

1. General Aspects

In the EURAMET technical committee for Metrology in Chemistry (TC-MC) 27 EURAMET member countries are represented. National standards in chemistry and biology are held by 20 members (NMIs) and 21 associate members (DIs). In the reporting period Iceland withdrew their membership and the designated Institute za vode d.o.o. Bijeljina from Bosnia and Herzegovina became a new associate member.

The technical committee is chaired by Dr. Hanspeter Andres (METAS, Switzerland). He started his second two-year mandate in May 2017. The TC-MC committee has four technical subcommittees. The conveners of the subcommittees are Janneke von Wjik (VSL, Netherlands) 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. Janneke von Wjik and Rainer Stosch started their second five-year mandate as subcommittee conveners.

2. Projects

The following TC-MC pilot studies were completed or are ongoing during the reporting period 2017/2018:

- EURAMET 708 VSL-NIST bilateral,
- EURAMET 1220 Hydrogen purity,
- EURAMET 1255 Coal mine methane,
- EURAMET 1280 EETGRAC,
- EURAMET 1293 C₆-C₁₀ hydrocarbons in methane,
- EURAMET 1305 NPL-VSL bilateral,
- EURAMET 1424 Determination of Elements in River Water

Six ongoing comparisons are currently run by the subcommittee on gas analysis. The bilateral projects EURAMET 708 and 1305 were established to inform the other NMIs on a regular basis on bilateral comparisons between VSL / NIST and NPL / VSL, respectively. One ongoing comparison is run by the subcommittee inorganic analysis.

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	EURAMET.QM-S1	completed	gas analysis
SC	EURAMET.QM-S2	completed	inorganic analysis
SC	EURAMET.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

In the reporting period the EURAMET key comparison EURAMET.QM-K111 was completed and the supplementary comparison EURAMET.QM-S11 started. The comparison is run in parallel to the aforementioned EURAMET 1424 comparison. A Draft A report of this comparison was presented at the subcommittee meeting inorganic analysis and the CCQM Inorganic Working Group.

4. CMCs

In the CMC cycle XVIII LGC was granted the first broad claim organic analysis CMCs. The originally approved CMCs by EURAMET triggered a extensive discussion within the CCQM Organic Analysis Working Group and will serve as a reference example for other institutes wishing to submit broad claim chemical CMCs.

In the CMC cycle XIX 77 new, 11 revised and 4 to be withdrawn CMCs were submitted by 13 members or associate members. The technical review was done at the subcommittee meetings held on 5th February 2018 after a pre-review by appointed technical experts. The submitted bio-CMCs had already been technically reviewed at the autumn meetings by the appropriate working groups of CCQM. 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 57 (59 %) of the submitted claims were approved without changes, 39 (41 %) were approved after changes. No submitted CMCs were rejected. Thus all 92 CMCs were subsequently forwarded to the chairperson of the CCQM KCWG on 20 February 2018 for the inter-regional review according to CCQM rules. This review is still ongoing.

5. Activities of the Subcommittees

The technical subcommittees reconvened ahead of the annual TC-MC plenary meeting on 5th February 2018. Topics of the meetings were running and new projects/comparisons, the intra-RMO review of the CMC cycle XIX, technical presentations and strategic discussions.

Subcommittee on gas analysis:

- 2 running projects were discussed; 2 projects were completed
- 1 new pilot study on aerosol counting in clean air was presented
- 19 new or revised CMC Cycle XIX were discussed and approved
- the EMPIR project 16ENG05 "Biomethane" was presented
- 1 potential research topic for the EMPIR call 2018 was discussed
- 2 potential European Metrology Networks (EMN) were presented

Subcommittee on bio and organic analysis:

- implications from the approved broad CMCs in Cycle XVIII were discussed
- 34 new CMC Cycle XIX were discussed and approved
- 3 of the 34 approved CMCs are from the bio-area
- interaction and integration of the bio analysis community in Europe was discussed
- 2 potential research topics for the EMPIR call 2018 were presented

