Shock compressibility and Hugoniot temperature of TiO_2 at pressure up to 2 TPa

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Rutile (titanium dioxide) is an important constituent of Earth crust and mantle, as well as other rocky planets, rocky cores of gas planets, asteroids and Moon regolith. Its shock-wave properties are required to construct a synthetic equation of state for compounds, mentioned above. In this work, a Mach-type cumulative generators of shock wave in conjunction with impedance match technique were used to study the shock compressibility of porous and monocrystalline rutile samples. Also, the use of monocrystalline samples allowed to measure Hugoniot temperature at pressure up to 2 TPa. Obtained experimental data is in a good agreement with semi-empirical equation-of-state calculations and with SAHA-IV plasma model calculations.