

Graphene doping technique in TiO₂ for dye-sensitized solar cells photo-anode

ABSTRACT

This paper proposed a technique to dope graphene in Titanium dioxide (TiO₂). The work focuses on avoiding the contents of carboxyl, hydroxyl or epoxy groups which is up to 55% of the Graphene Oxide (GO) alone in which enhance the conductive performance of the composite. We have characterised the composite on colour difference and voltage-current measurement (I-V Measurement) and Energy Dispersive Spectroscopy (EDS). The results of a simple eye observation for different thin films indicates a difference in colour shades due to better dispersion in TiO₂/Graphene thin film. Then the dispersion of the Graphene sheets can be seen by the uniform colour change with every different ratio. Moreover, the same ratio with different composite weight in I-V measurement resulted is similar to current/voltage readings. Finally, the oxygen atomic level and weight ratio is maintained while better atomic level and weight ratio of graphene sheets and Titania was concluded which shows a higher free electron mobility.

Keyword: TiO₂; Graphene; Nanocomposite; Low cost method; Photoanode; DSSCs