



ANNUAL REPORT of COOMET TC 1.12 "Reference Materials" January 2022 - April 2023

1. The general characteristic of cooperation in the subject-field "Reference Materials", including information on the list of work performed and/or projects and on the cooperators

Cooperation within TC 1.12 is mainly aimed at the creation of COOMET CRMs, which, under their status, may be used in COOMET member-countries and approved for application in accordance with the current national regulations and/or documents (in their absence, in accordance with COOMET publications). Currently, TC 1.12 includes representatives of national metrological bodies of 17 COOMET member-countries.

During the reporting period, TC 1.12 coordinated and organized the work of experts on CRMs within COOMET **on 13 projects** of cooperation. Among them 4 projects were elaborated in 2022 (the list of the projects is attached). The Project Coordinators are experts from Belarus and Russia. Information materials on the results of the completed projects and the progress of the current projects were considered at the 27th meeting of TC 1.12 (September, 2022).

The work on the development of COOMET CRMs

856/RU-a/22 Development of CRM for composition of Siberian pine needles (HSS-1) (*Pinus sylvestris*)

The work on the project is at the stage of preparing a report, which will be sent with documentation for CRMs by the Coordinator to the Secretariat of TC 1.12 for consideration and further circulated among the members of TC 1.12 to agree on the possibility of recognizing the CRM for composition of Siberian pine needles (HSS-1) as a COOMET CRM.

815/RUa/20 Conducting comparison tests of certified characteristics of GSO 10895-2017 for composition and properties of coal, OS rank (SO-42)

816/RU-a/20 Conducting comparison tests of certified characteristics of GSO 11039-2018 for composition of polymetallic ore of the Quartz Hill deposit (SO-45)

817/RU-a/20 Conducting comparison tests of certified characteristics of GSO 10895-2017 for composition and properties of coal, G rank (SO-43).

The progress reports and documentation for CRMs were circulated among the members of TC 1.12 (March, 2023) to consider the possibility of recognizing the CRM for composition and properties of coal, OS rank (SO-42), the CRM for composition of polymetallic ore of the Quartz Hill deposit (SO-45) and CRM for composition and properties of coal, G rank (SO-43), as COOMET CRMs, and approval by correspondence on inclusion in the List of RMs agreed for recognition as COOMET CRMs at the 34th COOMET Committee meeting (May, 2023).

Activities on the recognition (registration) of CRMs included in the Key Comparison Database of the International Bureau of Weights and Measures (hereinafter referred to as KCDB BIPM) as COOMET CRMs

The Secretariat of TC 1.12, within the project **858/RU-a/22** (on-going), is working on the creation of the List of national CRMs, included in the KCDB BIPM, for recognition as COOMET CRMs in accordance with the provisions of COOMET Recommendation R/RM/4:2008 "Procedure for joint development, recognition and registration of reference materials within COOMET" (see 4.1).

Activities on digitalization issues in the field of metrology and reference materials are carried out within the constant participation of Mrs. Olga Kremlava, the appointed representative of TC 1.12 in the WG on the COOMET project **825/RU-a/21** "Development of a COOMET concept for digitalization in metrology".

The work on comparisons of CRMs is carried out within the projects: **700/RU-a/16** and **701/RU-a/16**.

The on-going COOMET project 543/RU-a/11 “Creation and maintenance of COOMET CRM Data Base”

In May 2022, the COOMET website (www.coomet.org) was transferred to the information technology platform of the All-Russian Research Institute of Metrological Service (Russia) with the transfer of its administration to the specialists of this institute. Ilya Krasavin, Head of the Center for Monitoring and Forecasting of the All-Russian Research Institute of Metrological Service, was appointed as the new administrator of the COOMET website, and he will also be the new joint co-coordinator of the project 543/RU-a/11 with Olga Kremleva.

Considering that there was a change in the placement and administration of the COOMET website, an online meeting was held between the Secretariat of TC 1.12, the COOMET Secretariat and the coordinators of the projects to discuss the algorithm of actions for maintaining the COOMET Data Base of COOMET CRMs.

