Plastic Solar Cells

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The ability to fabricate molecularly tailored interfaces with nanoscale precision can selectively modulate charge transport across hard matter-soft matter interfaces, facilitating transport of the “correct charges” while blocking transport of the “incorrect charges.” This interfacial tailoring can also control defect densities at such interfaces and stabilize them with respect to physical/thermal decohesion. In this lecture, challenges and opportunities are illustrated for two specific and related areas of research: 1) charge transport across hard matter-soft matter interfaces in organic electroluminescent devices, 2) charge transport across hard matter-soft matter interfaces in organic photovoltaic cells. For the latter, rational interface engineering along with improved bulk-heterojunction polymer structures leads to solar power conversion efficiencies as high as 5.6% - 7.3%, along with far greater cell durability.

Photovoltaic References