Subcommittee on inorganic analysis:

- 1 ongoing and 1 potential new project were discussed
- 30 new CMC Cycle XIX were discussed and approved
- the simplified core competency approach and its implications on broad CMCs were discussed
- 2 potential research topics for the EMPIR call 2018 were presented

Subcommittee on electrochemical analysis:

- 1 supplementary comparison on electrolytic conductivity at pure water level and 1 pilot study on total acidity of seawater were proposed
- 13 new or revised CMC Cycle XIX were discussed and approved
- the two-successful electrochemical EMPIR call 2017 projects "LibforSecUse" and "UnipHied" were presented.
- network and projects on marine environment for the EMPIR call 2018 were presented

After the subcommittee meetings ended interested participants met to discuss collaboration in potential European Metrology Networks.

6. Participation EMPIR

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

EMPIR 2014 TP Industry

- 14IND01 3DMetChemIT «Advanced 3D chemical metrology for innovative technologies «
- 14IND12 Innanopart - Metrology for innovative nanoparticles

EMPIR 2014 TP Research potential

- 14RPT03 ENVCRM "Matrix reference materials for environmental analysis"

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 SO₂ 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"

The projects cover all the grand challenges of the EMPIR targeted program, thus indicating the cross-disciplinary nature of the TC-MC itself.

As the deadline of the EMPIR calls for PRTs is only shortly after the TC-MC meeting a dedicated EMPIR meeting later in the year to allow sufficient time for preparing joint PRTs was organised. The meeting took place in conjunction with the TG Health Stakeholder and Networking Meeting 12/13. December 2017 in Berlin. At this 2 hours meeting possible ideas for the EMPIR Network, Research Potential and Normative calls 2018 were discussed. Participation was rather low. During the annual plenary meeting it was therefore decided to stop separate EMPIR meetings and have again a session during the plenary meeting.

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 analyzing the particular needs of the concerned DIs an action plan on how to proceed was agreed.

Good progress has been observed in the reporting period for the Norwegian DI NILU, the Finnish DI MIKES/SYPE and the Slovenian MIRS/UP-ZRS/LPO. Furthermore the area of Designation of the Slovenian DI MIRS/ZAG has been adapted to allow them to participate in CIPM MRA comparisons. Additionally the newly designated institute za vode d.o.o. Bijeljina from Bosnia and Herzegovina already participated with good results in the EURAMET.QM-S11 comparison. Still no update has been received from the Norwegian DI NIVA.

At the annual plenary meeting also the situations of the British DI NIBSC and the Belgian DI University of Ghent were discussed. These two DI will soon reach their 5 year EURAMET associate membership maturity without CMCs. It was therefore decided to organize another workshop for designated institutes without CMCs so far. The workshop will take place in conjunction with the next annual TC-MC meeting.

8. Meetings

The annual meeting of the TC-MC took place from 5th February to the 7th February 2018 and was hosted by BEV, Austria. The first day was reserved for the four technical subcommittee meetings on gas analysis, bio and organic analysis, inorganic analysis and electrochemical analysis. The plenary meeting took place the 6th February 2017 and was followed by a joint workshop with TC-IR on the 7th February 2018.

At the beginning of the plenary meeting, Robert Edelmaier, Vice President of BEV, and Marina Fröhlich, representing the designated Environmental Agency of Austria, welcomed participants to BEV and Vienna. Subsequently, the TC-MC chair gave an overview of the activities in the last year. Then a session on TC management took place; the subcommittee convener for gas analysis (Janneke van Wijk, VSL) and inorganic analysis (Rainer Stosch, PTB) were re-elected for a second term. Bernhard Niederhauser from METAS will replace Jari Walden from FMI as TC-MC representative for gas analysis in the CCQM KCWG (key comparison working group) starting with cycle XX. Sophie Vaslin-Reimann from LNE is proposed as the new TC-MC chair. The composition and duties of the strategy working group were discussed and the group is open for 1 to 2 additional members bringing in specific expertise. The TC management session finished with an update on the status of DI without CMCs five year after becoming an associate member of EURAMET. After the break the subcommittee conveners reported on the activities of the subcommittees. The plenary approved the proposed three comparisons (1 supplementary in electrochemical analysis and 2 pilot studies in gas and electrochemical analysis). The scope of the in 2016 approved supplementary comparison in inorganic analysis is still in discussion and the TC-chair will give final approval as soon as all conditions set by the CCQM IAWG (inorganic analysis working group) are met.

