

CCQM-K117 Ammonia in nitrogen

Support to 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-K117, 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 to CMCs

Table 1 states the expanded uncertainties that are supported by participation in CCQM-K117 [1], calculated in accordance with the GAWG Strategy document [2]. Values in red indicate uncertainties that have been inflated because the submitted measurement result was not consistent with the KCRV. Table 2 shows the ranges of the amount fractions and the expanded uncertainties supported by participation in CCQM-K117.

Table 1: Expanded uncertainties (relative, $k = 2$) that are supported by CCQM-K117 per NMI

Lab	CMC
NIST	1.47%
CERI	1.30%
NPL	2.90%
KRISS	1.11%
NIM	3.72%
VSL	0.98%
METAS	10.57%
VNIIM	8.28%

Table 2: Supported ranges and expanded uncertainties

Lab	amount fraction ($\mu\text{mol mol}^{-1}$)		CMC
	from	to	
NIST	10	1000	1.47%
CERI	10	1000	1.30%
NPL	10	1000	2.90%
KRISS	10	1000	1.11%
NIM	10	1000	3.72%
VSL	10	1000	0.98%
METAS	10	1000	10.57%
VNIIM	10	1000	8.28%

References

- [1] Adriaan M.H. van der Veen, Janneke I. T. van Wijk, Kimberly Harris, Cassie Goodman, Joseph Hodges, Shinji Uehara, Ji Hwang Kang, Yong Doo Kim, Dal Ho Kim, Sangil Lee, David R. Worton, Sam Bartlett, Sivan Van Aswegen, Paul J. Brewer, Olga.V. Efremova, Tiqiang Zhang, Defa Wang, Qiao Han, Zhou Zeyi, Maitane Iturrate-Garcia, Céline Pascale, Bernhard Niederhauser, International comparison CCQM-K117 Ammonia in nitrogen, 2021, Metrologia 58 08017.
- [2] P. Brewer and A. M. H. van der Veen. GAWG strategy for comparisons and CMC claims. GAWG, Gas Analysis Working Group, Sèvres, 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.