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Quasi-Isentropic Compression of Vapor Deposited Hexanitroazobenzene (HNAB): Experiments and Analysis COLE YARRINGTON, ALEXANDER TAPPAN, PAUL SPECHT, ROBERT KNEPPER, Sandia National Labs — Vapor-deposited hexanitroazobenzene (HNAB) is an explosive with unique physical characteristics resulting from the deposition process that make it desirable for the study of microstructure effects. A relatively understudied high explosive (HE), few data are available on the equation of state (EOS) of HNAB reactants or products. HNAB samples exhibiting high density and sub-micron porosity and grain size were prepared using physical vapor deposition onto polymethyl methacrylate (PMMA) and lithium fluoride (LiF) substrates. The samples were quasi-isentropically ramp compressed using VELOCE, a compact pulsed power generator. Evidence of a low pressure phase transition was observed in HNAB. Interferometric measurements of reference and sample interface velocities enabled inference of the unreacted EOS for HNAB using DAKOTA, an optimization toolkit. Initial simulations of the HNAB critical thickness experiment have been carried out using the parameterized EOS, and a products EOS from thermal equilibrium calculations.

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