## **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<sup>-1</sup>. (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.

	CNTs	0 wt%	0.5 wt%	1.0 wt%	2.0 wt%
Cs (mF/cm <sup>2</sup> )	4.66	6.16	10.66	57.6	11.16
$Rs(\Omega)$	6.8	6.43	6.41	5	3.92



**Figure S7**. (a) CV curves of a supercapacitor based on CNTs composite with 12.4 wt% of Agdoped 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<sup>-2</sup>.



**Figure S9**. (a) CV curves (0.1 V s<sup>-1</sup>) and (b) Charge–discharge (at a current of 0.5 mA cm<sup>-2</sup>) 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, respecifively.



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.