Synthesis and Characterization of Multilayer Graphene Oxide Membrane using Flake Graphite of Sri Lanka

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It is important to gather information on high quality isolated flake graphite crystallite. Because nanomaterials synthesis from it may inherit properties deriving from its distinctive nature of origin. And this may not be possible to realize with the other forms of graphite varying according to its morphology. Such properties could be advantageous over other forms of graphite for specific applications. Therefor to synthesis and characterize the multilayer graphene oxide membrane (MGOM) fabricated using flake graphite of Sri Lanka will support any business venture who is interested on nanotechnology application using graphite. Graphene oxide was synthesized using two types of powders i.e. flake graphite powder where the coarse, flake, radial (KCFR) morphology is isolated from Kahatagaha veins and a vein graphite powder which is processed by Kahatagaha mines. This processed powder (KPF) has a flake morphology which is produced using rollers where the normal vein graphite is pressed to form very thin flakes. MGOM has synthesized using improved Hummers method. Obtained MGOM membranes were characterized using X-ray diffraction (XRD), Fourier transmission infrared technique (FT-IR) and scanning electron microscope (SEM) techniques. XRD and FT IR studies were done to precursor graphite powders to identify the impact of its crystallography for MGOM synthesized. According to XRD studies the two membranes gave its fundamental peaks for graphene oxide and FT-IR spectrums gave peaks for functional groups which must be there to decorate basal planes of graphene layers to produce graphene oxide. According to SEM studies the thickness of membranes varies in the range of 0.7 microns. In addition MGOM which synthesized via KPF showed morphology of graphite nanoplatelets.

Keywords: Graphite, Graphene, Graphene oxide, Graphite nanoplatelets

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