Supporting Information

Ag–Doped PEDOT:PSS/CNT Composites for Thin–Film All–Solid–State Supercapacitors with a stretchability of 480%

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**Figure S1.** (a-c) SEM images with different magnifications of as-grown aligned CNT array from side view. (d) SEM image of as-grown aligned CNT array from top view.

**Figure S2.** TEM images of CNTs with low (a) and high (b) magnifications.
Figure S3. SEM images of CNTs composite films containing a certain content of PEDOT:PSS with different concentration of Ag (a, 0.5 wt%; b, 1.0 wt%; c, 2.0 wt%).
Figure S4. Cross-sectional SEM image of a Ag-doped PEDOT:PSS/CNT composite film. The surface of the CNT composite cracked seriously when it was cut in liquid nitrogen.

Figure S5. I–V curves of bare CNTs film and Ag-doped PEDOT:PSS/CNT composite film. The effective length of samples for measurement was 2 cm.
Figure S6. (a) CV curves of supercapacitors by using bare CNT electrode and PEDOT:PSS/CNT composite electrodes with different Ag-doped contents in PEDOT:PSS (12.4wt%) at the scan rate of 0.3 V s\(^{-1}\). (b) GCD curves of the above supercapacitors at charge-discharge current of 0.5 mA. (c) Nyquist plots of the supercapacitors at the frequency varying from 10\(^{-2}\) to 10\(^{5}\) Hz.

Table S1. Electrochemical performance of supercapacitors based on different electrodes obtained from Figure S6.

<table>
<thead>
<tr>
<th></th>
<th>CNTs</th>
<th>0 wt%</th>
<th>0.5 wt%</th>
<th>1.0 wt%</th>
<th>2.0 wt%</th>
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<tbody>
<tr>
<td>Cs (mF/cm(^2))</td>
<td>4.66</td>
<td>6.16</td>
<td>10.66</td>
<td>57.6</td>
<td>11.16</td>
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<tr>
<td>Rs (Ω)</td>
<td>6.8</td>
<td>6.43</td>
<td>6.41</td>
<td>5</td>
<td>3.92</td>
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</table>
Figure S7. (a) CV curves of a supercapacitor based on CNTs composite with 12.4 wt% of Ag-doped PEDOT:PSS at different scanning rates. (b) GCD curves of the supercapacitor at different charge/discharge currents.

Figure S8 Cyclic performance of supercapacitors based bare CNTs films and Ag-doped PEDOT:PSS/CNT composite with 12.4 wt% of PEDOT at a charge-discharge current of 0.3 mA cm$^{-2}$. 
Figure S9. (a) CV curves (0.1 V s$^{-1}$) and (b) Charge–discharge (at a current of 0.5 mA cm$^{-2}$) curves of a supercapacitor under different bending and twisted states.

Figure S10. Dependence of specific capacitance with increasing tensile strains. $C_0$ and $C$ are the specific capacitances before and after stretching, respectively.
**Figure S11.** SEM images of aligned compact CNT film before (a) and after (b) stretched.

**Figure S12.** Dependence of the electrical resistance on different strains for the bare CNT film and Ag-PEDOT:PSS/CNT composite electrode.
Figure S13. Changes of specific capacitance of an all-solid-state supercapacitor based on Ag-PEDOT:PSS/CNT composite electrodes during to stretched to 400%, 300%, 200 and 100% strains for different cycles.