Isothermal equation of state for MgO derived from shock Hugoniot data and its implication on pressure scale KE JIN, QIANG WU, XINZHU LI, LINGCANG CAI, FUQIAN JING, National Key Laboratory of Shock Wave and Detonation Physics, Institute of Fluid Physics, China Academy of Engineering Physics, China — The isothermal bulk modulus, its first pressure derivative and the specific volume at zero pressure and temperature for MgO were derived directly from the experimental shock Hugoniot data with a simple method. Based on the derived parameters and Vinet equation of state, the isothermal equations of state for MgO were calculated to the relative volume change of 0.55 and high temperatures, which have excellent agreements with the available quasi-hydrostatic measurements in diamond-anvil-cell experiment. Comparison of the calculated results with the previous theoretical investigations also has been performed. The crosscheck on independent data and the excellent agreements with experimental data confirm that the present isothermal equations of state for MgO can be used as high-pressure scale for future static DAC experiments.

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