Contribution ID: **41** Type: **Oral Communications**

ORAL PRESENTATION - A new route for polonium-210 production from a bismuth-209 target

Wednesday 19 September 2012 10:30 (15 minutes)

A new method is proposed for the production and purification of polonium-210 (Po-210). This method is based on the bombardment of a bismuth-209 (Bi-209) target with a 38 MeV alpha particle beam that conducts to the production of astatine-210 (8.1 hrs) which decays to Po-210. It is further purified from bismuth target by a wet method using a liquid –liquid extraction process with tributyl phosphate (TBP). The main challenge relies on the separation of traces of Po-210 from a solution containing macroscopic quantities of bismuth. Several parameters were studied (acidity, aqueous medium, extraction time, TBP dilution, organic solvent) for defining the best conditions. The retained purification process consists in four steps: (i) the dissolution of the Bi target in nitric acid 10M followed by a reconditioning in 7M HCl, (ii) the extraction of Po-210 in 90% TBP in para xylene (iii) washing of the organic layer with 7M HCl and (iv) the back extraction of Po-210 in 9M nitric acid. The optimised process leads to a solution of Po-210 with a global recovery yield of 93 % with good radionuclide and chemical purities. The obtained data allow as well proposing an extraction mechanism of Po-210 by TBP.

Author: Mr YOUNES, Ali (SUBATECH laboratory (UMR 6457), Nantes 44307, France)

Co-authors: Dr ALLIOT, Cyrille (INSERM U892, ARRONAX laboratory, France, Nantes 44817); Dr MONTAVON, Gilles (SUBATECH laboratory (UMR 6457), France, Nantes 44307); Dr CHAMPION, Julie (SUBATECH laboratory (UMR 6457), France, Nantes 44307); Dr MOKILI, Marcel (INSERM U892, ARRONAX laboratory, France, Nantes 44817)

Presenter: Mr YOUNES, Ali (SUBATECH laboratory (UMR 6457), Nantes 44307, France)

Session Classification: Session 7 - Nuclear Chemistry, Radionuclide Production, High-Power Targetry

Track Classification: Nuclear Chemistry, Radionuclide Production, High-Power Targetry