

Effect of Chlorophyll Concentration Variations from Extract of Papaya Leaves on Dye-Sensitized Solar Cell

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Abstract : In this paper, extract of papaya leaves are used as a natural dye and combined by variations of solvent concentration applied on DSSC (Dye-Sensitized Solar Cell). Indonesian geographic located on the equator line occasions the magnitude of the potential to develop organic solar cells made from extracts of chlorophyll as a substitute for inorganic materials or synthetic dye on DSSC material. Dye serves as absorbing photons which are then converted into electrical energy. A conductive coated glass layer called TCO (Transparent Conductive Oxide) is used as a substrate of electrode. TiO₂ nanoparticles as binding dye molecules, redox couple iodide/ tri-iodide as the electrolyte and carbon as the counter electrode in the DSSC are used. TiO₂ nanoparticles, organic dyes, electrolytes and counter electrode are arranged and combined with the layered structure of the photo-catalyst absorption layer. Dye absorption measurements using a spectrophotometer at 200-800 nm light spectrum produces a total amount of chlorophyll 80.076 mg/l. The test cell at 7 watt LED light with 5000 lux luminescence were obtained Voc and Isc of 235.5 mV and 14 μ A, respectively.

Keywords : DSSC (Dye-Sensitized Solar Cell), natural dye, chlorophyll, absorption

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