

IN-REACTOR BEHAVIOUR OF ATOMIZED U-MO DISPERSION ROD TYPE FUEL IRRADIATED AT HIGH TEMPERATURE IN HANARO

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Abstract

In order to examine the in-reactor behaviour of atomized U-Mo dispersion rod type fuel, U-Mo fuel element has been irradiated to ~9at.% burn-up at high temperature at HANARO. There are few fission gas bubbles in the U-Mo particles even at high temperature, irrespective of the linear power of the dispersion fuel. The thickness of the fuel-matrix interaction layer in the atomized U-Mo dispersion fuel is very sensitive to linear power. The elevation effect between interaction layer and fuel temperature results in the formation of thick uranium-aluminide layer and the extensive cavity in the center, and leads to a significant contribution to large swelling. The cladding, in the region having a linear power of higher than about 80 KW/m, shows a long crack like an axial cleavage, initiated at the outer periphery of the cladding. The reasons of the cladding failure could be attributed to the weak bonding of aluminium plastic flows formed in the thinnest part during co-extrusion process from the viewpoint of breakage pattern and the swelling induced from severe interaction between Al and U-Mo particles.