

HIGH TEMPERATURE ELASTIC STRAIN EVOLUTION IN Si_3N_4 -BASED CERAMICS

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The deep penetration of neutrons in most materials allows *in-situ* studies in extreme environments. This advantage of neutron diffraction was utilized in the investigation of elastic lattice strain evolution during high temperature deformation of monolithic Si_3N_4 and its composites with SiC particulates. Tension experiments were performed in the 1100°C-1400°C temperature regime using the new SMARTS diffractometer at Los Alamos Neutron Science Center. In particular, the *hkl*-dependent strains were measured and the results were interpreted by employing Eshelby-based modeling. The diffraction data also provided information about thermal expansion coefficients and elastic constants at high temperature.

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