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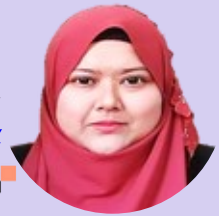
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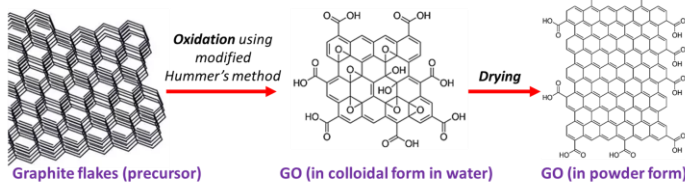
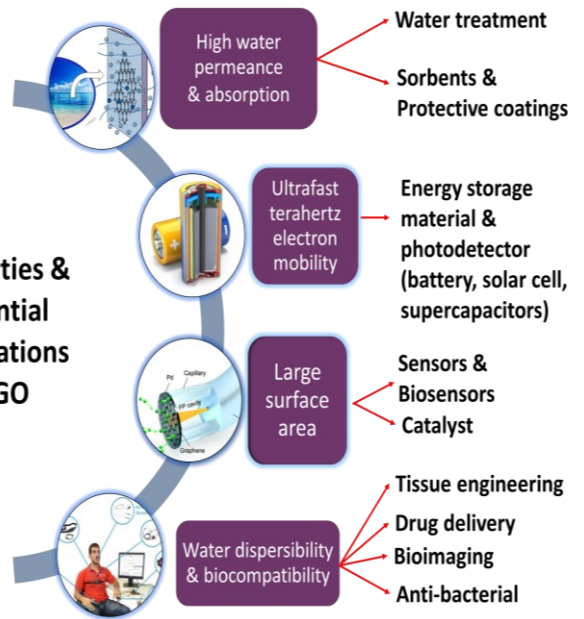


Simple and Low-Cost In-house Production of High Yield and Stable Graphene Oxide

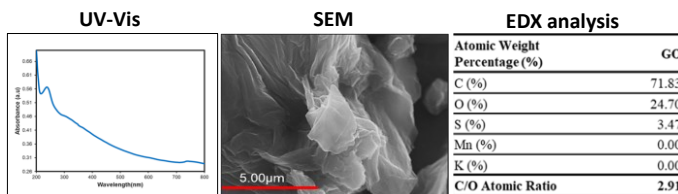
Graphene oxide (GO) possesses unique properties that are suitable for various applications. GO is the oxidized form of graphene and exhibits variable structures and properties depending on the synthesis process, incorporating groups such as hydroxyl, carbonyl, epoxy, and carboxyl. Due to its higher content of oxygen functional groups and increased number of defects, GO has a greater number of adsorption sites. These functional groups significantly influence the material properties, enabling potential applications in diverse fields of science and technology. The market demand for GO in advanced applications has driven its price from RM1,000 to RM8,000 per gram, depending on purity. This high price restricts research and further industrial-scale applications, especially given the lack of local supply.

Consequently, this study aims to develop a simple, low-cost, reliable, and stable synthesis method for GO using a straightforward setup based on a modified Hummer's method. An added benefit of excluding

Properties & Potential Applications of GO



Mechanism formation of GO



Characterisations of GO using UV-Vis, SEM and EDX

sodium nitrate (compared to conventional methods) is the elimination of harmful gas by-products such as nitrogen and dinitrogen tetroxide produced during the experiment. By systematically controlling the synthesis parameters, a high yield of up to 76% (1.76 g) of GO can be produced from 1.0 g of graphite powder. The synthesized GO exhibits excellent stability, which is confirmed through various characterizations; hence, there is evidence that high-quality GO can be produced locally. Our GO products are available either in suspension in water (colloidal form) or in powder form, depending on the intended application. In conclusion, the synthesized GO has a wide range of fascinating and distinctive features, making it ideal for various advanced applications.

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