

Degradation of Thermal Conductivity of Epoxy Resin-Diamond Filler Composites Under Radiation

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The aim of this work was to study the variation of the thermal conductivity of composite materials usually used as glues in experimental setups when exposed to different dose levels of ionizing radiation. The samples under study were epoxy resins filled with diamond powder irradiated with high-energy protons and neutrons. The thermal conductivity of each samples was measured before and after the irradiation. The dose absorbed by the samples was determined by activation analysis of the aluminum foils used as monitors. Additionally, the dose absorption and the radiation damage of the samples were simulated using the FLUKA and MCNPX software packages. The results revealed a significant reduction in the thermal conductivity of the samples after irradiation, highlighting the need for the careful selection and characterization of the materials to be used in high-radiation environments.

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