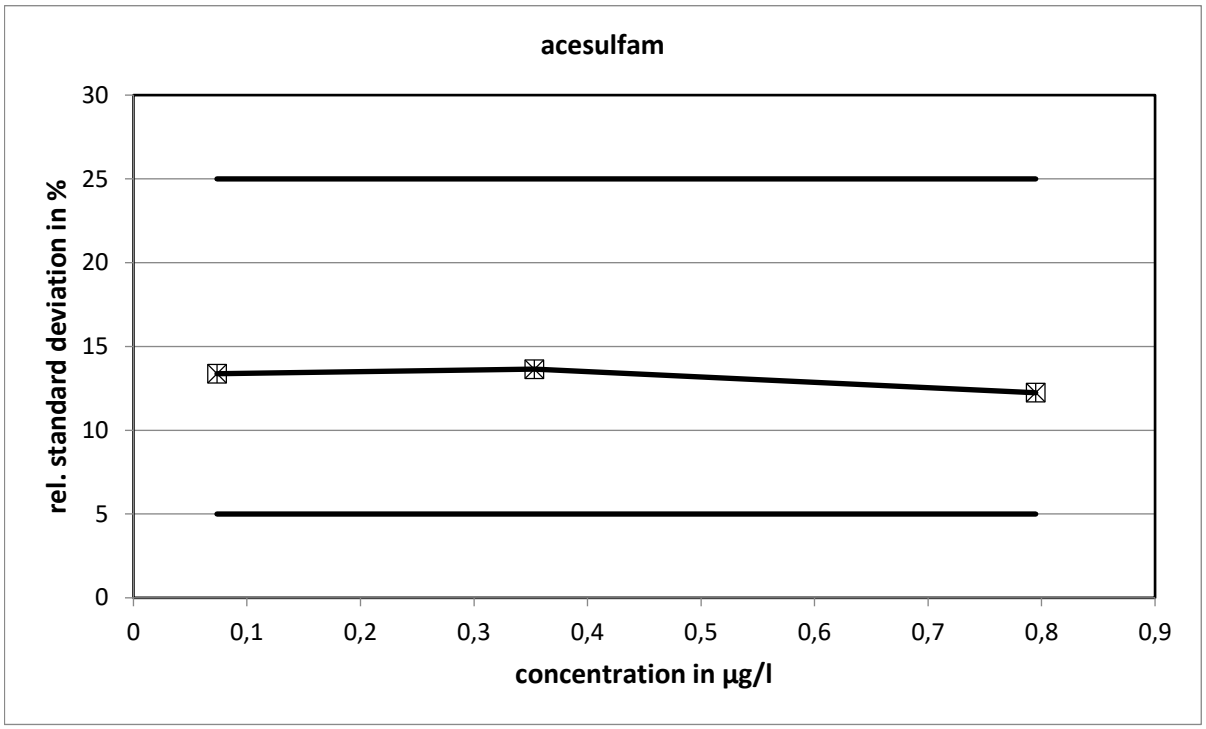
level	assigned value [µg/l]	expanded uncertainty of the assigned value [%]	standard deviation, calculated using robust statistics [µg/l]	standard deviation for proficiency assessment [µg/l]	standard deviation for proficiency assessment [%]	upper tolerance limit [µg/l]	lower tolerance limit [µg/l]	upper tolerance limit [%]	lower tolerance limit [%]	number of results	out below	out above	out [%]
1	0,0736	2,03	0,0098	0,0098	13,37	0,0948	0,0551	28,87	-25,12	32	0	2	6,1
2	0,3533	2,01	0,0482	0,0482	13,65	0,4576	0,2627	29,52	-25,63	32	1	2	9,1
3	0,7949	2,01	0,0973	0,0973	12,24	1,003	0,6112	26,24	-23,11	31	2	3	15,2
									sum	95	3	7	10,5

Recovery

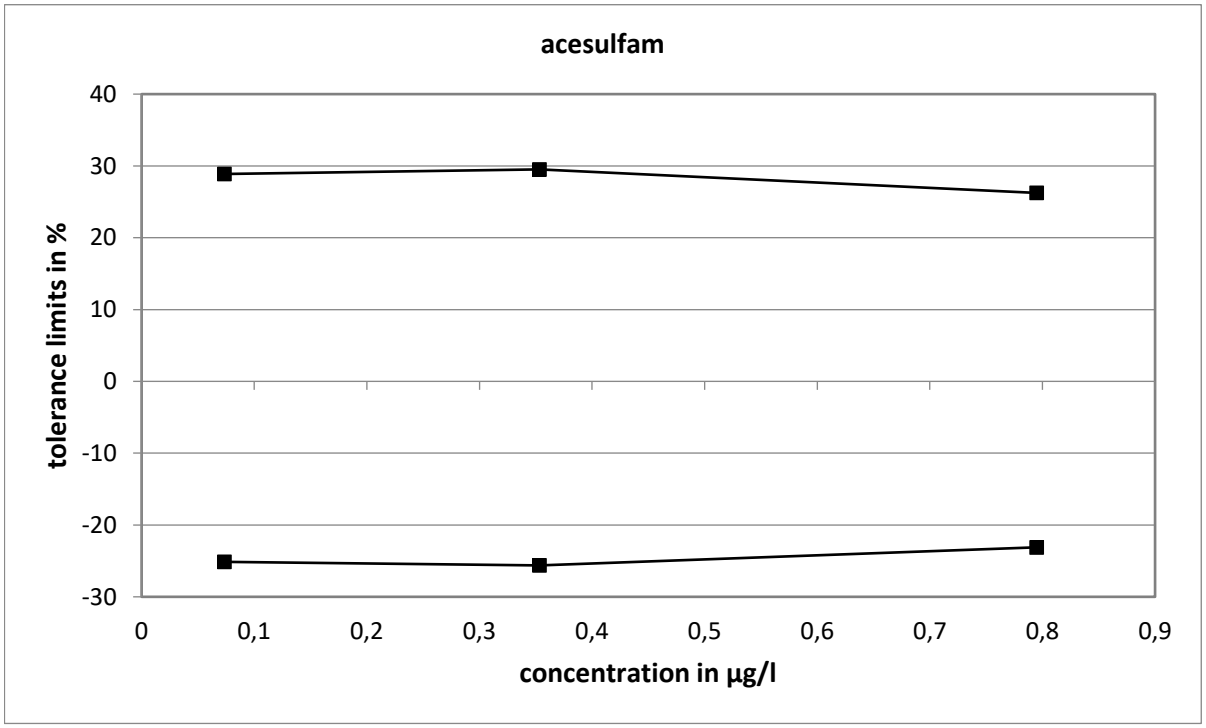


Slope of the regression: 0,961; average recovery: 96,1%

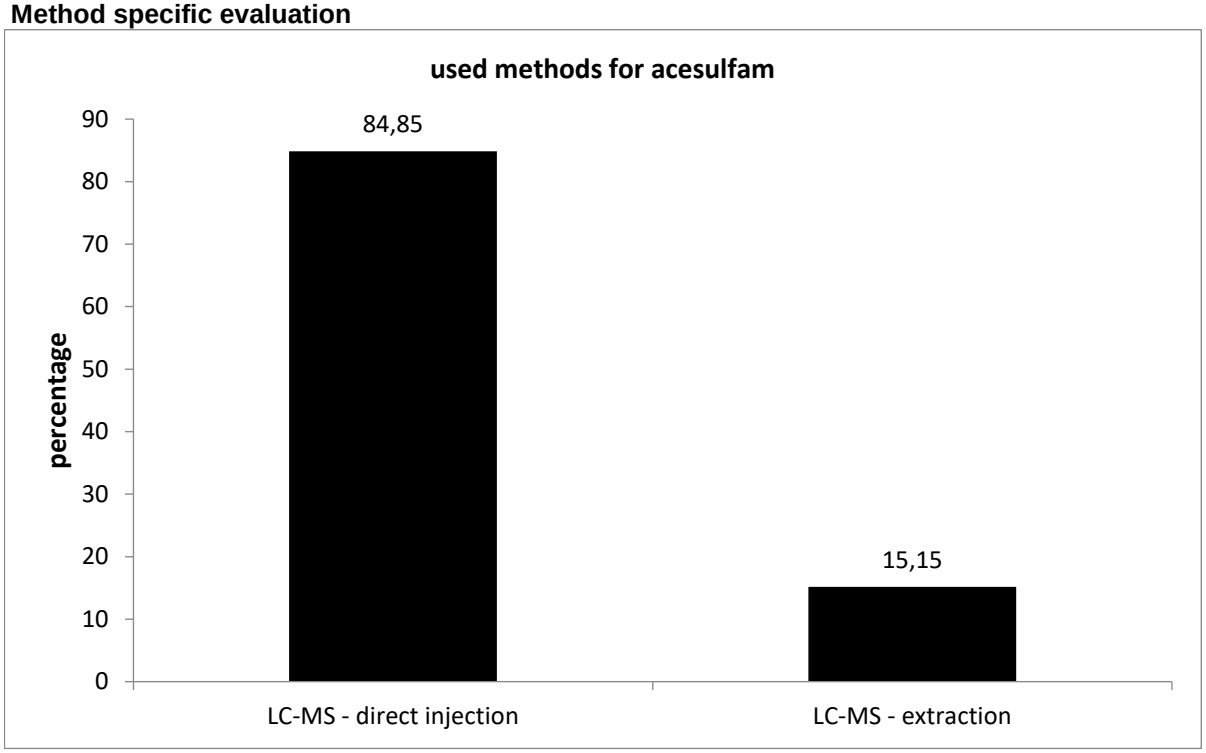
Relative standard deviation and tolerance limits

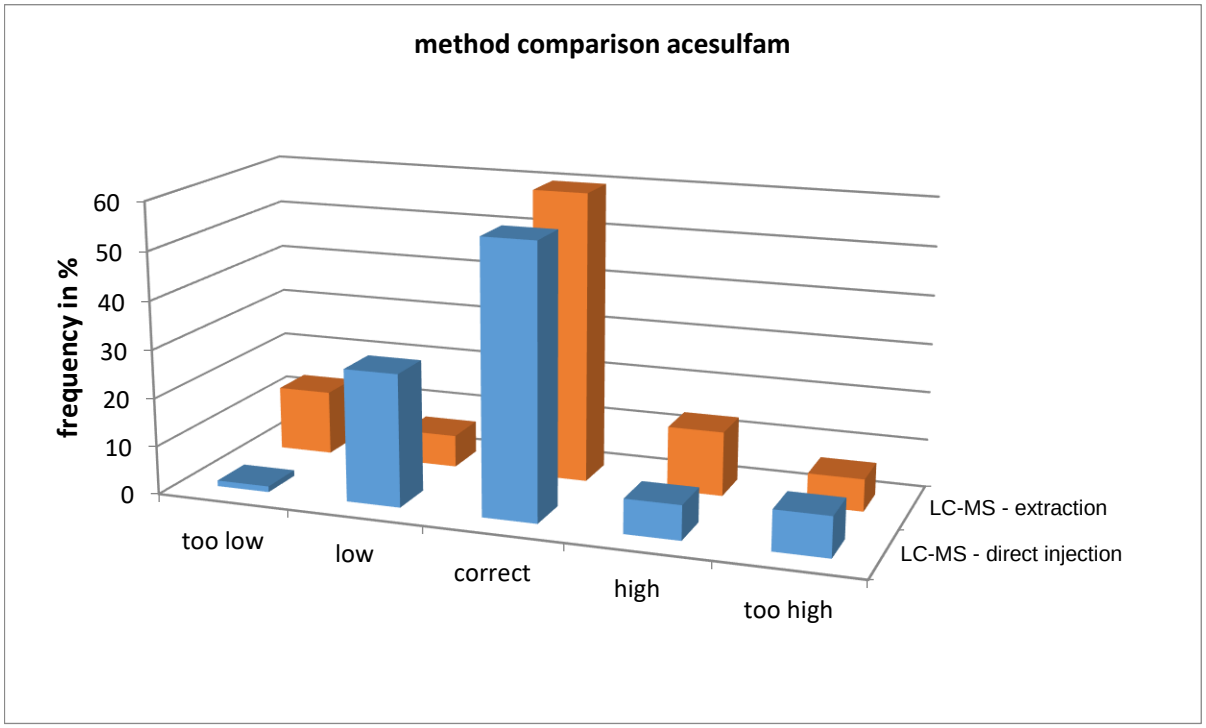


The relative standard deviations calculated with the Q-method did not reach the limits.



Method specific evaluation

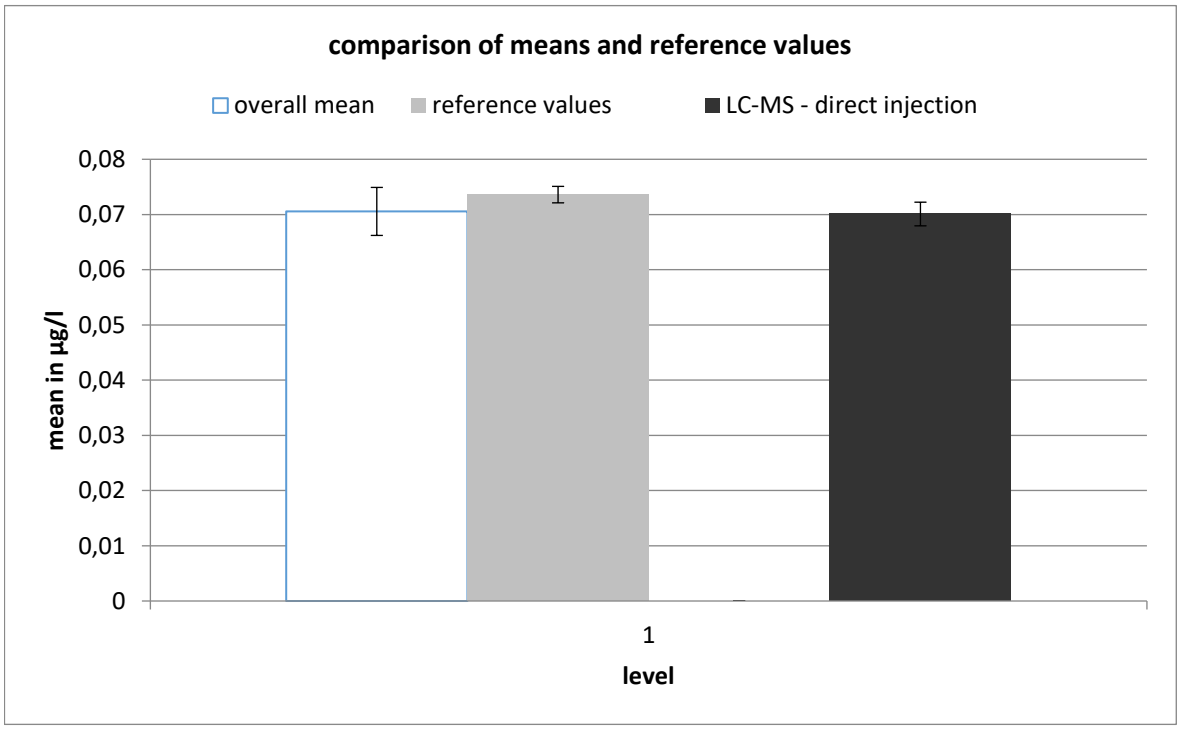


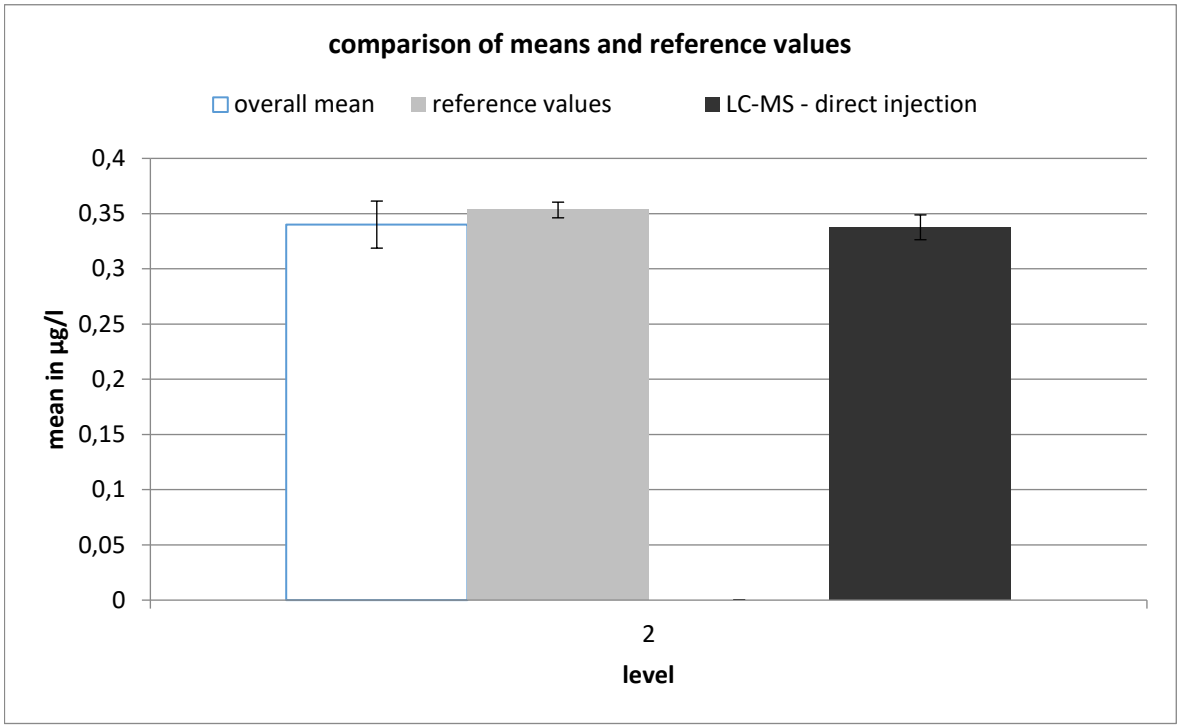


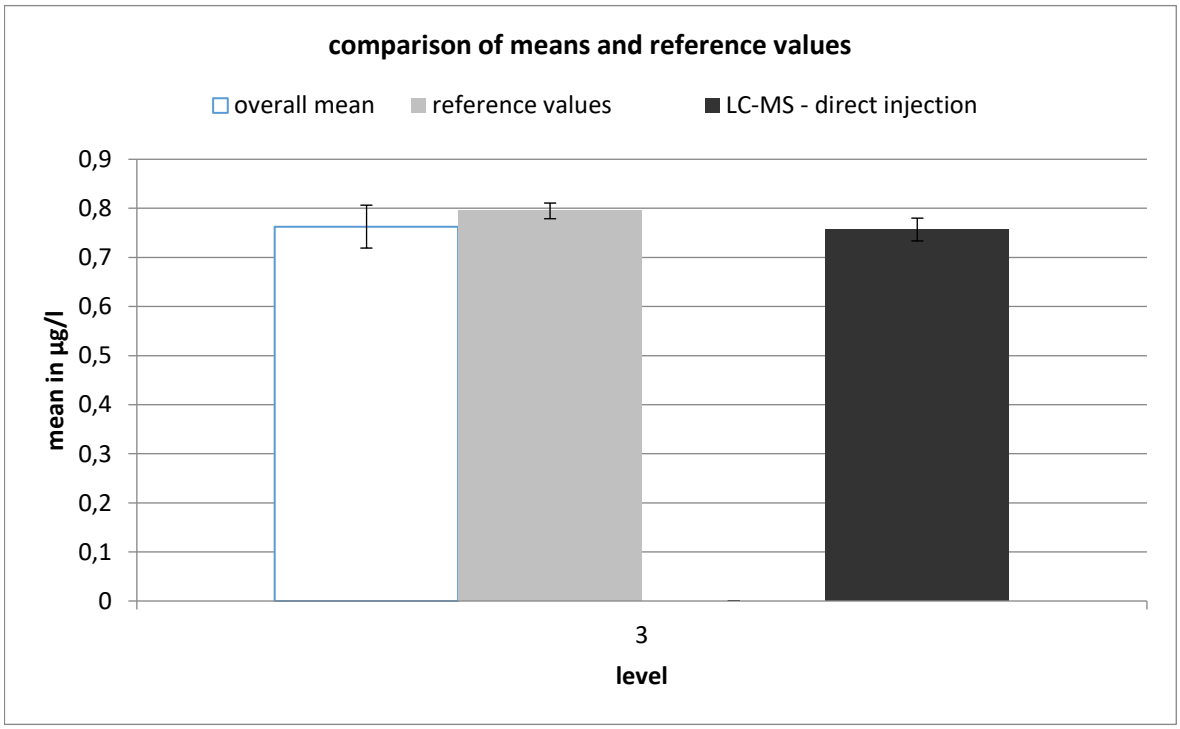
The values determined with LC-MS - direct injection were rather lower.

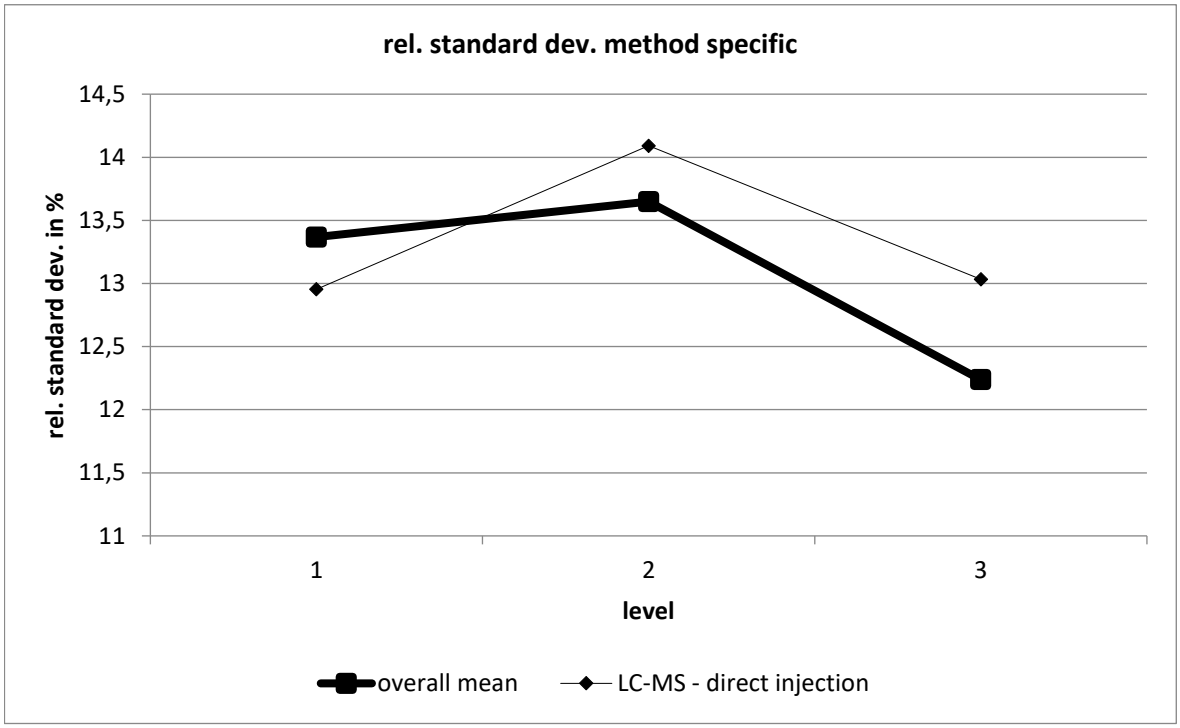
Comparison of means and reference values

level	mean [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]	reference value [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]
1	0,0706	0,0043	6,2	0,0736	0,0015	2,0
2	0,3401	0,0213	6,3	0,3533	0,0071	2,0
3	0,7628	0,0437	5,7	0,7949	0,0160	2,0




comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

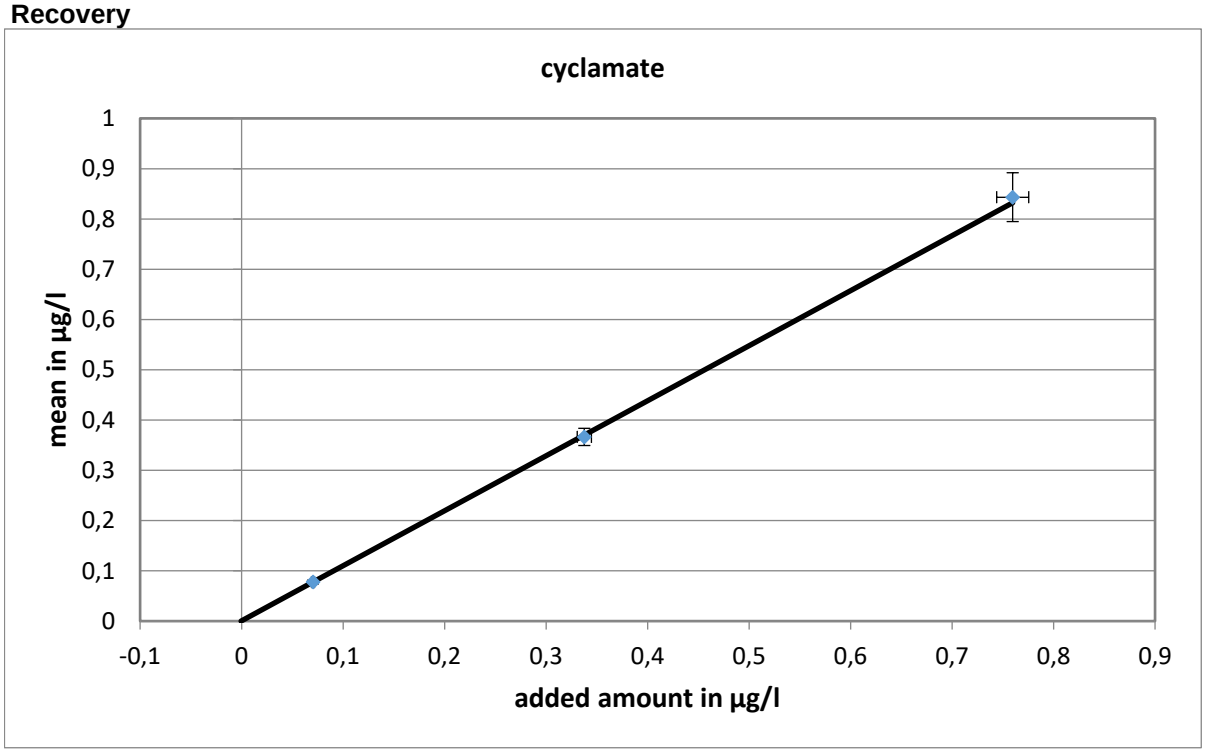


LC-MS - direct injection									
level	robust mean [µg/l]	exp. unc. of the mean [µg/l]	exp. unc. of the mean [%]	robust standard deviation [µg/l]	robust standard deviation [%]	number of results	out below	out above	out [%]
1	0,07	0,002	3,06	0,009	12,95	28	1	1	7,143
2	0,338	0,011	3,329	0,048	14,09	28	1	1	7,143
3	0,757	0,023	3,079	0,099	13,03	28	2	2	14,29

cyclamate

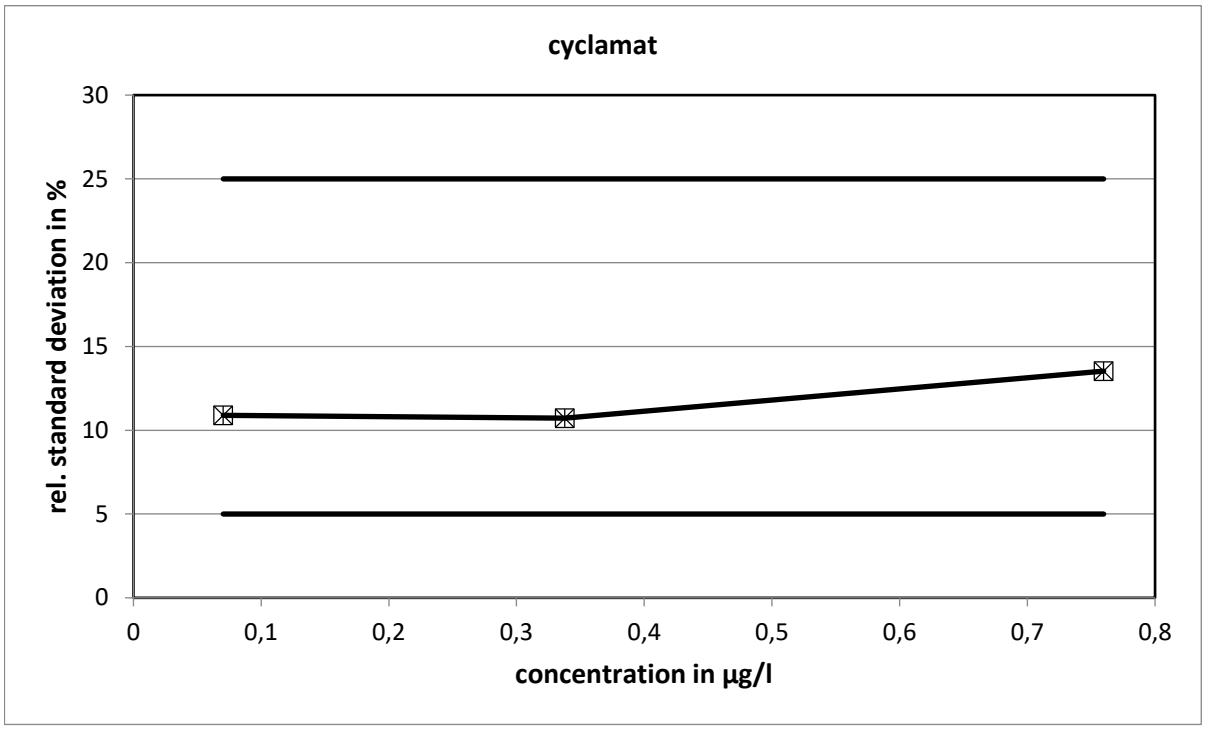
level	assigned value [µg/l]	expanded uncertainty of the assigned value [%]	standard deviation, calculated using robust statistics [µg/l]	standard deviation for proficiency assessment [µg/l]	standard deviation for proficiency assessment [%]	upper tolerance limit [µg/l]	lower tolerance limit [µg/l]	upper tolerance limit [%]	lower tolerance limit [%]	number of results	out below	out above	out [%]
1	0,0703	2,08	0,0077	0,0077	10,89	0,0865	0,0557	22,97	-20,82	28	1	5	20,7
2	0,3377	2,08	0,0362	0,0362	10,72	0,4140	0,2685	22,61	-20,49	28	0	4	13,8
3	0,7598	2,08	0,1028	0,1028	13,53	0,9794	0,5652	28,91	-25,61	28	0	4	13,8
									sum	84	1	13	16,7

Recovery

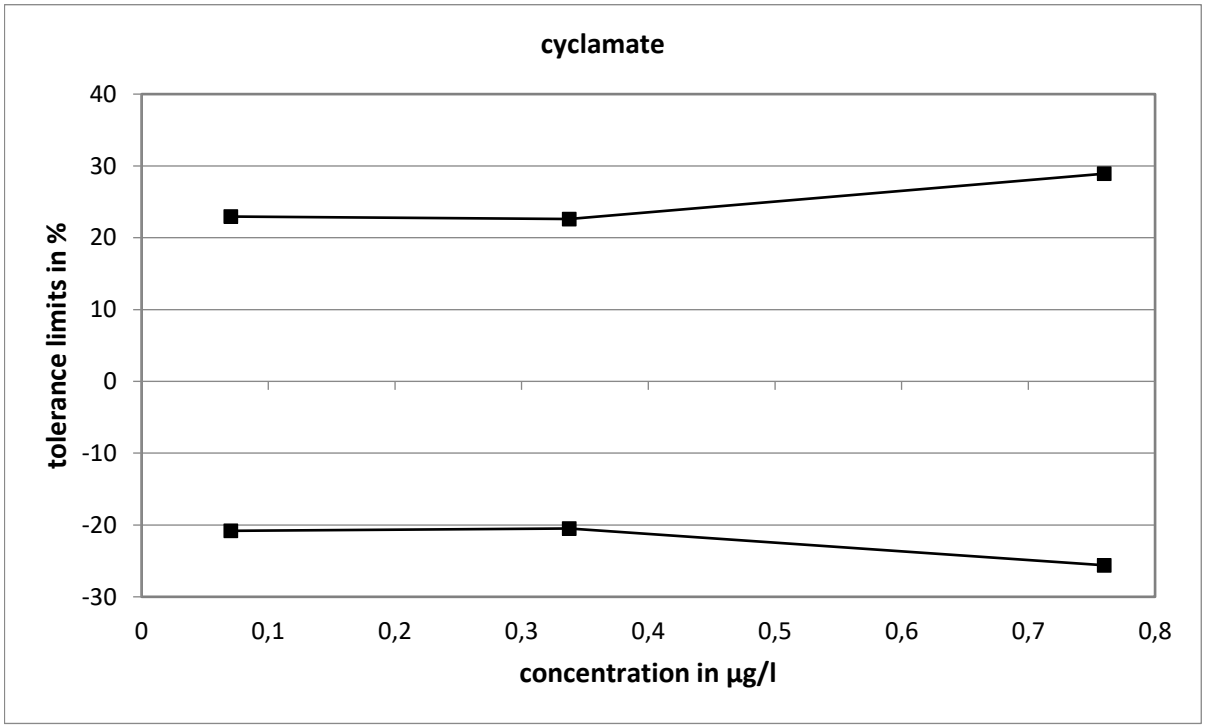


Slope of the regression: 1,095; average recovery: 109,5%

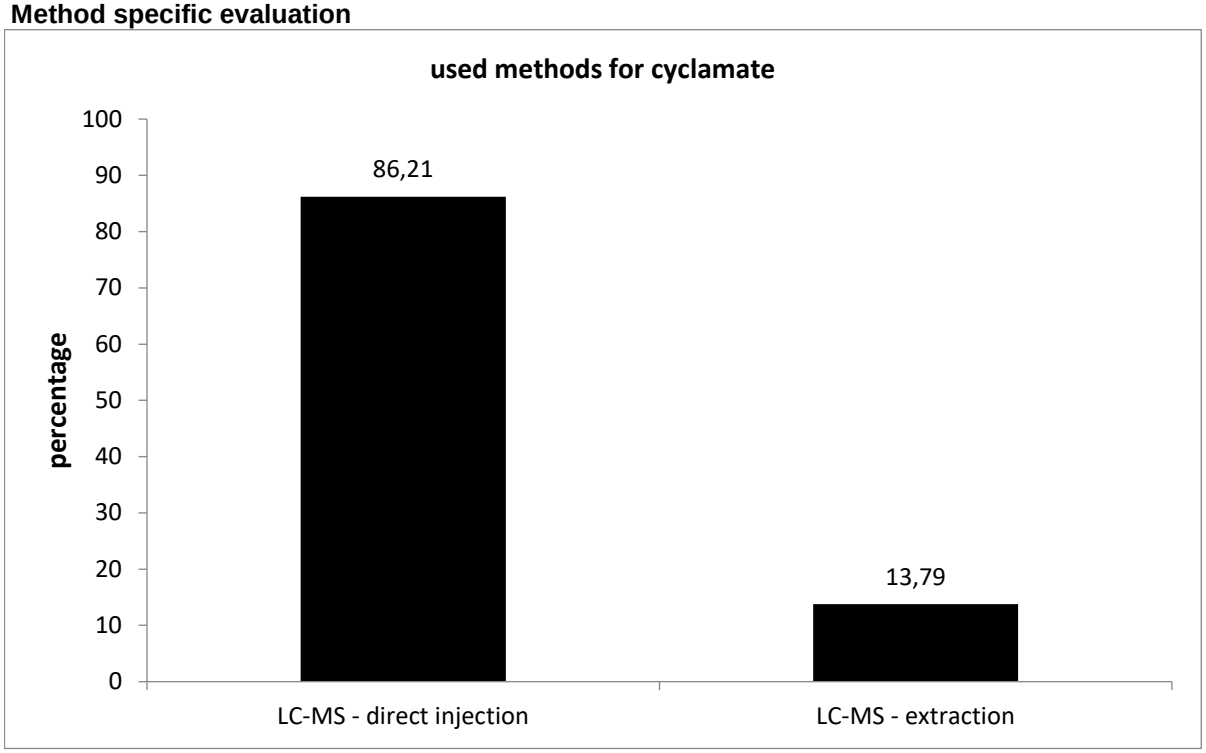
Relative standard deviation and tolerance limits

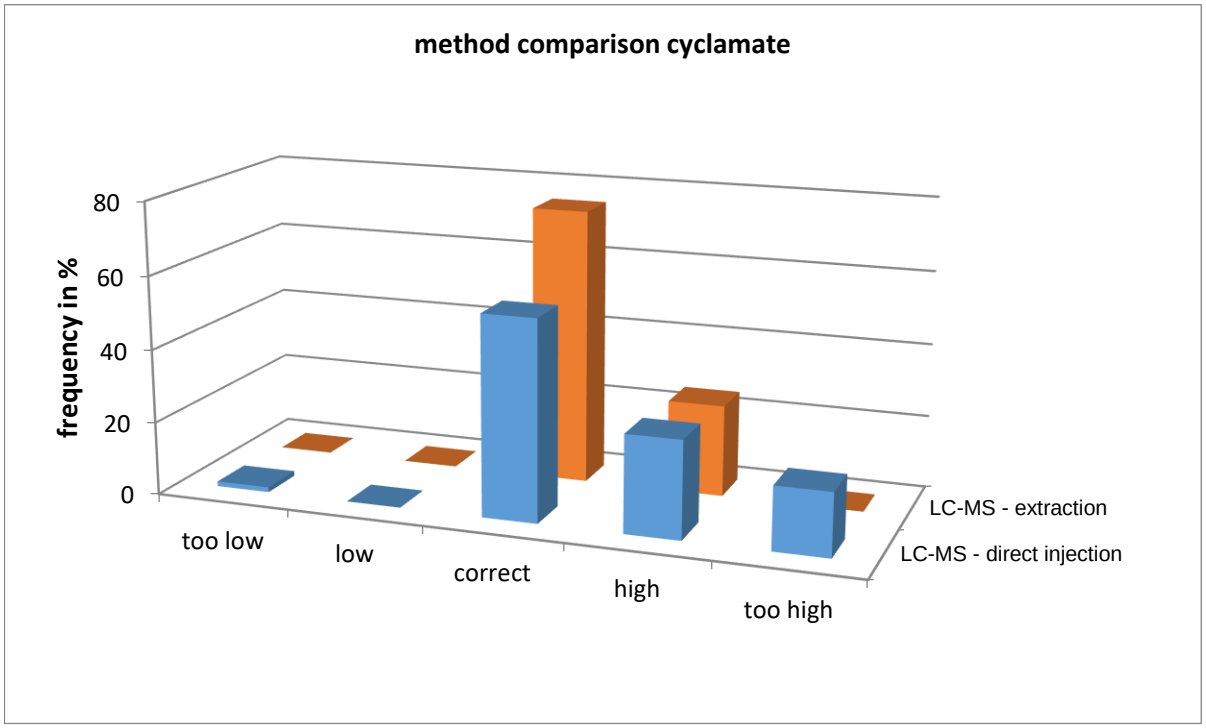


The relative standard deviations calculated with the Q-method did not reach the limits.



Method specific evaluation

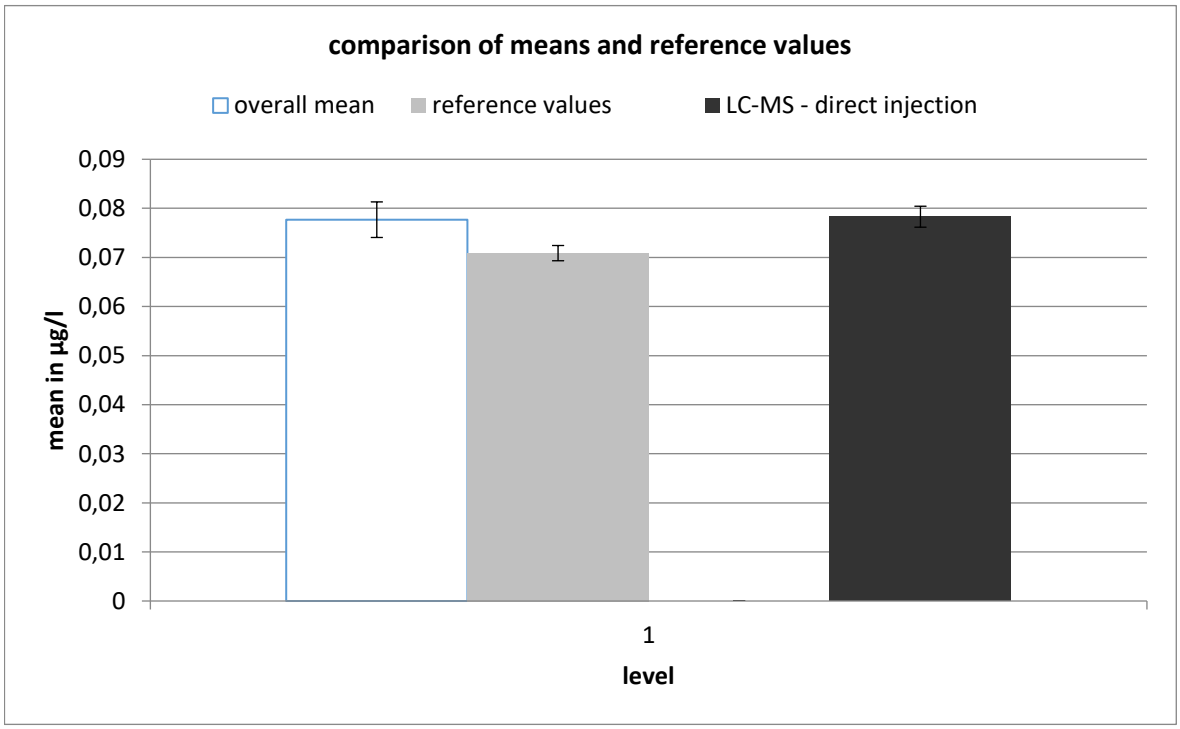


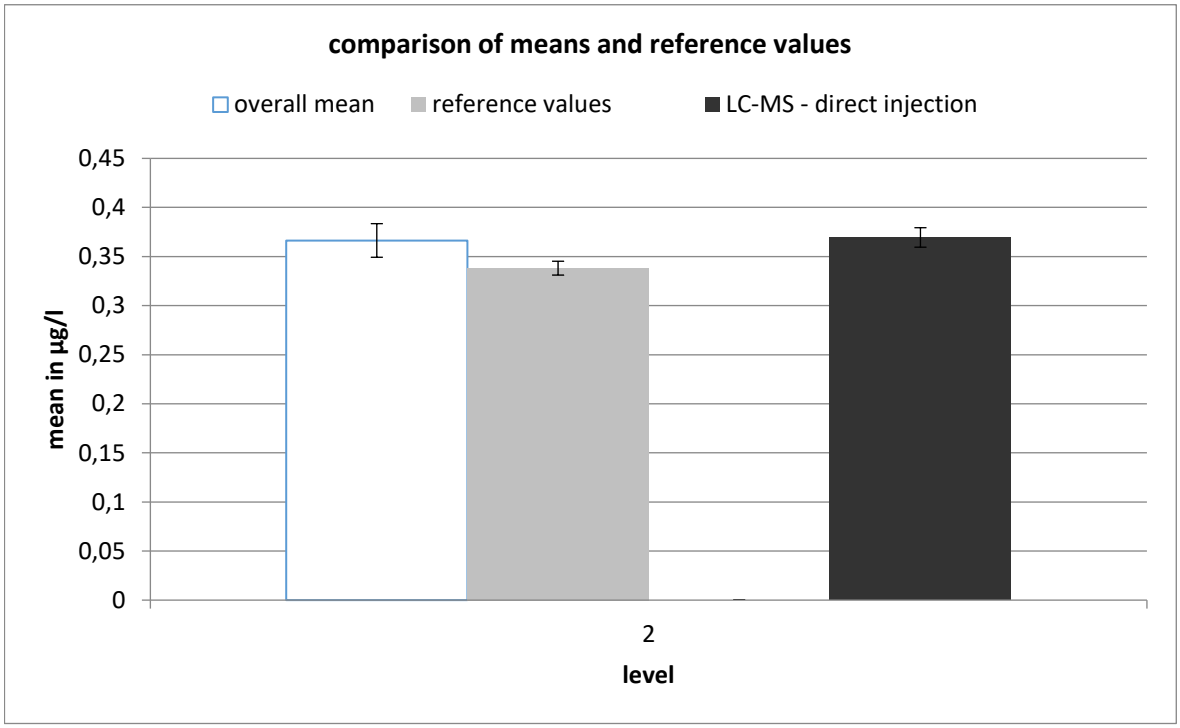


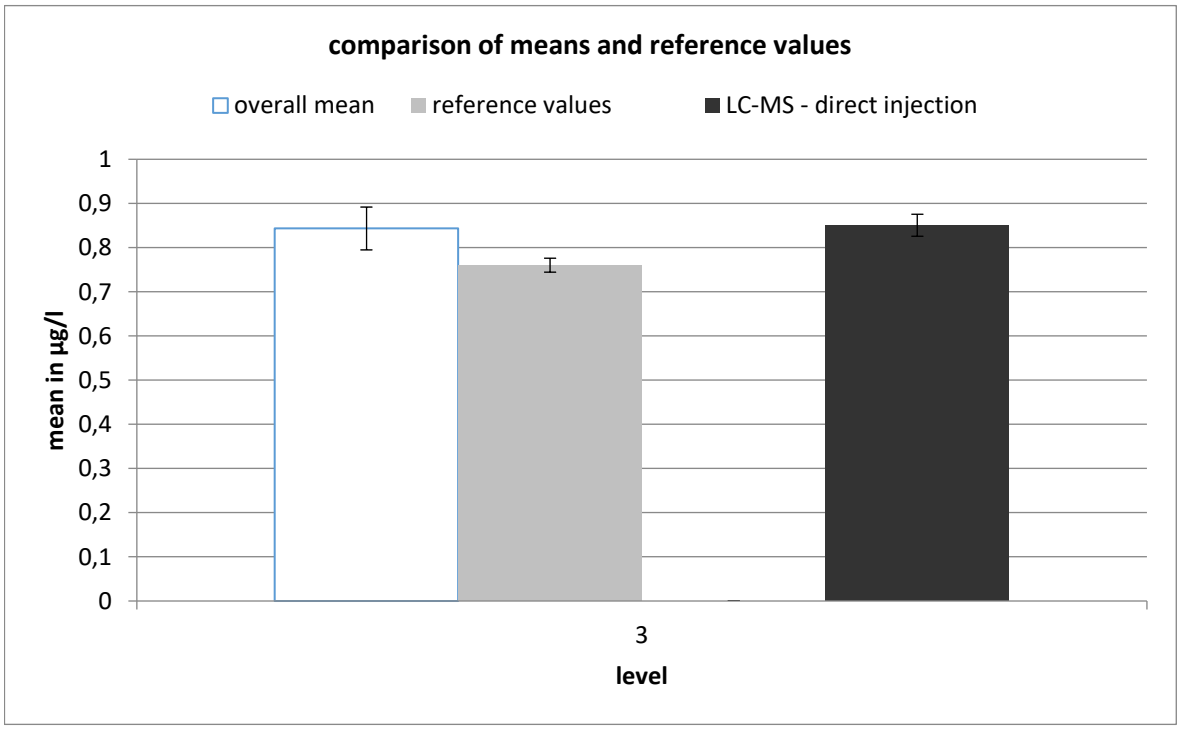
Both methods lead to higher or too high values.

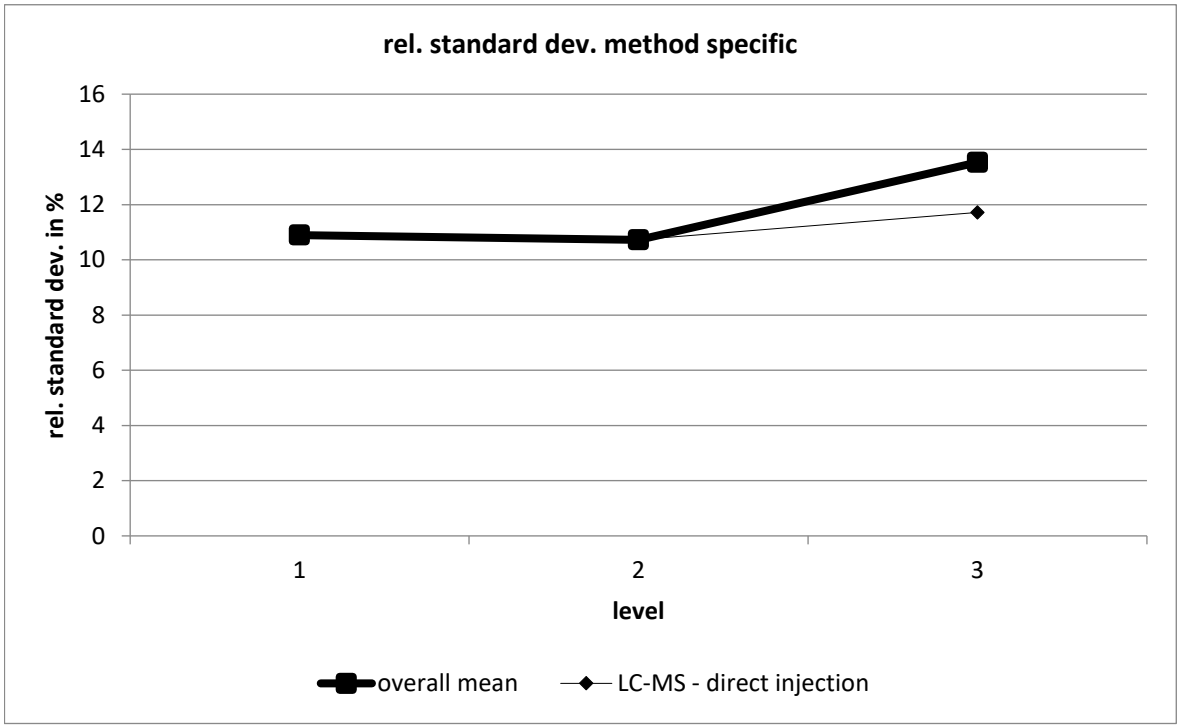
Comparison of means and reference values

level	mean [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]	reference value [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]
1	0,0777	0,0036	4,7	0,0709	0,0016	2,2
2	0,3664	0,0171	4,7	0,3382	0,0070	2,1
3	0,8433	0,0486	5,8	0,7603	0,0158	2,1




comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
mean in µg/l
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
2
level


comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
mean in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
3
level

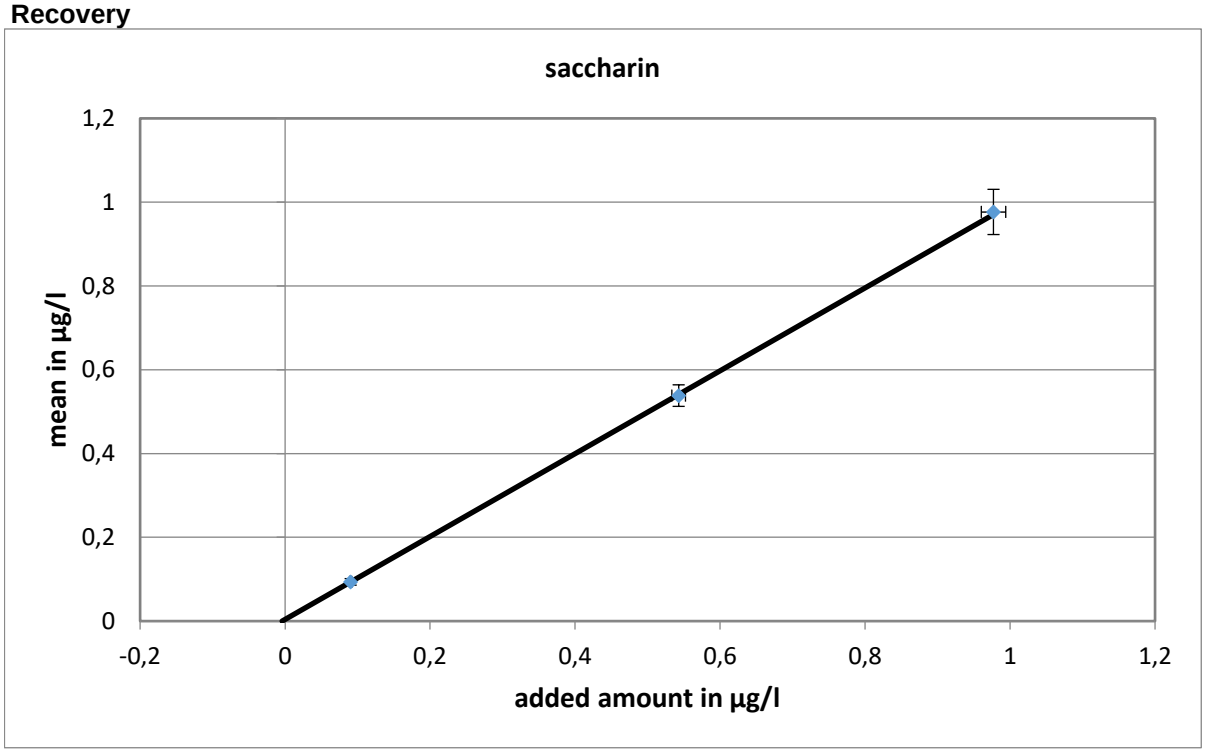


LC-MS - direct injection									
level	robust mean [µg/l]	exp. unc. of the mean [µg/l]	exp. unc. of the mean [%]	robust standard deviation [µg/l]	robust standard deviation [%]	number of results	out below	out above	out [%]
1	0,078	0,002	2,724	0,009	10,9	25	1	2	12
2	0,369	0,01	2,683	0,04	10,73	25	0	3	12
3	0,851	0,025	2,929	0,1	11,72	25	0	0	0

saccharin

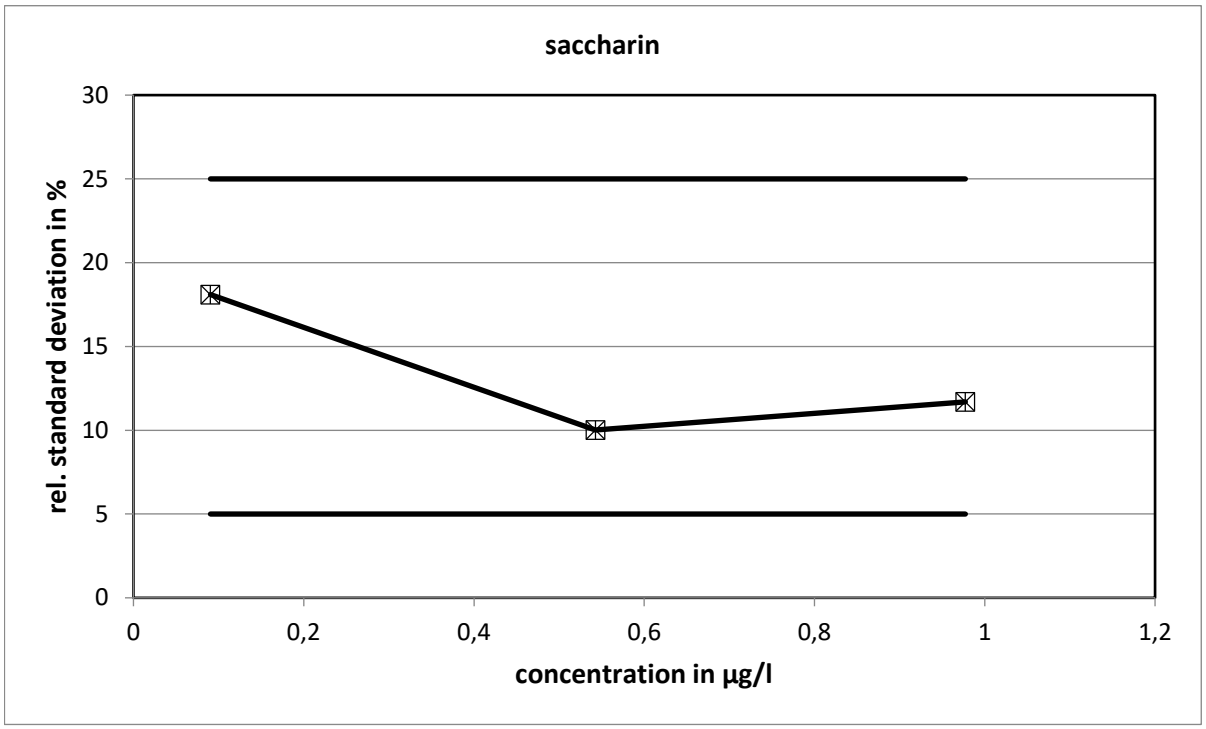
level	assigned value [µg/l]	expanded uncertainty of the assigned value [%]	standard deviation, calculated using robust statistics [µg/l]	standard deviation for proficiency assessment [µg/l]	standard deviation for proficiency assessment [%]	upper tolerance limit [µg/l]	lower tolerance limit [µg/l]	upper tolerance limit [%]	lower tolerance limit [%]	number of results	out below	out above	out [%]
1	0,0905	1,73	0,0164	0,0164	18,10	0,1266	0,0601	39,94	-33,56	28	1	3	13,8
2	0,5429	1,73	0,0544	0,0544	10,01	0,6577	0,4391	21,15	-19,12	28	1	2	10,3
3	0,9772	1,73	0,1142	0,1142	11,69	1,221	0,7606	24,91	-22,17	28	0	2	6,9
									sum	84	2	7	10,7

Recovery

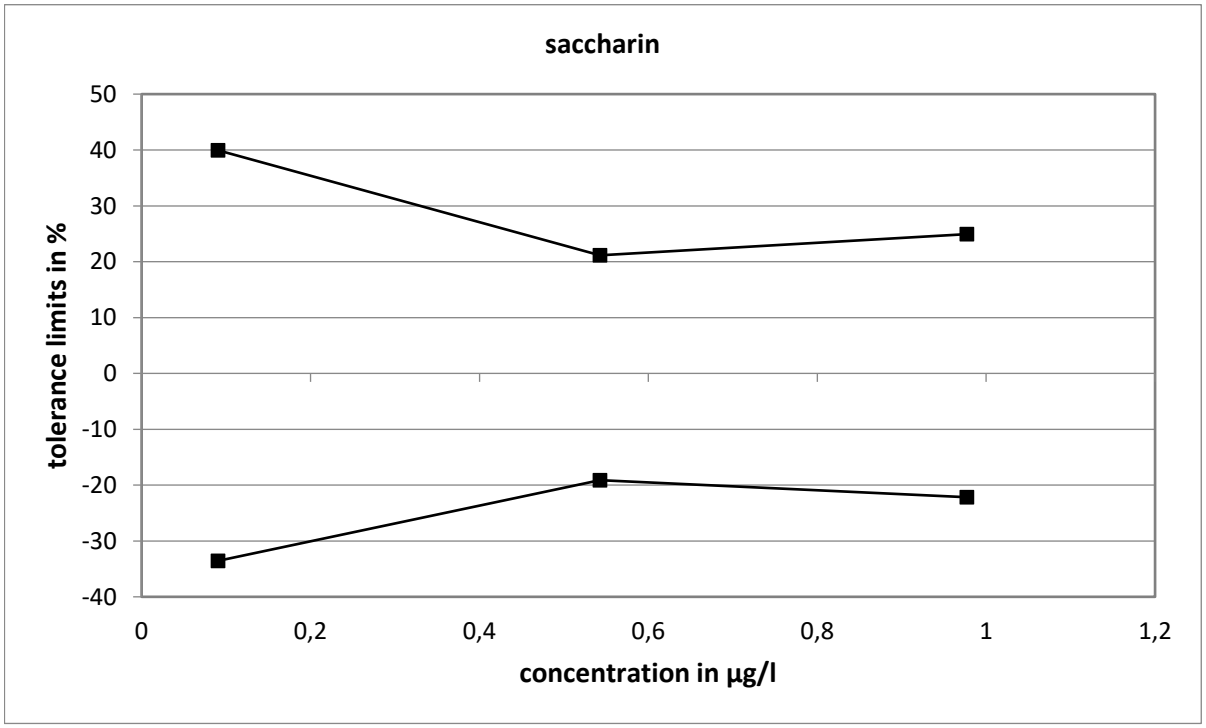


Slope of the regression: 0,989; average recovery: 98,9%

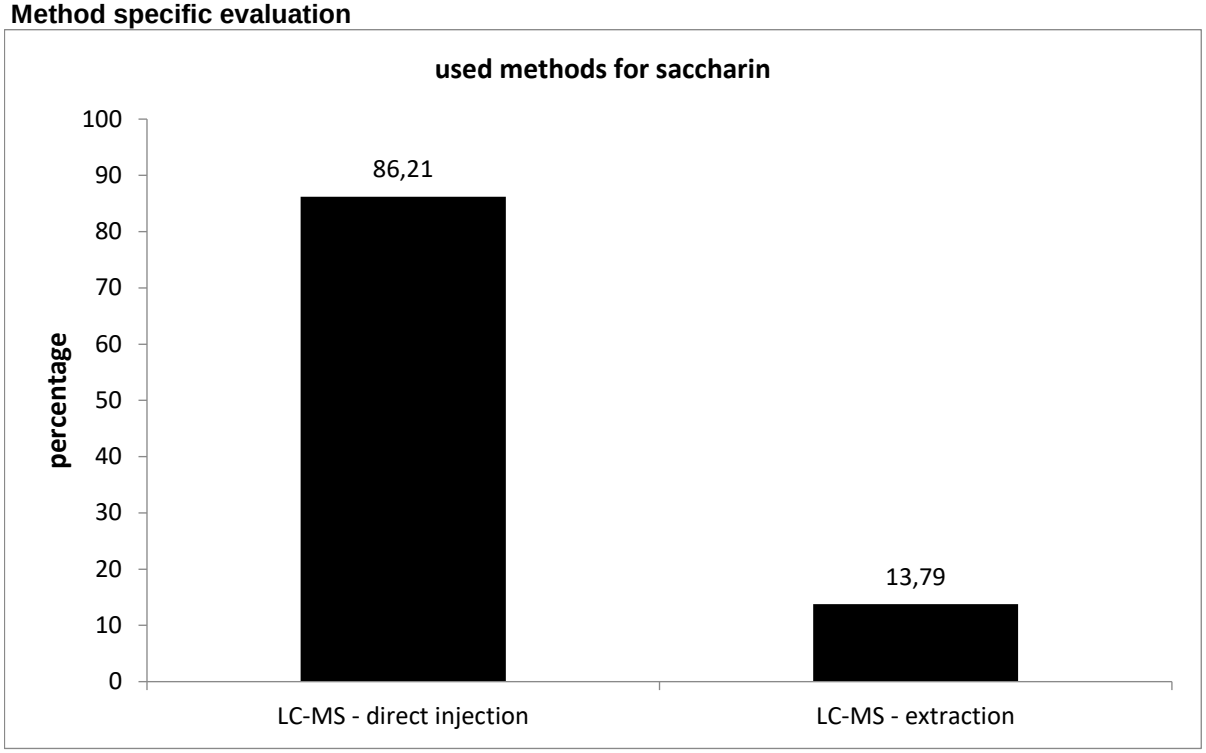
Relative standard deviation and tolerance limits

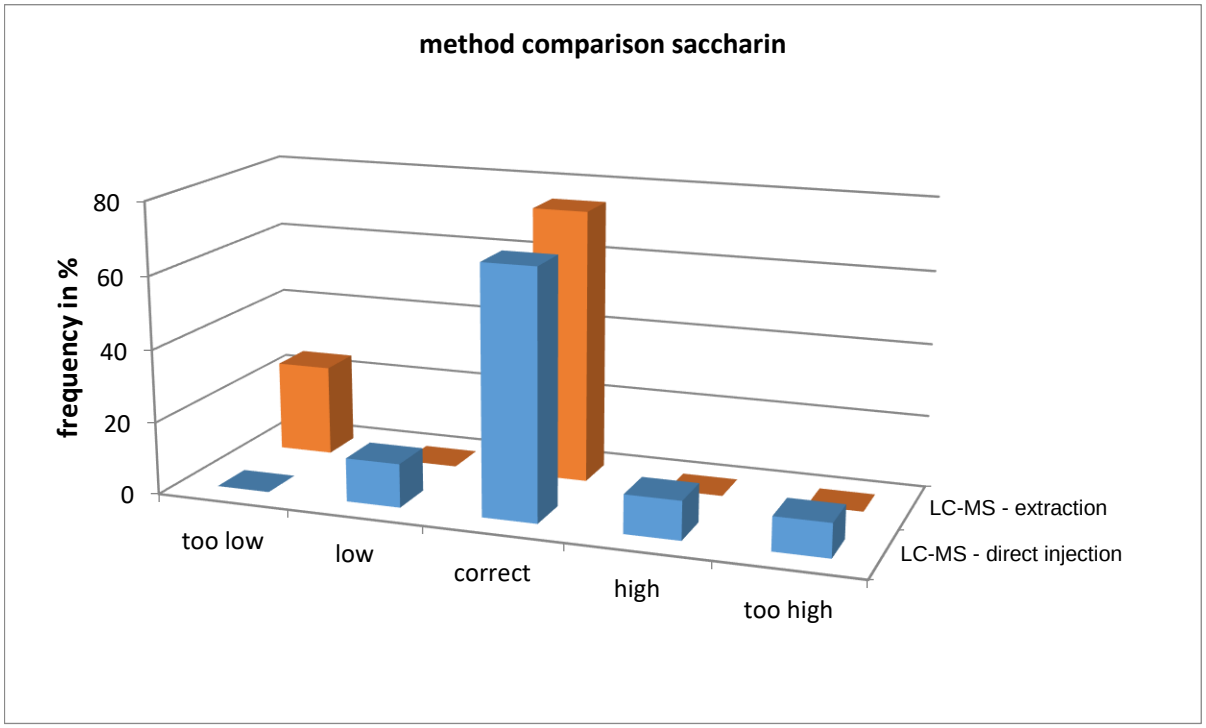


The relative standard deviations calculated with the Q-method did not reach the limits.



