Supporting Information

A Rectification-Free Piezo-Supercapacitor with a Polyvinylidene Fluoride Separator and Functionalized Carbon Cloth Electrodes

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A. Output voltage of PVDF film with opposite polarization direction.

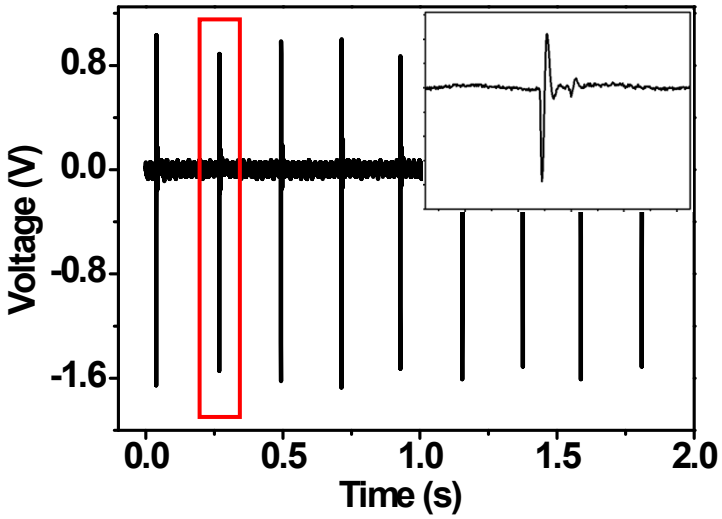

Figure S1. Output voltage of PVDF film with opposite polarization direction. The PVDF with opposite polarization is subjected to the periodic mechanical compressive force. The polarity of the output voltage is reversed.

B. Electrochemical performance comparison between the FCC electrodes supercapacitor with or without PVDF separator.

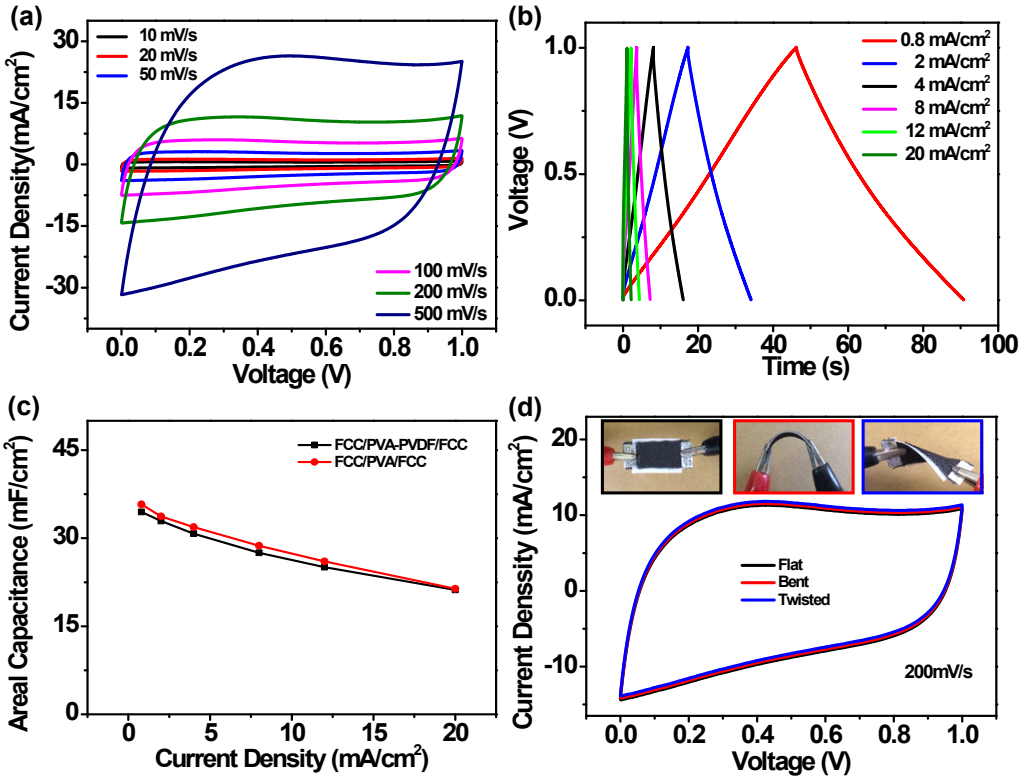

Figure S2. (a) and (b) are CV curves and galvanostatic charge and discharge curve of FCC supercapacitor without the PVDF separator. (c) Calculated areal capacitance of the supercapacitor with and without PVDF separator based on galvanostatic charging-discharging current density. These results suggest that the electrochemical properties of our self-power supercapacitor with the PVDF separator are comparable to those without it. In order to demonstrate the excellent flexibility of the piezo-supercapacitor, the device is measured under various bending conditions. (d) The CV curves of the piezo-supercapacitor in flat, bent and twisted states at a scan rate of 200 mV/s. Insets are the device pictures under different test conditions. The result shows that the supercapacitor can be bend and twist without affecting the device performance.

C. Supercapacitor charging base on initial voltage

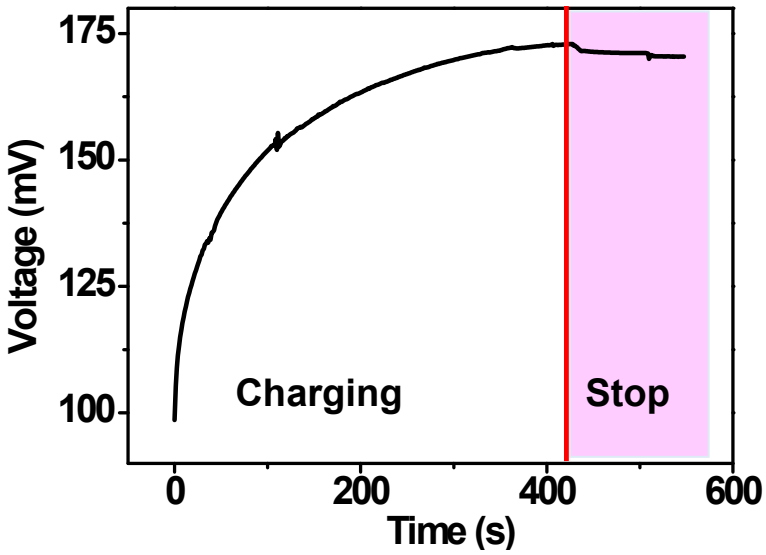

Figure S3. The piezo-supercapacitor without discharging at the initial stage is under compressive stress. The voltage of the device increased from 98 mV to 172 mV within 440 s and can sustain for a long time.