



Contribution ID: 401

Type: Poster

## Preparation of Ra-223 by neutron irradiation of Ra-226

*Thursday, 15 May 2014 17:30 (1h 15m)*

Radium-223 is prospective alpha-emitting therapeutic radionuclide for targeted radionuclide therapy. Although Ra-223 is formed naturally by the decay of U-235, for practical reasons its preparation involves neutron irradiation of Ra-226. The decay of Ra-227 leads to Ac-227, which decays to Th-227 and Ra-223 subsequently. Ra-226 as a decay product of U-238 is generally available in multigram quantities (mainly historical stock). Main purpose of this study was to experimentally and theoretically evaluate and verify available literature data on production of Ra-223.

According to dates obtained from gamma spectra, the yield of this irradiation and cross sections were calculated.

Radium-226 sample was flame-sealed in a quartz ampoule and irradiated for 11,7 days in a neutron flow. The yield of Ra-223 and other products were determined several weeks after EOB by evaluation of gamma and alpha spectra. Less than one month after irradiation Ra-223, Pb-212, Bi-212, Tl-208 peaks can be found on gamma spectra. In three–four month the best peaks can be seen are peaks of Pb-214 and Bi-214, which are decay products of Ra-226. Also peaks of Ac-227, Th-227, Ra-223, Pb-211, Th-228 and Ra-224 can be found, but some of them are interfered by Pb-214 and Bi-214 peaks, other of them are very small in compare with Pb-214 and Bi-214.

Partially supported by grants LK21310 and TA03010027.

**Primary author:** KUKLEVA, Ekaterina (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering)

**Co-authors:** Dr KOZEMPEL, Jan (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering); Dr VLK, Martin (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering); Ms MIČOLOVÁ, Petra (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering); Dr DUŠAN, Vopálka (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering)

**Presenter:** KUKLEVA, Ekaterina (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering)

**Session Classification:** Poster Session - Production and Application of Radionuclides

**Track Classification:** Production and Application of Radionuclides