

Abstract Submitted
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Multilayer photoelectrodes with different sized TiO₂ nanoparticles for highly efficient Dye Sensitized Solar Cells. ZACHARY PATTERSON-GOSS, University of West Georgia, K. H. HETTIARACHCHI, Rajarata University of Sri Lanka, DAVID BROOKS, LANDEWATTE DESILVA, University of West Georgia, T. M. W. J. BANDARA, Rajarata University of Sri Lanka — Dye Sensitized Solar cells (DSSCs) are low cost, ecofriendly emerging alternative to photovoltaics. We prepared a series of multilayered photo-anodes for DSSCs which contained different sized TiO₂ nanoparticles. The casting of thin films was done by incorporating of spin coating technique. In DSSCs, TiO₂ films were sensitized with N719 dye complex. Polyacrylonitrile based quasi-solid-state electrolyte and Pt counter electrode were used to test their performances. For an optimized device, open photovoltage of 750 mV and a short circuit photocurrent of 20 mA/cm² were obtained under 1 sun illumination. A high efficiency of 7.5 % is achieved but fill factor is only 50%. The optical and electrical characteristics of the DSSC as well as morphological analysis of the films are presented.

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