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Scaled-Up Synthesis and Characterization of High-Purity Graphene PATRICIA JOHNSON, MARK GRIEP, KRISTOPHER BEHLER, ROSE PESCE-RODREQUEZ, SHASHI KARNA, WENDY SARNEY, Army Research Laboratory, KATE DUNCAN, CERDEC — Graphene, a two-dimensional, single-atom sheet of carbon atoms, discovered in 2004, has emerged as a new class of novel nano-scale material due to its unique chemical and physical properties, and potential applications in a wide range of civilian and military technologies. However, a major challenge in its technological application is a lack of chemical/physical method(s) to produce/synthesize high-purity graphene in viable quantity. Another challenge in the technological application of graphene is a lack of detailed understanding of its structure-property relationship. In order to address these issues, we have developed a chemical exfoliation method that yields high-purity graphene in bulk quantity. The method is scalable to produce large quantities of high purity graphene. In this paper, we present the results of our synthetic approach and structure-property characterization of graphene.

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