

Abstract Submitted
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The advent, and physical properties, of new classes of graphene-based materials RODNEY S. RUOFF, INHWA JUNG, SUPINDA WATCHAROTONE, GEOFFREY H. B. DOMMETT, ERIC ZIMNEY, SASHA STANKOVICH, RICHARD PINER, SUNGJIN PARK, DMITRIY A. DIKIN, Department of Mechanical Engineering, Northwestern University — We have developed new materials based on chemically modified graphene (CMG) sheets. By working with aqueous colloidal suspensions of ‘graphene oxide’ sheets (graphene sheets that are surface functionalized with hydroxyl, epoxide, carboxylate, and possibly other oxygen-containing functionalities), and at times by doing further chemistry to create a portfolio of CMG sheets, it has been possible to study (i) individual CMG sheets deposited on substrates designed for optical characterization of them (ii) electrical properties of individual CMG sheets (iii) fabrication & properties of ceramic composites with embedded CMG sheets (iv) fabrication of novel “paper-like” materials (analogy: bucky paper) comprised of aligned CMG sheets and having thicknesses from less than 1 up to 20 micrometers. Here, we provide a broad overview of this work, and also new directions of research. Support from NASA (# NCC-1-02037) through the URETI on Bio-inspired Materials, the Naval Research Laboratory (#N00173-04-2-C003) and the NSF (CMS-0510212), is appreciated.

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