

FABRICATION OF DYE SENSITIZED SOLAR CELL

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ABSTRACT

Dye-sensitized solar cells combine the unique properties of both inorganic and organic compounds. They are potential alternatives for present day p-n junction photovoltaic devices. In this work fabrication of a dye-sensitized solar cell using Black Berry fruit extract as a natural organic dye and TiO₂ semiconductor nanoparticles synthesized through sol-gel method has been reported. Graphite was used as a counter electrode and potassium iodide was used as a charge carrier in the cell. Light from the sun excites the electrons of the organic dye that is coordinated to TiO₂ and the electrons are then injected into TiO₂ nanocrystals. The electrons then flow from TiO₂ coated electrode, through the load and back to the Graphite counter electrode. The counter electrode then donates electrons to the dye completing the circuit. SEM images of synthesized TiO₂ nanoparticles had an average size of 65 nm. An efficiency of 33.45% has been achieved by using Black Berry fruit extract as the dye.

KEYWORDS: Solar Cell, DSSC, Sol Gel Method, Dye of Black Berry, Carbon Electrode, SEM, EDS, Solar Spectrum