

## Supplementary Material

### **Electrochemically Exfoliated Graphene/Manganese Dioxide Nanowire Composites as Electrode Materials for Flexible Supercapacitors**

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Fig. S1 Twist testing of EG/MnO<sub>2</sub> film electrode at different angles.

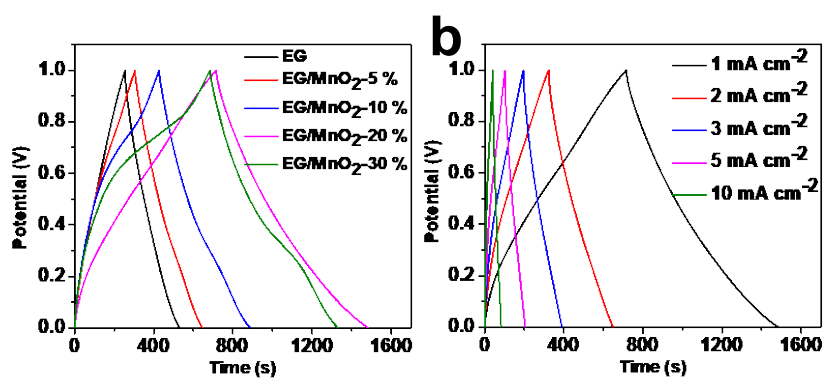


Fig. S2 (a) GCD curves of EG/MnO<sub>2</sub> with different mass fraction at 1 mA cm<sup>-2</sup>; (b) GCD curves of EG/MnO<sub>2</sub>-20 % at various current densities.

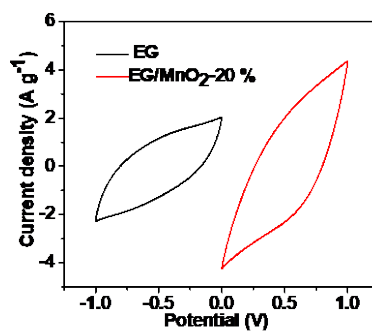


Fig.S3 CV curves of EG and EG/MnO<sub>2</sub> electrodes at a scan of 100 mV s<sup>-1</sup>.

**Table S1** Comparison of electrochemical performance of flexible solid-state supercapacitor designs based on different materials

Electrode material	Electrolyte	Energy density	Power density	Capacitance retention	Ref.
PANI nanofiber-graphene paper	H <sub>2</sub> SO <sub>4</sub>	18.8 Wh kg <sup>-1</sup>	3.3 kW Kg <sup>-1</sup>	79 % after 800 cycles	1
V <sub>2</sub> O <sub>5</sub> -graphene paper	LiClO <sub>4</sub> /PC	13.3 Wh kg <sup>-1</sup>	625 W kg <sup>-1</sup>	90 % after 8000 cycles	2
Ni(OH) <sub>2</sub> -graphene paper	PVA/KOH	18 Wh kg <sup>-1</sup>	850 W kg <sup>-1</sup>	158 % after 20000 cycles	3
Waste paper fibers-RGO-MnO <sub>2</sub>	PVA-Na <sub>2</sub> SO <sub>4</sub>	19.6 Wh kg <sup>-1</sup>	2.4 kW kg <sup>-1</sup>	85.3 % after 2000 cycles	4
PEDOT:PSS/MWCNT	PVA-KOH	13.2 Wh kg <sup>-1</sup>	4.99 kW kg <sup>-1</sup>	90 % after 1000 cycles	5
ZnCo <sub>2</sub> O <sub>4</sub> /rGO	PVA-KOH	11.44 Wh kg <sup>-1</sup>	1.382 kW kg <sup>-1</sup>	93.4 % after 5000 cycles	6
α-MnO <sub>2</sub> and h-CuS	PVA-LiClO <sub>4</sub>	18.9 Wh kg <sup>-1</sup>	32 kW kg <sup>-1</sup>	93.3 % after 5000 cycles	7
MnO <sub>2</sub> /Ti <sub>3</sub> C <sub>2</sub>	Na <sub>2</sub> SO <sub>4</sub>	8.3 Wh kg <sup>-1</sup>	221.33 W kg <sup>-1</sup>	93 % after 5000 cycles	8
Graphene/MnO <sub>2</sub> -textile	Na <sub>2</sub> SO <sub>4</sub>	12.5 Wh kg <sup>-1</sup>	110 kW kg <sup>-1</sup>	95 % after 5000 cycles	9
RuO <sub>2</sub> -IL-CMG	PVA-H <sub>2</sub> SO <sub>4</sub>	19.7 Wh kg <sup>-1</sup>	6.8 kW kg <sup>-1</sup>	79.4 % after 5000 cycles	10
EG/MnO <sub>2</sub>	PVA-LiCl	20.7 Wh kg <sup>-1</sup>	1000 W kg <sup>-1</sup>	84.2 % after 5000 cycles	This work

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