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Measurement and interpretation of shear viscosities at high pressures

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High pressures employed in the study of fluids allow density and temperature to be used as independent, experimental variables, providing extensive and clear comparison with theory. Measurements of the viscosities of simple fluids in the diamond-anvil cell have allowed confirmation of a hypothesized relation between viscosity and entropy, and a more general exploration of “isomorphs” as well as fluid-mixing rules. Densities and temperatures at which viscosities can be measured statically overlap those achievable by dynamic compression; inferences of viscosity from observations using, e.g., shock compression can thus be tested for accuracy.