Supporting Information

Experimental Section

(1) Synthesis of spinnable CNT arrays

Spinnable CNT arrays were synthesized by chemical chemical vapor deposition in a quartz tube furnace. Typically, Fe (1.2 nm)/Al_2O_3 (3 nm) (deposited by electron beam evaporation) on silicon wafer served as catalyst, ethylene served as carbon source with a flowing rate of 90 sccm, and a mixture of Ar (400 sccm) and H_2 (30 sccm) gases was used as carrying gas. The grow process was carried out at 740 °C for 10 min.

(2) Characterization

The structures were characterized by TEM (JEOL JEM-2100F operated at 200 kV), and scanning electron microscopy (SEM, Hitachi FE-SEM S-4800 operated at 1 kV). Cyclic voltammograms were obtained by a two-electrode system from an electrochemical analyzer system (CHI 660D). Galvanostatic charge-discharge characterizations were carried out by an Arbin multi-channel electrochemical testing system (Arbin, MSTAT-5 V/10 mA/16 Ch).

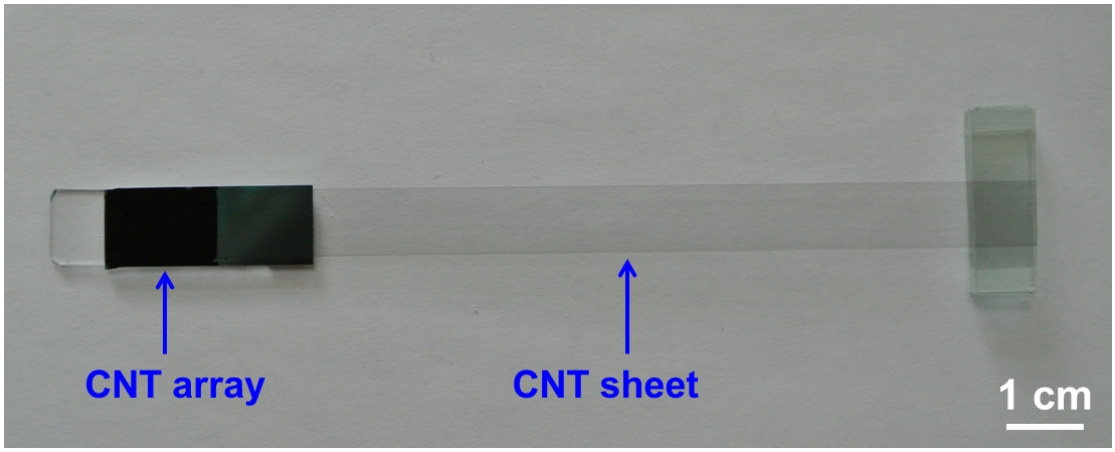

Figure S1. Photograph of the CNT sheet drawn from a spinnable CNT array.

