

1. General Aspects

In the EURAMET technical committee for Metrology in Chemistry (TC-MC) 29 EURAMET member countries or associate members are represented. National standards in chemistry or biology are held by 22 National Metrology Institutes (NMI), 22 Designated Institutes (DI) and the associate member JRC-IRMM.

At the EURAMET General Assembly in Kakow, Poland, 2nd -3rd June 2015, Dr. Hanspeter Andres (METAS, Switzerland), was elected as the new chair of the TC-MC. He succeeded Dr. Michela Sega (INRIM, Italy), who finished her second term as TC-MC chair.

Under the chairmanship of Hanspeter Andres the TC continued its work in the established format with four technical subcommittees. The conveners of the subcommittees are Dr. Hugo Ent (VSL, Netherlands) for gas analysis, Dr. Beatrice Lalère (LNE, France) for organic analysis, Dr. Nilgün Tokman (UME-TUBITAK, Turkey) for inorganic analysis and Dr. Pia T. Jakobsen (DFM, Denmark) for electroanalysis. Hugo Ent finished his second mandate as convener and Janneke van Wjik (VSL, Netherlands) was nominated as the new convener. Nilgün Tokman finished her first mandate as convener and decided not to stand for a second mandate. Dr. Rainer Stosch (PTB, Germany) was nominated as her successor.

2. Projects

The following TC-MC projects were completed or are ongoing during the reporting period 2015/2016:

- EURAMET 708 VSL-NIST bilateral,
- EURAMET 1112 Ethanol in water-saturated air (completed)
- EURAMET 1220 Hydrogen purity,
- EURAMET 1255 Coal mine methane,
- EURAMET 1274 (EURAMET.QM-S10) SMU-MKEH bilateral (completed),
- EURAMET 1280 EETGRAC,
- EURAMET 1290 (EURAMET.QM-111) 1000 $\mu\text{mol/mol}$ C_3H_8 in N_2 ,
- EURAMET 1371 (CCQM-K111.1) VSL-NMiSA bilateral,
- EURAMET 1293 $\text{C}_6\text{-C}_{10}$ hydrocarbons in methane,
- EURAMET 1305 NPL-VSL bilateral,
- EURAMET 1329 100 nmol/mol SO_2 in synthetic air,
- EURAMET 1370 Comparison on gold jewellery alloy,
- EURAMET 1371 (CCQM-K111.1) VSL-NMiSA bilateral,
- EURAMET 1377 Comparison measurement for Al and Mo.

12 comparisons are currently run by the subcommittee on gas analysis and 2 by the inorganic analysis group. The ongoing bilateral projects EURAMET 708 and 1305 were established to inform the other NMIs on a regular basis on bilateral comparisons between VSL and NIST and NPL and VSL respectively. The comparison EURAMET 1112 was given a final deadline of three months to finish the report.

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
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-K16	deleted	-
KC	EUROMET.QM-K17	completed	electroanalysis
KC	EURAMET.QM-K26.a	completed	gas analysis
KC	EURAMET.QM-K111	in progress	
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	in progress	gas analysis

The key comparison EURAMET.QM-K16 was originally started as EURAMET project 1112 and has been finally registered in the KCDB as EURAMET.QM-S9. Therefore the comparison EURAMET.QM-K16 has been deleted in the KCDB.

For the key comparison EURAMET.QM-K111 the draft A report has been circulated among the participants.

For the supplementary comparison EURAMET.QM-S10 the Draft B report is currently under review by the gas analysis working group (GAWG) of the Consultative Committee on Metrology in Chemistry and Biology (CCQM).

