

Fabrication of transparent reduced graphene oxide film by electrophoretic deposition technique

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Graphene is one-atom-thick planar sheet of sp²-bonded carbon atoms, densely packed in a honeycomb crystal lattice. Due to its unique physical and chemical properties, graphene has been actively researched in many scientific fields. We introduce a fabrication method for a transparent reduced graphene oxide (RGO) film by electrophoretic deposition (EPD). Graphene oxide (GO) solution was prepared by oxidation and exfoliation of natural graphite flakes. Then, the GO solution was slowly reduced with adding hydrazine at low temperature to achieve a stable RGO solution, which was subsequently deposited on a metal substrate by EPD technique. The transparency of developed RGO film was controlled by deposition time and applied voltage and measured over 70 % in visible light area. After the reduction of GO the oxygen content ratio was decreased from 25.4 % to 16.2 %. Developed RGO film has the surface resistance of 30-50 kΩ/sq (a thickness of 5-10 nm).