Abstract Submitted
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Shock Hugoniot equations of state for binary water-alcohol liquid mixtures[1] DAVID MOORE, CYNTHIA BOLME, KATHRYN BROWN, SHAWN MCGRANE, Los Alamos National Lab, PETER SCHULZE, Department of Chemistry, University of Utah — Shock Hugoniot data were obtained using laser generated shock and ultrafast dynamic ellipsometry (UDE) methods for several non-ideal water-alcohol liquid mixtures, using methanol, ethanol, 1-propanol, 2-propanol, 1-butanol, and t-butanol (a.k.a., 2-methyl-2-propanol or tert-butanol). The sound speeds of the mixtures were obtained using Brillouin scattering when not available in the literature. The shock and particle velocities obtained from the UDE data were compared to expectations of the universal liquid Hugoniot (ULH) and to literature shock (plate impact) data where available. The shock Hugoniot trends for all these mixtures, represented as deviations from predictions of the ULH, versus fraction of alcohol are quite similar to each other and suggest that complex hydrogen bonding networks in water-alcohol mixtures alter the compressibility of the mixtures. Data and trends will be presented.

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