## **Supporting information**

# Full capacitance potential of SWCNT electrode in ionic liquids at 4V

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### 7 SI-1 Single walled carbon nanotube sample and graphene sample

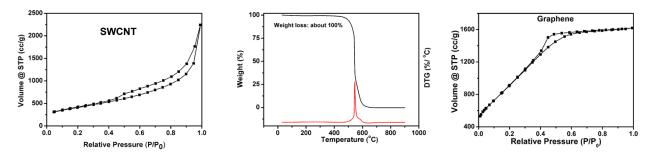


Fig.S1 Nitrogen adsorption (left) and TGA (middle) of SWCNT; Nitrogen adsorption of graphene (right).

#### SI-2 New charge mode of SCs

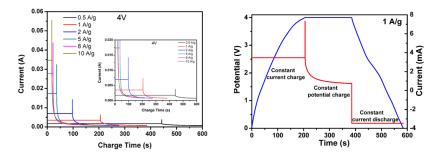


Fig.S2 Current change of SWCNT in new charge mode with different current densities.

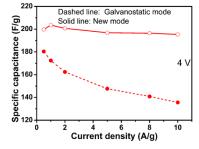


Fig.S3 Capacitance performance of graphene in different charge modes.

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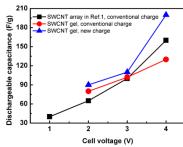
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## SI-3 Comparison of SWCNT performance in ILs electrolyte and in organic electrolyte



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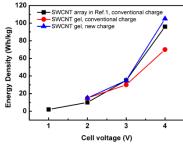


Fig.S4 Comparison of dischargeable capacitance (left) and energy density (right) of our electrode and electrode in ref. 1h.