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Shock chemistry in SX358 foams KATIE MAERZKE, JOSHUA COE, ANTHONY FREDENBURG, JOHN LANG, DANA DATTELBAUM, Los Alamos National Laboratory — We have developed new equation of state models for SX358, a cross-linked PDMS polymer. Recent experiments on SX358 over a range of initial densities (0-65% porous) have yielded new data that allow for a more thorough calibration of the equations of state. SX358 chemically decomposes under shock compression, as evidenced by a cusp in the shock locus. We therefore treat this material using two equations of state, specifically a SESAME model for the unreacted material and a free energy minimization assuming full chemical and thermodynamic equilibrium for the decomposition products. The shock locus of porous SX358 is found to be "anomalous" in that the decomposition reaction causes a volume expansion, rather than a volume collapse. Similar behavior has been observed in other polymer foams, notably polyurethane.

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