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Crystallization behavior of vapor-deposited hexanitroazobenzene (HNAB) films ROBERT KNEPPER, ALEXANDER TAPPAN, KATHY ALAM, MARK RODRIGUEZ, Sandia National Laboratories — Hexanitroazobenzene is an interesting material for microenergetic research on explosive behavior at sub-millimeter geometries due to its small critical thickness for detonation and its chemical stability at temperatures above its melting point, which allows for fast deposition rates. HNAB films have been observed to deposit in an amorphous state, provided the substrate remains sufficiently cool during deposition. These amorphous films crystallize over a period of hours to weeks, depending on the ambient temperature, to a structure consisting of primarily HNAB-II crystallites. Several films were deposited to a thickness of $\sim$ 100 microns and subjected to a variety of temperatures ranging from 30 – 75°C to observe crystallization behavior. Crystallization rates were observed using time-lapse optical microscopy and were also characterized using scanning electron microscopy, atomic force microscopy, x-ray diffraction, and Raman spectroscopy at various stages of crystallization.

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