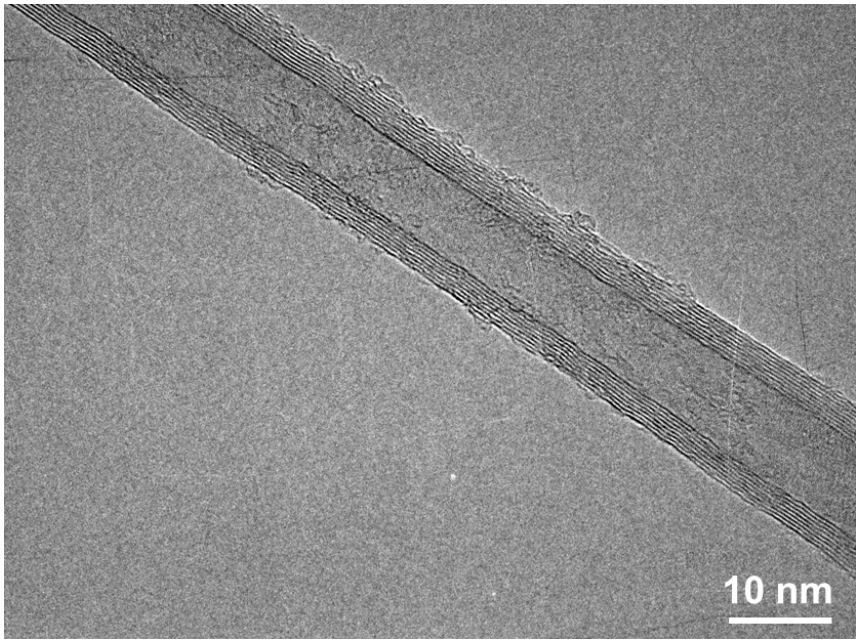

Figure S2. High resolution transmission electron microscopy image of a CNT.

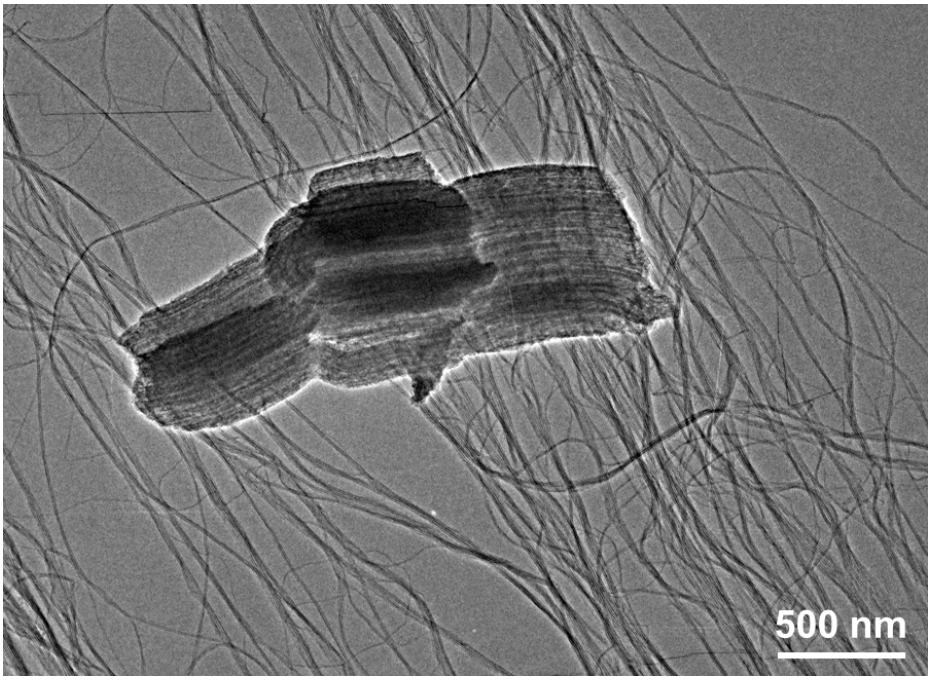

Figure S3. High resolution transmission electron microscopy image of the interface between CNT and MC particle.