Method specific evaluation

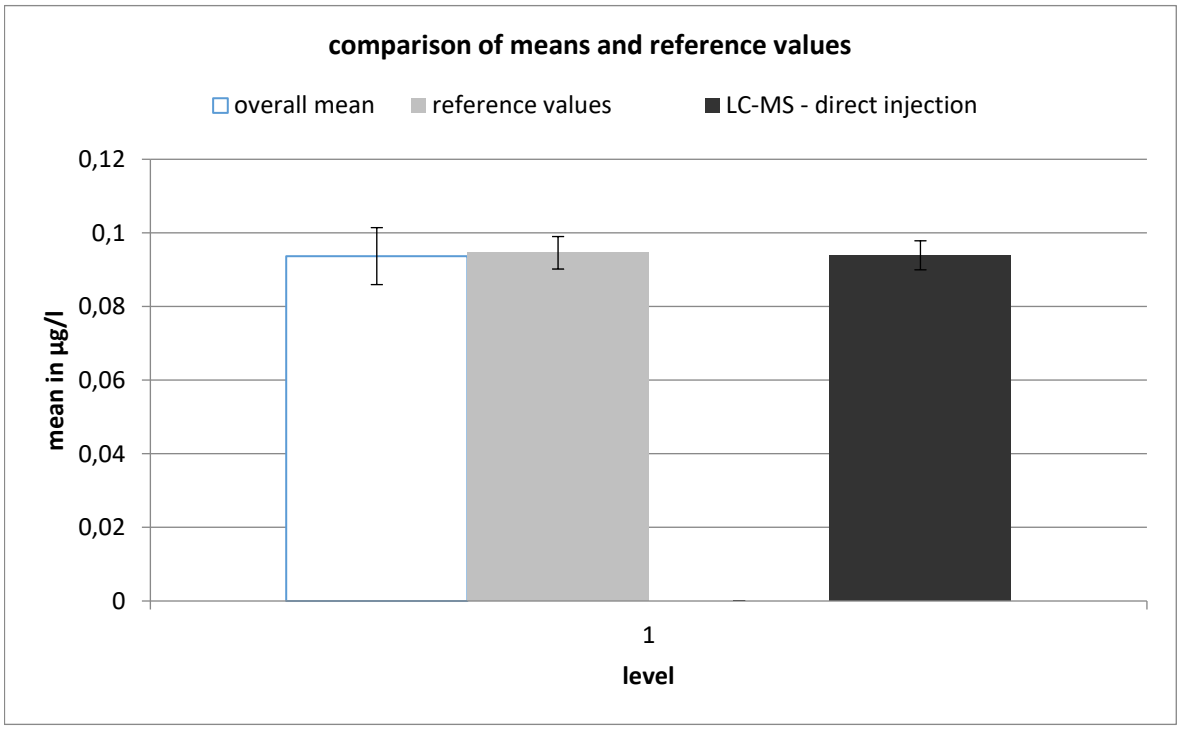


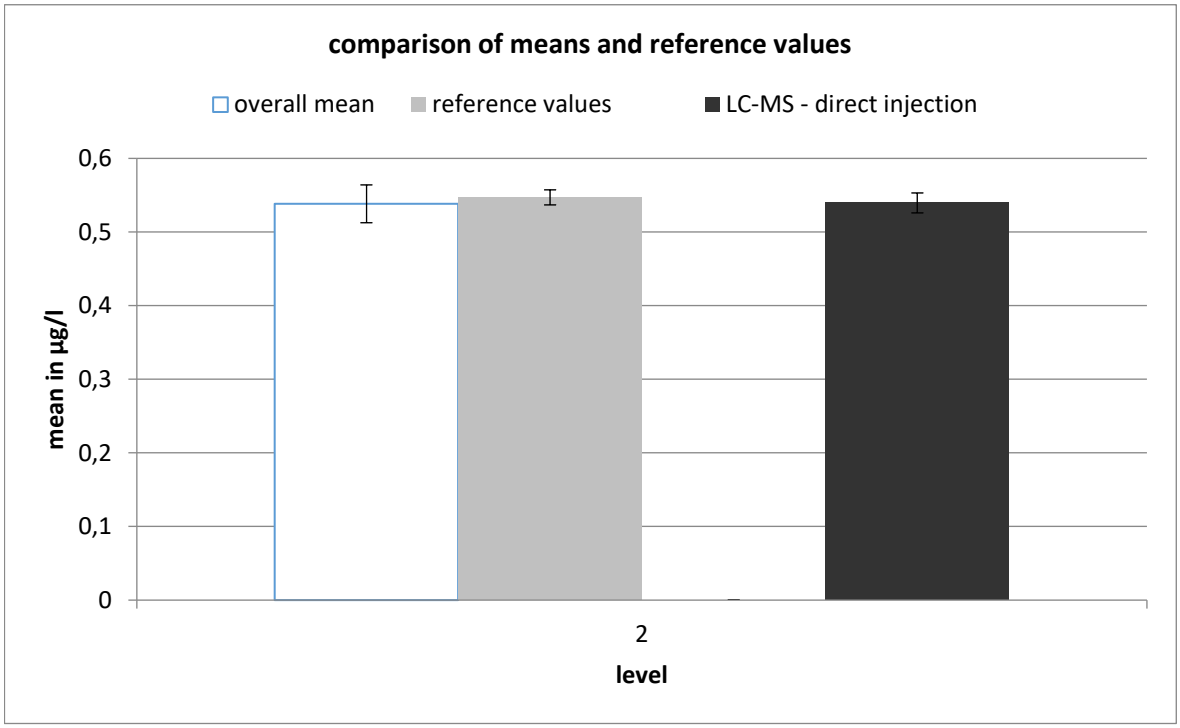


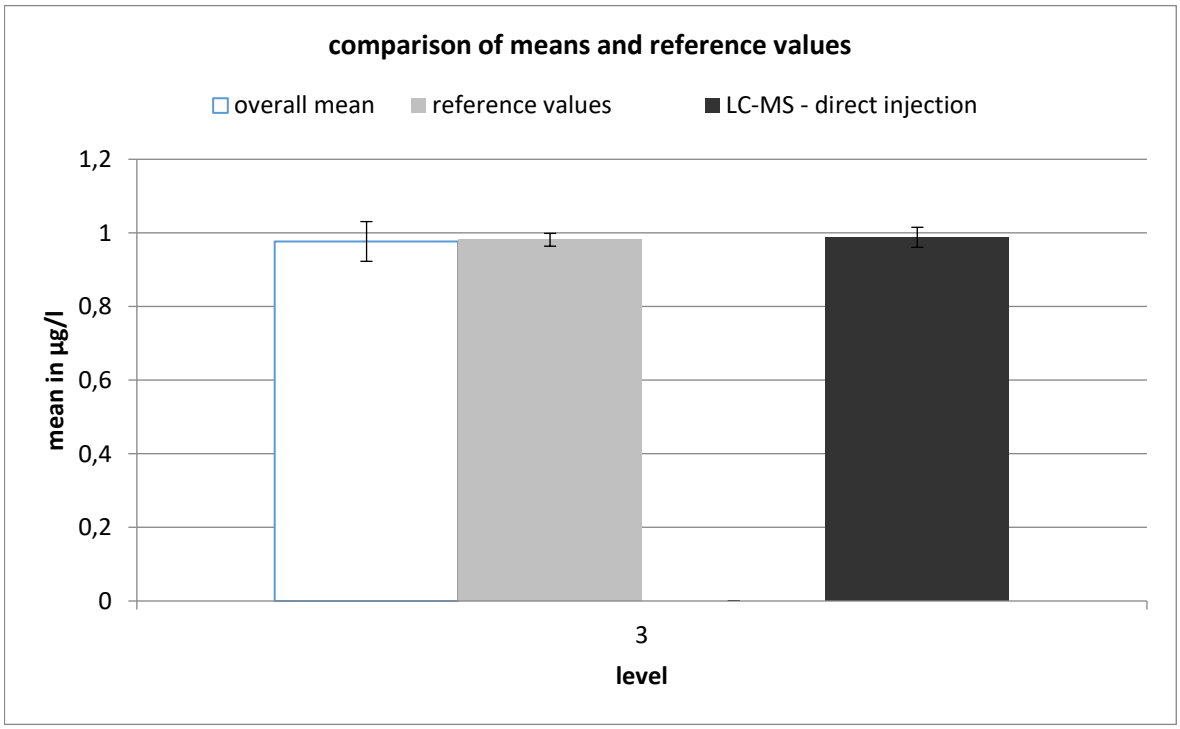
The values determined with LC-MS - direct injection showed the closest statistical distribution.

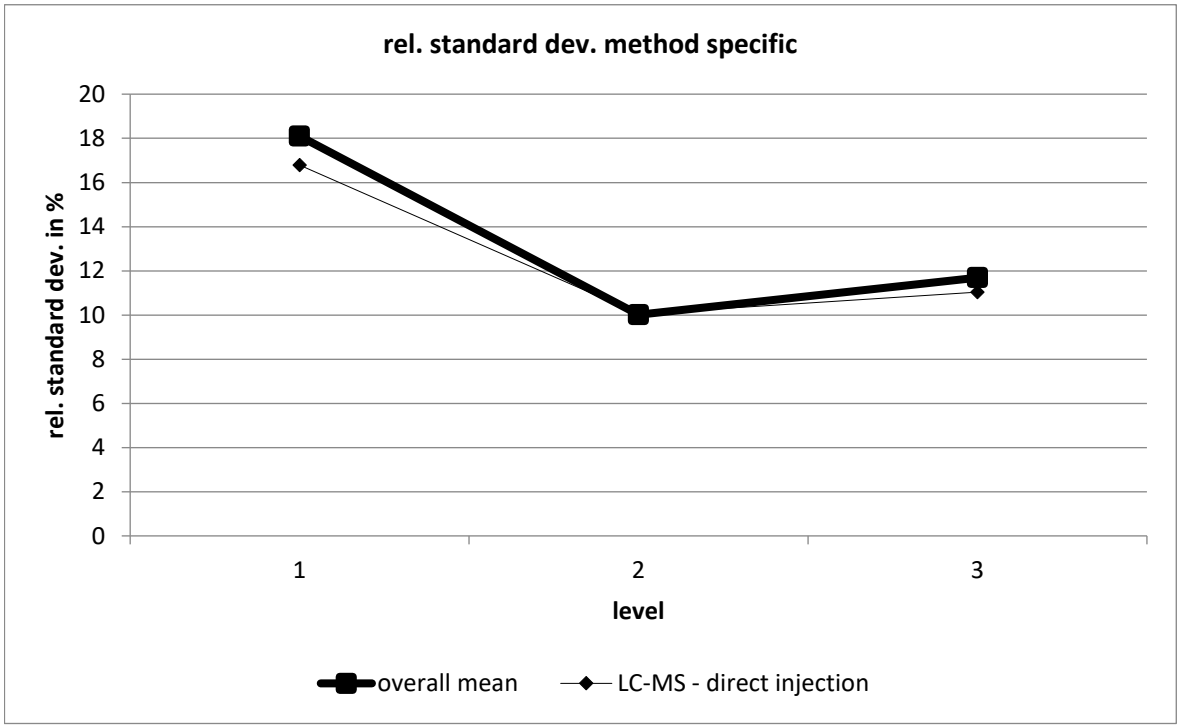
Comparison of means and reference values

level	mean [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]	reference value [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]
1	0,0937	0,0077	8,3	0,0946	0,0044	4,7
2	0,5383	0,0257	4,8	0,5470	0,0102	1,9
3	0,9767	0,0540	5,5	0,9813	0,0174	1,8




comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
1,2
1
0,8
0,6
0,4
0,2
0
mean in µg/l
3
level

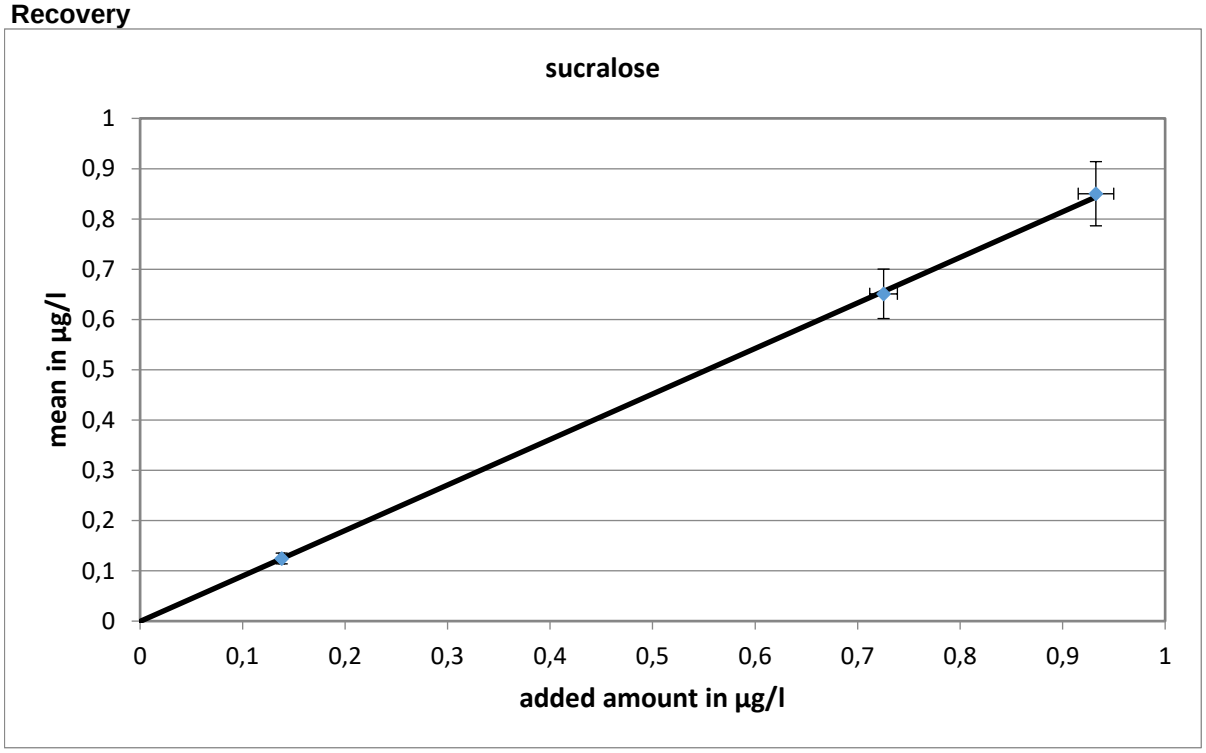


LC-MS - direct injection									
level	robust mean [µg/l]	exp. unc. of the mean [µg/l]	exp. unc. of the mean [%]	robust standard deviation [µg/l]	robust standard deviation [%]	number of results	out below	out above	out [%]
1	0,094	0,004	4,196	0,016	16,79	25	0	3	12
2	0,539	0,014	2,512	0,054	10,05	25	0	2	8
3	0,988	0,027	2,76	0,109	11,04	25	2	1	12

sucralose

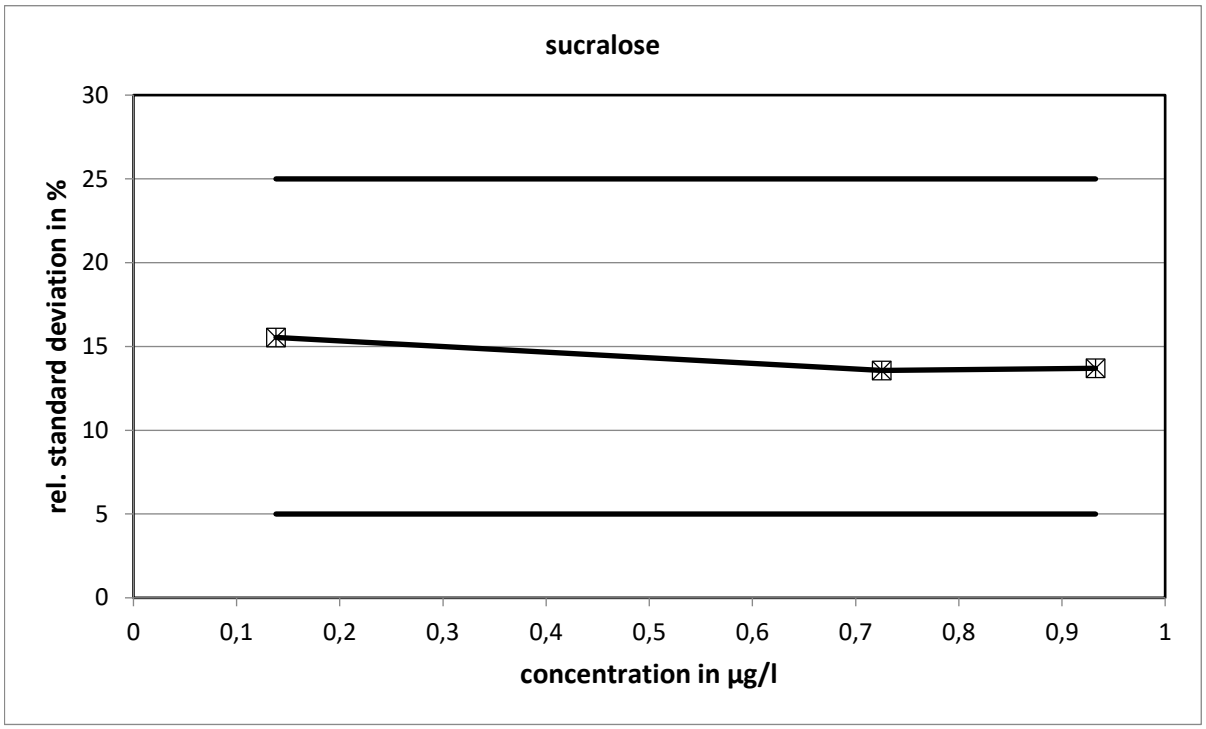
level	assigned value [µg/l]	expanded uncertainty of the assigned value [%]	standard deviation, calculated using robust statistics [µg/l]	standard deviation for proficiency assessment [µg/l]	standard deviation for proficiency assessment [%]	upper tolerance limit [µg/l]	lower tolerance limit [µg/l]	upper tolerance limit [%]	lower tolerance limit [%]	number of results	out below	out above	out [%]
1	0,1382	1,91	0,0215	0,0215	15,54	0,1855	0,0983	34,25	-28,84	25	1	3	15,4
2	0,7253	1,86	0,0984	0,0984	13,57	0,9394	0,5412	29,51	-25,39	25	2	2	15,4
3	0,9325	1,86	0,1277	0,1277	13,70	1,210	0,6935	29,77	-25,63	25	2	1	11,5
									sum	75	5	6	14,7

Recovery

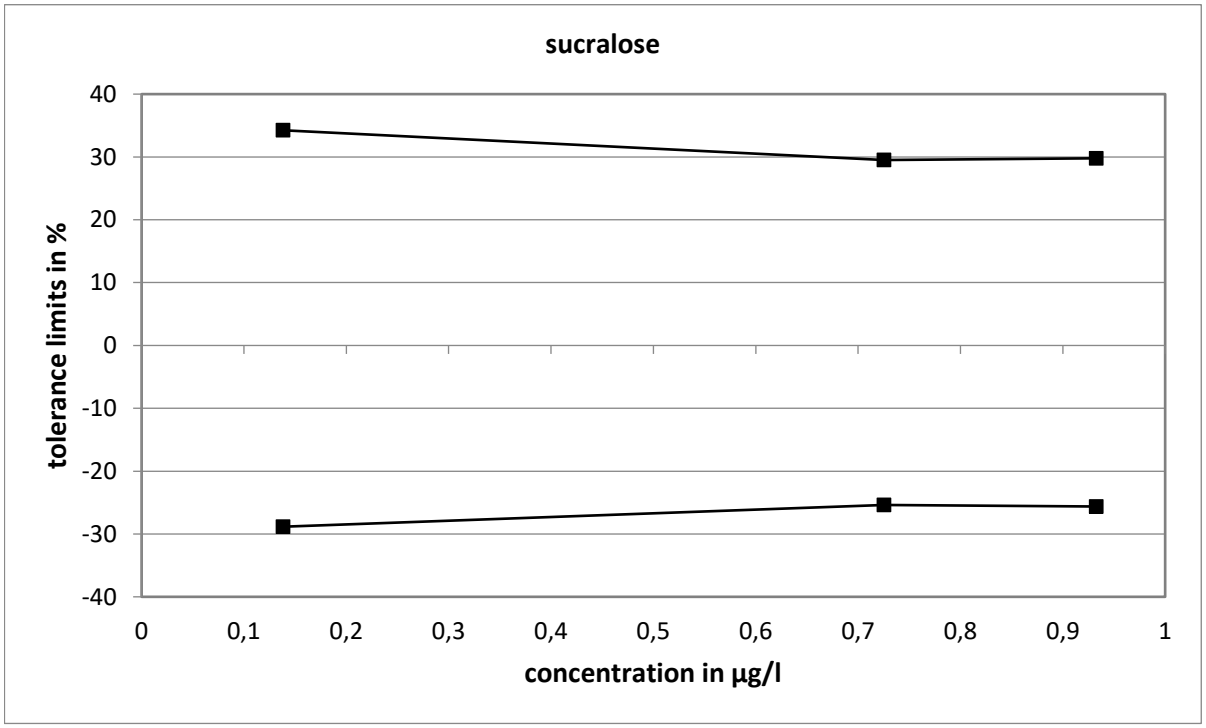


Slope of the regression: 0,905; average recovery: 90,5%

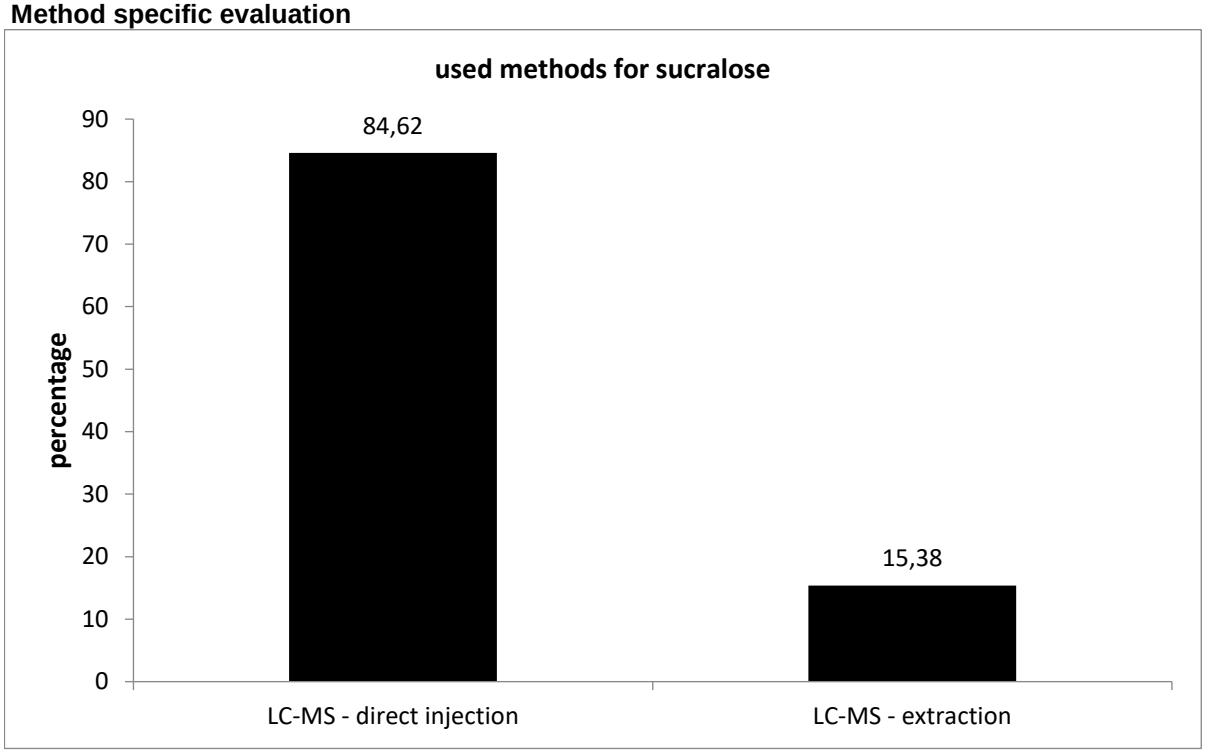
Relative standard deviation and tolerance limits

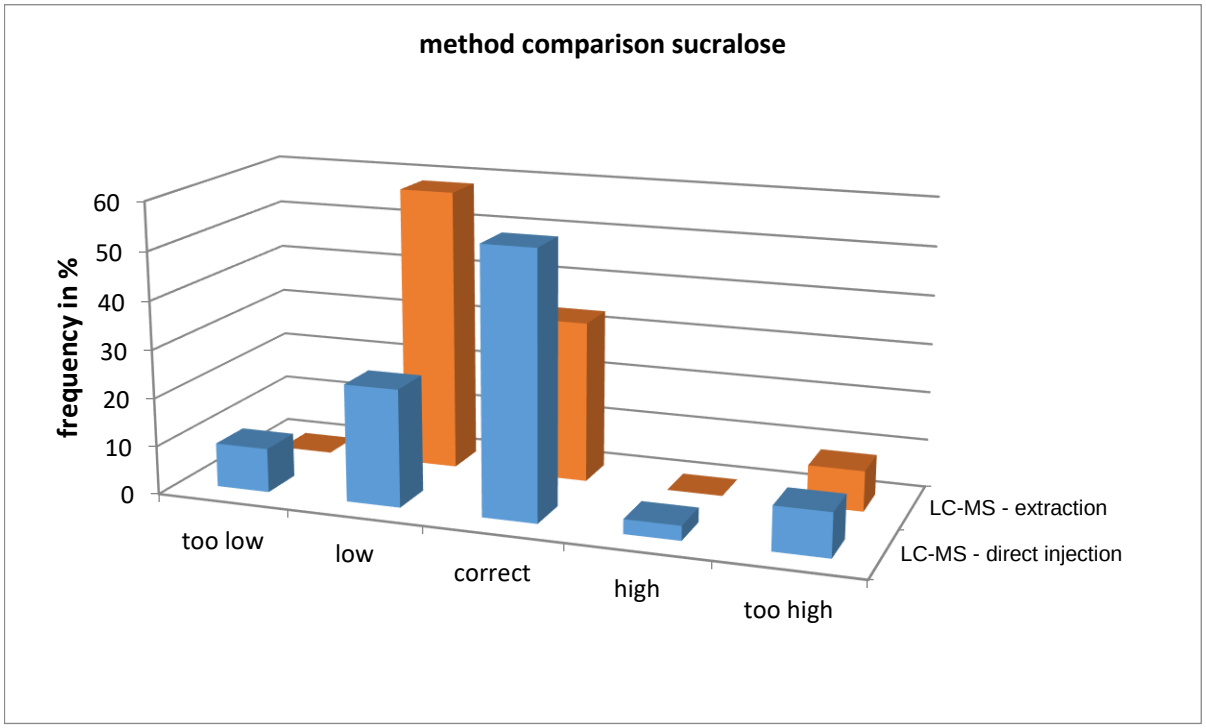


The relative standard deviations calculated with the Q-method did not reach the limits.



Method specific evaluation

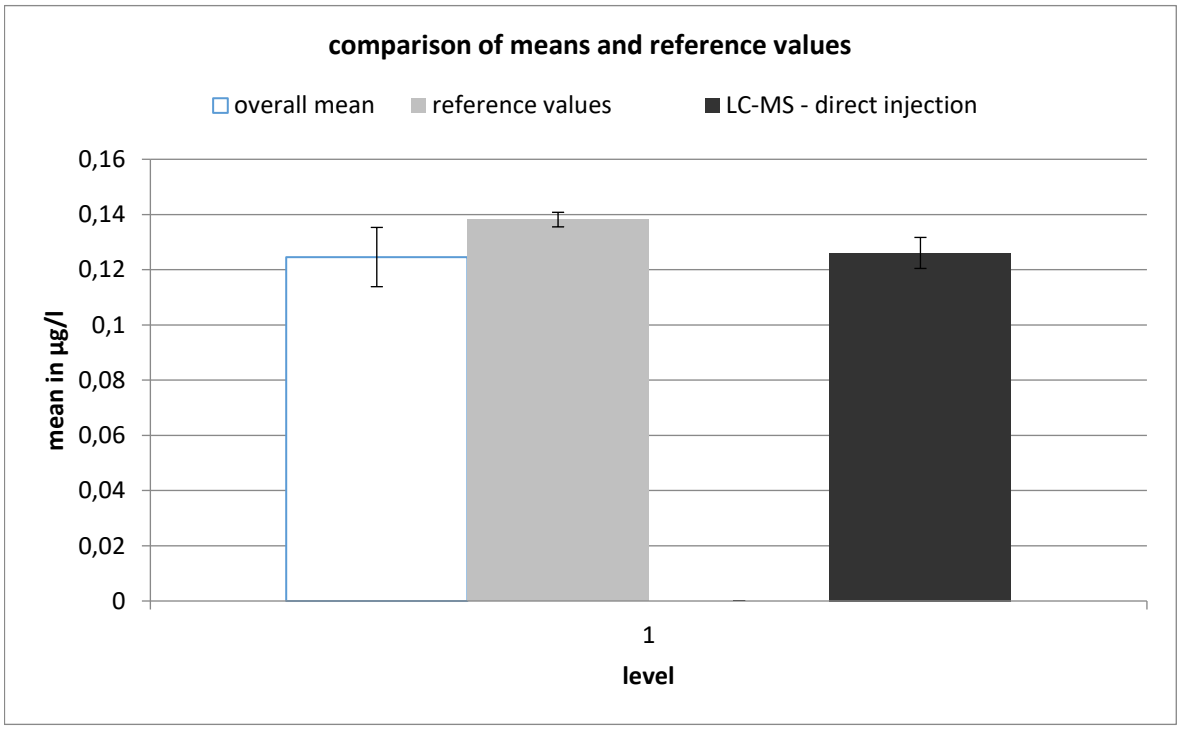


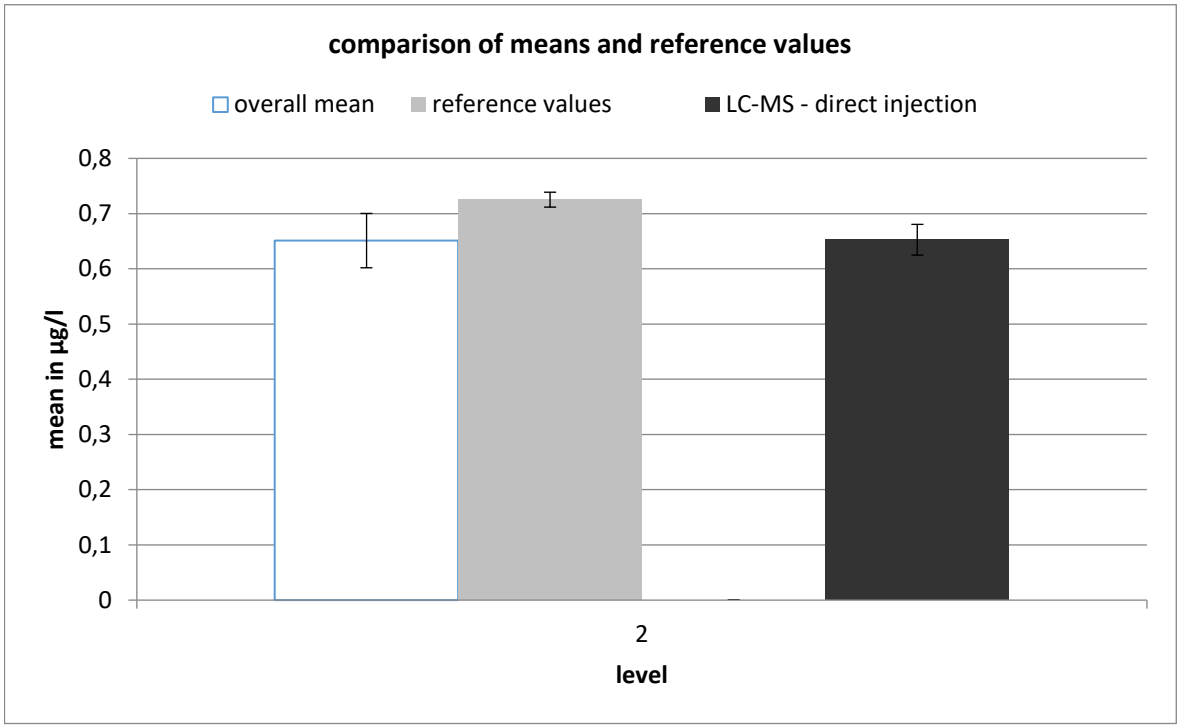


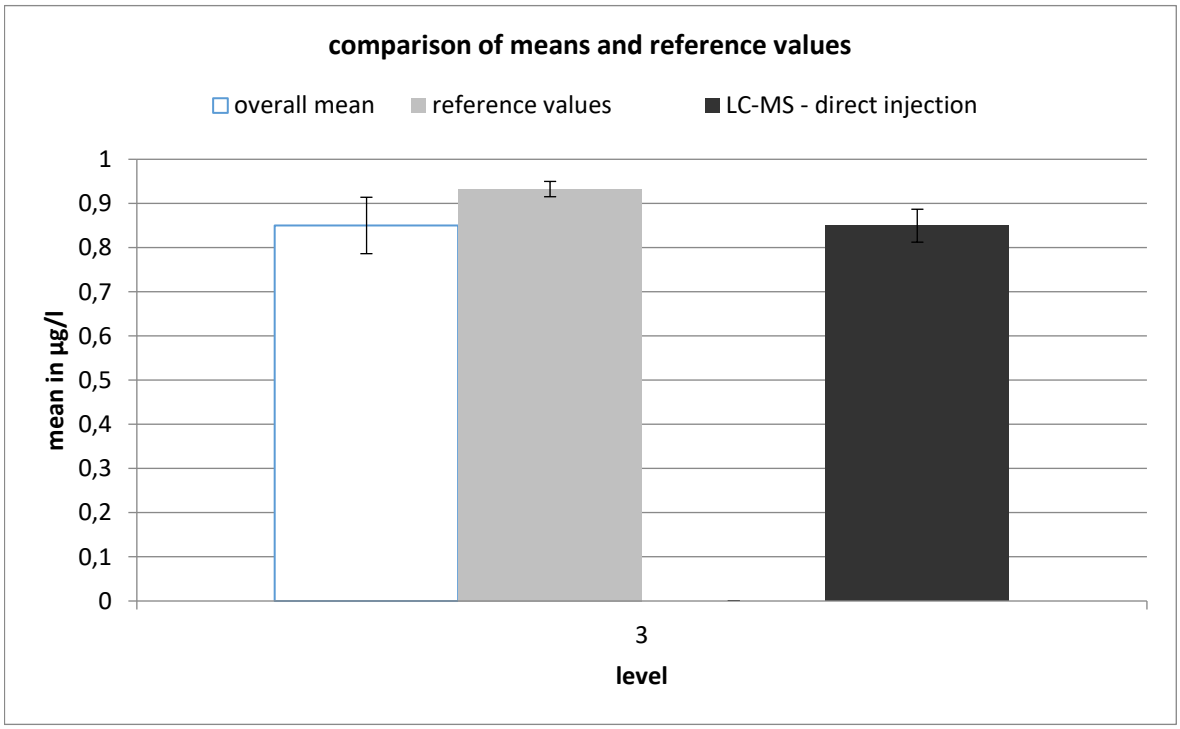
The values determined with LC-MS - direct injection showed the closest statistical distribution.

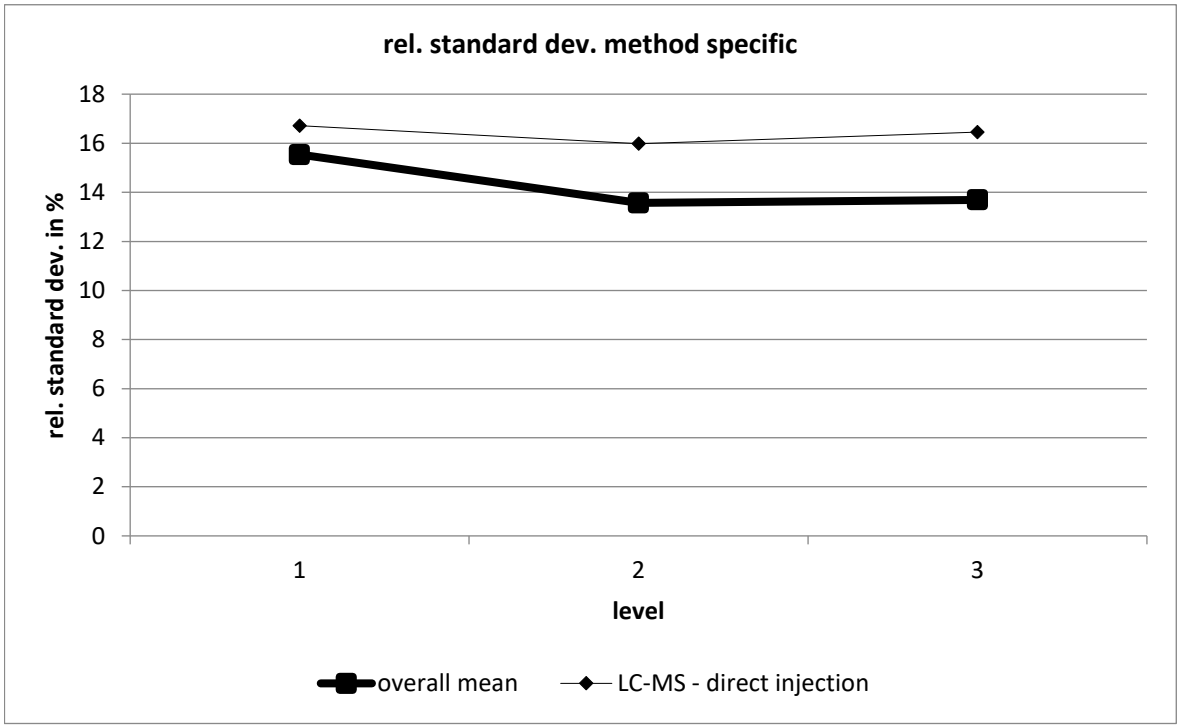
Comparison of means and reference values

level	mean [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]	reference value [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]
1	0,1246	0,0107	8,6	0,1382	0,0026	1,9
2	0,6511	0,0492	7,6	0,7253	0,0135	1,9
3	0,8501	0,0639	7,5	0,9325	0,0173	1,9




comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

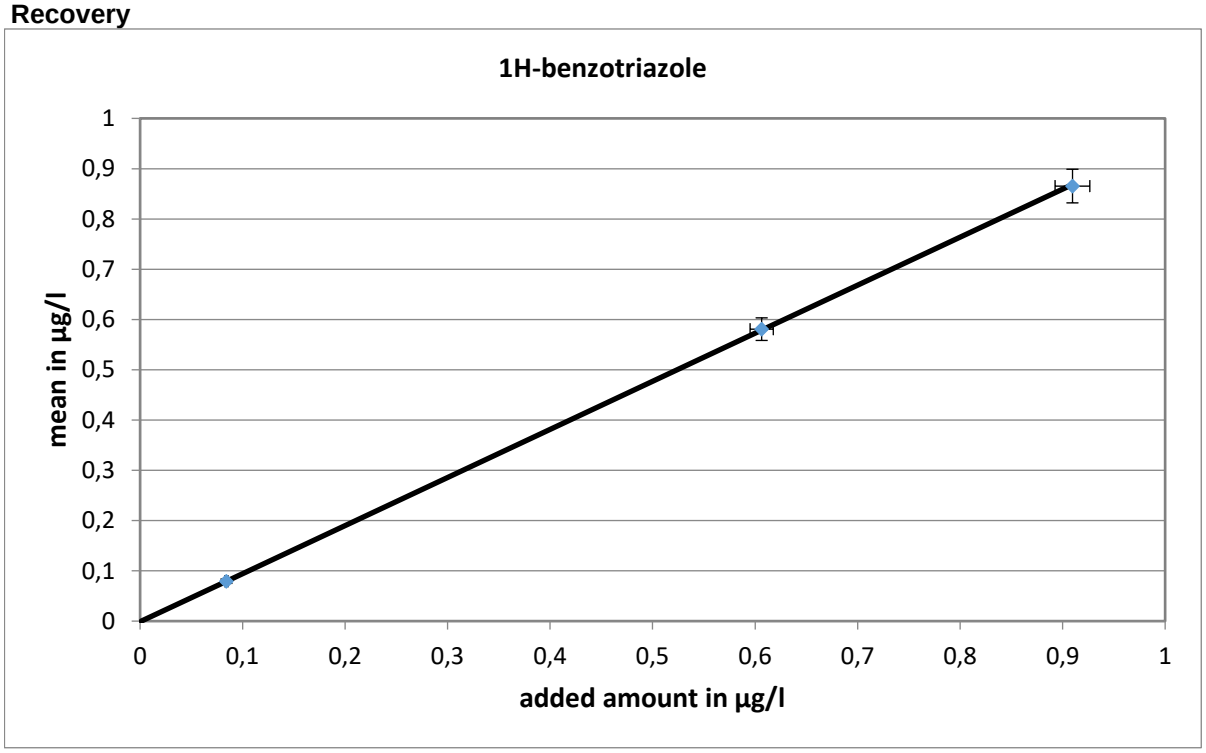


LC-MS - direct injection									
level	robust mean [µg/l]	exp. unc. of the mean [µg/l]	exp. unc. of the mean [%]	robust standard deviation [µg/l]	robust standard deviation [%]	number of results	out below	out above	out [%]
1	0,126	0,006	4,455	0,021	16,72	22	0	3	13,64
2	0,653	0,028	4,259	0,104	15,98	22	1	2	13,64
3	0,85	0,037	4,385	0,14	16,45	22	1	1	9,091

1H-benzotriazole

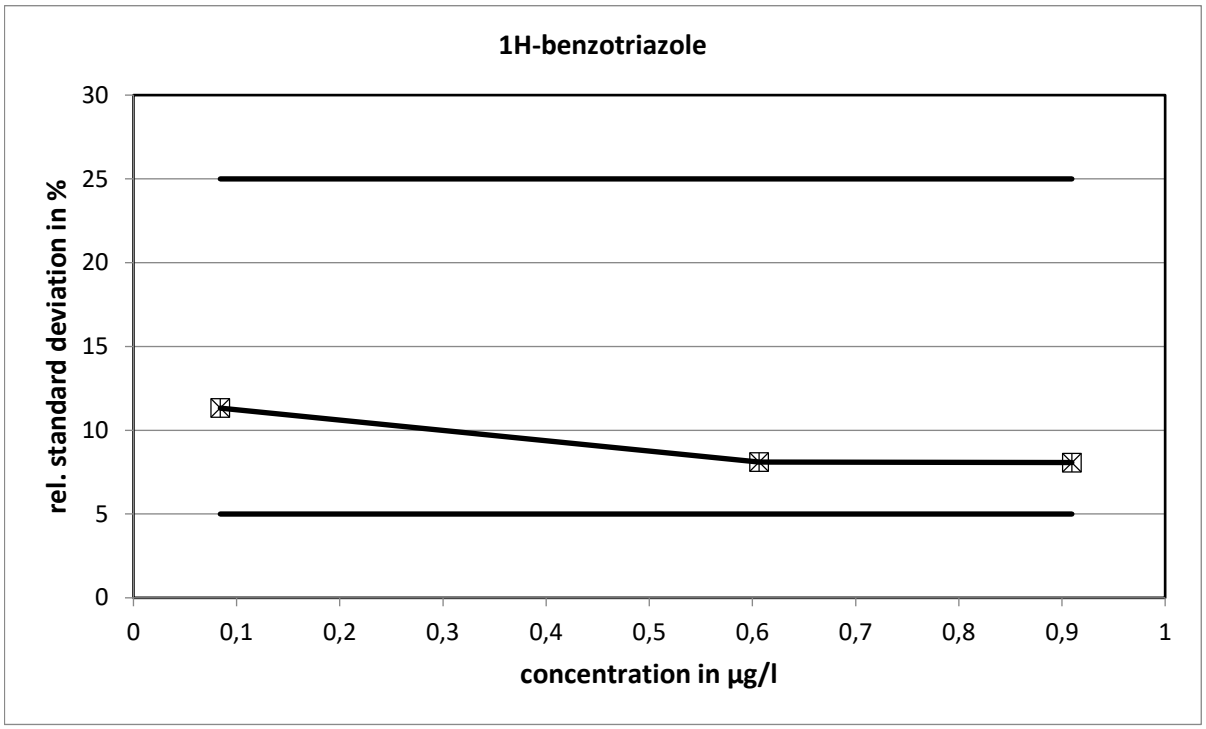
level	assigned value [µg/l]	expanded uncertainty of the assigned value [%]	standard deviation, calculated using robust statistics [µg/l]	standard deviation for proficiency assessment [µg/l]	standard deviation for proficiency assessment [%]	upper tolerance limit [µg/l]	lower tolerance limit [µg/l]	upper tolerance limit [%]	lower tolerance limit [%]	number of results	out below	out above	out [%]
1	0,0842	2,33	0,0095	0,0095	11,32	0,1046	0,0662	24,17	-21,44	30	2	3	16,1
2	0,6064	1,88	0,0491	0,0491	8,10	0,7091	0,5120	16,94	-15,57	30	2	4	19,4
3	0,9096	1,87	0,0734	0,0734	8,07	1,063	0,7684	16,89	-15,52	30	2	3	16,1
									sum	90	6	10	17,8

Recovery

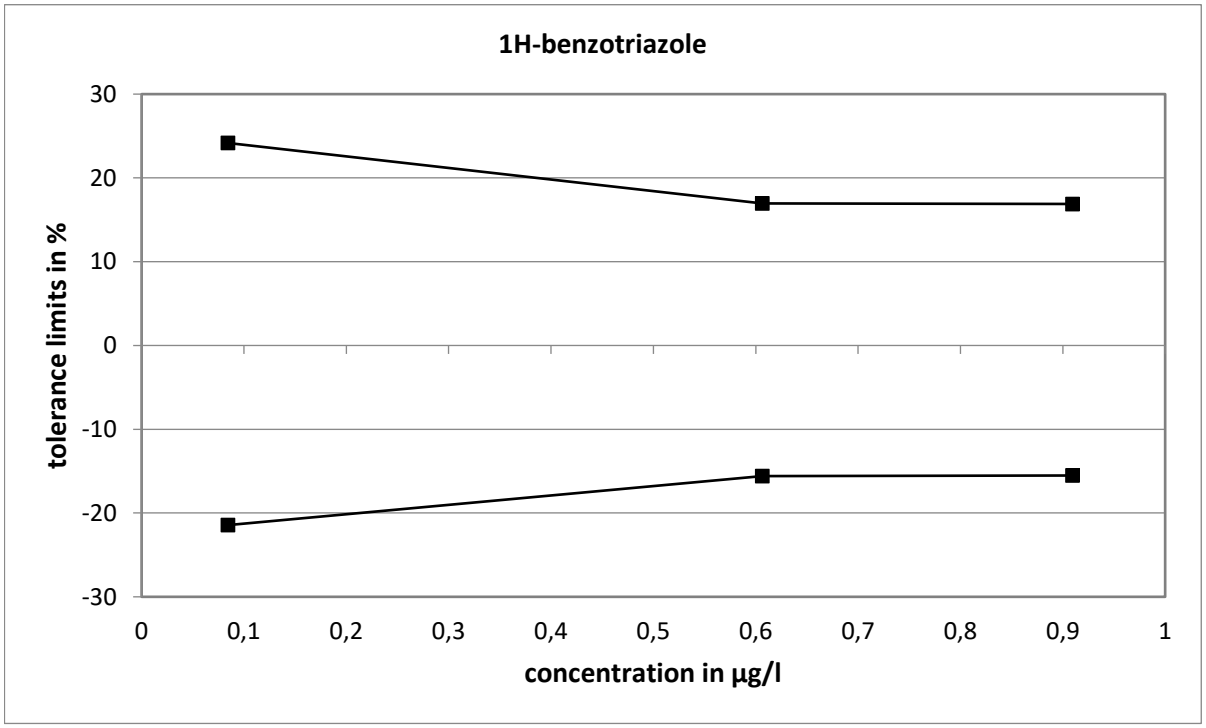


Slope of the regression: 0,956; average recovery: 95,6%

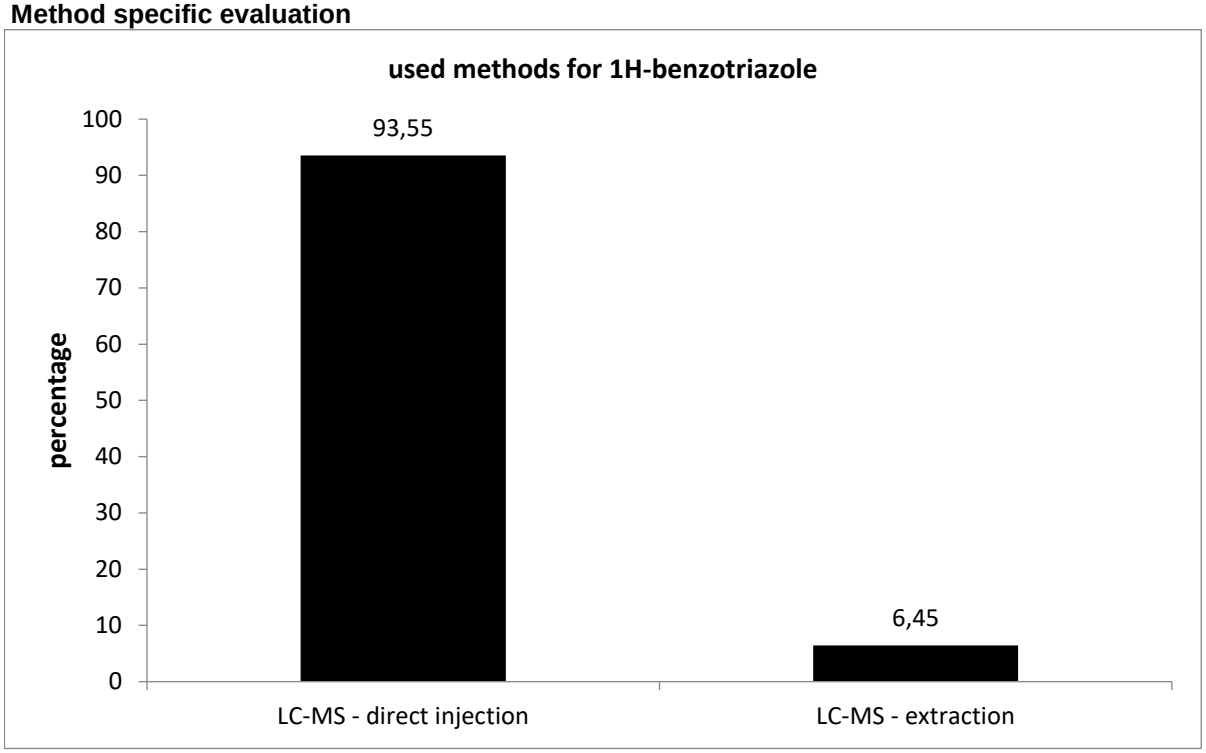
Relative standard deviation and tolerance limits

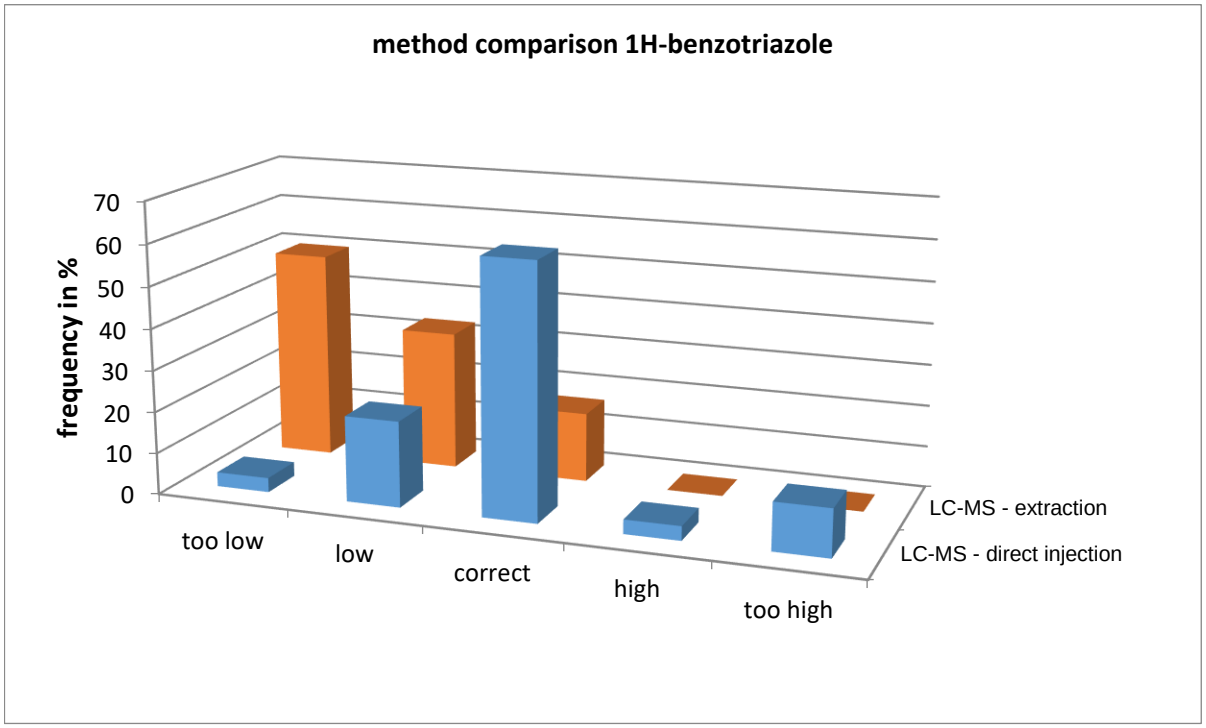


The relative standard deviations calculated with the Q-method did not reach the limits.



Method specific evaluation

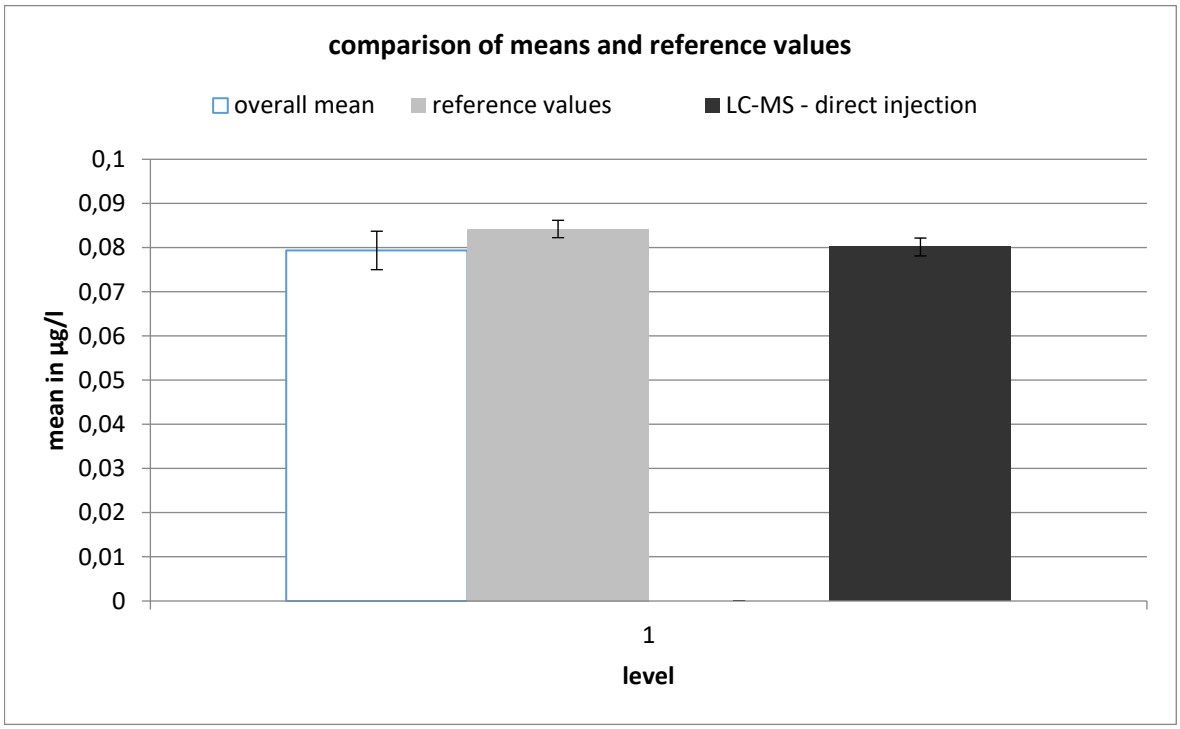


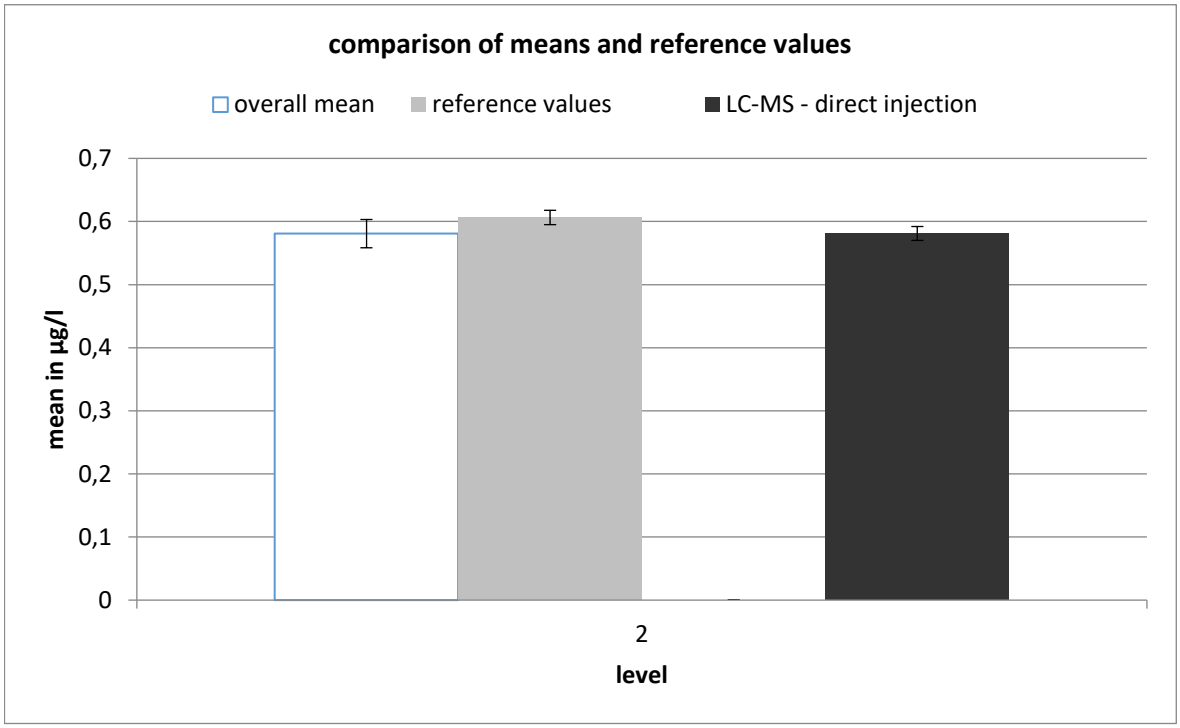


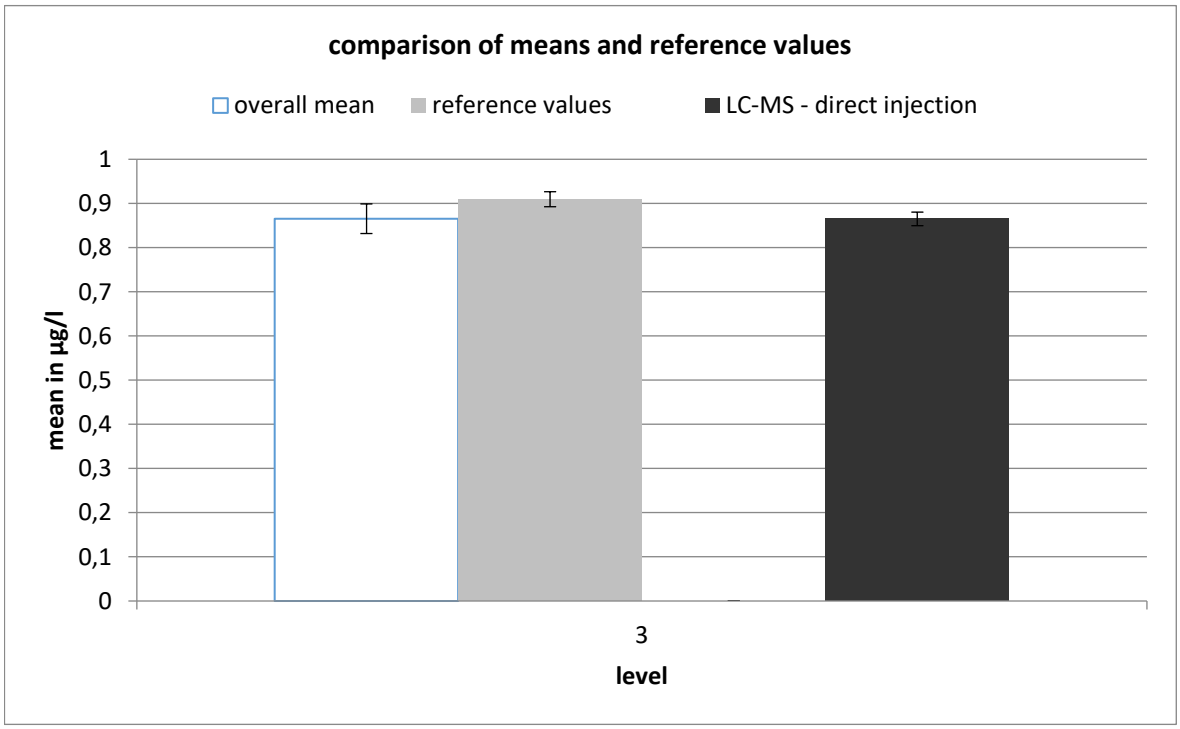
The values determined with LC-MS - direct injection showed the closest statistical distribution.

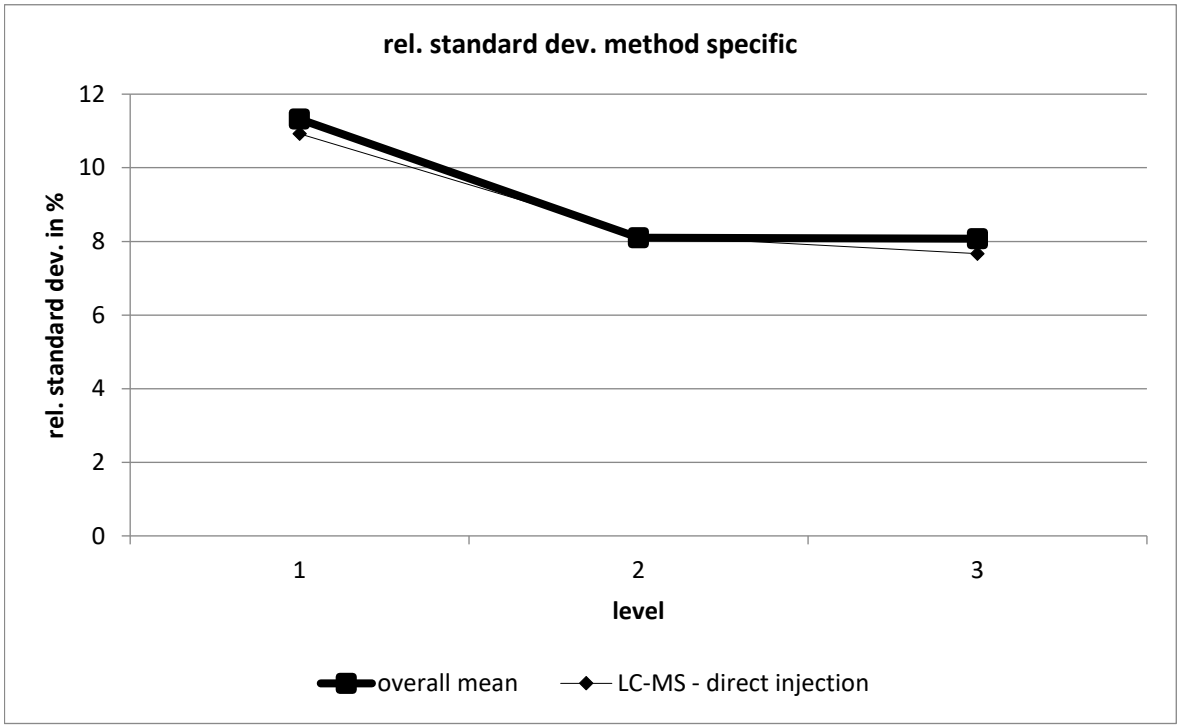
Comparison of means and reference values

level	mean [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]	reference value [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]
1	0,0794	0,0044	5,5	0,0842	0,0020	2,3
2	0,5807	0,0224	3,9	0,6064	0,0114	1,9
3	0,8654	0,0335	3,9	0,9096	0,0170	1,9




comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
mean in µg/l
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
2
level


comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
mean in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
3
level

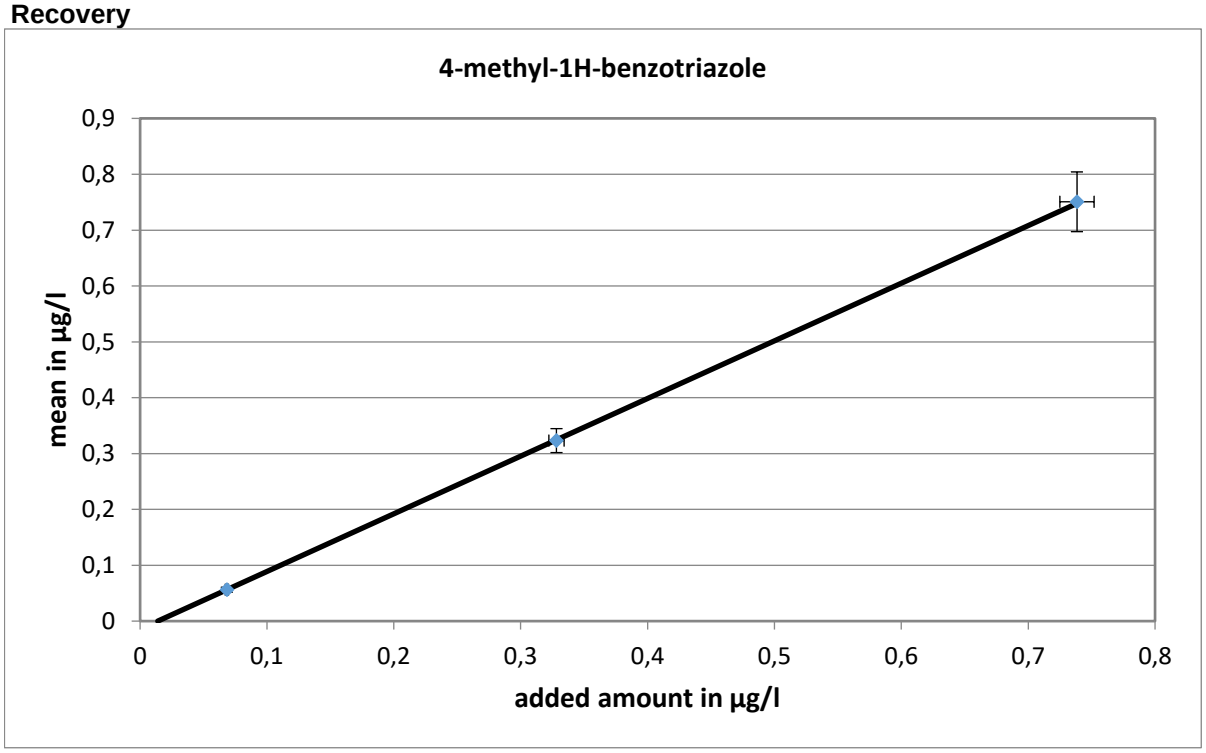


LC-MS - direct injection									
level	robust mean [µg/l]	exp. unc. of the mean [µg/l]	exp. unc. of the mean [%]	robust standard deviation [µg/l]	robust standard deviation [%]	number of results	out below	out above	out [%]
1	0,08	0,002	2,535	0,009	10,92	29	2	2	13,79
2	0,581	0,011	1,894	0,047	8,159	29	1	3	13,79
3	0,865	0,015	1,78	0,066	7,667	29	2	2	13,79

4-methyl-1H-benzotriazole

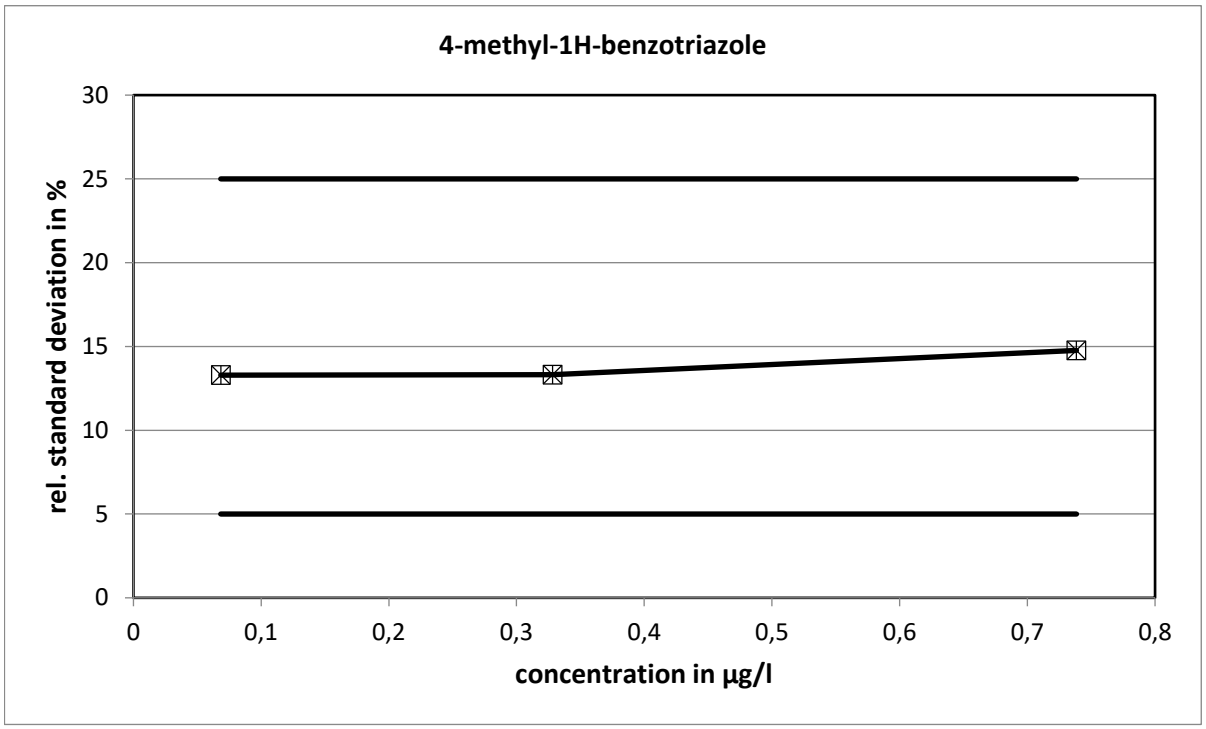
level	assigned value [µg/l]	expanded uncertainty of the assigned value [%]	standard deviation, calculated using robust statistics [µg/l]	standard deviation for proficiency assessment [µg/l]	standard deviation for proficiency assessment [%]	upper tolerance limit [µg/l]	lower tolerance limit [µg/l]	upper tolerance limit [%]	lower tolerance limit [%]	number of results	out below	out above	out [%]
1	0,0684	20,44	0,0091	0,0091	13,29	0,0883	0,0514	29,09	-24,76	26	6	2	29,6
2	0,3282	4,62	0,0437	0,0437	13,32	0,4224	0,2459	28,70	-25,08	26	2	3	18,5
3	0,7385	2,62	0,1090	0,1090	14,76	0,9748	0,5340	32,00	-27,68	26	1	2	11,1
									sum	78	9	7	20,5

Recovery

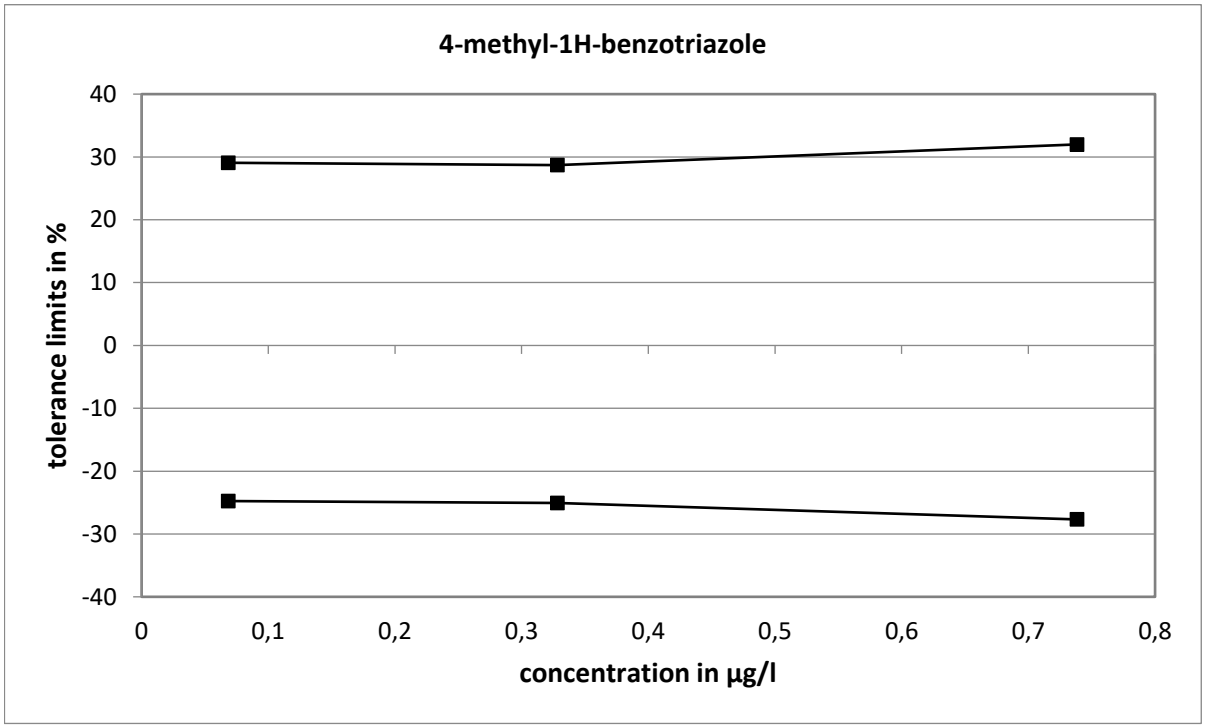


Slope of the regression: 1,032; average recovery: 103,2%

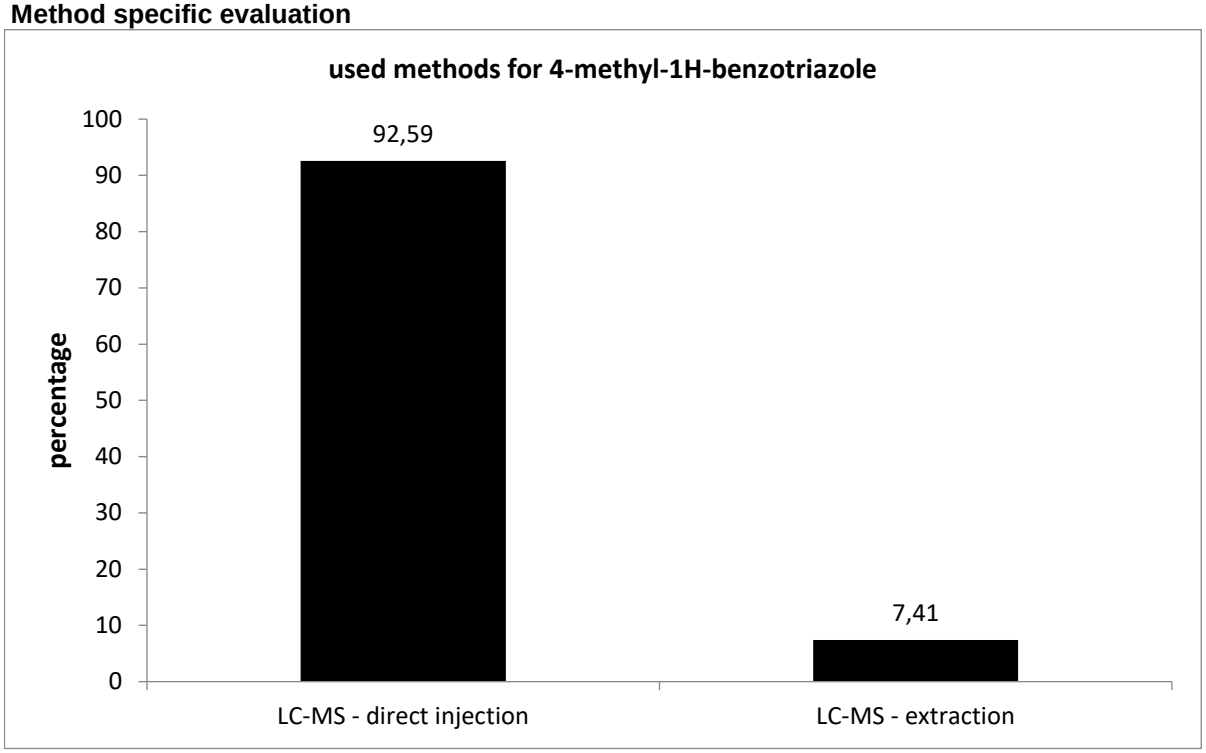
Relative standard deviation and tolerance limits

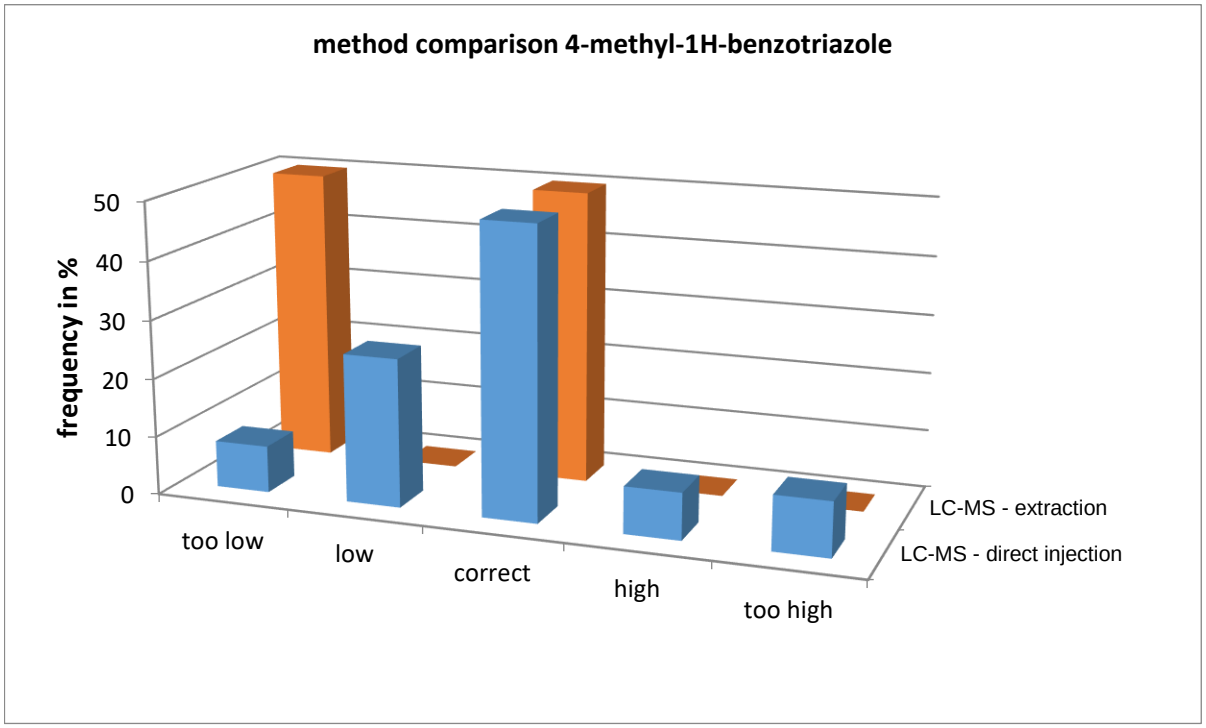


The relative standard deviations calculated with the Q-method did not reach the limits.