The Secretariat of TC 1.12 prepared an updated form for the agreed project 543/RU-a/11 for submission to the COOMET Secretariat in connection with the change of the information technology platform and the appointment of a new co-coordinator from the All-Russian Research Institute of Metrological Service.

Development of regulatory documents within COOMET

During the reporting period, the Secretariat of TC 1.12 supervised the implementation of work in terms of the development and revision of publications within COOMET on the following working projects:

- Revision of **COOMET Document D5.7/2013** “Regulations on COOMET Technical Committee “Reference Materials” (TC 1.12)” within the project **274/BY-a/03** (see 4.2);
- Revision of **COOMET Recommendation R/RM/4:2008** “Procedure for joint development, recognition and registration of reference materials within COOMET” within the project **857/RU-a/22** (see 4.3);
- Updating of **COOMET Document D3/2008** “Memorandum of understanding of the development and use of certified reference materials of composition and properties of substances and materials of COOMET” within the project **863/BY/22**;
- Agreement and implementation of the Plan for the revision of COOMET documents on CRMs for harmonization with international ISO documents within the project **819/RU-a/20**.

The revised version of the Plan for the revision of COOMET documents on CRMs for harmonization with international ISO documents (Schedule for updating COOMET publications on CRMs within TC 1.12) was prepared on the basis of proposals received from NMIs with responsible executors and implementation deadlines, which was presented at the 27th meeting of TC 1.12 (September, 2022). Considering that the work on revision of COOMET publications on CRMs before the adoption of the final version of **COOMET R/RM/4:202_** (new concept on assigning the status of COOMET CRMs) is not expedient, the terms for the development of these documents have been adjusted for 2023–2024.

Maintaining and updating the Register and Data Base of COOMET CRMs

In accordance with the decision of the 33rd meeting of the COOMET Committee and the rules of COOMET Recommendation R/RM/4:2008, 15 types of CRMs from Kazakhstan and Russia were registered in the Register of COOMET CRMs, 17 types of COOMET CRMs from Bulgaria and Russia were excluded. The Register of COOMET CRMs was updated taking into consideration the information from COOMET member-countries regarding the extension of the validity period of CRM types. The Register and Data Base of COOMET CRMs currently holds information on 132 types of COOMET CRMs. The updated Register of COOMET CRMs (COOMET Information material I/RM/2)

was approved at the 34th meeting of the Presidential Council (March 13-14, 2023) based on Resolution 33P-16.

For 2022-2023, the Secretariat of TC 1.12 carried out the following activities: updating the composition of TC 1.12 (information on the updated composition of TC 1.12 is presented in the working materials for the 27th meeting of TC 1.12 and sent to members of TC 1.12); updating the progress of projects in the subject-field of CRMs of COOMET working projects (formulation of the relevant forms according to the COOMET procedure); exclusion from the COOMET Working Program of the following projects: 537/RU/11, 538/RU/11, 539/RU/11, 659/RU/15, 660/RU/15, 661/RU/15, 662/RU/15, 729/RU/17, 733/RU/17 due to their irrelevance based on the recommendations of the COOMET Committee as part of the framework of the discussions of the projects for the development of CRMs lasting more than 5 years, reports and information of the Coordinators on the progress on the projects and the impossibility of further continuation of work for objective reasons.

2. The results of the 27th meeting of TC 1.12 "REFERENCE MATERIALS"

The 27th meeting of TC.12 "Reference Materials" was held on September 12, 2022 at the UNIIM - Affiliated Branch of the D. I. Mendeleyev Institute for Metrology, Yekaterinburg. The meeting was held in a combined format in the presence of Mr. Valery Hurevich, President of the organization, who arrived in Yekaterinburg to participate in the program of the V International Scientific Conference "Reference Materials in Measurement and Technology".

While welcoming the members of TC 1.12 and other industry experts of the COOMET member-countries, Valery Hurevich noted the key role of the development and production of RMs in ensuring the uniformity of measurements.