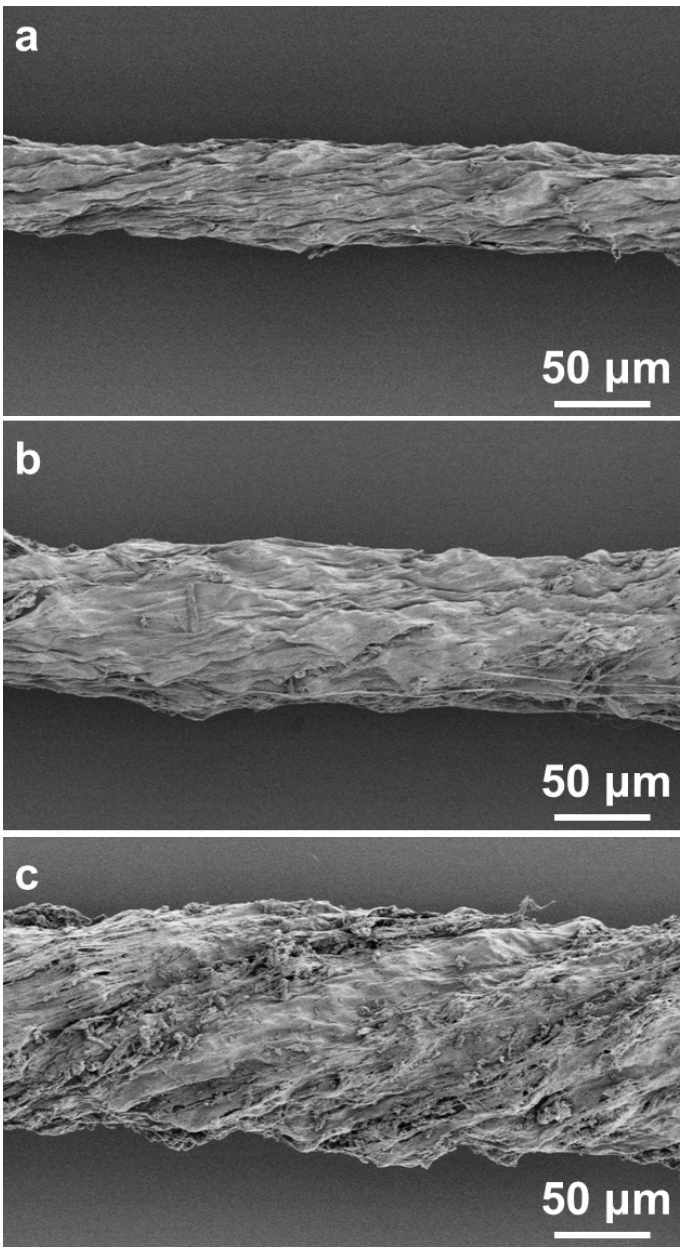

Figure S4. SEM images of CNT/MC hybrid fibers with different MC weight percentages. **(a)** 32%. **(b)** 53%. (**c**) 86 %.

