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Type: Invited Speaker

Natural Materials for Dye Sensitized Solar Cells: Experimental and Theoretical Study

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Density functional theory (DFT) and time dependent DFT (TDDFT) were used to study on electronic and photoelectrochemical properties of monascus, cochineal, lac insects and anthocyanin dyes. The low-cost dye-sensitized solar cells (DSSCs) utilized by crude and pre-concentrated anthocyanins extracted from mangosteen pericarp, roselle, red cabbage, Thai berry, black rice, blue pea and purple corn were fabricated. The ultraviolet-visible (UV-VIS) spectroscopy, Fourier transform infrared spectroscopy (FTIR), electrochemical impedance spectroscopy (EIS) and incident photo-to-current efficiency (IPCE) were employed to characterize the natural dye and the DSSCs. Nanoporous carbon microspheres from carrot juice and mesoporous honeycomb-like carbon structure from mangosteen peel were used as counter electrodes for DSSCs.

References

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