

Post-Irradiation Examination Capabilities at PNNL Relevant to Target and Window Materials

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The Pacific Northwest National Laboratory has a number of facilities and capabilities that are relevant to post-irradiation examination of high power accelerator target and window materials such as graphite, beryllium, and Ti-base alloys. The Radiochemical Processing Laboratory contains a variety of shielded hot cell facilities routinely used for cask handling, experiment disassembly, visual inspection, gamma spectroscopy, metallographic sample preparation, chemical analysis, and thermal and mechanical property measurement. Small samples can be prepared in the hot cells to enable more specialized analyses in shielded gloveboxes and fume hoods including optical, scanning, and transmission electron microscopy, energy- and wavelength-dispersive x-ray spectroscopy, electron backscatter diffraction, x-ray diffraction, hydrogen and helium isotope assay, surface science such as Auger electron spectroscopy, x-ray photoelectron spectroscopy and Fourier transform infrared spectroscopy. Complementary radiological capabilities in the Materials Science and Technology Laboratory include additional scanning and transmission electron microscopes, a focused ion beam for micro-scale sample preparation, load frames for mechanical property measurements, immersion density apparatus, and autoclaves for corrosion testing. The poster will highlight relevant capabilities and provide examples of work from fission and fusion reactor materials irradiation experiments.

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