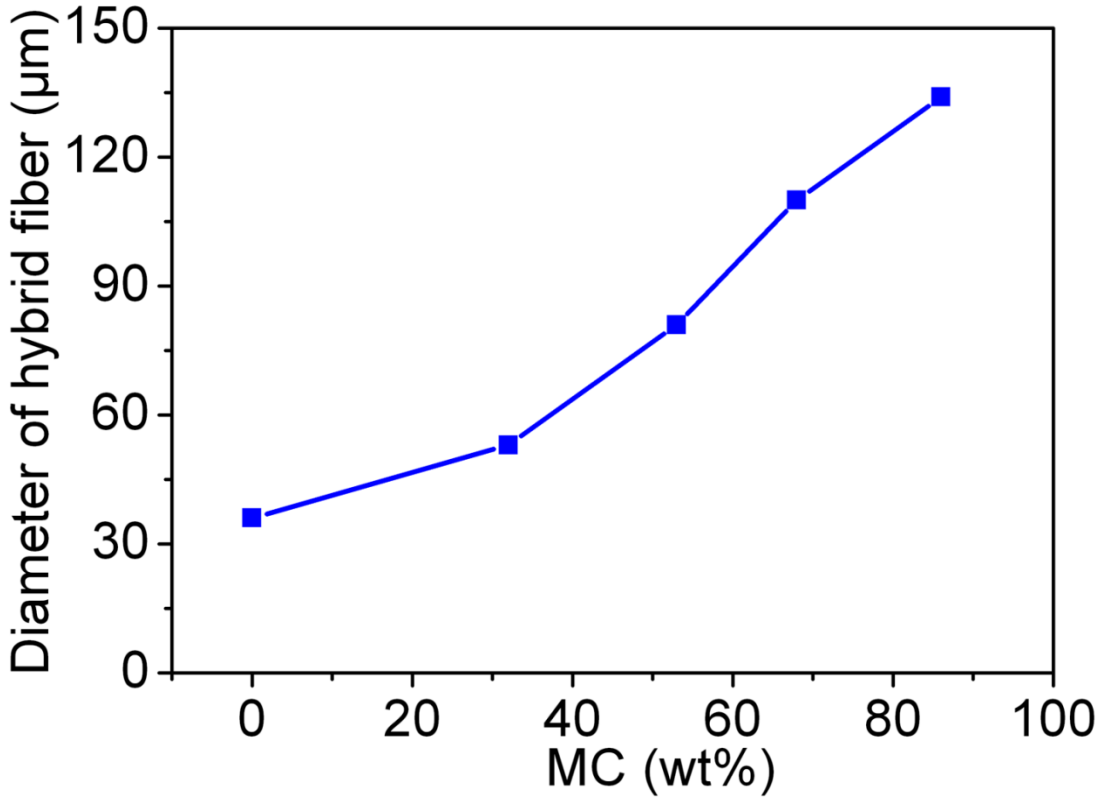

Figure S5. Diameters of CNT/MC hybrid fibers with different MC weight percentages.

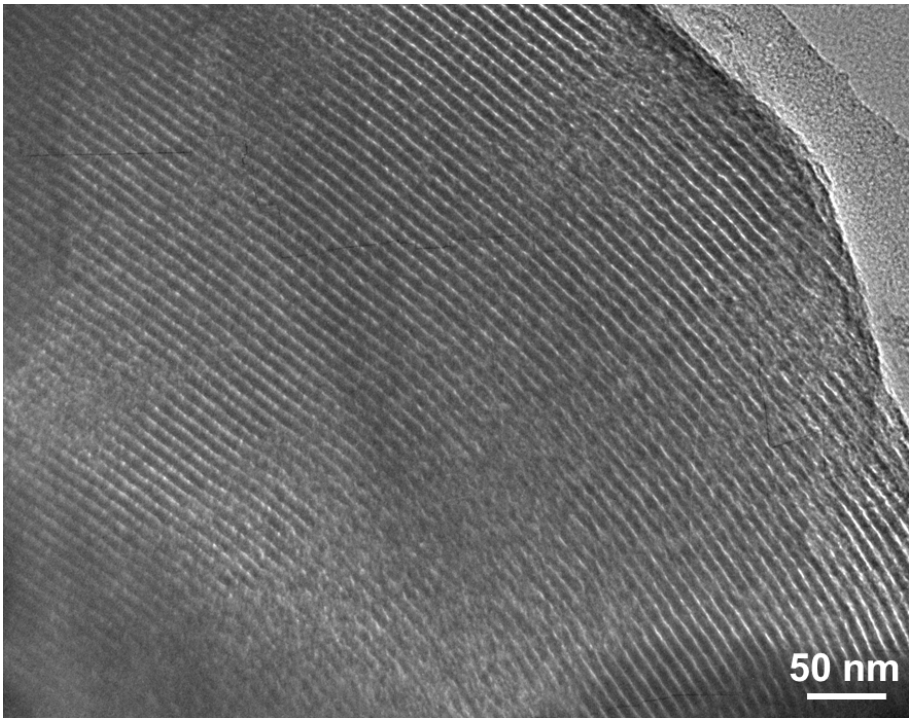

Figure S6. High resolution transmission electron microscopy image of an MC particle.

