Supporting Information

Flexible All-in-one Zinc-ion Batteries

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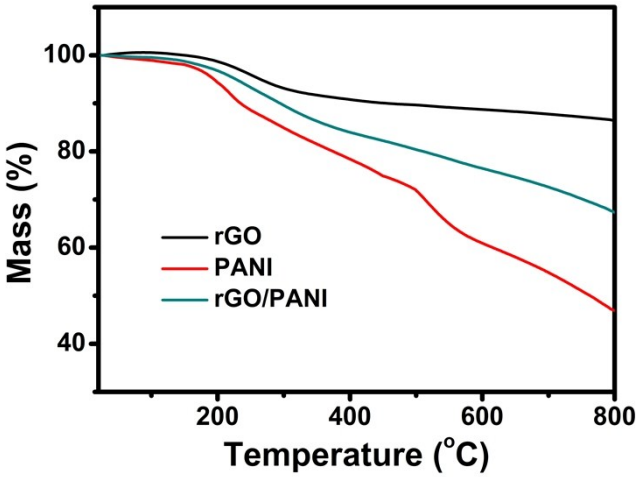

Fig. S1. Thermogravimetric analysis (TGA) curves of rGO, PANI and rGO/PANI.

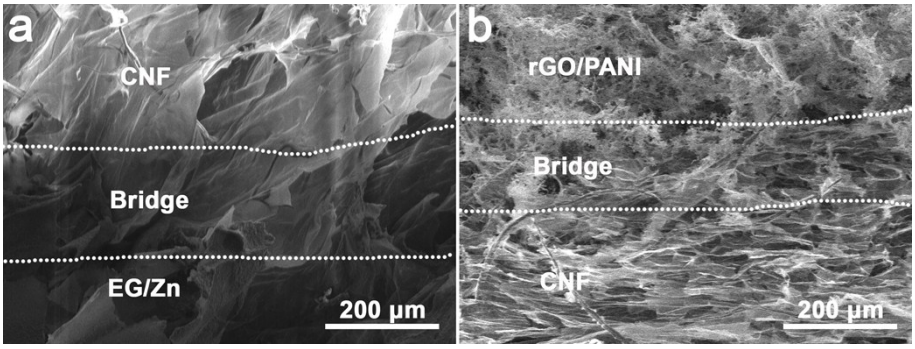

Fig. S2. The cross-sectional SEM images of all-in-one architecture of (a) CNF-EG/Zn and (b) rGO/PANI-CNF, respectively.

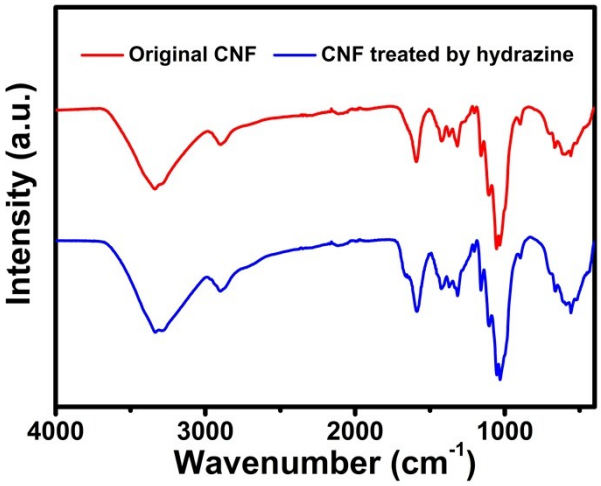

Fig. S3. FTIR spectra of CNF before and after hydrazine treatment.

