

Abstract Submitted
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Investigating kinetic properties of warm dense hydrocarbons in shock release experiments.¹ JAMES HAWRELIAK, Washington State University, MAX KARASIK, JAECHUL OH, YEFIM AGLITSKIY, Division of Plasma Physics, Naval Research Laboratory — Kinetic processes like diffusion, viscosity, and thermal conduction are time-dependent processes governed by particle collisions at the atomic scale. These processes are the mechanism by which systems with large gradients (both in stress and temperature) reach equilibrium. Viscosity, in particular, is important in rapidly deforming systems as it provides a resistance force which depends on the rate of deformation. In this case mechanical energy is covered into thermal energy. We used the NIKE laser at the Naval Research Laboratory to determine the release velocity of shock compressed CH using time-dependent x-ray radiography. We observed that the release was significantly slower than hydrodynamic estimates assuming an isentropic release. We investigate the kinetic process that could be responsible for the observed reduction in velocity.

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