Method specific evaluation

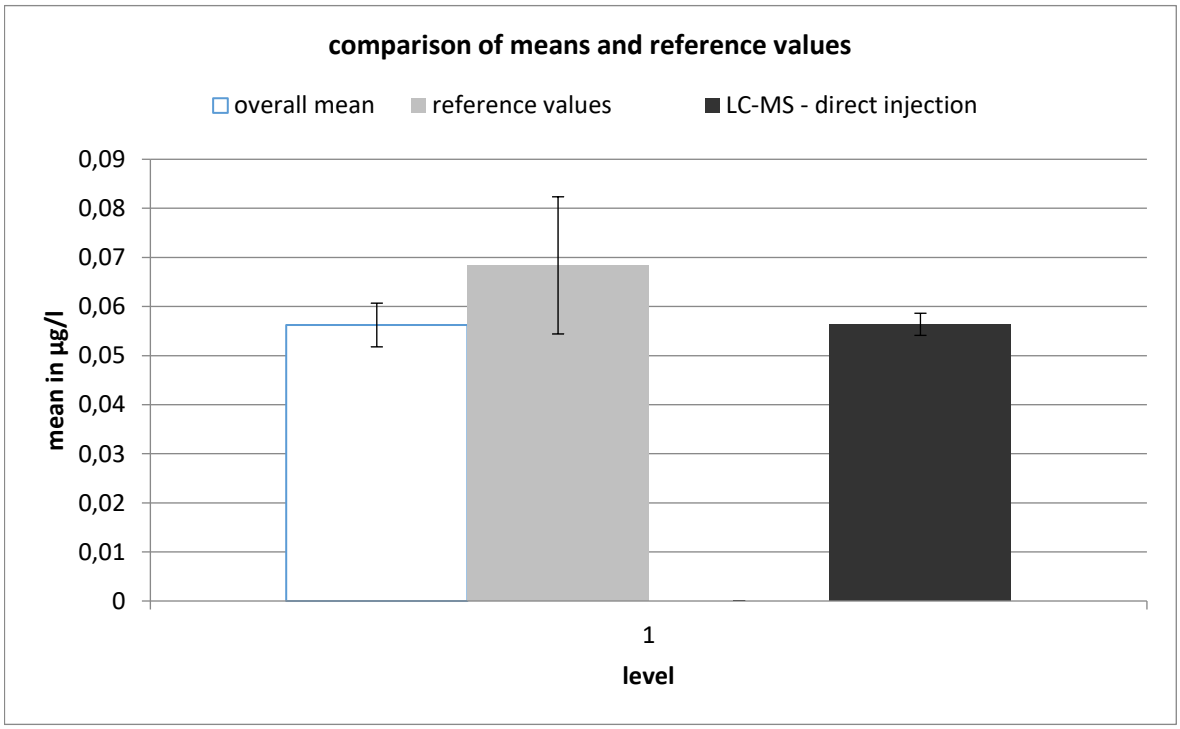


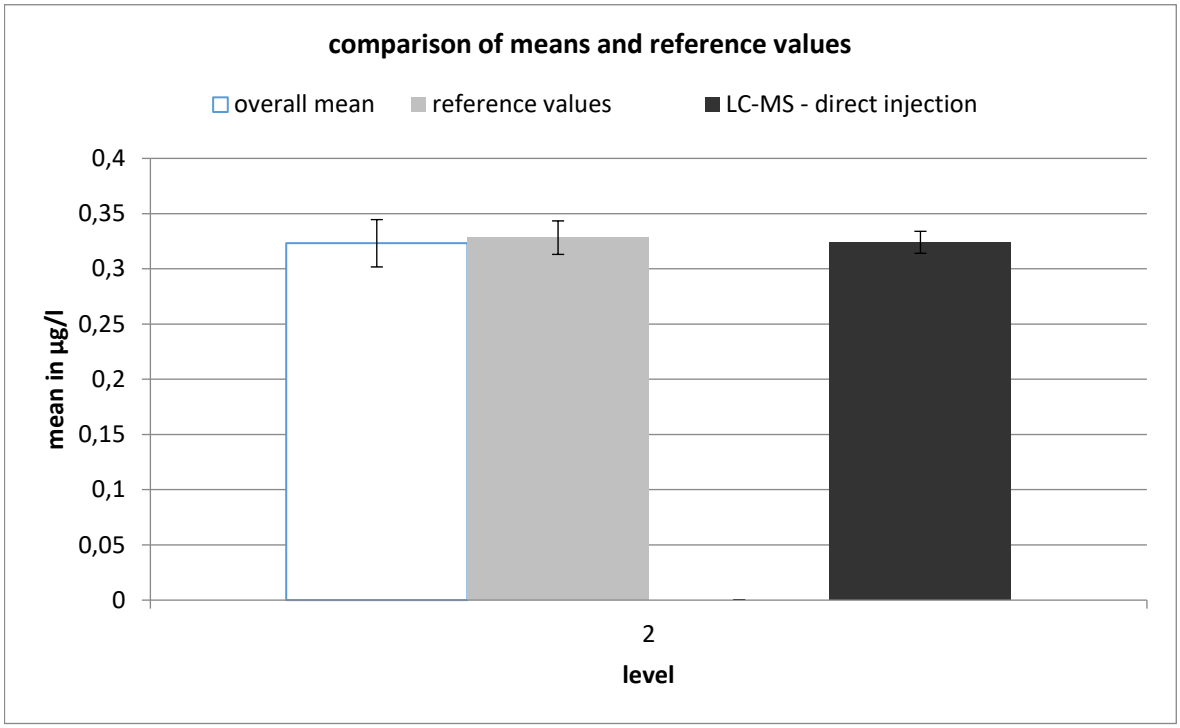


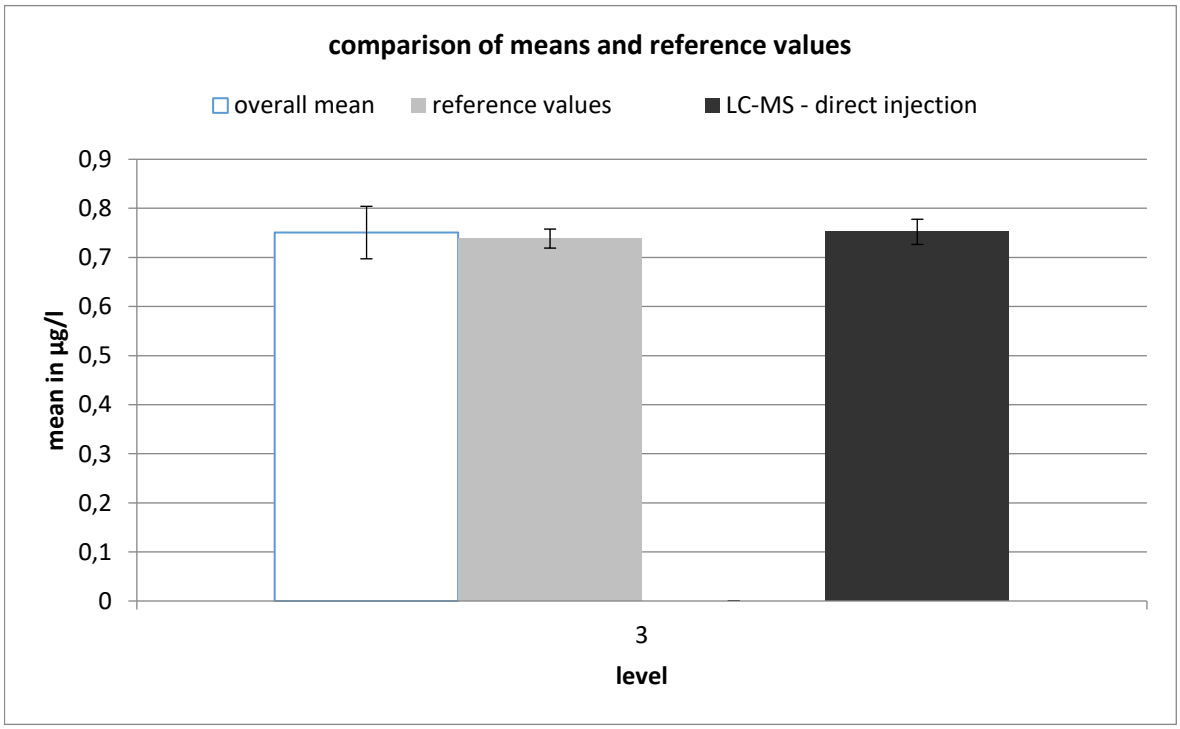
The values determined with LC-MS - direct injection showed the closest statistical distribution.

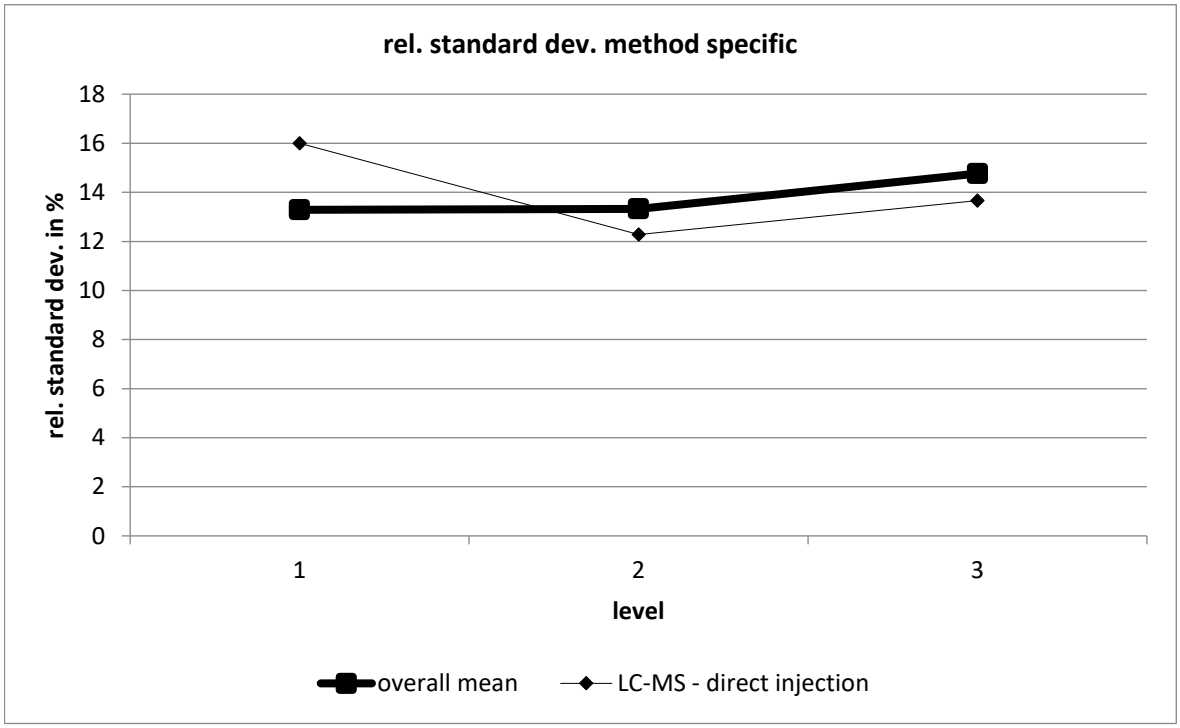
Comparison of means and reference values

level	mean [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]	reference value [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]
1	0,0562	0,0045	7,9	0,0684	0,0140	20,4
2	0,3231	0,0214	6,6	0,3282	0,0152	4,6
3	0,7507	0,0535	7,1	0,7385	0,0194	2,6




comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

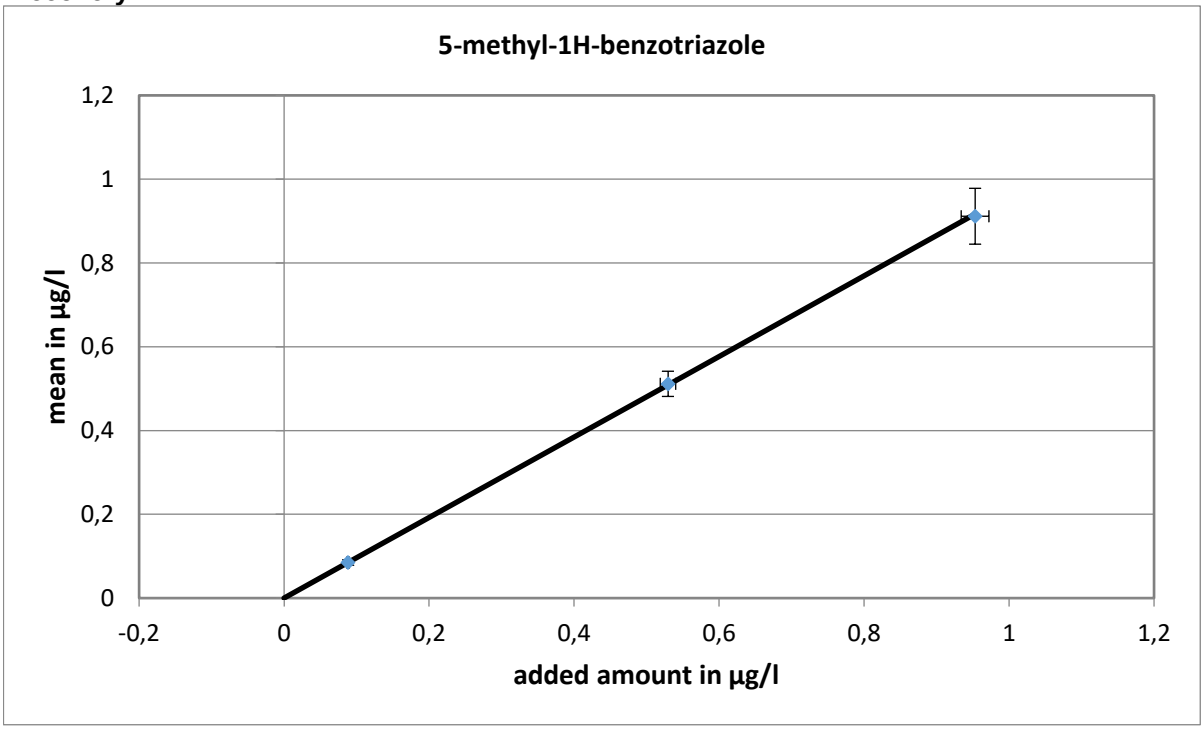


LC-MS - direct injection									
level	robust mean [µg/l]	exp. unc. of the mean [µg/l]	exp. unc. of the mean [%]	robust standard deviation [µg/l]	robust standard deviation [%]	number of results	out below	out above	out [%]
1	0,056	0,002	4	0,009	16	25	0	3	12
2	0,324	0,01	3,07	0,04	12,28	25	1	3	16
3	0,752	0,026	3,416	0,103	13,66	25	0	1	4

5-methyl-1H-benzotriazole

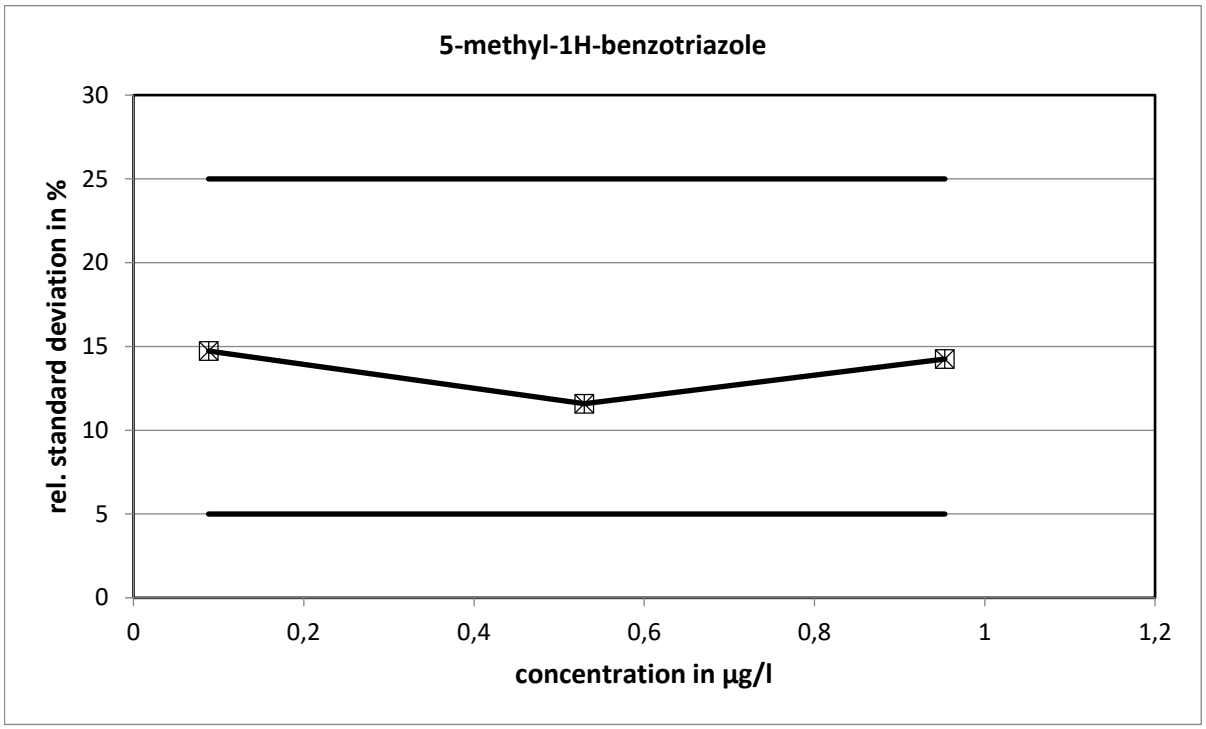
level	assigned value [µg/l]	expanded uncertainty of the assigned value [%]	standard deviation, calculated using robust statistics [µg/l]	standard deviation for proficiency assessment [µg/l]	standard deviation for proficiency assessment [%]	upper tolerance limit [µg/l]	lower tolerance limit [µg/l]	upper tolerance limit [%]	lower tolerance limit [%]	number of results	out below	out above	out [%]
1	0,0883	2,01	0,0130	0,0130	14,73	0,1166	0,0640	32,07	-27,53	26	0	3	11,1
2	0,5295	2,01	0,0613	0,0613	11,58	0,6605	0,4133	24,73	-21,94	26	3	2	18,5
3	0,9531	2,01	0,1359	0,1359	14,26	1,248	0,6986	30,98	-26,70	26	2	1	11,1
									sum	78	5	6	14,1

Recovery

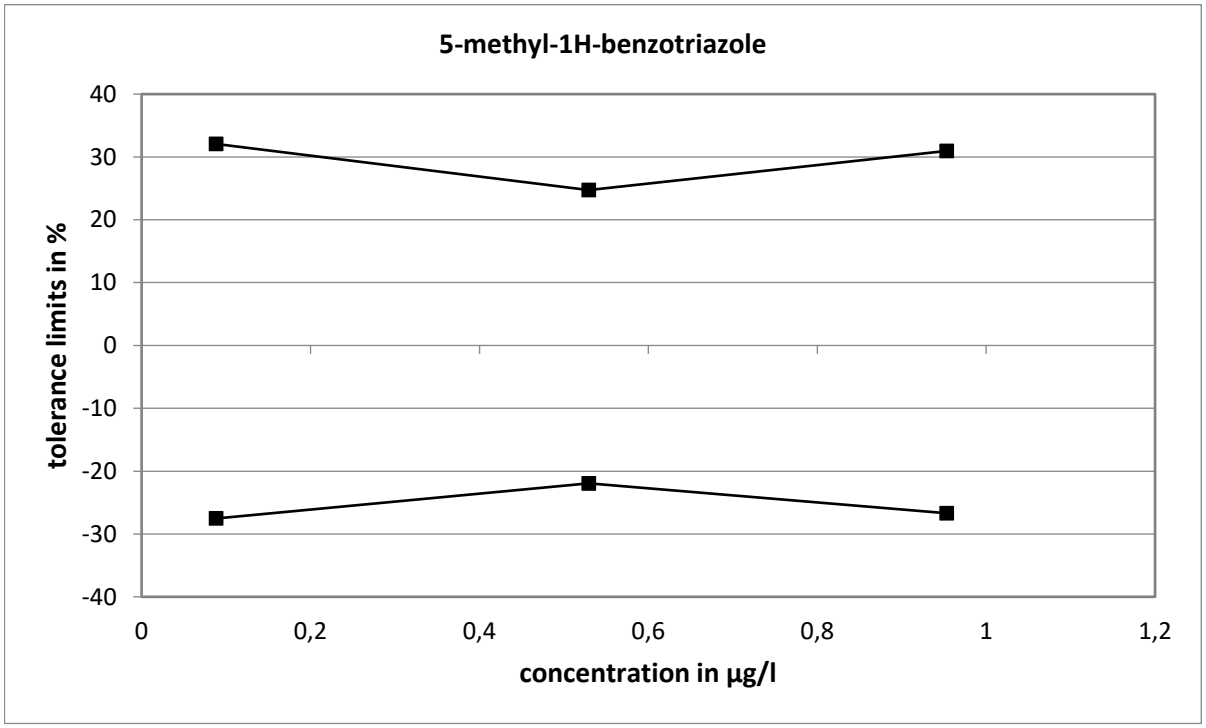


Slope of the regression: 0,962; average recovery: 96,2%

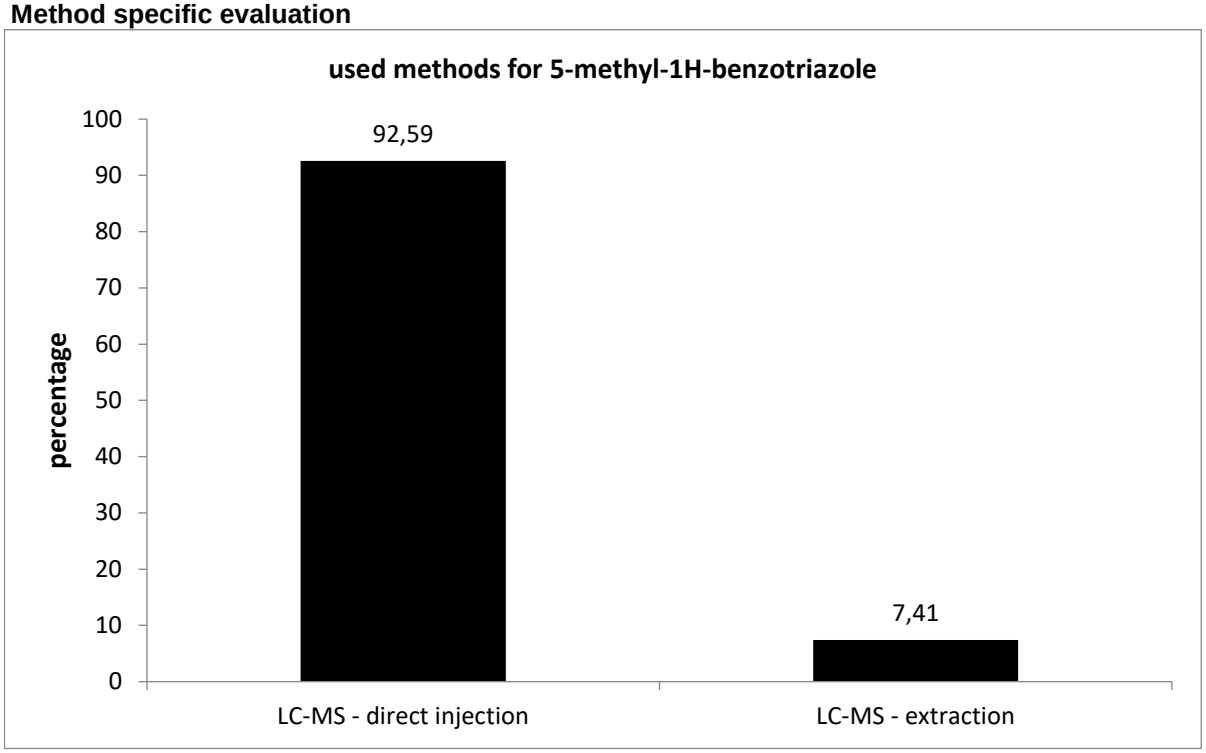
Relative standard deviation and tolerance limits

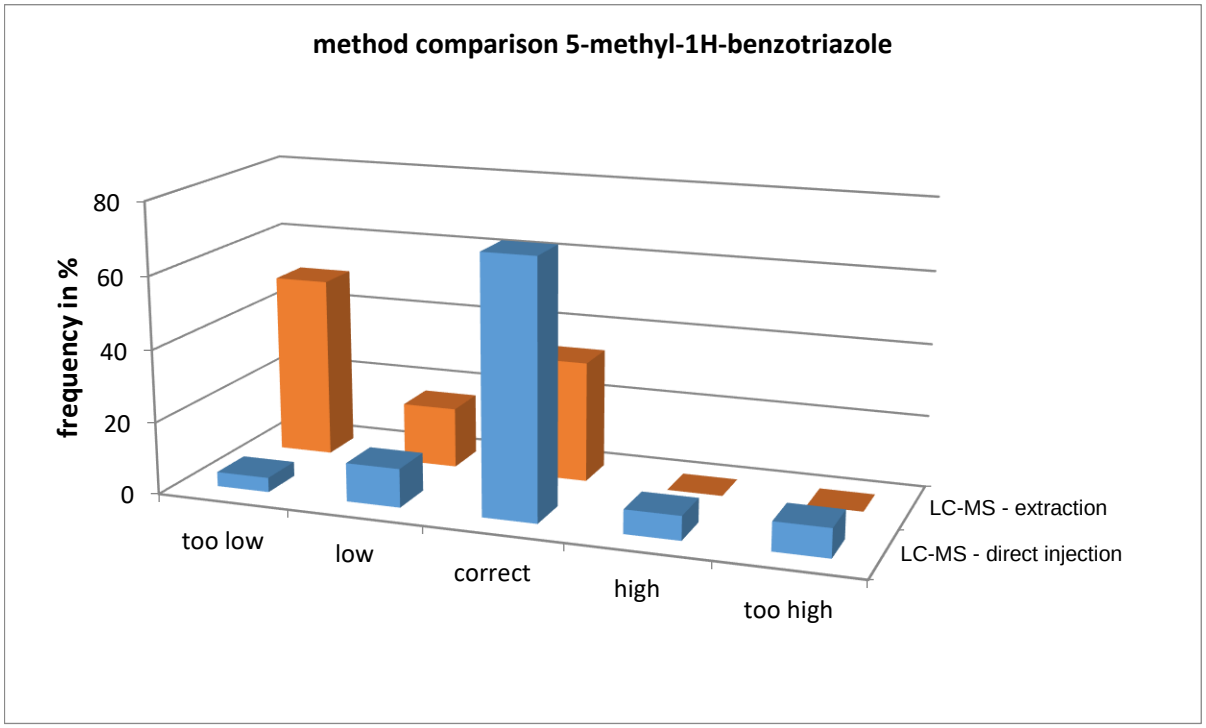


The relative standard deviations calculated with the Q-method did not reach the limits.



Method specific evaluation

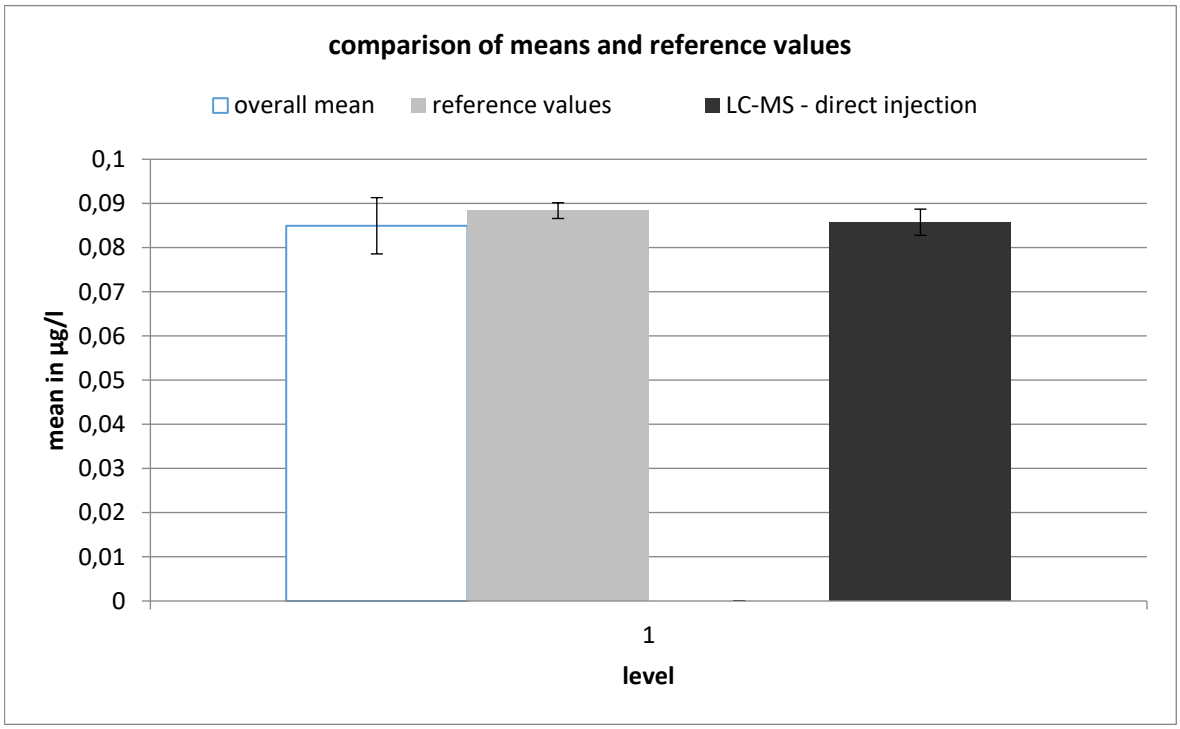


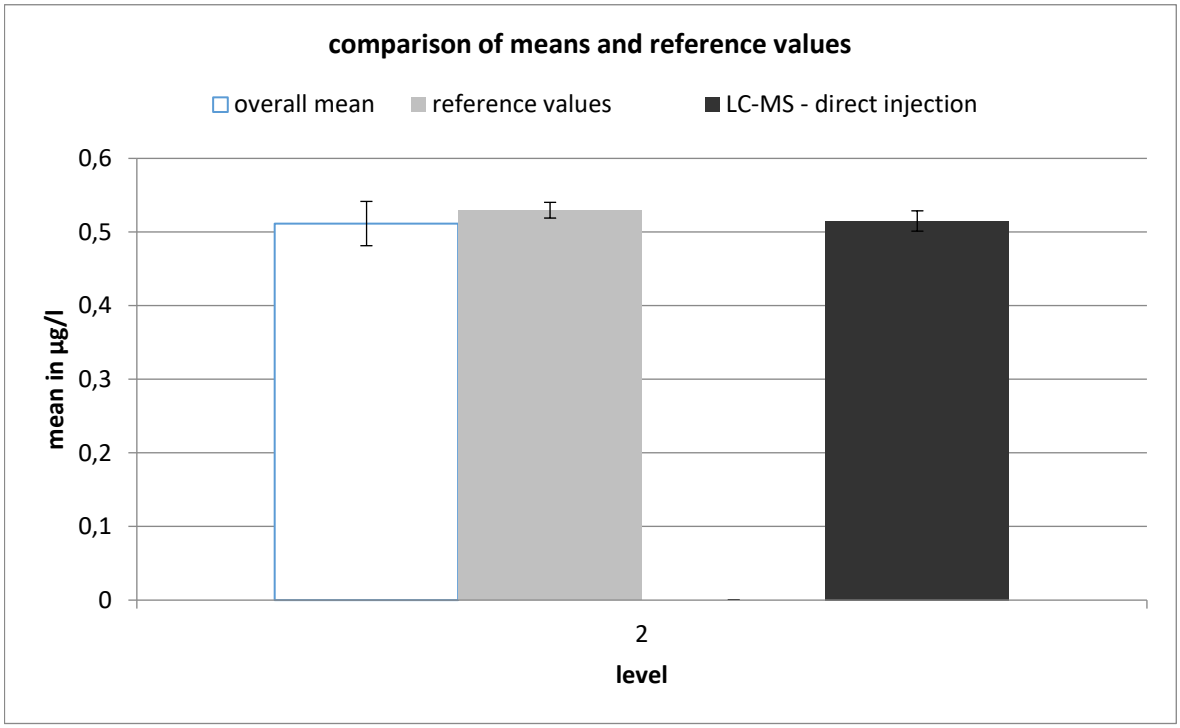


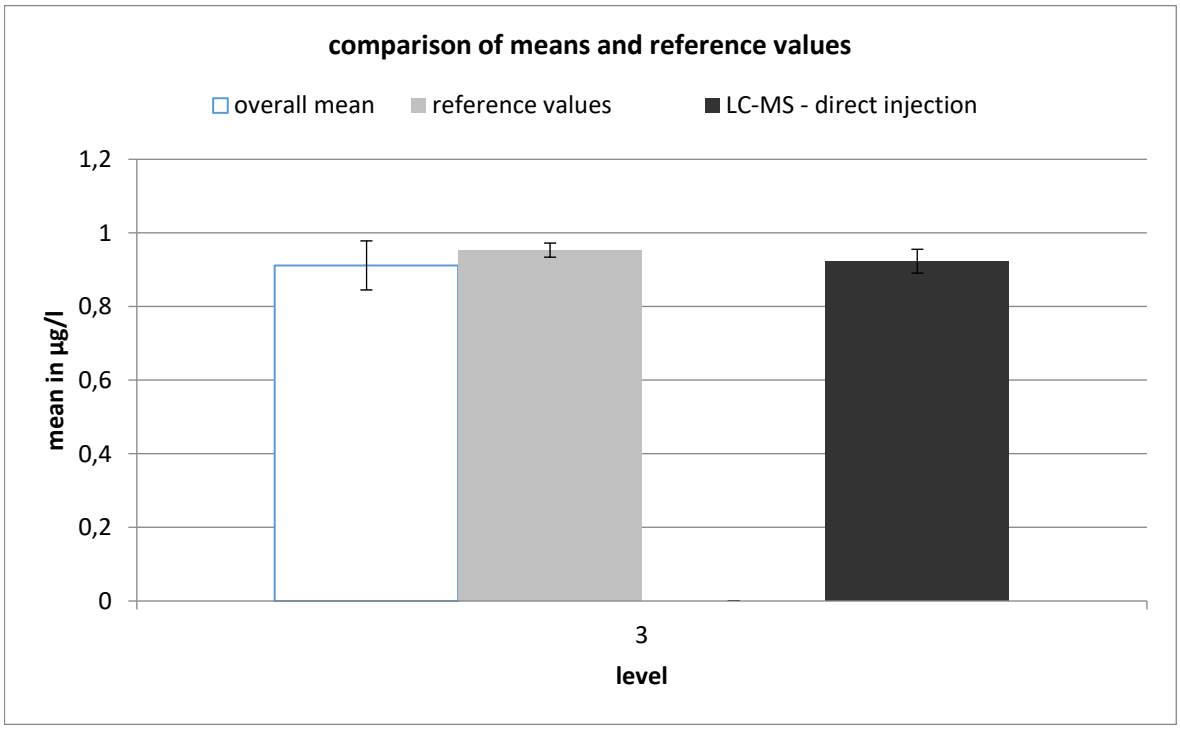
The values determined with LC-MS - direct injection showed the closest statistical distribution.

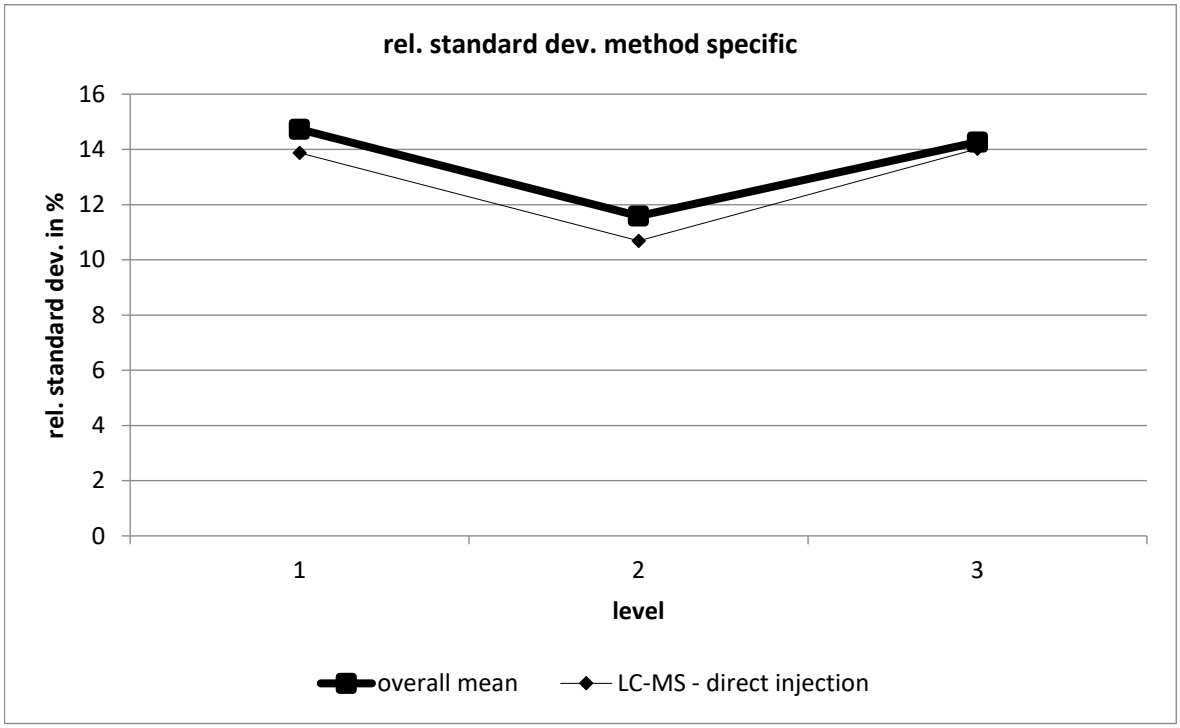
Comparison of means and reference values

level	mean [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]	reference value [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]
1	0,0849	0,0064	7,5	0,0884	0,0018	2,0
2	0,5115	0,0301	5,9	0,5296	0,0107	2,0
3	0,9116	0,0666	7,3	0,9532	0,0192	2,0




comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
1,2
1
0,8
0,6
0,4
0,2
0
mean in µg/l
3
level

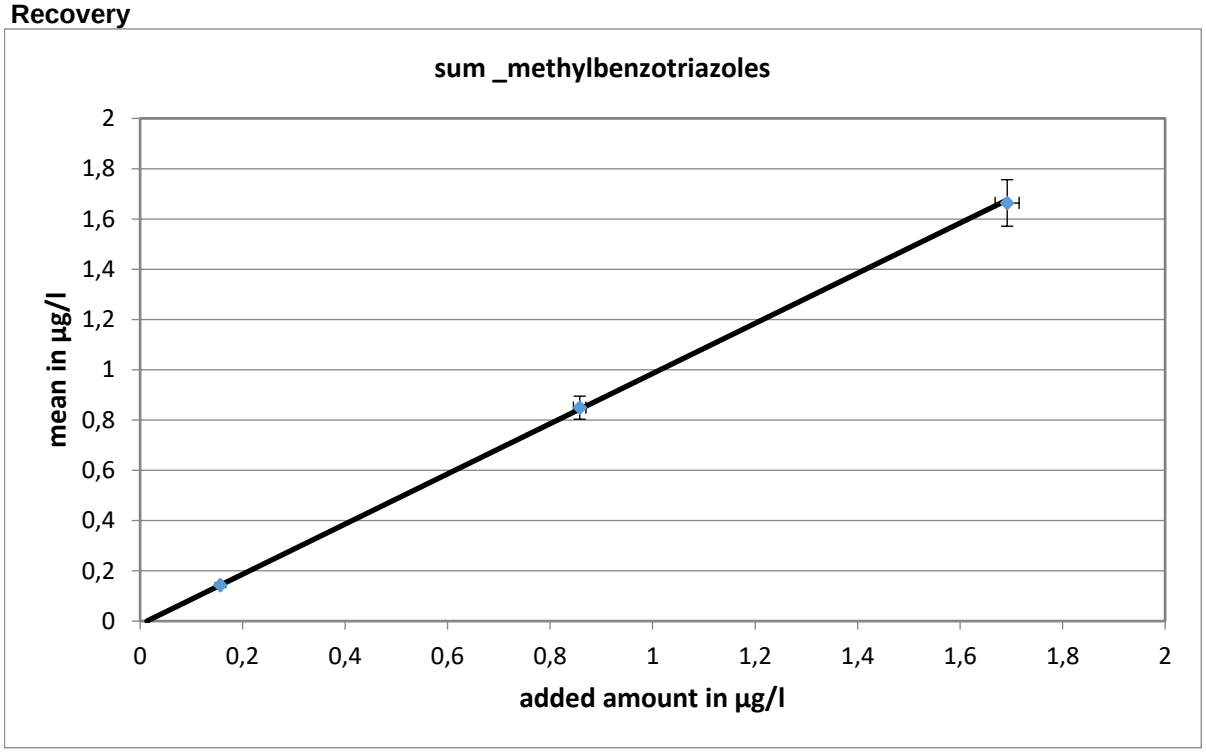


LC-MS - direct injection									
level	robust mean [µg/l]	exp. unc. of the mean [µg/l]	exp. unc. of the mean [%]	robust standard deviation [µg/l]	robust standard deviation [%]	number of results	out below	out above	out [%]
1	0,086	0,003	3,468	0,012	13,87	25	0	3	12
2	0,515	0,014	2,672	0,055	10,69	25	2	2	16
3	0,923	0,032	3,506	0,129	14,02	25	1	1	8

sum _methylbenzotriazoles

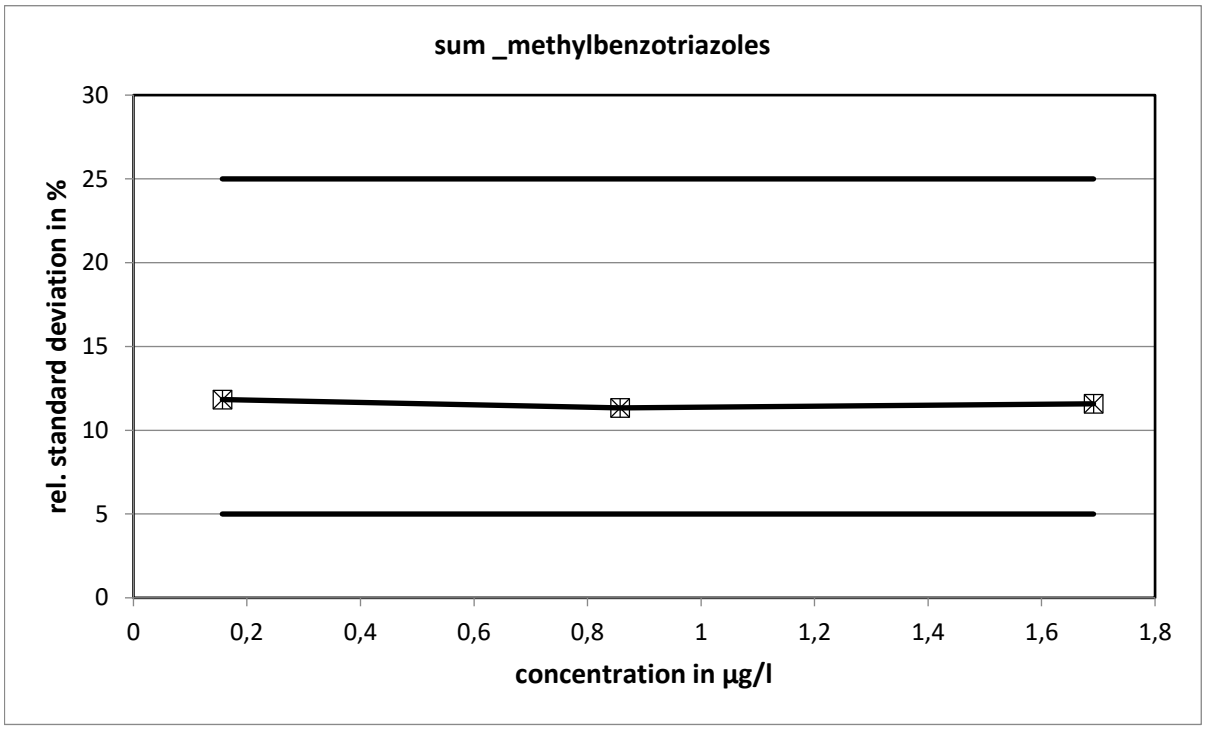
level	assigned value [µg/l]	expanded uncertainty of the assigned value [%]	standard deviation, calculated using robust statistics [µg/l]	standard deviation for proficiency assessment [µg/l]	standard deviation for proficiency assessment [%]	upper tolerance limit [µg/l]	lower tolerance limit [µg/l]	upper tolerance limit [%]	lower tolerance limit [%]	number of results	out below	out above	out [%]
1	0,1566	8,60	0,0185	0,0185	11,83	0,1964	0,1217	25,41	-22,33	27	2	4	20,7
2	0,8577	2,10	0,0972	0,0972	11,33	1,065	0,6732	24,12	-21,52	28	4	3	24,1
3	1,692	1,59	0,1959	0,1959	11,58	2,109	1,320	24,69	-21,95	28	3	3	20,7
									sum	83	9	10	22,9

Recovery

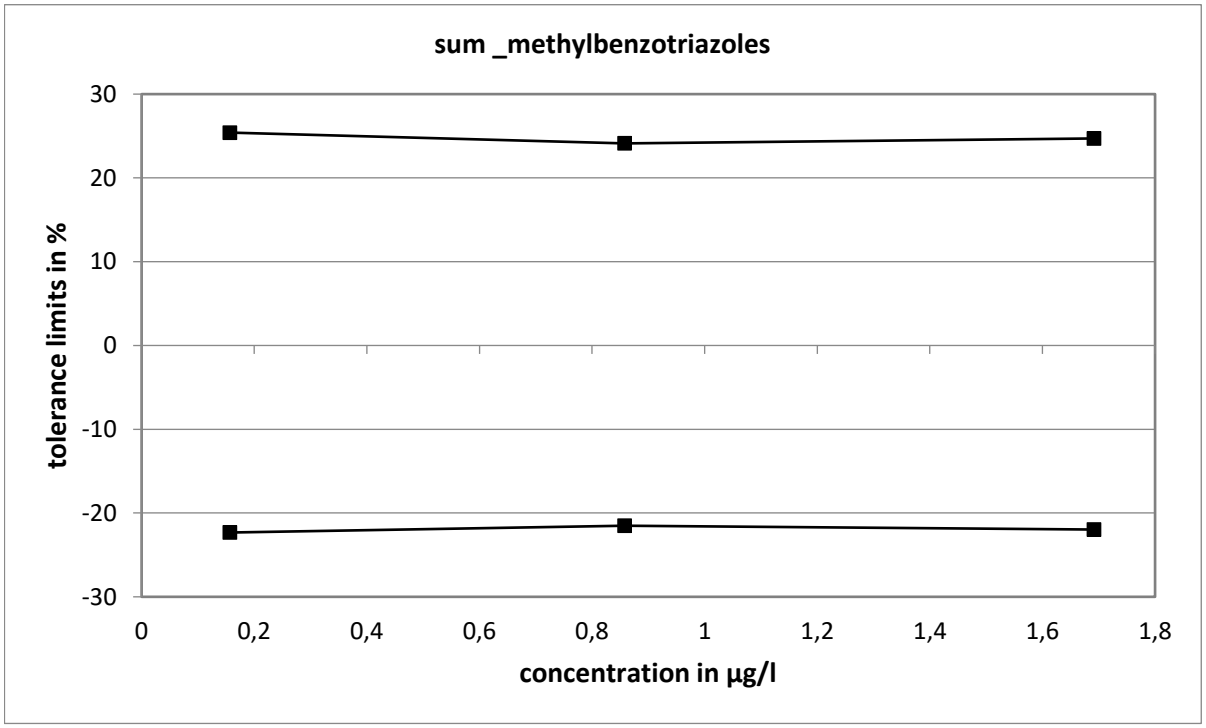


Slope of the regression: 0,998; average recovery: 99,8%

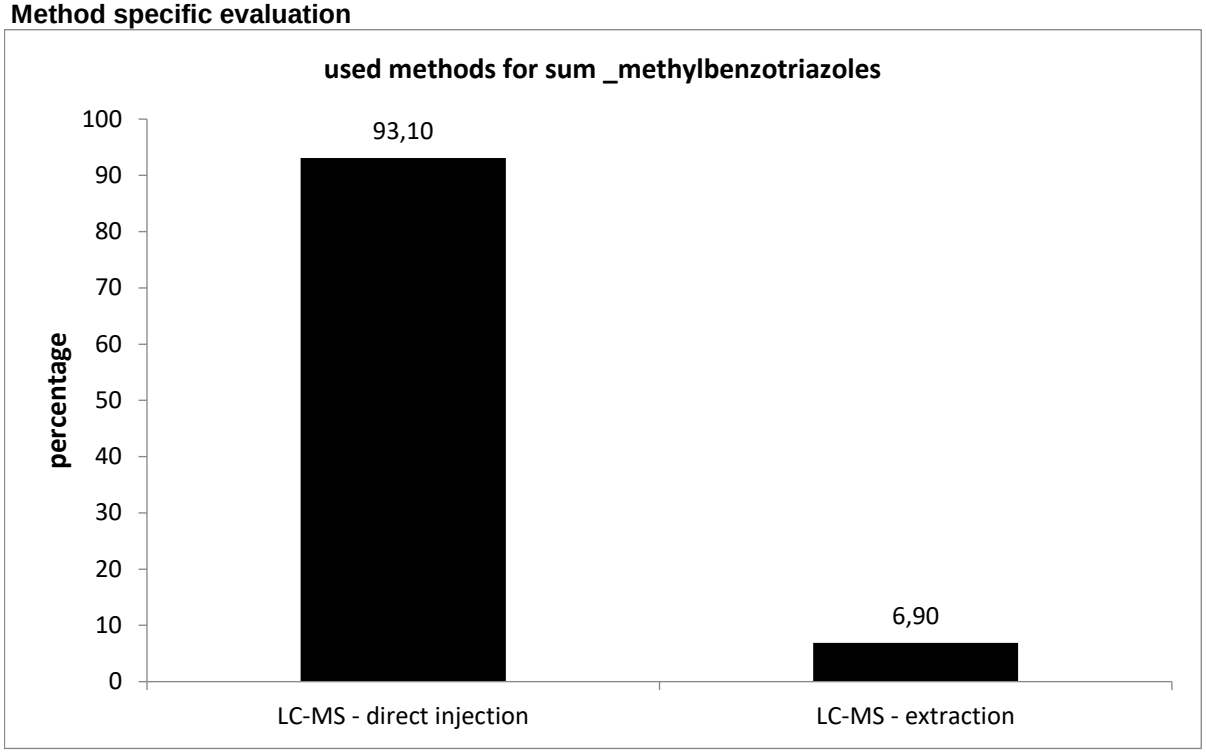
Relative standard deviation and tolerance limits

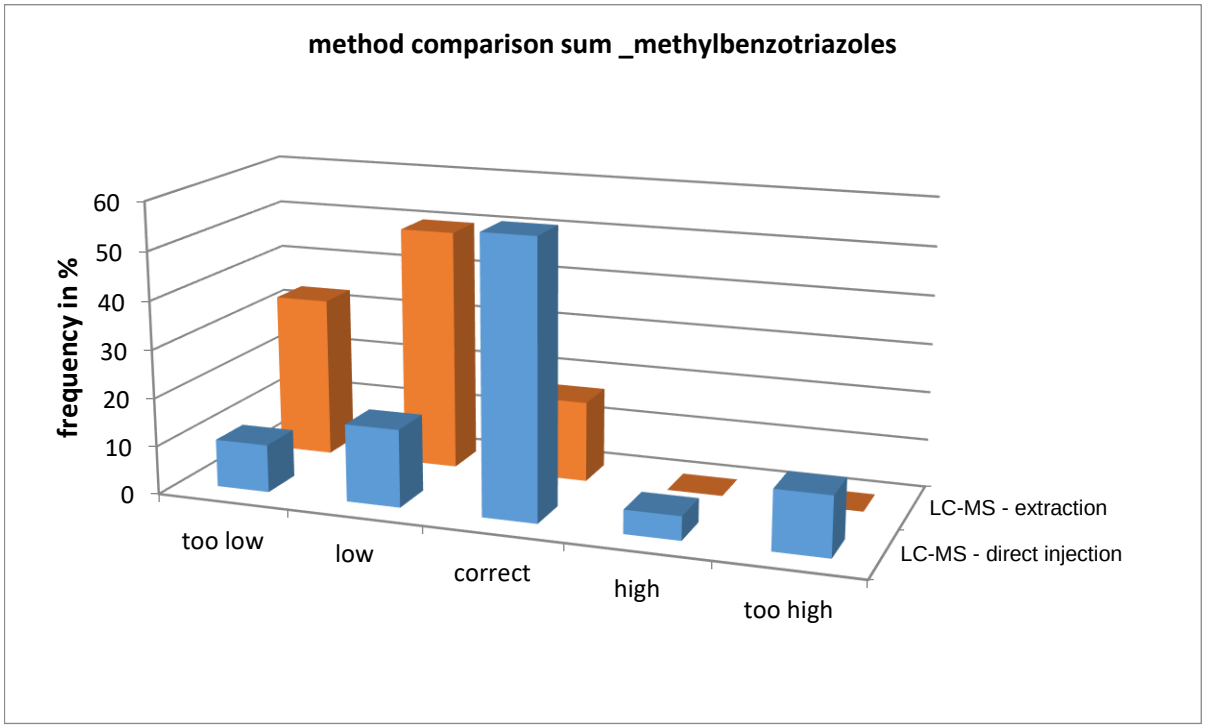


The relative standard deviations calculated with the Q-method did not reach the limits.



Method specific evaluation

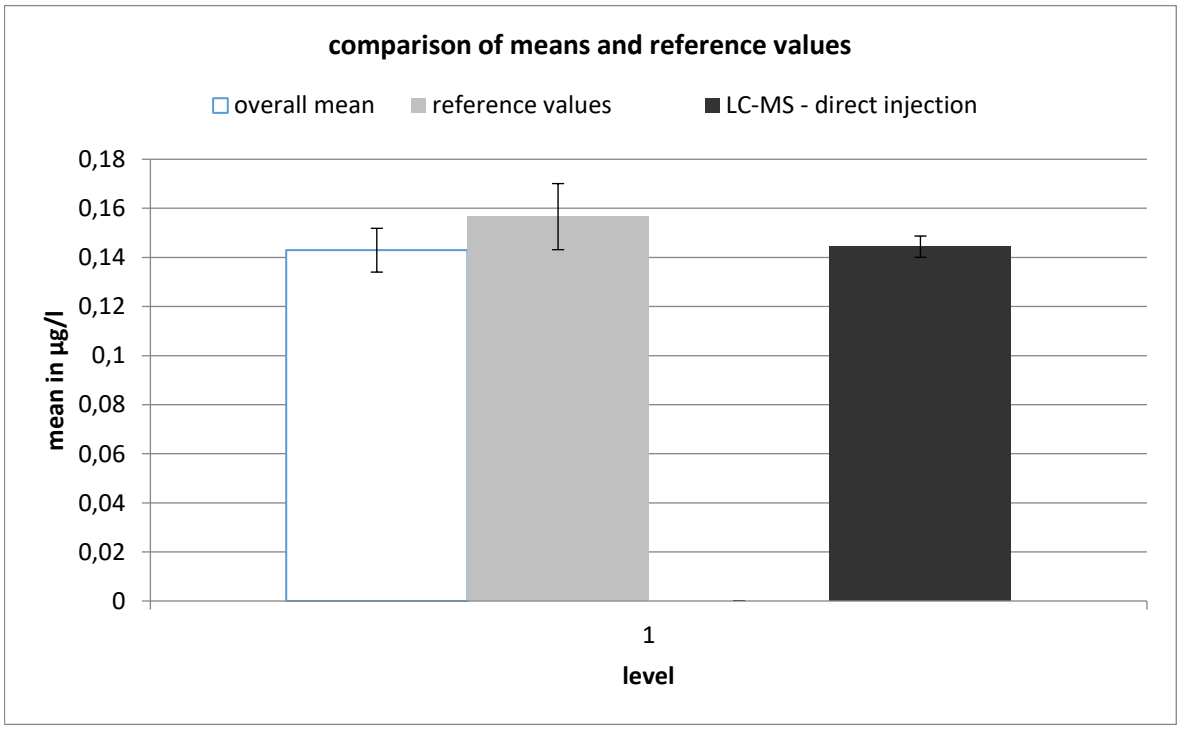


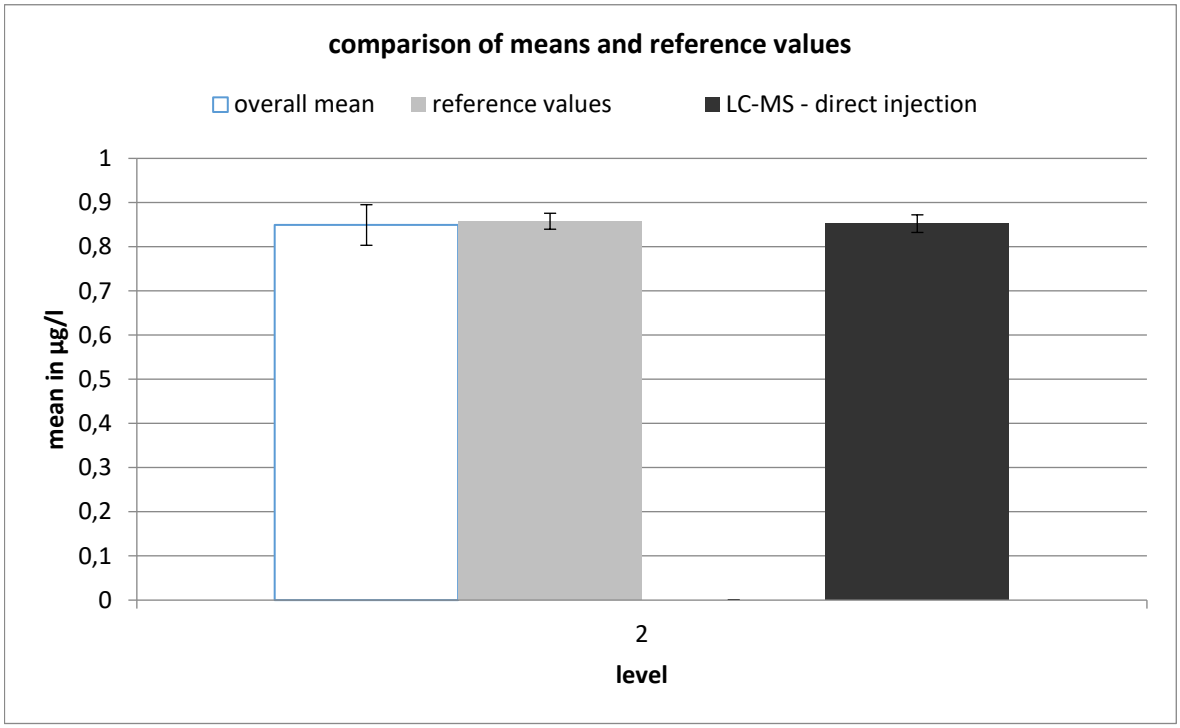


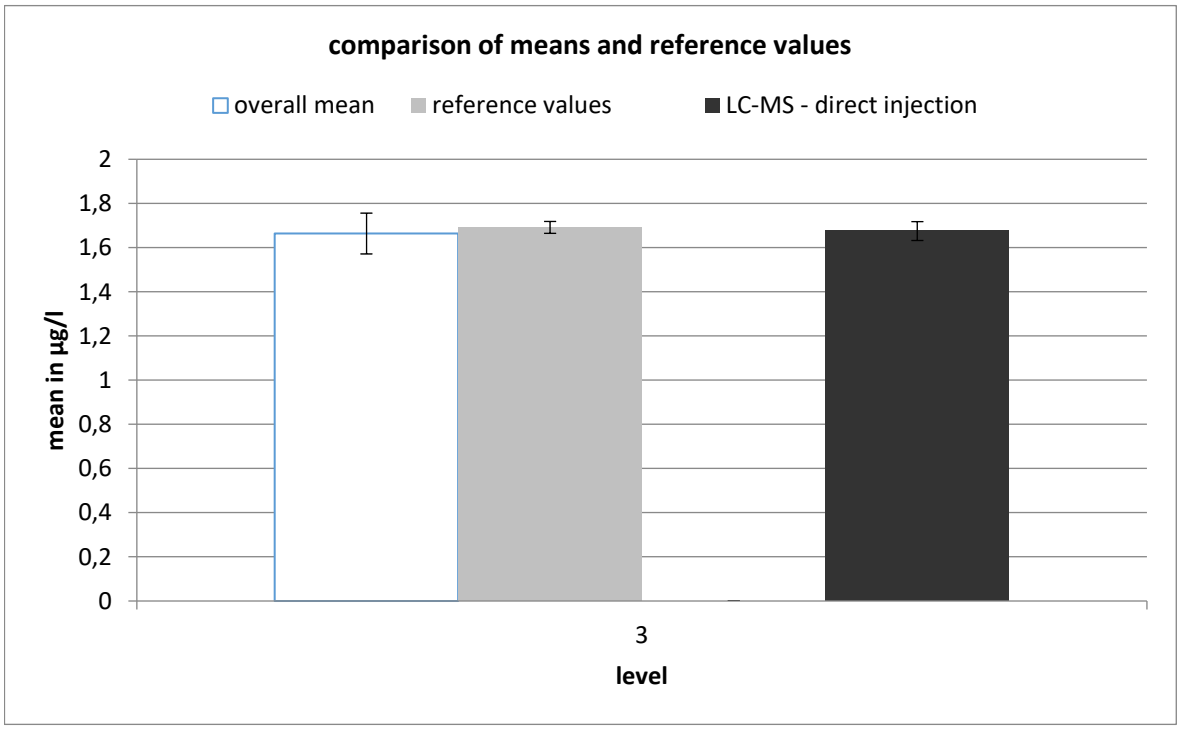
The values determined with LC-MS - direct injection showed the closest statistical distribution.

