

**ANNUAL REPORT**  
**on Work of COOMET TC 1.8 “Physical Chemistry”**  
**for 2007–2008 (first quarter)**

**1. GENERAL CHARACTERISTIC OF THE COOPERATION IN THE FIELD OF PHYSICAL CHEMISTRY**

**In 2006/2007, the work of COOMET TC 1.8 “Physical Chemistry” was carried out in the following directions:**

- Organization and realization of the work on the preparation of the NMI CMC data of the COOMET Member States that have signed the MRA.
- Organization and realization of the internal review of CMC for COOMET NMIs and the interregional review of NMI CMCs for other regional metrological organizations.
- Planning and organizing of international comparisons and interlaboratory researches.
- Getting the TC 1.8 Members acquainted with the CCQM and COOMET documents aimed at the realization of the MRA.
- Improvement of the TC 1.8 structure.
- Promotion in rendering metrological services in the field of physical–chemical measurements.

**2. TC WORKS ON THE COOMET PROJECTS**

**VNIIM is the coordinator of:**

- 1 COOMET Project № 400/RU/07 “Key comparisons of standard natural gas samples”. The Project is agreed and registered in the KCDB as COOMET.QM–K23.b “Standard Reference Materials — Synthetic Natural Gas”. Participants: VNIIM (Russia), BelGIM (Belarus), BAM (Germany), SMI (Czech. Rep.), SMU (Slovakia), Ukrmetrteststandart (Ukraine). Samples are prepared for dispatching to participants.
- 2 COOMET Project № 401/RU/07 “Key comparisons of standard samples of CO gas mixtures in Nitrogen (100 and 1000 ppm)”. The Project is agreed and registered in the KCDB as COOMET.QM–K1.a “Standard Reference Materials — Gas Mixtures CO in Nitrogen”. Participants: VNIIM (Russia), BelGIM (Belarus), BAM (Germany), Ukrmetrteststandart (Ukraine). Preparation of the Draft A report.
- 3 COOMET Project № 361/RU/06 “Pilot comparisons in the field of electrical conductivity measurements”. Participants: VNIIM (Russia), VNIIFTRI (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine), SMU (Slovakia). This is the Project agreed. The Technical Protocol has been sent to participants.
- 4 COOMET Project № 362/RU/06 “Pilot comparisons in the field of measuring the aqueous glucose standards”. Participants: VNIIM (Russia), BelGIM (Belarus). This is the Project agreed. The Technical Protocol was sent to participants.
- 5 COOMET Project № 375/RU/06 Pilot comparisons “Determination of gene–modified objects in food”. Participants: VNIIM (Russia), RAS Institute of Cytology (Russia), BelGIM (Belarus). This is the Project agreed. Preparation of the samples is in process.
- 6 COOMET Project № 378/RU/06 “Pilot comparisons in the field of measuring particle sizes”. Participants: VNIIM (Russia), VNIIFTRI (Russia). This Project is completed. The Report was sent to the COOMET Secretary.

### **UNIIM is the coordinator of:**

- 7 COOMET Project № 379/RU/06 “Pilot comparisons in the field of humidity mass fraction measurements in cereal grain and cereal products”. Participants: BelGIM (Belarus), Ukrmetrteststandart (Ukraine), SP Technical Research Institute of Sweden (Sweden), PTB (Germany) and UNIIM (Russia). This Project is completed. The Final Report was sent to participants.
- 8 COOMET Project № 211/RU/06 “Carrying out interlaboratory comparisons on the determination of toxic microimpurities in vodkas”. Participants: UNIIM (Russia), VNIIM (Russia) and others. This is the Project proposed.

### **Other COOMET PROJECTs. COOMET TC 1.12 is the coordinator of:**

- 9 COOMET Project № 293/RU/03 “Development of CRMs for comparison of dry residue of Baikal water SOVB–1, birch leaf LB–1, mixture of meadow herbs Tr–1, Canadian pond weed EK–1 and perch tissue Bok–2”. Participants: BelGIM (Belarus), BAM (Germany), KazInMetr (Kazakhstan), IGC SB of RAS, VNIIM (Russia). The Project is in progress.

### **3. RESULTS of the LAST MEETING of TC 1.8**

The last meeting of COOMET TC 1.8 “Physical chemistry” was held in May, 14–15, 2007. Its decisions were included into the Protocol (attached).

### **4. REVIEW of the PROJECTS COMPLETED**

Two Projects were completed in 2007:

- 1) COOMET Project № 378/RU/06. The comparisons carried out in working–off the measurement procedure for the particles of an average diameter more than 1  $\mu\text{m}$ , which can be used as the basis for international comparisons with participation of other NMIs.
- 2) COOMET Project № 379/RU/06. The conclusion was drawn about the comparability of measurement results obtained by comparison participants within the limits of the uncertainties claimed. The basis for key comparisons was prepared.

