Public Abstract
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Title: ICP-MS Analysis of Fission Product Diffusion in Graphite for High-Temperature Gas-Cooled Reactors

High-temperature gas-cooled reactors (HTGRs) are one of the candidates being considered for the replacement of current nuclear reactor designs. Diffusion coefficients for fission products in HTGR graphite are required for estimation of fission product release rates from such reactors.

We developed a method for analysis of fission product of fission product surrogate release rates from heated graphite samples. The graphite samples were infused with fission product surrogate material, and material which diffused from the graphite samples was transported via a carbon aerosol laden He jet system to an online inductively coupled plasma mass spectrometer for quantification of the release rate. Diffusion coefficients for cesium in IG-110 and NBG-18 grade nuclear graphites are reported.