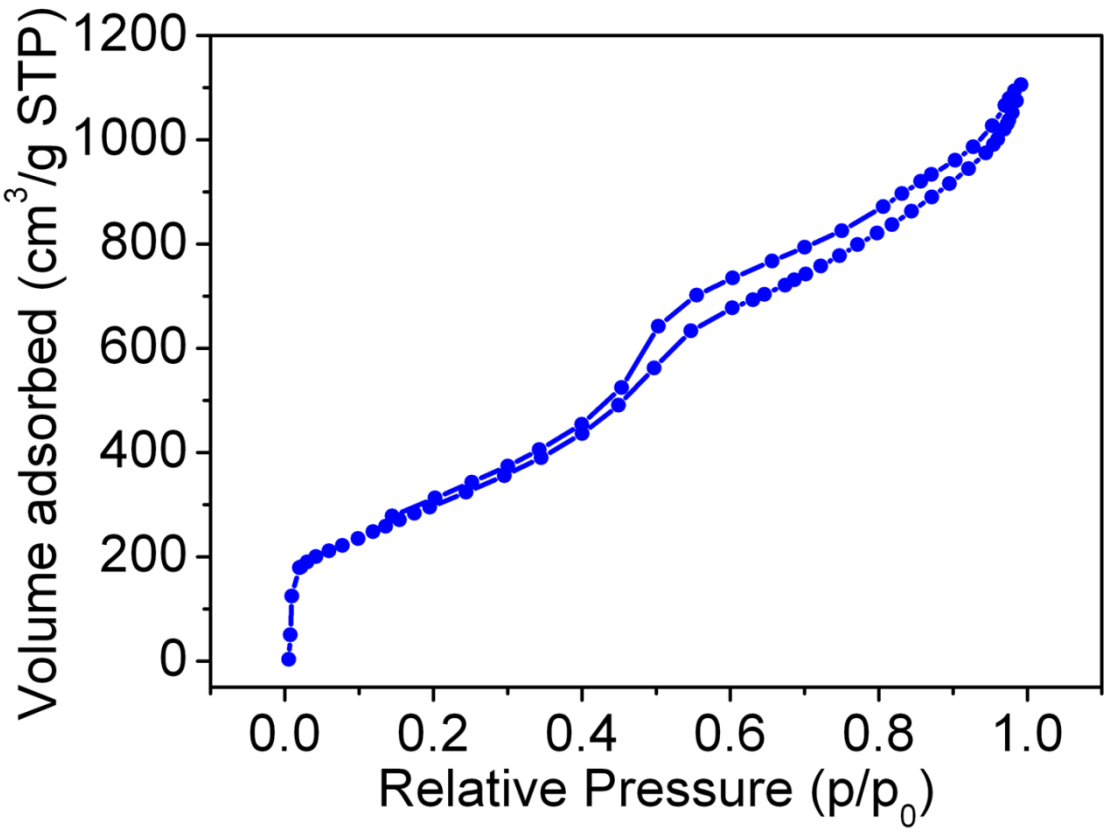

Figure S7. Nitrogen sorption isotherm of the MC.

