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Low-temperature Electrical conductivity and Magneto-resistance of Reduced Graphene Oxide Layers

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<p>We report on the electrical transport properties of graphene oxide (GO) and GO reduced using an organic acid (RGO). Two terminal GO and RGO devices were assembled via dielectrophoresis. The current-voltage characteristics of these devices were studied at low temperatures (77 K to 300 K) using a micromanipulated probe station. The I-V characteristics for RGO devices were found to be almost linear, indicating metallic behavior. This is in contrast to reports by other groups who have suggested variable range hopping (both Mott and Efros-Shklovskii) or space charge limited conduction. The density of states at the Fermi level in RGO was found to be an order of magnitude greater than that of GO. This was confirmed by four probe low temperature RT data (3 K to 300 K) which showed a $T^2 dependence. Further support for the metallic nature of RGO was confirmed with magnetoresistance data at low temperatures (f$ $speed spintronic and magnetic memory devices.$

Level (Hons, MSc,
   PhD, other)?

MSc

Consider for a student
   award (Yes / No)?

Yes

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

No

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