

Synthesis and Characterization of Partially Oxidized Graphite Oxide for Solar Energy Storage Applications

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Abstract : The graphene oxide (GO) material has attracted much attention for solar energy applications. This paper reports the synthesis and characterization of partially oxidized graphite oxide (GTO). GTO was obtained by modified Hummers method, which is based on the chemical oxidation of natural graphite. Several samples were prepared with different oxidation degree by an adjustment of the oxidizing agent's amount. The effect of the oxidation degree on the chemical structure and on the morphology of GTO was determined by using Fourier transform infrared (FT-IR) spectroscopy, Energy Dispersive X-ray Spectroscopy (EDS), and scanning electronic microscope (SEM). The thermal stability of GTO was evaluated by using thermogravimetric analyzer (TGA) in Nitrogen atmosphere. The results indicate high degree oxidation of graphite oxide for each sample, proving that the process is efficient. The GTO synthesized by modified Hummers method shows promising characteristics. Graphene oxide (GO) obtained by exfoliation of GTO are recognized as a good candidate for thermal energy storage, and it will be used as solid shell material in the encapsulation of phase change materials (PCM).

Keywords : modified hummers method, graphite oxide, oxidation degree, solar energy storage

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