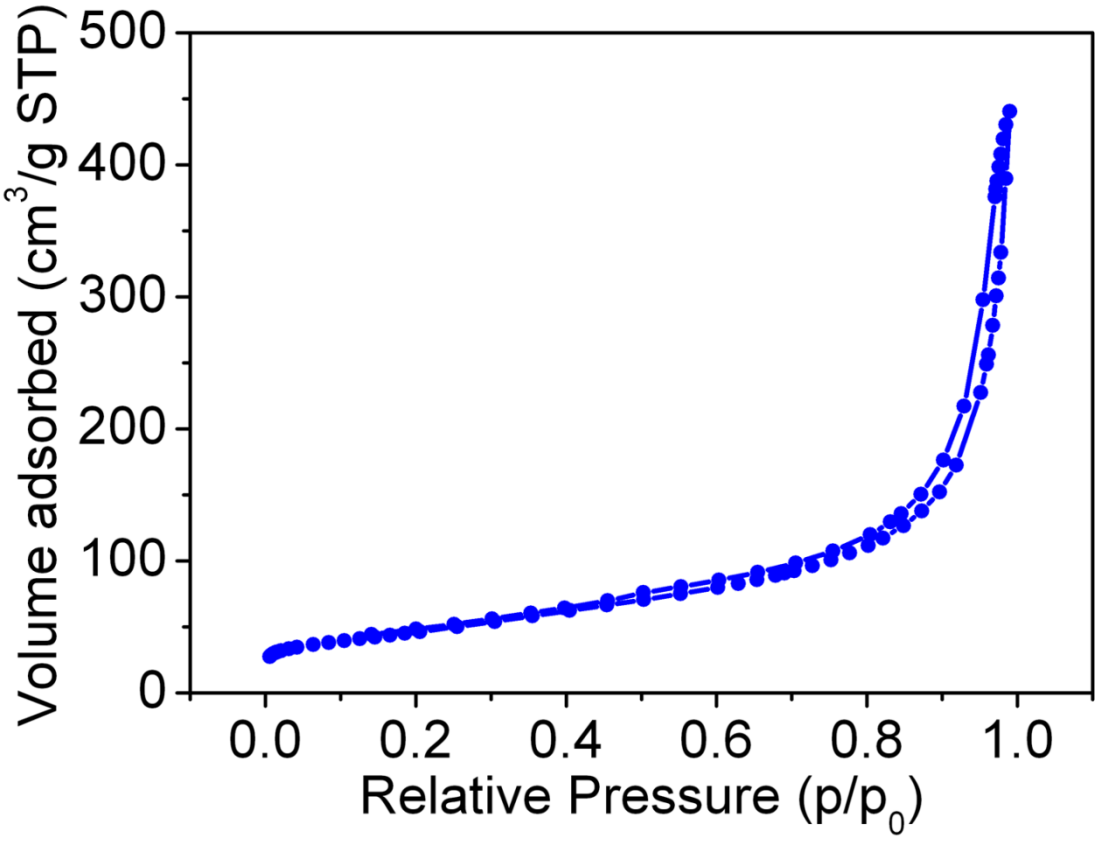

Figure S8. Nitrogen sorption isotherm of CNTs.

