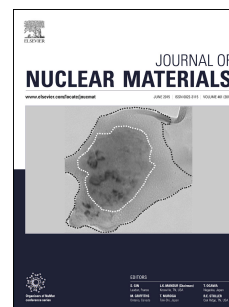


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Solid solubility and thermal expansion studies of uranium-europium mixed oxides

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Abstract

Uranium-europium mixed oxides ($\text{U}_{1-y}\text{Eu}_y\text{O}_{2-x}$ ($y=0.2, 0.4, 0.6, 0.65, 0.7, 0.75, 0.8$) were prepared by citrate gel-combustion synthesis and characterized by using X-ray diffraction (XRD). The terminal solid solubility of $\text{EuO}_{1.5}$ in UO_2 is in the composition range 60 – 65 mol% $\text{EuO}_{1.5}$. The coefficients of thermal expansions at 1973 K for $(\text{U}_{1-y}\text{Eu}_y)\text{O}_{2-x}$ ($y=0.2, 0.4, 0.6$) measured by using high-temperature X-ray diffraction (HTXRD) were found to be 15.80, 14.81 and $14.30 \times 10^{-6} \text{ K}^{-1}$ respectively.

Key words: Uranium, Europium, solid solution, solid solubility, thermal expansion, high temperature XRD

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