The meeting was attended by representatives of six COOMET member-countries: Belarus, Kazakhstan, Russia, Slovakia, Tajikistan, Turkey. Russia was represented by the leading metrological institutes of the country (D.I. Mendeleyev Institute for Metrology (VNIIM) and its Ural branch, VNIIOFI, VNIIFTRI), as well as organizations-developers of reference materials (JSC Krastsvetmet and JSC Zscentre). All of them are coordinators of special COOMET projects aimed at the development of metrological assurance using RMs.

The following issues were considered at the meeting:

- Information of COOMET President and Head of COOMET Secretariat;
- Information on the current state of metrological activity in the subject-field of CRMs in the COOMET member-countries;
- Information on CRM activity within international organizations: ISO/TC 334; OIML; NTKMetr EASC; COOMET TC 1.8;
- Report on the activities of TC 1.12 in 2021–2022;
- On the status of COOMET projects the subject-field of CRMs;
- Revision of regulatory documents;
- On updating the Information material COOMET/IR/2:2022 "Register of certified reference materials for composition and properties of substances and materials, developed within COOMET" (exclusion of types of COOMET CRMs), etc.

The meeting participants were informed about the results of work on already completed and current projects within TC 1.12. Proposals on new projects were discussed, including: the development of the CRM for the composition of the fleet concentrate; the CRM for the composition of the cathode deposit; comparisons of certified characteristics of CRMs for the composition and properties of coal grade T. The results of the reporting annual period have been summed up: 15 types of national CRMs of Russia and Kazakhstan, included in the Key Comparison Database of the International Bureau of Weights and Measures (KCDB BIPM), are recommended for recognition as COOMET CRMs.

The Program of Joint CRM Production within COOMET (updated as of September 2022) within the on-going COOMET Project 186/RU/99, and the Register of COOMET CRMs with proposals for its updating were presented at the meeting.

Information on COOMET courses in the area of TC 1.12 activities on the BIPM e-learning platform, and information on the transfer of the COOMET website (www.coomet.org) to the information technology platform of the All-Russian Research Institute of Metrological Service (Russia) with the transfer of its administration to the specialists of the institute were provided.

Particular attention was paid to the issue of creating **a new concept of assigning the status of COOMET CRMs to reference materials** proposed for consideration within the revision of COOMET Recommendation R/RM/4:2008 "Procedure for joint development, recognition and registration of reference materials within COOMET" in accordance with the Plan for revision of COOMET documents on CRMs for harmonization with new international ISO documents, which is provided for by the COOMET Strategy and Development Program.

At the meeting, the participants presented reports and presentations, discussed and specified the content and deadlines of the implementation of projects. The participants of the meeting made decisions on each of the agenda items that determine the plan for further actions and the terms of their implementation. Minutes of TC 1.12 No. 27–2022 were prepared and circulated among the members of TC 1.12.

3. The results of the implementation of the COOMET Strategy and the COOMET Development Program regarding the activities of TC 1.12, as well as the COOMET Working Program

according to item 75 (G.2) Updating and implementation of the Program for the joint development of certified reference materials within COOMET (taking into account the recommendations under item 73)

During the reporting period, work on the annual updating of the COOMET Program R5/2022 "Program for the joint development of CRMs within COOMET" (carried out within the framework of the on-going projects 186/RU/99) was carried out based on the analysis of the work progress on the implementation of the Program in 2022, taking into account proposals received at the 27th meeting of TC 1.12, and proposals received from organizations-developers of the Russian CRMs. Changes have been made to the Program regarding the removal of completed and recognized as irrelevant items, the addition of new items, the adjustment of the deadlines for the completion of work, the contact details of the Projects Coordinators, etc.

according to item 79. (Ind-g.2.6) In accordance with the COOMET Development Program for 2020-2022 and Plan for revision of COOMET documents on CRMs for harmonization with international documents: ISO Guide 30:2015; ISO Guide 31:2015; ISO Guide 33:2015; ISO 17034:2016; ISO Guide 35:2017, the following activities is being carried out:

