

MEGAPIE and its post-irradiation examination

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The joint international MEGAPIE initiative – MegaWatt Pilot Experiment - aimed for the demonstration of designing, licensing, operating, dismantling, exploring and disposing a liquid metal spallation target at a beam power level of 1 MW. The initiative started in 1999 and resulted in the operation of the MEGAPIE target in the Swiss Intense Neutron Source (SINQ) in 2006. Thereafter, the target was dismantled in the ZWILAG facility, the interim storage facility of Swiss Nuclear Power Plants. Ten target pieces dedicated for sample production for subsequent post irradiation examination were brought to the Hot Laboratory of PSI, while the remains of the target were disposed.

From the target pieces brought to the Hot Laboratory approximately 1000 PIE samples of the lead bismuth eutectic (LBE) spallation target material and the structural materials – T91 in case of the lower liquid metal container and SS316L in case of the flow guide tube (FGT) – were fabricated. The LBE samples were analyzed at PSI with the aim of gaining information on isotope production and distribution throughout the target. Approximately one third of PIE samples from the structural materials were shipped to the international partner laboratories – CEA (France), JAEA (Japan), KIT (Germany), Los Alamos National Laboratory (USA), SCK-CEN (Belgium) – for investigation in 2013.

In this presentation we will provide an overview of the sample fabrication and show some results from the PIE investigations on the LBE and the structural material samples.