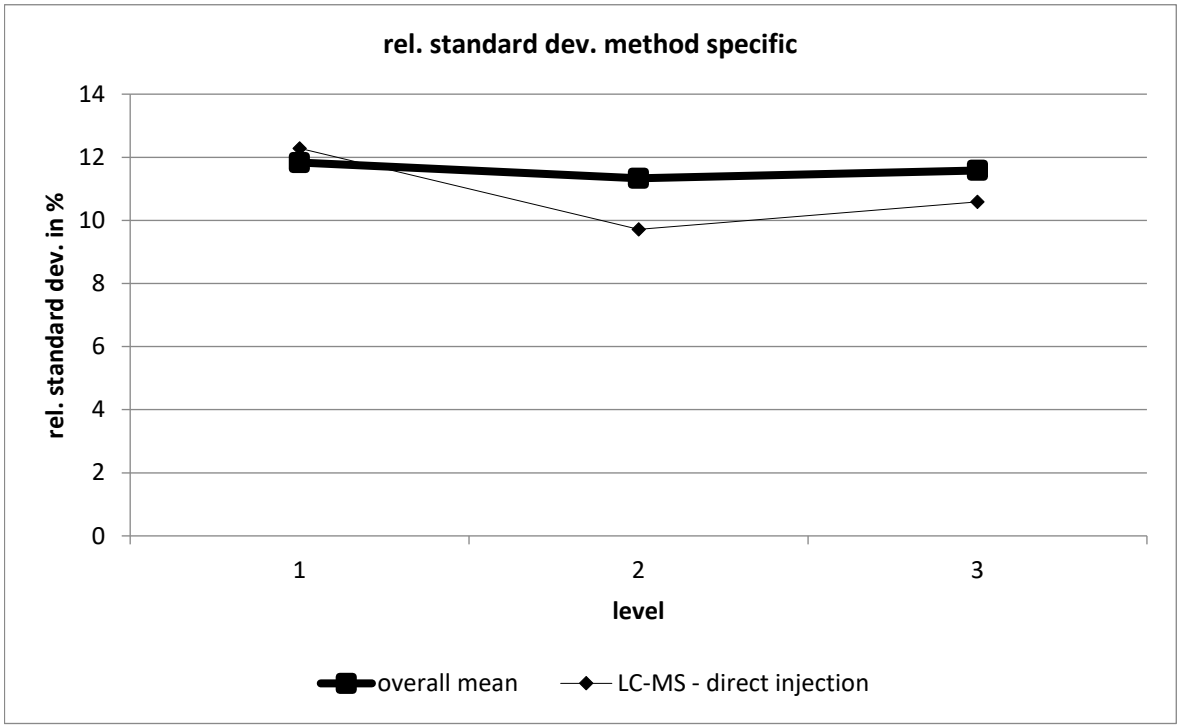
Comparison of means and reference values

level	mean [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]	reference value [µg/l]	exp. uncertainty [µg/l]	exp. uncertainty [%]
1	0,1430	0,0089	6,2	0,1566	0,0135	8,6
2	0,8492	0,0459	5,4	0,8577	0,0181	2,1
3	1,664	0,093	5,6	1,692	0,027	1,6

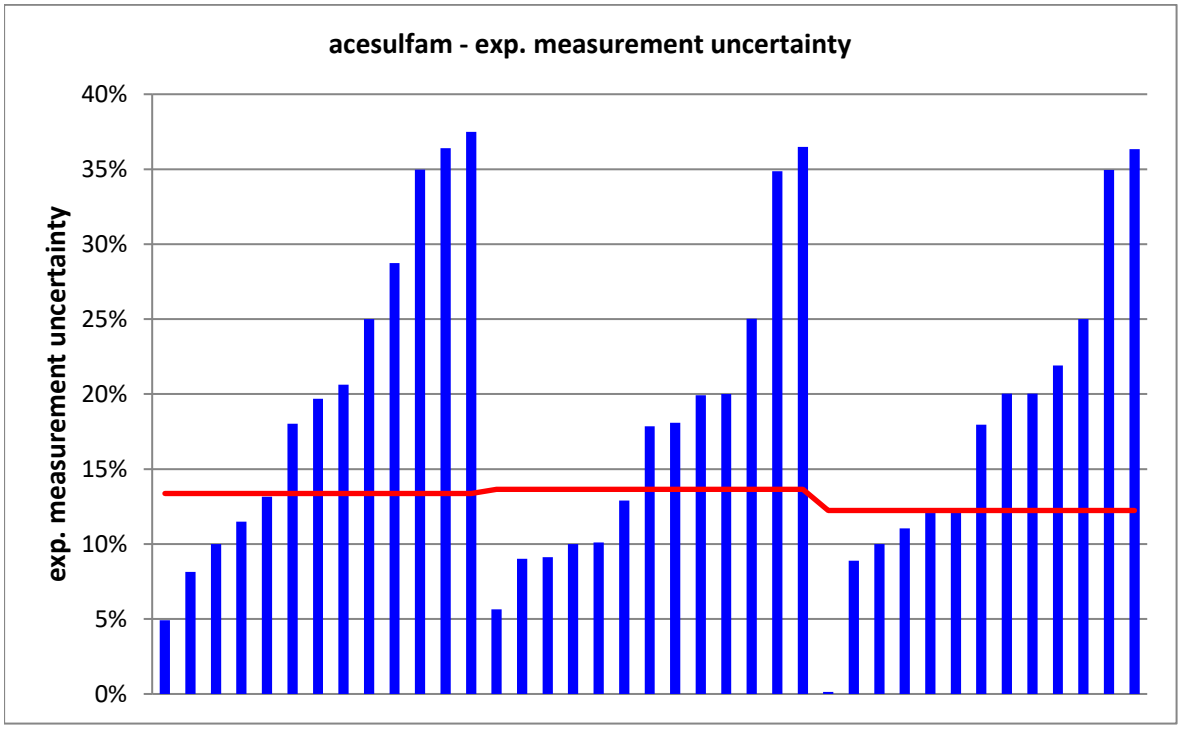


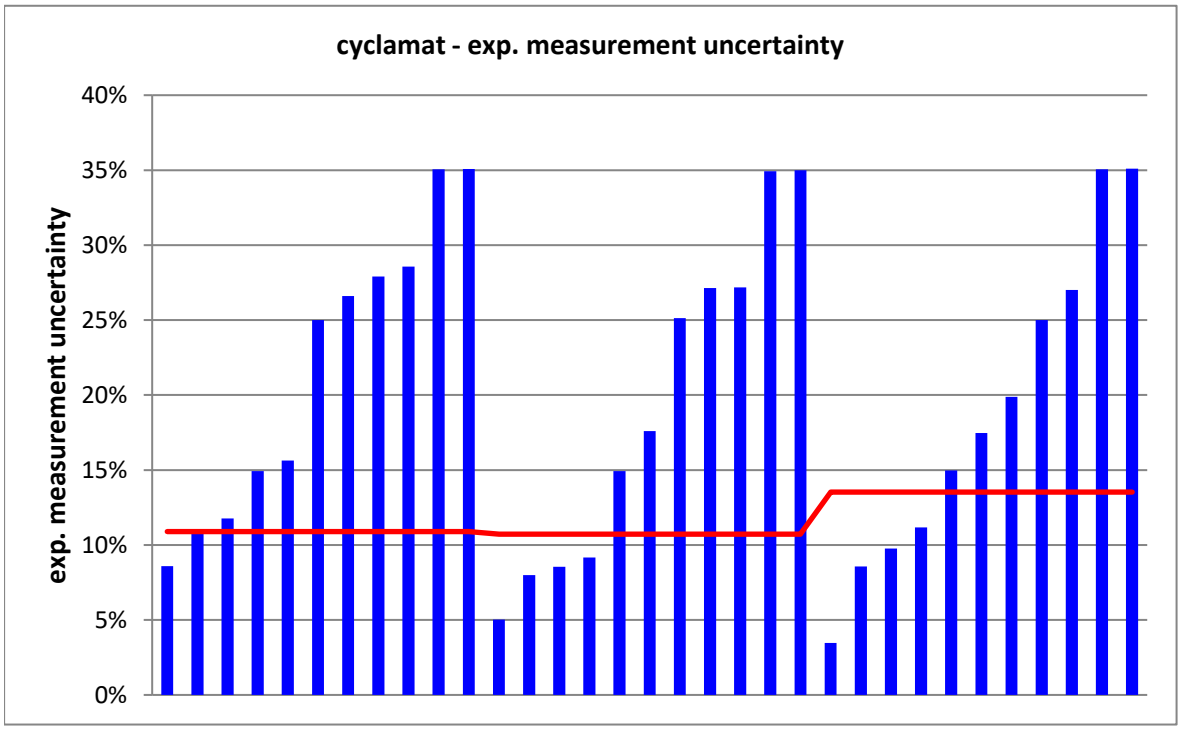

comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
mean in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
2
level

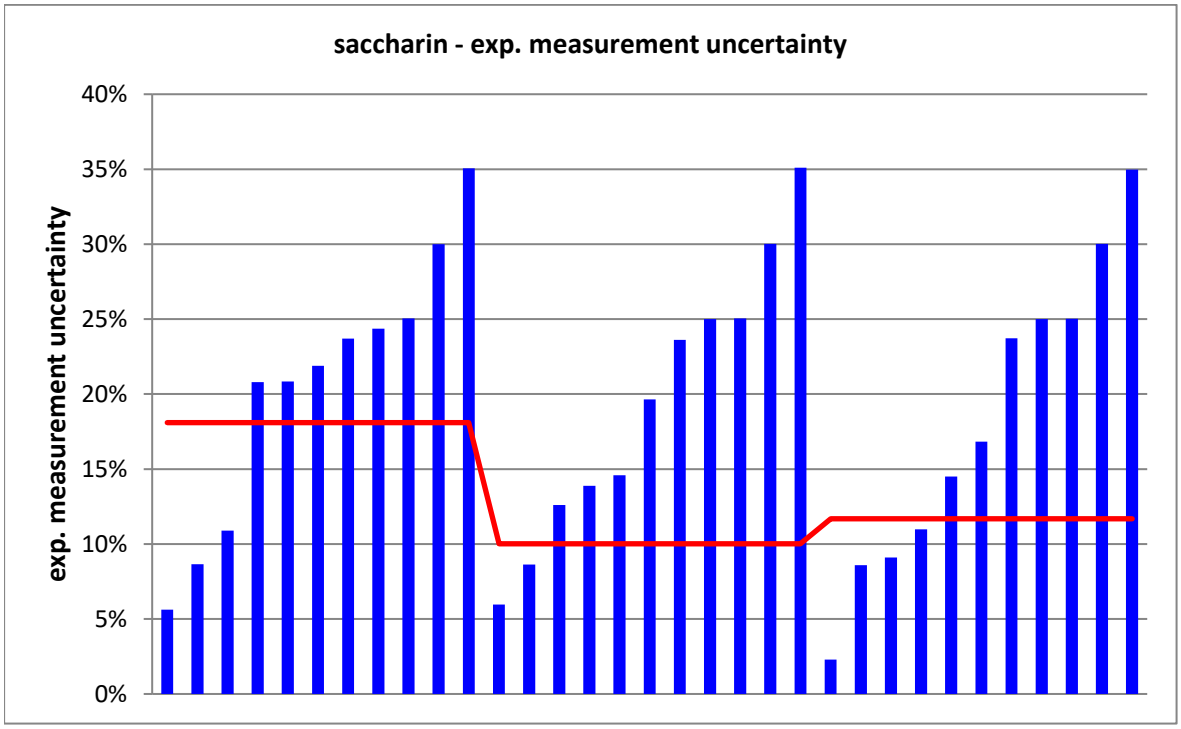

comparison of means and reference values
overall mean
reference values
LC-MS - direct injection
mean in µg/l
2
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
3
level

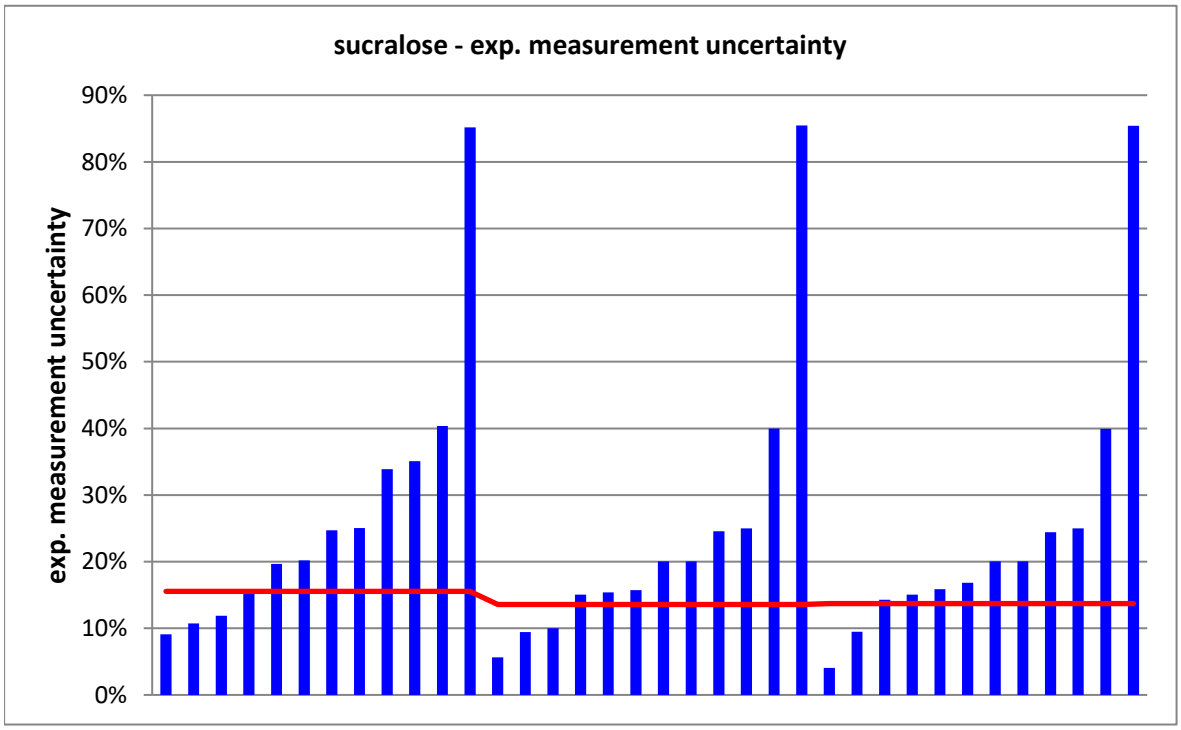


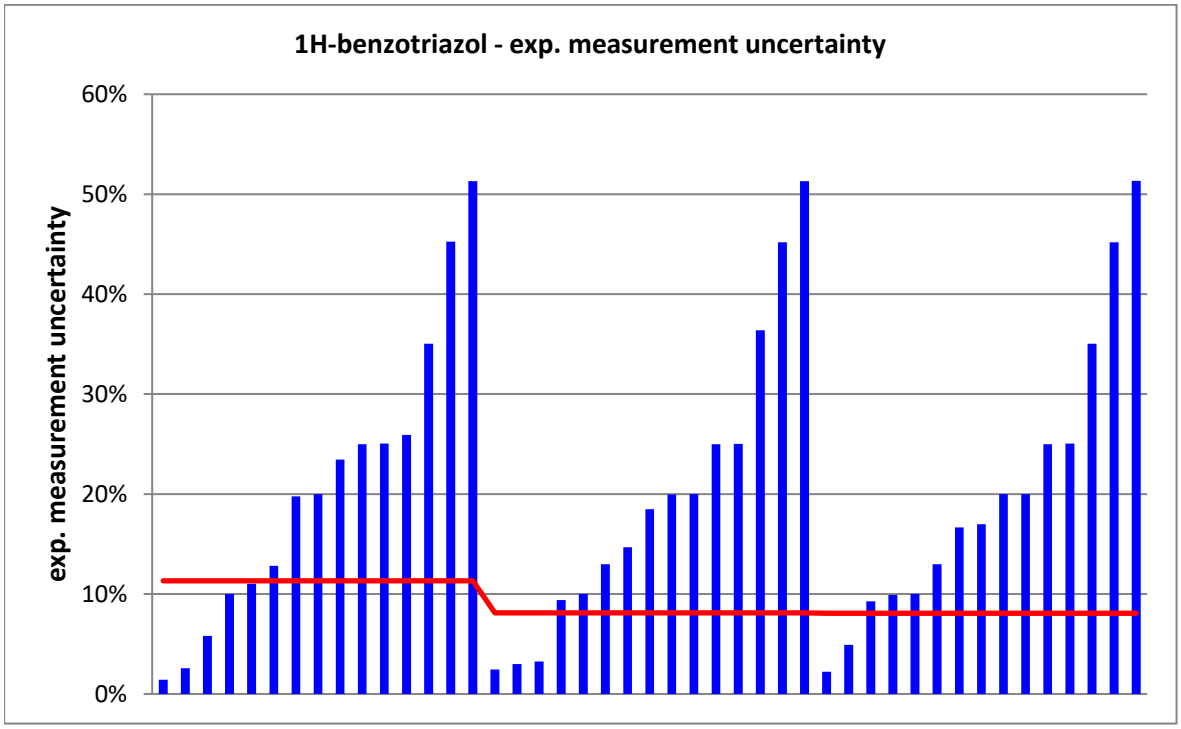
LC-MS - direct injection									
level	robust mean [µg/l]	exp. unc. of the mean [µg/l]	exp. unc. of the mean [%]	robust standard deviation [µg/l]	robust standard deviation [%]	number of results	out below	out above	out [%]
1	0,144	0,004	3,011	0,018	12,28	26	1	3	15,38
2	0,852	0,02	2,337	0,083	9,715	27	3	3	22,22
3	1,675	0,043	2,547	0,177	10,59	27	3	3	22,22

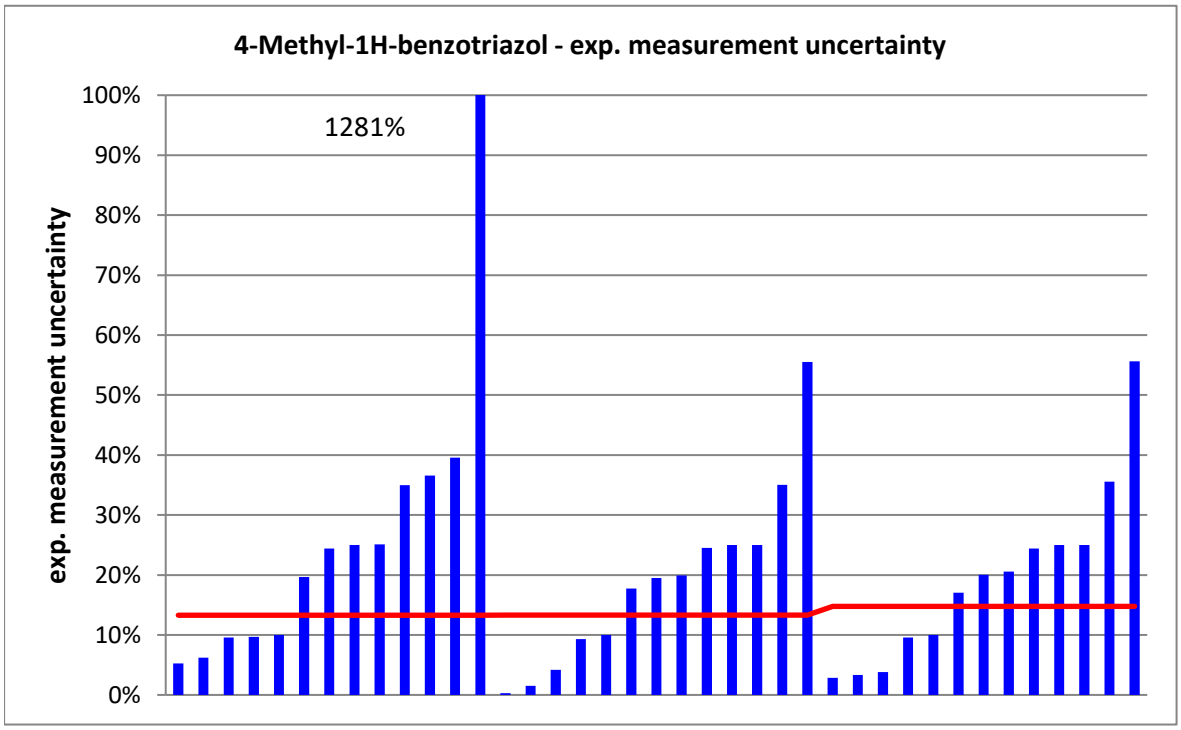

acesulfam - exp. measurement uncertainty
exp. measurement uncertainty
40%
35%
30%
25%
20%
15%
10%
5%
0%

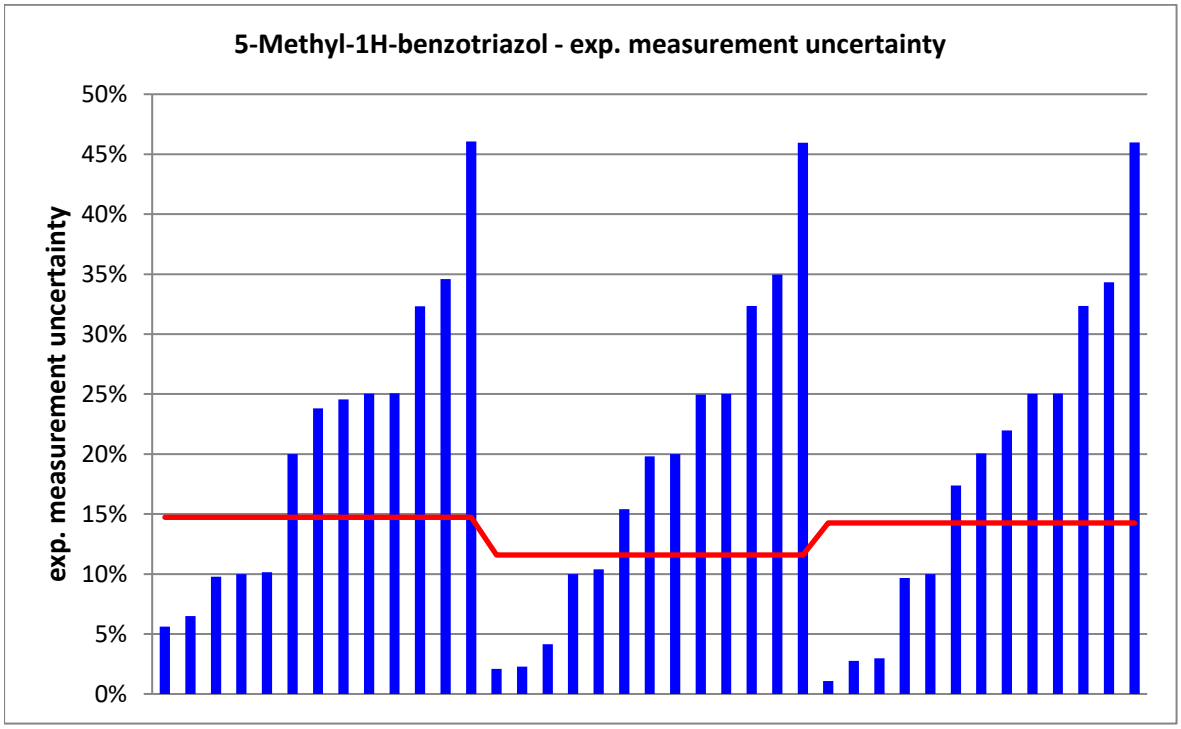

cyclamat - exp. measurement uncertainty
exp. measurement uncertainty
40%
35%
30%
25%
20%
15%
10%
5%
0%

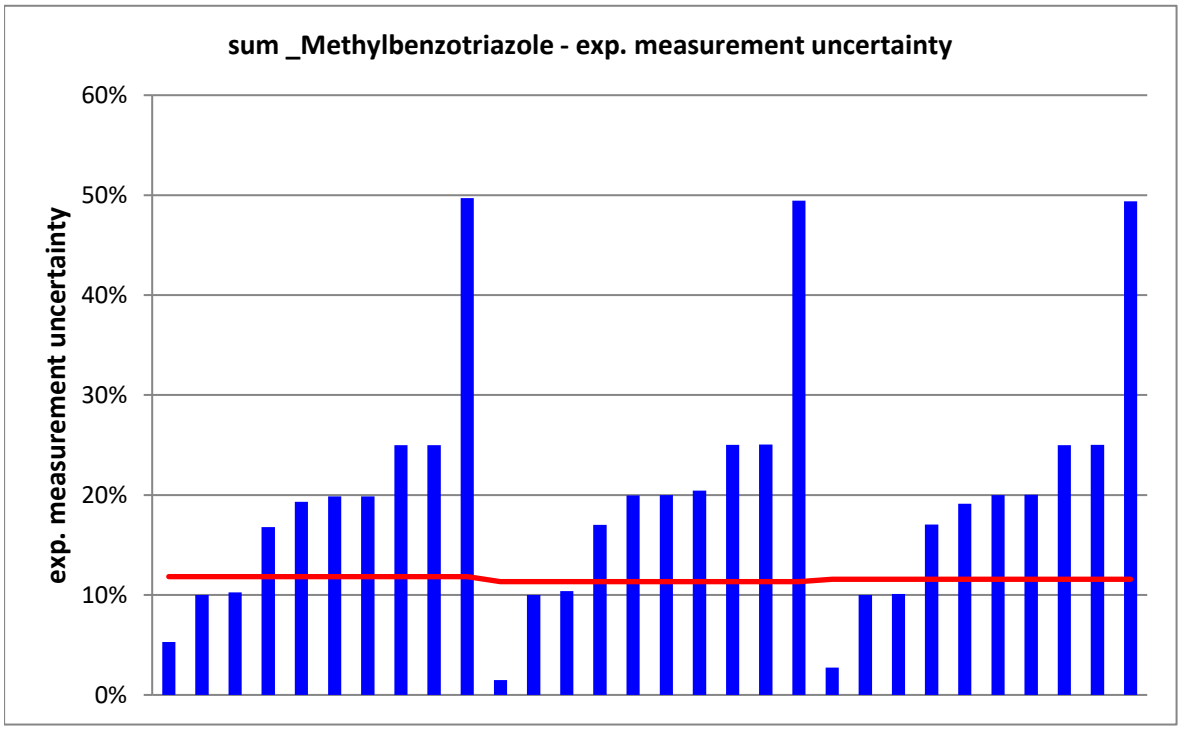

saccharin - exp. measurement uncertainty
exp. measurement uncertainty
40%
35%
30%
25%
20%
15%
10%
5%
0%


sucralose - exp. measurement uncertainty
exp. measurement uncertainty
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%


1H-benzotriazol - exp. measurement uncertainty
exp. measurement uncertainty
60%
50%
40%
30%
20%
10%
0%


4-Methyl-1H-benzotriazol - exp. measurement uncertainty
exp. measurement uncertainty
1281%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

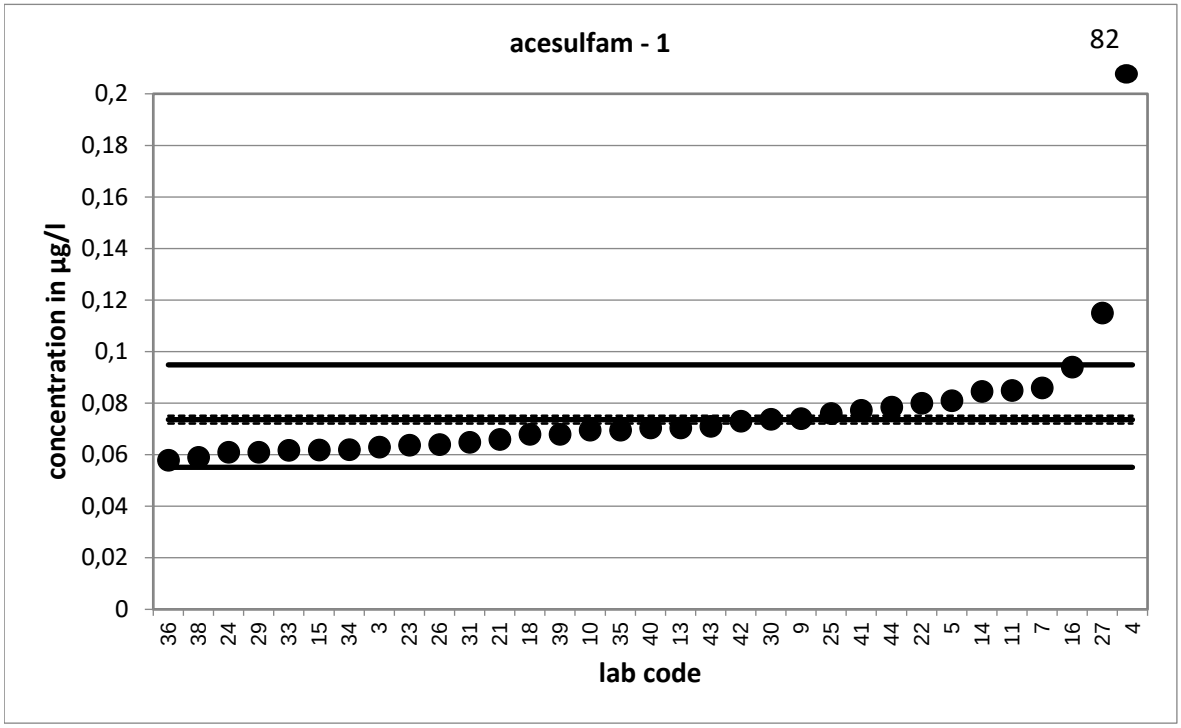

5-Methyl-1H-benzotriazol - exp. measurement uncertainty
exp. measurement uncertainty
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%

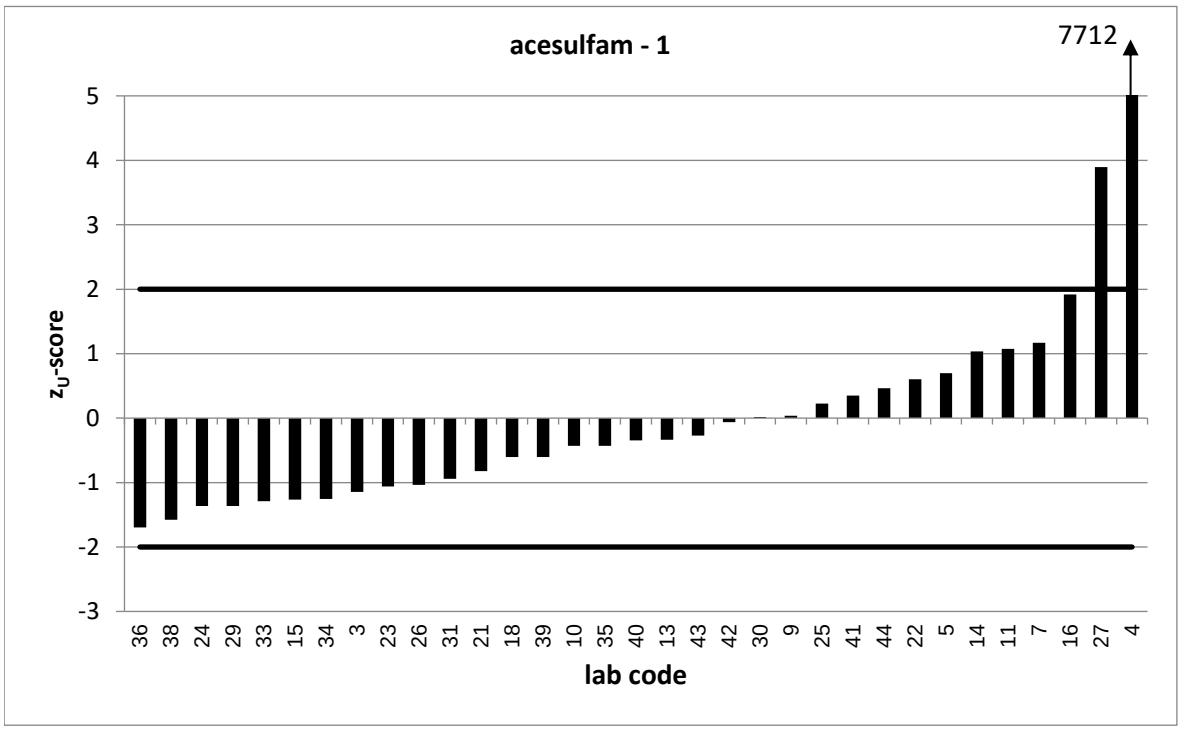

sum _Methylbenzotriazole - exp. measurement uncertainty
exp. measurement uncertainty
60%
50%
40%
30%
20%
10%
0%

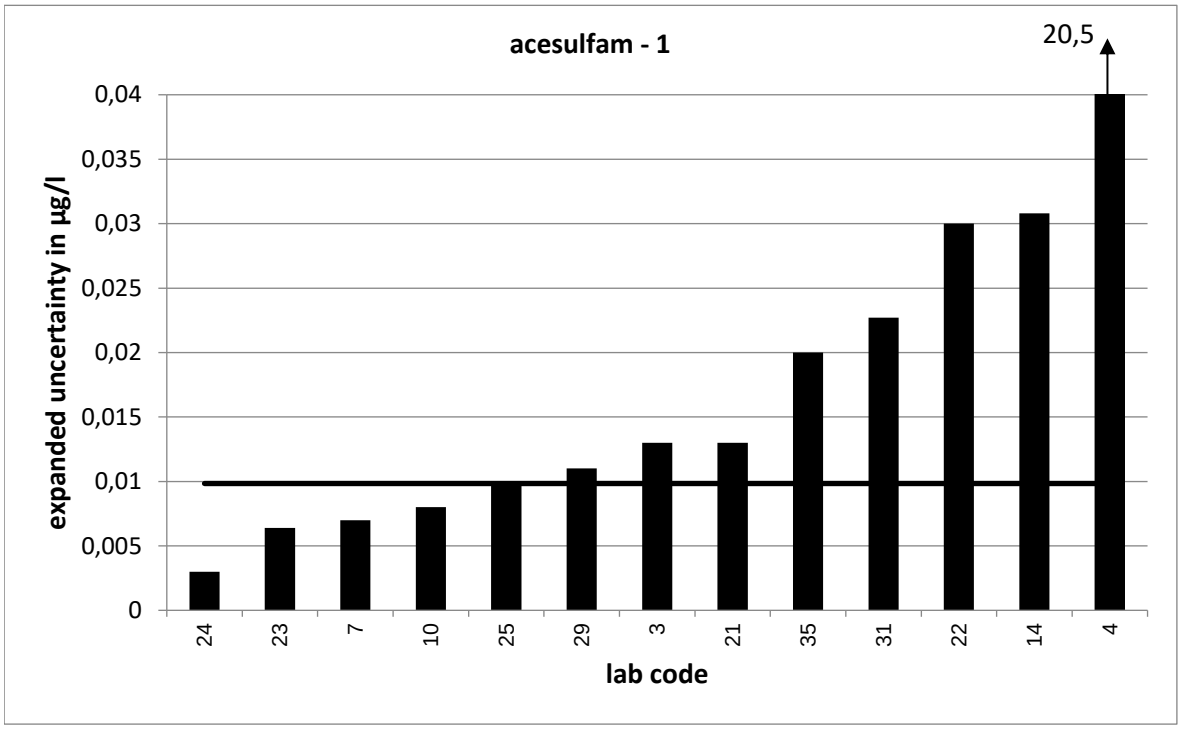
PT 3/19 - TW S1		acesulfam - 1			
assigned value [µg/l]*			0,0736	± 0,00149	
upper tolerance limit [µg/l]			0,09485		
lower tolerance limit [µg/l]			0,05511		
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,063	0,013	-1,6	-1,1	s
4	82	20,5	8,0	7711,8	u
5	0,081			0,7	s
7	0,086	0,007	3,5	1,2	s
9	0,074			0,0	s
10	0,0696	0,008	-1,0	-0,4	s
11	0,085			1,1	s
13	0,0705			-0,3	s
14	0,0846	0,031	0,7	1,0	s
15	0,06189			-1,3	s
16	0,094			1,9	s
18	0,068			-0,6	s
21	0,066	0,013	-1,2	-0,8	s
22	0,08	0,03	0,4	0,6	s
23	0,0638	0,006	-3,0	-1,1	s
24	0,061	0,003	-7,5	-1,4	s
25	0,076	0,01	0,5	0,2	s
26	0,064			-1,0	s
27	0,115			3,9	u
29	0,061	0,011	-2,3	-1,4	s
30	0,0738			0,0	s
31	0,0649	0,023	-0,8	-0,9	s
33	0,0617			-1,3	s
34	0,062			-1,3	s
35	0,0696	0,02	-0,4	-0,4	s
36	0,0579			-1,7	s
38	0,059			-1,6	s
39	0,068			-0,6	s
40	0,0704			-0,3	s
41	0,0773			0,3	s
42	0,073			-0,1	s
43	0,0711			-0,3	s
44	0,0785			0,5	s

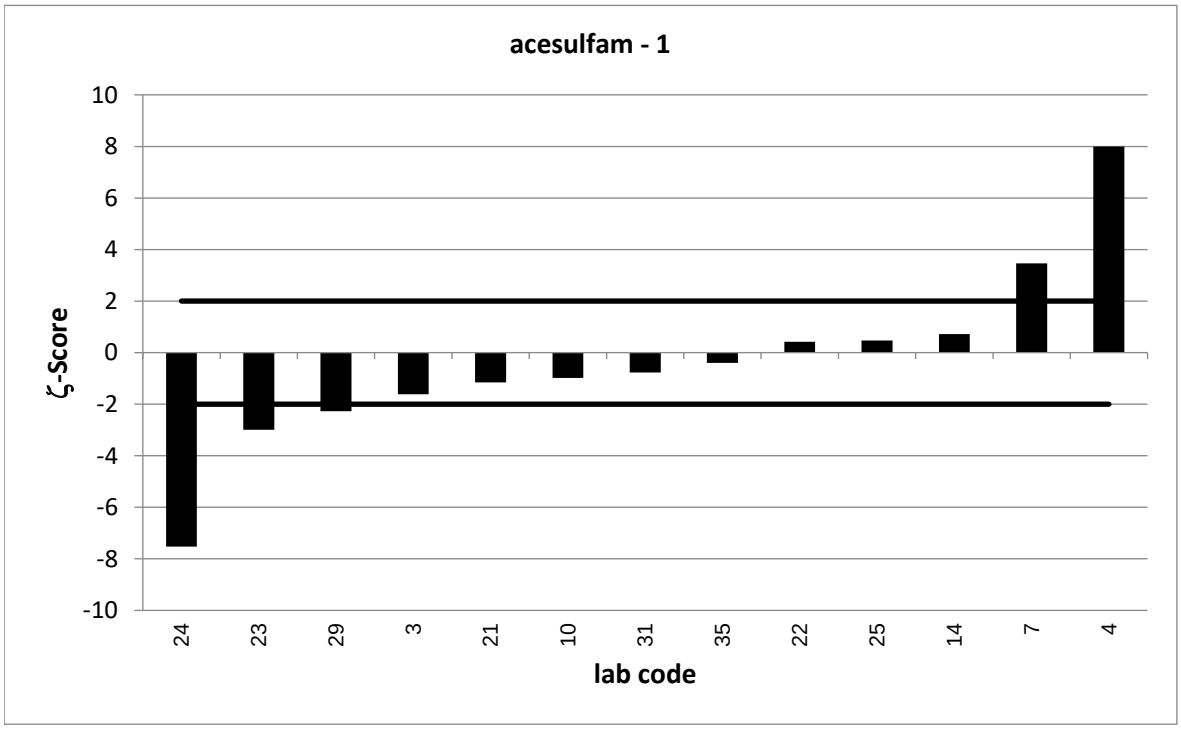
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


acesulfam - 1
82
concentration in µg/l
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
36 38 24 29 33 15 34 3 23 26 31 21 18 39 10 35 40 13 43 42 30 9 25 41 44 22 5 14 11 7 16 27 4
lab code


acesulfam - 1
7712
z_U-score
5
4
3
2
1
0
-1
-2
-3
36 38 24 29 33 15 34 3 23 26 31 21 18 39 10 35 40 13 43 42 30 9 25 41 44 22 5 14 11 7 16 27 4
lab code

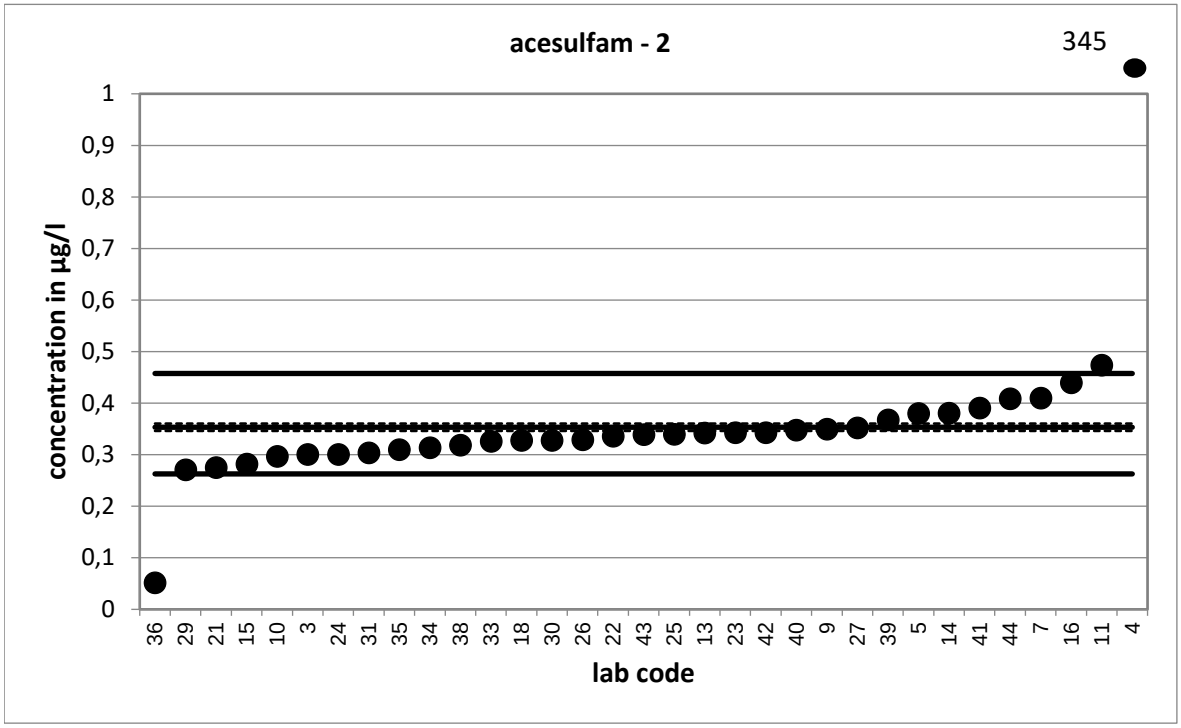

acesulfam - 1
20,5
expanded uncertainty in µg/l
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
24
23
7
10
25
29
3
21
35
31
22
14
4
lab code

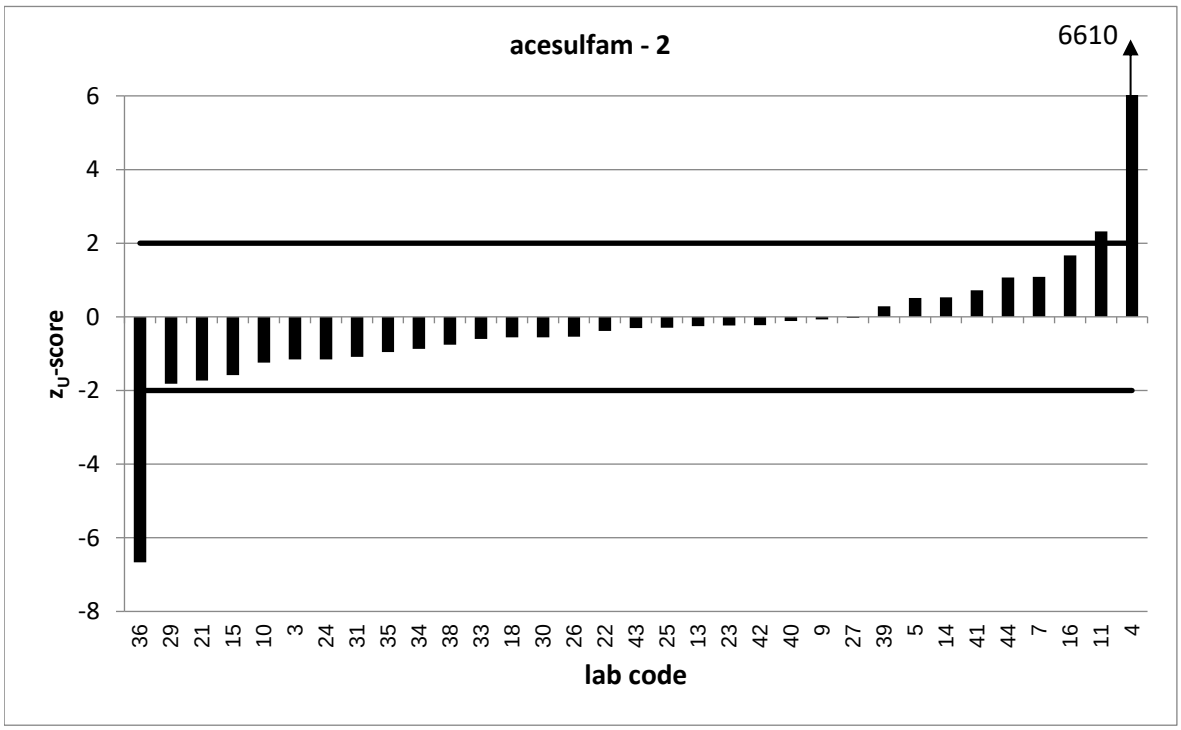

acesulfam - 1
ζ-Score
10
8
6
4
2
0
-2
-4
-6
-8
-10
24
23
29
3
21
10
31
35
22
25
14
7
4
lab code

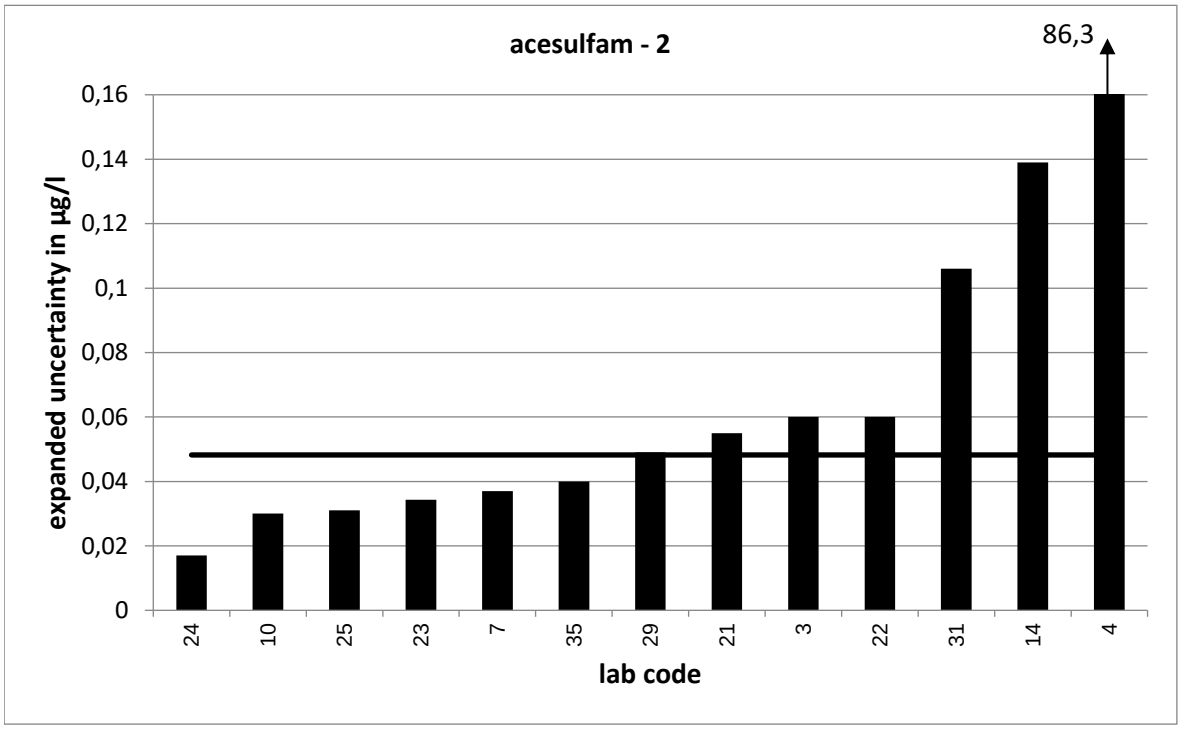
PT 3/19 - TW S1		acesulfam - 2			
assigned value [µg/l]*			0,3533	± 0,0071	
upper tolerance limit [µg/l]			0,4576		
lower tolerance limit [µg/l]			0,2627		
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,301	0,06	-1,7	-1,2	s
4	345	86,3	8,0	6610,0	u
5	0,38			0,5	s
7	0,41	0,037	3,0	1,1	s
9	0,35			-0,1	s
10	0,297	0,03	-3,7	-1,2	s
11	0,474			2,3	q
13	0,342			-0,2	s
14	0,381	0,139	0,4	0,5	s
15	0,2818			-1,6	s
16	0,44			1,7	s
18	0,328			-0,6	s
21	0,275	0,055	-2,8	-1,7	s
22	0,336	0,06	-0,6	-0,4	s
23	0,3427	0,034	-0,6	-0,2	s
24	0,301	0,017	-5,7	-1,2	s
25	0,34	0,031	-0,8	-0,3	s
26	0,329			-0,5	s
27	0,352			0,0	s
29	0,271	0,049	-3,3	-1,8	s
30	0,328			-0,6	s
31	0,304	0,106	-0,9	-1,1	s
33	0,326			-0,6	s
34	0,314			-0,9	s
35	0,31	0,04	-2,1	-1,0	s
36	0,0517			-6,7	u
38	0,319			-0,8	s
39	0,368			0,3	s
40	0,348			-0,1	s
41	0,391			0,7	s
42	0,343			-0,2	s
43	0,3394			-0,3	s
44	0,409			1,1	s

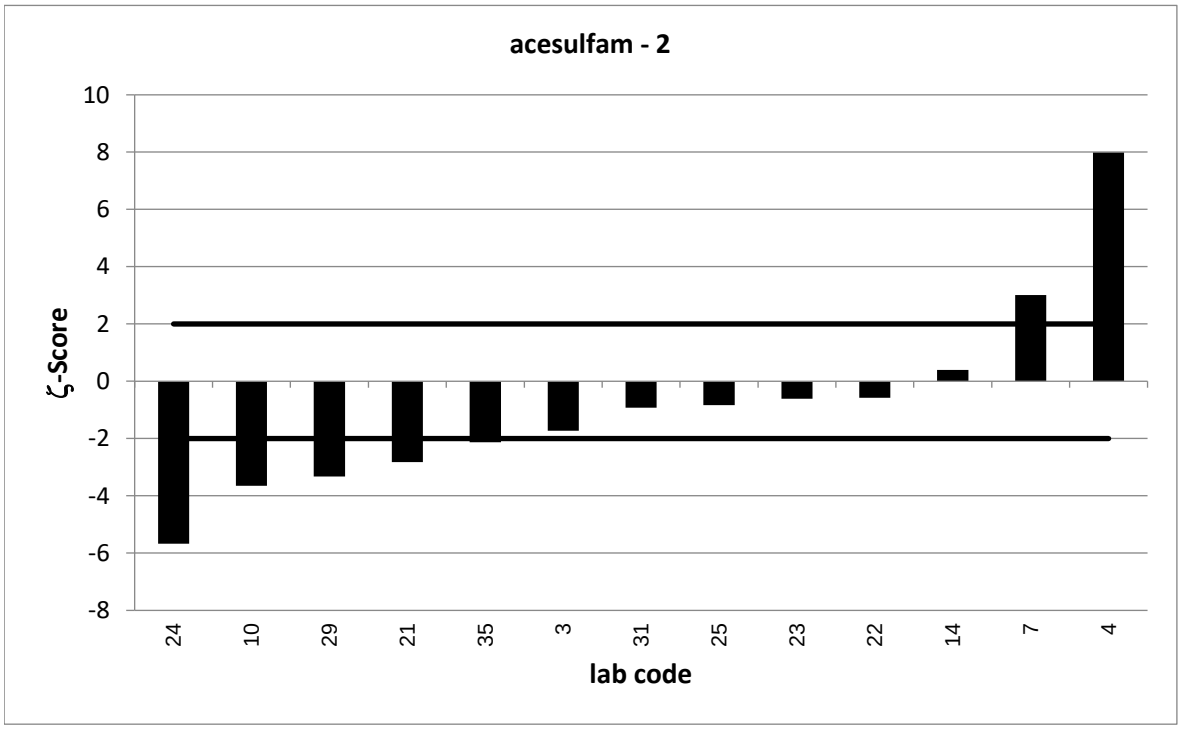
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


acesulfam - 2
345
concentration in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
36 29 21 15 10 3 24 31 35 34 38 33 18 30 26 22 43 25 13 23 42 40 9 27 39 5 14 41 44 7 16 11 4
lab code


acesulfam - 2
6610
z_U-score
6
4
2
0
-2
-4
-6
-8
36 29 21 15 10 3 24 31 35 34 38 33 18 30 26 22 43 25 13 23 42 40 9 27 39 5 14 41 44 7 16 11 4
lab code

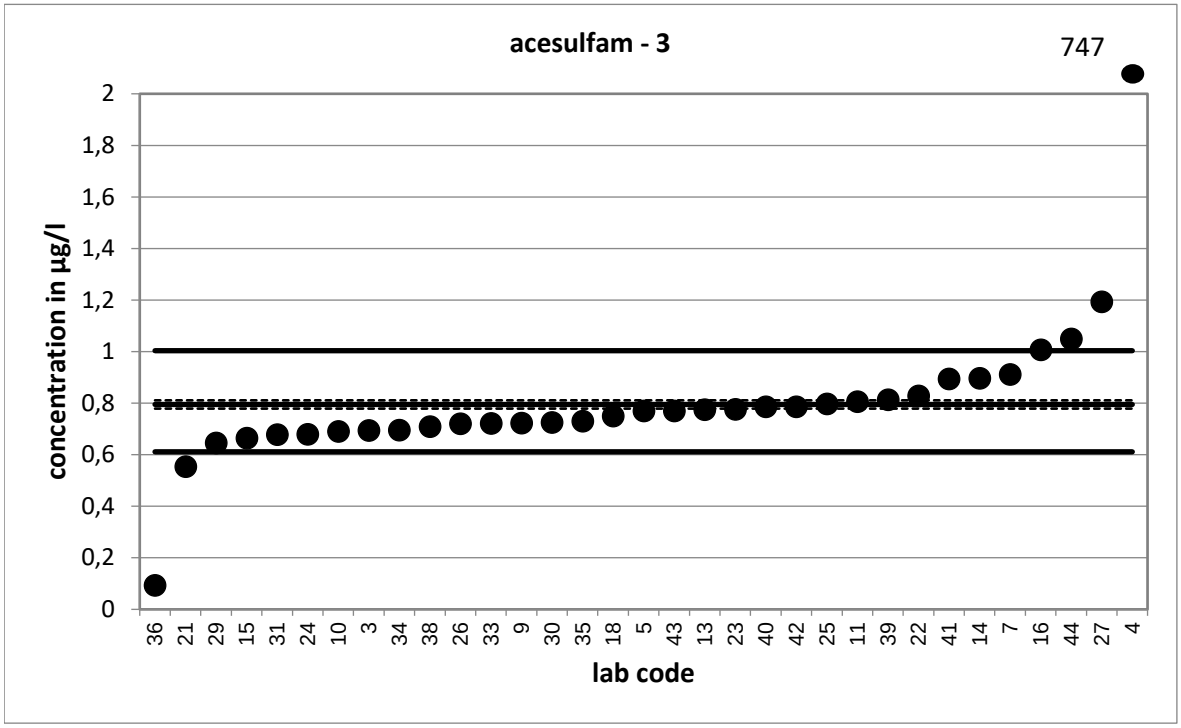

acesulfam - 2
86,3
expanded uncertainty in µg/l
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
24
10
25
23
7
35
29
21
3
22
31
14
4
lab code

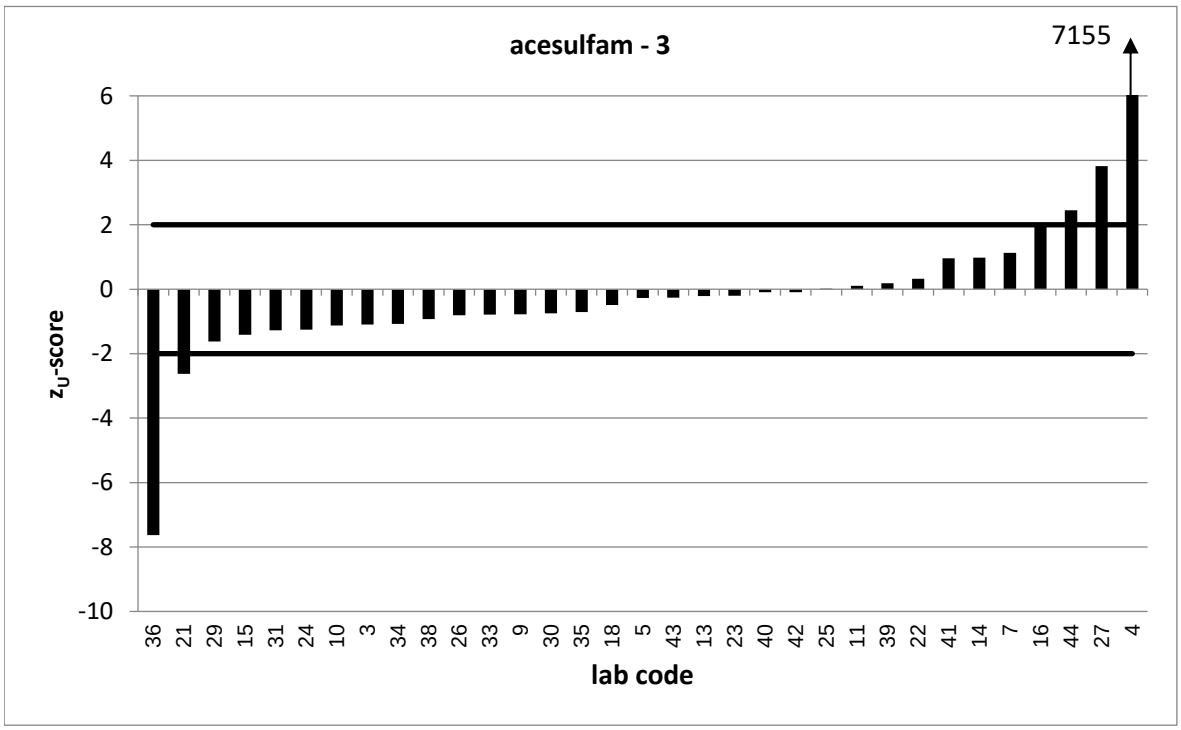

acesulfam - 2
ζ-Score
10
8
6
4
2
0
-2
-4
-6
-8
24
10
29
21
35
3
31
25
23
22
14
7
4
lab code

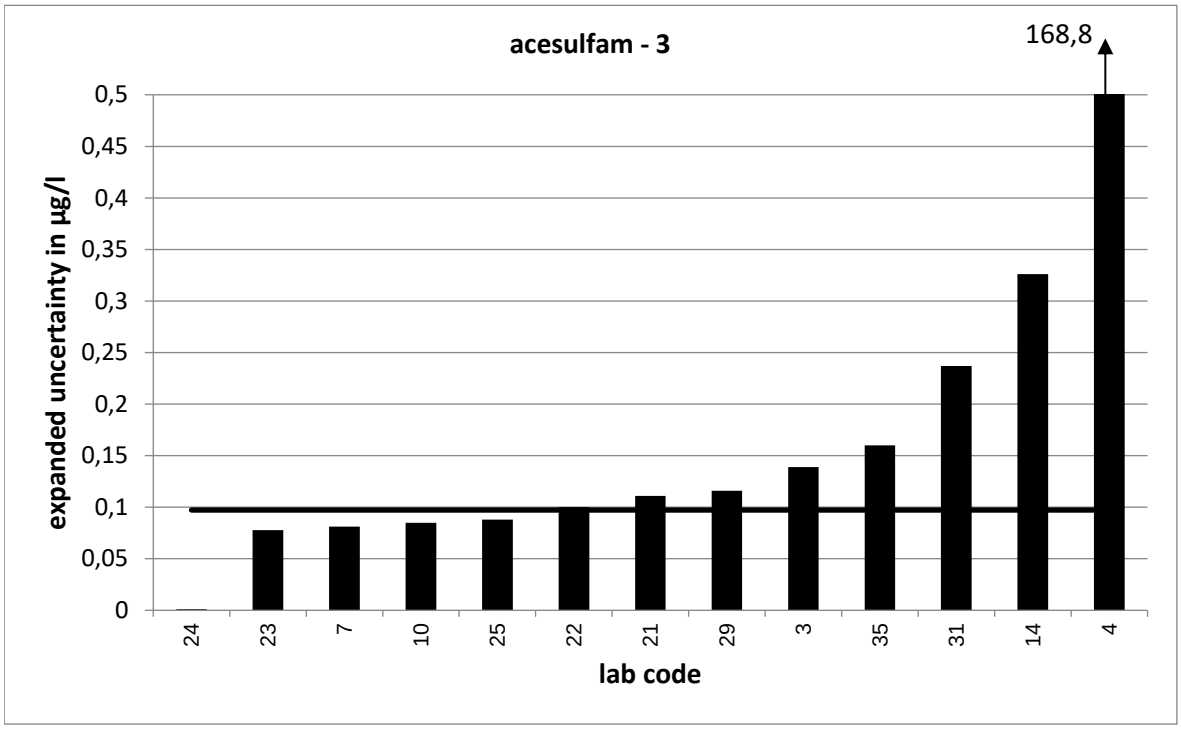
PT 3/19 - TW S1		acesulfam - 3			
assigned value [µg/l]*			0,7949	± 0,016	
upper tolerance limit [µg/l]			1,003		
lower tolerance limit [µg/l]			0,6112		
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,694	0,139	-1,4	-1,1	s
4	747	186,8	8,0	7155,2	u
5	0,77			-0,3	s
7	0,912	0,081	2,8	1,1	s
9	0,723			-0,8	s
10	0,691	0,085	-2,4	-1,1	s
11	0,806			0,1	s
13	0,775			-0,2	s
14	0,897	0,326	0,6	1,0	s
15	0,6651			-1,4	s
16	1,007			2,0	s
18	0,75			-0,5	s
21	0,554	0,111	-4,3	-2,6	q
22	0,829	0,1	0,7	0,3	s
23	0,7764	0,078	-0,5	-0,2	s
24	0,68	0,001	-14,3	-1,3	s
25	0,797	0,088	0,0	0,0	s
26	0,721			-0,8	s
27	1,193			3,8	u
29	0,646	0,116	-2,5	-1,6	s
30	0,726			-0,7	s
31	0,678	0,237	-1,0	-1,3	s
33	0,722			-0,8	s
34	0,696			-1,1	s
35	0,73	0,16	-0,8	-0,7	s
36	0,0939			-7,6	u
38	0,71			-0,9	s
39	0,814			0,2	s
40	0,786			-0,1	s
41	0,895			1,0	s
42	0,786			-0,1	s
43	0,7705			-0,3	s
44	1,05			2,4	q

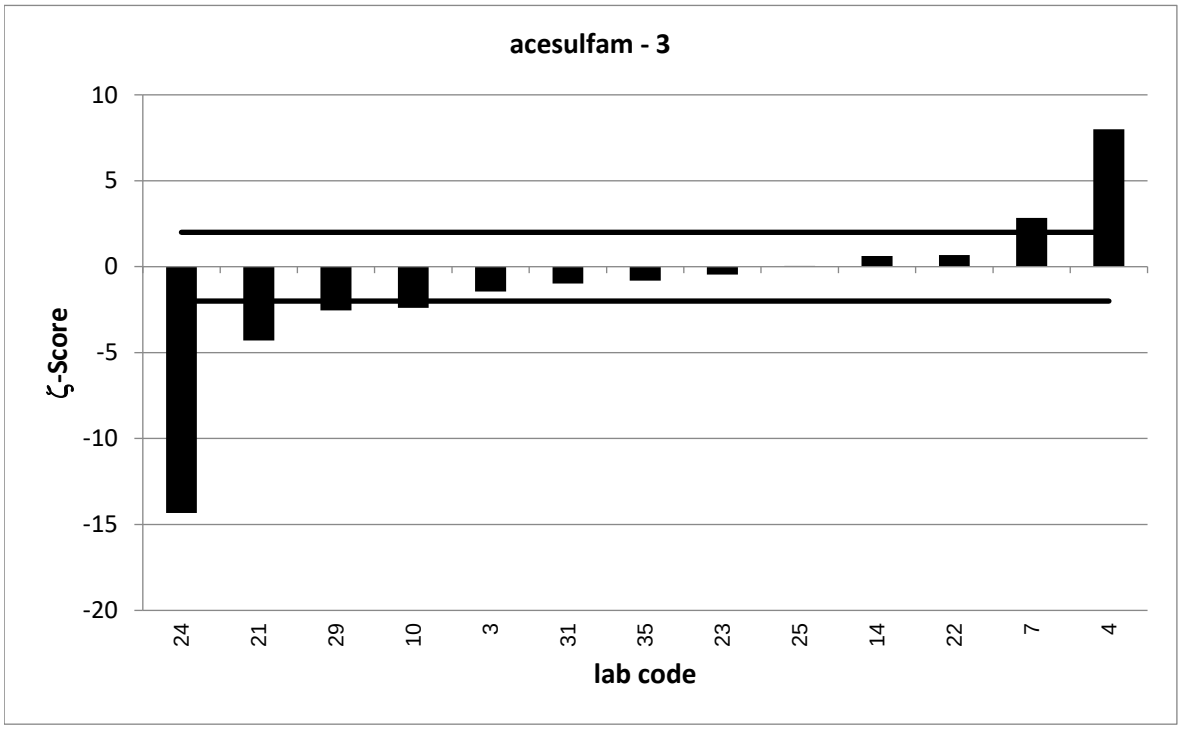
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


acesulfam - 3
747
concentration in µg/l
2
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
36 21 29 15 31 24 10 3 34 38 26 33 9 30 35 18 5 43 13 23 40 42 25 11 39 22 41 14 7 16 44 27 4
lab code


acesulfam - 3
7155
z_U-score
6
4
2
0
-2
-4
-6
-8
-10
36 21 29 15 31 24 10 3 34 38 26 33 9 30 35 18 5 43 13 23 40 42 25 11 39 22 41 14 7 16 44 27 4
lab code

