MICROSTRUCTURE OF SWIFT HEAVY ION IRRADIATED SiC, Si3N4 AND AlN

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Several studies have shown that swift heavy ions with electronic stopping powers >10-15 keV/nm can induce phase transformations in oxide ceramics and other materials. In contrast, we have recently found that track formation did not occur in SiC, Si3N4 or AlN following 330 MeV Kr ion irradiation (dE/dx~16 keV/nm). These three materials have been irradiated with 710 MeV Bi ions at fluences of 1e12 and 1e13/cm2 (single track regime) in order to determine if track formation can be induced at electronic stopping power values >25 keV/nm. The microstructures were examined using plan view and cross section transmission electron microscopy. The results will be compared with predictions from existing swift heavy ion irradiation models.

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