### **5. COOPERATION with INTERNATIONAL and REGIONAL ORGANIZATIONS**

Participation of the representatives of TC 1.8 “Physical chemistry” was organized in the following events:

#### **CCQM**

- 14<sup>th</sup> meeting of the CCQM (2 specialists from VNIIM) (Paris, April, 2008)
- meetings of the Working Groups of the CCQM (4 specialists from VNIIM):
  - on Key Comparisons and CMC Quality (KCWG) (Paris, April, 2008)
  - on Gas Analysis (GAWG) (Paris, April, 2008)
  - on Organic Analysis (OAWG) (Paris, April, 2008)
  - on Bioanalysis (BAWG) (Paris, April, 2008)
- CCQM Workshop (1 specialist from VNIIM) (Paris, April, 2008)

## **EUROMET**

- meeting in the framework of EUROMET Project № 893 on the nanoparticle metrology in air (1 specialist from VNIIM) (Berlin, October, 2007)

## **ISO**

- meeting of ISO/TC 146/SC1 “Stationary source emissions” (31 participants/14 countries), (St. Petersburg, VNIIM — organizer, October, 2007)

## **RMO/RAB (Regional Metrological Organizations/Accreditation Bodies):**

- participation in the work of team group on accreditation of NMI (1 specialist from VNIIM) (The Netherlands, February, 2008)

## **6. ACTIVITIES FOR IMPLEMENTATION of MRA**

### **I. Organization and realization of works on preparation of the CMC data**

- 1 The COOMET review of CMCs for cycle VIII was completed. The results were published in Appendix C (MRA), 15 positions of the VNIIM, 1 BelGIM, 1 position of Ukrmetrteststandart on the gas analysis and 1 position of BelGIM on the electrochemical analysis having been included.
- 2 At present, the International CMC Database (Appendix C) contains 234 positions of VNIIM, 3 positions of UNIIM, 7 positions of VNIIFTRI, 4 positions of Ukrmetrteststandart, 2 positions of BelGIM.

Distribution of the COOMET CMCs according to measurement categories is the following: gas analysis — 182; organic solution — 21; inorganic solution — 13; metals — 9; sediments, soils, ores and particles — 4; biological fluids and materials — 0; high purity chemicals — 3; foods — 5; water — 1; advanced materials — 0; electrochemical analysis — 12.

- 3 Arrangements made for the COOMET CMCs review of cycle IX are as follows:
  - The intraregional review of the COOMET CMCs claimed by VNIIM (Russia) in the field of gas analysis (18 new positions and 11 corrected former positions), organic analysis (6 positions), inorganic analysis (5 positions) and inorganic solutions (2 positions) was completed;
    - Reviewers: Ukrmetrteststandart (Ukraine), BelGIM (Belarus);
  - All CMCs were presented for interregional review.

### **II. Participation of COOMET NMIs in international comparisons and interlaboratory researches**

Planning and organization of participation of the active COOMET member–states in the international (key and pilot) comparisons are provided.

**CCQM, BIPM and EUROMET comparisons:**

<b>Comparison</b>	<b>COOMET NMI</b>	<b>Status</b>
CCQM–K46 “NH <sub>3</sub> in nitrogen”	VNIIM (Russia)	Completed
CCQM–K61 “Quantitative PCR study”	VNIIM (Russia)	Report in progress
CCQM–P58.1 “Fluorescence in ELIDA (Stage 2)”	VNIIM (Russia)	Planned
CCQM–P113 “Relative quantification of genomic DNA fragments extracted from a biological tissue”	VNIIM (Russia)	In progress
CCQM–K51 “Carbon monoxide in Nitrogen (at a level of 5 ppm)”	VNIIM (Russia)	In progress
CCQM–K68 “N <sub>2</sub> O at ambient level”	VNIIM (Russia)	Participation claimed
CCQM–K59 “Inorganic solutions (nitrates, nitrites)”	VNIIM (Russia)	Completed
CCQM–PXX “Stack Gas mixture comparison”	VNIIM (Russia)	Participation claimed
CCQM–P91 “Pyrethroids in apple juice”	VNIIM (Russia)	Planned
CCQM–K57 “Chemical composition of clay”	VNIIM (Russia)	In progress
CCQM–P109 “Determination of acrylamide in potato chips”	VNIIM (Russia)	In progress
CCQM–K34.1 “Assay of Potassium hydrogen phthalate”	VNIIM (Russia)	Planned
CCQM–P111 “Seawater salinity”	VNIIM (Russia)	In progress
CCQM–P64.1 “Trace elements in Soybean powder”	VNIIM (Russia)	In progress
CCQM–K43.1 “As, Hg, Se and methylmercury content in marine fish”	ВНИИМ (Россия)	Report in progress
CCQM–K66 “Purity analysis of Methane”	VNIIM (Russia)	Participation claimed
BIPM.QM–K1 “Ozone, ambient level”	VNIIM (Russia)	Completed
EUROMET 621 “Humidity (dew–point temperature/freezing point)	VNIIM (Russia)	Report in progress
EUROMET 918 “Study on the traceability of salinity measurements in seawater”	VNIIM (Russia)	In progress
CCQM–K65 “Mercaptans in methane”	VNIIM (Russia) — <b>coordinator</b>	In progress

**7. INFORMATION on a PROSPECTIVE PLACE and DATE for the FOLLOWING MEETING**

The next meeting of TC 1.8 “Physical chemistry” will be held in May, 12–13, 2008 (St. Petersburg, VNIIM).

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Chairman of COOMET TC 1.8 “Physical chemistry”



Enclosure: Protocol of the COOMET TC 1.8 “Physical Chemistry” meeting, which was held in May, 14–15, 2007.