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Transmission Electron Microscopy of a Graphene-based Polymer Nanocomposite KEVIN KOHLHAAS, DMITRIY DIKIN, SASHA STANKOVICH, RODNEY RUOFF, Department of Mechanical Engineering, Northwestern University, Evanston, IL 60208, ERIC STACH, School of Materials Engineering, Purdue University, West Lafayette, IN 47906 — A Polystyrene/CMG (chemically modified graphene) composite has been made by a solution-based processing technique followed by hot pressing or injection molding to form continuous specimens. Microtomed samples were prepared for study by transmission (TEM) and scanning (SEM) electron microscopy. The electron diffraction patterns and the resulting d-spacings, as well as high-resolution bright field TEM images, suggest that the platelets are individual graphene sheets randomly dispersed in the polymer matrix. Scanning electron microscopy observation indicates that the sheets are in a wrinkled conformation; this wrinkling has also been observed in TEM, in the form of 10 nm domains exhibiting lattice fringes of varying orientations. We gratefully acknowledge the NASA University Research, Engineering and Technology Institute on Bio Inspired Materials (BIMat; No. NCC-1-02037) and the National Science Foundation (No. DMR-0526959).

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