

Shock and shock-ramp compression of iron-rich (Mg,Fe)O at Earth's core conditions

Hannah J. Bausch¹, Joshua P. Townsend², Steven D. Jacobsen¹, Alisha N. Clark³, Sakun Duwal²,
Chad A. McCoy², Jean-Paul Davis²

¹Northwestern University, Evanston, IL, ²Sandia National Laboratories, Albuquerque, NM,

³University of Colorado Boulder, Boulder, CO

Where Earth's iron core and silicate mantle meet is a region of the Earth's interior that is still poorly understood. Seismological results suggest the presence of ultra-low velocity zones (ULVZ's) sitting directly atop the core. One possible explanation for these features is that they are regions of highly iron-enriched ferropericlase (Mg,Fe)O (Wicks et al. 2010), however the thermodynamic properties at near-core conditions are poorly constrained. Here we present the results of combined ab-initio calculations and shock measurements of (Mg,Fe)O containing 25 and 50 mol% Fe. The results are being used to design shock-ramp experiments on the Z machine at Sandia National Laboratories.

SNL is managed and operated by NTESS under DOE NNSA contract DE-NA0003525

Wicks, J. K., Jackson, J. M., & Sturhahn, W. (2010) Very low sound velocities in iron-rich (Mg, Fe) O: Implications for the core-mantle boundary region. *Geophysical Research Letters*, 37(15).