

# Dependence of Fill Factor on Cathode Polymer Interface in Organic Solar Cells

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## Abstract

Increasing energy assumption and rising energy prices in the world forces to look for energy alternatives, one of the most promising is the photovoltaic energy.

Solar cells made from organic materials are particularly attractive because they are relatively easy to produce, structurally flexible, and can be applied to large areas at low cost.

Fill Factor is a more sensitive parameter compared to open-circuit voltage and short-circuits current density Thickness of the active-polymer layer and on the morphology of the cathode–polymer interface and temperature. In this article, we study the dependence of fill factor (FF) on different parameters in organic bulk heterojunction solar cells.

Table 1: Performances of TCO / MEH-PPV/ Al

TCO	Eg	Jsc <sup>c</sup> (mA/cm <sup>2</sup> )	Voc (V) <sup>d</sup>	FF (%)
TiO <sub>2</sub>	3.0	0.42	-0.74	0.30
Nb <sub>2</sub> O <sub>5</sub> <sup>a</sup>	2.3	0.28	-0.64	0.40
Nb <sub>2</sub> O <sub>5</sub> <sup>b</sup>	2.3	0.34	-0.40	0.36
SnO <sub>2</sub>	3.1	0.20	-0.50	0.33
ZnO	3.2	0.30	-0.38	0.35
CeO <sub>2</sub>	3.0	0.004	+0.12	0.25
CeO <sub>2</sub> -TiO <sub>2</sub>	3.2	0.007	+0.42	0.32

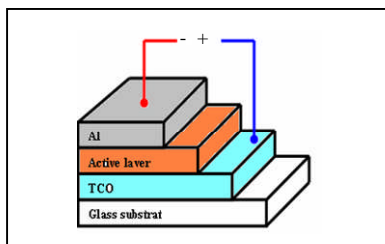


Fig. 2. Structure of the organic solar cells

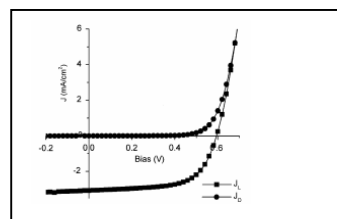


Fig.4. J (V) characteristics of a P3HT: PCBM solar cell with active area 25mm<sup>2</sup>

## References

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