



## **Subject Field: METROLOGY IN CHEMISTRY**

### **Annual report 2001**

#### **1 General aspects**

As it was decided by EUROMET and Eurachem the former Amount of Substance group had been transformed in June 2000 to METCHEM and strengthened by joining Eurachem representatives. Last summer, Eurachem Chair nominated thirteen members to the group including six joint Eurachem/EUROMET representatives.

Four sub-fields were formed mirroring the CCQM: gas, electrochemistry, inorganic and organic WGs. EUROMET Chairman nominated the Convenors: Dr Woods, Dr Mariassy, Dr Matschat, Dr Walsh respectively.

Gas WG had to begin the activity at the very moment of its birth because of the deadline to submit gas CMCs by the end of October 2000.

Working groups on the other three sub-fields were practically formed in February 2001 at the plenary METCHEM meeting and more specialists are expected to join to them.

The main tasks of the last year were:

- re-organisation of the group, effective collaboration of "old" and "new" members
- to learn and to accept the EUROMET/METCHEM rules
- to seek for links to national chemical reference laboratories
- to submit CMC files to App. C by deadline

The tasks are performed or being performed continuously.

Metrology in chemistry is developing world-wide so inter-regional contacts are extremely important to METCHEM both for co-operation and for sustaining competitiveness.

In this CMC harmonising period Rapporteurs of RMOs are in close contact by e-mail and occasionally they meet at different events. Dr Kaarls, President of CCQM, recommends regular meetings to rapporteurs.

#### **2 Meetings**

Plenary METCHEM meeting: 15 – 16 February 2001, Bratislava

It was the first meeting of the joint group. Members agreed upon to proceed according to the EUROMET rules, guides and procedures but a number of CPs were not yet aware of them.

Minutes (Draft) of the meeting are put on METCHEM down-load site (operated by NPL):

[http://www.npl.co.uk/environment/euromet\\_aos.html](http://www.npl.co.uk/environment/euromet_aos.html)

### Gas Sub-field meetings:

21 – 22 September 2000, Teddington: review of ongoing and future projects;  
review of CMCs

Minutes are available on METCHEM down-load site

22 – 23 January 2001, Delft: discussion of some (mainly uncertainty) problems  
that have arisen during the evaluation of gas analysis CMCs

14 February 2001, Bratislava: review of ongoing and future projects;  
experience with intra- and inter-reviewing of CMCs , links to App.B

### Inorganic, Organic, Electrochemistry Sub-fields meeting:

15 February, Bratislava: first meeting of the newly formed groups, devoted to  
the future plans but mainly to CMCs.

**Next METCHEM meeting:** 7 – 8 February 2002, Prague

Sub-fields meetings are expected on 6 February 2002, Prague

## **3 Projects**

Completed in last period but only **485** has been approved yet:

**485 EUROMET.QM.K-3** comparison

**Standards and calibration facilities for automotive gases**

Participants: NMI (NL), CMI-CHMI (CZ), CSIR-NML (ZA), GUM (PL), IMGC  
(IT), IPQ (PT), SMU (SK)

**548 EUROMET.QM.K-13** comparison

**Trace elements in sediment (Cd, Pb)**

Participants: IRMM (CEC), EMPA (CH), NMI (NL), LGC (GB), SMU (SK), SP  
(SE), OMH-VITUKI (HU)

**580 EUROMET.QM.K-4** comparison

**Key comparison of ethanol/air standards**

Participants: NPL (GB), BNM-LNE (FR), IPQ (PT), SKL (SE), GUM (PL), VTT  
(FI), CSIR (ZA), VNIIM (RU), SMU (SK), BAM (DE).

