

Supporting Information

Silver nanowire/polyimide composite transparent electrodes for reliable flexible polymer solar cells operating at high and ultra-low temperature

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As seen in Fig. S1, the transmittance of the PI/AgNW composite film remains largely unchanged after annealing at different temperatures, indicating that the optical properties of the film are stable.

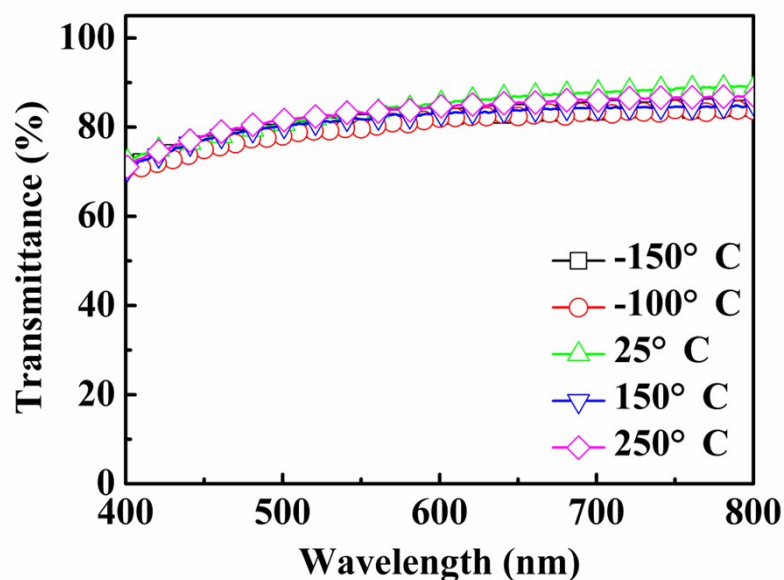


Fig. S1. Transmittance spectra of PI/AgNW composite films annealed at different temperatures.

The sheet resistance of the flexible PET/ITO electrode increases dramatically to about 1800 Ω/sq after just 400 bending cycles, confirming the poor flexibility of PET/ITO electrodes.

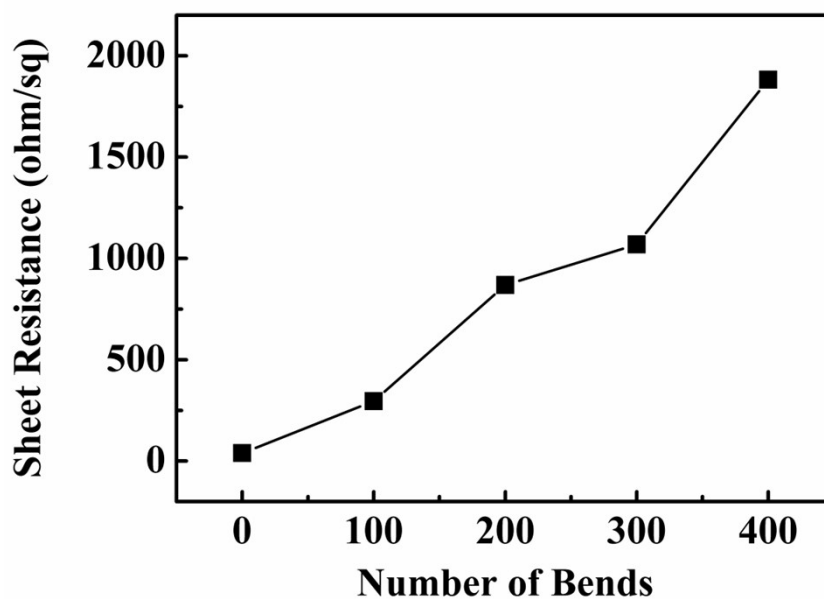


Fig. S2. Sheet resistance of a PET/ITO flexible electrode subjected to repeated bending.

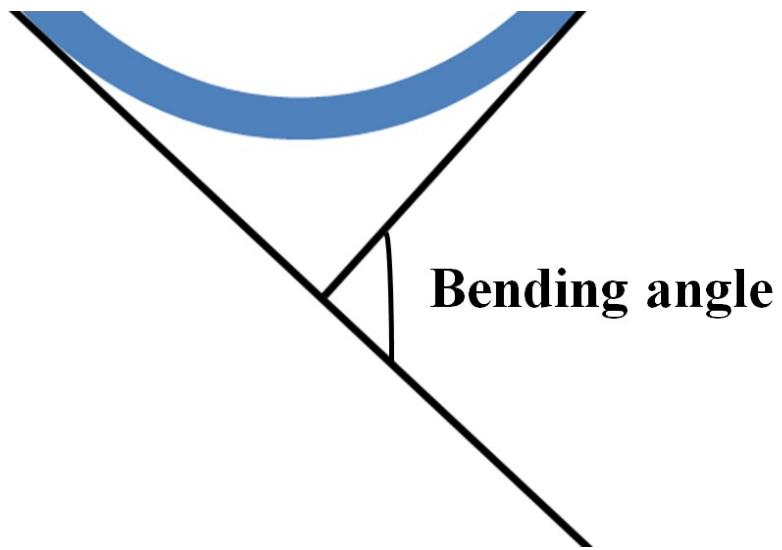


Fig. S3. The diagram of bending angle defined in the paper. The bending properties of flexible electrodes were investigated using a lab-made cyclic bending test system with a bending radius of 15 mm and a bending angle of 90° .

