Model of Actinides Transport in Fast Reactor

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In fuel-behavior codes for sodium fast reactors (SFR), the modeling of actinides redistribution is of great importance because most of thermal, mechanical and chemical processes depend on the local plutonium contents. Several mecanisms are known to contribute to the transport of uranium and plutonium under a high temperature gradient : solid state diffusion and vapor transport. This paper compares the various models available in the litterature [1], [2], [3] and suggests an alternative formalism to treat the evaporation/condensation process and the transport of plutonium in porosities. The present model also takes into account the presence of americium. A qualitative comparison of the present model is shown with recent experiments [4] performed at the japanese JOYO reactor.

References

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