**Abstract**

Dye Sensitized Solar Cells are currently the most efficient third-generation solar technology. Natural dye sensitized solar cells are becoming promising candidates for replacing synthetic dyes. Graphene oxide is prepared from natural graphite flakes by modified hummers’ method. A novel Graphene oxide/yttrium oxide (GO/Y2O3) nanocomposites are prepared by chemical precipitation method. The different concentration of (5.1, 5:2 and 5:3) of Yttrium oxide nanoparticles exaggerated on the surface of Graphene oxide nanosheets. The prepared nanocomposites are characterized by X-Ray diffraction (XRD), Scanning electron microscopy (SEM), High Resolution Transmission Electron Microscopy(HRTEM), Energy-dispersive X-ray spectroscopy(EDAX), Fourier-transform infrared spectroscopy (FT-IR), Raman Scattering Spectroscopy and UV-visible (UV-vis) absorption spectroscopy. The X-Ray diffraction analysis shows that the crystallite size of the GO/Y2O3 (5:1, 5:2 and 5:3) is found to be around 23nm, 25.2 nm and 26.92 nm.Field emission scanning electron microscopy (FESEM) reveals that the flake like shape Y2O3nanoparticles are uniformly dispersed on the surface of GO sheets.The UV-Vis studies showed that the prepared Jasminoum Grandiflorum L**(**JG) dye belong to chlorophyll group with absorption about 4.2 eV respectively. The electrochemical activity of the prepared nanocomposites is investigated by cyclic voltammetry(CV) technique.The power conversion efficiency of prepared sandwich type DSSCs (5:3) is 1.6%