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**High-performance inverted polymer solar cells with ITO coated with a thin layer of oxide for electron collection** JIANYONG OUYANG, HONGMEI ZHANG, National University of Singapore — Solar cells using organic or polymeric materials as the active material have been attracting strong attention due to the low fabrication cost and high mechanical flexibility. The photovoltaic efficiency has been improved to more than 8% under AM1.5 G illumination. However, polymer solar cells are usually not very stable, which severely impedes the practical application. The stability is strongly affected by the electrodes. Both PEDOT:PSS used as the buffer layer on ITO for the hole electron and active metals like Ca for the electron collection are blamed to lower the stability of polymer solar cells. Polymer solar cells with an inverted structure can have much better stability than normal devices because they do not use PEDOT:PSS and active metals. One big challenge in building the inverted polymer solar cells is to lower the work function of ITO for effective electron collection. Here, we report a new method to effectively lower the work function of ITO by depositing a thin layer of oxide and demonstrate high-performance polymer solar cells. The photovoltaic efficiency of the inverted polymer photovoltaic cells is even higher than the normal devices. The mechanism for the oxide effect on the work function of ITO will be presented as well.

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