Rheology of Cubic Boron Nitride at High Temperatures and Pressures	X17B1

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The rheological properties of powdered and sintered polycrystalline cubic boron nitride (cBN) were investigated at 9.3 GPa and up to 1820 K. The cBN was strained by hydrostatic pressure in a DIA-type multi-anvil apparatus and by local deviatoric stresses induced by grain-to-grain contacts within the samples. Strain rates were investigated by heating the cBN and then collecting time-resolved energy dispersive x-ray diffraction spectra at intervals between 30 and 120 s. Strain due to deviatoric stress broadens the x-ray diffraction peaks. Strain-broadening is deconvolved by Fourier analysis from instrumental effects that are estimated from spectra at room temperature and pressure. For this analysis, diffraction peaks are fit to a split Pearson VII function since a split function accommodates asymmetry in the peaks and the Pearson VII function approximates the data better than Cauchy and Gaussian functions. Due to the quantity of data, automated proceedures are implemented for peak identification, background subtraction, peak fitting, and deconvolution.