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A More Efficient Organic Photovoltaic Cell with Enhanced Performance

Although there have been several proposed alternative materials for organic photovoltaic cells, they are comparatively inefficient to silicon-based photovoltaic cells. UCF researchers have developed a new, more effective and efficient way of utilizing organic materials within the organic photovoltaic cell.

Specifically, this invention involves an organic photovoltaic material comprised of a bulk heterojunction (BHJ) composition of poly(3-hexylthiophene) (P3HT) and [6,6]-phenyl C61 butyric acid methyl ester (PCBM), often referred to as P3HT:PCBM BHJ, providing improved performance in charge carrier extraction efficiency, especially from the anode side. This organic photovoltaic cell structure provides a work function in the nickel and indium doped tin oxide (Ni-ITO) material anode, in the range of -5.0 to -5.4 eV, thereby providing enhanced hole extraction.

Technical Details

This invention uses a Ni-ITO material layer as an anode to increase the work function of the anode for P3HT:PCBM BHJ organic photovoltaic cells. This invention's chemical composition provides enhanced hole charge carrier extraction, transport, and collection within an organic photovoltaic cell device that derives from the organic photovoltaic cell structure. The P3HT:PCBM BHJ composition can be used in multiple applications within non-limiting organic photovoltaic cell structures.

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Benefits

- Increased efficiency

Applications

- Solar energy
  - Solar panels
  - Electronics

Tech Fields

Solar and Thermal

Keywords

organic photovoltaic cells, OPVs, solar energy, solar cell

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If you or your company are interested in this opportunity, Contact:

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