

ANNUAL REPORT
ON WORK OF COOMET TC 1.8 “PHYSICAL CHEMISTRY”
FOR 2010

I GENERAL CHARACTERISTIC OF THE COOPERATION IN THE FIELD OF PHYSICAL CHEMISTRY

COOMET TC 1.8 Members:

The TK 1.8 consists of the representatives from national metrological organizations of the COOMET member-countries: Azerbaijan (AZSTANDART), Armenia (ZAO “NIM”), Belarus (BelGIM), Germany (PTB), Georgia (GeoStandMetrology), Kazakhstan (KazInMetr), Kyrgyzstan (NISM), KNDR (CIM), Cuba (INIMET), Lithuania (VMT), Moldova (INSM), Rumania (NIM), Russia (VNIIM), Slovakia (SMU), Uzbekistan (SE “CNS”), Ukraine (Ukrmetrteststandart).

In 2010 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.
- Promotion in rendering metrological services in the field of physical-chemical measurements.

II TC WORKS ON THE COOMET PROJECTS

VNIIM is the coordinator of:

1 COOMET Project 400/RU/07 (COOMET.QM-K23.b) «Key comparisons of standard natural gas samples». Participants: VNIIM (Russia), BelGIM (Belarus), BAM (Germany), SMI (Czech. Rep.), SMU (Slovakia), Ukrmetrteststandart (Ukraine). The final report is prepared, the results are published in the journal “Metrologia”.

2 COOMET Project 401/RU/07 (COOMET.QM-K1.a) «Key comparisons of standard samples of CO gas mixtures in Nitrogen (100 and 1000 ppm)». Participants: VNIIM (Russia), BelGIM (Belarus), BAM (Germany), Ukrmetrteststandart (Ukraine). The final report is prepared, the results are published in the journal “Metrologia”.

3 COOMET Project 435/RU/08 «Pilot comparisons in the field of aerosol particles mass concentration measurement». Participants: VNIIM, VNIIFTRI (Russia) and other COOMET member countries. This is the Project proposed. In order to increase the number of participants the information about the project was presented within the regular CCQM Gas Analysis Working Group meeting (Singapore, November 2010).

4 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), GEOSTM (Georgia), KazInMetr (Kazakhstan). The final report is prepared, the project is finished.

5 COOMET Project 362/RU/06 «Pilot comparisons in the field of measuring the aqueous glucose standards». Participants: VNIIM (Russia), Ukrmetrteststandart (Ukraine) and others. Project's state is agreed. The list of participants is being specified. The technical protocol of the project is prepared.

6 COOMET Project 375/RU/06 Pilot comparisons «Determination of gene-modified objects in food». Participants: VNIIM (Russia), Institute of cytology if the Russian Academy of Sciences (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine). The research is completed. The Draft A report is prepared and sent out to the participants.

7 COOMET Project 367/RU/06 «Pilot comparisons in the field of blood elements studies». Project's state is proposed. The list of participants is being specified.

8 COOMET Project 483/RU/09 «Key comparisons of primary standards of concentration of components in gas media – NO in Nitrogen (50 mkmol/mol)». Participants: VNIIM (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine) and others. The technical protocol of the project is prepared.

9 COOMET Project 484/RU/09 «Key comparisons of primary standards of concentration of components in gas media – SO₂ in Nitrogen (100 mkmol/mol)». Participants: VNIIM (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine). The technical protocol of the project is prepared.

10 COOMET Project XX/RU/10 «Key comparisons in the field of electrical conductivity measurements». Participants: VNIIM (Russia), GEOSTM (Georgia) and others. The project was presented in the regular TC 1.8 meeting (VNIIM, September).

UNIIM is the coordinator of:

11 COOMET Project 436/RU/08 «Pilot comparisons in the field of moisture mass fraction measurements in barley cereal grain». Participants: UNIIM (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine), PTB (Germany), SP TRIS (Sweden), KazInMetr (Kazakhstan). The final report is prepared.