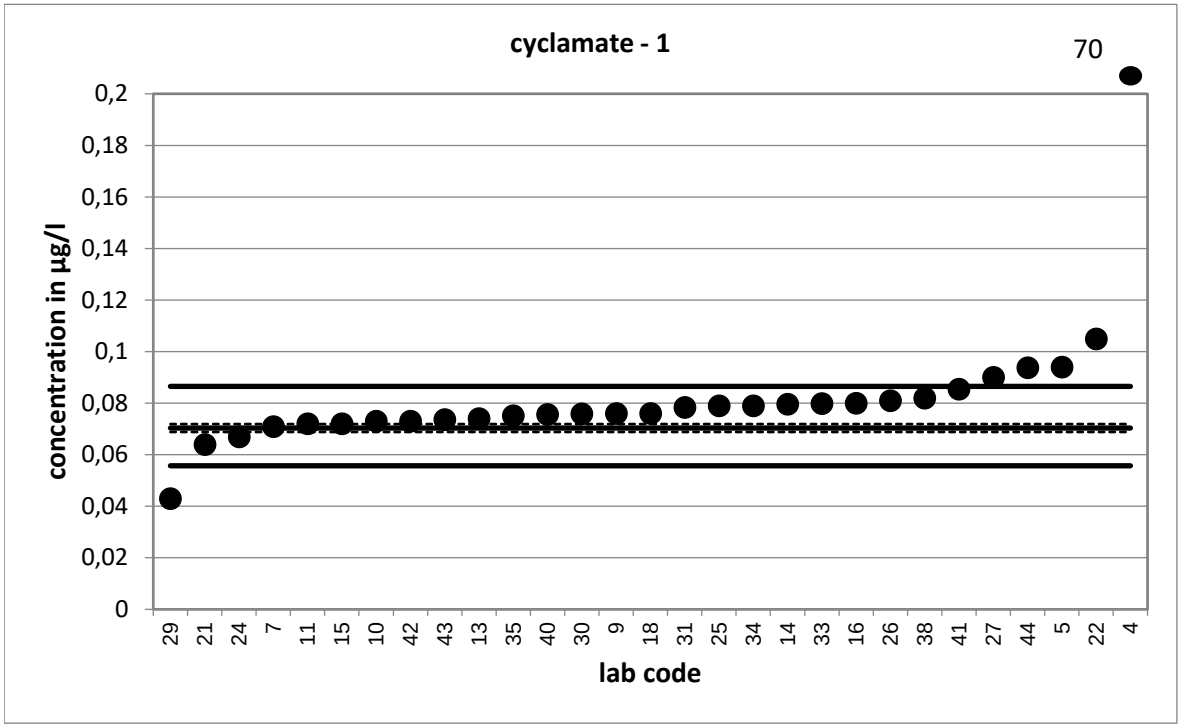

acesulfam - 3
168,8
expanded uncertainty in µg/l
0,5
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
24
23
7
10
25
22
21
29
3
35
31
14
4
lab code

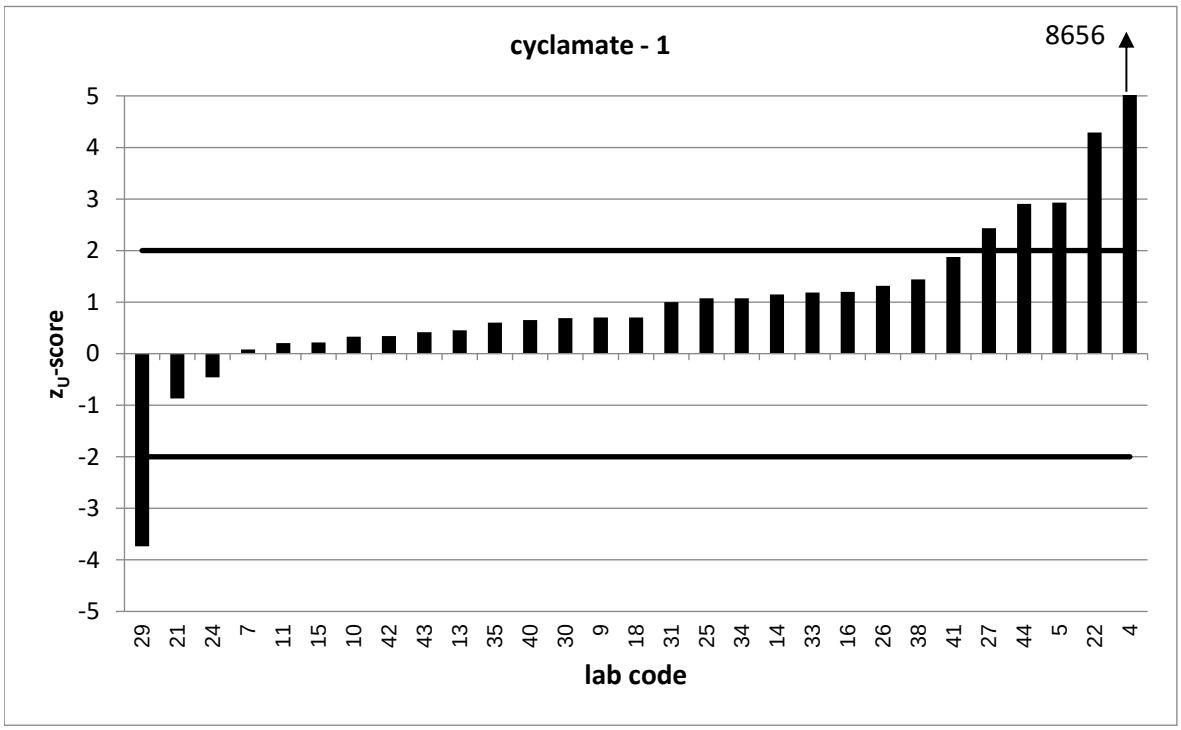

acesulfam - 3
ζ-Score
10
5
0
-5
-10
-15
-20
24
21
29
10
3
31
35
23
25
14
22
7
4
lab code

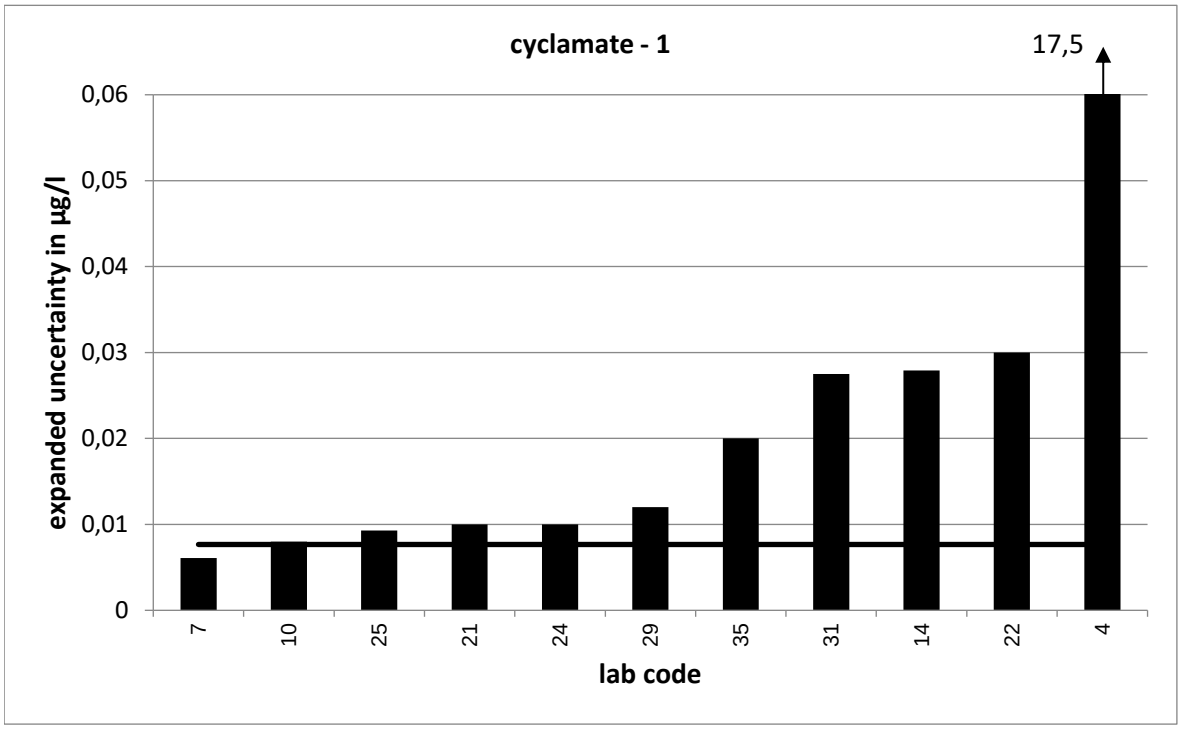
PT 3/19 - TW S1		cyclamate - 1			
assigned value [µg/l]*		0,07035	± 0,00155		
upper tolerance limit [µg/l]		0,08651			
lower tolerance limit [µg/l]		0,0557			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
4	70	17,5	8,0	8655,7	u
5	0,094			2,9	q
7	0,071	0,006	0,2	0,1	s
9	0,076			0,7	s
10	0,073	0,008	0,7	0,3	s
11	0,072			0,2	s
13	0,074			0,5	s
14	0,0796	0,028	0,7	1,1	s
15	0,07208			0,2	s
16	0,08			1,2	s
18	0,076			0,7	s
21	0,064	0,01	-1,3	-0,9	s
22	0,105	0,03	2,3	4,3	u
24	0,067	0,01	-0,7	-0,5	s
25	0,079	0,009	1,8	1,1	s
26	0,081			1,3	s
27	0,09			2,4	q
29	0,043	0,012	-4,5	-3,7	u
30	0,0759			0,7	s
31	0,0784	0,028	0,6	1,0	s
33	0,0799			1,2	s
34	0,079			1,1	s
35	0,0752	0,02	0,5	0,6	s
38	0,082			1,4	s
40	0,0756			0,7	s
41	0,0855			1,9	s
42	0,0731			0,3	s
43	0,0737			0,4	s
44	0,0938			2,9	q

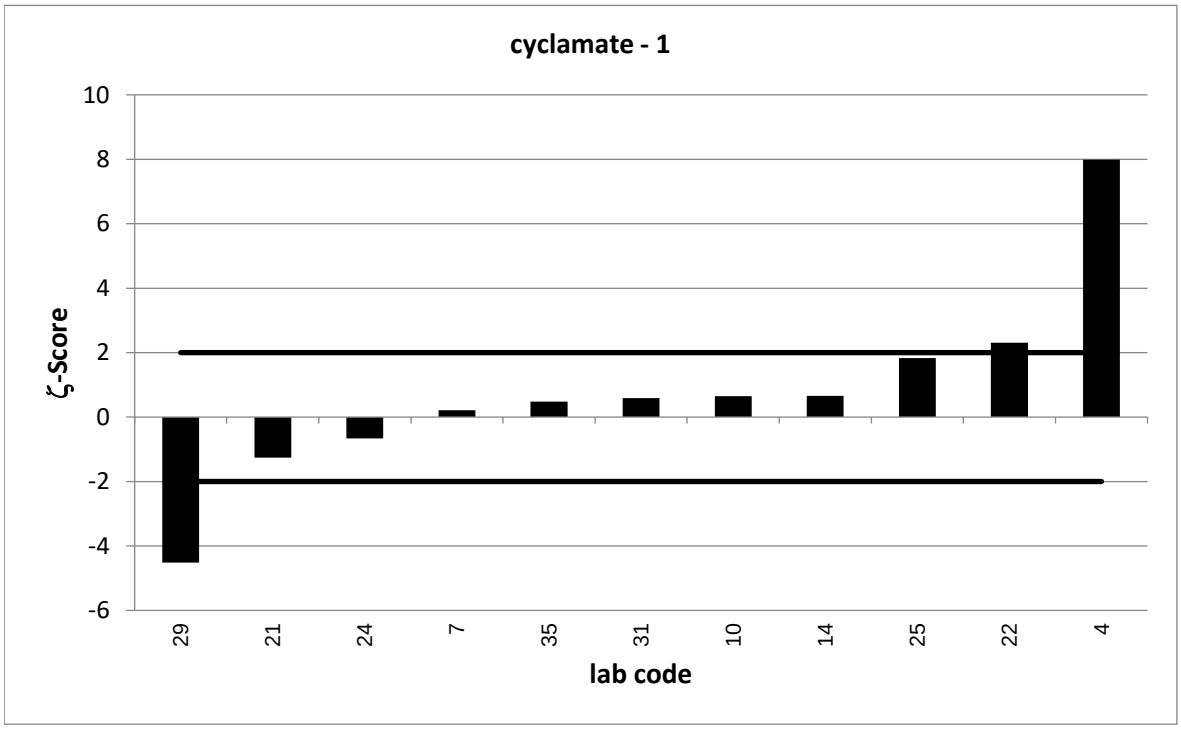
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


cyclamate - 1
70
concentration in µg/l
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
29 21 24 7 11 15 10 42 43 13 35 40 30 9 18 31 25 34 14 33 16 26 38 41 27 44 5 22 4
lab code


cyclamate - 1
8656
z_U-score
5
4
3
2
1
0
-1
-2
-3
-4
-5
29 21 24 7 11 15 10 42 43 13 35 40 30 9 18 31 25 34 14 33 16 26 38 41 27 44 5 22 4
lab code

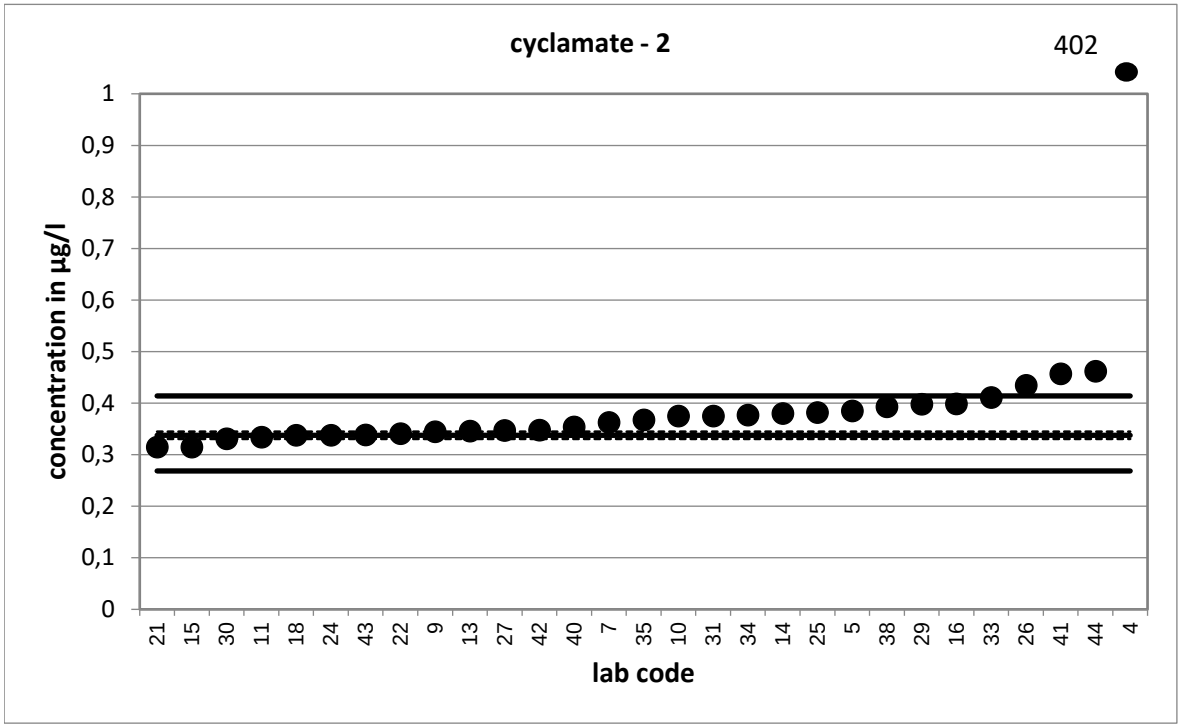

cyclamate - 1
17,5
0,06
0,05
0,04
0,03
0,02
0,01
0
expanded uncertainty in µg/l
7
10
25
21
24
29
35
31
14
22
4
lab code

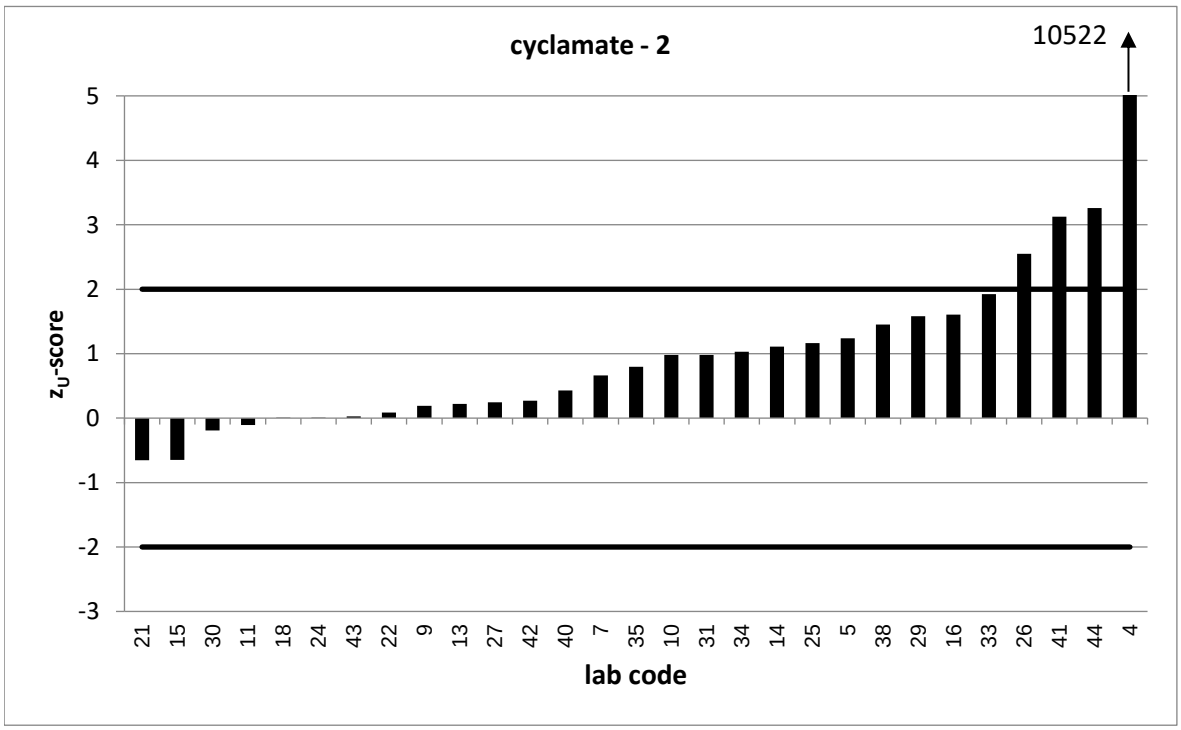

cyclamate - 1
10
8
6
4
2
0
-2
-4
-6
ζ-Score
29
21
24
7
35
31
10
14
25
22
4
lab code

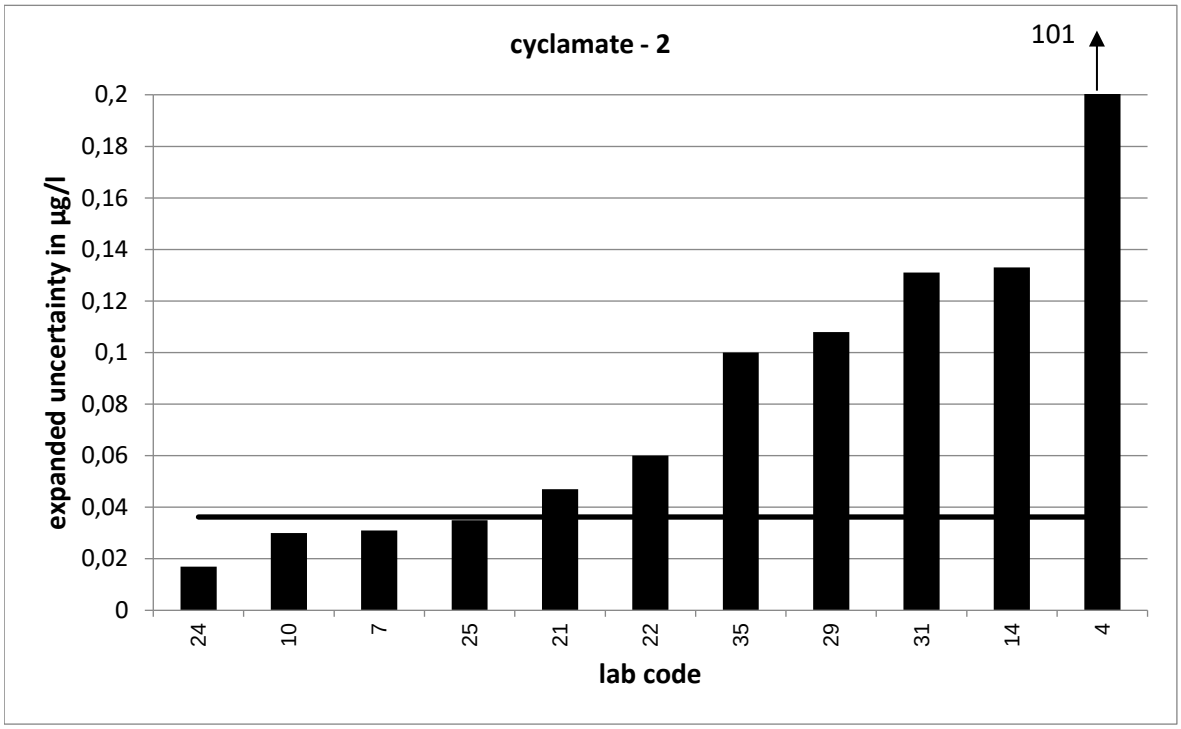
PT 3/19 - TW S1		cyclamate - 2			
assigned value [µg/l]*			0,3377	± 0,007	
upper tolerance limit [µg/l]			0,414		
lower tolerance limit [µg/l]			0,2685		
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
4	402	101	8,0	10521,9	u
5	0,385			1,2	s
7	0,363	0,031	1,6	0,7	s
9	0,345			0,2	s
10	0,375	0,03	2,4	1,0	s
11	0,334			-0,1	s
13	0,346			0,2	s
14	0,38	0,133	0,6	1,1	s
15	0,3152			-0,6	s
16	0,399			1,6	s
18	0,338			0,0	s
21	0,315	0,047	-1,0	-0,7	s
22	0,341	0,06	0,1	0,1	s
24	0,338	0,017	0,0	0,0	s
25	0,382	0,035	2,5	1,2	s
26	0,435			2,5	q
27	0,347			0,2	s
29	0,398	0,108	1,1	1,6	s
30	0,331			-0,2	s
31	0,375	0,131	0,6	1,0	s
33	0,411			1,9	s
34	0,377			1,0	s
35	0,368	0,1	0,6	0,8	s
38	0,393			1,4	s
40	0,354			0,4	s
41	0,457			3,1	u
42	0,348			0,3	s
43	0,3386			0,0	s
44	0,462			3,3	u

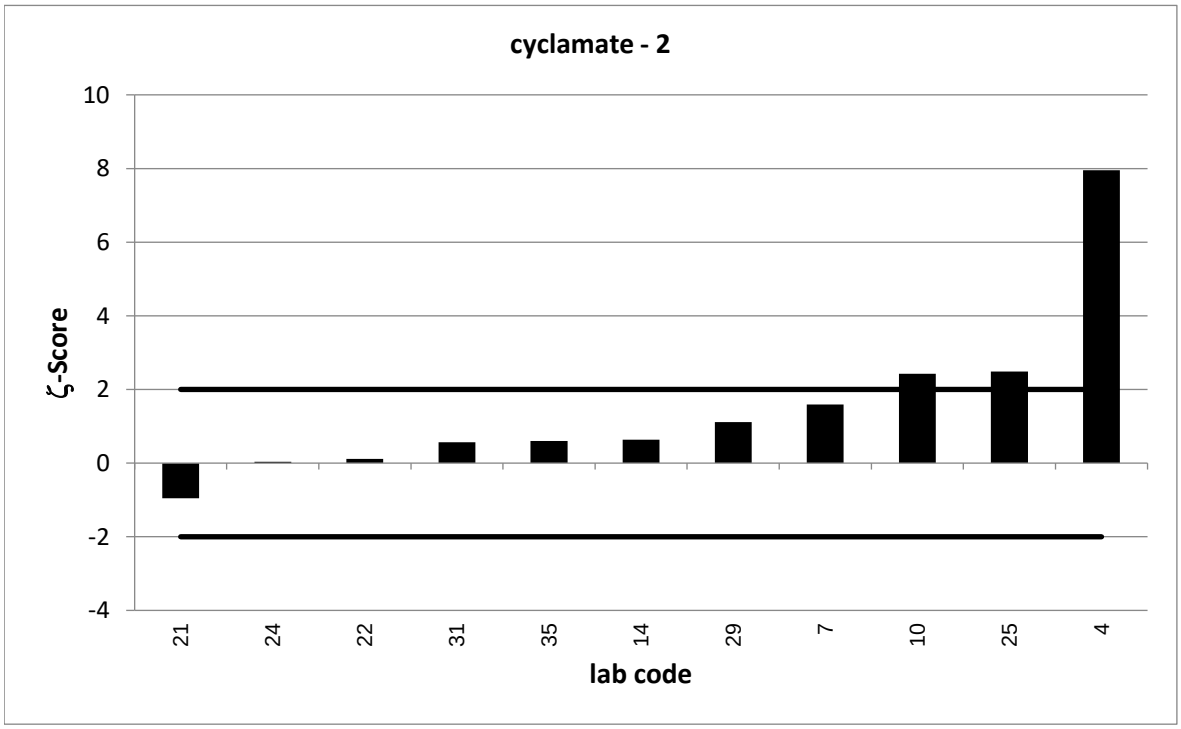
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


cyclamate - 2
402
concentration in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
21 15 30 11 18 24 43 22 9 13 27 42 40 7 35 10 31 34 14 25 5 38 29 16 33 26 41 44 4
lab code


cyclamate - 2
10522
z_U-score
5
4
3
2
1
0
-1
-2
-3
21 15 30 11 18 24 43 22 9 13 27 42 40 7 35 10 31 34 14 25 5 38 29 16 33 26 41 44 4
lab code

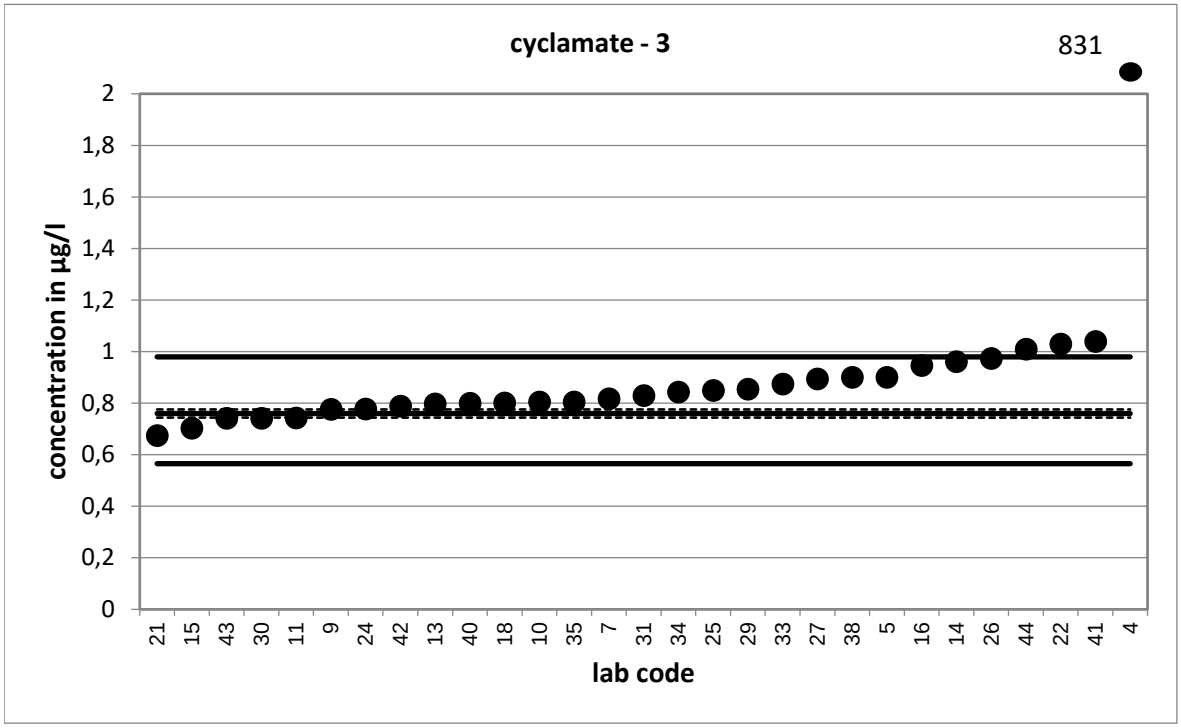

cyclamate - 2
101
expanded uncertainty in µg/l
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
24
10
7
25
21
22
35
29
31
14
4
lab code

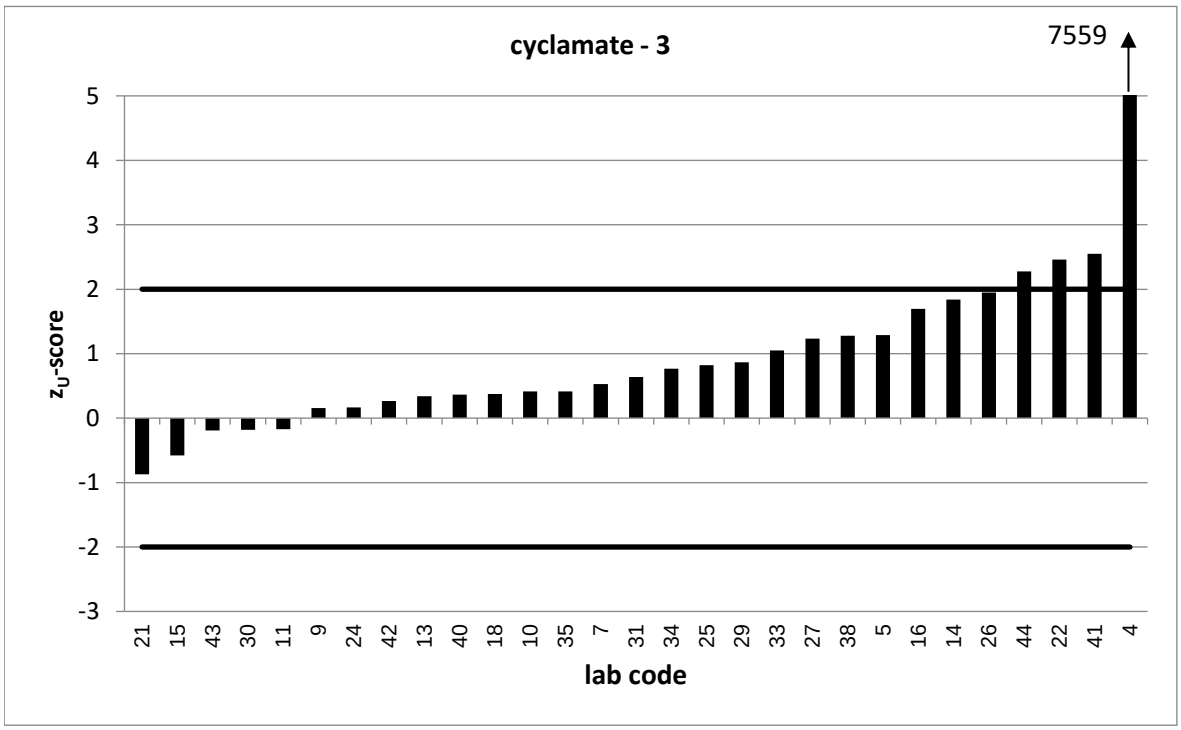

cyclamate - 2
ζ-Score
10
8
6
4
2
0
-2
-4
21
24
22
31
35
14
29
7
10
25
4
lab code

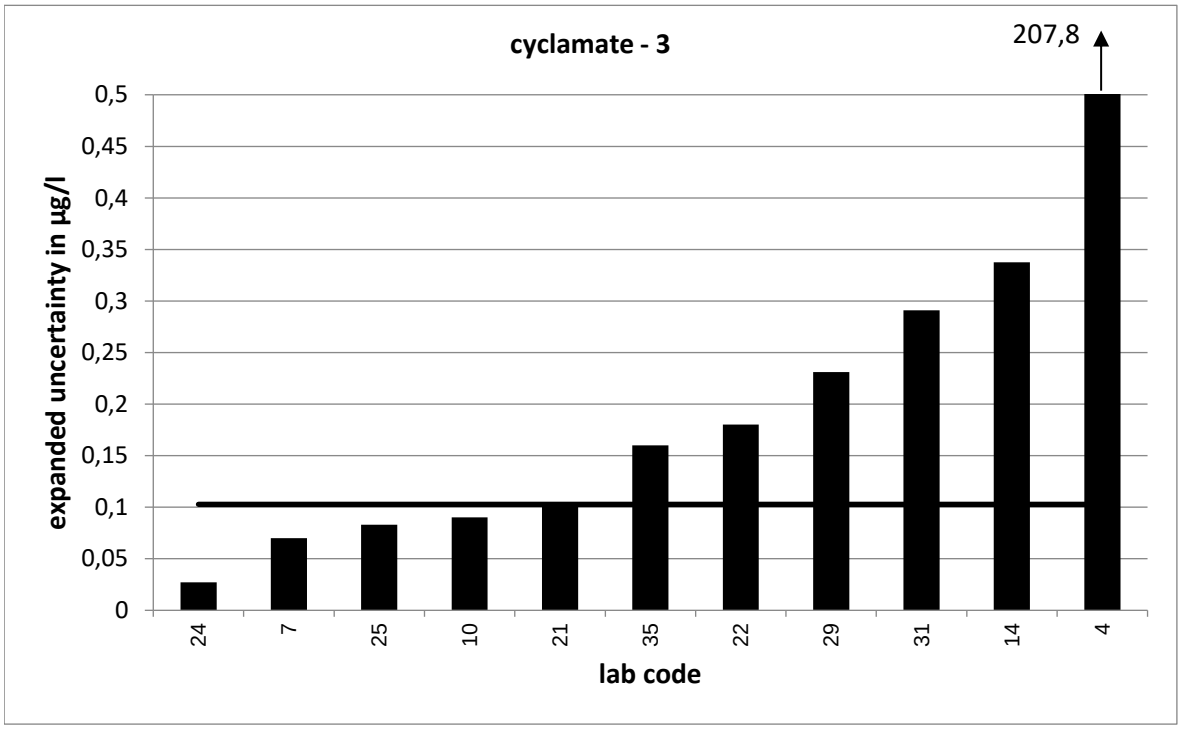
PT 3/19 - TW S1		cyclamate - 3			
assigned value [µg/l]*		0,7598	± 0,0158		
upper tolerance limit [µg/l]		0,9794			
lower tolerance limit [µg/l]		0,5652			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
4	831	207,8	8,0	7558,7	u
5	0,901			1,3	s
7	0,818	0,07	1,6	0,5	s
9	0,777			0,2	s
10	0,805	0,09	1,0	0,4	s
11	0,743			-0,2	s
13	0,797			0,3	s
14	0,962	0,338	1,2	1,8	s
15	0,7036			-0,6	s
16	0,946			1,7	s
18	0,801			0,4	s
21	0,675	0,101	-1,7	-0,9	s
22	1,03	0,18	3,0	2,5	q
24	0,778	0,027	1,2	0,2	s
25	0,85	0,083	2,1	0,8	s
26	0,974			2,0	s
27	0,895			1,2	s
29	0,855	0,231	0,8	0,9	s
30	0,742			-0,2	s
31	0,83	0,291	0,5	0,6	s
33	0,875			1,0	s
34	0,844			0,8	s
35	0,805	0,16	0,6	0,4	s
38	0,9			1,3	s
40	0,8			0,4	s
41	1,04			2,6	q
42	0,789			0,3	s
43	0,7411			-0,2	s
44	1,01			2,3	q

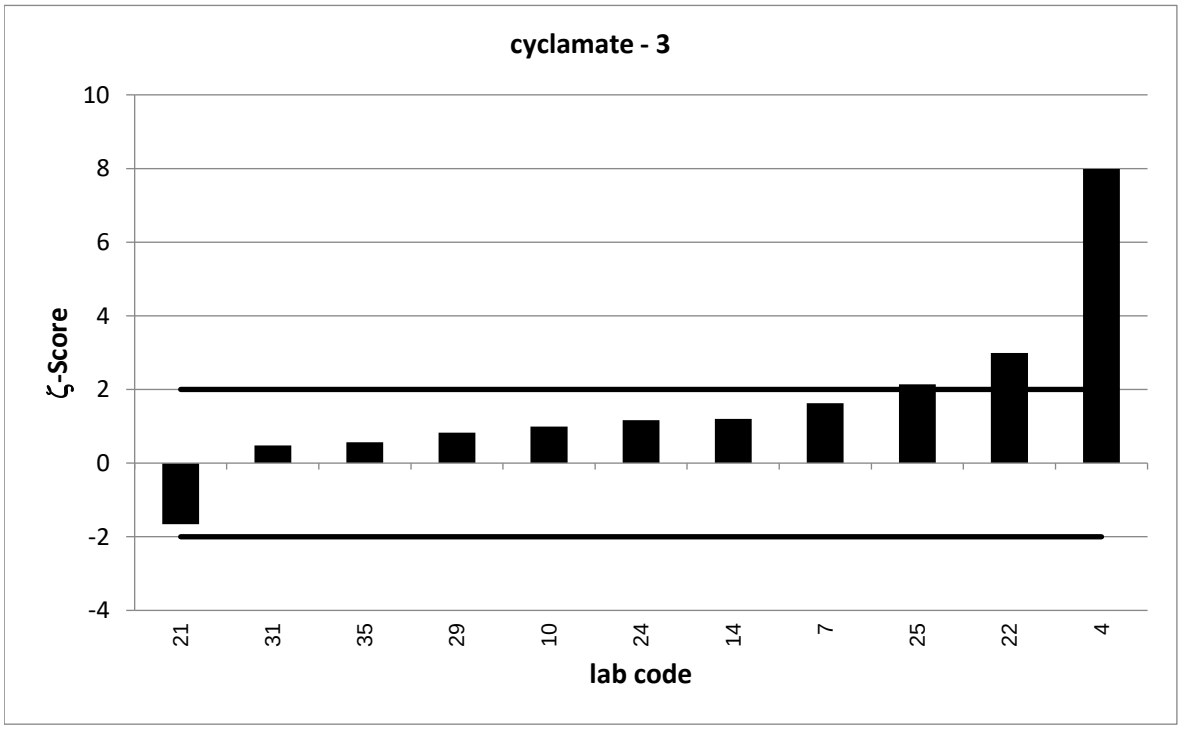
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


cyclamate - 3
831
concentration in µg/l
2
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
21 15 43 30 11 9 24 42 13 40 18 10 35 7 31 34 25 29 33 27 38 5 16 14 26 44 22 41 4
lab code


cyclamate - 3
7559
z_U-score
5
4
3
2
1
0
-1
-2
-3
21 15 43 30 11 9 24 42 13 40 18 10 35 7 31 34 25 29 33 27 38 5 16 14 26 44 22 41 4
lab code

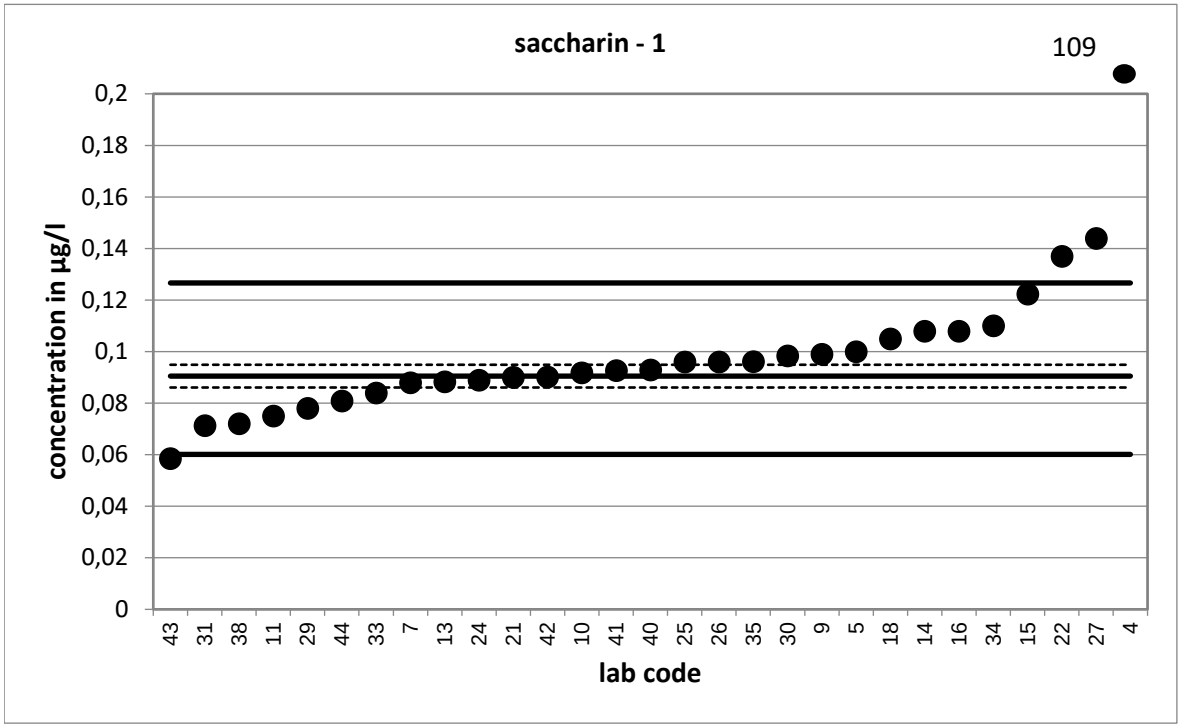

cyclamate - 3
207,8
expanded uncertainty in µg/l
0,5
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
24
7
25
10
21
35
22
29
31
14
4
lab code

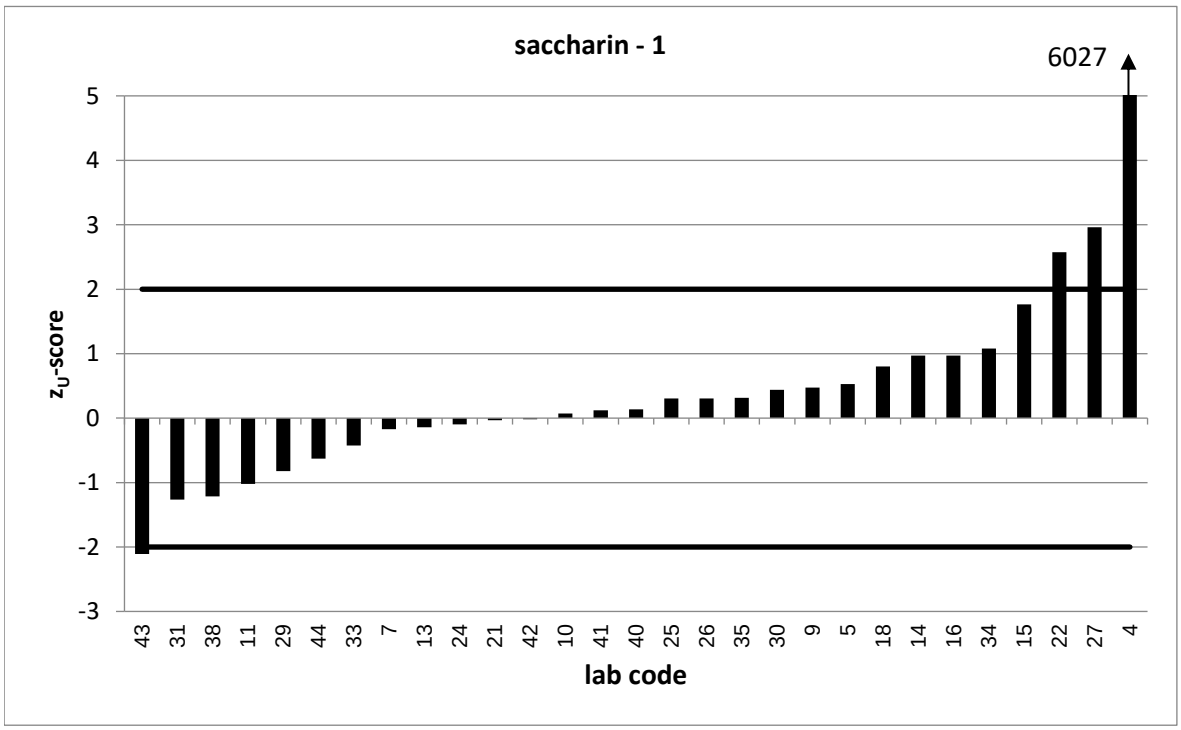

cyclamate - 3
ζ-Score
10
8
6
4
2
0
-2
-4
21
31
35
29
10
24
14
7
25
22
4
lab code

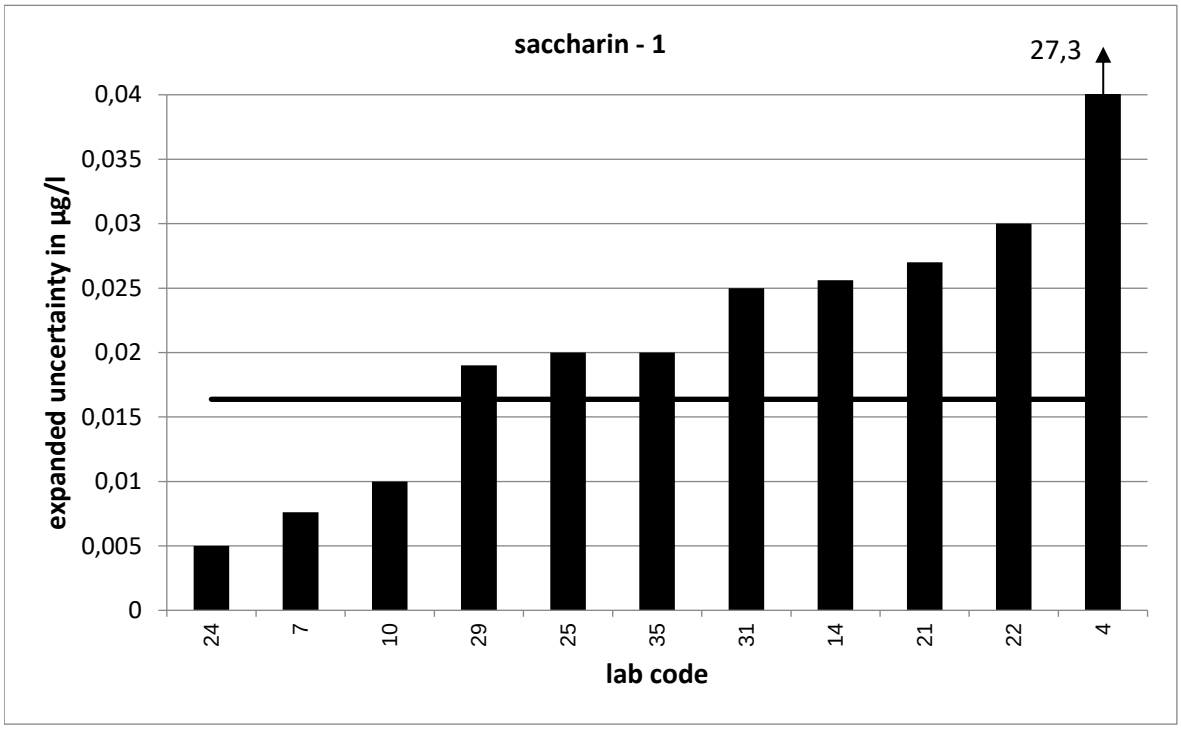
PT 3/19 - TW S1		saccharin - 1			
assigned value [µg/l]*		0,09048	± 0,00441		
upper tolerance limit [µg/l]		0,1266			
lower tolerance limit [µg/l]		0,06012			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
4	109	27,3	8,0	6027,0	u
5	0,1			0,5	s
7	0,0879	0,008	-0,6	-0,2	s
9	0,099			0,5	s
10	0,0918	0,01	0,2	0,1	s
11	0,075			-1,0	s
13	0,0883			-0,1	s
14	0,108	0,026	1,3	1,0	s
15	0,1224			1,8	s
16	0,108			1,0	s
18	0,105			0,8	s
21	0,09	0,027	0,0	0,0	s
22	0,137	0,03	3,1	2,6	q
24	0,089	0,005	-0,4	-0,1	s
25	0,096	0,02	0,5	0,3	s
26	0,096			0,3	s
27	0,144			3,0	u
29	0,078	0,019	-1,3	-0,8	s
30	0,0984			0,4	s
31	0,0713	0,025	-1,5	-1,3	s
33	0,084			-0,4	s
34	0,11			1,1	s
35	0,0962	0,02	0,6	0,3	s
38	0,072			-1,2	s
40	0,0929			0,1	s
41	0,0927			0,1	s
42	0,0902			0,0	s
43	0,0585			-2,1	q
44	0,0809			-0,6	s

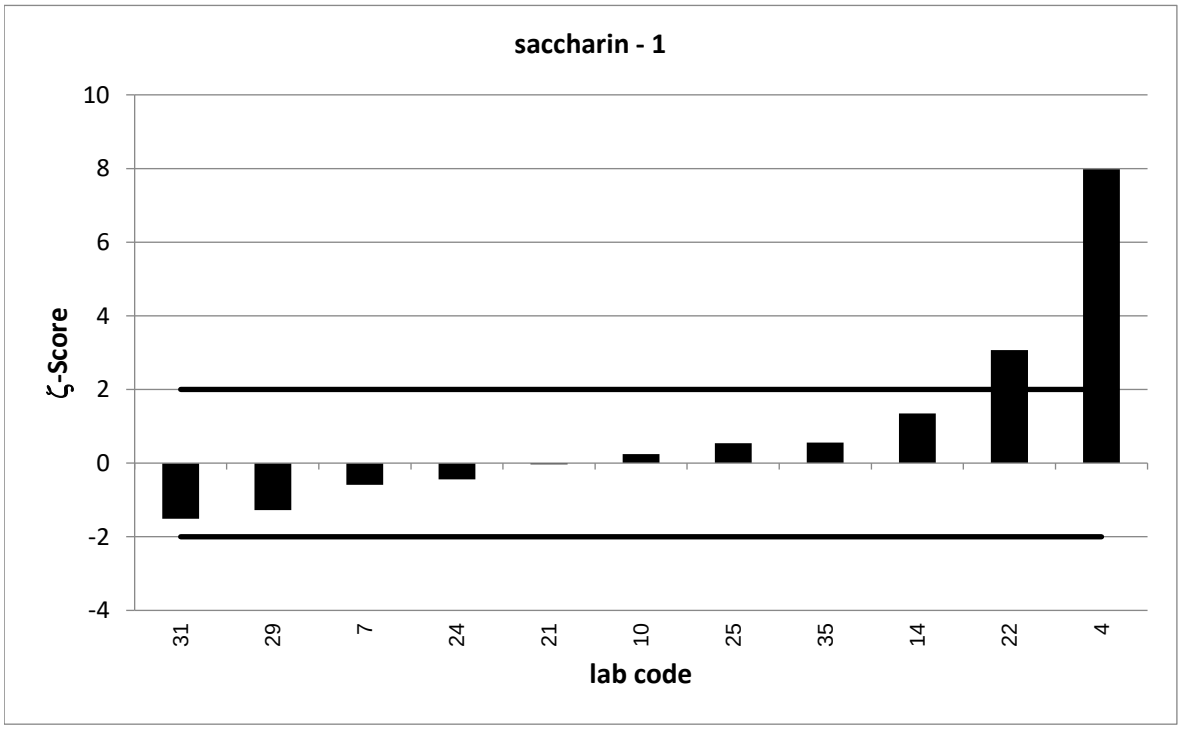
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


saccharin - 1
109
concentration in µg/l
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
43 31 38 11 29 44 33 7 13 24 21 42 10 41 40 25 26 35 30 9 5 18 14 16 34 15 22 27 4
lab code


saccharin - 1
6027
z_U-score
5
4
3
2
1
0
-1
-2
-3
43 31 38 11 29 44 33 7 13 24 21 42 10 41 40 25 26 35 30 9 5 18 14 16 34 15 22 27 4
lab code

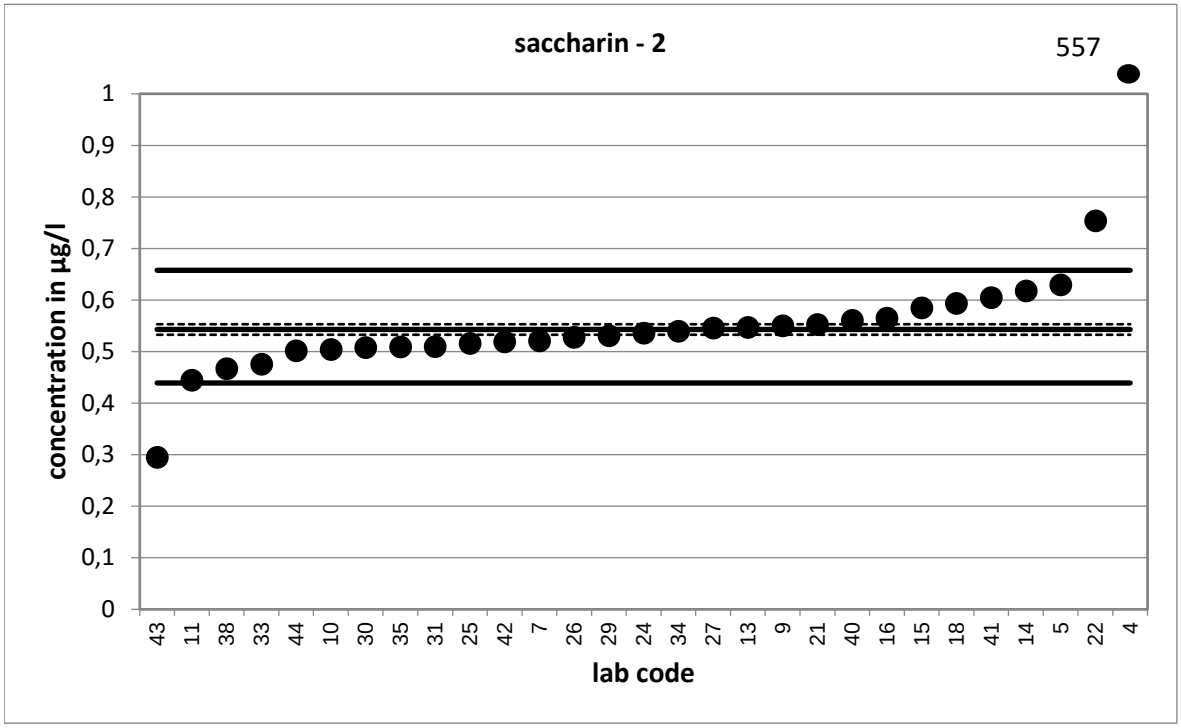

saccharin - 1
27,3
expanded uncertainty in µg/l
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
24
7
10
29
25
35
31
14
21
22
4
lab code

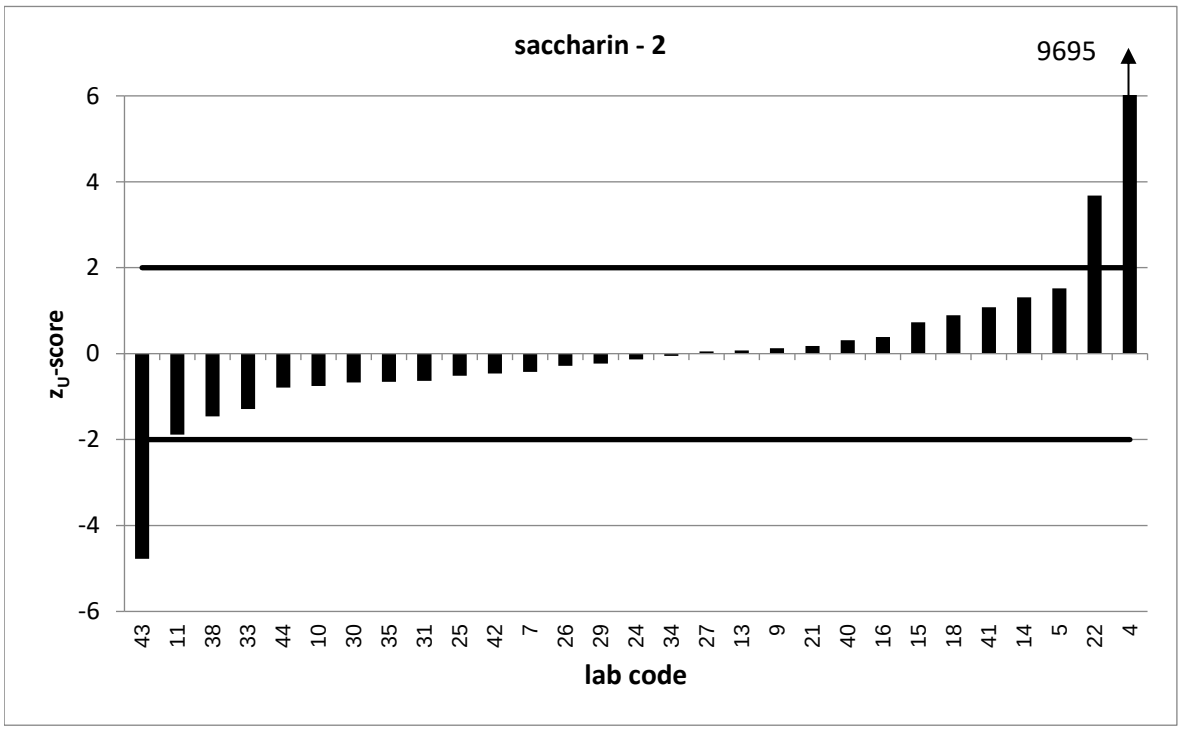

saccharin - 1
ζ-Score
10
8
6
4
2
0
-2
-4
31
29
7
24
21
10
25
35
14
22
4
lab code

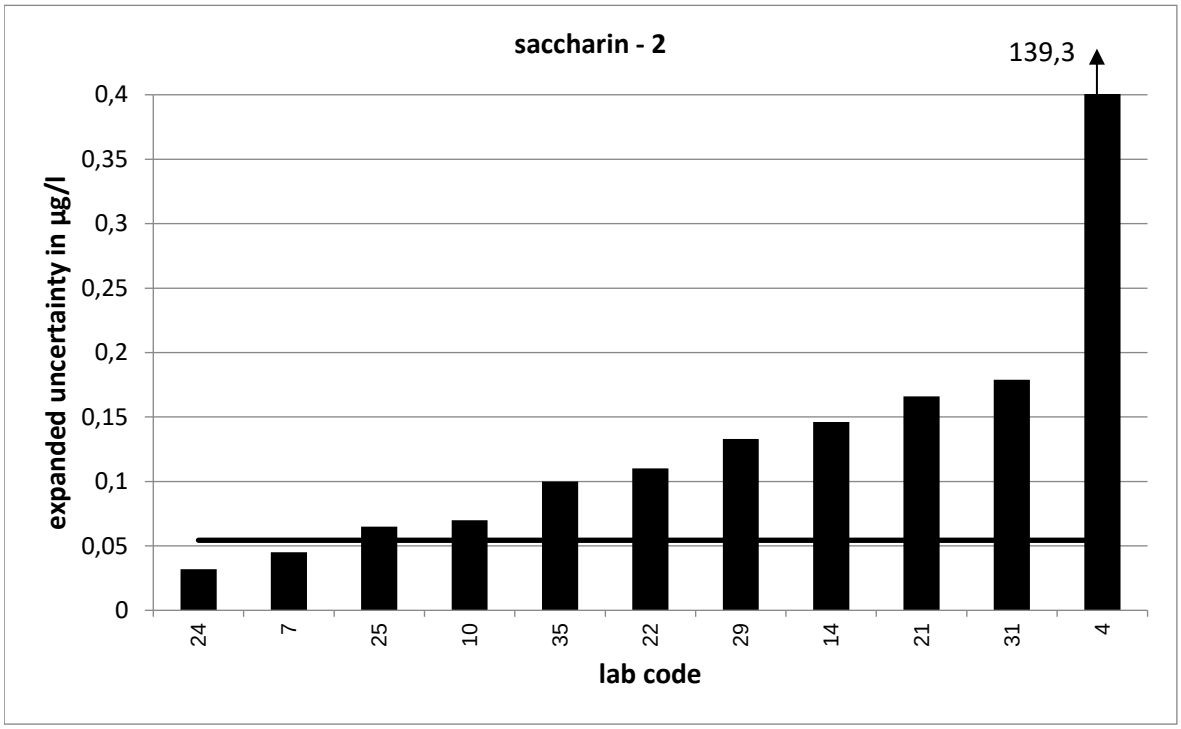
PT 3/19 - TW S1		saccharin - 2			
assigned value [µg/l]*		0,5429	± 0,0102		
upper tolerance limit [µg/l]		0,6577			
lower tolerance limit [µg/l]		0,4391			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
4	557	139,3	8,0	9694,9	u
5	0,63			1,5	s
7	0,521	0,045	-0,9	-0,4	s
9	0,55			0,1	s
10	0,504	0,07	-1,1	-0,7	s
11	0,445			-1,9	s
13	0,547			0,1	s
14	0,618	0,146	1,0	1,3	s
15	0,5849			0,7	s
16	0,565			0,4	s
18	0,594			0,9	s
21	0,553	0,166	0,1	0,2	s
22	0,754	0,11	3,8	3,7	u
24	0,536	0,032	-0,4	-0,1	s
25	0,516	0,065	-0,8	-0,5	s
26	0,528			-0,3	s
27	0,546			0,1	s
29	0,531	0,133	-0,2	-0,2	s
30	0,508			-0,7	s
31	0,51	0,179	-0,4	-0,6	s
33	0,476			-1,3	s
34	0,54			-0,1	s
35	0,509	0,1	-0,7	-0,7	s
38	0,467			-1,5	s
40	0,561			0,3	s
41	0,605			1,1	s
42	0,519			-0,5	s
43	0,295			-4,8	u
44	0,502			-0,8	s

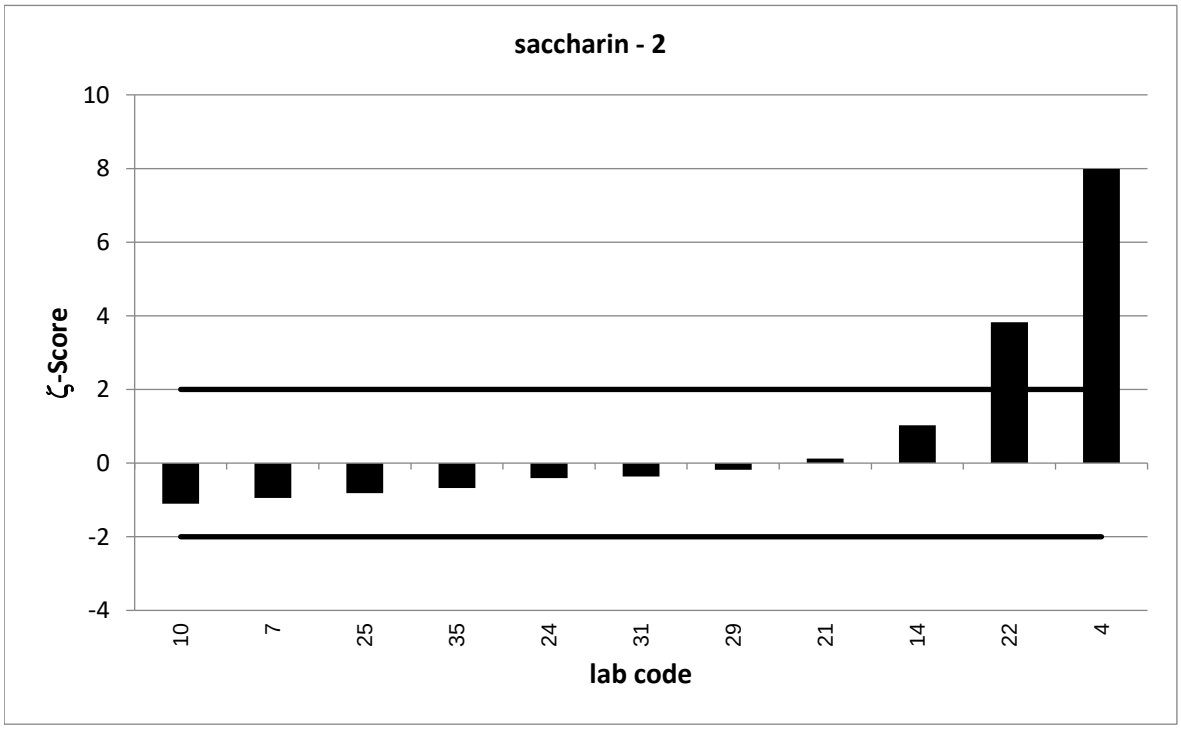
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


saccharin - 2
557
concentration in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
43 11 38 33 44 10 30 35 31 25 42 7 26 29 24 34 27 13 9 21 40 16 15 18 41 14 5 22 4
lab code


saccharin - 2
9695
z_U-score
6
4
2
0
-2
-4
-6
43 11 38 33 44 10 30 35 31 25 42 7 26 29 24 34 27 13 9 21 40 16 15 18 41 14 5 22 4
lab code

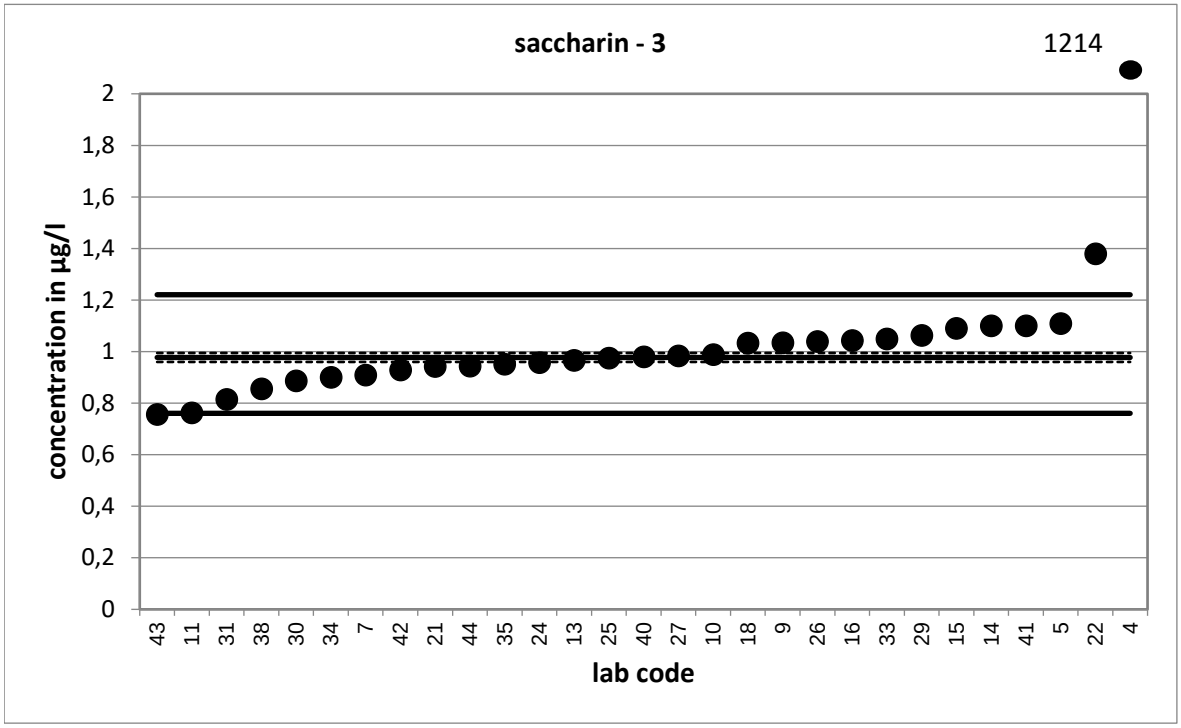

saccharin - 2
139,3
expanded uncertainty in µg/l
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
24
7
25
10
35
22
29
14
21
31
4
lab code

