

Development of Inorganic and Organic Charge Transport Layers for High-Performance Perovskite Solar Cells

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Organo-metal halide perovskites have attracted tremendous attention as a breakthrough light harvester due to their exceptional optoelectronic properties. These merits allowed the rapid and significant progress in achieving high power conversion efficiency (PCE) of perovskite solar cells (PSCs). The performance of these PSCs depends not only on the perovskite material itself, but also it is dramatically affected by their interfacial layers which dominantly control charge extraction and transport. In this presentation, a novel approach to achieve high-efficiency PSCs using solution processable inorganic (Cu-doped NiOx) and organic (fullerene surfactant) interfacial layers as hole and electron extraction layers, respectively, will be presented. In particular, this organic electron extraction layer features room-temperature, solution processability, which eventually allowed demonstration of flexible PSCs with a promising PCE over 10%.