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**Insulator-conductor transitions at multi-Mbar pressures** G.W. COLLINS, LLNL, P. LOUBEYRE, S. BRYGOO, CEA, R.S. MCWILLIAMS, P.M. CELLIERS, D.G. HICKS, LLNL, T.R. BOEHLY, LLE, D.K. BRADLEY, LLNL, R. JEANLOZ, UC Berkeley, J. EGGERT, LLNL — At high enough shock pressures all materials become conductors. How do wide band gap insulators transition from insulator to conductor (IC) at very high shock pressures? Is there a metal-insulator transition, a plasma-phase transition, or just a continuous thermal ionization? We have measured the optical reflectance of C, H2O, SiO2, N2, D2, H2, LiF, Al2O3, and He at shock pressures up to 30 Mbar. We determine the change in electrical conductivity through the change in optical reflectance of the shock front. For highly compressible materials we can separate the density and temperature dependence for the onset of electrical conduction by varying the initial density before shock compression. The IC transition is sometimes coincident with a change in chemistry or the melt transition, but in general provides rich insight into the material's high pressure behavior.

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