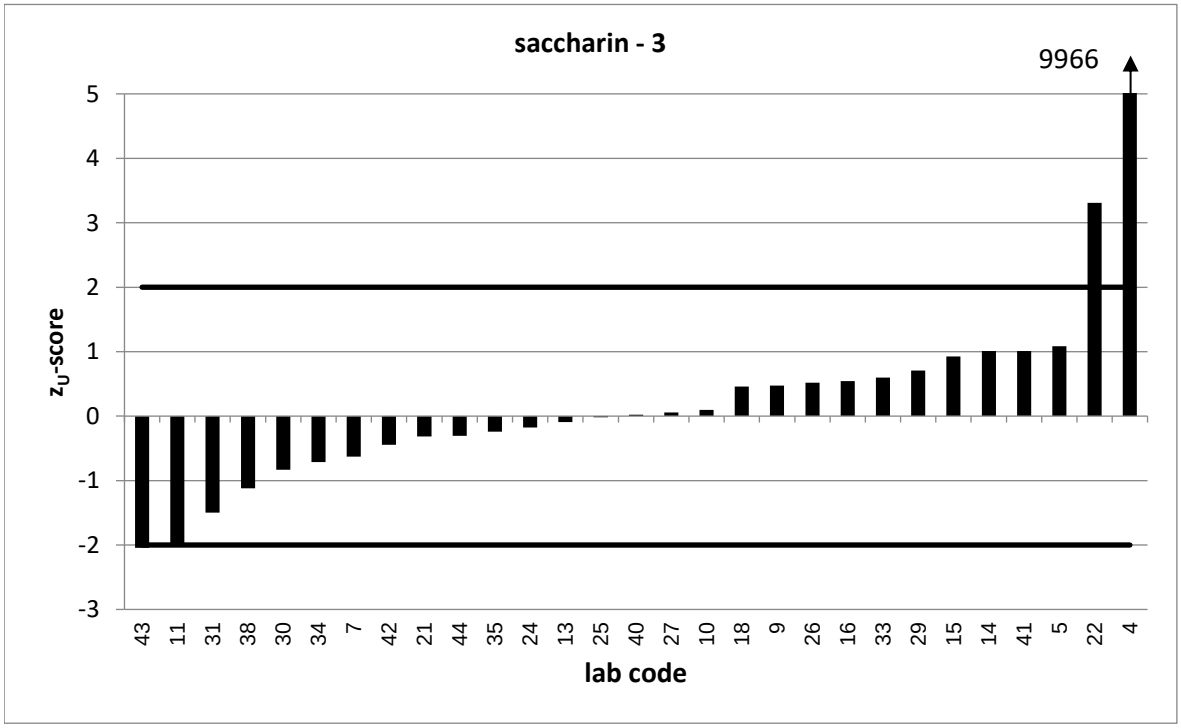

saccharin - 2
ζ-Score
10
8
6
4
2
0
-2
-4
10
7
25
35
24
31
29
21
14
22
4
lab code

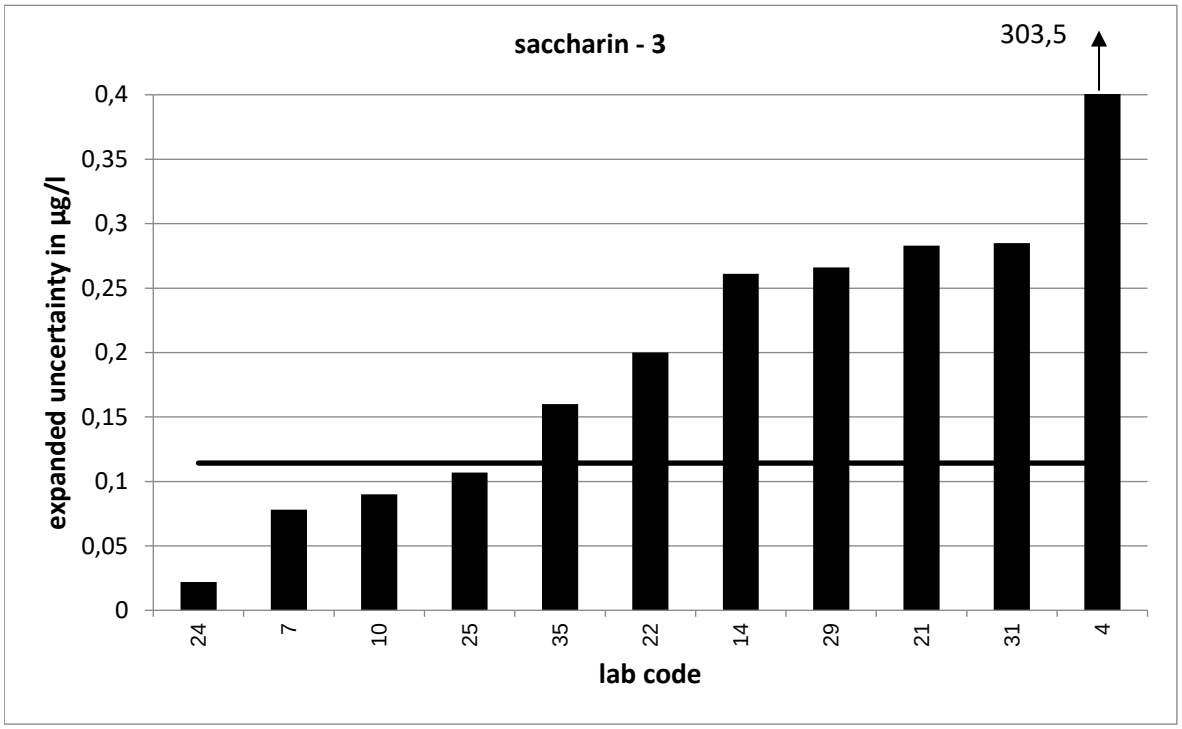
PT 3/19 - TW S1		saccharin - 3			
assigned value [µg/l]*			0,9772	± 0,0174	
upper tolerance limit [µg/l]			1,221		
lower tolerance limit [µg/l]			0,7606		
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
4	1214	303,5	8,0	9965,9	u
5	1,109			1,1	s
7	0,909	0,078	-1,7	-0,6	s
9	1,035			0,5	s
10	0,989	0,09	0,3	0,1	s
11	0,763			-2,0	s
13	0,967			-0,1	s
14	1,1	0,261	0,9	1,0	s
15	1,09			0,9	s
16	1,043			0,5	s
18	1,033			0,5	s
21	0,943	0,283	-0,2	-0,3	s
22	1,38	0,2	4,0	3,3	u
24	0,958	0,022	-1,4	-0,2	s
25	0,975	0,107	0,0	0,0	s
26	1,04			0,5	s
27	0,984			0,1	s
29	1,063	0,266	0,6	0,7	s
30	0,887			-0,8	s
31	0,815	0,285	-1,1	-1,5	s
33	1,05			0,6	s
34	0,9			-0,7	s
35	0,951	0,16	-0,3	-0,2	s
38	0,856			-1,1	s
40	0,98			0,0	s
41	1,1			1,0	s
42	0,929			-0,4	s
43	0,756			-2,0	s
44	0,944			-0,3	s

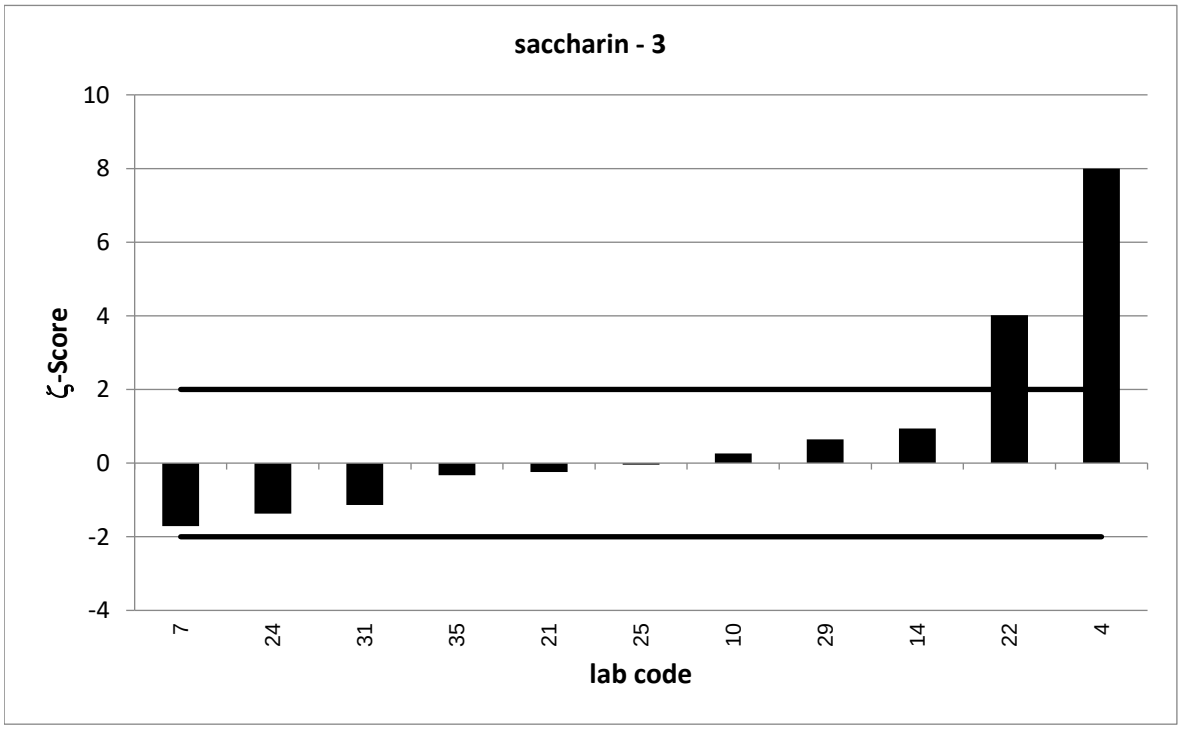
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


saccharin - 3
1214
concentration in µg/l
2
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
43 11 31 38 30 34 7 42 21 44 35 24 13 25 40 27 10 18 9 26 16 33 29 15 14 41 5 22 4
lab code


saccharin - 3
9966
z_U-score
5
4
3
2
1
0
-1
-2
-3
43 11 31 38 30 34 7 42 21 44 35 24 13 25 40 27 10 18 9 26 16 33 29 15 14 41 5 22 4
lab code

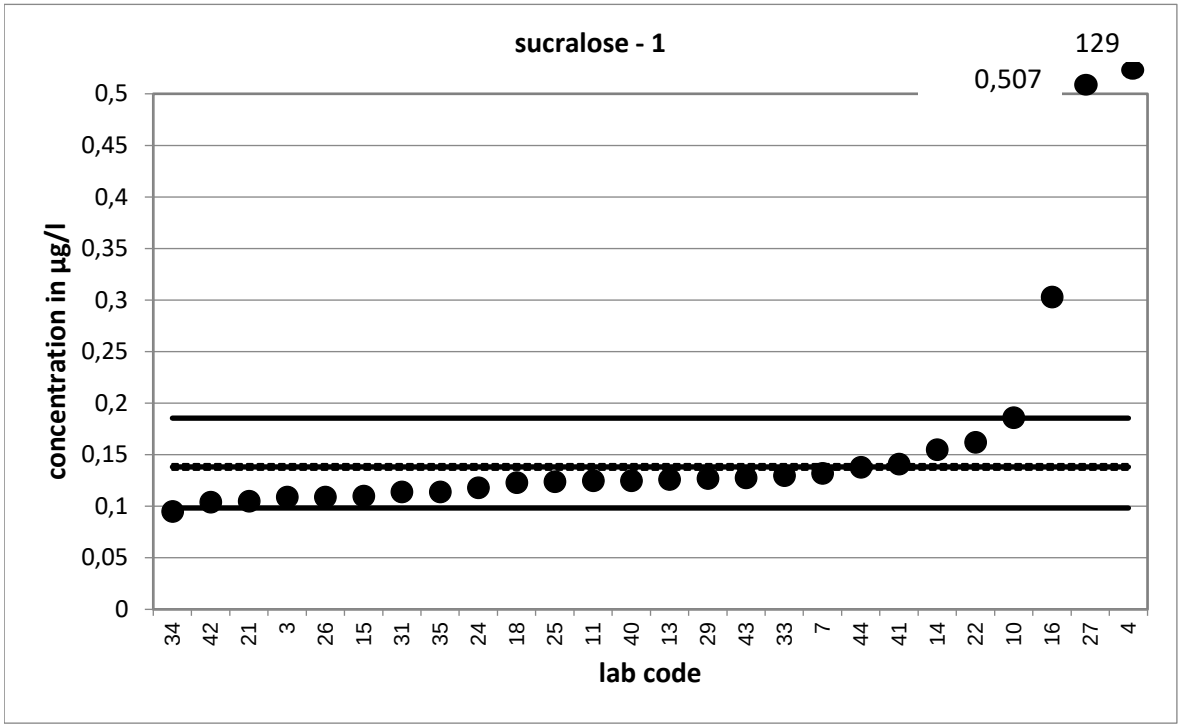

saccharin - 3
303,5
expanded uncertainty in µg/l
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
24
7
10
25
35
22
14
29
21
31
4
lab code

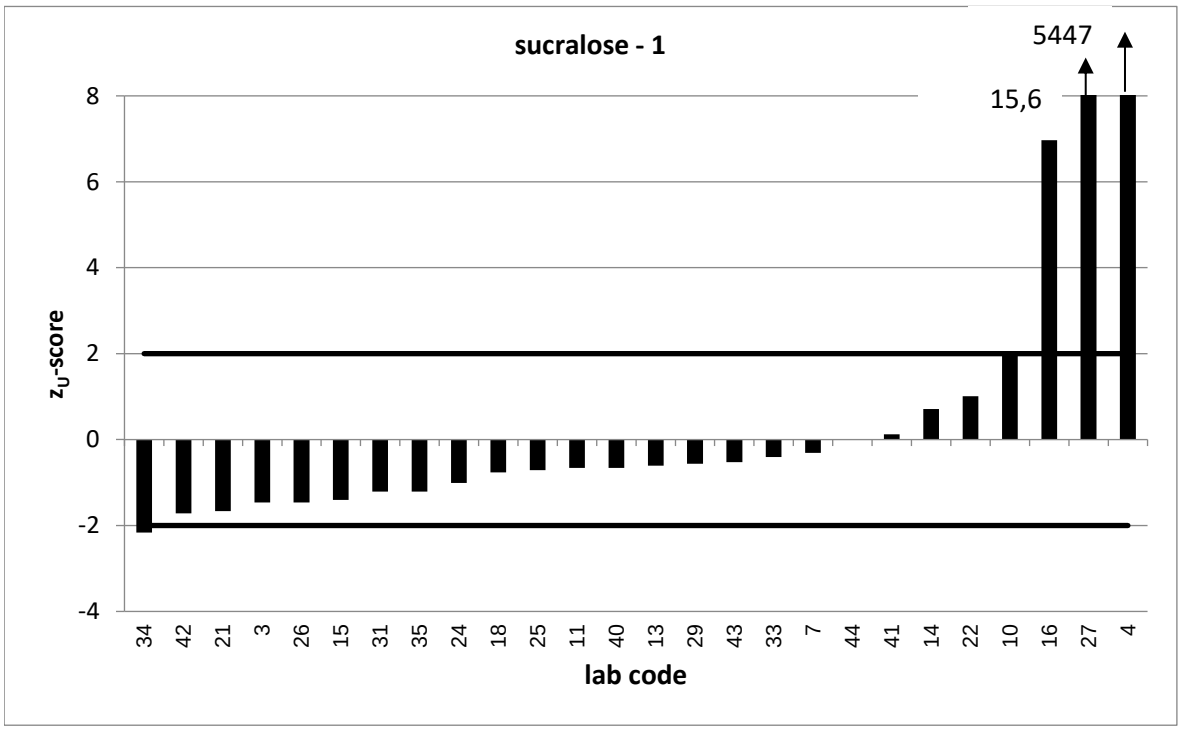

saccharin - 3
ζ-Score
10
8
6
4
2
0
-2
-4
7
24
31
35
21
25
10
29
14
22
4
lab code

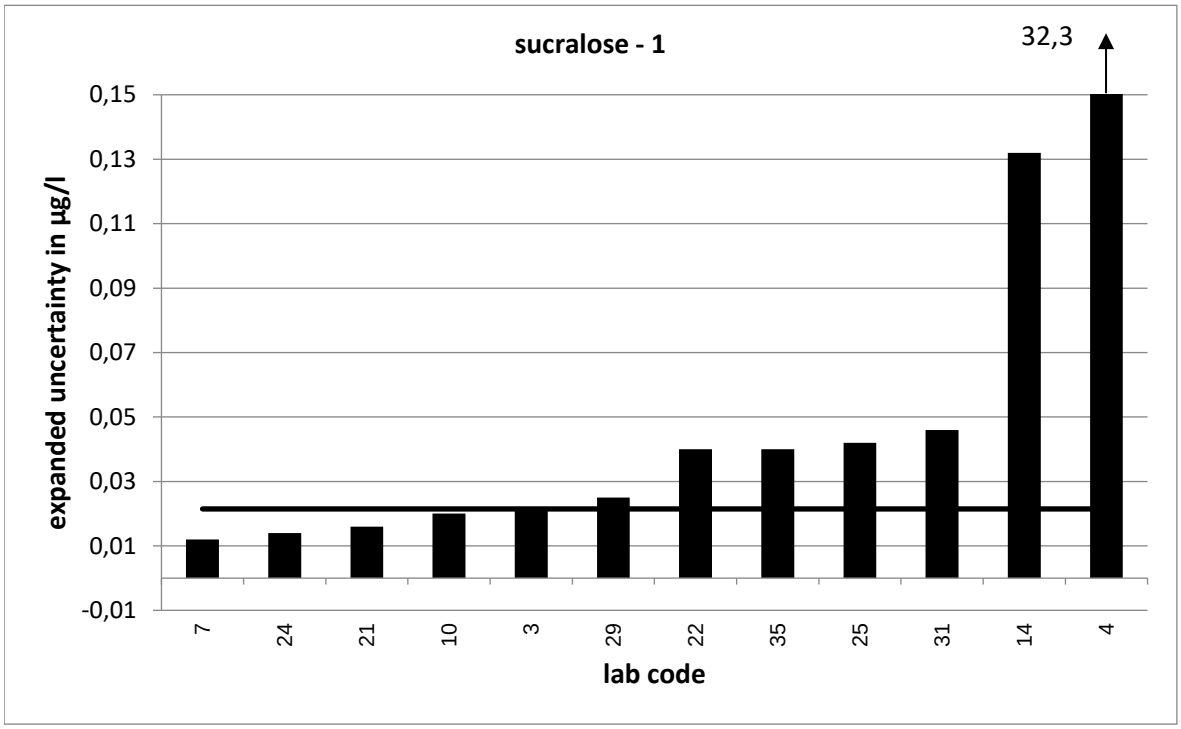
PT 3/19 - TW S1		sucralose - 1			
assigned value [µg/l]*			0,1382	± 0,0026	
upper tolerance limit [µg/l]			0,1855		
lower tolerance limit [µg/l]			0,09831		
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,109	0,022	-2,6	-1,5	s
4	129	32,3	8,0	5447,4	u
7	0,132	0,012	-1,0	-0,3	s
10	0,186	0,02	4,7	2,0	s
11	0,125			-0,7	s
13	0,126			-0,6	s
14	0,155	0,132	0,3	0,7	s
15	0,1101			-1,4	s
16	0,303			7,0	u
18	0,123			-0,8	s
21	0,105	0,016	-4,1	-1,7	s
22	0,162	0,04	1,2	1,0	s
24	0,118	0,014	-2,8	-1,0	s
25	0,124	0,042	-0,7	-0,7	s
26	0,109			-1,5	s
27	0,507			15,6	u
29	0,127	0,025	-0,9	-0,6	s
31	0,114	0,046	-1,0	-1,2	s
33	0,13			-0,4	s
34	0,095			-2,2	q
35	0,114	0,04	-1,2	-1,2	s
40	0,125			-0,7	s
41	0,141			0,1	s
42	0,104			-1,7	s
43	0,1277			-0,5	s
44	0,138			0,0	s

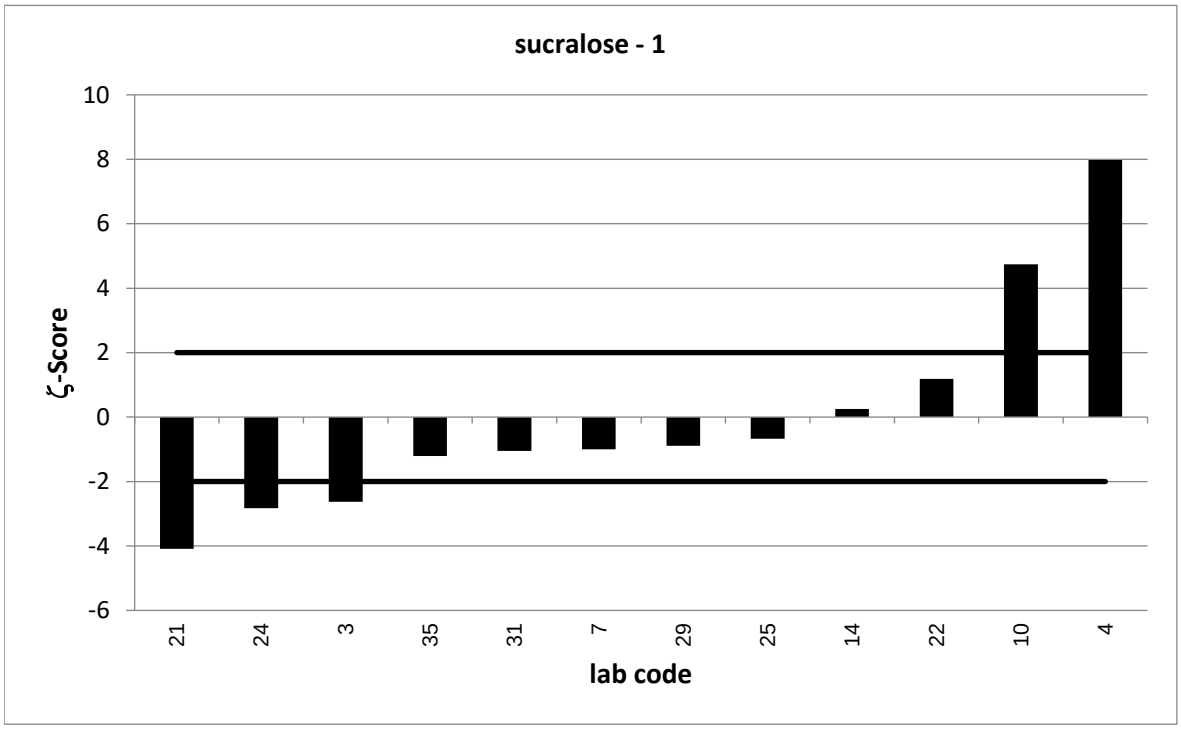
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sucralose - 1
129
0,507
concentration in µg/l
0,5
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
34 42 21 3 26 15 31 35 24 18 25 11 40 13 29 43 33 7 44 41 14 22 10 16 27 4
lab code


sucralose - 1
5447
15,6
z_U-score
8
6
4
2
0
-2
-4
34 42 21 3 26 15 31 35 24 18 25 11 40 13 29 43 33 7 44 41 14 22 10 16 27 4
lab code

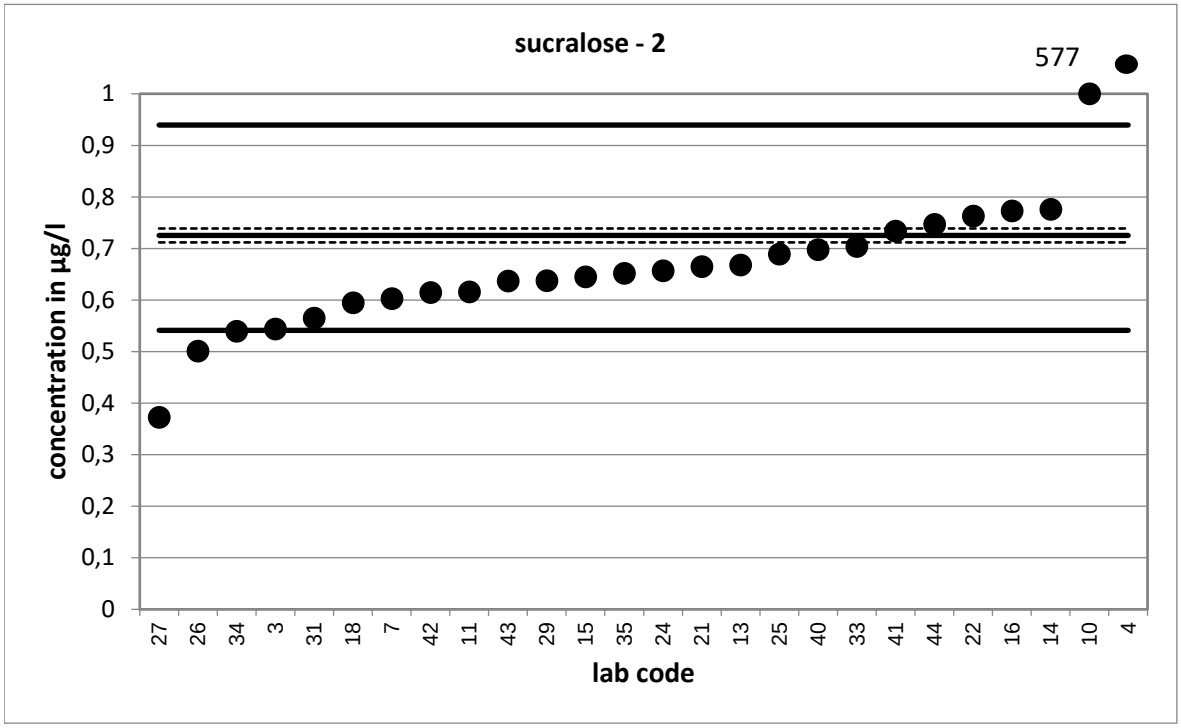

sucralose - 1
32,3
expanded uncertainty in µg/l
0,15
0,13
0,11
0,09
0,07
0,05
0,03
0,01
-0,01
7
24
21
10
3
29
22
35
25
31
14
4
lab code

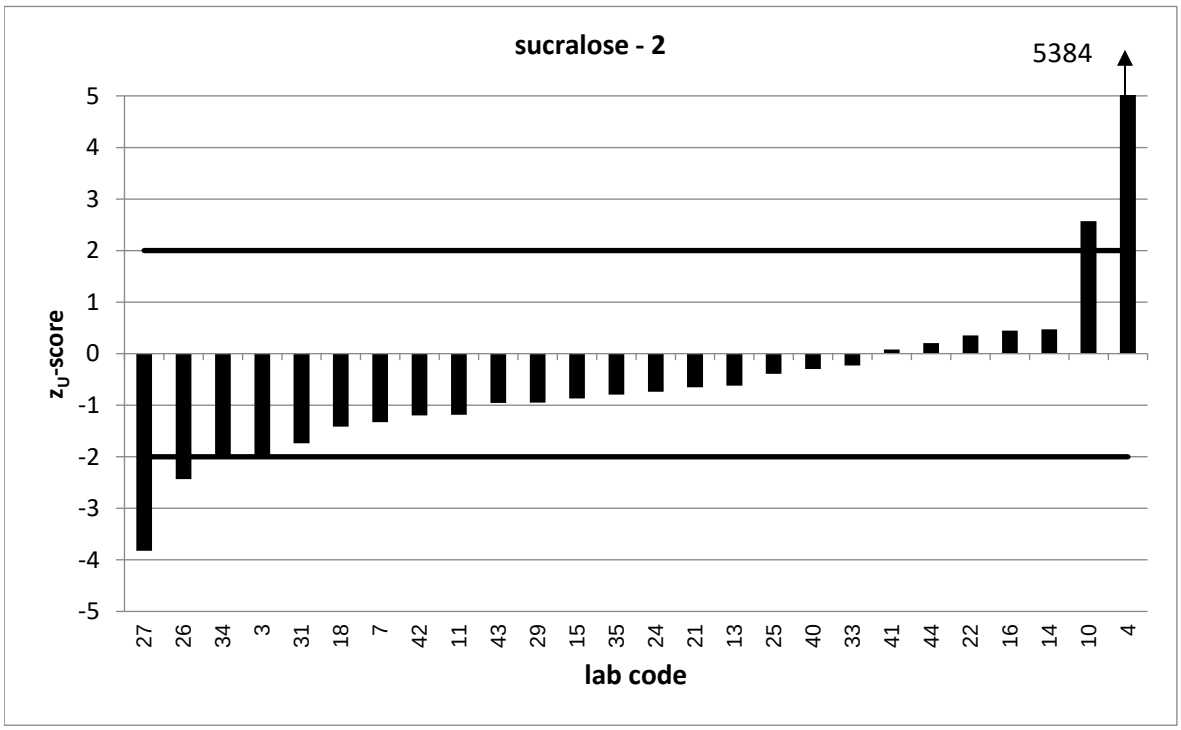

sucralose - 1
ζ-Score
10
8
6
4
2
0
-2
-4
-6
21
24
3
35
31
7
29
25
14
22
10
4
lab code

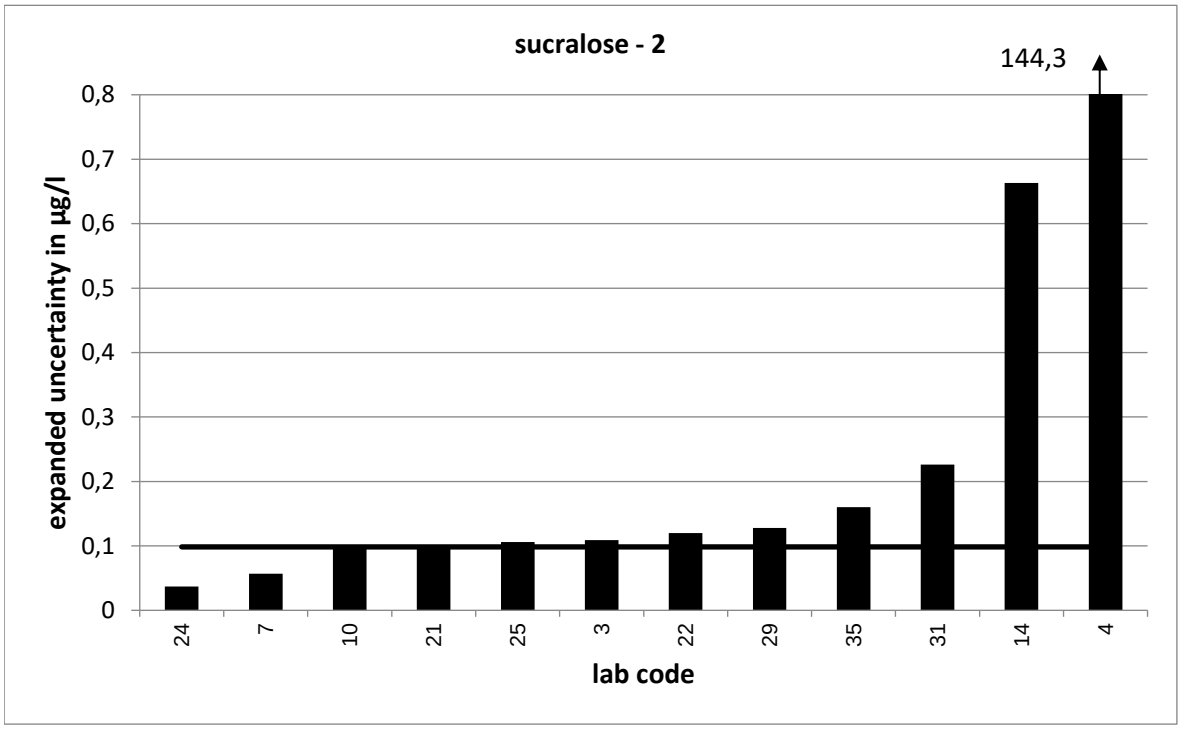
PT 3/19 - TW S1		sucralose - 2			
assigned value [µg/l]*			0,7253	± 0,0135	
upper tolerance limit [µg/l]			0,9394		
lower tolerance limit [µg/l]			0,5412		
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,544	0,109	-3,3	-2,0	s
4	577	144,3	8,0	5384,1	u
7	0,603	0,057	-4,2	-1,3	s
10	1	0,1	5,4	2,6	q
11	0,616			-1,2	s
13	0,668			-0,6	s
14	0,776	0,663	0,2	0,5	s
15	0,6453			-0,9	s
16	0,773			0,4	s
18	0,595			-1,4	s
21	0,665	0,1	-1,2	-0,7	s
22	0,763	0,12	0,6	0,4	s
24	0,657	0,037	-3,5	-0,7	s
25	0,689	0,106	-0,7	-0,4	s
26	0,501			-2,4	q
27	0,373			-3,8	u
29	0,638	0,128	-1,4	-0,9	s
31	0,565	0,226	-1,4	-1,7	s
33	0,704			-0,2	s
34	0,54			-2,0	s
35	0,652	0,16	-0,9	-0,8	s
40	0,698			-0,3	s
41	0,734			0,1	s
42	0,615			-1,2	s
43	0,6373			-1,0	s
44	0,747			0,2	s

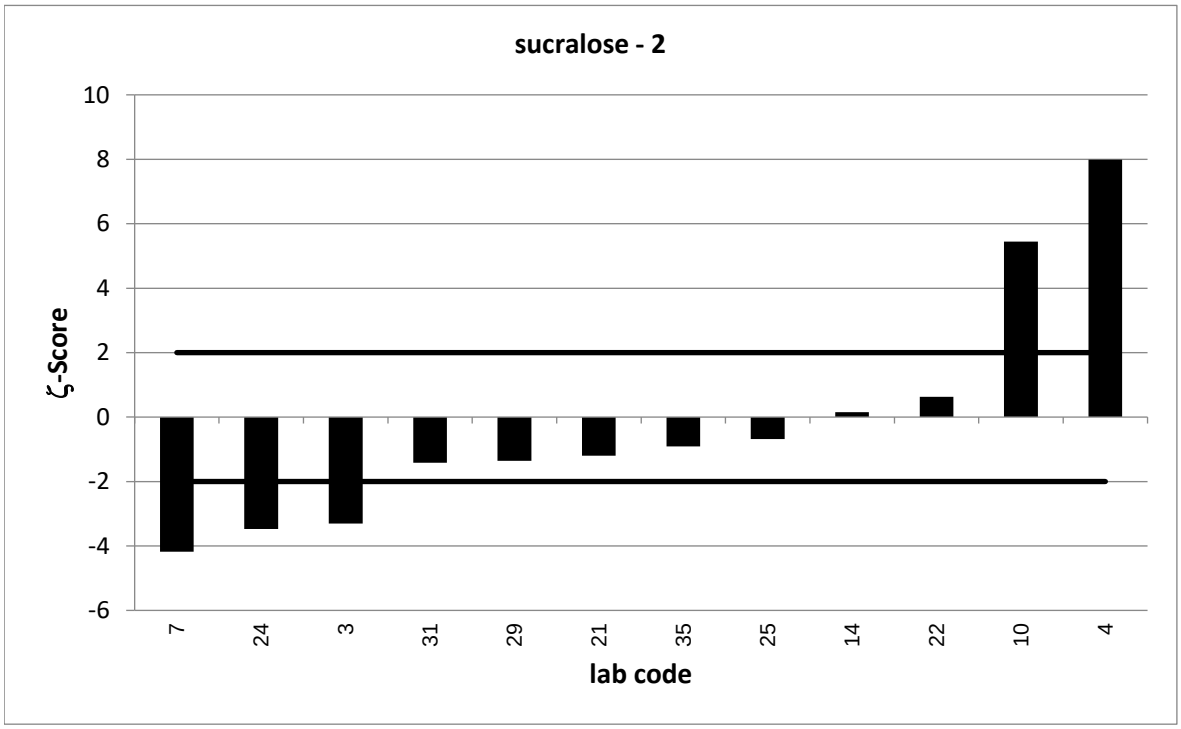
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sucralose - 2
577
concentration in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
27 26 34 3 31 18 7 42 11 43 29 15 35 24 21 13 25 40 33 41 44 22 16 14 10 4
lab code


sucralose - 2
5384
z_U-score
5
4
3
2
1
0
-1
-2
-3
-4
-5
27 26 34 3 31 18 7 42 11 43 29 15 35 24 21 13 25 40 33 41 44 22 16 14 10 4
lab code

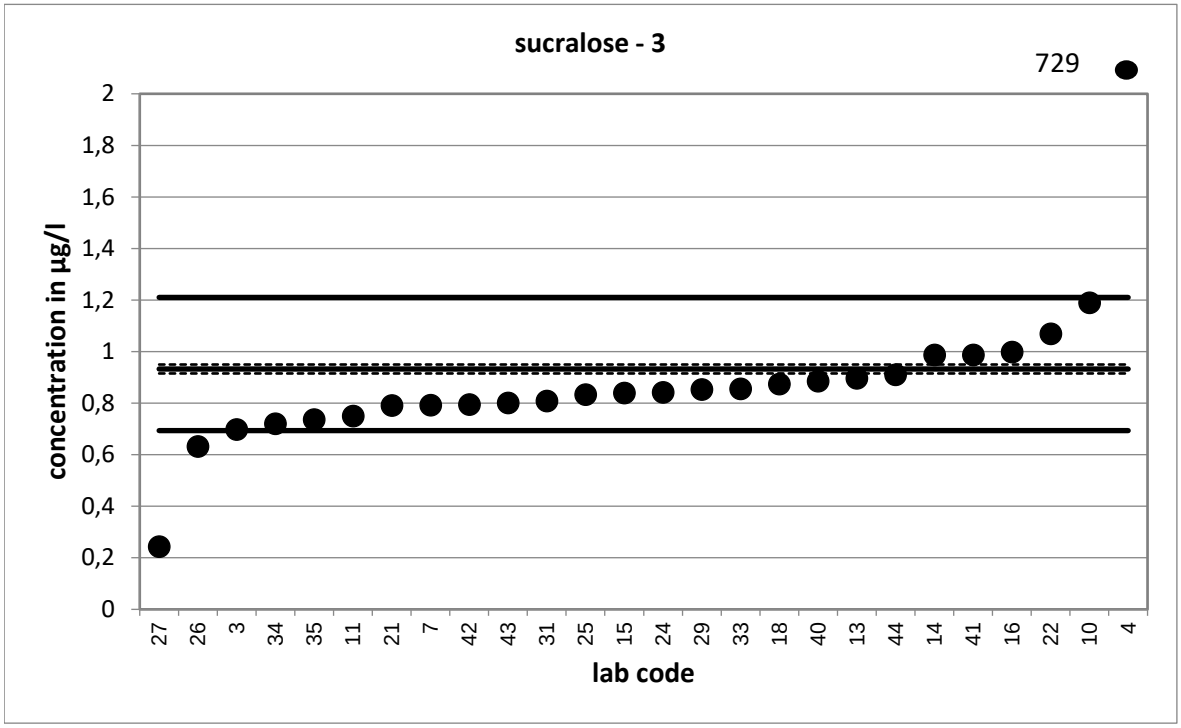

sucralose - 2
144,3
expanded uncertainty in µg/l
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
24
7
10
21
25
3
22
29
35
31
14
4
lab code

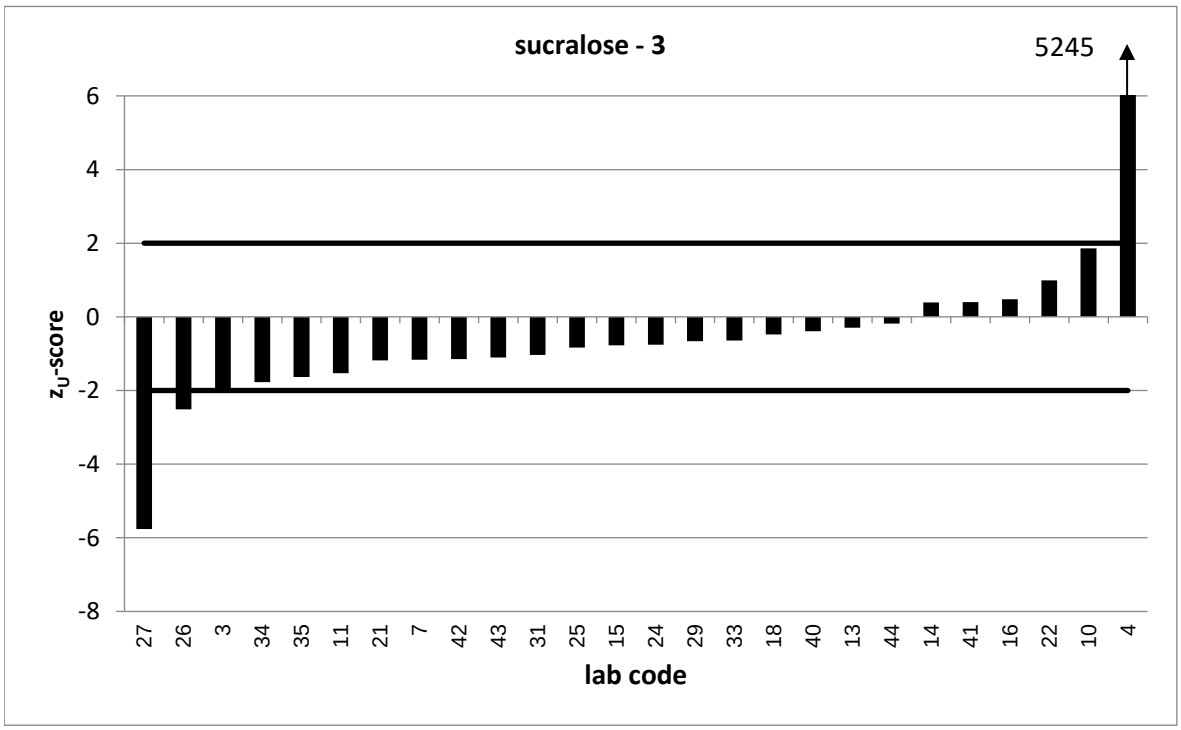

sucralose - 2
ζ-Score
10
8
6
4
2
0
-2
-4
-6
7
24
3
31
29
21
35
25
14
22
10
4
lab code

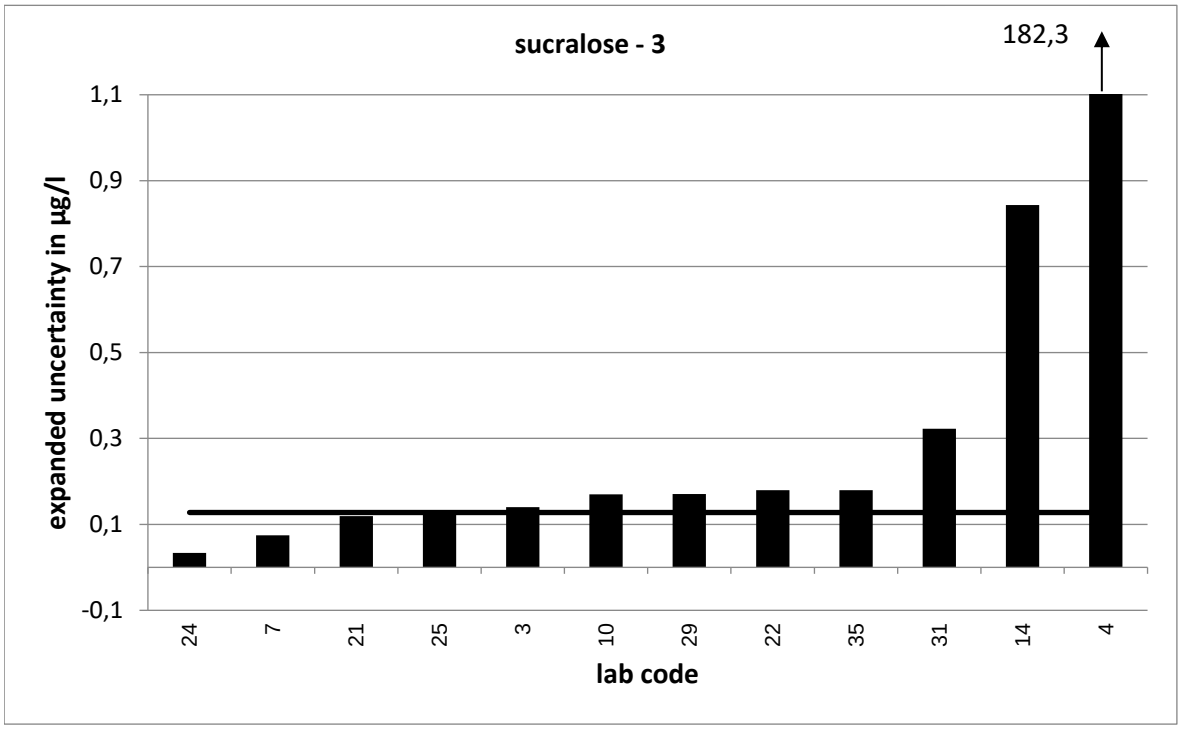
PT 3/19 - TW S1		sucralose - 3			
assigned value [µg/l]*			0,9325	± 0,0173	
upper tolerance limit [µg/l]			1,21		
lower tolerance limit [µg/l]			0,6935		
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,698	0,14	-3,3	-2,0	s
4	729	182,3	8,0	5245,1	u
7	0,793	0,075	-3,6	-1,2	s
10	1,19	0,17	3,0	1,9	s
11	0,75			-1,5	s
13	0,897			-0,3	s
14	0,987	0,843	0,1	0,4	s
15	0,8396			-0,8	s
16	0,999			0,5	s
18	0,875			-0,5	s
21	0,791	0,119	-2,4	-1,2	s
22	1,07	0,18	1,5	1,0	s
24	0,842	0,034	-4,7	-0,8	s
25	0,833	0,132	-1,5	-0,8	s
26	0,632			-2,5	q
27	0,244			-5,8	u
29	0,853	0,171	-0,9	-0,7	s
31	0,809	0,323	-0,8	-1,0	s
33	0,856			-0,6	s
34	0,721			-1,8	s
35	0,737	0,18	-2,2	-1,6	s
40	0,886			-0,4	s
41	0,988			0,4	s
42	0,795			-1,2	s
43	0,8008			-1,1	s
44	0,911			-0,2	s

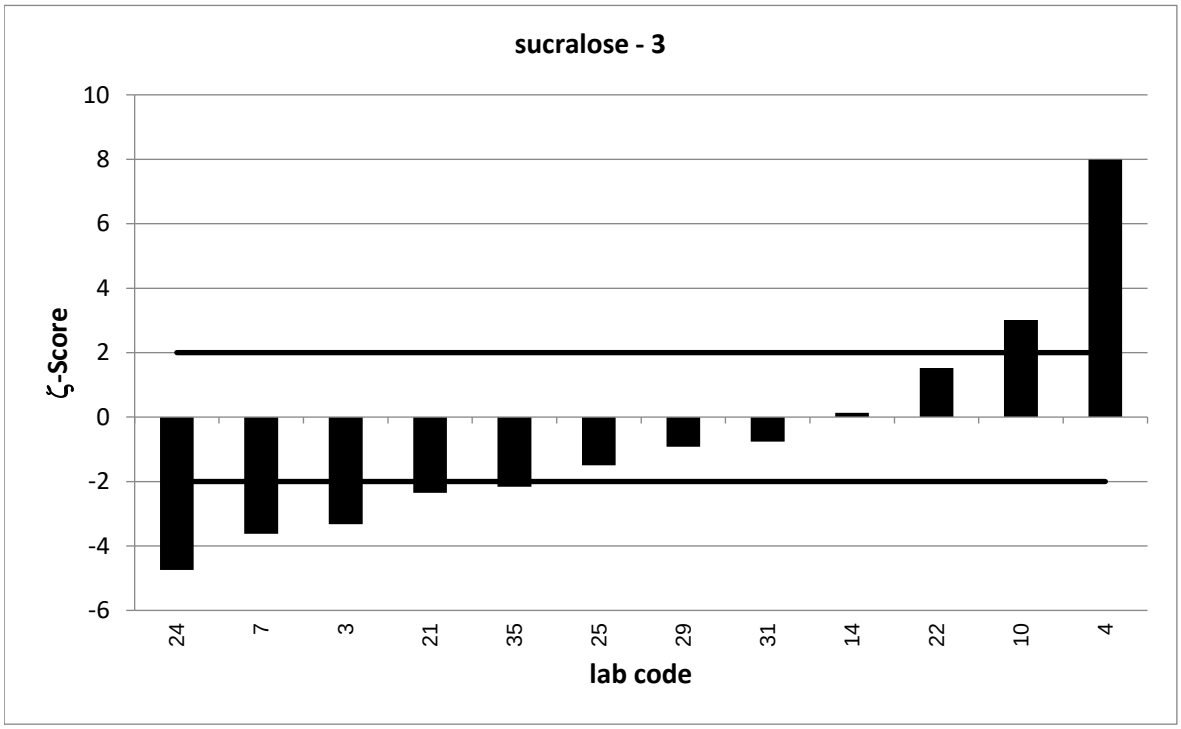
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sucralose - 3
729
concentration in µg/l
2
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
27 26 3 34 35 11 21 7 42 43 31 25 15 24 29 33 18 40 13 44 14 41 16 22 10 4
lab code


sucralose - 3
5245
z_U-score
6
4
2
0
-2
-4
-6
-8
27 26 3 34 35 11 21 7 42 43 31 25 15 24 29 33 18 40 13 44 14 41 16 22 10 4
lab code

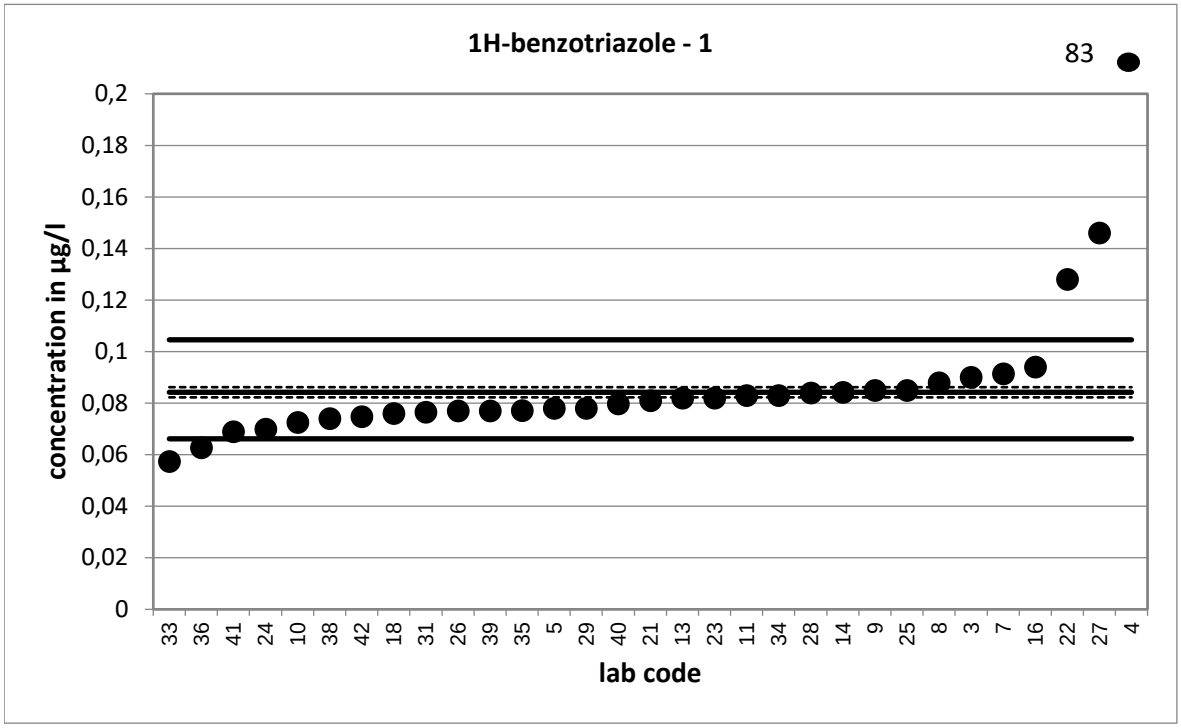

sucralose - 3
182,3
expanded uncertainty in µg/l
1,1
0,9
0,7
0,5
0,3
0,1
-0,1
24
7
21
25
3
10
29
22
35
31
14
4
lab code

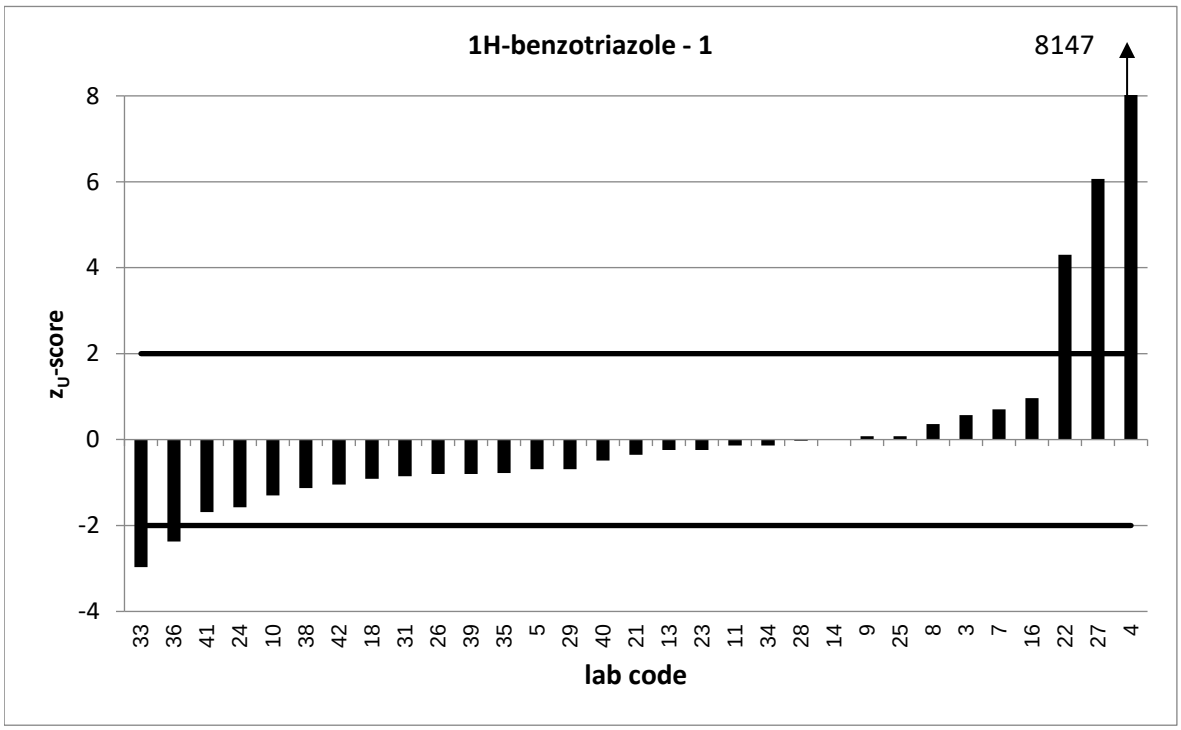

sucralose - 3
ζ-Score
10
8
6
4
2
0
-2
-4
-6
24
7
3
21
35
25
29
31
14
22
10
4
lab code

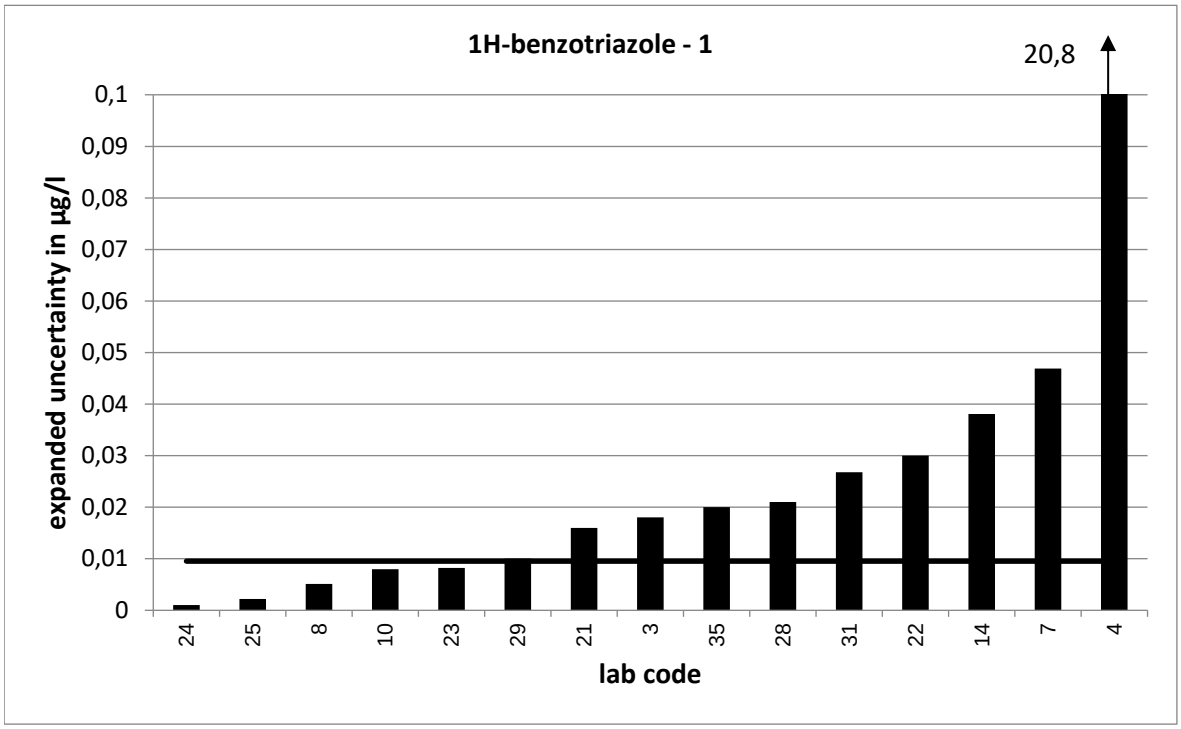
PT 3/19 - TW S1		1H-benzotriazole - 1			
assigned value [µg/l]*		0,08422	± 0,00197		
upper tolerance limit [µg/l]		0,1046			
lower tolerance limit [µg/l]		0,06616			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,09	0,018	0,6	0,6	s
4	83	20,8	8,0	8146,7	u
5	0,078			-0,7	s
7	0,0914	0,047	0,3	0,7	s
8	0,0879	0,005	1,3	0,4	s
9	0,085			0,1	s
10	0,0725	0,008	-2,8	-1,3	s
11	0,083			-0,1	s
13	0,082			-0,2	s
14	0,0842	0,038	0,0	0,0	s
16	0,094			1,0	s
18	0,076			-0,9	s
21	0,081	0,016	-0,4	-0,4	s
22	0,128	0,03	2,9	4,3	u
23	0,082	0,008	-0,5	-0,2	s
24	0,07	0,001	-12,9	-1,6	s
25	0,085	0,002	0,5	0,1	s
26	0,077			-0,8	s
27	0,146			6,1	u
28	0,084	0,021	0,0	0,0	s
29	0,078	0,01	-1,2	-0,7	s
31	0,0765	0,027	-0,6	-0,9	s
33	0,0574			-3,0	u
34	0,083			-0,1	s
35	0,0772	0,02	-0,7	-0,8	s
36	0,0628			-2,4	q
38	0,074			-1,1	s
39	0,077			-0,8	s
40	0,0798			-0,5	s
41	0,069			-1,7	s
42	0,0748			-1,0	s

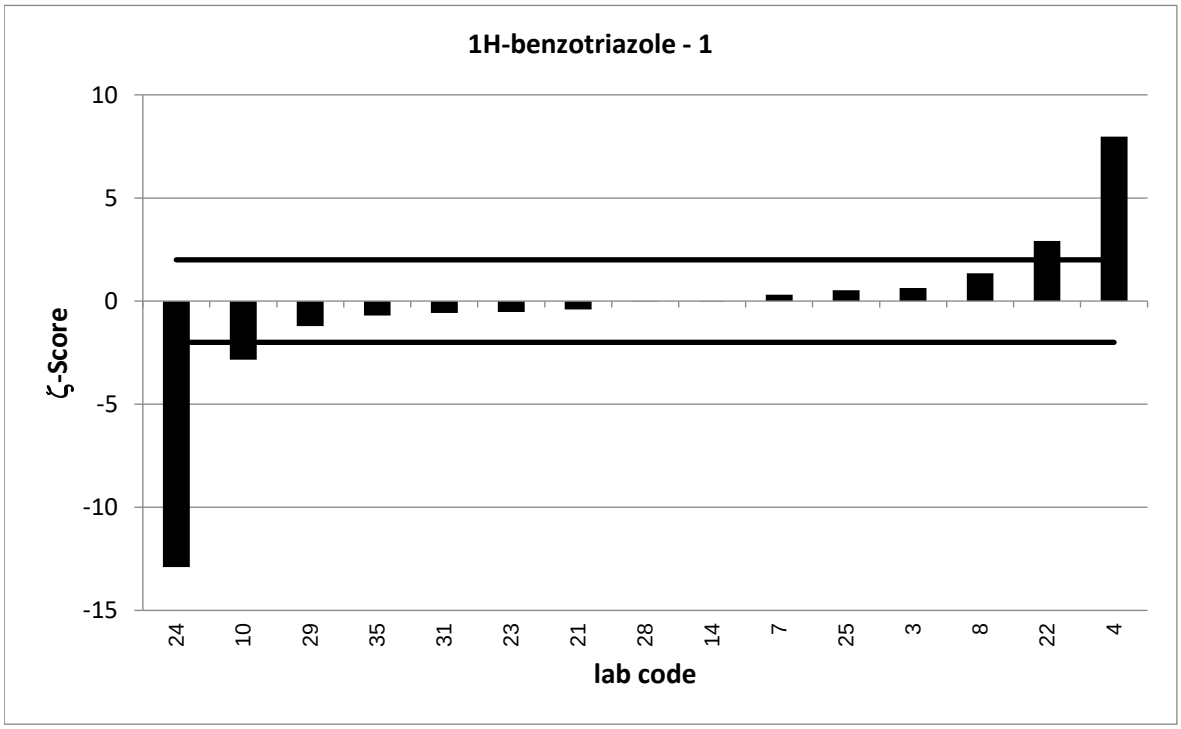
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


1H-benzotriazole - 1
83
concentration in µg/l
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
33 36 41 24 10 38 42 18 31 26 39 35 5 29 40 21 13 23 11 34 28 14 9 25 8 3 7 16 22 27 4
lab code


1H-benzotriazole - 1
8147
z_U-score
8
6
4
2
0
-2
-4
33 36 41 24 10 38 42 18 31 26 39 35 5 29 40 21 13 23 11 34 28 14 9 25 8 3 7 16 22 27 4
lab code

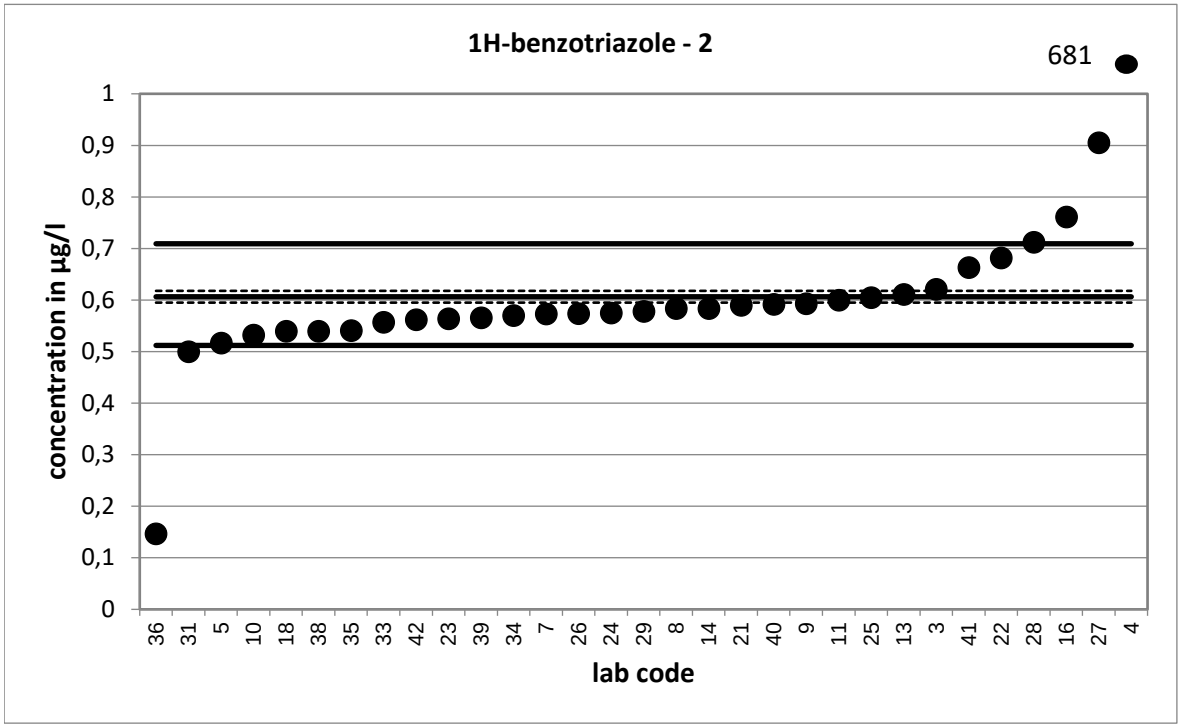

1H-benzotriazole - 1
20,8
expanded uncertainty in µg/l
0,1
0,09
0,08
0,07
0,06
0,05
0,04
0,03
0,02
0,01
0
24
25
8
10
23
29
21
3
35
28
31
22
14
7
4
lab code

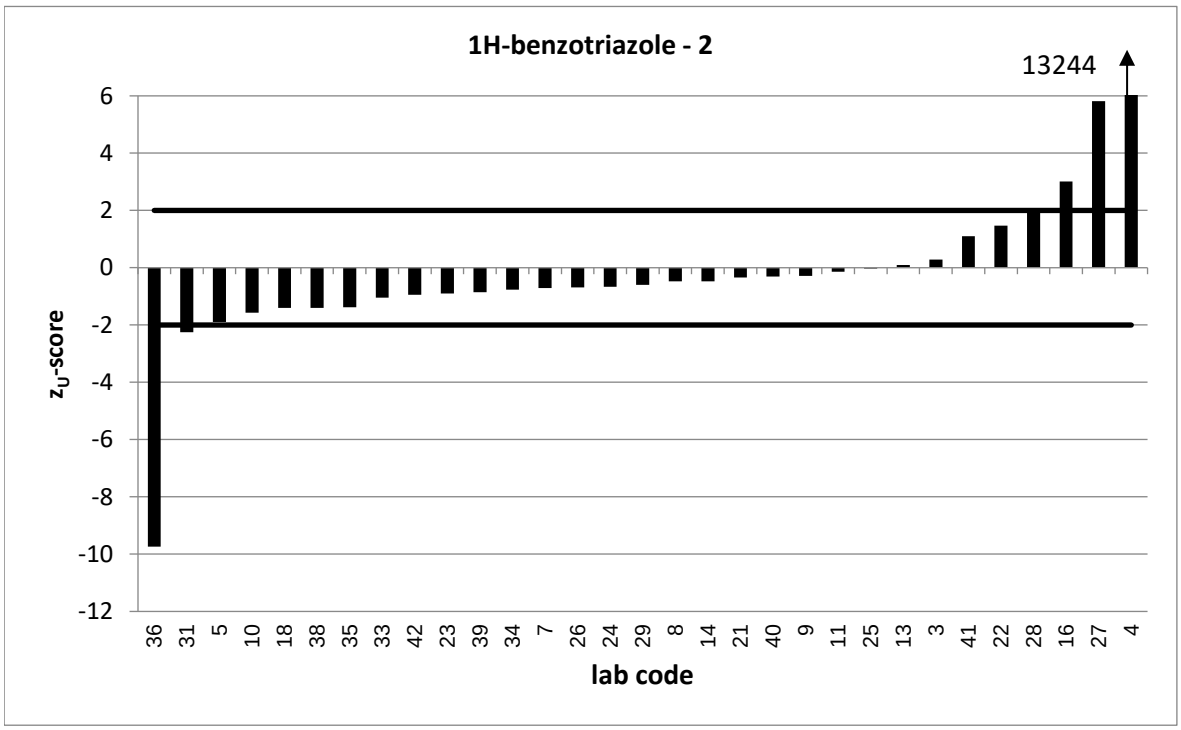

1H-benzotriazole - 1
ζ-Score
10
5
0
-5
-10
-15
24
10
29
35
31
23
21
28
14
7
25
3
8
22
4
lab code

