TC Chair Annual Report 2018 - 2019

TC for Metrology in Chemistry (TC-MC)
TC Chair: Hanspeter Andres
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1. General Aspects

In the EURAMET technical committee for Metrology in Chemistry (TC-MC) has 27 national contact persons and 1 observer. 20 members (NMIs) and 20 associate members (DIs) have national standards in chemistry or biology. In the reporting period, the designation of the University of Ghent (Belgium) was withdrawn and the designated institute DHMZ-SOUL from Croatia became a new associate member.

Dr. Hanspeter Andres (METAS, Switzerland) chairs the technical committee. He will finish his second two-year mandate in Mai 2019 and Dr. Sophie Vaslin-Reimann (LNE, France) will start her first two-year mandate in Mai 2019. The TC-MC committee has four technical subcommittees and a strategy working group. The conveners of the subcommittees are Janneke von Wjik (VSL, Netherland) for gas analysis, John Warren (LGC, Great Britain) for bio and organic analysis, Rainer Stosch (PTB, Germany) for inorganic analysis and Daniela Stoica (LNE, France) for electrochemical analysis. The strategy working group is chaired by the TC-MC chair.

2. Projects

The following TC-MC pilot studies are ongoing or are in progress at the time of this report:

- EURAMET 708 VSL-NIST bilateral,
- EURAMET 1220 Hydrogen purity,
- EURAMET 1293 C_6-C_{10} hydrocarbons in methane,
- EURAMET 1305 NPL-VSL bilateral,
- EURAMET 1424 Determination of Elements in River Water
- EURAMET 1453 Comparison for particle number concentration up to 2P/cm^3
- EURAMET 1455 Comparison on determination of gold content in white alloy
- EURAMET 1462 Electrolytic conductivity at pure water levels
- EURAMET 1470 Measurement capabilities for the quantification of ethanol in water
- EURAMET 1471 Value assigned forensic alcohol in water reference materials

The subcommittee gas analysis runs five comparisons. The bilateral projects EURAMET 708 and 1305 were established to inform the other NMIs/DIs on a regular basis on bilateral comparisons between VSL / NIST and NPL / VSL, respectively. The subcommittee inorganic analysis runs four and the subcommittee electrochemical analysis runs one comparison.

3. Comparisons

The following EURAMET key and supplementary comparisons in the metrology area “Amount of Substance” are registered in the key comparison database (KCDB) of the BIPM:

Comparison type	Name	Status	field
SC	EUROMET.QM-S1	completed	gas analysis
SC	EUROMET.QM-S2	completed	inorganic analysis
SC	EUROMET.QM-S3	completed	gas analysis
SC	EURAMET.QM-S4	completed	gas analysis
SC	EURAMET.QM-S5	completed	gas analysis

SC	EURAMET.QM-S6	completed	gas analysis
SC	EURAMET.QM-S7	completed	electroanalysis
SC	EURAMET.QM-S8	completed	gas analysis
SC	EURAMET.QM-S9	completed	gas analysis
SC	EURAMET.QM-S10	completed	gas analysis
KC	EUROMET.QM-K1.c	completed	gas analysis
KC	EUROMET.QM-K3	completed	gas analysis
KC	EUROMET.QM-K4	completed	gas analysis
KC	EURAMET.QM-K4.1	completed	gas analysis
KC	EURAMET.QM-K12	completed	organic analysis
KC	EUROMET.QM-K17	completed	electroanalysis
KC	EURAMET.QM-K26.a	completed	gas analysis
KC	EURAMET.QM-K111	completed	gas analysis
KC	EURAMET.QM-S11	Draft A	inorganic analysis
KC	EURAMET.QM-S12	ongoing	electroanalysis

In the reporting period the supplementary comparison EURAMET.QM-S12 started. The comparison runs in parallel to the aforementioned EURAMET comparison 1462.

4. CMCs

In the completed CMC cycle XIX the DI Syke from Finland was granted its first CMCs. All submitted 96 EURAMET CMCs to the inter-regional review were accepted fast-track. This result underlays the good quality of the intra-RMO review.

