Fabrication and applications of SWCNT/SnO_2 nanowire heterojunction devices on flexible polyimide substrate

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We report on the fabrication and applications of SWCNT/SnO_2 nanowire (NW) heterojunction device arrays on flexible polyimide substrates. The heterojunction diode showed a rectifying behavior with a rectification ratio of $4.6x10^3$ at ± 1 V and $6.7x10^3$ at V = ± 1.5 V, respectively. We also demonstrated successful AC full-wave rectification behaviors via fabricating full-wave bridge circuit of heterojunctions. In addition, we also exhibited high sensitivity of such formed heterojunction devices to UV light and humidity. This work suggests the potential application of p-n heterojunction consisting of SWCNTs and SnO_2 NWs to various electronic, optoelectronic and sensor devices.