

CCQM-K112 Biogas

Support for measurement capabilities

Preamble

This guidance note is aimed at reviewers of calibration and measurement capabilities, supported by the participation in a key comparison. In principle, support to measurement capabilities is limited to those measurement results that are consistent with the key comparison reference value (KCRV). In this key comparison [1], several measurement results were not consistent with the KCRV. For those results, this guidance note provides larger expanded uncertainties, based on the GAWG strategy document [2]. The idea behind these larger uncertainties is that

- a) National Metrology Institutes (NMIs) can still use their participation in a key comparison to support their measurement service;
- b) The stated uncertainty is large enough to ensure comparability with the KCRV and the results of other NMIs;
- c) There is a harmonised way of dealing with discrepant results in relation to CMCs.

Discrepant measurement results can occur for a number of reasons. For a discussion of the measurement result in CCQM-K112, see the final report [1]. In case of incidental discrepant results, the default response would be to investigate the cause of the discrepancy and to resolve it [3]. Hence, the attached table should not be viewed as

- a) A substitute for appropriate corrective measures from the side of the NMI to resolve the discrepancy;
- b) A consent from the GAWG that the submitted measurement result is acceptable;
- c) A guarantee that a CMC submitted in accordance with this guidance note will be accepted by reviewers in the review process by the Regional Metrology Organisations;
- d) Support for the metrological traceability of the measurement result submitted;
- e) A direction or recommendation to assessors in peer reviews or accreditation visits.

Support for CMCs

Table 1 shows the ranges of the amount fractions and the expanded uncertainties supported by participation in CCQM-K112 [1], calculated in accordance with the GAWG Strategy document [2].

Table 1: Supported ranges and expanded uncertainties

	Methane			Carbon Dioxide			Nitrogen			Hydrogen		
	Amount Fraction (cmol mol ⁻¹)		U (% rel.)	Amount Fraction (cmol mol ⁻¹)		U (% rel.)	Amount Fraction (cmol mol ⁻¹)		U (% rel.)	Amount Fraction (cmol mol ⁻¹)		U (% rel.)
	From	To		From	To		From	To		From	To	
VNIIM	35	95	0.11	4	45	0.15	4	25	0.19	0.2	3	0.40
INMETRO	35	95	0.32	4	45	0.54	4	25	0.82	0.2	3	3.54
BFKH	35	95	1.54	4	45	1.71	4	25	8.00	0.2	3	7.79
SMU	35	95	0.15	4	45	0.33	4	25	0.16	0.2	3	1.64
CEM	35	95	0.22	4	45	0.43	4	25	0.99	0.2	3	29.97
CMI	35	95	1.00	4	45	0.07	4	25	2.78	0.2	3	7.95
RISE	35	95	0.66	4	45	0.66	4	25	1.08	0.2	3	2.27
VSL	35	95	0.06	4	45	0.08	4	25	0.09	0.2	3	0.18
NPL	35	95	0.10	4	45	0.10	4	25	0.30	0.2	3	0.40
UME	35	95	0.29	4	45	0.16	4	25	0.15	0.2	3	0.18
	Oxygen			Ethane			Propane					
	Amount Fraction (cmol mol ⁻¹)		U (% rel.)	Amount Fraction (cmol mol ⁻¹)		U (% rel.)	Amount Fraction (cmol mol ⁻¹)		U (% rel.)			
	From	To		From	To		From	To				
VNIIM	0.2	1.5	0.26	0.002	0.5	0.29	0.002	0.5	0.40			
INMETRO	0.2	1.5	0.60	0.002	0.5	0.39	0.002	0.5	0.80			
BFKH	0.2	1.5	7.64	0.002	0.5	1.29	0.002	0.5	2.68			
SMU	0.2	1.5	0.86	0.002	0.5	0.84	0.002	0.5	0.80			
CEM	0.2	1.5	10.20	0.002	0.5	0.19	0.002	0.5	0.67			
CMI	0.2	1.5	2.59	0.002	0.5	9.66	0.002	0.5	20.11			
RISE	0.2	1.5	2.59	0.002	0.5	16.51	0.002	0.5	14.74			
VSL	0.2	1.5	1.29	0.002	0.5	0.23	0.002	0.5	1.75			
NPL	0.2	1.5	0.30	0.002	0.5	0.42	0.002	0.5	0.40			
UME	0.2	1.5	8.31	0.002	0.5	0.55	0.002	0.5	0.54			

References

- [1] Adriaan M.H. van der Veen, Ewelina T. Zalewska, Deborah R. van Osselen, Teresa E. Fernández, Concepción Gómez, Jan Beránek, Rutger J. Oudwater, Denise C. Sobrino, Mariana C. Brum, Cristiane R. Augusto, Judit Fükö, Tamás Büki, Zsófia Nagyné Szilágyi, Paul J. Brewer, Michael L. Downey, Richard J.C. Brown, Miroslava Valkova, Zuzana Durisova, Karine Arrhenius, Bertil Magnusson, Haleh Yaghooby, Tanil Tarhan, Erinç Engin, L.A. Konopelko, T.A. Popova, M.N. Pir, and O.V. Efremova. International comparison CCQM-K112 Biogas. Metrologia TS, to be published.
- [2] P. Brewer and A. M. H. van der Veen. CCQM-GAWG strategy for comparisons and CMC claims (GAWG/19-41), Gas Analysis Working Group, Sévres, France, October 2016.
- [3] ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories. ISO, International Organization for Standardization, Geneva, Switzerland, 2017. Third edition.