In the CMC cycle XX 76 new, 78 revised and 29 to be withdrawn CMCs were submitted by 13 members or associate members. The cycle included a mandatory re-review of all Category 1.2 "High Purity Organic Compounds" CMCs. The technical review was took place at the subcommittee meetings held on 5th February 2019 after a pre-review by appointed technical experts. The intra-regional review was done according to EURAMET Guide No. 3, based on JCRB criteria. Relevant and valid Key Comparisons, Pilot Studies and further evidence such as peer reviewed papers and technical reports were considered as supporting evidence. All CMCs were accompanied by a EURAMET TC-Q approved self-declaration on the underlying quality management system. In the review 79 (51 %) of the submitted claims were approved without changes, 75 (49 %) were approved after changes. No submitted CMCs were rejected. Thus, all 183 CMCs were subsequently forwarded to the chairperson of the CCQM KCWG on 15 February 2019 for the inter-regional review according to CCQM rules. This review is still ongoing.

On the 5th of July 2018 all CMCs from JRC Geel (formally IRMM, 82 in QM) were greyed out. The initiated re-review of CMCs with traceability to JRC Geel revealed 11 inorganic EURAMET CMCs with such a traceability. Particularly traceability to the CRM IRMM-530R for neutron activation analysis by MRS-IJS is an issue, as the CRM shelf live will expire 26. Feb. 2020. IJS was advised to find other sources for traceability to the SI within the CIPM MRA. Also many bio-CMCs use a CRM of JRC Geel as source of traceability. This issue is referred to the concerned CCQM WGs.

5. Activities of the Subcommittees

The technical subcommittees reconvened ahead of the annual TC-MC plenary meeting on 5th February 2019. Topics of the meetings were ongoing, in progress and new projects/comparisons, the intra-RMO review of the CMC cycle XX, technical presentations and strategic discussions.
Subcommittee on gas analysis:

• the results from 4 ongoing comparisons were presented and discussed ,
• a new pilot study on aerosol counting at high concentrations was proposed,
• 36 new or revised CMC Cycle XX were discussed and approved,
• 5 EMPIR "MetroHyve", "MetNO2", "SIRS", "MercOx" and "Biomethane" projects were presented,
• the EMNs "Climate and Ocean Observation" and "Energy Gases" and a potential EMN on "Environmental Monitoring" were presented.

Subcommittee on bio and organic analysis:
• still predominantly organic in nature, but already more discussion on bio than in previous year,
• 1 - 2 new comparisons on forensic alcohol reference materials were proposed,
• 4 EMPIR projects "Alcoref", "AntiMicroResist", "Neuromet" and "Biostand" were presented,
• two potential EMNs on "Food Safety" and "Precision Medicine & Advanced Therapeutics" were presented.

Subcommittee on inorganic analysis:
• the status of 2 ongoing projects was presented and discussed,
• 7 new or revised CMC Cycle XX were discussed and approved,
• the core competency approach and its implementation in the matrix table was presented,
• 11 inorganic CMCs with traceability to JRC Geel were identified and issues discussed.

Subcommittee on electrochemical analysis:
• the timetable of the supplementary comparison EURAMET.QM-S12 was presented,
• 10 new or revised CMC Cycle XX were discussed and approved,
• the results of the EMPIR project “ChemMet-Cap” was presented,
• the EMN "Climate and Ocean Observation" was presented.

After the subcommittee meetings ended interested participants had the possibility to visit the electrochemical laboratories of CMI in Brno.