- revision of COOMET Recommendation R/RM/4:2008 "Procedure for joint development, recognition and registration of reference materials within COOMET" (see 4.3);
- updating the COOMET Document D3/2008 "Memorandum of understanding of the development and use of certified reference materials of composition and properties of substances and materials of COOMET".

according to item 83. (Ind-g.2.7) Updating the provisions on the QMS - the draft updated COOMET Document D5.7/2022 "Regulations on TC 1.12" is approved (see 4.2);

according to item 97. (Ind-g.3.6) Development of the concept for the use of digital technologies in the implementation of metrological services of the NMIs of the COOMET member-countries is carried out within COOMET Project 825/RU-a/21 (see 1);

4. The review of the completed projects in the subject-field "REFERENCE MATERIALS" and information on the application of the results

4.1 In 2022, the Secretariat of TC 1.12 and the member of TC 1.12 from Kazakhstan prepared and sent to the members of TC 1.12 a set of documents for 9 types of national CRMs of Kazakhstan, included in the KCDB BIPM, to consider the possibility of their recognition as COOMET CRMs (the set of documents also contains Certificates for COOMET CRMs prepared in accordance with COOMET Recommendation R/RM/22:2020) within the on-going project No. **858/RU-a/22**. **A list of 15 types of national CRMs, included in the KCDB BIPM, and proposed for recognition as COOMET CRMs**, including 9 types of Kazakhstan CRMs and 6 types of Russian CRMs, included in the KCDB BIPM, (previously presented at the 26th meeting of TC 1.12 in August 2021), has been prepared. The list was agreed at the 27th meeting of TC 1.12, approved at the meeting of the JCMS and approved at the 33rd meeting of the COOMET Committee (October, 2022) - all 15 types of submitted CRMs were recognized as COOMET CRMs, and entered in the Register of COOMET CRMs with the assignment of registration numbers of COOMET **CRMs 0118-2022-RU – COOMET RM 0123-2022-RU and COOMET RM 0124-2022-KZ–COOMET RM 0132-2022-KZ**.

Armenia, Belarus (4 types), Russia, Slovakia and Uzbekistan gave positive decisions on the possibility of recognizing 9 types of Kazakhstan national CRMs, included in the KCDB BIPM, as COOMET CRMs. Azerbaijan, Armenia, Belarus, Kazakhstan, Slovakia and Uzbekistan gave positive decisions on the possibility of recognizing 6 types of Russian national CRMs, included in the KCDB BIPM, as COOMET CRMs.

The list of recognized COOMET CRMs:

- CRM for sorption properties of nanoporous carbon;
- CRM for composition of sodium chloride of the first class;
- CRM for composition of glycine;
- CRM for composition of sulphamic acid;
- CRM for nanoporous aluminium oxide;
- CRM for composition of potassium chloride;
- CRM for the composition of the calibration gas mixture of propane in helium (C_3H_8 -He);
- CRM for the composition of the calibration gas mixture of propane in nitrogen (C_3H_8 - N_2);
- CRM for the composition of the calibration gas mixture of carbon monoxide, carbon dioxide, propane in nitrogen (CO - CO_2 - C_3H_8 - N_2);
- CRM for the composition of the calibration gas mixture of carbon monoxide, carbon dioxide, oxygen, propane in nitrogen (CO - CO_2 - O_2 - C_3H_8 - N_2);
- CRM for the composition of the calibration gas mixture of carbon monoxide, carbon dioxide, oxygen, propane in nitrogen/air (CO - CO_2 - O_2 *- C_3H_8 - N_2 /air).

The work on projects **815/RU-a/20**, **816/RU-a/20** and **817/RU-a/20** is in the process of completion.

4.2 As part of the revision of COOMET regulatory documents within the project **274/BY-a/03**, the final draft of the updated COOMET Document D5.7 was prepared, agreed within TC 1.12 and with the Chairman of the JCMS, approved at the 30th meeting of the COOMET Presidential Council (June, 2022) and approved at the 33rd meeting of the COOMET Committee (October, 2022) in accordance with the procedure established by COOMET. The updated **COOMET Document D5.7/2022** is published on the COOMET website.

