Public Abstract

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Title:Oxidation of Nuclear- and Matrix-Grade Graphite for VHTR Air Ingress Accident Scenarios

The oxidation or burn up rate of nuclear-grade graphite was studied for the purposes of nuclear reactor safety. Nuclear graphite is an excellent and affordable material that can be used as core components in nuclear reactors. State of the art nuclear reactors plan to incorporate new nuclear-grade graphites. However, only a few tests have been performed on their high temperature oxidation resistance in air, which could be the case during a potential reactor accident. Data was collected experimentally in a controlled lab setting for the change in weight of graphite samples as temperature was increased. The results indicated that the oxidation rate of each graphite grade tested was different and that the surface of samples were changed in distinctly different ways. The ability to predict the nuclear graphite oxidation rate is related to the prediction of its service life in the event of a reactor accident and also normal operations.