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Synthesis of graphene like graphite sheets and its ferromagnetism

RAKESH CHAUDHARY, Department of Physics, The University of Texas at Arlington, "MAX" QINHONG HU, Department of Earth and Environmental Sciences, The University of Texas at Arlington, ALI R. KOYMEN, Department of Physics, The University of Texas at Arlington — Scientific reports of experimental studies on magnetism of graphite have suggested that disorder and hydrogen adsorption on the surface in graphite may trigger ferromagnetism. In this study we report magnetism of few layers of graphene like graphite sheets prepared by plasma in the cavitation field of toluene due to ultrasonication. Transmission electron microscopy (TEM) observations show transparent planar graphene like sheets that are few microns in size. Number of graphene layers observed using high resolution transmission electron microscopy (HRTEM) are ~ 10 to 35. X-ray diffraction (XRD) and Raman spectroscopy of the powder sample suggest some degree of disorder in the crystal structure. Magnetic properties of synthesized powder measured using vibrating sample magnetometer (VSM) showed a saturation magnetization of ~ 0.05 emu/g and coercivity of ~ 75 Oe at room temperature. We explore the uncommon and new, top down synthesis route of few layers of graphene sheets and their magnetic properties.

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