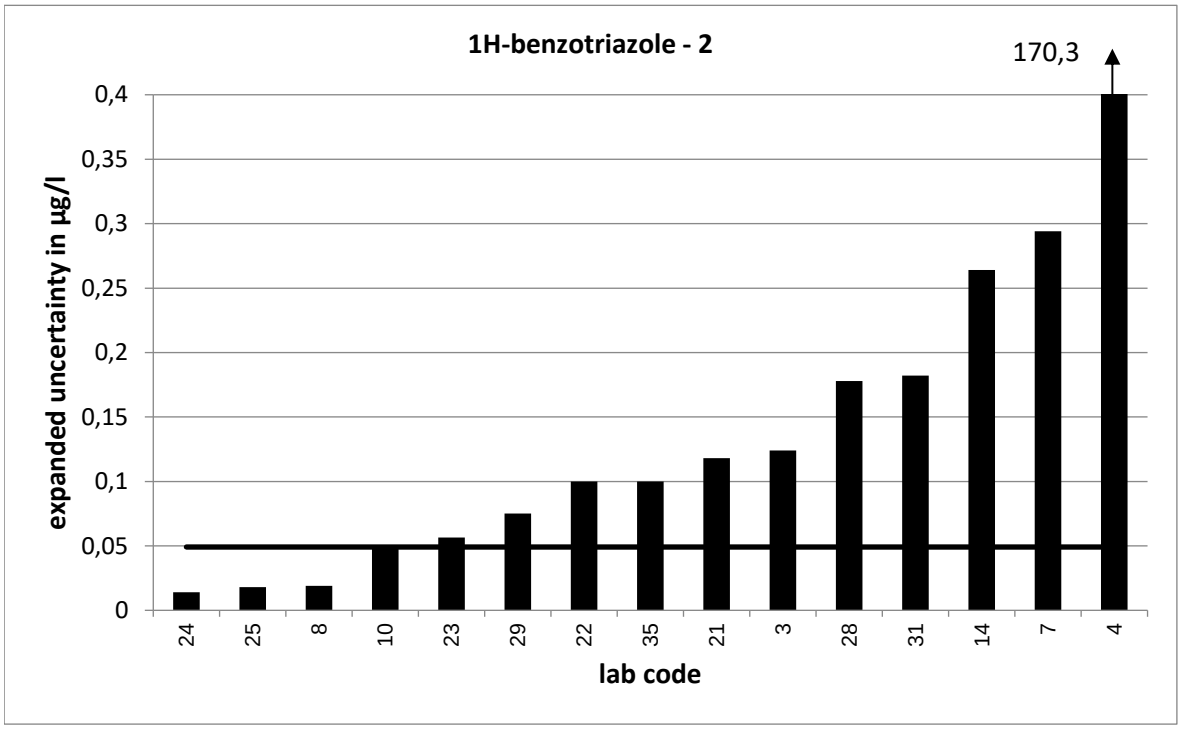
PT 3/19 - TW S1		1H-benzotriazole - 2			
assigned value [µg/l]*		0,6064	± 0,0114		
upper tolerance limit [µg/l]		0,7091			
lower tolerance limit [µg/l]		0,512			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,621	0,124	0,2	0,3	s
4	681	170,3	8,0	13244,3	u
5	0,517			-1,9	s
7	0,573	0,294	-0,2	-0,7	s
8	0,584	0,019	-2,0	-0,5	s
9	0,593			-0,3	s
10	0,532	0,05	-2,9	-1,6	s
11	0,6			-0,1	s
13	0,611			0,1	s
14	0,584	0,264	-0,2	-0,5	s
16	0,761			3,0	u
18	0,54			-1,4	s
21	0,59	0,118	-0,3	-0,3	s
22	0,682	0,1	1,5	1,5	s
23	0,564	0,056	-1,5	-0,9	s
24	0,575	0,014	-3,5	-0,7	s
25	0,605	0,018	-0,1	0,0	s
26	0,574			-0,7	s
27	0,905			5,8	u
28	0,712	0,178	1,2	2,1	q
29	0,578	0,075	-0,7	-0,6	s
31	0,5	0,182	-1,2	-2,3	q
33	0,557			-1,0	s
34	0,57			-0,8	s
35	0,541	0,1	-1,3	-1,4	s
36	0,1468			-9,7	u
38	0,54			-1,4	s
39	0,566			-0,9	s
40	0,592			-0,3	s
41	0,663			1,1	s
42	0,562			-0,9	s

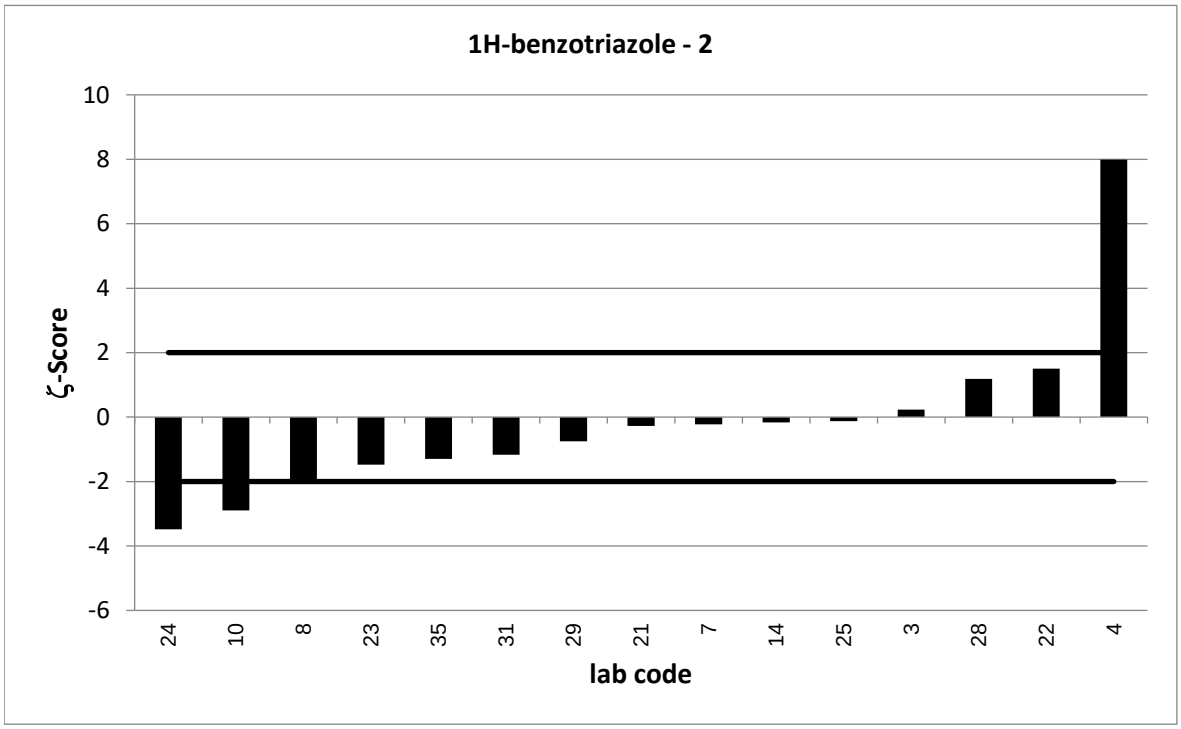
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


1H-benzotriazole - 2
681
concentration in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
36 31 5 10 18 38 35 33 42 23 39 34 7 26 24 29 8 14 21 40 9 11 25 13 3 41 22 28 16 27 4
lab code


1H-benzotriazole - 2
13244
z_U-score
6
4
2
0
-2
-4
-6
-8
-10
-12
36 31 5 10 18 38 35 33 42 23 39 34 7 26 24 29 8 14 21 40 9 11 25 13 3 41 22 28 16 27 4
lab code

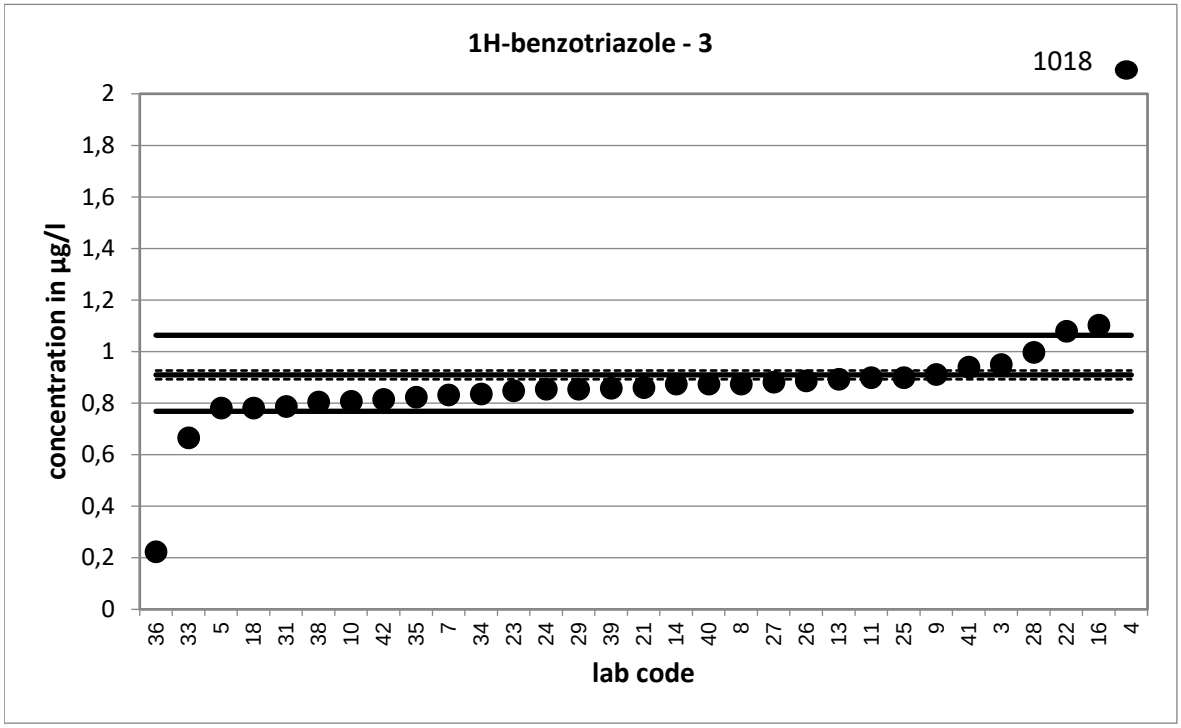

1H-benzotriazole - 2
170,3
expanded uncertainty in µg/l
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
24
25
8
10
23
29
22
35
21
3
28
31
14
7
4
lab code

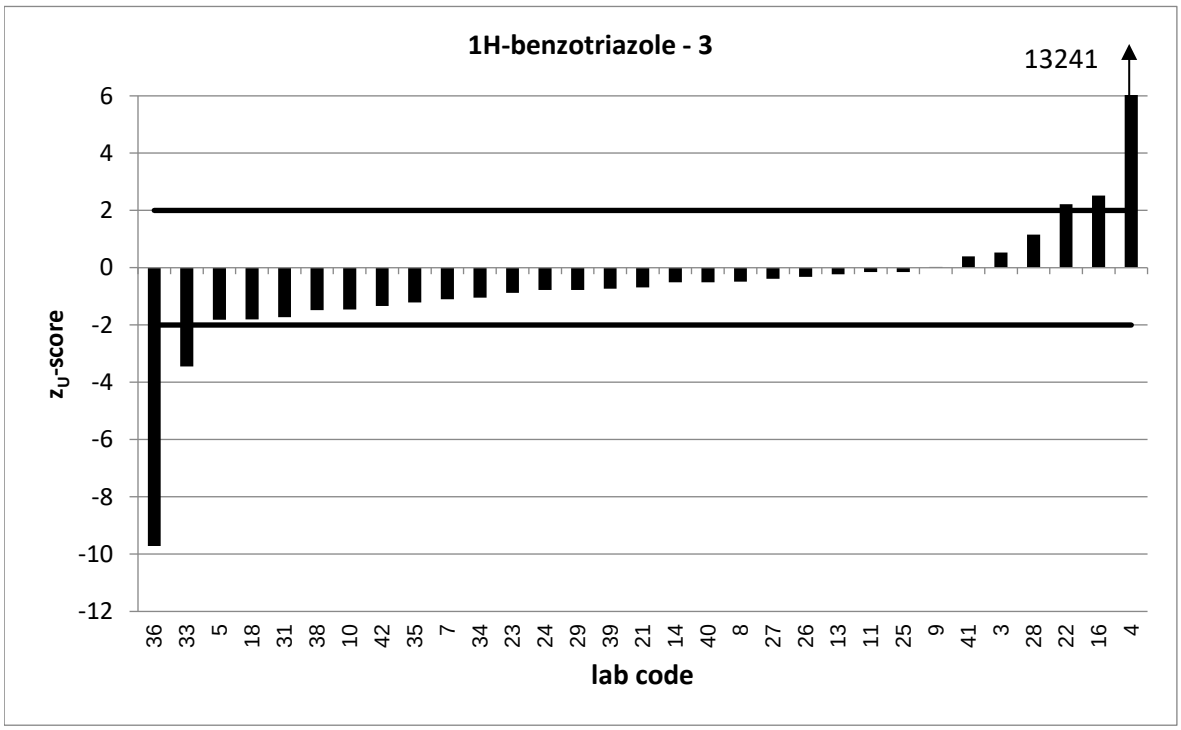

1H-benzotriazole - 2
ζ-Score
10
8
6
4
2
0
-2
-4
-6
24
10
8
23
35
31
29
21
7
14
25
3
28
22
4
lab code

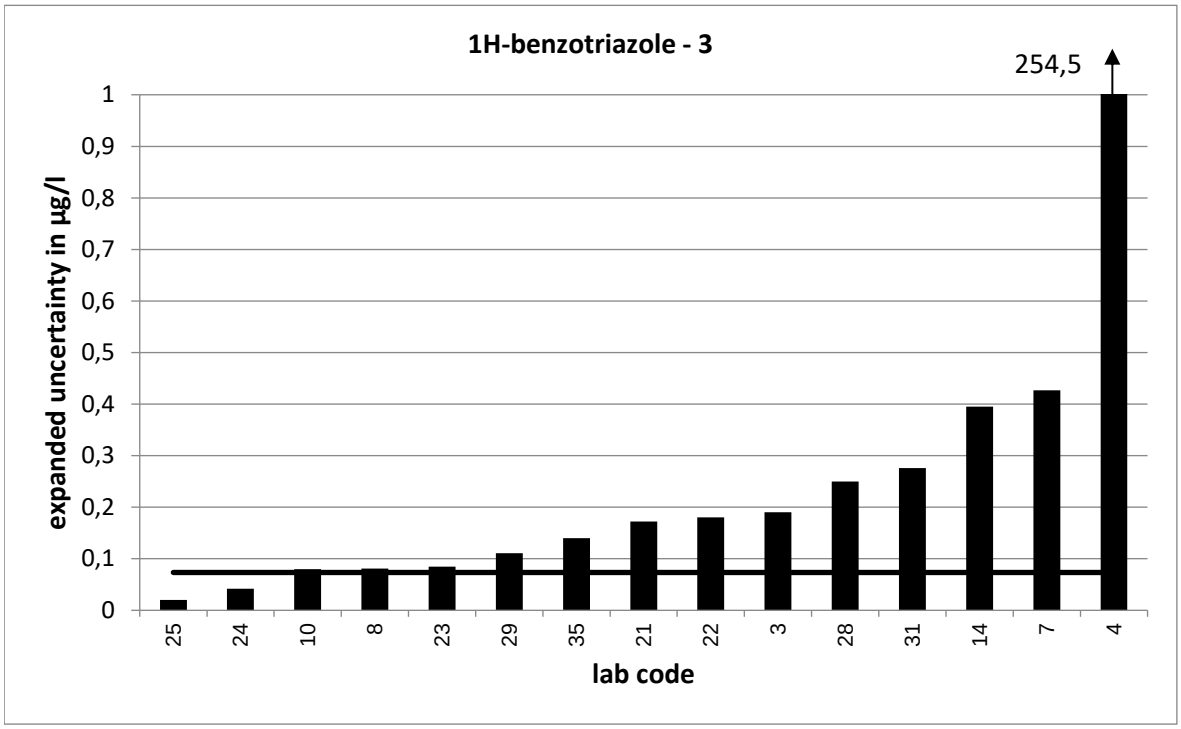
PT 3/19 - TW S1		1H-benzotriazole - 3			
assigned value [µg/l]*		0,9096	± 0,017		
upper tolerance limit [µg/l]		1,063			
lower tolerance limit [µg/l]		0,7684			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,95	0,19	0,4	0,5	s
4	1018	254,5	8,0	13240,7	u
5	0,781			-1,8	s
7	0,832	0,427	-0,4	-1,1	s
8	0,875	0,081	-0,8	-0,5	s
9	0,912			0,0	s
10	0,807	0,08	-2,5	-1,5	s
11	0,899			-0,1	s
13	0,893			-0,2	s
14	0,874	0,395	-0,2	-0,5	s
16	1,103			2,5	q
18	0,782			-1,8	s
21	0,861	0,172	-0,6	-0,7	s
22	1,08	0,18	1,9	2,2	q
23	0,848	0,085	-1,4	-0,9	s
24	0,855	0,042	-2,4	-0,8	s
25	0,899	0,02	-0,8	-0,1	s
26	0,887			-0,3	s
27	0,882			-0,4	s
28	0,998	0,25	0,7	1,2	s
29	0,855	0,111	-1,0	-0,8	s
31	0,788	0,276	-0,9	-1,7	s
33	0,666			-3,5	u
34	0,836			-1,0	s
35	0,824	0,14	-1,2	-1,2	s
36	0,2238			-9,7	u
38	0,805			-1,5	s
39	0,858			-0,7	s
40	0,874			-0,5	s
41	0,94			0,4	s
42	0,815			-1,3	s

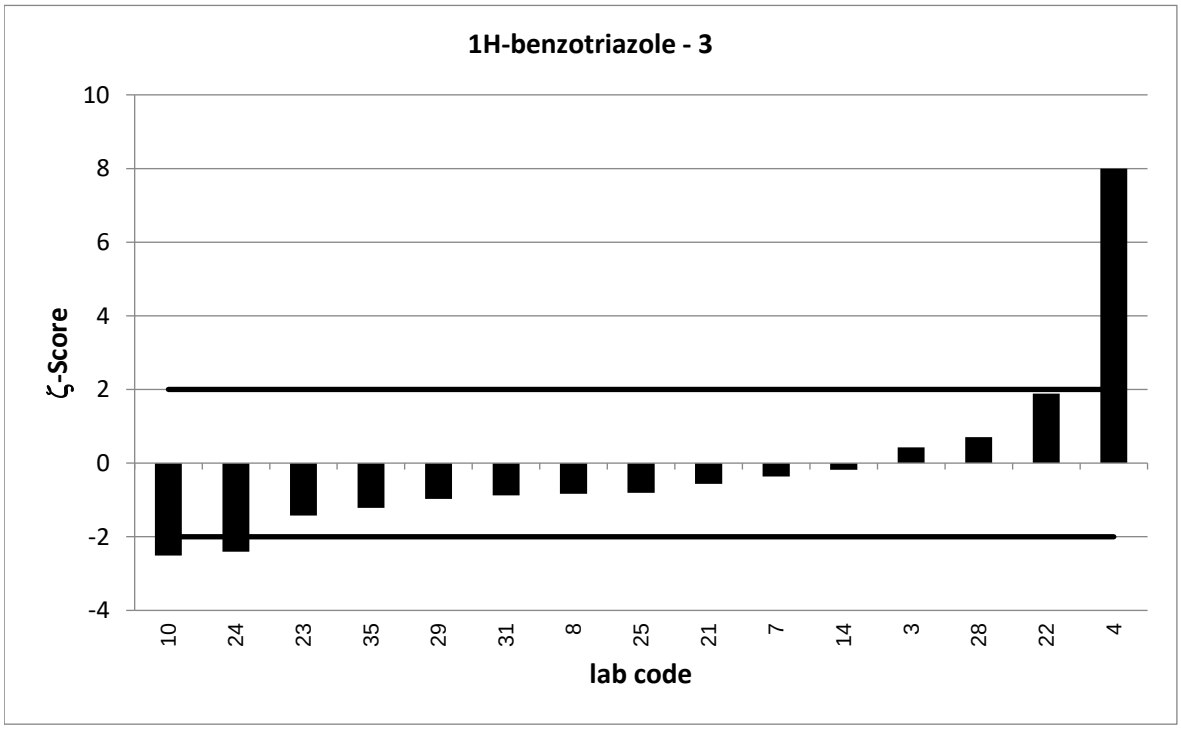
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


1H-benzotriazole - 3
1018
concentration in µg/l
2
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
36 33 5 18 31 38 10 42 35 7 34 23 24 29 39 21 14 40 8 27 26 13 11 25 9 41 3 28 22 16 4
lab code


1H-benzotriazole - 3
13241
z_U-score
6
4
2
0
-2
-4
-6
-8
-10
-12
36 33 5 18 31 38 10 42 35 7 34 23 24 29 39 21 14 40 8 27 26 13 11 25 9 41 3 28 22 16 4
lab code

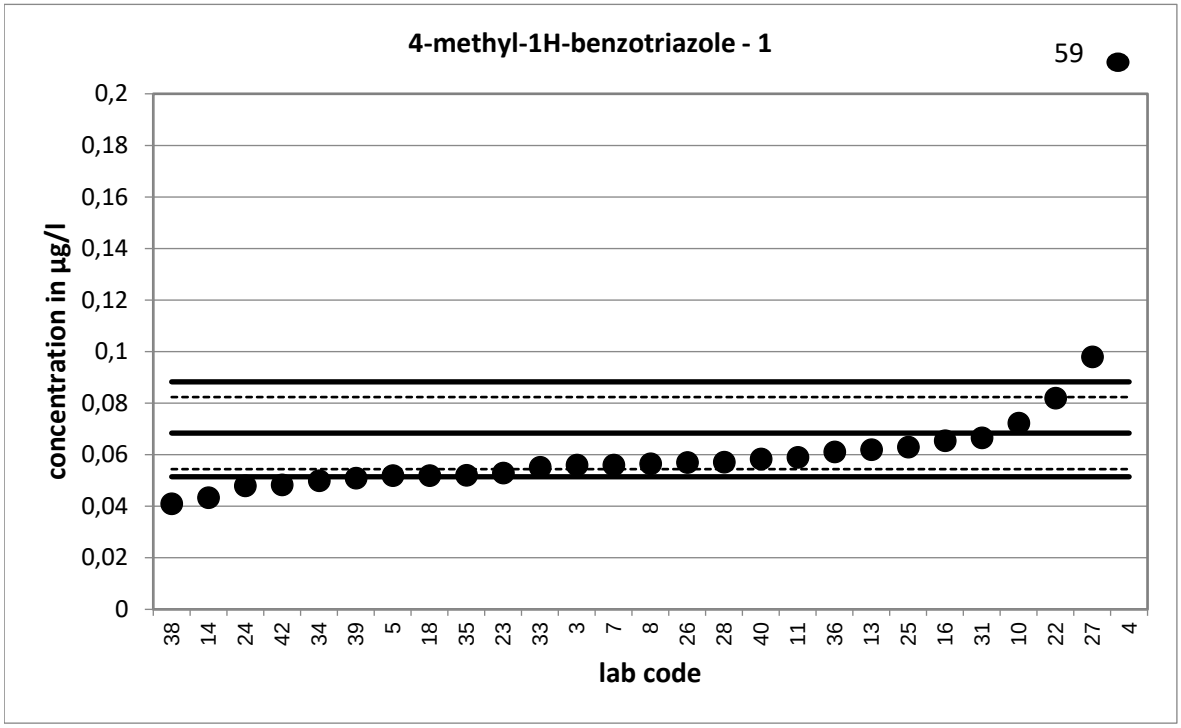

1H-benzotriazole - 3
254,5
expanded uncertainty in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
25
24
10
8
23
29
35
21
22
3
28
31
14
7
4
lab code

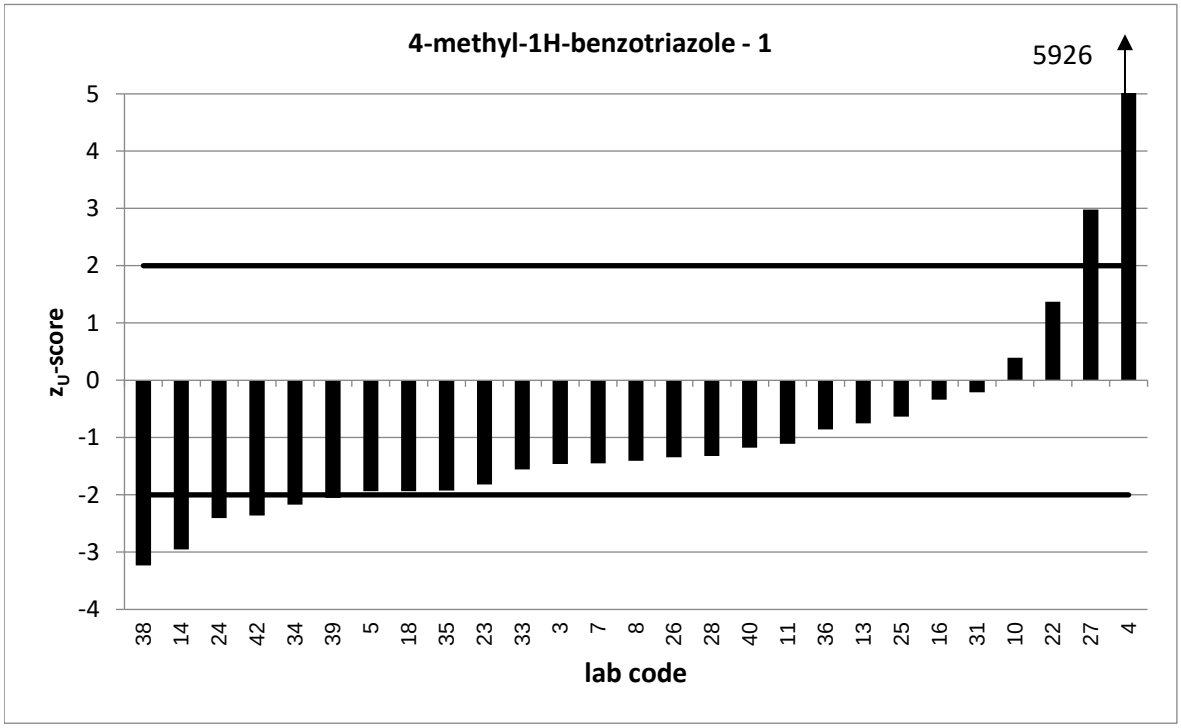

1H-benzotriazole - 3
ζ-Score
10
8
6
4
2
0
-2
-4
10
24
23
35
29
31
8
25
21
7
14
3
28
22
4
lab code

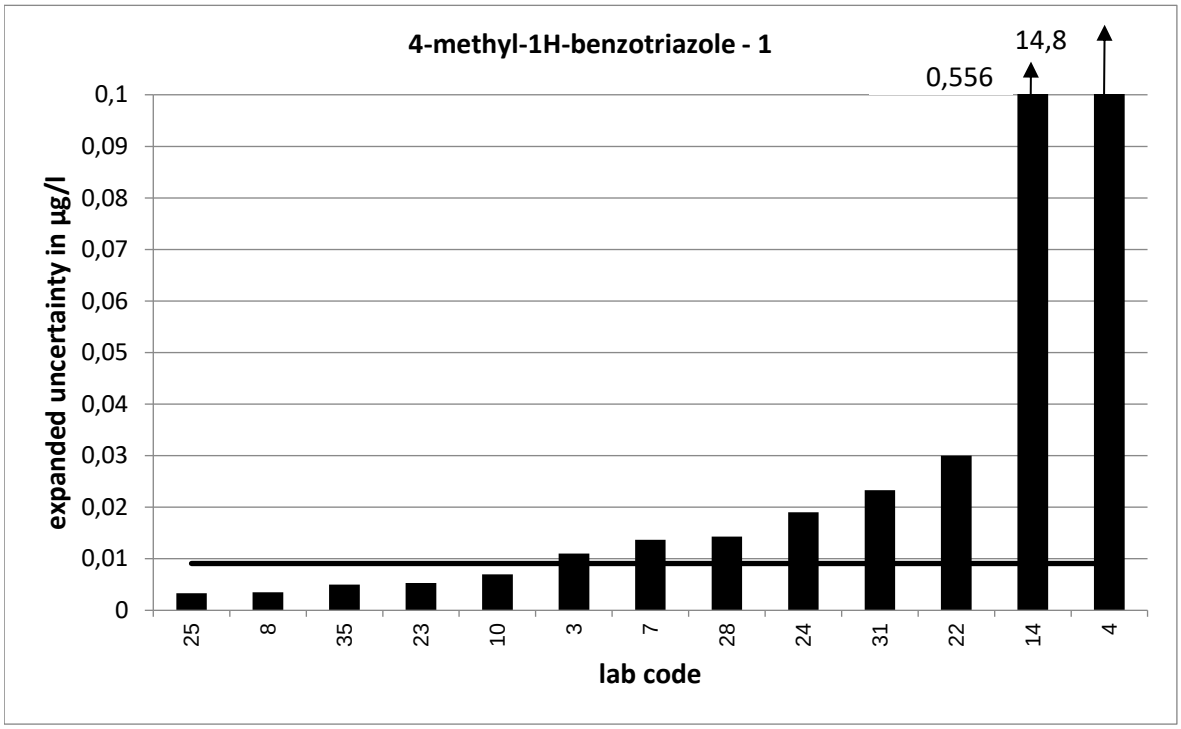
PT 3/19 - TW S1		4-methyl-1H-benzotriazole - 1			
assigned value [µg/l]*		0,06838	± 0,01398		
upper tolerance limit [µg/l]		0,08827			
lower tolerance limit [µg/l]		0,05145			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,056	0,011	-1,4	-1,5	s
4	59	14,8	8,0	5926,1	u
5	0,052			-1,9	s
7	0,0561	0,014	-1,3	-1,5	s
8	0,0565	0,004	-1,6	-1,4	s
10	0,0723	0,007	0,5	0,4	s
11	0,059			-1,1	s
13	0,062			-0,8	s
14	0,0434	0,556	-0,1	-3,0	u
16	0,0655			-0,3	s
18	0,052			-1,9	s
22	0,082	0,03	0,8	1,4	s
23	0,053	0,005	-2,1	-1,8	s
24	0,048	0,019	-1,7	-2,4	q
25	0,063	0,003	-0,7	-0,6	s
26	0,057			-1,3	s
27	0,098			3,0	u
28	0,0572	0,014	-1,1	-1,3	s
31	0,0666	0,023	-0,1	-0,2	s
33	0,0552			-1,6	s
34	0,05			-2,2	q
35	0,0521	0,005	-2,2	-1,9	s
36	0,0611			-0,9	s
38	0,041			-3,2	u
39	0,051			-2,1	q
40	0,0584			-1,2	s
42	0,0484			-2,4	q

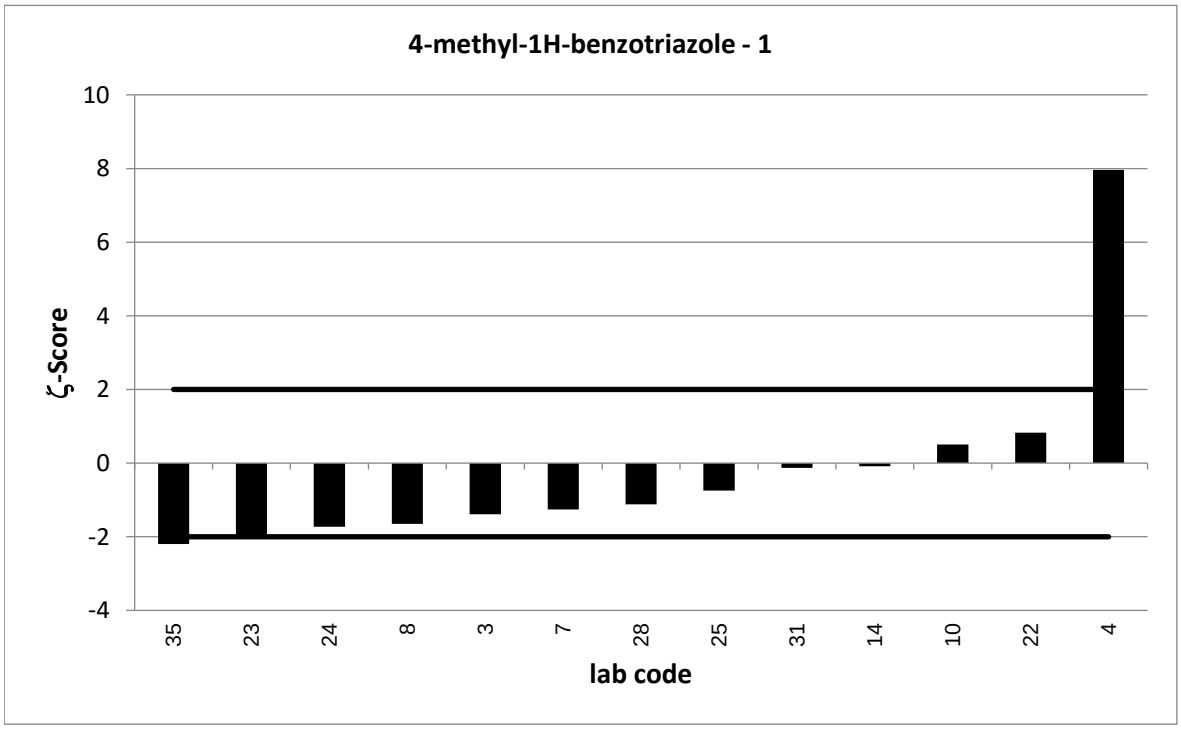
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


4-methyl-1H-benzotriazole - 1
59
concentration in µg/l
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
38 14 24 42 34 39 5 18 35 23 33 3 7 8 26 28 40 11 36 13 25 16 31 10 22 27 4
lab code


4-methyl-1H-benzotriazole - 1
5926
z_U-score
5
4
3
2
1
0
-1
-2
-3
-4
38 14 24 42 34 39 5 18 35 23 33 3 7 8 26 28 40 11 36 13 25 16 31 10 22 27 4
lab code

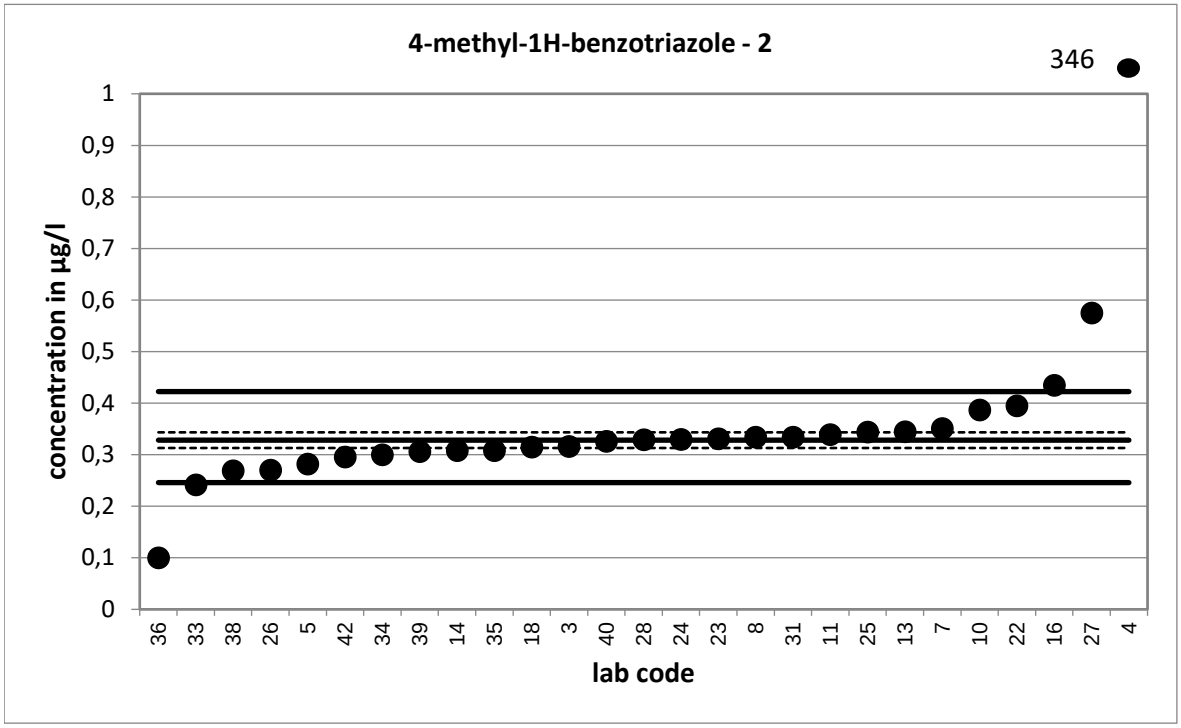

4-methyl-1H-benzotriazole - 1
14,8
0,556
expanded uncertainty in µg/l
0,1
0,09
0,08
0,07
0,06
0,05
0,04
0,03
0,02
0,01
0
25
8
35
23
10
3
7
28
24
31
22
14
4
lab code

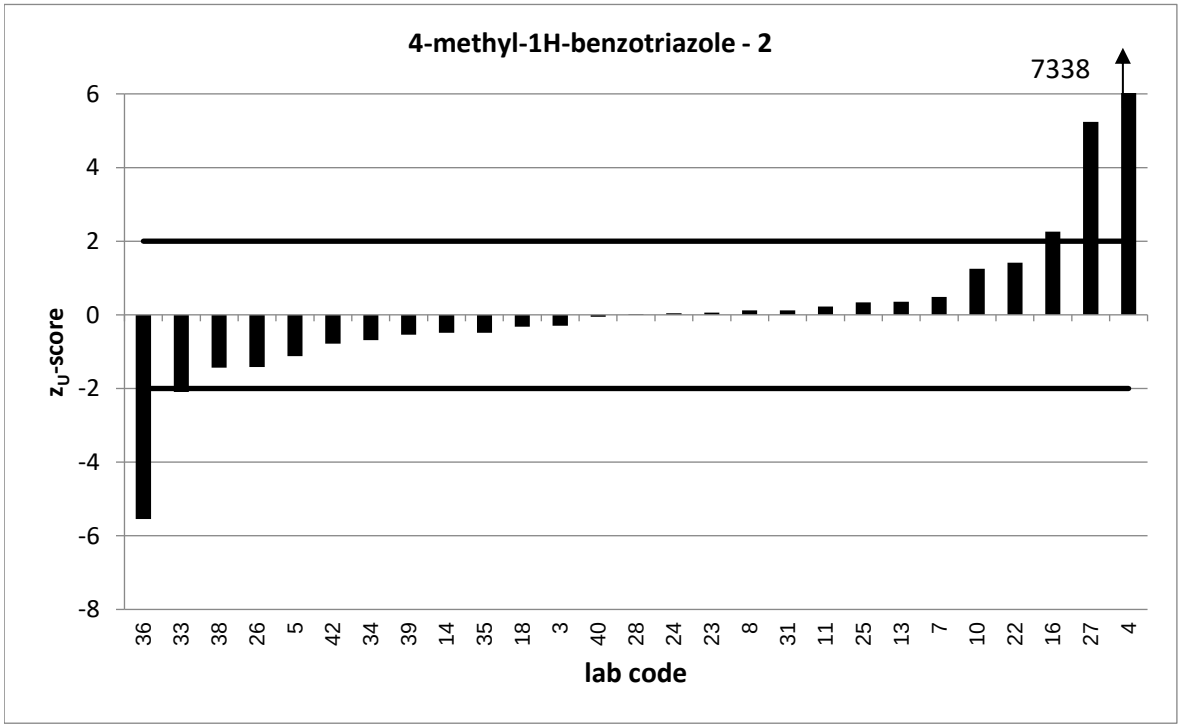

4-methyl-1H-benzotriazole - 1
ζ-Score
10
8
6
4
2
0
-2
-4
35
23
24
8
3
7
28
25
31
14
10
22
4
lab code

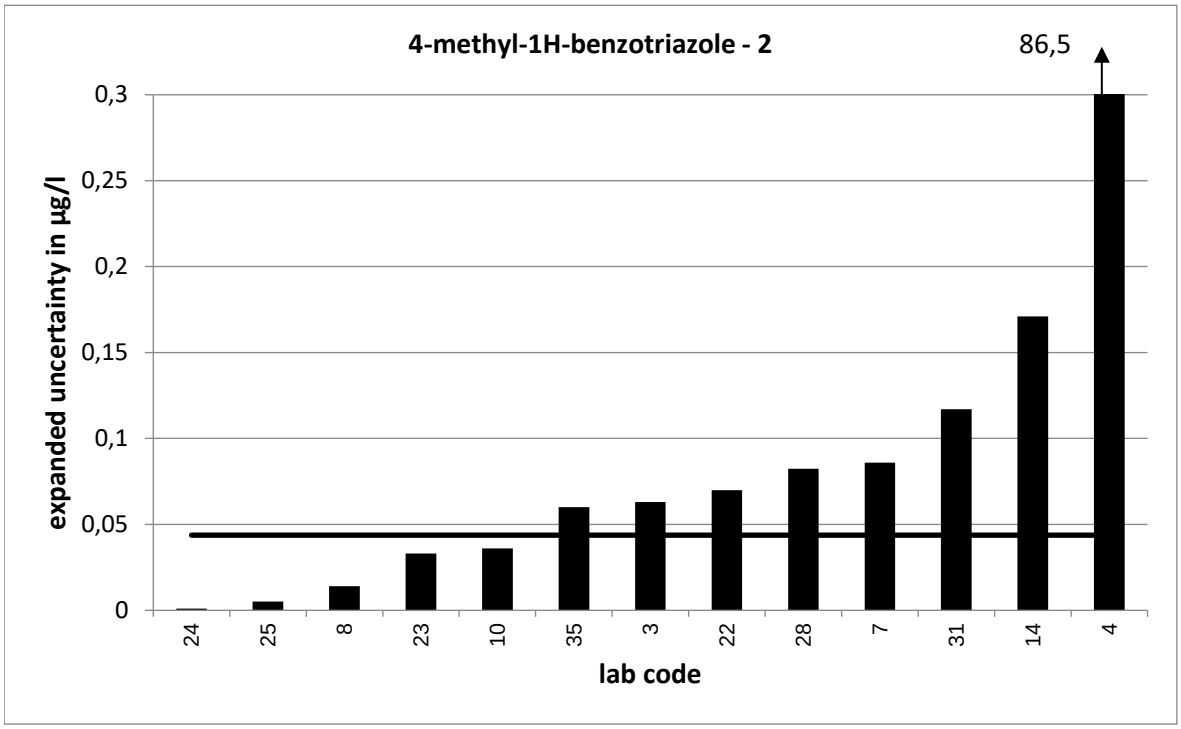
PT 3/19 - TW S1		4-methyl-1H-benzotriazole - 2			
assigned value [µg/l]*		0,3282	± 0,0152		
upper tolerance limit [µg/l]		0,4224			
lower tolerance limit [µg/l]		0,2459			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,316	0,063	-0,4	-0,3	s
4	346	86,5	8,0	7338,2	u
5	0,282			-1,1	s
7	0,351	0,086	0,5	0,5	s
8	0,334	0,014	0,6	0,1	s
10	0,387	0,036	3,0	1,2	s
11	0,339			0,2	s
13	0,345			0,4	s
14	0,308	0,171	-0,2	-0,5	s
16	0,4345			2,3	q
18	0,315			-0,3	s
22	0,395	0,07	1,9	1,4	s
23	0,331	0,033	0,2	0,1	s
24	0,33	0,001	0,2	0,0	s
25	0,344	0,005	2,0	0,3	s
26	0,27			-1,4	s
27	0,575			5,2	u
28	0,329	0,082	0,0	0,0	s
31	0,334	0,117	0,1	0,1	s
33	0,242			-2,1	q
34	0,3			-0,7	s
35	0,308	0,06	-0,7	-0,5	s
36	0,1			-5,5	u
38	0,269			-1,4	s
39	0,306			-0,5	s
40	0,326			-0,1	s
42	0,296			-0,8	s

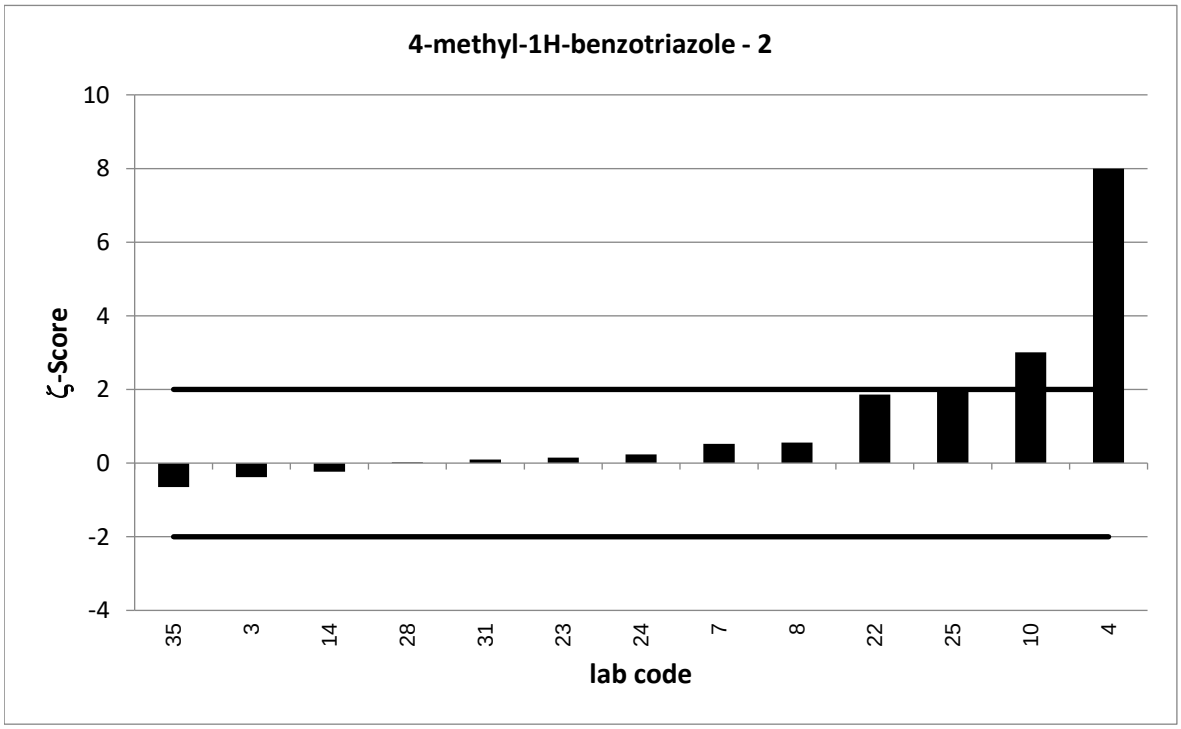
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


4-methyl-1H-benzotriazole - 2
346
concentration in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
36 33 38 26 5 42 34 39 14 35 18 3 40 28 24 23 8 31 11 25 13 7 10 22 16 27 4
lab code


4-methyl-1H-benzotriazole - 2
7338
z_u-score
6
4
2
0
-2
-4
-6
-8
36 33 38 26 5 42 34 39 14 35 18 3 40 28 24 23 8 31 11 25 13 7 10 22 16 27 4
lab code

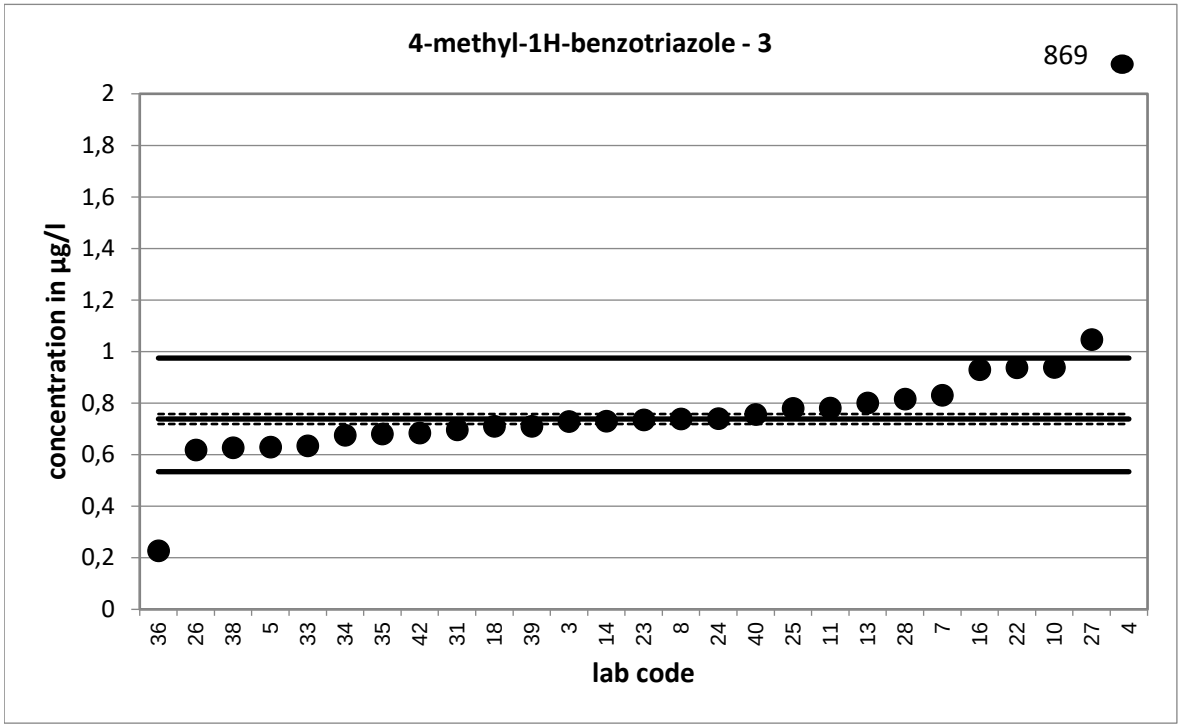

4-methyl-1H-benzotriazole - 2
86,5
expanded uncertainty in µg/l
0,3
0,25
0,2
0,15
0,1
0,05
0
24
25
8
23
10
35
3
22
28
7
31
14
4
lab code

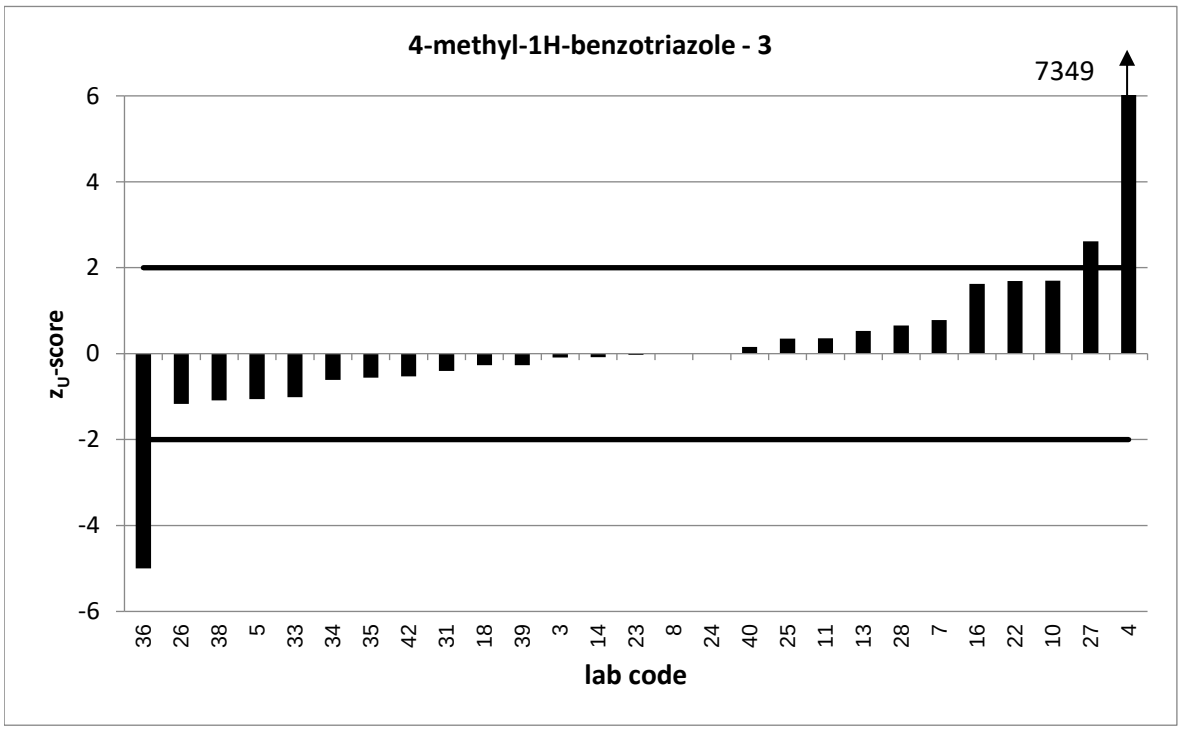

4-methyl-1H-benzotriazole - 2
ζ-Score
10
8
6
4
2
0
-2
-4
35
3
14
28
31
23
24
7
8
22
25
10
4
lab code

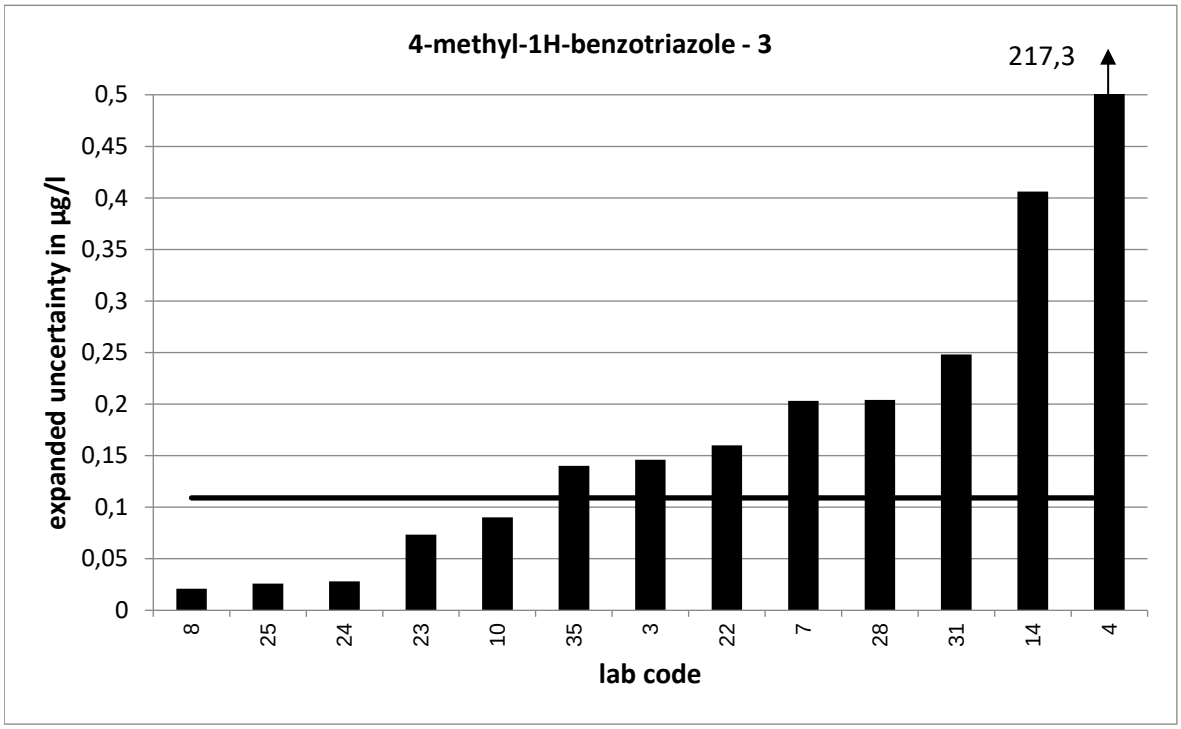
PT 3/19 - TW S1		4-methyl-1H-benzotriazole - 3			
assigned value [µg/l]*		0,7385	± 0,0194		
upper tolerance limit [µg/l]		0,9748			
lower tolerance limit [µg/l]		0,534			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,729	0,146	-0,1	-0,1	s
4	869	217,3	8,0	7349,2	u
5	0,63			-1,1	s
7	0,831	0,203	0,9	0,8	s
8	0,739	0,021	0,0	0,0	s
10	0,939	0,09	4,4	1,7	s
11	0,781			0,4	s
13	0,801			0,5	s
14	0,73	0,406	0,0	-0,1	s
16	0,9305			1,6	s
18	0,711			-0,3	s
22	0,938	0,16	2,5	1,7	s
23	0,735	0,074	-0,1	0,0	s
24	0,74	0,028	0,1	0,0	s
25	0,78	0,026	2,6	0,4	s
26	0,619			-1,2	s
27	1,047			2,6	q
28	0,816	0,204	0,8	0,7	s
31	0,697	0,248	-0,3	-0,4	s
33	0,635			-1,0	s
34	0,676			-0,6	s
35	0,681	0,14	-0,8	-0,6	s
36	0,2275			-5,0	u
38	0,627			-1,1	s
39	0,711			-0,3	s
40	0,757			0,2	s
42	0,684			-0,5	s

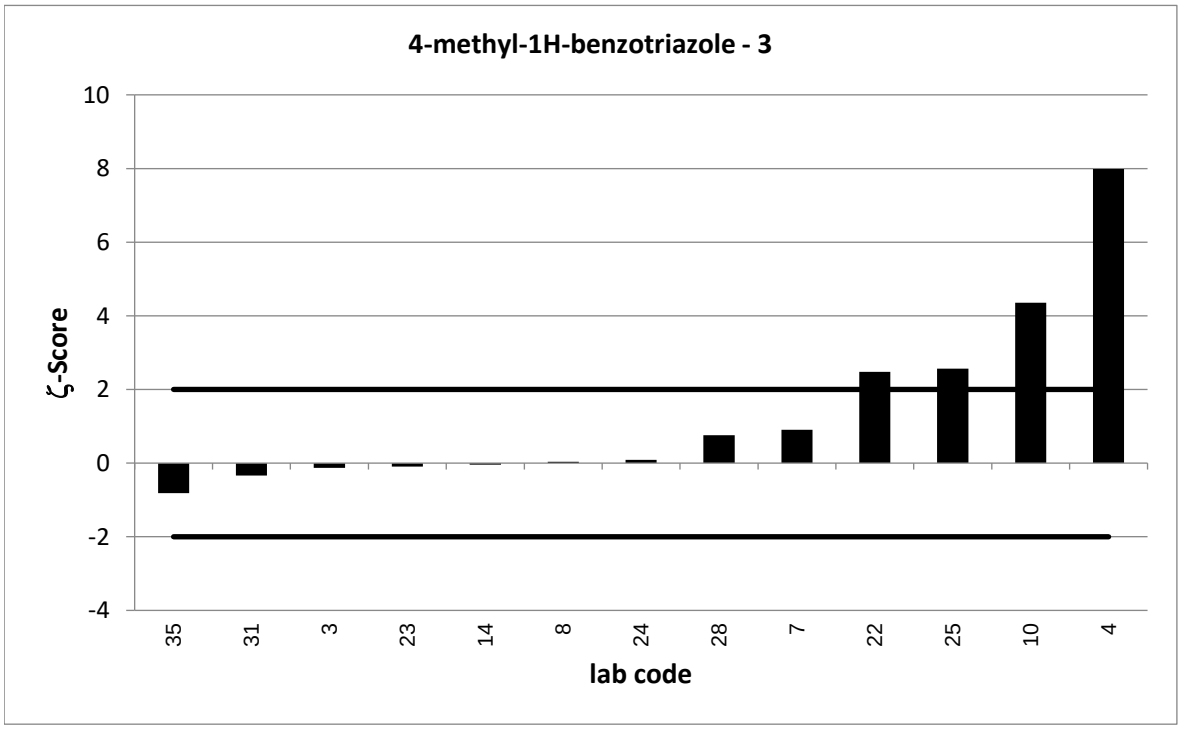
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


4-methyl-1H-benzotriazole - 3
869
concentration in µg/l
2
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
36 26 38 5 33 34 35 42 31 18 39 3 14 23 8 24 40 25 11 13 28 7 16 22 10 27 4
lab code


4-methyl-1H-benzotriazole - 3
7349
z_U-score
6
4
2
0
-2
-4
-6
36 26 38 5 33 34 35 42 31 18 39 3 14 23 8 24 40 25 11 13 28 7 16 22 10 27 4
lab code

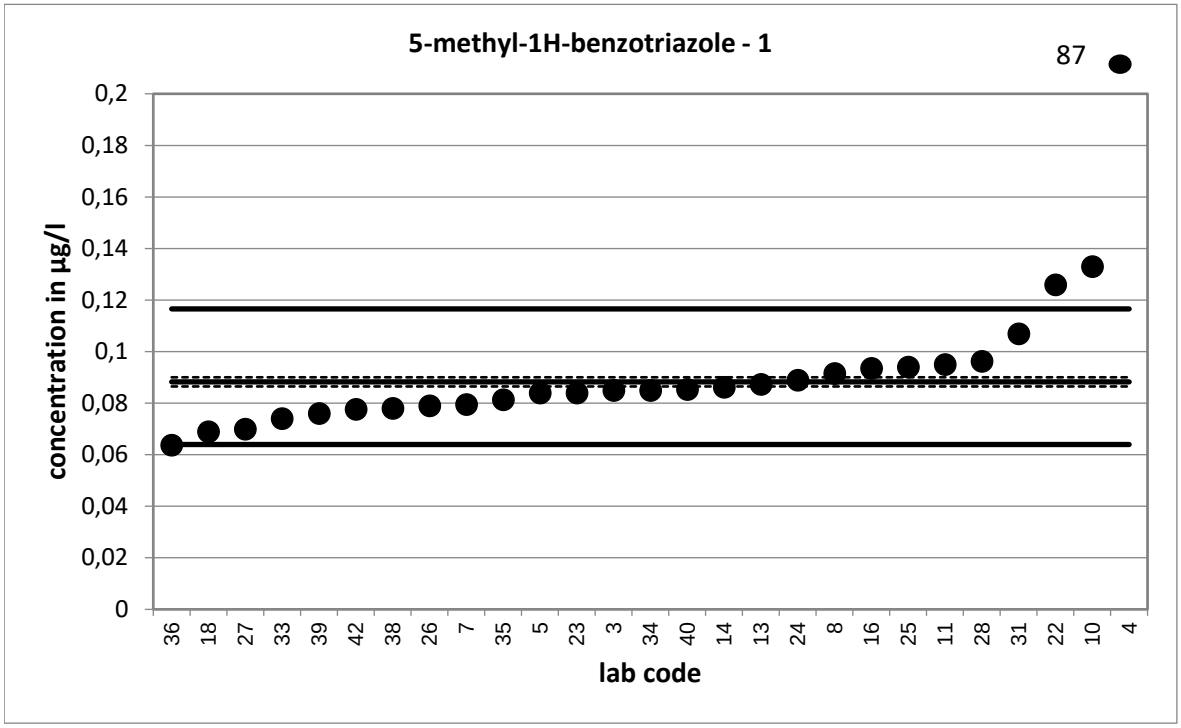

4-methyl-1H-benzotriazole - 3
217,3
expanded uncertainty in µg/l
0,5
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
8
25
24
23
10
35
3
22
7
28
31
14
4
lab code

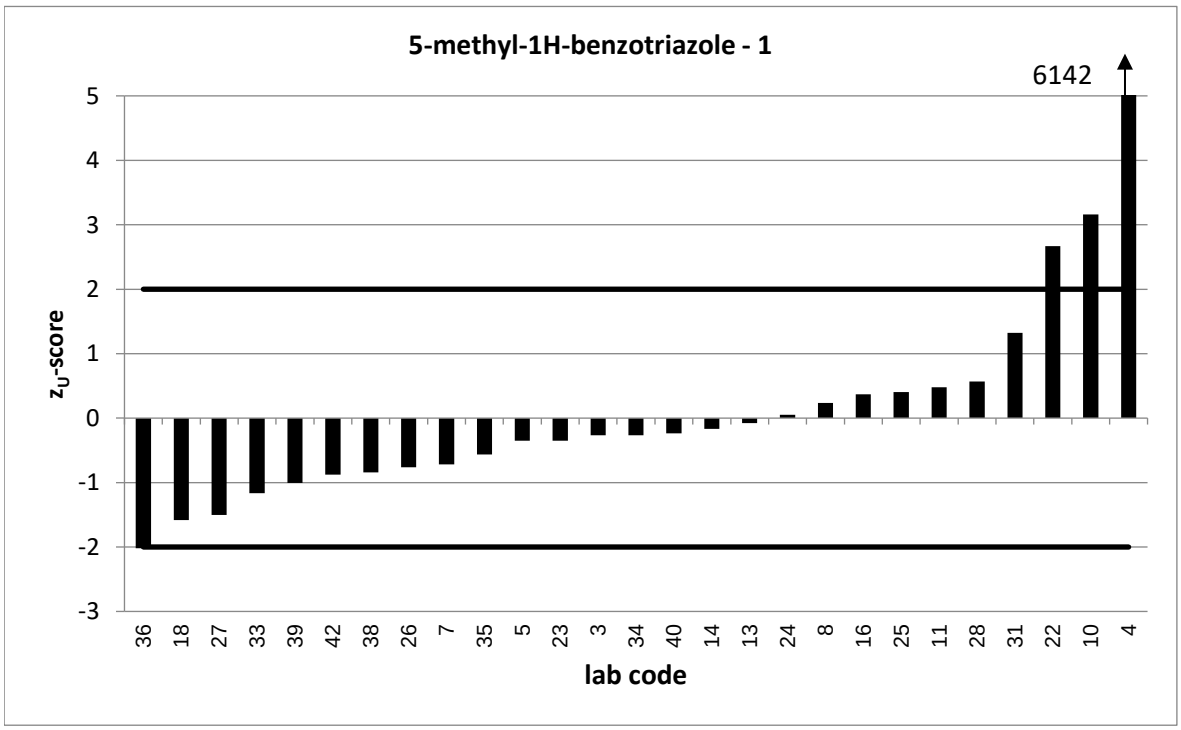

4-methyl-1H-benzotriazole - 3
ζ-Score
10
8
6
4
2
0
-2
-4
35
31
3
23
14
8
24
28
7
22
25
10
4
lab code

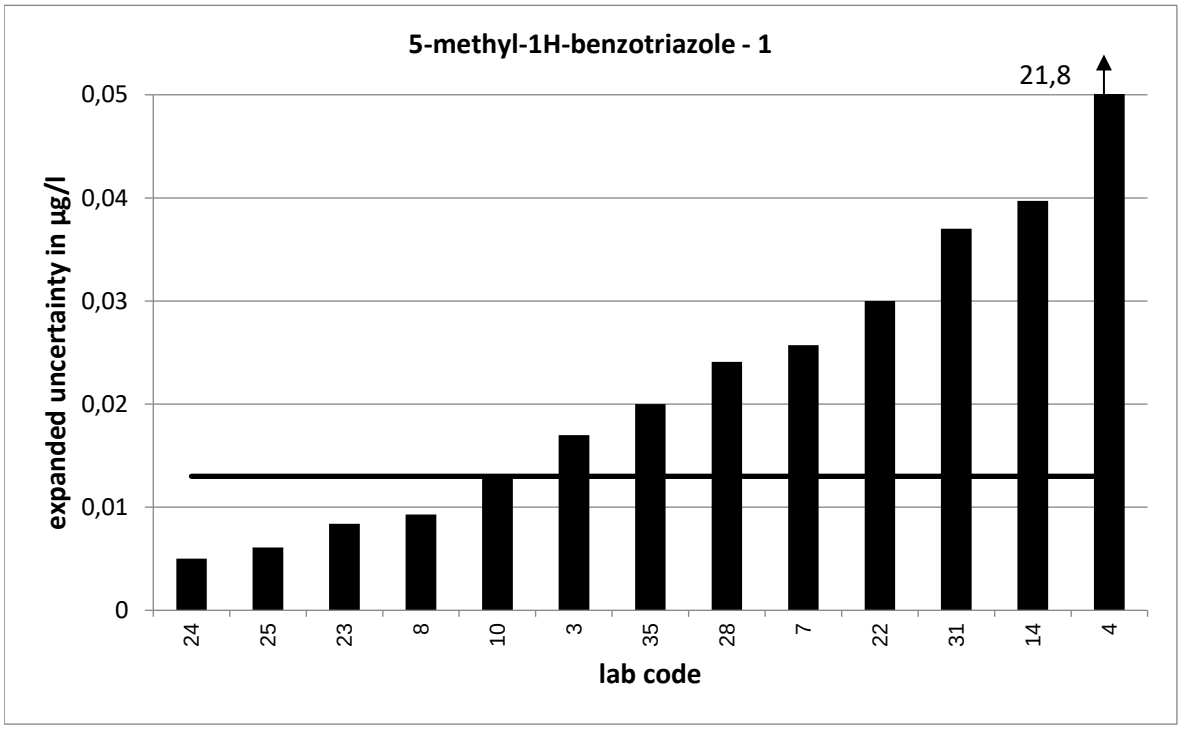
PT 3/19 - TW S1		5-methyl-1H-benzotriazole - 1			
assigned value [µg/l]*		0,08825	± 0,00178		
upper tolerance limit [µg/l]		0,1166			
lower tolerance limit [µg/l]		0,06395			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,085	0,017	-0,4	-0,3	s
4	87	21,8	8,0	6141,9	u
5	0,084			-0,4	s
7	0,0795	0,026	-0,7	-0,7	s
8	0,0916	0,009	0,7	0,2	s
10	0,133	0,013	6,8	3,2	u
11	0,095			0,5	s
13	0,0873			-0,1	s
14	0,0862	0,04	-0,1	-0,2	s
16	0,0935			0,4	s
18	0,069			-1,6	s
22	0,126	0,03	2,5	2,7	q
23	0,084	0,008	-1,0	-0,4	s
24	0,089	0,005	0,3	0,1	s
25	0,094	0,006	1,8	0,4	s
26	0,079			-0,8	s
27	0,07			-1,5	s
28	0,0963	0,024	0,7	0,6	s
31	0,107	0,037	1,0	1,3	s
33	0,0741			-1,2	s
34	0,085			-0,3	s
35	0,0814	0,02	-0,7	-0,6	s
36	0,0637			-2,0	s
38	0,078			-0,8	s
39	0,076			-1,0	s
40	0,0854			-0,2	s
42	0,0776			-0,9	s

