

Understanding nuclear fuel and the performance of materials in a nuclear environment at the micrometer scale is important to the development of fuels and materials for future nuclear energy systems. The role of a microfocus X-ray diffractometer is to examine phases and precipitation within solid matrices at  $\mu\text{m}$  level spatial resolution. The microfocus X-ray diffractometer at the Idaho National Laboratory was acquired as one component of a suite of state-of-the-art instrumentation chosen to perform Post Irradiation Examination (PIE) of nuclear fuel and other radioactive and contaminated reactor materials. Additional instrumentation includes a scanning electron microscope, an electron probe microanalyzer, and a scanning thermal diffusivity microscope. The purpose of the PIE equipment is to allow for micro-scale characterization of these types of materials. A number of preliminary experiments have been performed to better understand how to integrate these instruments to elicit complementary data. Data acquired on this suite of instruments from non-irradiated samples is presented.