

The strength of moissanite

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ABSTRACT

The yield strength of moissanite was investigated at pressures up to 18.3 GPa and temperatures up to 1200 °C by analyzing the peak shapes of diffraction lines from a powder sample. At room temperature, the moissanite crystal behaves elastically with increasing pressure up to 13.7 GPa. At higher pressures applied, the sample is yielded; the yield strength of moissanite is determined to be 13.6 GPa. Upon heating at 18.3 GPa, significant stress relaxation is observed at temperatures above 400 °C, and the yield strength of moissanite decreases rapidly from 12.8 GPa at 400 °C to 4.2 GPa at 1200 °C. Such behavior will place severe limitations on the use of moissanite as an anvil material when external heating is desired for high pressure and temperature experiments.