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An experimental characterization of condensed phase soot from overdriven detonations of Composition B ROBERT REEVES, GARTH EGAN, GREG KLUNDER, SORIN BASTEA, RIAD MANAA, Lawrence Livermore National Laboratory — An experimental series was undertaken to produce and characterize the reaction products formed during detonation of Composition B under conditions varying from C-J detonation to overdriven conditions. Overdriven conditions were replicated utilizing a two-stage gas gun, in order to provide a supported shock at a continuous pressure for the entirety of the detonation event. Input pressures ranged from 31.3 GPa to 55.0 GPa, and the results were compared to a standard detonation of Composition B at C-J pressures. In all tests, the amount of post-detonation products, gaseous and condensed phase, were quantified. The gaseous products were analyzed for chemical content by mass spectrometry and gas chromatography. The morphology and phase of the soot was analyzed by electron microscopy and x-ray photoelectron spectroscopy. Several trends were identified. The gas generation rate generally increased with input pressure. For condensed phase products, the relative production of graphitic to diamond-like material increased with pressure, but the size of the formed particles seemed to decrease. This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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