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Synthesis and Application of an Organic Dye in Nanostructure Solar Cells Device

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Abstract : Two organic dyes comprising carbazole as the electron donors and cyanoacetic acid moieties as the electron acceptors were synthesized. The organic dye was prepared by standard reaction from carbazole as the starting material. To this end, carbazole was reacted with bromobenzene and further oxidation and reacted with cyanoacetic acid. The obtained organic dye was purified and characterized using differential scanning calorimetry (DSC), Fourier transform infrared spectroscopy (FT-IR), proton nuclear magnetic resonance (¹HNMR), carbon nuclear magnetic resonance (¹³CNMR) and elemental analysis. The influence of heteroatom on carbazole donors and cyno substitution on the acid acceptor is evidenced by spectral and electrochemical photovoltaic experiments. Finally, light fastness properties for organic dye were investigated.

Keywords : dye-sensitized solar cells, indoline dye, nanostructure, oxidation potential, solar energy
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