

Effect of transition metal oxide interlayer on the performance of bulk heterojunction solar cell

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➤ Introduction

Polymer solar cells are attractive

inexpensive, flexible,
light weight and
large area device fabrication

➤ Motivation

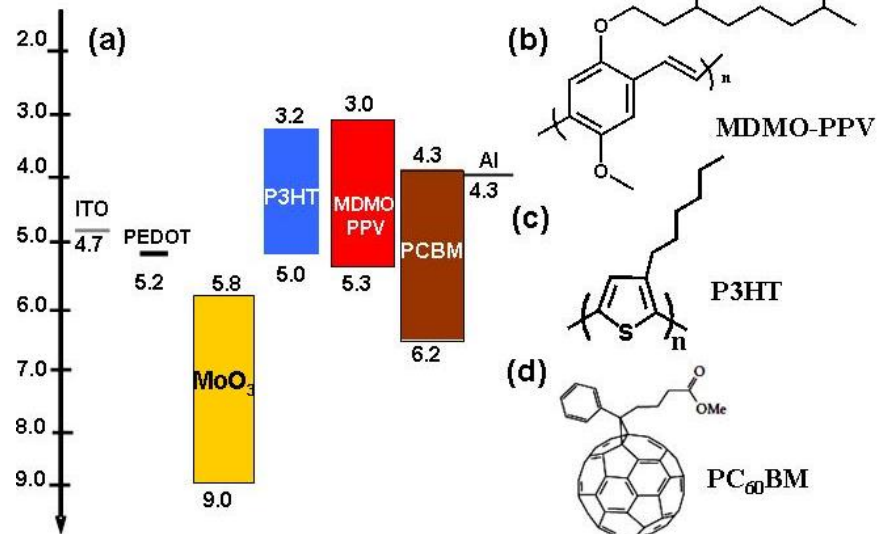
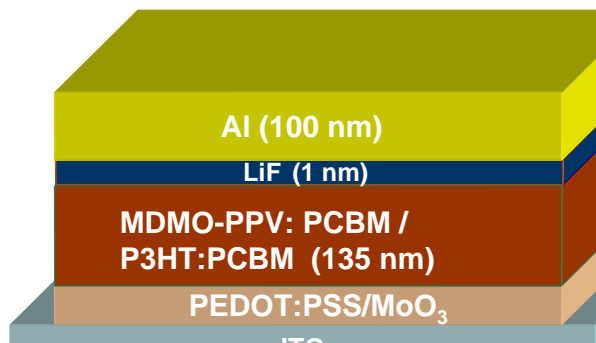
ITO surface modification with MoO_3

Efficient interlayer for enhanced device performance

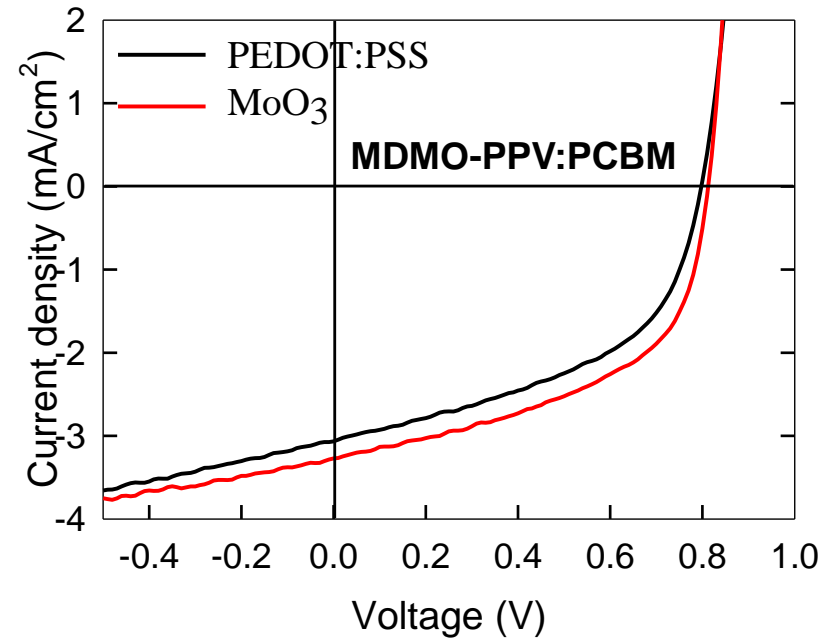
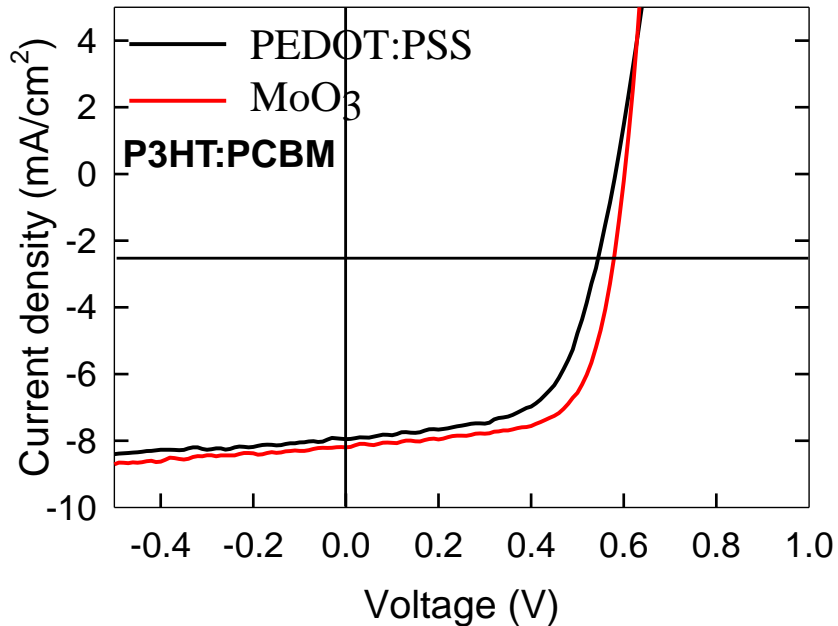
➤ Effect of Interlayer (metal oxide) on the performance of Polymer solar Cell

Effect of MoO_3 interlayer in MDMO-PPV device

Effect of MoO_3 interlayer in P3HT device



Effect of interlayer on device performance



Polymer cell	Interlayer	J _{sc} (mA/cm ²)	V _{oc} (V)	FF (%)	η _P (%)	R _{SA} (Ωcm ²)
P3HT:PCPM	PEDOT	7.95	0.58	62.0	2.85	12.9
	MoO ₃	8.20	0.60	67.0	3.31	7.5
MDMO PPV:PCBM	PEDOT	3.00	0.79	49.0	1.19	35.0
	MoO ₃	3.30	0.80	52.0	1.36	20.5

Conclusion

- The MoO₃ interlayer enhances the power conversion efficiency of ~ 15% .
- The enhancement in fill factor is due to efficient charge extraction and reduced contact resistance