4. CMCs

In the CMC cycle XVII 121 new, revised or to be withdrawn CMCs were submitted by 9 member countries and JRC-IRMM. In this cycle Inorganics in biological fluids and matrices were re-reviewed. The technical review was done at the subcommittee meetings held on 3rd February 2016 after a pre-review by appointed technical experts. The bio-CMC had already been technically reviewed at a dedicated meeting of the bioanalysis CMC review group. The intra-regional review was done according to EURAMET Guide No. 8, 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 self-declaration on the underlying quality management system. The TC-Chair randomly compared the self-declaration with the corresponding entries in the database of the EURAMET technical committee on quality (TC-Q). In the review 72 (60 %) of the submitted claims were approved without changes, 38 (31 %) were approved after changes and 11 (9 %) were rejected or greyed-out. Claims were rejected respectively greyed-out on technical reasons only. The remaining 113

CMCs (30 new, 59 revised, 22 withdrawn and 2 greyed-out) were subsequently forwarded to the chairperson of the CCQM KCWG on 20 February 2016 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 3 February 2016. Topics of the meetings were running and new projects/comparisons, the intra-RMO review of the CMC cycle XVII, technical presentations and strategic discussions.

Subcommittee on gas analysis:

- 10 running projects were discussed; 1 project was completed and 1 new project were proposed
- 16 new or revised CMC Cycle XVII were discussed and approved
- 11 potential research topics for the EMPIR call 2016 were discussed

Subcommittee on organic analysis:

- 14 new or revised CMC Cycle XVII were discussed and 10 approved
- 2 of the 10 approved CMCs are from the bio-area
- 7 potential research topics for the EMPIR call 2016 were discussed
- Francesca Durbiano from INRIM presented their organic analysis activities in the food area

Subcommittee on inorganic analysis:

- 2 running projects were discussed and 2 new projects were proposed
- 85 new, revised or to be re-reviewed CMC Cycle XVII were discussed
- 81 CMCs were approved, 1 had to be withdrawn and 2 were greyed-out
- 11 potential research topics for the EMPIR call 2016 were discussed
- Mike Sargent from LGC reported on the activities of the IAWG
- Mike Sargent from LGC and Paola Fiscaro from LNE presented their approaches to evaluate the measurement uncertainty of SeMET in CCQM-K107.
- Olaf Rienitz from PTB presented real-world examples on how to calculate a KCRV

Subcommittee on electroanalysis:

- 4 new CMC Cycle XVII were discussed and 1 approved
- Michal Mariassy from SMU reported on the activities of the EAWG • Steffen Seitz reported on metrology for Li-Ion batteries at PTB
- The group reflected on current and future challenges in electroanalysis

The subcommittees on inorganic analysis and electroanalysis had a common session where results from EMRP/EMPIR projects and ideas were presented.

The TC-Chair made a presentation on the CIPM MRA and EURAMET rules on conducting comparisons to further harmonize the work in the technical subcommittees.

6. Participation in EMRP/ EMPIR

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

EMRP 2013 TP Environment:

- ENV51-MeTra "Traceability for mercury measurements"
- ENV52-HIGHGAS "Metrology for high impact greenhouse gases"
- ENV55-MetNH3 "Metrology for ammonia in ambient air"
- ENV56-KEY-VOCs "Metrology for VOC indicators in air pollution and climate change"

- ENV59-atmoz “Traceability for atmospheric total column ozone”
EMRP 2013 TP Energy:
- ENG54-Biogas “Metrology for biogas”
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”

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

The JRP consortium ENV51 met at the occasion of the TC-MC annual meeting in Geel, Belgium. As the topics of the EMPIR call 2016 were sufficiently addressed by specific preparation meetings of the EURAMET Task Group (TG) Environment and Energy no dedicated workshop was organised during the TC-MC plenary meeting. Instead, the TG leader Energy (Gert Rietfeld from VSL) and a representative of the TG Environment (Anna-Rita Baldan from VSL) presented the outcomes of the preparation meetings and the needs for and opportunities of the chemical community during the TC-MC plenary meeting. Furthermore Eveline Domini from LNE presented the results of the STAIR-EMPIR meeting.

