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High Pressure Behavior of Precompressed CO₂ Shocked to ~10 Mbar L. CRANDALL, J.R. RYGG, G.W. COLLINS, T.R. BOEHLY, Laboratory for Laser Energetics, U. of Rochester, A. JENEI, D.E. FRATANDUONO, M.C. GREGOR, J.H. EGGERT, M. MILLOT, LLNL, D. SPAULDING, UC Davis — CO₂ is present in the atmospheres and interiors of Jovian planets, atmospheres of exoplanets, and within Jovian moons. To study the high-pressure behavior of CO₂, we used laser-driven shocks to compress CO₂, to ~1 TPa (10 Mbar). The CO₂ was precompressed in diamond-anvil cells to ~5 kbar, producing liquid at density (~1.5 g/cm³), and then shocked by the OMEGA Laser System. Equation of state, temperature, and optical reflectivity were measured between 150 and 950 GPa. CO₂ undergoes an insulator-to-conductor transition above ~200 GPa, which may be result from dissociation to metallic oxygen. These data can add to understanding of thermochemical histories of the giant planets. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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