12 COOMET Project 211/RU/06 «Carrying out interlaboratory comparisons on the determination of toxic microimpurities in vodkas». Participants: VNIIM (Russia), FGU «Uraltest» (Russia), BelGIM

(Belarus), UkrNIIsirtbioprod (Ukraine), NISM RM (Moldova). The research is completed, the preliminary report is prepared.

13 COOMET Project 479/RU/09 «Supplementary comparisons in the field of moisture mass fraction measurements in cereal grain and cereal products». Participants: UNIIM (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine) and others. Project's state is proposed.

14 COOMET Project XX/RU/10 «Pilot comparisons in the field of hydrogen ions concentration measurements in hydrochloric acid solutions (mol/kg)». The project was presented in the regular TC 1.8 meeting (VNIIM, September).

15 COOMET Project 508/RU/10 «Pilot comparisons in the field of nitrogen mass fraction measurements in milk food». The project's state is proposed, the project was presented in the regular TC 1.8 meeting (VNIIM, September).

III RESULTS OF THE LAST MEETING OF TC 1.8

The last meeting of TC 1.8 "Physical Chemistry" was held in VNIIM in September 23-24, 2010. The representatives from Russia (VNIIM, VNIIFTRI, VNIIMS, UNIIM, «Analitpribor»), Kyrgyzstan (CSM), Belarus (BelGIM), Ukraine (Ukrmetrteststandard), Kazakhstan (KasInMetr). The meeting decisions were included into the Protocol (attached).

IV REVIEW OF THE PROJECTS COMPLETED

Four Projects were completed in 2010:

- COOMET Project 400/RU/07 (COOMET.QM-K23.b).
- COOMET Project 401/RU/07 (COOMET.QM-K1.a).
- COOMET Project 361/RU/06.
- COOMET Project 436/RU/08.

V COOPERATION WITH INTERNATIONAL AND REGIONAL ORGANIZATIONS

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

CCQM:

- 16-th meeting of the CCQM - 1 specialist from VNIIM (Paris, April, 2010)
- meetings of the Working Groups of the CCQM - 5 specialists of VNIIM, 1 specialist from VNI-

IFTRI:

- on Key Comparisons and CMC Quality (KCWG) (Paris, April 2010)
- on Gas Analysis (Paris, April 2010, Singapore, November 2010)
- on Organic Analysis (Paris, April 2010, Singapore, November 2010)
- on Inorganic Analysis (Paris, April 2010)

on Bioanalysis (Paris, April 2010, Singapore, November 2010)

- meeting of Advisory Group of CCQM – 1 specialist from VNIIM (Paris, April 2010)
- workshop on the CCQM-K74 and P110 comparisons – 1 specialist from VNIIM (Singapore, November 2010)

APMP:

- APMP/TCQM Gas CRM Workshop (Tsukuba, June 2010)

WMO:

- Technical Conference on Meteorological and Environmental Instruments and Methods of Observation «TECO-2010» (Helsinki, August 30 – September 01 2010)
- Measurement Challenges for Global Observing Systems for Climate Change Monitoring - Traceability, Stability and Uncertainty (Geneva, March 30 – April 01 2010)

- TC 1.12 meeting with the presentation about VNIIM preparing to the Quality Management System confirmation – 1 specialist from VNIIM (Yerevan, September 2010).

VI ACTIVITIES FOR IMPLEMENTATION OF MRA

1. Organization and realization of works on preparation of the CMC data:

1.1 The COOMET review of CMCs for cycle XI “fast track” was completed, the results were published in Appendix C (MRA) of BIPM database.

VNIIM has 2 new and 4 revised CMCs in Gas Analysis, 4 new CMCs in Inorganic Analysis, 1 CMC in Gas Analysis was deleted by VNIIM; BelGIM has 1 new CMC in Gas Analysis.

Besides, now some CMCs are claiming within “non-fast track”:

- 7 new and 4 revised CMCs of VNIIM, 3 new CMCs of Ukrmetrteststandard, 1 new CMC of BelGIM in Gas Analysis;
- 9 revised CMCs of Ukrmetrteststandard, 5 revised CMCs of VNIIFTRI, 1 revised CMC of BelGIM, 1 revised CMC of VNIIM in Electrochemistry;
- 11 new CMCs of VNIIM and 1 new CMC of UNIIM in Inorganic Analysis.

