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Fulleropyrrolidine interlayers lower cathode work function to raise organic solar cell efficiency YAO LIU, ZACHARIAH PAGE, VOLODIMYR DUZHKO, TODD EMRICK, THOMAS RUSSELL, Univ of Mass - Amherst — A major challenge in organic solar cell design is the trade-off between oxidative stability and work function of the metal used as a cathode. Here we report that solution-based incorporation of fulleropyrrolidines with amine (**C_{60}-N**) or zwitterionic (**C_{60}-SB**) substituents as cathode-independent buffer layers conveniently surmounts this barrier in single junction polymer solar cells. Specifically, a thin layer of **C_{60}-N** reduced the effective work function of Ag, Cu, and Au electrodes to 3.65 eV. Power conversion efficiency (PCE) values exceeding 8.5% were obtained for organic photovoltaics independent of the cathode selection (Al, Ag, Cu or Au). Such high efficiencies did not require precise control over interlayer thickness, as devices prepared with **C_{60}-N** and **C_{60}-SB** layers ranging from 5 to 55 nm functioned with high efficiency.

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