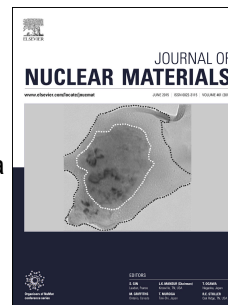


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Synthesis of plutonium trifluoride by hydro-fluorination and novel thermodynamic data for the PuF₃-LiF system

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Abstract. PuF₃ was synthesized by hydro-fluorination of PuO₂ and subsequent reduction of the product by hydrogenation. The obtained PuF₃ was analysed by X-Ray Diffraction (XRD) and found phase-pure. High purity was also confirmed by the melting point analysis using Differential Scanning Calorimetry (DSC). PuF₃ was then used for thermodynamic assessment of the PuF₃-LiF system. Phase equilibrium points and enthalpy of fusion of the eutectic composition were measured by DSC. XRD analyses of selected samples after DSC measurement confirm that after solidification from the liquid, the system returns to a mixture of LiF and PuF₃.

Keywords: Molten Salt Reactor, PuF₃ synthesis, Fluorination, Actinide fluorides, PuF₃-LiF phase diagram, Thermodynamics

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