Docket #: S09-368

Solar Cell Having Organic Nanowires

Stanford researchers are using nanowires (NWs) to raise the performance of organic solar cells. Organic solar cells' main weakness is their lack of efficiency compared to in-organic solar cells. Incorporating NWs into the polymer layer provides a more direct electron path to the electrode, which reduces some of the cells' inefficiencies. Stanford's process, however, goes even further to improve the power conversion efficiency by aligning the NWs and increasing the carrier mobility of each NW. In addition, this invention enables solution-processing of organic semiconducting materials that are difficult to process by typical solution-based methods such as spin-coating, screen-printing, and inkjet printing. The techniques have great potential for achieving solution-processable high-performance organic photovoltaic electronics and devices.

Stage of Research
Synthesized nanowires for organic solar cells.

Applications

- Organic electronics such as thin-film transistors, light-emitting diodes, photovoltaic devices, photodetectors

Advantages

- Improves Power Conversion Efficiency by approximately an order of magnitude, compared with those of bilayer or bulkheterojunction (BHJ) structures
- Scalable to large areas
- Ease of manufacturing
- Enables solution processing of organic semiconducting materials with poor solubility in common organic solvents

Publications

- J. H. Oh, L. H. Wong, Z. Bao, “Organic Solar Cells Based on Aligned Organic Nanowires”, Materials Research Society (MRS) Spring Meeting, San Francisco, USA, Apr 05-09, 2010.

Patents

- Published Application: 20110088783

Innovators

- Zhenan Bao
- Joon Hak Oh
- Young Jun Park

Licensing Contact

Evan Elder

Associate Director, Licensing and Strategic Alliances, Physica

Email