GRG TRUST RESEARCH PROJECT

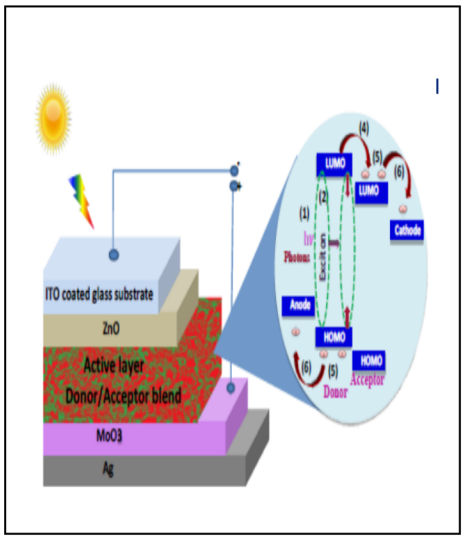
TITLE OF THE PROJECT

Synthesis and Characterization of metals doped TiO_2 nanoparticles for inverted organic solar cell

PI: **Dr.N.Nithya** Co PI: **Dr.G.Magesh**

Amount Sanctioned: 2.7 Lakhs Year: 2019

Project outcomes:



- TiO_2 nanoparticles and Zirconium, Niobium, Palladium and Silver doped TiO_2 nanoparticles can be prepared and characterized to improve efficiency and stability of the solar cells.
- TiO_2 nanoparticles and Zirconium, Niobium, Palladium and Silver doped TiO_2 nanoparticles provides remarkable changes in solar cell fabrication and characterization.
- The device characterizations are performed and studied.
- ZnO and Pd doped ZnO nanorods are synthesized by chemical method. The organic solar cell device is fabricated with area 7 mm^2, ETL: ZnO – 4000 rpm/40s (40 nm), active layer polymer: acceptor (100-200 nm), MoO_3 act as HTL (10 nm), Ag act as a cathode (120 nm). The fabricated device is characterized by J–V measurement (Solar simulator), EQE spectra for IPCE, absorption spectra and surface topography of the ETLs and active layers by UV-Visible Spectroscopy and AFM analysis. The obtained device parameters are Voc is 0.87 V, Jsc is 18.68 mA/cm^2, FF is 66.30 % and PCE is 9.98%, respectively.

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- Publications: https://doi.org/10.1007/s10904-021-02076-0
- Conference/ Seminar/ Workshop: Nil
- Books: Nil
- Any other achievements: Nil

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