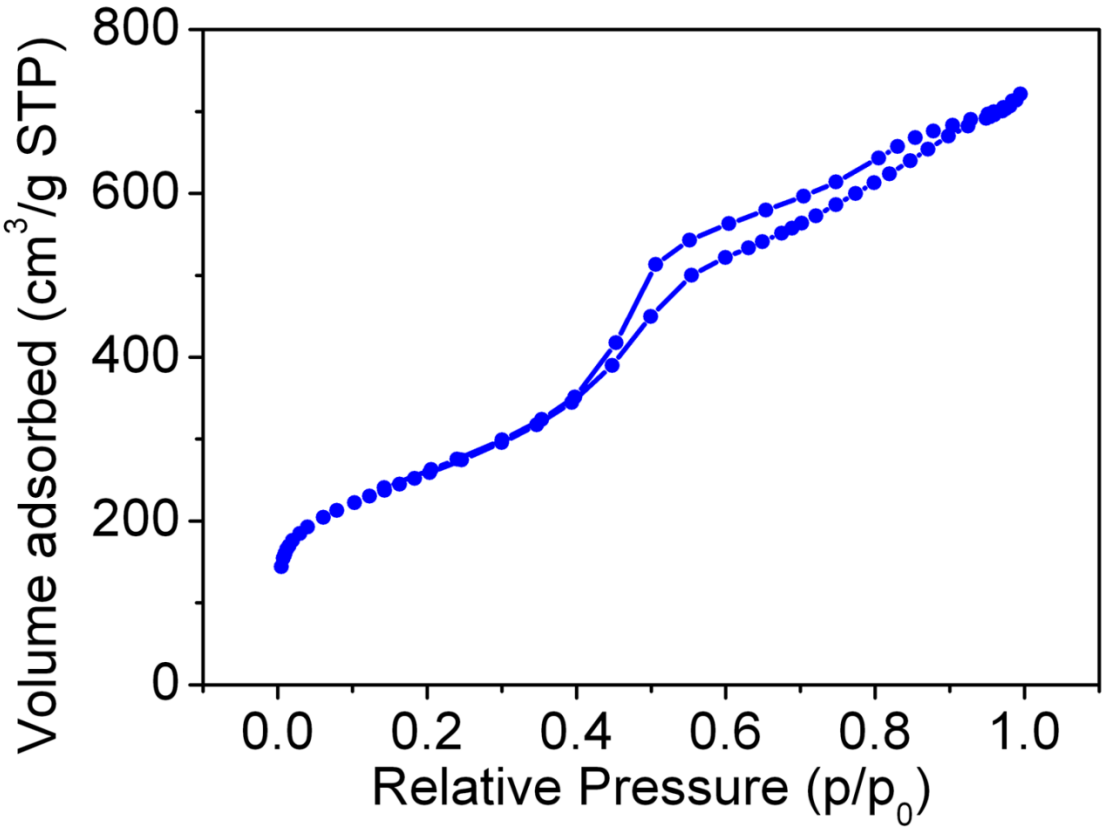

Figure S9. Nitrogen sorption isotherm of the CNT/MC hybrid.

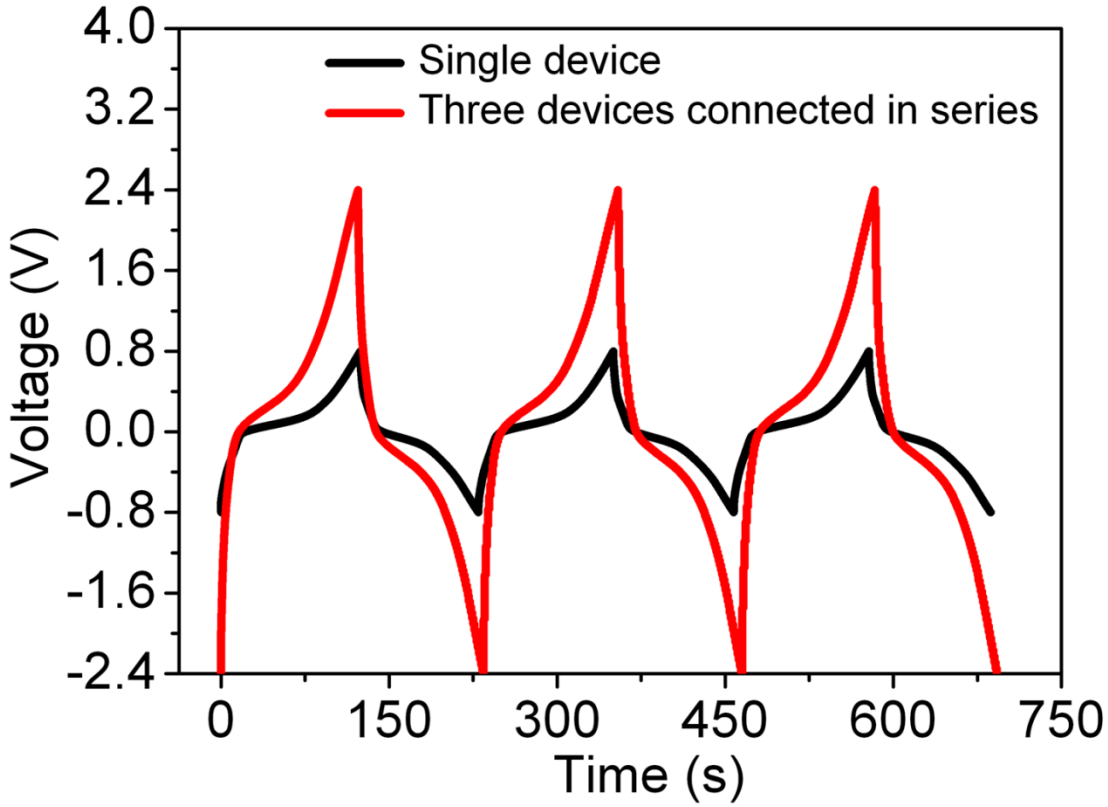

Figure S10. Galvanostatic charge/discharge curves of three FSSs being connected in series.