1.2 At present, the International CMC Database (Appendix C) contains 252 CMCs of VNIIM, 4 of UNIIM, 7 of VNIIFTRI, 7 of Ukrmetrteststandard, 3 of BelGIM.

Distribution of the COOMET CMCs according to measurement categories is the following: Gas Analysis – 188, Organic Solutions – 21, Inorganic Solutions – 15, Metals – 16, Sediments, Soils, Ores and Particles – 9, Biological Fluids and Materials – 0, High Purity Chemicals – 3, Foods – 5, Water – 1, Electrochemical Analysis – 15.

II. PARTICIPATION IN INTERNATIONAL COMPARISONS AND INTERLABORATORY STUDIES

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

CCQM, EUROMET, APMP and SIM comparisons:

Comparison	COOMET NMI	Status
CCQM-K66 – Impurity analysis in Methane	VNIIM (Russia)	Draft B is approving
CCQM-K68 – Nitrous in Synthetic Air	VNIIM (Russia)	Draft B is approving
CCQM-K74 – Nitrogen Dioxide in Nitrogen at 10 µmol/mol	VNIIM (Russia)	The research is completed, Draft A is prepared
CCQM-K76 – Sulfur Dioxide in Nitrogen at 10 µmol/mol	VNIIM (Russia)	The research is completed, Draft A is preparing
CCQM-K77 – Synthetic Refinery Gas	VNIIM (Russia)	The research is completed, Draft A is preparing
CCQM-P102 – Quantification of cells with specific phenotypic characteristics	VNIIM (Russia)	The research is completed, Draft A is preparing
CCQM-P103 – Measurement of multiplexed biomarker panel of RNA transcripts	VNIIM (Russia)	The research is completed, Draft A is prepared, Draft B is preparing
CCQM-P94.1 – Quantification of DNA methylation	VNIIM (Russia)	The research is completed, Draft A is preparing
CCQM-K86 – Relative Quantification of Genomic DNA Fragments Extracted from a Biological Tissue	VNIIM (Russia)	The research is completed, Draft A is prepared
CCQM-K79 – Value-assignment of CRMs and Proficiency Testing Materials for Ethanol in Aqueous Matrix	VNIIM (Russia)	The research is completed, Draft A is prepared, Draft B is preparing
CCQM-K55.b – Purity assessment of high purity organic materials: Aldrin	VNIIM (Russia)	The research is completed, Draft A is prepared, Draft B is preparing
CCQM-P100.3 – Mercury in natural water	VNIIM (Russia)	Draft A is prepared
CCQM-K88 – Pb in lead-free solder	VNIIM (Russia)	The research is completed, Draft A is preparing
EURAMET 1092 – Ethanol in Nitrogen	VNIIM (Russia)	The research is completed, Draft A is prepared, Draft B is preparing
APMP.QM-K41 – Hydrogen Sulfide in Nitrogen	VNIIM (Russia)	The research is completed, Draft A is preparing
APMP.QM-P14 – Pesticides in carry-paste	VNIIM (Russia)	The research is completed, Draft A is preparing
APMP.QM-P19 – Melamin in milk powder	VNIIM (Russia)	The research is completed, Draft A is preparing
SIM.QM-S2 – Metals in drinking water	VNIIM (Russia)	The research is completed.

VII INFORMATION ON A PROSPECTIVE PLACE AND DATE FOR THE FOLLOWING MEETING

The next meeting of TC 1.8 “Physical chemistry” will be held in Saint-Petersburg, VNIIM. The date of the meeting will be specified later.

Chairman of COOMET TC 1.8 “Physical chemistry”, Prof.



L.A. Konopelko

Enclosure:

Protocol of the COOMET TC 1.8 “Physical Chemistry” meeting held in May, 23 - 24 2010.