

Abstract

This publication describes the development of a computational model for a new fuel reprocessing technique called traveling molten zone refining (TMZR). TMZR achieves separation of actinides from fission products in metallic used fuel based on phase equilibrium behavior. Upon melting, immiscible liquid phases with different densities are formed that are predicted to separate. The computational model tracks how fission products move during the process to predict the final state of a used fuel rod after the refining process is complete. Additionally, the experimental system used to validate the model is outlined.