

Elastic Properties of MgO at High Pressure and High Temperature *	X17B1
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Elastic properties of polycrystalline MgO were measured to 8 GPa and 1273 K using simultaneous X-ray diffraction and ultrasonic measurements in a DIA-type cubic anvil apparatus (SAM85) installed at the superwiggler beamline X17B1 at NSLS in Brookhaven National Laboratory. The polycrystalline specimen (3.25 g/cm^3 in bulk density) was from the same source as previous deformation experiment targeted in obtaining references for the deformation experiment. Ultrasonic measurements were carried out by mounting a Lithium Niobate transducer (36 degree Y-cut, P wave) at the back of the WC anvil. The sample was inserted into a cubic boron epoxy cell assembly with NaCl and BN as surrounding materials, which provides pseudo-hydrostatic stress at high pressures. An alumina buffer rod was inserted between the sample and the anvil inside the boron epoxy cube. The X-ray spectra of the sample were analyzed to obtain the cell parameters and sample volumes from which the sample lengths at high pressure and high temperatures were obtained for velocity calculation. The sample pressure was determined using the Decker pressure scale based on the equation of state of NaCl. After reaching peak P and T conditions, multiple heating/cooling/decompression cycles were performed to provide dense coverage of experimental P-T range. Simultaneous measurements of P-V-T data and ultrasonic velocities for MgO will also provide information about the absolute pressure scale.

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