

Abstract Submitted
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Theory for Isentropic Compression of Ta CARL GREEFF, SVEN RUDIN, SCOTT CROCKETT, JOHN WILLS, Los Alamos National Laboratory — In high-pressure isentropic compression experiments (ICE), the pressure is dominated by the cold curve. In order to obtain an accurate semi-empirical cold curve for Ta, we calculate the thermal pressure from *ab initio* phonon and electronic excitation spectra. The cold curve is then inferred from ultrasonic and shock data to pressures in the 2-3 Mbar range, and extended to higher pressures using electronic structure calculations. We predict the principal isentrope to 5 Mbar on this basis. We also make estimates of the contribution of shear strength, both directly and via dissipation of plastic work, in Mbar-range ICE.

Carl Greeff
Los Alamos National Laboratory

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