



FABRICATION AND CHARACTERISATION OF DYE-SENSITISED SOLAR CELLS USING GRAPHENE OXIDE-TiO₂ AS COUNTER ELECTRODE

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Abstract:

Graphene oxide was prepared using the tours method and reduced by using hydrazine hydrate. TiO₂ paste was synthesised using the Gratzel method by putting the TiO₂ powder in a mortar, add water and stir until TiO₂ paste is formed. TiO₂ was then doped with reduced graphene oxide such as (RGO-TiO₂). The doped material was investigated for use as a counter electrode. The samples were characterized using X-ray diffractometry (XRD), and UV-visible spectroscopy (UV-Vis). It was observed that the *I-V* curve of the TiO₂ sample counter electrode produces an open circuit voltage (V_{oc}) of 0.38, short circuit density (J_{sc}) of 0.145 and produces a lesser power efficiency of 0.17% compared to the other two doped samples. It was also observed that as RGO is doped with TiO₂, the J_{sc} value increases a little higher, due to high conductivity of RGO and has efficiency of 0.18% compared to that of TiO₂. In the third sample, it was observed that it produces a V_{oc} of 0.46 and J_{sc} of 0.215.

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