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

At the TC-MC plenary meeting a dedicated session on EURAMET DIs took place. Within this session Wolfgang Schmid of the EURAMET secretariat presented the EURAMET Capacity Building activities. In the discussion it was decided to deal with capacity building in the existing technical subcommittees. They are best suited to coordinate the corresponding activities.

8. Meetings

The annual meeting of the TC-MC was held from 1 to 5 February 2016 and was hosted by the Joint Research Center in Geel, Belgium. The first two days were reserved for meetings of EMRP / EMPIR JRP consortia, the conveners and the four technical subcommittees on gas analysis, organic analysis, inorganic analysis and electroanalysis. The plenary meeting took place on 4-5 February 2016

At the plenary meeting, Dr. Enki Anklan, Director of the JRC-IRMM, gave an overview of their activities in chemical metrology.

Subsequently, activities of EURAMET (Wolfgang Schmid from EURAMET), CIPM/CCQM and the BIPM program in Metrology in Chemistry (Dr. Robert Wielgosz from BIPM), EURACHEM (Dr.

Michela Segal from INRIM), GAWG (Dr. Paul Brewer from NPL), OAWG (Dr. Marina Ricci from JRC-IRMM), IAWG (Dr. Mike Sargent from LGC), EAWG (Dr. Michal Mariassy from SMU), BAWG (Dr. Helen Parkes from LGC), TC-MC subcommittees were presented.

In a dedicated session at the end of the first day on European Metrology Centers existing collaborations were presented: AQUILA, the European network of air quality reference laboratories (Dr. Jari Walden from FMI), The French Networks (Dr. Sophie Vaselein-Reimann from LNE) and the Joint Committee on Traceability in Laboratory Medicine (JCTLM, Dr. Bernd Güttler from PTB). In the discussion of the draft TC-MC perspective on European Metrology Centers it was recommended to omit the term Centre and work out the relation of the legally mandated reference laboratories (European Reference Laboratories) and the NMI/DI landscape.

The second day a special session on EURAMET DIs was organized. Dr. Mike Sargent from LGC presented the success story of a large and experienced DI and Dr. Charis Alexopoulos from the State Laboratory of Greece the activities of a smaller emerging DI.

The last session of the plenary meeting was dedicated to the EMPIR call 2016.

The next annual TC-MC meeting is scheduled for the 31st January to the 3rd of February 2017 in Warsaw, Poland.

9. Issues

Re-review of the CMCs on Inorganics in Biological fluids and materials revealed missing new evidence. Several CMCs had to be withdrawn or greyed out during the intra-RMO review of the CMC cycle XVII.

The draft TC-MC perspective on European Metrology Centers needs to be revised. Particularly the relation of the TC-MC to the legally mandated European Reference Laboratories (ERL) needs to be better defined.

There is still little involvement of emerging NMI/DIs in comparisons and in the activities of the technical subcommittees.

For the EMPIR call 2016 no dedicated workshop was organized during the plenary meeting. Instead the task group conveners were invited to present the outcomes of specific preparation workshops of the task groups.

Co-organization of the periodic meetings EMRP/EMPIR consortia in the week of the annual meeting is no longer effective as the consortia get more interdisciplinary

10. Strategic Planning

The bioanalysis activities within Europe are steadily growing. A trigger for this growth is the joint R&D projects funded by EMRP/EMPIR. For the moment the subcommittee on organic analysis offers the platform to discuss the bio-related issues. The situation will be newly analyzed in 2018 when all technical subcommittees have to be re-evaluated.

Together with the EURAMET Technical Committee on Temperature (TC-T) a project will be started moisture/water content in materials development. This multidisciplinary approach is needed to advance in the field.

11. Outlook for 2016/2017

Organization of an EMPIR call 2017 workshop at the next TC-MC annual meeting

Organization of CMC cycle XVIII

The TC-MC perspective on European Metrology Centers will be revised and consulted among members.

The relationship with Eurachem needs to be clarified. The ToR of the TC-MC will be adapted accordingly.