6. Participation EMPIR

The members of the TC-MC are very active in running and planned EMPIR projects:

EMPIR 2015 TP Health
• 15HLT01 MetVBadBugs “Quantitative measurement and imaging of drug-uptake by bacteria with antimicrobial resistance”
• 15HLT02 ReMIND “Role of metals and metal containing biomolecules in neurodegenerative diseases such as Alzheimer’s disease”
• 15HLT04 NeuroMet “Innovative measurements for improved diagnosis and management of neurodegenerative diseases”
• 15HLT07 AntiMicroResist “Novel materials and methods for the detection, traceable monitoring and evaluation of antimicrobial resistance”
EMPIR 2015 Normative
• 15NRM01 SulfNorm “Metrology for sampling and conditioning SO_2 emissions from stacks”
• 15NRM03 Hydrogen “Metrology for sustainable hydrogen energy applications”

EMPIR 2016 TP Environment
• 16ENV01 MercOx "Metrology for oxidised mercury"
• 16ENV02 Black Carbon "Metrology for light absorption by atmospheric aerosols"
• 16ENV05 MetNO2 "Metrology for nitrogen dioxide"
• 16ENV06 SIRS "Metrology for stable isotope reference standards"

• 16ENV07 AEROMET "Aerosol metrology for atmospheric science and air quality"
• 16ENV08 IMPRESS 2 "Metrology for air pollutant emissions"
EMPIR 2016 TP Energy
• 16ENG01 MetroHyve "Metrology for hydrogen vehicles"
• 16ENG05 Biomethane "Metrology for biomethane"
• 16ENG09 LNG III "Metrological support for LNG and LBG as a transport fuel"
EMPIR 2016 TP Research potential
• 16RPT01 ChemMet-Cap "Development of scientific and technical capabilities in the field of chemical analysis"
• 16RPT02 ALCOREF "Certified forensic alcohol reference materials"

EMPIR 2017 TP Industry
• SRT-i17 MetAMCII “Metrology for airborne molecular contaminants II”
• SRT-i25 LiBforSecUse “Quality assessment of electric vehicle Li-ion batteries for second use applications”
EMPIR 2017 TP Fundamental
• SRT-f09 UnipHied “Realisation of a unified pH scale”

EMPIR 2018 TP Health
• 18HLT02 "Aerotox "Measurements for mitigating adverse health effects from atmospheric particulate pollutants"
• 18HLT03 SEPTIMET "Metrology to enable rapid and accurate clinical measurements in acute management of sepsis"
• 18HLT09 NeuroMet2 "Metrology and innovation for early diagnosis and accurate stratification of patients with neurodegenerative diseases"
• 18HLT10 "CardioMET "Providing the measurement infrastructure to allow quantitative diagnostic methods for biomarkers of coronary heart diseases"
EMPIR 2018 TP Normative
• 18NRM01 EDC-WFD "Metrology for monitoring endocrine disrupting compounds under the Water Framework Directive"
• 18NRM04 Heroes "Determining new uncertainty requirements for increasingly stringent legislative HCl industrial emission limits"
EMPIR 2018 Networks
• 18NET01 Energy Gases
• 18NET02 TraceLabMed
• 18NET04 ForClimateOcean

The projects cover all the grand challenges of the EMPIR targeted program, thus indicating the cross-disciplinary nature of the TC-MC itself. Three out of five selected joint network projects have a strong participation of TC-MC members.

7. Capacity Building: Activities of the last year and future needs

In 2016 a dedicated workshop for DIs without CMCs after 5 year of associate EURAMET status had been organized. After analysing the particular needs of the concerned DIs an action plan on how to proceed was agreed and implemented. Good progress has been observed in the last two years, yet, new DIs have been designated in the meantime and are approachin the 5 year deadline. It was therefore decided to repeat the workshop in 2019 and open it up to all DIs without CMCs yet.

The TC-MC chair invited representatives from all seven concerned DIs as well as their national TC-MC contact persons. The institutes NILU from Norway and IMBIH - IW from Bosnia Herzgovina were unable to attend, yet referred to their successful participation in key and supplementary comparisons. As soon as the reports of these comparisons are published, CMCs will be submitted. The institute NIVA from Norway did not respond to the invitation. The institutes HMI/DHMZ-SOUL from Croatia, NIBSC from UK, and MIRS/UP-ZRS/LPOO as well as MIRS/ZAG/SM 480 from Slovenia attended the workshop.

