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Liquid organic foams for formulation optimization: an assessment of foam linear viscoelasticity and its temporal dependence JAMIE KROPKA, LISA MONDY, MAT CELINA, Sandia National Labs — Liquid foams are viscoelastic liquids, exhibiting a fast relaxation attributed to local bubble motions and a slow response due to structural evolution of the intrinsically unstable system. In this work, these processes are examined in unique organic foams that differ from the typically investigated aqueous systems in two major ways: the organic foams (1) posses a much higher continuous phase viscosity and (2) exhibit a coarsening response that involves coalescence of cells. The transient and dynamic relaxation responses of the organic foams are evaluated and discussed in relation to the response of aqueous foams. The change in the foam response with increasing gas fraction, from that of a Newtonian liquid to one that is strongly viscoelastic, is also presented. In addition, the temporal dependencies of the linear viscoelastic response are assessed in the context of the foam structural evolution. These foams and characterization techniques provide a basis for testing stabilization mechanisms in epoxy-based foams for encapsulation applications. Sandia is a multi-program laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under Contract DE-AC04-94AL85000.

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