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Fission Product Behavior in High-Temperature Water: CsI vs MoO_4

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Fission product behaviors of Cs, a major element released in a severe nuclear accident, still remain unclear. The question frequently addressed is whether Cs released will be in the form of $CsMoO_4$ or CsOH. This is a challenging issue since it has been demonstrated that the reaction between $CsMoO_4$ and water leading to CsOH production is thermodynamically favored. The present research aims at investigation of CsOH generation through this chemical channel. A high-temperature setup with a flow system based on the cooling system of a water-cooled nuclear reactor has been assembled. The reaction between aqueous solutions of CsI and $NaMoO_4$ in a high-corrosion-resistant hot cell (Hastelloy) has been studied up to 80°C both in air and deoxygenated system. The products have been characterized using XRD and FTIR.

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