The role of temperature and time in the synthesis of SnO₂/reduced graphene oxide composites via conventional method

ABSTRACT

The synthesis of SnO2/Reduced Graphene Oxide(rGO) composites was carried out using the conventional method to study the effect of temperature and time. Synthesis of graphene oxide (GO) was carried out by oxidation of graphite with potassium permanganate (KMnO₄), using Improved Hummer's Method and further used to synthesise rGO composite via the conventional method. This method incorporated the reduction of GO in the presence of tin (II) chloride (SnCl₂) and ethylene glycol The temperature range used were 50°C to 90°C while time of reaction of 2 and 4 hours. The formation of both GO and rGO were characterized using FTIR, UV-Vis and SEM. The results obtained for GO demonstrated the presence of oxygen-containing groups and the formation of $n-\pi^*$ electron transition energy. The graphitic structural distortion due to the oxidation was visibly confirmedin this study. Formation of rGO were observed by the removal of O-H group, C=O group and C-O-C group from the composite plane structure. The extension of the conjugated system in the reasing electronic transitional energy. The distribution of SnO₂ on the rGOsurface also confirmed the stability of the composite formed.