2018 Denver X-ray Conference Abstract

Structural Investigation of Plutonium Oxalate Species and Comparison of Their Oxide Products

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Plutonium oxide can be synthesized via calcination of plutonium oxalate as a key step in the process to produce plutonium metal. Although they have been studied since the 1940s, the structural properties of plutonium oxalates are not well understood. Furthermore, the Pu center is known to radiolytically decompose its oxalate ligands leading to phase transformations over time. With this study, we have used powder X-ray diffraction to structurally characterize plutonium (III) and (IV) oxalate species, we have monitored their phase transitions over time and we have compared the plutonium (IV) oxide products that result from calcination of each oxalate precursor.

[PNNL-SA-132503]