

Laboratory of Radioactivity Standards  
Radioisotope Centre POLATOM  
Institute of Atomic Energy  
05-400 Otwock-Świerk, Poland

### **Review of activity (2005-2007)**

Contribution to the 19<sup>th</sup> meeting of Section II of CCRI

#### **Organization of the laboratory**

The Laboratory of Radioactivity Standards (LRS, 8 persons) is located in the structure of RC POLATOM (65 persons) which is the research and development centre having activity in the field of radiochemistry, biochemistry, radiopharmacy, immunology and radionuclide metrology. The main partner of the RC POLATOM for production and trading of radiopharmaceuticals, radiochemical preparations and sealed sources is the Polatom Co. Ltd.(125 persons). In January 2007 both the RC POLATOM and the Polatom Co. Ltd. were joined to the Institute of Atomic Energy in Świerk. In 2006 the staff of the LRS was increased and the management has been changed.

The actual tasks of the LRS are:

- Elaboration of the precise method of the uncertainty determination for measurement equipment in the LRS
- Development of radionuclides standardization by the LSC method using the Monte Carlo algorithm
- Standardization of the radioactive solutions applying an absolute and indirect LSC-methods,
- Elaboration of an absolute method of the  $^{99m}\text{Tc}$  and  $^{113}\text{Sn}$  standardization
- Determination of radionuclidic purity of radioactive solutions applying  $\gamma$ - and  $\beta$ -spectrometry methods
- Calibration and testing of stability of the gamma – spectrometer with the HPGe crystal
- Applying and keeping of the National Standard Unit of Radionuclides Activity,
- Participation in the international comparisons of radionuclides activity measurements,
- Service and calibration of instruments for measurement of radionuclides activity,
- Organization of the  $^{99m}\text{Tc}$  and  $^{131}\text{I}$  comparison of measurement in Polish hospitals

#### **International and national activities**

- Participation in the national conference “Radiotracers for In vivo assessment of biological function-New directions COST B12”, Warsaw, Poland (April 2005)
- Participation in the 18<sup>th</sup> Meeting of Section II of Comité Consultatif des Rayonnements Ionisants (CCRI), BIPM, Sevres, France, (May 2005)
- Participation in the 15<sup>th</sup> International Conference on Radionuclide Metrology and its Applications, ICRM 2005, Oxford, United Kingdom, (September, 2005)
- Participation in the in the 3<sup>rd</sup> VERMI Young Researchers Workshop, Varna, Bulgaria (September 2005)
- Participation in the national conference “Nuclear Technique in Industry, Medicine, Agriculture and Environmental Protection”, Kraków, Poland (September 2005)

- Participation in the international conference „Advances in Liquid Scintillation Spectrometry” (LSC 2005), Katowice, Poland, (October 2005)
- Participation in the in the 4<sup>th</sup> VERMI Young Researchers Workshop, Varna, Bulgaria (September 2006)
- Participation in the in the Liquid Scintillation Techniques Working Group of ICRM, Paris, France (January 2007)
- Participation in the in the ESGW meeting, BIPM, Sevres, France (April 2007)

### **Publications**

R. Broda, K. Małetka, A. Muklanowicz, A. Listkowska, Metrological laboratory in RC POLATOM, Proceedings of the national conference on “Nuclear Technique in Industry, Medicine, Agriculture and Environmental Protection”,(in Polish), AGH, Kraków, 2005, pp. 549 – 554.

R. Broda, A. Chyliński, T. Radoszewski, K. Małetka, T. Terlikowska-Drożdziel. The national standard of the radionuclides activity unit in Poland. Proc. Internat. Conference “Applications of high precision atomic & nuclear methods”, Ed. Acad. Romane, Rumunia, pp. 63-68, 2005.

Anna Listkowska, Technologies for dispensing of PET radiopharmaceuticals, Master Thesis, European School of Advanced Study in Nuclear and Ionizing Radiations Technologies, Pisa, Italy, 2005 (report for IAEA).

A.C. Razdolescu, R. Broda, P. Cassette, B.R.S. Simpson, W.M. Van Wyngaardt, The IFIN-HH triple coincidence liquid scintillator counter. Appl. Radiat. Isot., No.64, 2006, pp. 1510-1514.

### **In preparation**

R. Broda, T. Dziel, A. Listkowska. Some remarks on photon statistics in the LS-counter. (paper for the ICRM conference, 2007).

R. Broda, P. Cassette, K. Kossert. Chapter “Radionuclide Metrology using Liquid Scintillation Counting” in Metrologia Special Issue, BIPM Monography, (BIPM, 2007).

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