

光电系统与工程

采用高传导率银铜镍网格电极的柔性聚合物太阳能电池

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摘要:

采用一种新的阳极材料: 银、铜、镍的复合金属网格阳极, 利用旋涂法制成了活性层为P3HT (poly(3-hexylthiophene)):PCBM( [6,6] phenylC61 butyricacidmethylester)的柔性衬底聚合物太阳能电池。制备了5种不同结构的柔性聚合物太阳能电池器件, 将采用新型阳极材料的柔性衬底聚合物太阳能电池与传统ITO (Indium tin oxide) 阳极的柔性衬底聚合物太阳能电池进行对比, 发现新型阳极材料所制成的器件性能得到大幅度的提高, 其电池器件在50mW/cm<sup>2</sup>强度光照下, 开路电压(Voc)为0.54V, 短路电流密度(Jsc)为5.39mA/cm<sup>2</sup>, 能量转换效率为2.060%。

关键词: 合金网格 阳极 P3HT:PCBM 柔性聚合物 太阳能电池 能量转换效率

Flexible polymer solar cells using high conductivity Ag:Cu:Ni metal grid anode

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Abstract:

A new metal grid anode made of silver, copper and nickel is reported. Using it as anode, P3HT(poly(3-hexylthiophene)):PCBM( [6,6] -phenylC61 butyricacidmeth-ylester) layer as active layer, flexible polymer solar cells were manufactured by spin-coating. Five different structures of solar cell devices were made by using the traditional Indium tin oxide (ITO) anode material or the new anode material. After comparison, it is found that the performances of the new anode material device is greatly improved, open circuit voltage of 0.54V, short circuit current density of 5.39mA/cm<sup>2</sup>, and power conversion efficiency (PCE) of 2.060% are achieved under 50mw/cm<sup>2</sup> illumination.

Keywords: alloy grid anode P3HT:PCBM flexible polymer solar cells power conversion efficiency

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