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Abstract for an Invited Paper
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Graphene-based Materials¹

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Our top-down approaches [Lu et al.] inspired physicists to obtain graphene by micromechanical exfoliation. Another approach to individual layers involves converting graphite to graphite oxide (GO) to generate aqueous colloidal suspensions of ‘graphene oxide’(GO’) sheets. (i) Reduced GO’ (RGO’) sheets were embedded in polymers such as polystyrene and their dispersion/morphology studied by SEM/TEM, and the conductivity/ percolation threshold of such composites was determined; (ii) individual GO’ and RGO’ sheets were studied to elucidate their chemical, optical, and electrical properties, (iii) GO’ and RGO’ sheets were embedded in thin glass films by a sol-gel route yielding conductive/transparent films, (iii) a ‘paper’ material of stacked GO’ sheets was made and characterized, (iv) powders composed of RGO’ showed exceptional promise for use in ultracapacitors, and (v) C13-labeled GO was made and the detailed chemical structure of GO was determined with SS NMR. –Lu,Yu,Huang,Ruoff, “Tailoring graphite with the goal of achieving single sheets”, Nanotechnology, 10, 269-272 (1999). See also <http://bucky-central.me.utexas.edu/publications.htm> 139, 146, 150, 155, 160, 164, 166, 168, 169, 174, 179-182, 184 where collaborators are shown as coauthors.

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