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## **Pd-based intermetallic targets for high intensity irradiations**

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The stability of actinide targets during the irradiation with intense heavy ion beams is a prerequisite to successful experiments with super heavy elements [1]. Due to higher thermal conductivity, electrical conductivity and mechanical stability metallic targets are suggested to be superior to the widely used nowadays solely electroplated ones. Recently we proposed a simple method which allows producing Pd-based intermetallic targets for high intensity irradiations [2]. Based on the molecular plating technique [3] followed by coupled reduction [4] this method was successfully applied to different lanthanide and actinide isotopes. 3 µm Pd backing foils were found to be the most suitable for preparing pinhole-free targets [5].

First irradiation experiments with intermetallic targets were carried out in November 2011 at the Oslo Cyclotron Laboratory, University of Oslo, Norway. 0.73 mg/cm<sup>2</sup> <sup>238</sup>U/Pd target was irradiated at the MC-35 Scanditronix cyclotron using a 0.5 nA proton beam with cyclotron energy of 30 MeV.

Two <sup>243</sup>Am/Pd intermetallic targets (0.85 and 1.7 mg/cm<sup>2</sup>) have been prepared and irradiated at the U-400 cyclotron at the Flerov Laboratory of Nuclear Reactions in March 2012 for several days with intense beams of <sup>48</sup>Ca. Both <sup>243</sup>Am targets were characterized by alpha-particle spectroscopy and light microscopy before and after irradiation. For direct comparison, the performance of a 'classical' electroplated <sup>243</sup>AmO<sub>2</sub>/Ti target was examined.

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[1] R. Eichler, et al., Nature, 447 (2007) 72.

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[4] S. Möbius, L. Hellwig, C. Keller, J. Less-Common Met., 121 (1986) 43.

[5] I. Usoltsev, et al., Preparation of Pd-based intermetallic targets for high intensity irradiations, Nucl. Instr. and Meth. A (2012), 10.1016/j.nima.2012.06.060.

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