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Synthesis, isolation, purification and characterization of nanocarbons derived from detonated high explosives MILLICENT FIRESTONE, BRYAN RINGSTRAND, RACHEL HUBER, DAVID PODLESAK, KWYENTERO KELSO, Los Alamos National Laboratory — Products evolved during the detonation of high explosives are primarily a collection of molecular gases and solid carbon condensates. Examination of the post-detonation soot employing X-ray scattering, Raman spectroscopy, and electron microscopy has revealed a wide range of interesting nano-architectures that are not readily attainable through other synthetic strategies. Critical to understanding the mechanism of individual carbon particles during detonation requires their isolation and purification. To address this opportunity we are working to develop benign, low temperature and non-oxidizing multistep purification schemes for isolation of the carbons from residual metals and more importantly, separation of the various carbon phases based upon density differences. Room temperature aqueous phase extractions using sodium polytungstate, zinc chloride and tetrabromoethane have yielded the greatest success. This multistep separation procedure applied to Composition B recovered soot will be presented. It is envisioned that the recovered novel nanocarbons will be of significant value to both the shock physics and nanoscience communities.

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