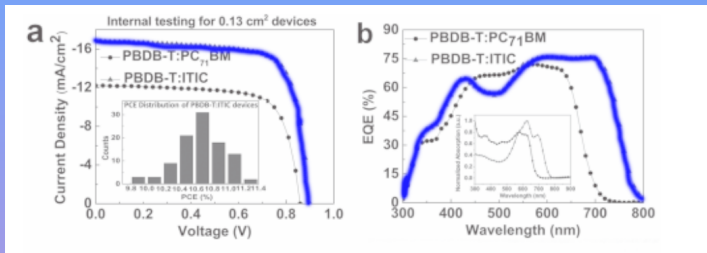


Organic Photovoltaics for longer lifetime and lower cost via blending with commodity polymers.

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Intro

Currently, there are many different solar panels that are available, however, they are generally less than 20% in efficiency. Furthermore, this is a major problem as the turn-over period will be relatively long compared to the new solutions that have been researched and evaluated by 2 different groups of researchers from Durham university, Linköping University, and Chinese Academy of Sciences.

Enhancing the lifetimes of OPVs

- The use of organic photovoltaic cells (OPVs) to provide cheap, scalable access to renewable energy, it is necessary to improve their lifetime. This can be achieved by blending the donor and acceptor with the commodity polymer, PMMA, to form a ternary blend device with enhanced lifetime.*
- Ternary OPV devices prepared in this manner can have up to double the lifetime of the binary control devices to an extent that depends upon the PMMA morphology and the processing additives used.*

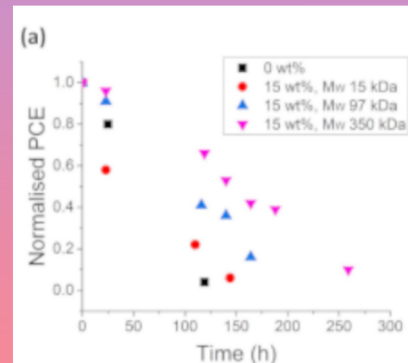
*Balder A. Nieto-Díaz, D. (2021). Enhanced lifetime of organic photovoltaic diodes achieved by blending with PMMA: Impact of morphology and Donor:Acceptor combination, Solar Energy Materials and Solar Cells, Volume 219

Higher Efficiency with Polyester Solar Cells

The Fullerene free PSCs have superior performance compared to the fullerene based PSCs as the fullerene free have much broader absorption band and a more appropriate molecular energy level alignment. The fullerene free PSCs have shown outstanding PCEs with up to 11.21% with excellent thermal stability.*

This can be seen in the graphs above as graph a show that the current density for PBDB-T:ITIC blend is higher than fullerene based and that the wavelength that can be taken by PBDB-T:ITIC is wider than the fullerene based.*

* Wenchao Zhao, D. (2016), Fullerene-Free Polymer Solar Cells with over 11% Efficiency and Excellent Thermal Stability, Advanced Materials, Volume 28



This graph illustrates the significant variation in OPV lifetime upon PMA Mw*

Conclusion

Through the use of PSCs or by the use of OPVs we can provide electricity in developing countries where there is little to no electricity. Also, because they are compact and are more efficient than the traditional solar cell, they are easy to produce through roll to roll printing making it even more accessible than a fullerene based solar panel