

High Performance Vertically Aligned Electrospun PVP:PC71BM Nanofiber for Organic Solar Cells

ABSTRACT

This paper is directed towards investigating the characteristic of poly(4-vinylpyrrolidone) (PVPy):[6,6]-phenyl C71 butyric acid methyl ester (PC 71 BM) solar cell for both structural and electrical characteristic by varying the effect of polymer solution concentration and drum rotation speed towards improving the efficiency of Organic solar cell (OSC). PVP:PC 71 BM solar cell with polymer solution concentration of 4wt% and 200rpm drum rotation speed exhibit highest Power Conversion Efficiency (PCE) at 7.8% and 7.5% respectively, a J_{sc} ranging from 17.28 to 16.90 mA cm⁻² and FF value from 63.0 to 62.8% respectively. The added benefit of high absorption properties of PC 71 BM and incorporation of PVP in reducing work function and interfacial resistance further improve the efficiency of OSCs device. This is where PVP:PC 71 BM nanofiber become relevant to the photovoltaic market which lowered production cost with better efficiency without hindering their transparent and flexibility properties for future building integrated photovoltaic application.