HIGH TEMPERATURE CREEP OF A Si_3N_4 CERAMIC PREPARED BY HOT ISOSTATIC PRESSING

B.S.B. Karunaratne, B.A. Karunaratne,
& S.M.S. Abeyweera
Dept. of Physics, University of Peradeniya.

High temperature creep deformation of hot isostatically pressed (HIP) Si_3N_4 containing 4% wt.of Y_2O_3 was investigated in an ambient-air atmosphere in the temperature range 1200-1400 ^{o}C in four point bending mode. A high temperature creep machine was designed and constructed for creep testing. The stress variation tests were conducted in the stress range of 75-300 Mpa at 1300 and 1350 ^{o}C the temperature variation tests were conducted in the temperature range 1200-1400 ^{o}C. The tests showed non linear dependence of creep rate on stress indicating a possible cavity growth mechanism during high temperature deformation. This was confirmed by the microstructural investigations on deformed samples.

This research project is supported by IPPS, Uppsala, Sweden, NARESA, Sri Lanka and a University Research Grant, Peradeniya. The authors would like to thank ABB Cerama AB, Sweden for providing the specimens. The authors also wish to thank Mr. Keerthi Jayasekera and Mr. A.J.A. Abeyratne for their help in constructing the creep machine.