Photoelectrochemical Effect of Poly(*N*-vinylcarbazole) as Electrolyte Additive in a N719 Dye Sensitized TiO₂ Solar Cell

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Poly(*N*-vinylcarbazole) (PVK) has been used as additive in the I[−]/I₃[−] redox electrolyte and the photoelectrochemical effect of PVK with various concentration to the photovoltaic performance was studied. Under optimum condition, a maximum efficiency of 6.3% was achieved with a current density of 19.31 mA/cm² at the addition of 30 μL THF solution to the electrolyte which is 45 % improved photovoltaic performance compared to that of bare electrolyte. This could be attributed that the electron rich PVK increases the basicity of the electrolyte medium and increases the catalytic reduction of I₃[−] ions. So, the increased dye regeneration rate improved photovoltaic performance.

Keywords: Photoelectrochemistry; Poly(*N*-vinylcarbazole); Electrolyte additive; Dye sensitized solar cell; I[−]/I₃[−] redox electrolyte

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