

Fabrication of inverted organic solar cells with hydrothermal grown ZnO nanorods coupled with ZnO ALD

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Photovoltaic properties of inverted organic solar cells were investigated by using low density ZnO nanorods (ZnO NR) synthesized hydrothermally at low temperature with additional ultrathin ZnO ALD to decrease morphological defects. The inverted organic solar cell with ZnO NR (length < 100 nm) and treated with 5 nm ZnO ALD showed an improvement of 40% in power conversion efficiency compared to the cell with hydrothermally grown ZnO NR. The ultrathin ZnO ALD acted as surface defects healing layer which enhanced the photovoltaic performance by reducing recombination rate evidenced by EIS data. The optical transmittance confirms high photon absorption through ZnO NR with 5 nm ZnO ALD layer.