

メタノインデンフラーレンを用いたペロブスカイト太陽電池における開放電圧の向上

Improvement of Open-circuit Voltage in Perovskite Solar Cells by Using Methano-Indene-Fullerene (MIF)

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Methano-indene-fullerene has been used in polymer/fullerene organic solar cells^[1] and small-molecule organic solar cells^[2] to have high open-circuit voltage (V_{OC}). Methano and indeno addends reduces the π -conjugation of fullerene for a higher lying LUMO level, giving high V_{OC} values >1.0 V without any significant loss in short-circuit current density (J_{SC}) and fill factor (FF) due to the small volume of the indeno group that can provide short fullerene–fullerene contact distance for high electron mobility.

In this presentation, we will discuss the use of MIF in the inverted planar NiO-diethanolamine/ $\text{CH}_3\text{NH}_3\text{PbI}_3$ /fullerene p–i–n solar cells.^[3] Compared the using PCBM, V_{OC} increased to 1.13 V because of the energy loss at the interface between perovskite and fullerene layers.

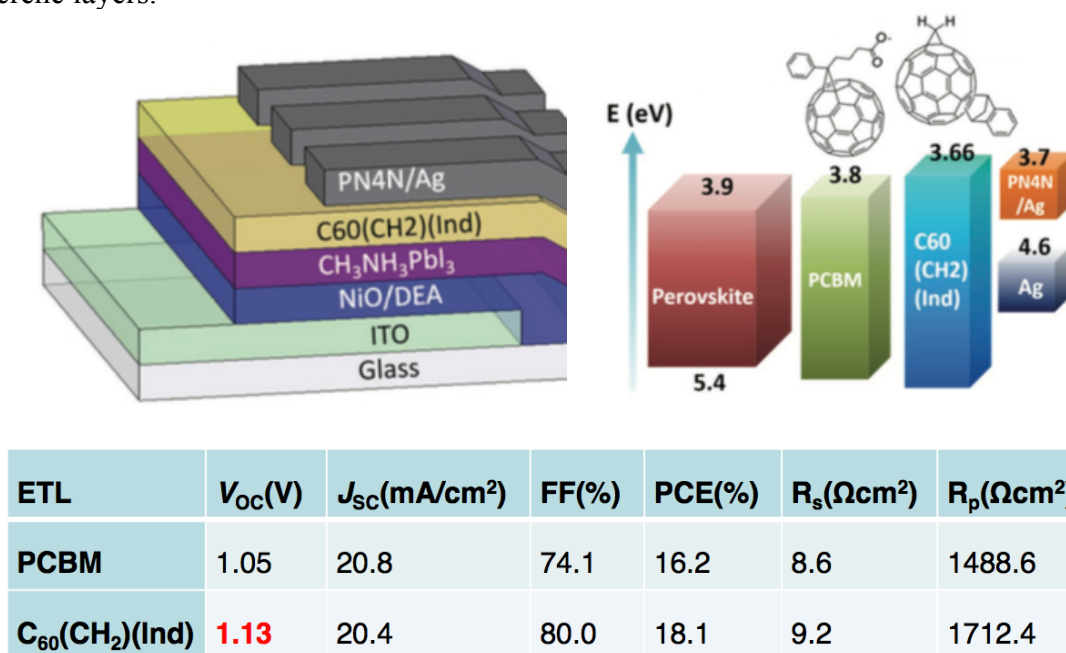


Figure. Device structure, energy diagram, and device performance of perovskite solar cells using methano-indene-fullerene.

References

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