An untreated flexible PI/AgNW composite film has a flat surface topology, with a RMS of 2.3 nm (Fig. S4(a)). After taping or wiping (Fig. S4(b) and (c)), however, the removal of some of the AgNWs at the film surface reveals grooves embedded in the film surface, resulting in RMS values of 3.1 and 3.5 nm, respectively.

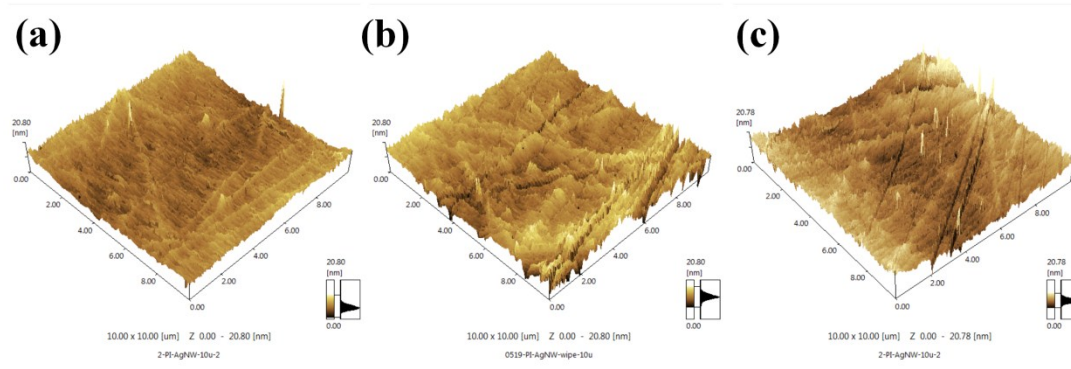


Fig. S4. AFM height images of the PI/AgNW composite film (a) without treatment, and after (b) taping three times or (c) wiping three times.

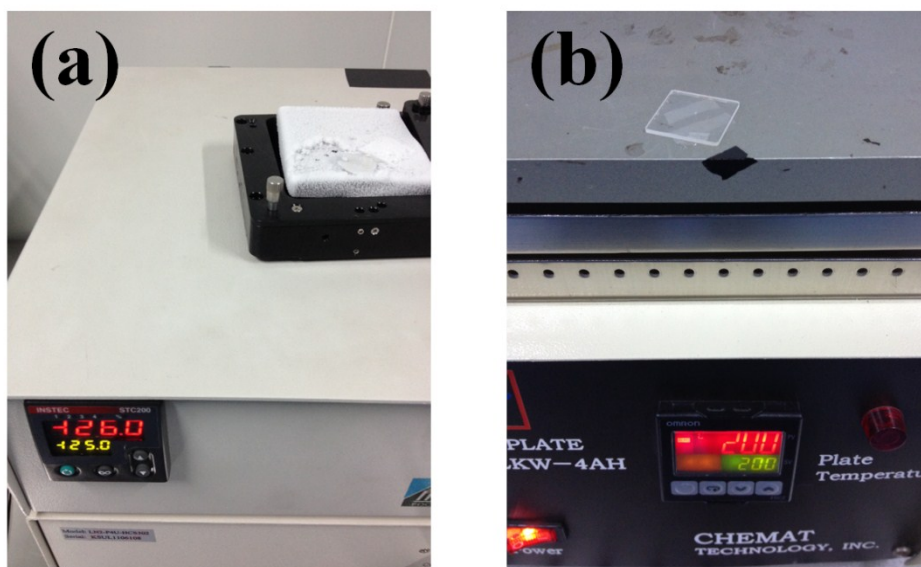


Fig. S5. Photos of PI/AgNW composite films being annealed at (a) ultra-low and (b) high temperatures.

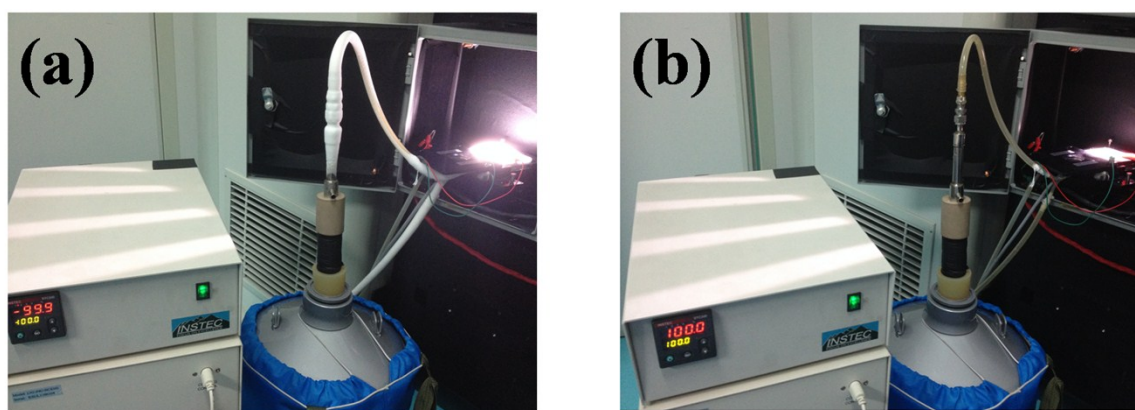


Fig. S6. Photos of stability measurements of the flexible PSCs based on PI/AgNW composite films under (a) ultra-low and (b) high temperatures.