

The Stability and Performances of Terminalia Catappa L. Dye-Sensitized Solar Cell

Authors : A. O. Boyo, A. T. Akinwunmi

Abstract : The effect of extracting solvent and adjustment of pHs on the stability of Terminalia catappa L. dye-sensitized solar cell was investigated. We introduced ZnO as an alternative to TiO₂ in the dye sensitized solar cells (DSSCs) due to its band gap similar to TiO₂, higher electron mobility, and flexible procedures of preparations. Dye-sensitized solar cells (DSSCs) based on Terminalia catappa L. was extracted in water (A), ethanol (B) and the mixture of ethanol and water in the ratio 1:1 by volume (C). The best performance Solar cells sensitized was from extracts A and achieved up to J_{sc} 1.51 mAcm⁻², V_{oc} 0.75V, FF 0.88 and η 0.63%. We notice that as pHs decreases there is the increase in DSSC efficiency. There is Long period stability in efficiency of the cells prepared using A than in C and a fair stability in efficiency of B cell. The results obtained with extracts B and C confirmed that Ethanol with water could not be considered as a suitable solvent for the extraction of natural dye.

Keywords : zinc oxide, dye-sensitized solar cell, terminalia catappa L., TiO₂

Conference Title : ICSREE 2016 : International Conference on Sustainable and Renewable Energy Engineering

Conference Location : Montreal, Canada

Conference Dates : May 16-17, 2016