

IUPAC Project Progress Report

Date: November 2008

Project number: 2003-015-1-500

Project Title: Terminology, quantities and units concerning Production and Applications of radionuclides in radiopharmaceutical and Radioanalytical Chemistry

Task Group Leader: Mauro L. Bonardi

Starting date: 2003

Report:

1. Projected completion date (documents ready for external review): extension required to 2009 for meetings and presentation of results.

2. Have the project objectives been modified during the last 6 months? NN

3. Please list the task group members involved in the work during the last 6 months: Zeev B. Alfassi, Ren Iwata, Vladimir Kolotov, Geerd Meyer, David Shlyer, Leonard Wiebe.

4. Difficulties encountered (or concerns): NN

5. Please list the to-date results (outputs) of the project: new definitions of concepts, terminology, quantities and units concerning isotopic and non-isotopic carrier, carrier free, no carrier added, carrier added, specific activity, isotope dilution factor, radiochemical separation, chemical and radiochemical yield. Related topics.

6. Please list the dissemination events (viz. articles, CD, conference presentations; etc.)

(i) already accomplished

Publications/articles relevant and updated

- Z.B. Alfassi, F. Groppi, M.L. Bonardi, J.J.M. de Goeij, On the “artificial” nature of Tc and the “carrier-free” nature of ^{99m}Tc from $^{99}\text{Mo}/^{99m}\text{Tc}$ generator, *Appl. Rad. Isot.*, **63** (2005) 37-40.
- M.L. Bonardi, J. J. M de Goeij, How do we ascertain specific activities in no-carrier-added radionuclide preparations?, *J. Radioanal. Nucl. Chem.*, **263** (2005) 87-92.
- J.J.M. de Goeij, M.L. Bonardi, How do we define the concepts specific activity, radioactive concentration, carrier, carrier-free and no-carrier-added?, *J. Radioanal. Nucl. Chem.*, **263** (2005) 13-18.
- M.L. Bonardi, Critical review of the “Handbook on Nuclear Chemistry”: by A. Vértes, S. Nagy and Z. Klencsár (Eds.) 5 Volumes, Kluwer Academic, The Netherlands, *Rad. Phys. Chem.*, **72** (2005) 737-738. **Invited Review.**
- M.L. Bonardi, F. Groppi, Accelerator and Nuclear Reactor Production, followed by Quality Control, of high specific activity radionuclides for radioanalytical and radiopharmaceutical purposes: updated IUPAC terminology, Report IAEA, CRP on Nuclear Analytical Techniques, IAEA, Vienna, Mar 2007. **Invited Contribution.**
- M.L. Bonardi, D.S. Moore, Radionuclides and Radiochemistry. Part I: Their Role in Society, *Chem. Int., The News Magazine of IUPAC*, **29** (6) (2007).
- M.L. Bonardi, D.S. Moore, Part II: Terminology in Nuclear Processes - Misconceptions and Inaccuracies, *Chem. Int., The News Magazine of IUPAC*, **30** (1) (2008).
- W.C. Eckelman, M. Bonardi, W.A. Volkert, True radiotracers: are we approaching theoretical specific activity with Tc-99m and I-123 ?, *Nucl. Med. Biol.*, **35** (5) (2008) 523-527.
- S. Ridone, M.L. Bonardi, F. Groppi, A. Martinotti, Z.B. Alfassi, Paper radiochromatography for evaluation of radiochemical purity and stability of [^{186}gRe]Re-HEDP in biological samples after human administration, *J. Radioanal. Nucl. Chem.*, **277** (1) (2008) 117-123.

- Z.B. Alfassi, E. Persico, F. Groppi, M.L. Bonardi, On the photon self-absorption correction for thin-target-yields vs. thick-target-yields in radionuclide production, *Appl. Rad. Isot.*, **in press**.

Conferences

- M.L. Bonardi, The IUPAC project: Terminology, quantities and units concerning production and applications of radionuclides in radiopharmaceutical and radioanalytical chemistry, 17th Int. Symp. Radiopharm. Sci., Aachen, FRG, Apr 2007, *J. Label. Cpd. Radiopharm.*, **50** (S1) (2007) 505, ISSN 0362-4803.
- M.L. Bonardi, Accelerator and nuclear reactor production, radiochemical processing and quality control of high specific activity radionuclides for applications in the life sciences, 2-nd Int. Nucl. Chem. Congr. INCC-08 of the Int. Nucl. Chem. Soc., Cancun, Mexico, Apr 2008. **Invited Plenary Lecture.**
- M.L. Bonardi, Update on the IUPAC project: Terminology, quantities and units concerning production and applications of radionuclides in radiopharmaceutical and radioanalytical chemistry, 7th Int. Conf. Nucl. & Radiochem., NRC7, Budapest, Hungary, 24-29 Aug 2008. Member Organizing Committee. **Plenary Invited Lecture. Charged on Project Budget.**
- M.L. Bonardi, Update on IUPAC Project: Terminology, quantities and units concerning Production and Applications of Radionuclides in Radiopharmaceutical and Radioanalytical Chemistry, on behalf of IUPAC ACD Task Group IUPAC Project #2003-015-1-500, WorkShop on Metodi radiochimici per la caratterizzazione di matrici liquide ambientali, biologiche e industriali, Radiochemical methods for characterization of liquid matrices of environmental, biological and industrial origin, Urbino, Italy, Oct 1-3 2008, **Plenary Invited Lecture.**

(ii) planned

Conference 2008-2009

- M.L. Bonardi et al, Interdivisional Group of Radiochemistry of the Italian Society of Chemistry, WorkShop on Radiochemistry, Pavia, Italy, Nov 28-29 2008.
- M. L. Bonardi et al., 8-th Methods and Applications of Radioanalytical Chemistry, MARC VIII, conference to be held Apr 6-10, 2009 in Kona, HI, USA.

7. If your project is within 6 months of completion, how do you plan to utilise any remaining budget for this project? Meetings with some members during conferences

8. Work on this project may have identified new problems, issues, challenges, emerging topics, opportunities for related projects, etc. Please indicate these here so that the Division can follow up on them. NN