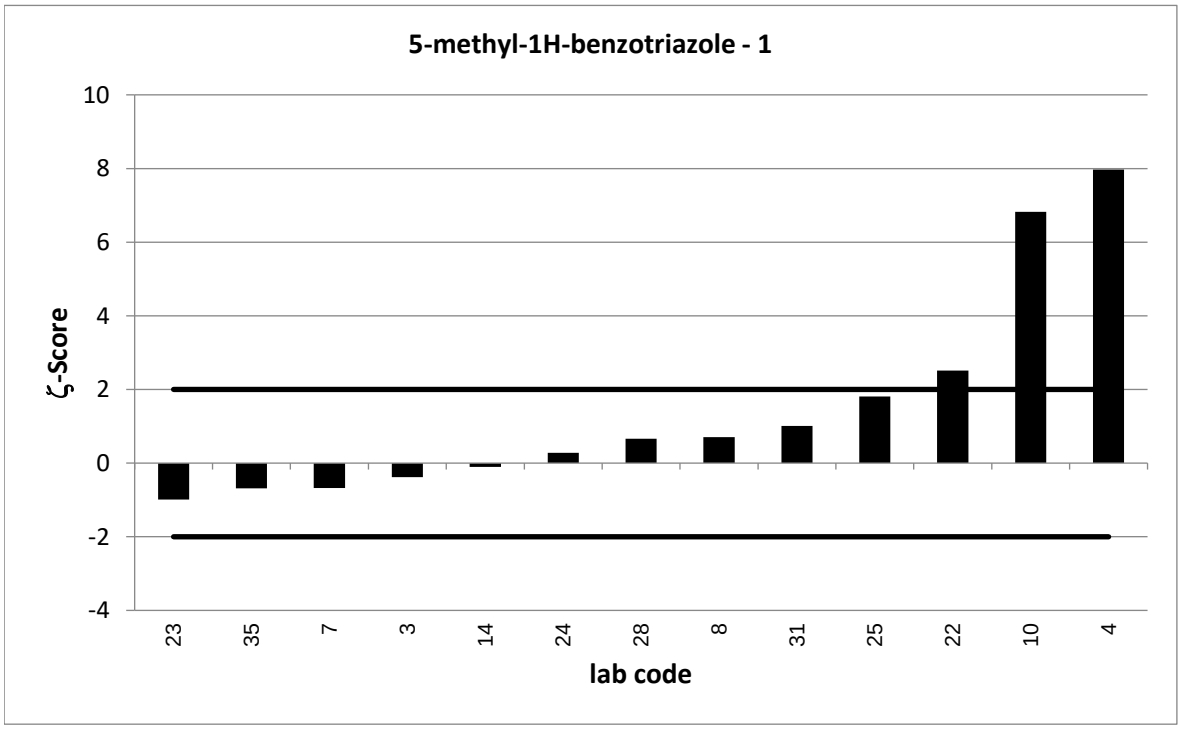
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


5-methyl-1H-benzotriazole - 1
87
concentration in µg/l
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
36 18 27 33 39 42 38 26 7 35 5 23 3 34 40 14 13 24 8 16 25 11 28 31 22 10 4
lab code


5-methyl-1H-benzotriazole - 1
6142
z_U-score
5
4
3
2
1
0
-1
-2
-3
36 18 27 33 39 42 38 26 7 35 5 23 3 34 40 14 13 24 8 16 25 11 28 31 22 10 4
lab code

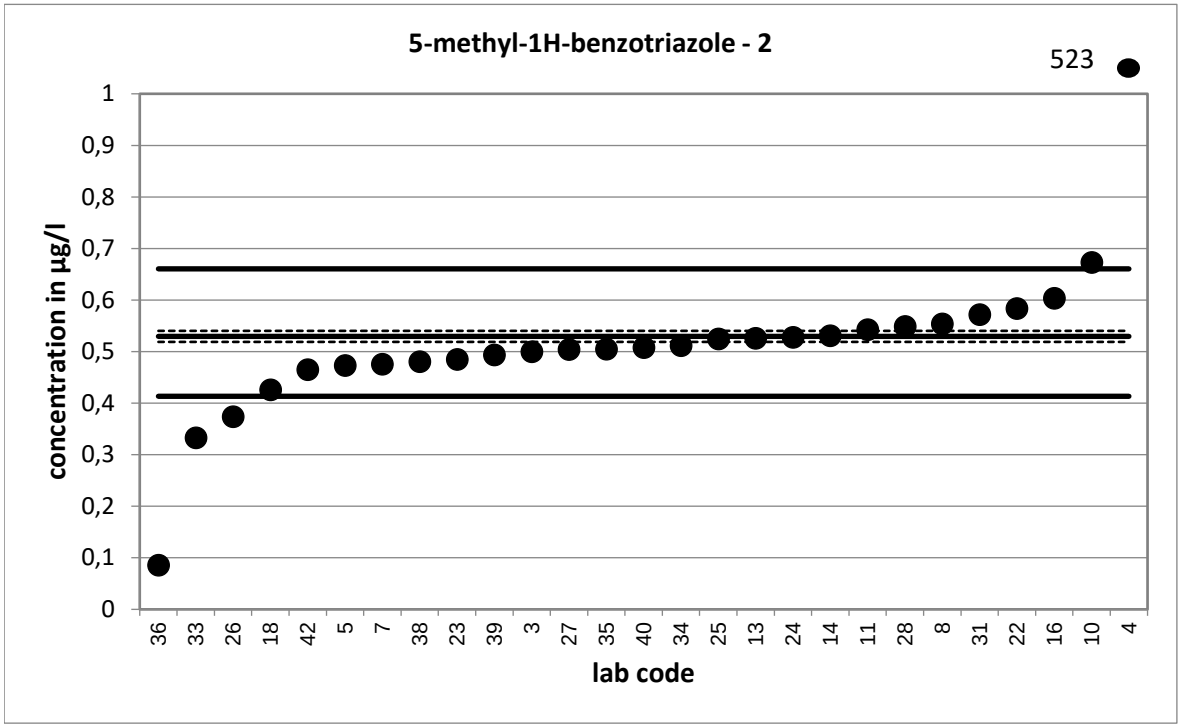

5-methyl-1H-benzotriazole - 1
21,8
expanded uncertainty in µg/l
0,05
0,04
0,03
0,02
0,01
0
24
25
23
8
10
3
35
28
7
22
31
14
4
lab code

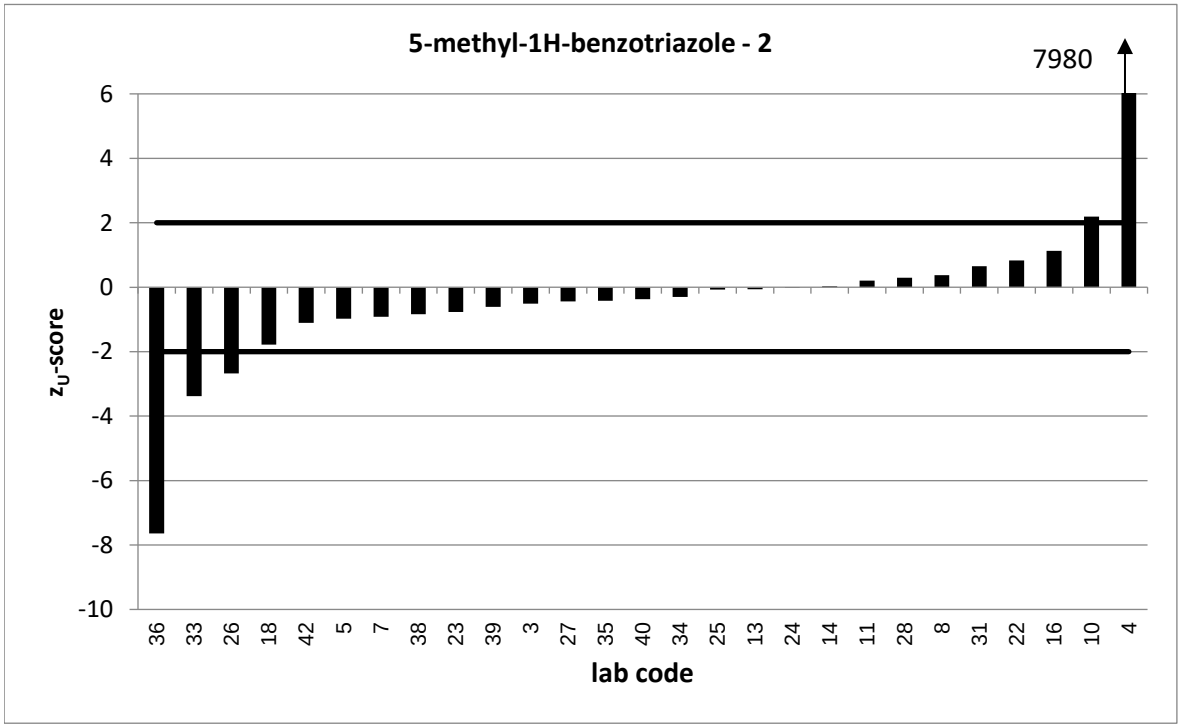

5-methyl-1H-benzotriazole - 1
ζ-Score
10
8
6
4
2
0
-2
-4
23
35
7
3
14
24
28
8
31
25
22
10
4
lab code

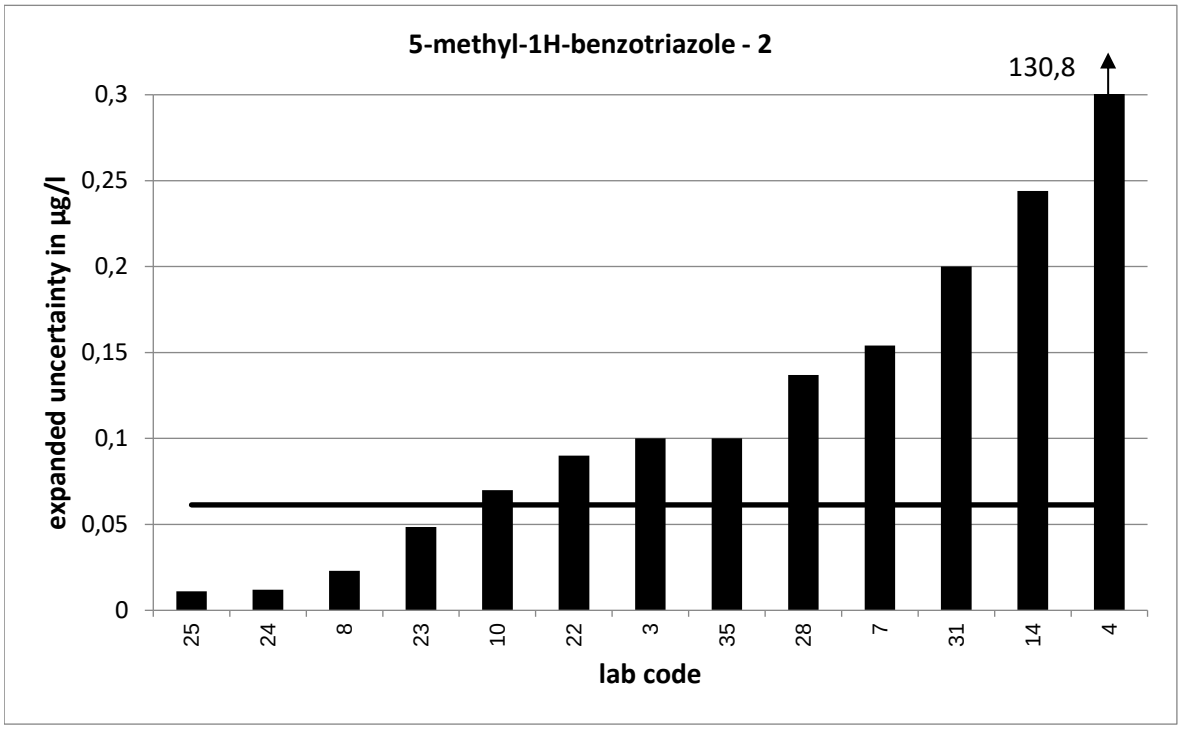
PT 3/19 - TW S1		5-methyl-1H-benzotriazole - 2			
assigned value [µg/l]*		0,5295	± 0,0107		
upper tolerance limit [µg/l]		0,6605			
lower tolerance limit [µg/l]		0,4133			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,5	0,1	-0,6	-0,5	s
4	523	130,8	8,0	7979,7	u
5	0,473			-1,0	s
7	0,476	0,154	-0,7	-0,9	s
8	0,554	0,023	1,9	0,4	s
10	0,673	0,07	4,1	2,2	q
11	0,543			0,2	s
13	0,526			-0,1	s
14	0,531	0,244	0,0	0,0	s
16	0,6035			1,1	s
18	0,426			-1,8	s
22	0,584	0,09	1,2	0,8	s
23	0,485	0,049	-1,8	-0,8	s
24	0,528	0,012	-0,2	0,0	s
25	0,525	0,011	-0,6	-0,1	s
26	0,374			-2,7	q
27	0,504			-0,4	s
28	0,549	0,137	0,3	0,3	s
31	0,572	0,2	0,4	0,6	s
33	0,333			-3,4	u
34	0,512			-0,3	s
35	0,505	0,1	-0,5	-0,4	s
36	0,0858			-7,6	u
38	0,481			-0,8	s
39	0,494			-0,6	s
40	0,508			-0,4	s
42	0,465			-1,1	s

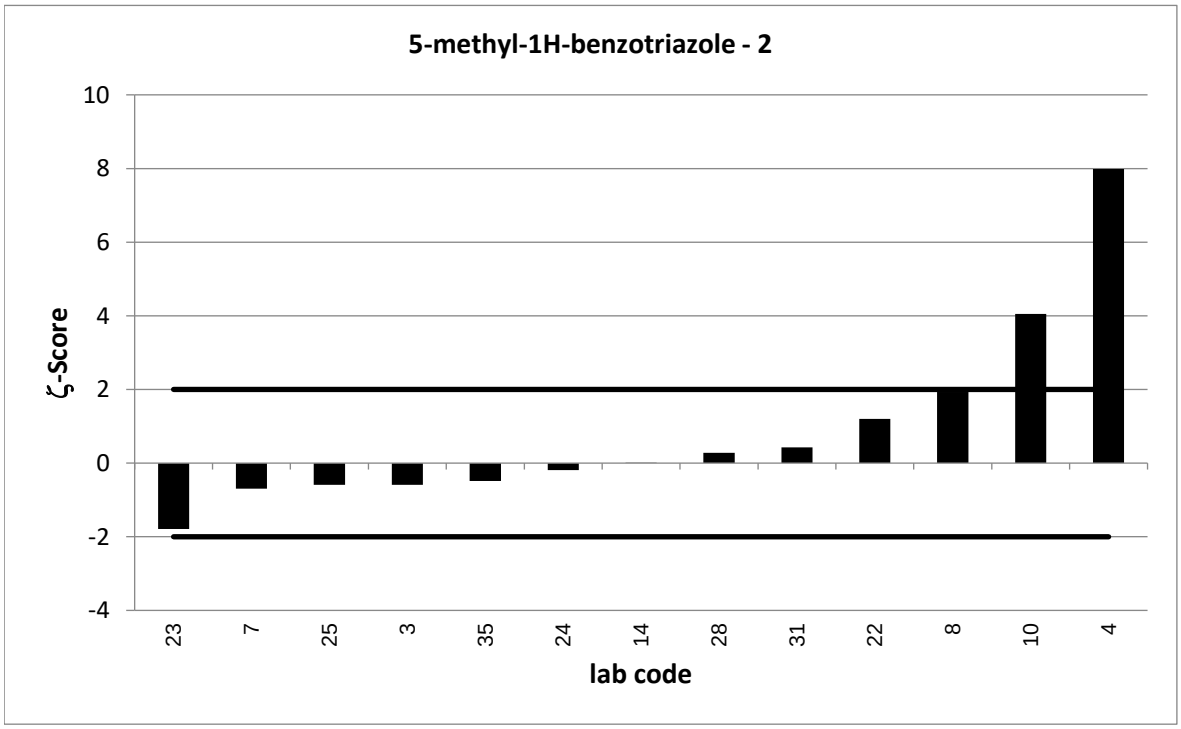
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


5-methyl-1H-benzotriazole - 2
523
concentration in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
36 33 26 18 42 5 7 38 23 39 3 27 35 40 34 25 13 24 14 11 28 8 31 22 16 10 4
lab code


5-methyl-1H-benzotriazole - 2
7980
z_U-score
6
4
2
0
-2
-4
-6
-8
-10
36 33 26 18 42 5 7 38 23 39 3 27 35 40 34 25 13 24 14 11 28 8 31 22 16 10 4
lab code

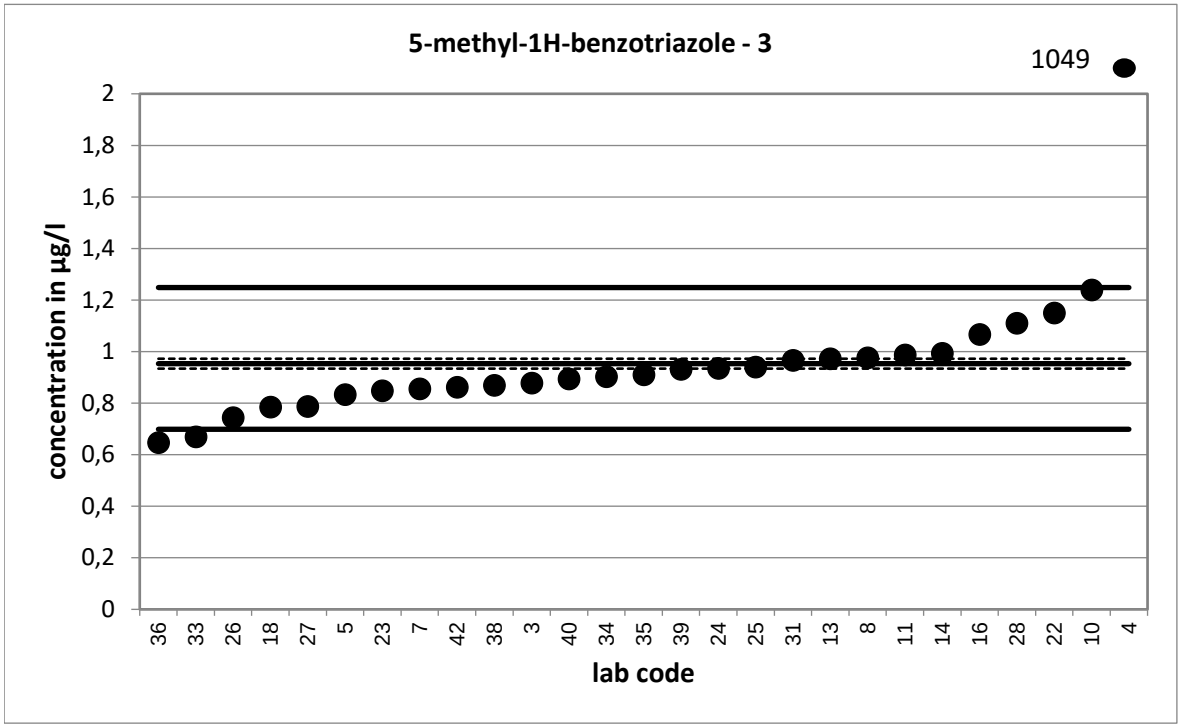

5-methyl-1H-benzotriazole - 2
130,8
expanded uncertainty in µg/l
0,3
0,25
0,2
0,15
0,1
0,05
0
25
24
8
23
10
22
3
35
28
7
31
14
4
lab code

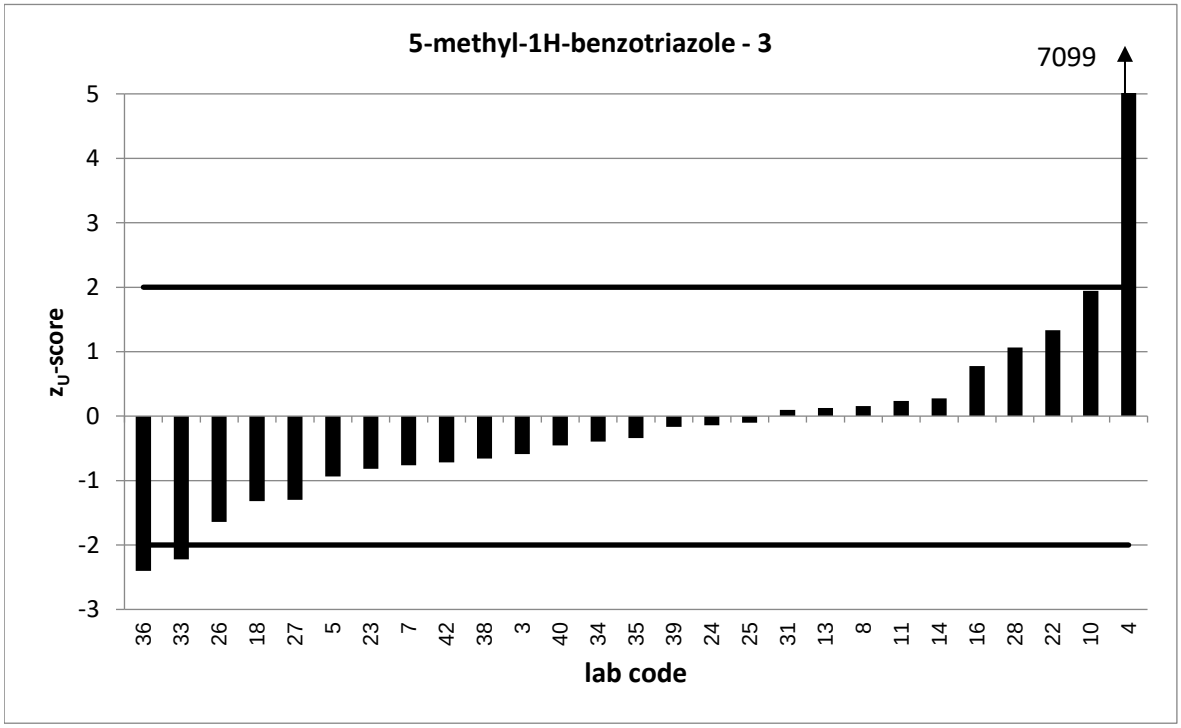

5-methyl-1H-benzotriazole - 2
ζ-Score
10
8
6
4
2
0
-2
-4
23
7
25
3
35
24
14
28
31
22
8
10
4
lab code

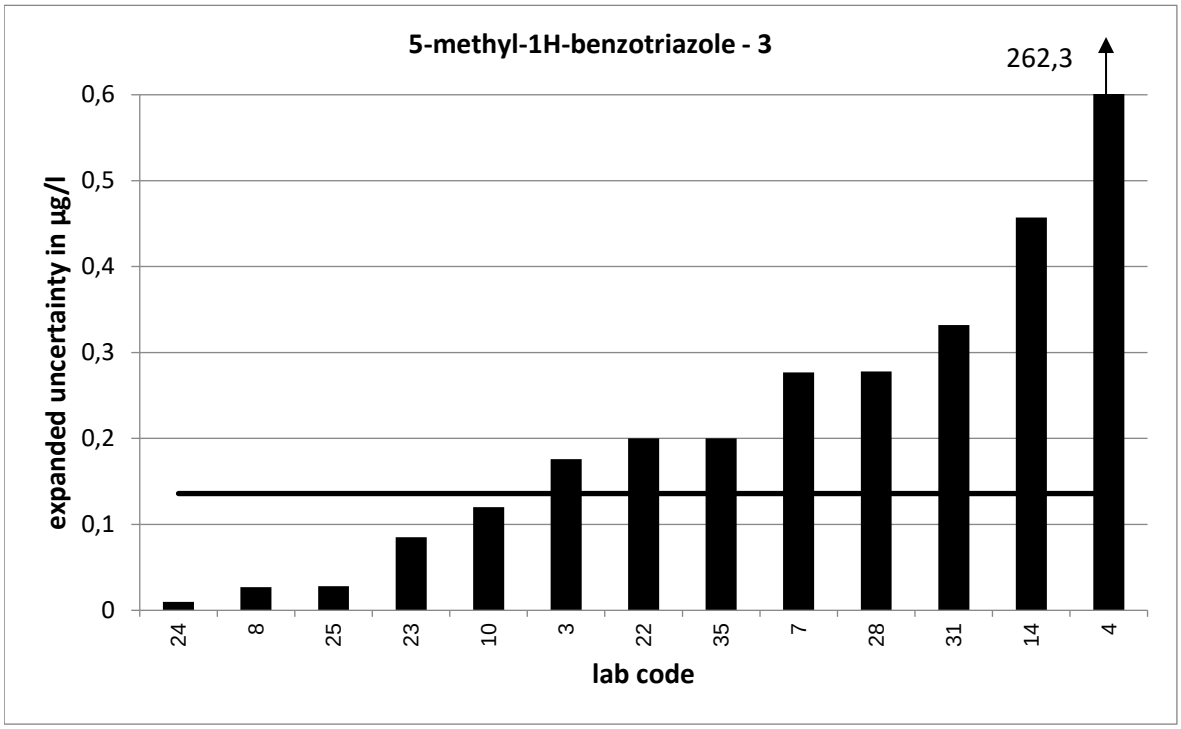
PT 3/19 - TW S1		5-methyl-1H-benzotriazole - 3			
assigned value [µg/l]*		0,9531	± 0,0192		
upper tolerance limit [µg/l]		1,248			
lower tolerance limit [µg/l]		0,6986			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,878	0,176	-0,8	-0,6	s
4	1049	262,3	8,0	7098,9	u
5	0,834			-0,9	s
7	0,856	0,277	-0,7	-0,8	s
8	0,976	0,027	1,4	0,2	s
10	1,24	0,12	4,7	1,9	s
11	0,988			0,2	s
13	0,972			0,1	s
14	0,994	0,457	0,2	0,3	s
16	1,0675			0,8	s
18	0,785			-1,3	s
22	1,15	0,2	2,0	1,3	s
23	0,849	0,085	-2,4	-0,8	s
24	0,935	0,01	-1,7	-0,1	s
25	0,94	0,028	-0,8	-0,1	s
26	0,744			-1,6	s
27	0,788			-1,3	s
28	1,11	0,278	1,1	1,1	s
31	0,967	0,332	0,1	0,1	s
33	0,67			-2,2	q
34	0,903			-0,4	s
35	0,91	0,2	-0,4	-0,3	s
36	0,6475			-2,4	q
38	0,869			-0,7	s
39	0,932			-0,2	s
40	0,895			-0,5	s
42	0,862			-0,7	s

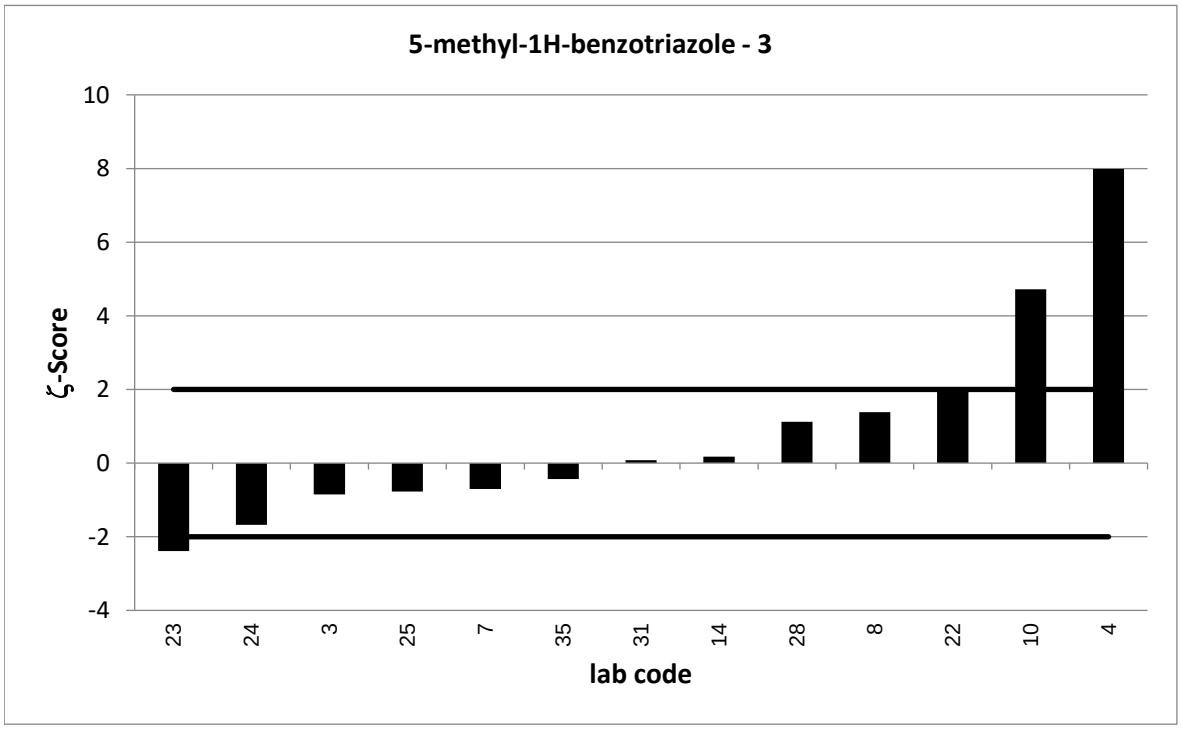
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


5-methyl-1H-benzotriazole - 3
1049
concentration in µg/l
2
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
36 33 26 18 27 5 23 7 42 38 3 40 34 35 39 24 25 31 13 8 11 14 16 28 22 10 4
lab code


5-methyl-1H-benzotriazole - 3
7099
z_U-score
5
4
3
2
1
0
-1
-2
-3
36 33 26 18 27 5 23 7 42 38 3 40 34 35 39 24 25 31 13 8 11 14 16 28 22 10 4
lab code

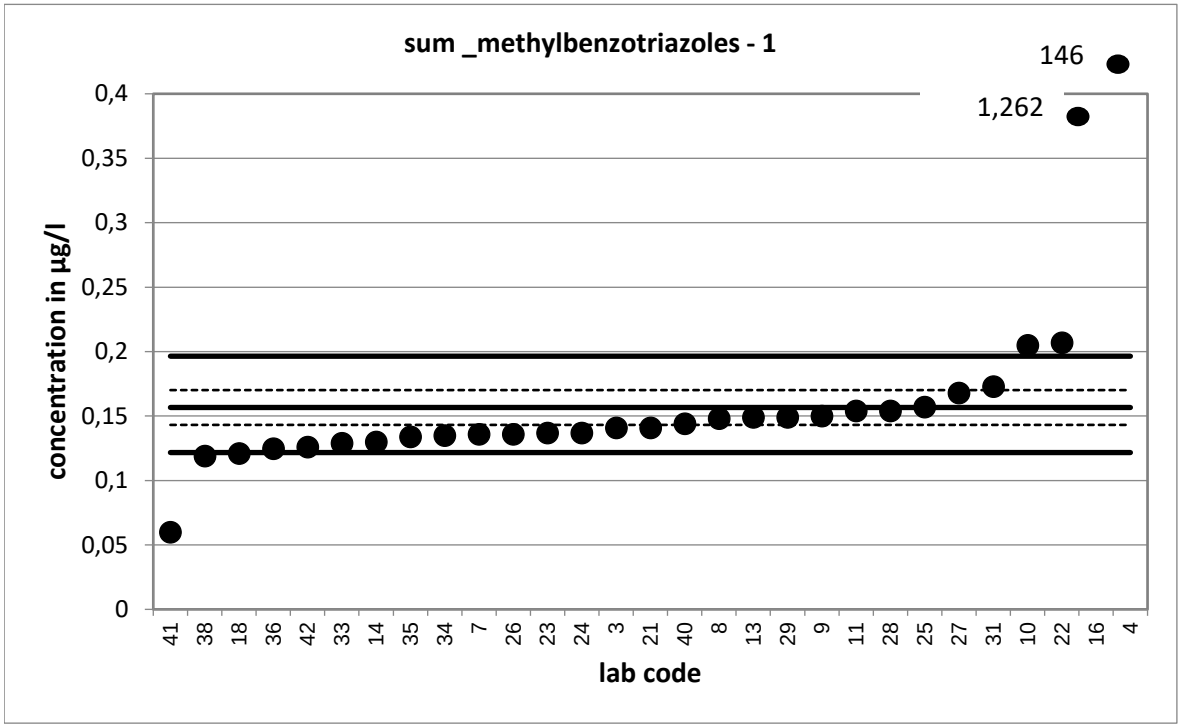

5-methyl-1H-benzotriazole - 3
262,3
expanded uncertainty in µg/l
0,6
0,5
0,4
0,3
0,2
0,1
0
24
8
25
23
10
3
22
35
7
28
31
14
4
lab code

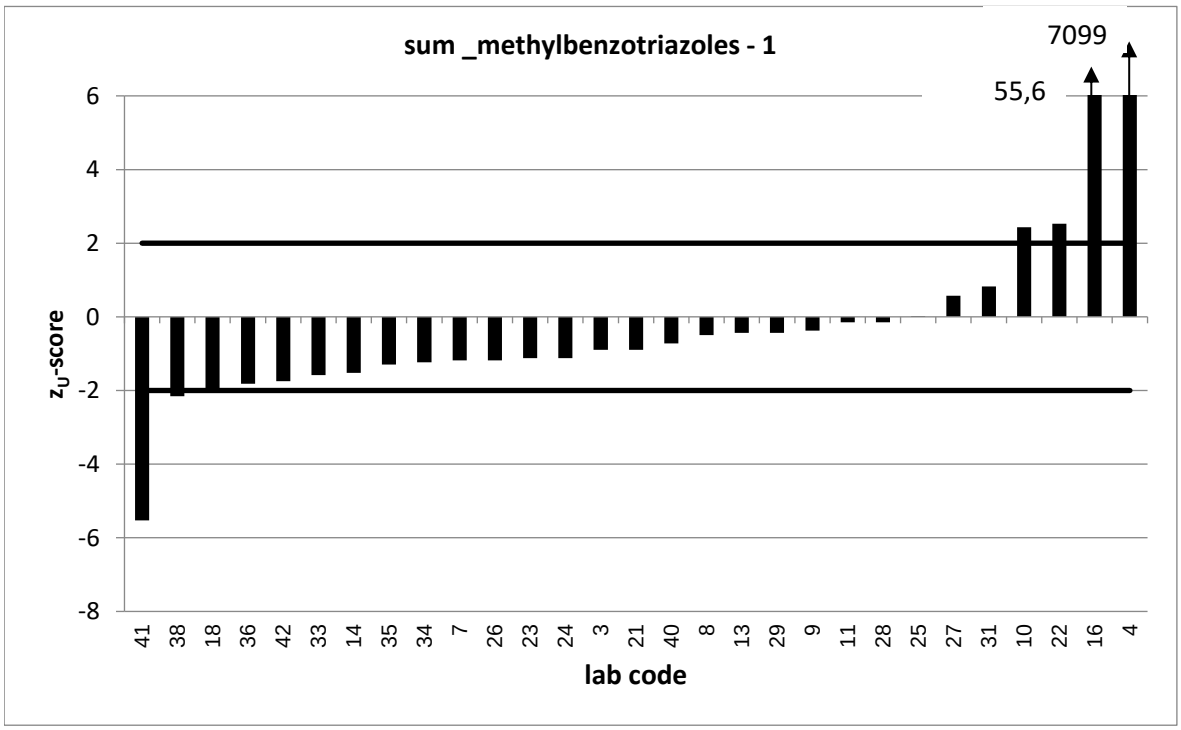

5-methyl-1H-benzotriazole - 3
ζ-Score
10
8
6
4
2
0
-2
-4
23
24
3
25
7
35
31
14
28
8
22
10
4
lab code

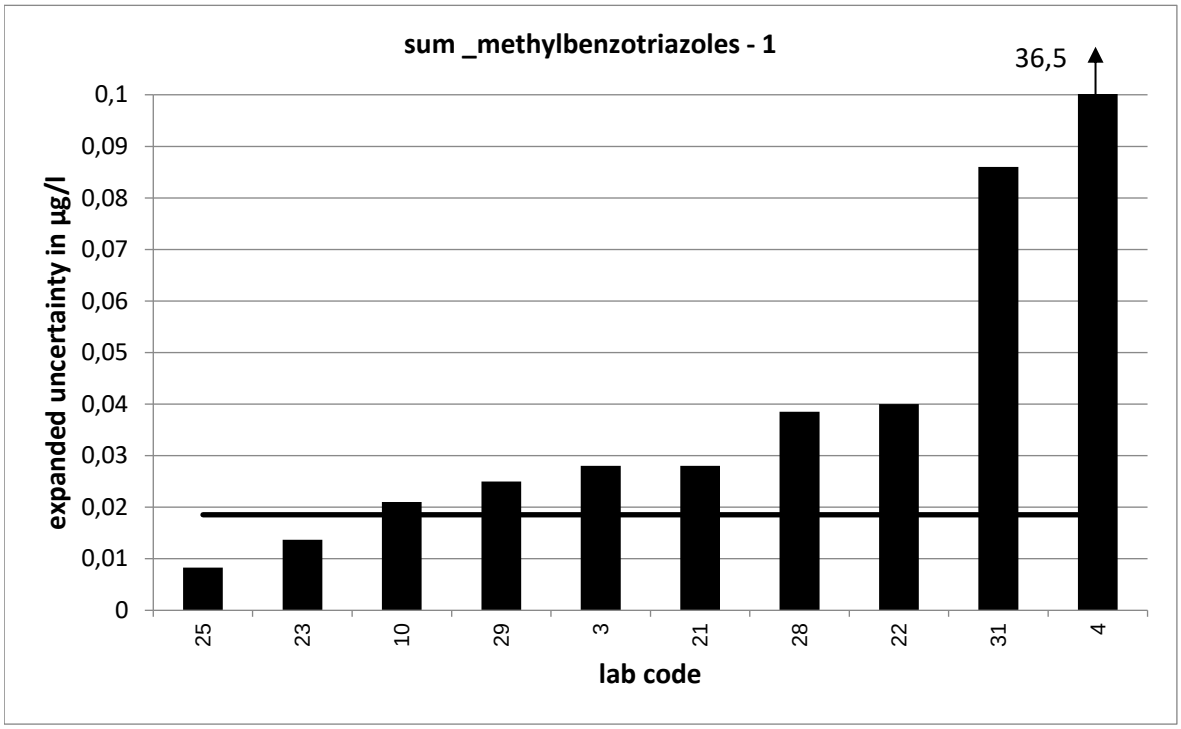
PT 3/19 - TW S1		sum _methylbenzotriazoles - 1			
assigned value [µg/l]*		0,1566	± 0,0135		
upper tolerance limit [µg/l]		0,1964			
lower tolerance limit [µg/l]		0,1217			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,141	0,028	-1,0	-0,9	s
4	146	36,5	8,0	7329,9	u
7	0,136			-1,2	s
8	0,148			-0,5	s
9	0,15			-0,4	s
10	0,205	0,021	3,9	2,4	q
11	0,154			-0,2	s
13	0,149			-0,4	s
14	0,13			-1,5	s
16	1,262			55,6	u
18	0,121			-2,0	s
21	0,141	0,028	-1,0	-0,9	s
22	0,207	0,04	2,4	2,5	q
23	0,137	0,014	-2,0	-1,1	s
24	0,137			-1,1	s
25	0,157	0,008	0,0	0,0	s
26	0,136			-1,2	s
27	0,168			0,6	s
28	0,154	0,039	-0,1	-0,2	s
29	0,149	0,025	-0,5	-0,4	s
31	0,173	0,086	0,4	0,8	s
33	0,129			-1,6	s
34	0,135			-1,2	s
35	0,134			-1,3	s
36	0,1248			-1,8	s
38	0,119			-2,2	q
40	0,144			-0,7	s
41	0,0599			-5,5	u
42	0,126			-1,8	s

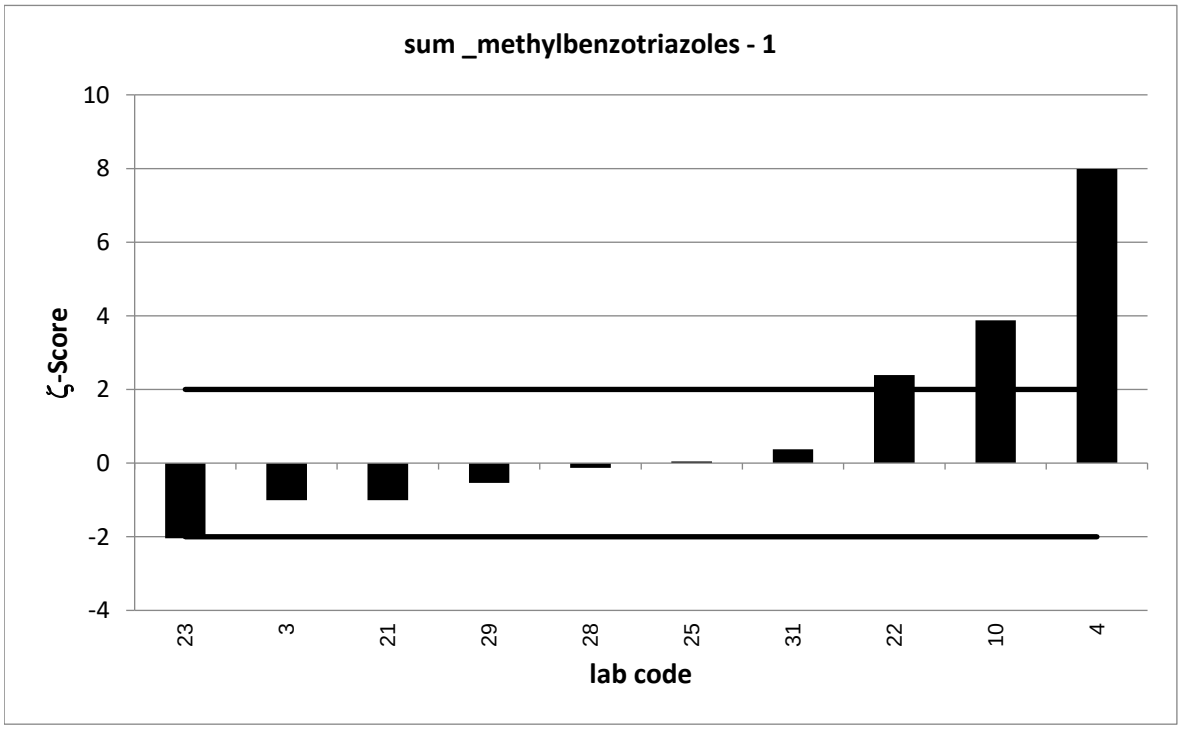
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sum _methylbenzotriazoles - 1
146
1,262
concentration in µg/l
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
41 38 18 36 42 33 14 35 34 7 26 23 24 3 21 40 8 13 29 9 11 28 25 27 31 10 22 16 4
lab code


sum _methylbenzotriazoles - 1
7099
55,6
z_u-score
6
4
2
0
-2
-4
-6
-8
41 38 18 36 42 33 14 35 34 7 26 23 24 3 21 40 8 13 29 9 11 28 25 27 31 10 22 16 4
lab code

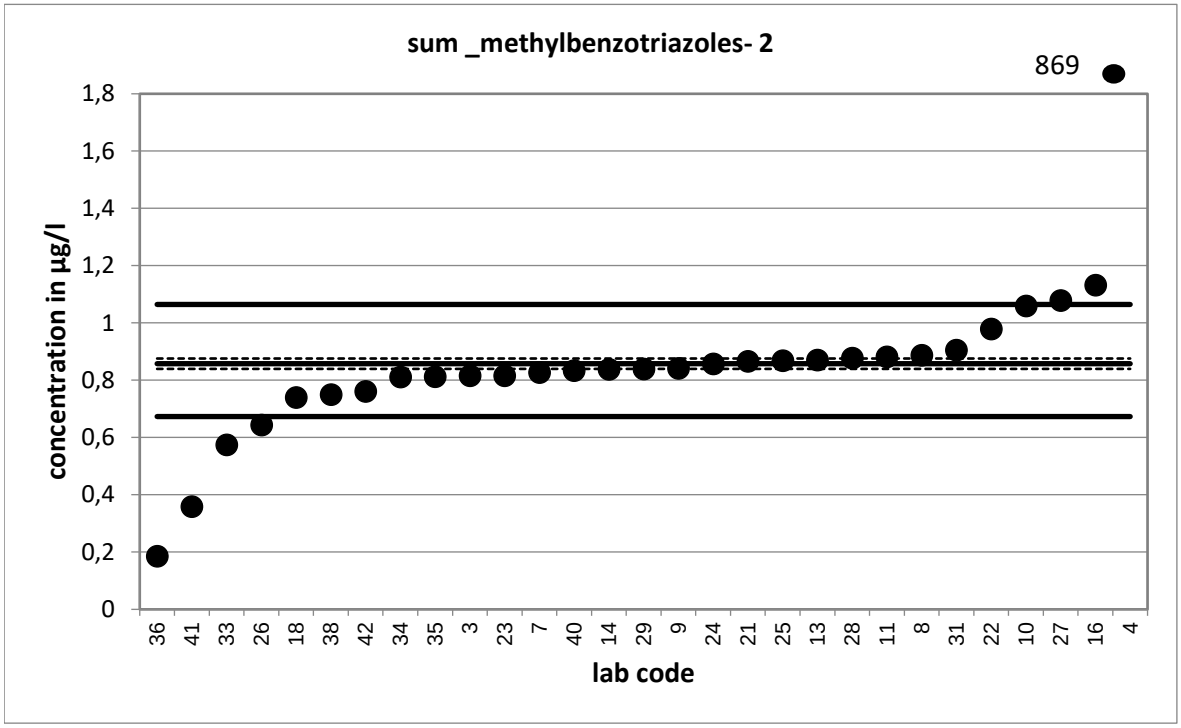

sum _methylbenzotriazoles - 1
36,5
expanded uncertainty in µg/l
0,1
0,09
0,08
0,07
0,06
0,05
0,04
0,03
0,02
0,01
0
25
23
10
29
3
21
28
22
31
4
lab code

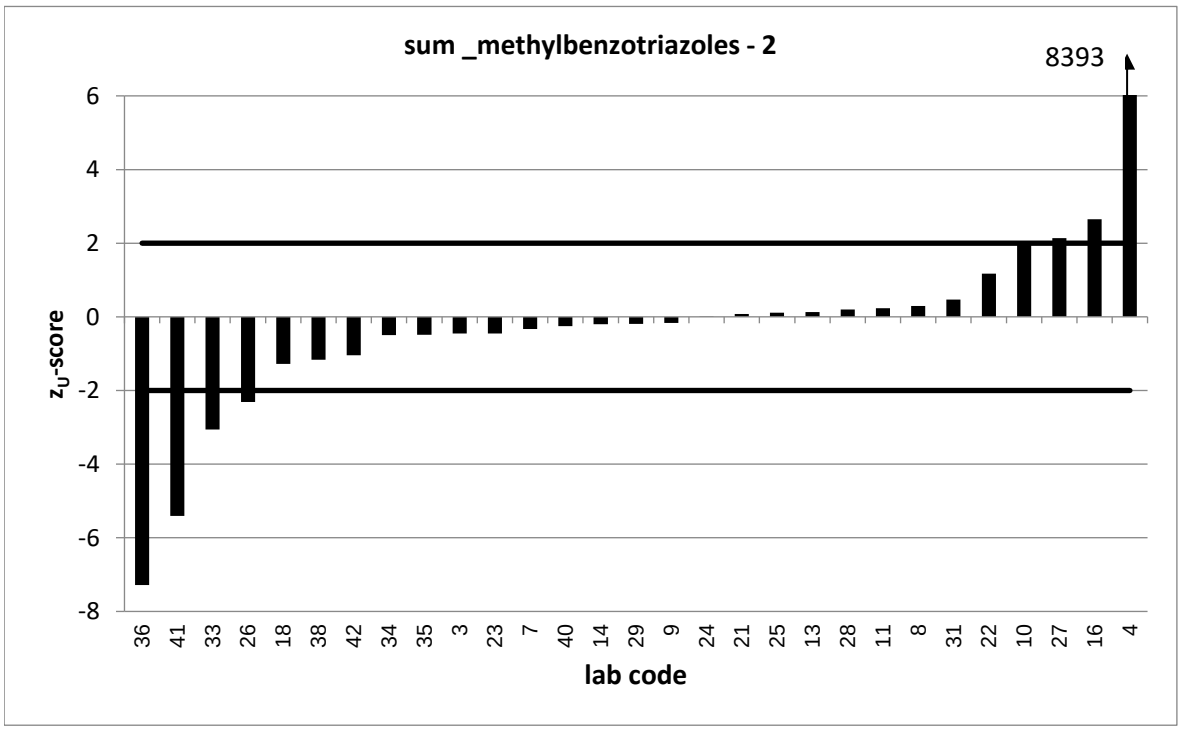

sum _methylbenzotriazoles - 1
ζ-Score
10
8
6
4
2
0
-2
-4
23
3
21
29
28
25
31
22
10
4
lab code

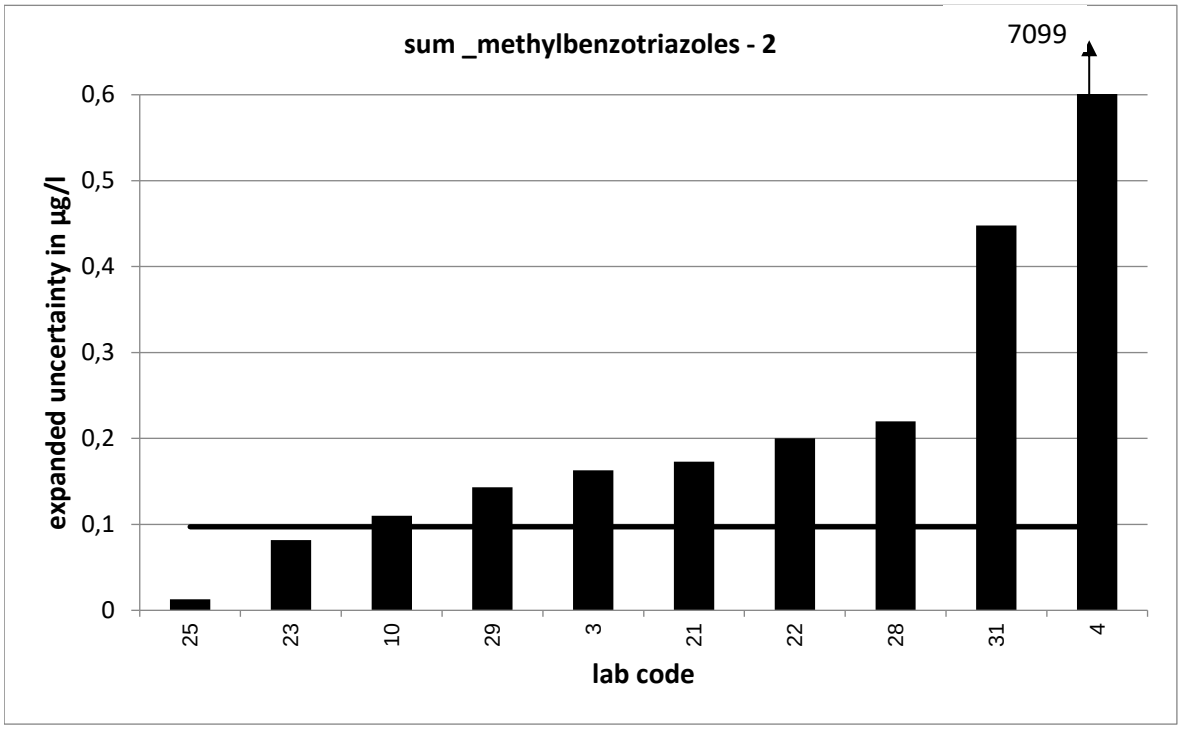
PT 3/19 - TW S1		sum _methylbenzotriazoles - 2			
assigned value [µg/l]*		0,8577	± 0,0181		
upper tolerance limit [µg/l]		1,065			
lower tolerance limit [µg/l]		0,6732			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	0,816	0,163	-0,5	-0,5	s
4	869	217,3	8,0	8393,5	u
7	0,827			-0,3	s
8	0,888			0,3	s
9	0,842			-0,2	s
10	1,06	0,11	3,6	2,0	s
11	0,882			0,2	s
13	0,871			0,1	s
14	0,839			-0,2	s
16	1,132			2,7	q
18	0,74			-1,3	s
21	0,866	0,173	0,1	0,1	s
22	0,979	0,2	1,2	1,2	s
23	0,816	0,082	-1,0	-0,5	s
24	0,858			0,0	s
25	0,869	0,013	1,0	0,1	s
26	0,644			-2,3	q
27	1,079			2,1	q
28	0,878	0,22	0,2	0,2	s
29	0,84	0,143	-0,2	-0,2	s
31	0,906	0,448	0,2	0,5	s
33	0,575			-3,1	u
34	0,812			-0,5	s
35	0,813			-0,5	s
36	0,1858			-7,3	u
38	0,75			-1,2	s
40	0,834			-0,3	s
41	0,359			-5,4	u
42	0,761			-1,0	s

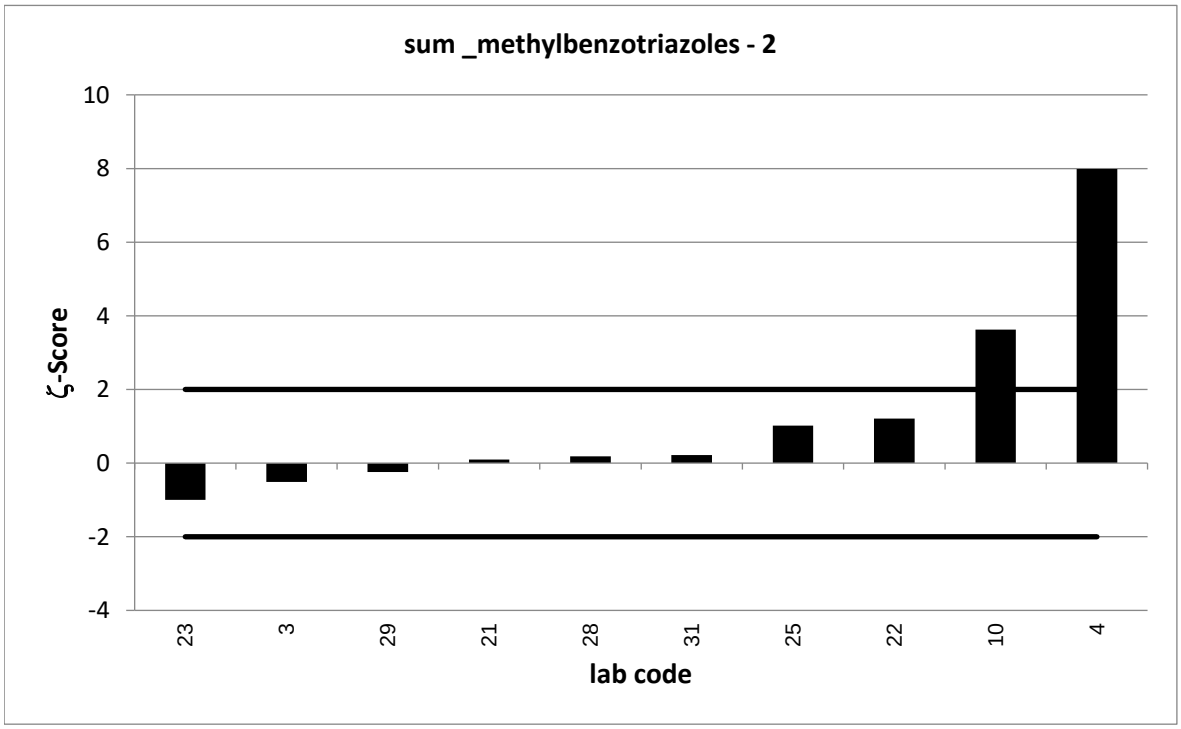
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sum _methylbenzotriazoles- 2
869
concentration in µg/l
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
36 41 33 26 18 38 42 34 35 3 23 7 40 14 29 9 24 21 25 13 28 11 8 31 22 10 27 16 4
lab code


sum _methylbenzotriazoles - 2
8393
z_U-score
6
4
2
0
-2
-4
-6
-8
36 41 33 26 18 38 42 34 35 3 23 7 40 14 29 9 24 21 25 13 28 11 8 31 22 10 27 16 4
lab code

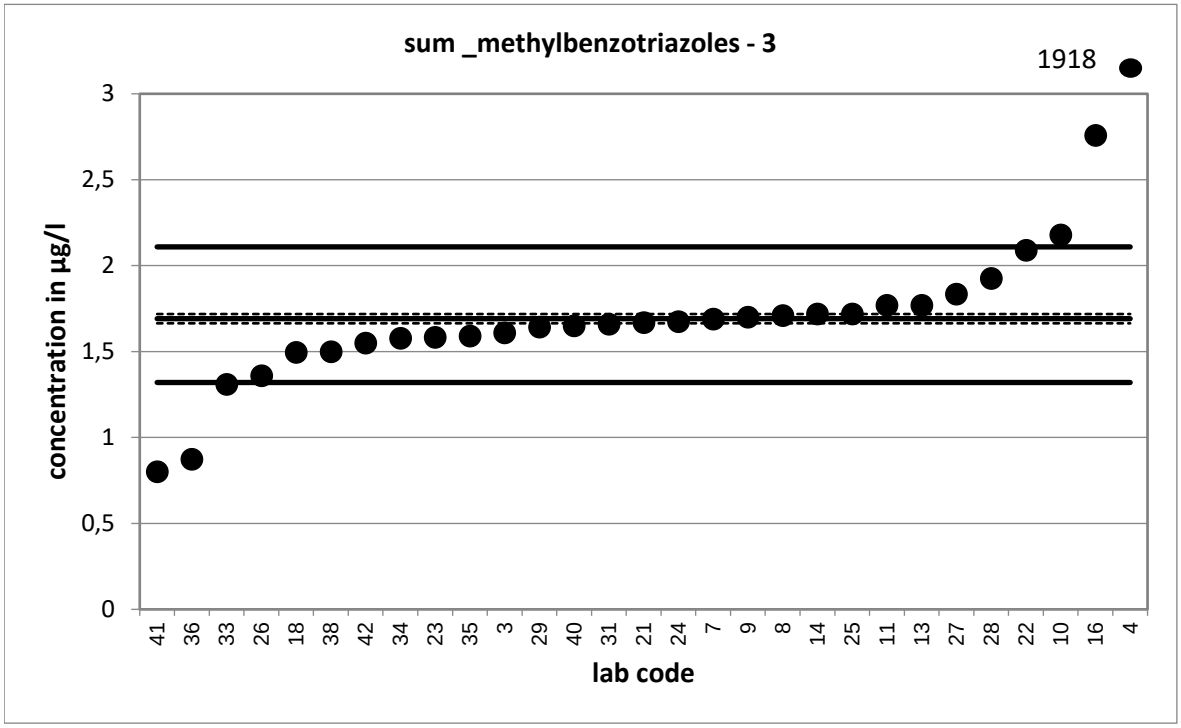

sum _methylbenzotriazoles - 2
7099
expanded uncertainty in µg/l
0,6
0,5
0,4
0,3
0,2
0,1
0
25
23
10
29
3
21
22
28
31
4
lab code

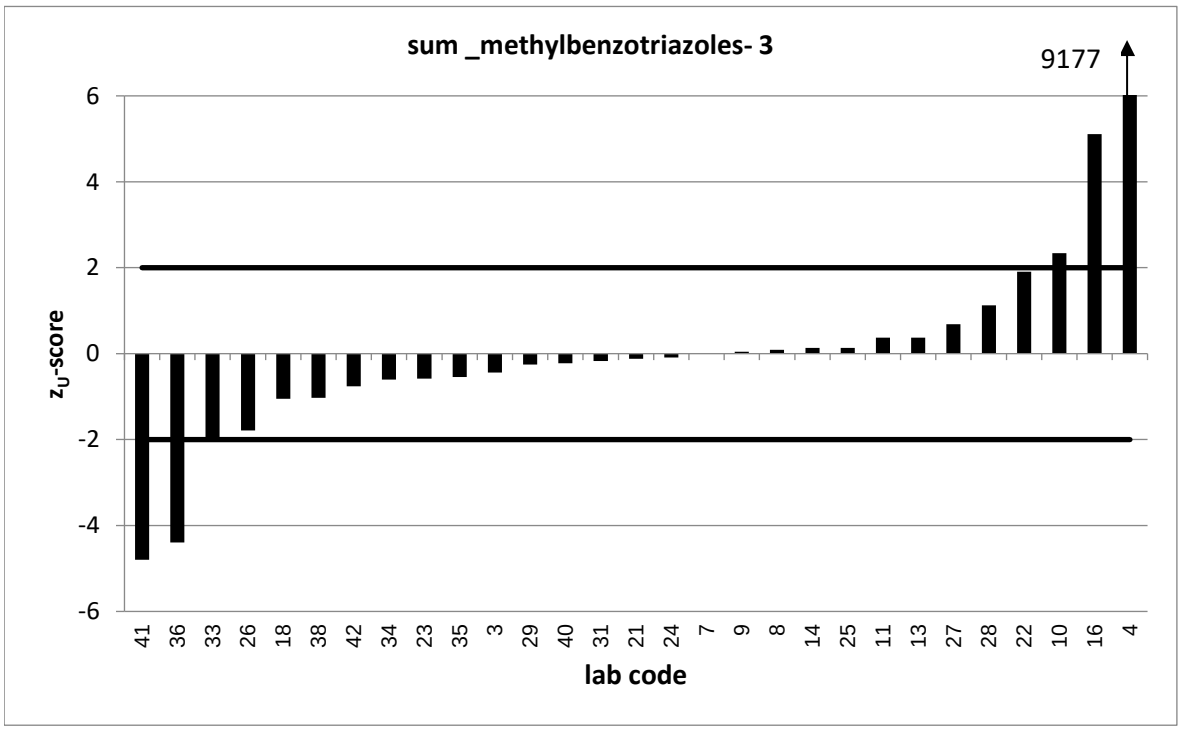

sum _methylbenzotriazoles - 2
ζ-Score
10
8
6
4
2
0
-2
-4
23
3
29
21
28
31
25
22
10
4
lab code

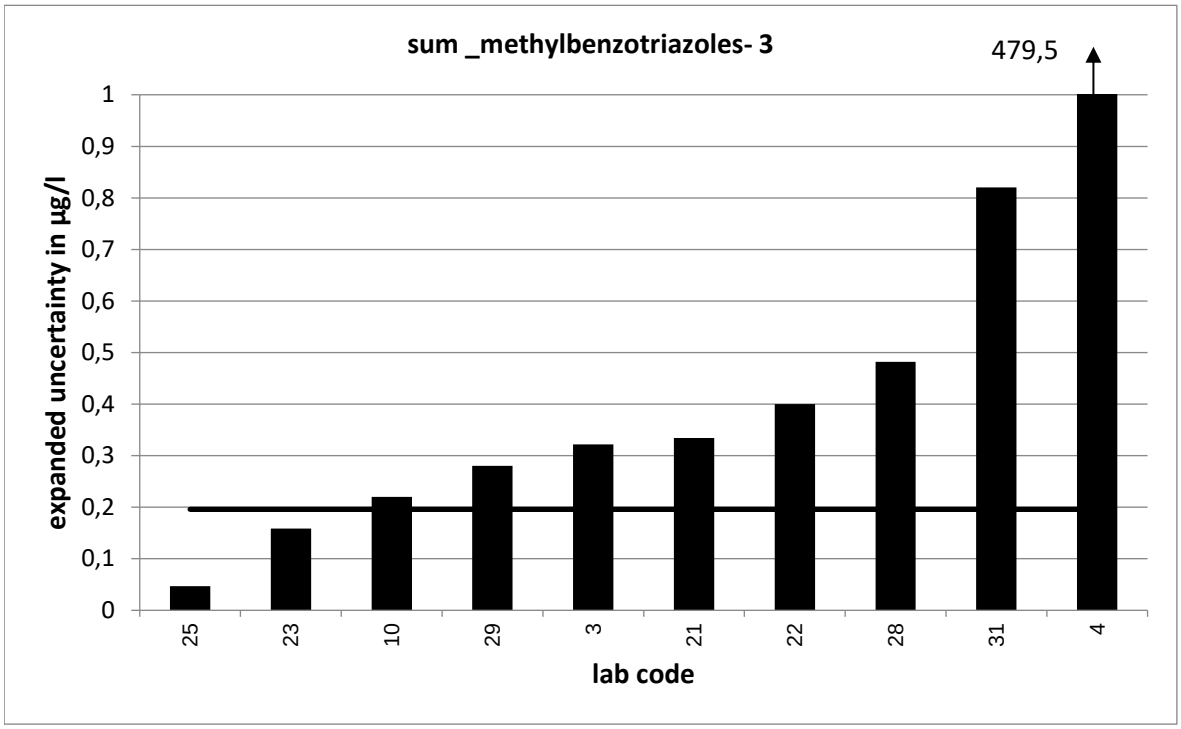
PT 3/19 - TW S1		sum _methylbenzotriazoles - 3			
assigned value [µg/l]*		1,692	± 0,027		
upper tolerance limit [µg/l]		2,109			
lower tolerance limit [µg/l]		1,32			
lab code	result [µg/l]	±	ζ-score	z_U-score	assessm.**
3	1,61	0,322	-0,5	-0,4	s
4	1918	479,5	8,0	9176,8	u
7	1,69			0,0	s
8	1,71			0,1	s
9	1,701			0,0	s
10	2,18	0,22	4,4	2,3	q
11	1,769			0,4	s
13	1,77			0,4	s
14	1,72			0,1	s
16	2,759			5,1	u
18	1,496			-1,1	s
21	1,669	0,334	-0,1	-0,1	s
22	2,09	0,4	2,0	1,9	s
23	1,584	0,158	-1,3	-0,6	s
24	1,675			-0,1	s
25	1,72	0,047	1,0	0,1	s
26	1,36			-1,8	s
27	1,835			0,7	s
28	1,926	0,482	1,0	1,1	s
29	1,644	0,28	-0,3	-0,3	s
31	1,66	0,82	-0,1	-0,2	s
33	1,31			-2,1	q
34	1,579			-0,6	s
35	1,591			-0,5	s
36	0,875			-4,4	u
38	1,5			-1,0	s
40	1,65			-0,2	s
41	0,801			-4,8	u
42	1,55			-0,8	s

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sum _methylbenzotriazoles - 3
1918
concentration in µg/l
3
2,5
2
1,5
1
0,5
0
41 36 33 26 18 38 42 34 23 35 3 29 40 31 21 24 7 9 8 14 25 11 13 27 28 22 10 16 4
lab code


sum _methylbenzotriazoles- 3
9177
z_U-score
6
4
2
0
-2
-4
-6
41 36 33 26 18 38 42 34 23 35 3 29 40 31 21 24 7 9 8 14 25 11 13 27 28 22 10 16 4
lab code


sum _methylbenzotriazoles- 3
479,5
expanded uncertainty in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
25
23
10
29
3
21
22
28
31
4
lab code

sum _methylbenzotriazoles- 3
ζ-Score
10
8
6
4
2
0
-2
-4
23
3
29
21
31
28
25
22
10
4
lab code