4.3 As part of the revision of COOMET regulatory documents within the project **857/RU-a/22**, an updated draft document **COOMET R/RM/4__** was prepared (**taking into account the new concept on the issue of recognizing CRMs as COOMET CRMs**), agreed within TC 1.12, approved at the 34th meeting of the COOMET Presidential Council (March, 2023), and submitted for approval at the 34th COOMET Committee meeting (May, 2023).

5. Liaisons with international and regional organizations on the subject-field "Reference Materials"

To coordinate the issues on RMs discussed within COOMET, the liaisons are regularly maintained with the leading international organizations: **ISO/TC 334, OIML TC3/SC3, Interstate Council (NTCMetr)**, etc. The Members of TC 1.12 and the representatives of these organizations mutually participate in international meetings, providing the necessary information about the activities of their organizations. Information support for the activities of TC 1.12 is provided by means of participation in seminars, conferences and other events, as well as publications in the journals of the metrological community.

6. Information on the venue and date of the next meeting of TC 1.12 "Reference Materials"

The 28th meeting of TC 1.12 is planned to be held in September-October 2023 in a combined format. The final decision on the format and dates of the event will be made later, taking into account the global situation.

7. Proposals to the resolutions of the COOMET Committee

7.1 Approve the updated COOMET Recommendation R/RM/4:2023 "Procedure for joint development, approval and registration of reference materials within COOMET" (with specification of the title, instead of COOMET R/RM/4:2008).

Chairman of COOMET
TC 1.12 "Reference Materials"



Dr. S. Medvedevskikh

**LIST of the COOMET projects in the subject-field "Reference Materials",
(2022–2023)**

No	Project No.	Status	Project name
1.	186/RU-a/99	A	Development of the Programme of joint CRM production within COOMET
2.	274/BY-a/03 <i>The work of TC 1.12 on the document within this project has been completed</i>	A	Revision of COOMET Document D5.7/2013 "Regulations on COOMET Technical Committee "REFERENCE. MATERIALS" (TC 1.12)" <i>(within the Project 274/BY-a/03 "Formation and organization of activities of structural and working bodies of COOMET")</i>
3.	543/RU-a/11	A	Creation and maintenance of COOMET CRM Data Base
4.	700/RU-a/16	A	Pilot comparisons of CRM for composition of ferric ion solution
5.	701/RU-a/16	A	Pilot comparisons of CRM for composition of copper ion solution
6.	815/RU-a/20	A	Conducting comparison tests of certified characteristics of GSO 10895-2017 for composition and properties of coal, OS rank (SO-42) – GSO 10894-2017
7.	816/RU-a/20	A	Conducting comparison tests of certified characteristics of GSO 11039-2018 for composition of polymetallic ore of the Quartz Hill deposit (SO-45) – GSO 11039-2018
8.	817/RU-a/20	A	Conducting comparison tests of certified characteristics of GSO 10895-2017 for composition and properties of coal, G rank (SO-43) – GSO 10895-2017
9.	819/RU-a/20	A	Agreement and implementation of the Plan for the revision of COOMET CRMs documents for harmonization with the republished international ISO documents
10.	856/RU-a/22	A	Development of CRM for composition of Siberian pine needles (XSS-1) (<i>Pinus sylvestris</i>)
11.	857/RU-a/22	A	Revision of COOMET Recommendation R/RM/4:2008 "Procedure for joint development, recognition and registration of reference materials within COOMET"
12.	858/RU-a/22	A	Recognition (registration) of RMs included in Annex C of the CIPM MRA Agreement (in the KCDB BIPM Database) as COOMET CRMs
13.	863/BY/22	P	Update of document COOMET D3:2008 "Memorandum on cooperation in development and application of reference materials of composition and properties of substances and materials within COOMET"