

## **Comparison of Graphene Oxide Properties Synthesized by Electrochemical Exfoliation and Hummers' Method**

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### ***Abstract***

Graphene oxide (GO) is one of the nanoscales materials that have a unique property thus exhibit great potential applications in various field. However, to synthesize high- quality GO, environment- friendly and fast production rate is a huge challenge that needs to overcome. Although chemical synthesis method is the easiest, inexpensive, and high amount production rate as compared to the other methods but there are some drawbacks using chemicals such as toxicity, poisonous and corrosive which are harmful to the human health and environment. Therefore, researchers suggested a green route as an alternative method. This study compares the dissimilarities in properties such as morphologies, presence of functional groups and crystallization of GO synthesized by using electrochemical exfoliation method and the improved Hummers' method. This research delivers a useful guideline to compare the effectiveness of both methods to benefit researchers who keen to synthesize GO. It also discussed the characterization results of GO using of X-ray diffraction (XRD), scanning electron microscopy (SEM), Energy Dispersive X-Ray (EDX) and Fourier transform infrared spectroscopy (FTIR).

**Keywords:** Graphene oxide; Green route; Electrochemical exfoliation method; Improved Hummers' method.