Optical characterization on ITO/TiO2/P3HT/Areca Catechu/Au for thin film hybrid solar cell

ABSTRACT

In this research, dye sensitized solar cell is fabricated by a combination of inorganic titanium dioxide nanoparticles sensitized by a locally available natural dye extract from organic Areca Catechu nut. This hybrid solar cells are fabricated accordingly by deposition of ITO/TiO2/P3HT/Areca Catechu/Au by using electrochemical method. The deposition rates of TiO2 are varied from 0.05, 0.07, 0.09 to 0.11 vs-1 whereas the number of scan of each layers are fixed to 5. The absorption spectra analysis is carried out in the wavelength range 200 to 600 nm, showed a wide and significant absorption spectrum in UV and visible regions. Analysis shows that scan rate affects the electrical conductivity of hybrid solar cell. The highest conductivity is recorded at 0.278 Scm-1 corresponding to the scan rate of 0.07 Vs-1at a potential value of 3.5 V.

Keyword: Areca Catechu; Hybrid solar cells; Poly (3-hexylthiophene); Titania nanocrystals TiO2