**568** comparison

**Pb content in wine**

Participants: IRMM (CEC), and eight laboratories

Agreed ongoing projects:

**414** comparison

**Comparison of ozone standard reference photometers**

Participants: IRECL (B), RIVM (NL), ISC III (E), Ispra (EU), OFMET (CH), LNE  
(FR). CHMI (CZ), UBA (AT), SMHI (SK), IEP (HU), DMU (DK), NILU (NO), ITM  
(SE), FMI (FI), UBA (DE), GUM (PL)

Reports are ready, a final workshop will be held in June

- 422 comparison  
**Primary gas mass flow standards**  
Participants: LNE (FR), PTB (DE), CMI (CZ), IMGC (IT)
- 528 **EUROMET.QM.S-1** comparison, linked to EU drinking water directive  
**Metals in water**  
Participants: IRMM (CEC), EMPA (CH), LGC (GB), NMi (NL), SP (SE), SMU (SK)
- 563 **EUROMET.QM.K-11, EUROMET.QM.K-12** comparison  
**Calcium, glucose and creatinine in human serum**  
Participants: IRMM (CEC), EMPA (CH), LGC (GB), NMi (NL), PTB (DE), Univ.Gent (B), Ecochem (CZ), UKB (CZ), Univ.Poznan (PL), DEKS (DK), UMC (SI), Fürst Med.Lab. (NO), Rikshospitalet (NO)
- 564 **EUROMET.QM.K-** comparison  
**Cadmium content in rice**  
Participants: IRMM (CEC), no final list. Project is going parallel with the CCQM key comparison
- 565 comparison  
**Determination of sulfur in fuel**  
Participants: IRMM (CEC), no final list.
- 500 co-operation  
**Atomic spectroscopy as a potential primary method**  
Participants: DFM (DK), NPL (GB)
- 527 consultation  
**Revision of terms for the revision of VIM**  
Participants: EUROMET members
- 589 consultation  
**Standards and calibration facilities for reactive gases**  
Participants: NMi (NL), NPL (GB), METAS (CH), CMI (CZ)

Planned projects:

- **Project to study and explain the BCR value assignment process**  
Participants: IRMM (CEC), LGC (GB), BAM (DE)
- **EUROMET.QM.K- 1.c: Comparison of NO<sub>x</sub> in nitrogen at 100µmol/mol concentration** (led by NMi)
- **EUROMET.QM.S-2: Comparison of NO and SO<sub>2</sub> in air at ambient levels** (linked to EU Dir., led by NPL)
- **Project on electrolytic conductivity cell constructions** (led by NMi and IEN)

## EU project (METCHEM related)

“**CERMATAIR**” has started, co-ordinated by NMi and involving several METCHEM participants. The project is concerned with supporting EU directives in ambient air.

### **4 Mutual Recognition Arrangement**

- CIPM CCQM Key Comparisons: Ten comparisons have been approved, ten are running or planned in the next future. Many of EUROMET members are participating.

Generally applied rule in CCQM to start with a study before conducting a key comparison. Sometimes EUROMET members would be able to conduct immediately a key comparison before the CCQM KC but it is not allowed.

- EUROMET Key Comparisons: see in details at “**3 Projects**” point

- three KC have an approved or Draft B status
- four KC start in the next future

- Supplementary comparisons: see in details at “**3 Projects**” point

- two comparisons are planned supporting the drinking water and ambient air EU Directives

- Calibration and measurement capabilities

- EUROMET internal reviews: two pre-reviewers from different countries were appointed to each worksheet to check the content. Experiences of the pre-review were discussed on WG meetings and by mail. Authors corrected, deleted or explained their submission. After repeated review the whole WG checked and approved the entries. BIPM, JCRB and EUROMET documents provided the guidance to review. Review of 567 gas entries have been ended last year, 350 entries from other chemical fields submitted by nine countries and IRMM are under review. (METCHEM decided to submit only this limited number in the first round).

- Reviews of EUROMET CMCs by other RMOs: up to now only the gas analytical CMCs were sent to SIM, COOMET and APMP. After explanatory remarks and minor, mainly editorial corrections the RMOs accepted all of the EUROMET submissions.

- Reviews of the CMCs of other RMOs by EUROMET: 20% of the CMCs of SIM, COOMET and APMP had been reviewed, especially the submissions where the uncertainties seemed to be too low. All of our comments were accepted so we could approve the final versions of the mentioned RMOs.

Gas analytical measurement capabilities were submitted to JCRB in March this year. JCRB approved them and in May they will appear on the BIPM database.