

Physical Interpretation of MA Transmutation in Ultra-Long Life FR Cores

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Abstract

The transmutation rates of minor actinides (MAs) are compared in two ultra-long life fast reactors; MOX fueled Na cooled core (MOX-Na core) and metal fueled Pb cooled core (metal-Pb core). The transmutation rates are decomposed into two terms; direct fission term and indirect fission term. The direct fission term expresses the transmutation of MAs by direct fission reactions, while the indirect fission term expresses that by fission reactions of other nuclides which are transmuted by capture reactions from the original MA. The direct fission term in the metal-Pb core is generally larger than that in the MOX-Na core, but the indirect fission term is less than that in the MOX-Na core. Thus, the overall transmutation rates are a little larger for the MOX-Na core.