

A Nuclear Characteristics Study of Inert Matrix Fuel for MA Transmutation in Thermal Spectrum

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Abstract

The nuclear characteristics of a new conceptual fuel were analyzed as an option for incineration of plutonium extracted from nuclear warheads and spent fuel and transmutation of MAs. In order to eliminate uranium conversion to plutonium, the inert matrix fuel without uranium was selected to raise incinerating ratio. Erbium(Er_2O_3) and MAs as neutron absorbers were used for a reduction of large burnup reactivity swing and for a maximization of MA transmutation. The effects of plutonium and MA transmutation were compared with various neutron spectra which could be obtained on commercial PWR. As an option of inert matrix fuel with MA additives, it was confirmed that the feasibility of plutonium incineration in thermal spectrum and the transmutation of MAs is larger with hardened spectrum specially.