Abstract

Successful conversion of visible light into electrical output was achieved by using four locally available natural dyes as wide band gap semiconductor sensitizers in Dye sensitized solar cells. Natural dyes extracted from Java plum (Syzigium cumin), Red cabbage (Brassica oleracea), Hibiscus rosa sinensis flower, and Begonia rex leaves were employed as light absorbing dyes anchored to nanostructured mesoporous TiO2 film photo anode. Simple procedures were employed in extracting natural dyes. The dye extracts were stored for four months prior to UV vis spectra and photoelectrical measurements. The absorption spectra analyses for all extracts carried out in the wavelength range 350 to 800 nm, showed a wide and significant absorption spectrum in UV and visible regions. Photovoltaic parameters such as short circuit current (Jsc), open circuit voltage (Voc), fill factor (FF), power output (Pm), and energy conversion efficiency (η) were determined for the four dyes. Conversion efficiencies obtained from Java plum, Red cabbage; Hibiscus flower and Begonia rex were 0.098, 0.051, 081, and 0.094%, respectively. Efficiency of fabricated cells and cell characteristics were found to correlate with absorption spectra of dyes.