- HMI/DHMZ-SOUL from Croatia has successfully participated in a key comparisonon ozone and will submit CMCs in the next CMC cycle if their QMS is approved by TC-Q after the reorganisation of the metrology system in Croatia.
- The situation with NIBSC is more complex. Their active participation within the CIPM MRA is acknowledged and important. Yet, their scope of designation does not allow them to submit CMCs, biological activity is outside the SI. CMCs in established areas would overlap with the designation of LGC. The situation has to be resolved in the UK.
- Good progress has been seen for MIRS/UP-ZRS/LPOO. They participated successfully in a key comparison and with the help of the subcommittee bio and organic analysis traceability issues should be resolved soon. Upon approval of the report they will submit a CMC.
- Although the scope of MIRS/ZAG/SM 480 has been extended no matching activities within the CIPM MRA were found. The situation of designation is therefore revisited in Slovenia.

8. Meetings

The annual meeting of the TC-MC took place from 4th February to the 7th February 2019 and was hosted by CMI, Czech Republic.

The first day was reserved for the meeting of the strategy working group and the DI workshop.

On the second day the four technical subcommittees on gas analysis, bio and organic analysis, inorganic analysis and electrochemical analysis convened simultaneously.

The plenary meeting took place the 6th and 7th February 2019. At the beginning of the plenary meeting, Pavel Klenovsky, Director of CMI, welcomed participants to CMI and Brno. Subsequently, activities of EURAMET (Wolfgang Schmid from EURAMET), activities of the TC-MC (TC chair), activities of the TC-MC subcommittees (subcommittee convenors), activities of CCQM and the BIPM chemistry department (Dr. Robert Wielgosz from BIPM), activities of GAWG (Dr. Paul Brewer from NPL), activities of EAWG (Dr. Michal Mariassy from SMU), activities of OAWG (Dr. John Warren from LGC), activities of IAWG (Dr. Paola Fisicaro from LNE), activities of the three bio-WGs (Dr. Helen Parkes from LGC), activities of Gulfmet/SASO (Dr. Abdulrahman R.Alaskar from SASO), activities of NIBSC (Paul Matejtschuk from NIBSC) and an upcoming Eurachem workshop (Dr. Ivo Leito from University of Tartu) were presented. The second day of the plenary meeting started with a session on TC-MC management. Dr. Sophie-Vaselin Reimann from LNE will take over chairwomenship after the EURAMET GA in May 2019. She will also implement with the help of the strategy working group a strategy for comparisons according to EURAMET rules. No other changes are anticipated in the TC-MC management until 2021. A session on three established and three potential EMNs allowed representatives to update the TC on the progress of EMNs/JNPs. A final session on the EMPIR call allowed to share ideas for new projects.

The next annual TC-MC meeting is scheduled from the 4th to the 7th February 2020 at METAS in Berne, Switzerland.

9. Issues

The review of the CMCs with traceability to JRC Geel showed the areas for further considerations. The concerned NMIs/DIs are aware of the issues and progress will be monitored by the subcommittee convenors. The concerned WGs of CCQM will also be informed at their next meetings.

10. Strategic Planning

Status

The TC-MC had its first regular meeting after the approval of G-TCG-PRC-001 the week before the 17th TCC/BoD meeting. Based on what has been developed as input to the CCQM strategy the need for a more strategic approach on the TC level was agreed on. For Cat. 1 "High purity chemicals" a pilot analysis was conducted. The approach will now be extended to other mature areas, such as gases and electrochemistry by the strategy working group of the TC.

Concept:

- CCQM comparisons are covering most of the need for all EURAMET members in the specific area. There is no serious limitation to the number of participants, as CRM can be easily shipped worldwide.
- EURAMET comparisons are mainly SCs or pilot studies, to cover new and additional regional needs outside the CCQM core competencies approach.

Next steps:

- the incoming TC-MC chair will refine the strategy with the help of the strategy working group
- presentation at the next TC-MC plenary meeting

11. Outlook for 2019/2020

Change of the TC-MC chair,
Refinement of strategic plan of comparisons,
Organization of the CMC cycle XXI,
Organization of the next TC-MC plenary meeting.