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Controlling Stability and Rheology of Organic Foams JAMIE KROPKA, MATHEW CELINA, Sandia National Laboratories — It is often important to understand the stability and flow properties of polymeric foams in order to optimize industrial processing conditions or design new materials. The fact that foaming, polymerization and temperature rise are often coupled in these systems makes it difficult to even characterize existing materials, much less model behaviors to optimize formulations and processing conditions. To make progress in this area, we have developed model foaming systems that decouple these processes and allow us to characterize the physical properties of liquid foams. We are specifically interested in understanding the controlling factors of foam persistence, shear stability, and rheological behavior. We show both chemical (e.g., partial polymerization) and physical (e.g., particulate additives) means of tuning foam persistence as well as both small strain deformation flow and the less understood liquid-like flow at high applied stresses. 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.

Jamie Kropka
Sandia National Laboratories

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