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SYNTHESIS OF REDUCED GRAPHENE OXIDE FROM SRI LANKAN VEIN GRAPHITE USING SODIUM HYDROXIDE AS AN ECO-FRIENDLY ALTERNATIVE

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Sri Lankan vein graphite, being renowned for its high crystallinity and high natural purity (95-99 of C%), has a very high potential to synthesize into graphene with comparatively low cost. Chemical reduction of Graphene Oxide (GO) is the most efficient way to produce graphene on large scale, starting with graphite. However, this chemical reduction process has severe limitations as far as the toxicity of the presently used reducing agents are concerned. Hence, an eco-friendly approach of using sodium hydroxide to reduce GO into reduced Graphene Oxide (rGO) was investigated in this study. GO was synthesized by modified Hummer's method and reduced with sodium hydroxide to produce rGO. The prepared GO and rGO were characterized by X-ray Diffractometry (XRD), UV-visible spectroscopy and Fourier Transform Infrared (FTIR) spectroscopy. The XRD results showed that the reducing agent used in this study (NaOH) was highly effective to produce rGO from GO. Further, the FTIR analysis confirmed the successful reduction of oxygen functional groups in rGO. Moreover, the UV absorption peak present at 236 nm in GO had shifted to 263nm as the reduction proceeded. Therefore, this study unravels a successful synthesis of reduced graphene oxide out of Sri Lankan natural vein graphite by chemical reduction using NaOH as the reducing agent. Moreover, it reveals this approach is a simple, easily controllable and alternative eco-friendly method with a great potential for production of rGO in large scale.

Keywords: *Sri Lankan vein graphite, Graphite oxide, Chemical reduction, Reduced graphene oxide*