

Number of Graphene Layers As a Modulator of the Open-circuit Voltage of Graphene-Based Solar Cell

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Impressive optical properties of graphene have been attracting the interest of researchers, and, recently, the photovoltaic effects of a heterojunction structure embedded with few layer graphene (FLG) have been demonstrated. Here, we show the direct dependence of open-circuit voltage (Voc) on numbers of graphene layers. After unavoidably adsorbed contaminants were removed from the FLGs, by means of in situ annealing, prepared by layer-by-layer transfer of the chemically grown graphene layer, the work functions of FLGs showed a sequential increase as the graphene layers increase, despite of random interlayer-stacking, resulting in the modulation of photovoltaic behaviors of FLGs/Si interfaces.

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