Organic Photovoltaic Devices on HNO$_3$–Treated Multilayer Graphene Electrodes

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We reported on the characteristics of organic solar cells (OSC) fabricated on HNO$_3$-treated multilayer graphene (MLG) transparent electrodes. MLG electrodes were prepared using a chemical vapor deposition and a multi-transfer process. Compared to organic solar cells (OSC) on the ITO electrodes had a fill factor of 65.97%, and a power conversion efficiency (PCE) of 3.364%, OSCs on the MLG (three-layer graphene) electrodes with sheet resistance of 274±1 $\Omega$/square and transparency of 92.1% had a fill factor of 43.46%, and a PCE of 2.019%. However, OSCs on the HNO$_3$-treated MLG electrodes with lower sheet resistance of 119±1 $\Omega$/square had a fill factor of 57.54%, and a PCE of 2.861%. The results would provide a promising method to improve the performance of large-area OSCs based on MLG electrodes.

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