In the afternoon the chairs of six potential European Metrology Networks (EMN) in Metrology in Chemistry/Biology presented the scope and status of their EMNs. The presented potential EMNs were Laboratory Medicine (Rainer Stosch, PTB), Advanced Therapeutics and Precision Medicine (Helen Parkes, LGC), Marine Reference Networks (Paola Fisicaro, LNE), Energy Gases (Anna-Rita Baldan), Atmospheric Chemical Essential Climate Variables (Céline Pascale, METAS) and Food Safety (Andrea Marino Rossi).

The last session was decided to reports. Robert Wielgosz from BIPM gave an update on the CCQM strategy and BIPM Capacity Building Activities and Knowledge Transfer Program. Paul Brewer from NPL reported on the activities of CCQM GAWG, Michal Mariassy from SMU on activities from CCQM EAWG, John Warren from LGC on the activities of CCQM OAWG, Mike Sargent from LGC on activities of CCQM IAWG and Helen Parkes from LGC on CCQM bio working group activities. The last report was given by Olga Efremova on the COOMET TC 1.8 "Physics-Chemistry".

The joint workshop with TC-IR started with the introduction of the two technical committees by the TC-chairs.

In the subsequent session on the revised MRA, Wolfgang Schmid from EURAMET presented the revised MRA and its consequences, Sophie Vaslin-Reimann from LNE presented the implementation strategy by the CCQM IAWG and Dirk Arnold from PTB the TC-IR approach. The next session was on EURAMET and capacity building. Wolfgang Schmid from EURAMET started with News from EURAMET, Tanasko Tasic from EURAMET gave an overview on Capacity Building activities before the TC-MC chair and Denis Glavič-Cindro presented the activities of TC-MC and TC-IR, respectively. The session closed with a short presentation by Michela Segal from INRIM with an update on the Varenna Summer School.

In the afternoon, case studies of common interest were presented. Ben Russell from NPL (TC-IR) and Janine Noordmann from PTB (TC-MC) presented mass spectrometric applications. Sophie

Vaslin Reinmann from LNE (TC-MC), Carole Fréchou from LNHB, Dirk Arnold from PTB, Andrew Robinson from NPL (all TC-IR) presented activities in the targeted program Health.

The next annual TC-MC meeting is scheduled from the 4th to the 7th February 2019 at CMI in Brno, Czech Republic.

9. Issues

There are no particular issues to be reported.

The TC took note, that issues with JRC Geel are still ongoing and EURAMET decided not to continue reviewing their CMCs and their Quality Management System.

10. Strategic Planning

In line with the revision of the CCQM strategy a more strategic approach to the planning of EURAMET TC-MC supplementary and pilot studies is required. A working draft has been prepared by the EURAMET/TC-EM/TC-MC chairs and presented at the occasion of the last TC-chairs meeting. The consultation of the TC chairs took place and the next step is the approval by the EURAMET Board of Directors. In line with the updated CCQM strategy the EURAMET TC-MC will develop its first strategic plan of comparisons.

11. Outlook for 2018/2019

Preparation of change in TC-MC chairmanship;
Preparation of first strategic plan of comparisons;
Organization of the CMC cycle XX;
Organization of the second dedicated "DIs without CMCs yet" workshop;
Organization of the next TC-MC plenary meeting.