

Progress report of VNIIM in radionuclide metrology
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1. International comparison and SIR contributions.

The VNIIM organized a RMO key comparison of Am-241 radioactivity measurements designated as COOMET RI(II)-K2. Am-241. The Am-241 liquid source in standard NIST ampoules was prepared by the VNIIM, and the ampoules were sent to COOMET participants of the BelGim (Belarus) and CENTIS/DMR (Cuba). To link this RMO comparison to the BIPM/SIR, one ampoule was also sent to the BIPM. In total, the laboratories reported the results obtained with their own methods. Now, the draft report has been prepared and submitted to the BIPM and KCWG CCRI(II) for its approval. Moreover, in accordance with the COOMET TC 1.9. IR decision, the VNIIM, as the pilot laboratory, will carry out the RMO key comparison of Cs-137 radioactivity measurements, designated as COOMET RI(II)-K2. Cs-137. Among the comparison participants there will be BelGim (Belarus), CENTIS/DMR (Cuba) и SMU(Republic of Slovakia). To link this RMO comparison to the BIPM/SIR, one of the ampoules will be sent to the BIPM too.

2. The VNIIM ionization chamber as a second measurement standard.

In 2006 the VNIIM purchased an ionization chamber, Fidelis Secondary Standard Dose Calibrator, Southern Scientific Ltd., i.e. the same that is used as the Secondary Standard at the NPL. At present, the sensitivity investigation of the chamber is being done for radionuclides Cs-137, Ba-133, Co-57, Am-241, J-125 with regard to the ampoules used by the Russian enterprises producing reference solutions of radionuclides. Furthermore, the chamber will be calibrated for the NIST ampoules as the VNIIM participates in new BIPM/SIR comparisons. When the investigation is completed, the chamber will be applied for calibrating the radionuclide solutions in accordance with the CMCs the VNIIM have claimed in Appendix C to the MRA.

3. Standardization and calibration services(some examples)

Some of area sources (from 1 cm² to 160 cm²) of Sr -90+ Y- 90, and of Pu-239 were formally calibrated as the secondary measurements standards of activity, and beta and alpha radiation flux for a number of the laboratories belonging to the network of calibration laboratories of Russia.

The VNIIM performed calibration a P-33 solution and determined an impurity of P-32 with regard to P-33 for the Research Institute of Atomic Reactors, which produces this preparation for medical diagnostic centers. The VNIIM also made the calibration of a Sr -89 solution and determined an impurity of Sr -90

with regard to Sr –89 in a preparation that is applied at Moscow clinics for spine radiation therapy .

In St.Petersburg clinics the solutions of short-lived radionuclides are used for the purposes of computer tomography. The radionuclide activity is determined in clinics with the help of radionuclide activity dose -calibrators that are calibrated at the VNIIM. Moreover, the calibration of dose –calibrators belonging to St.Petersburg enterprises producing radionuclide solutions intended for diagnostics is also realized at the VNIIM.

The solutions of tritium, Cs-137, Co-57, Co-60, Eu-152, Am-241 and Pu-239, calibrated at the VNIIM and introduced into references materials, are used in verifying the technical competence of the radiation control laboratories that form a network of the laboratories accredited for environmental radiation control in Russia.

In all cases, when calibration services executed for customers were in compliance with the VNIIM CMCs registered in the BIPM database , the VNIIM measurement certificates with the BIPM logo were given to the customers.

4. The VNIIM Quality System

In 2005, on the basis of the decisions of the COOMET Quality Forum, the certificate of Conformation of recognition QSF-R01 of the Quality Management System in accordance with the Standard ISO/IEC 17025 was given to the VNIIM .

5. Comparisons planned for 2007-2008

According to the COOMET TC 1.9. IR decision, the VNIIM has a plan to carry out, the RMO key comparison of Eu-152 radioactivity measurements as COOMET RI(II)-K2. Eu-152. taking part in it as a pilot laboratory. To link this RMO comparison to the BIPM/SIR measurements (comparison), an ampoule will be sent to the BIPM as well.

At present, an Eu-152 solution with a minimum impurity of Eu-154 is being prepared for this comparison.

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