

Conceptual Study of Post Irradiation Examination (PIE) Facility at J-PARC

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JAEA has been developing accelerator-driven systems (ADS) for nuclear transmutation to reduce the volume and hazardousness of high-level radioactive waste generated by nuclear power plants. In order to prepare the material irradiation database necessary for the design of ADS and to study the irradiation effects of candidate structural materials for ADS in liquid lead-bismuth eutectic (LBE) alloys, a proton irradiation facility is under consideration at J-PARC. In this proton irradiation facility, a 400 MeV and 250 kW proton beam will be injected into the LBE spallation target, and irradiation tests under LBE flow will be performed for the candidate structural materials. Furthermore, semiconductor soft-error tests, medical RI production, and proton beam applications will be performed. Among these, post irradiation examination (PIE) of irradiated samples and separation and purification of medical RI, for instance Ac-225, will be carried out in the PIE facility to be constructed near the proton irradiation facility. In this PIE facility, PIE of the equipment and samples irradiated in the other facilities in J-PARC will also be performed. In this presentation, first, the conceptual study of the PIE facility, including the items to be tested and the test flow will be described. And then, the specifications and quantities of the facilities and the test equipment required to perform these test items will be shown. Finally, the layout of the PIE facility will be proposed.

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