

**THE ADSORPTION OF FISSION PRODUCTS
ON VHTR STRUCTURAL MATERIALS**

Sean Branney

Dr. Tushar Ghosh, Dissertation Supervisor

ABSTRACT

The Very High Temperature Reactor (VHTR) is being considered as a candidate for the next generation of nuclear reactors. There are several areas that require further study in VHTR reactor designs. One such area is the adsorption of fission products on the reactor's structural materials, such as graphite and stainless steel. It is important to know how much of these fission products have adsorbed on various parts of the reactor both for the purposes of understanding the possible activity of the components during maintenance operations, and also to quantify potential releases of these fission products during accident scenarios. The adsorption of fission products on reactor materials has been studied in the past, but further data are required.

This project was undertaken in order to acquire some of these data. Several analysis methods were used during the course of this study, including Gravimetry, Neutron Activation Analysis, Energy Dispersive Spectroscopy, and Inductively Coupled Plasma Mass Spectroscopy.

Some isotherm data has been generated and recommendations for future work have been formulated.