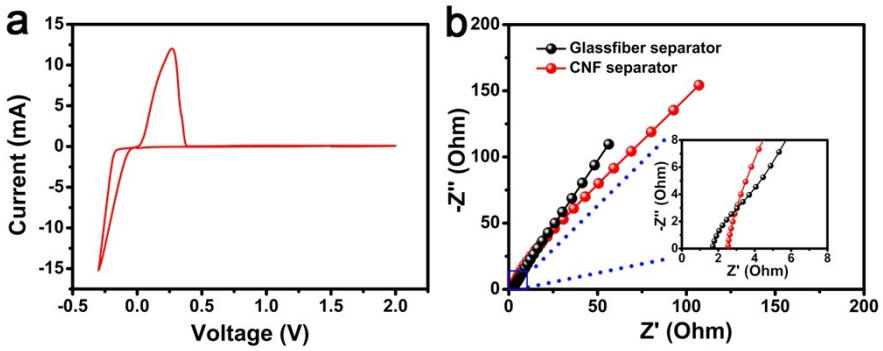

Fig. S4. (a) CV curve of the battery between -0.4 and 2.0 V at a scan rate of 1.0 mV s^{-1}. The battery used EG/Zn as anode, CNF as separator and steel as cathode, respectively. (b) Nyquist plots of fresh cells based on glassfiber and CNF as separator, respectively.

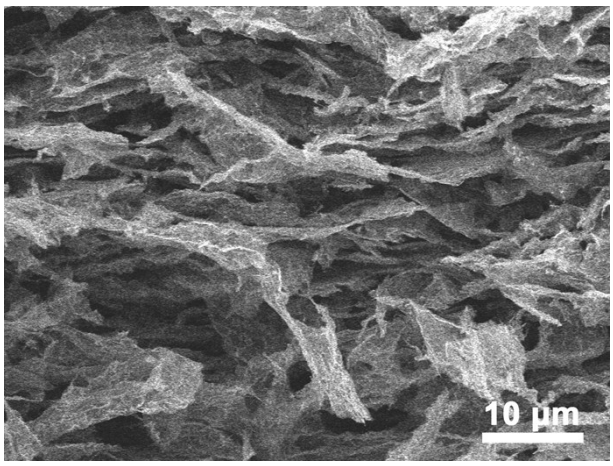

Fig. S5. Cross-sectional SEM image of the rGO/PANI film after compression.

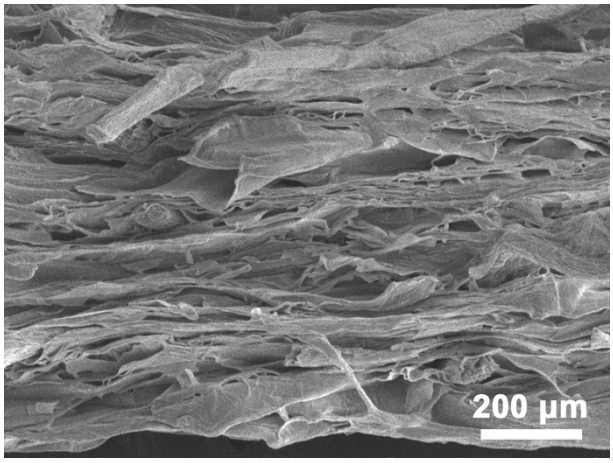

Fig. S6. Cross-sectional SEM image of the CNF film after compression.

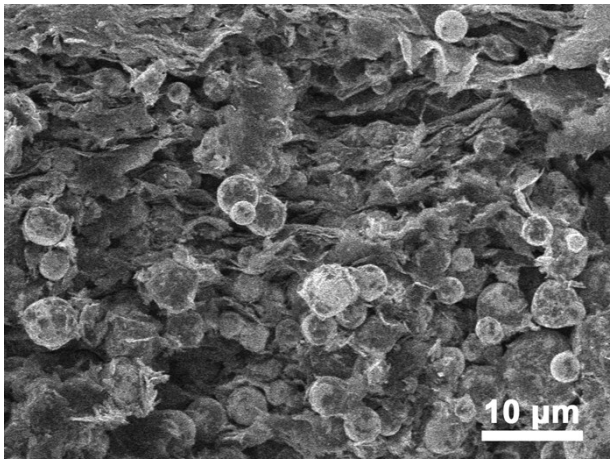

Fig. S7. Cross-sectional SEM image of the EG/Zn film after compression.

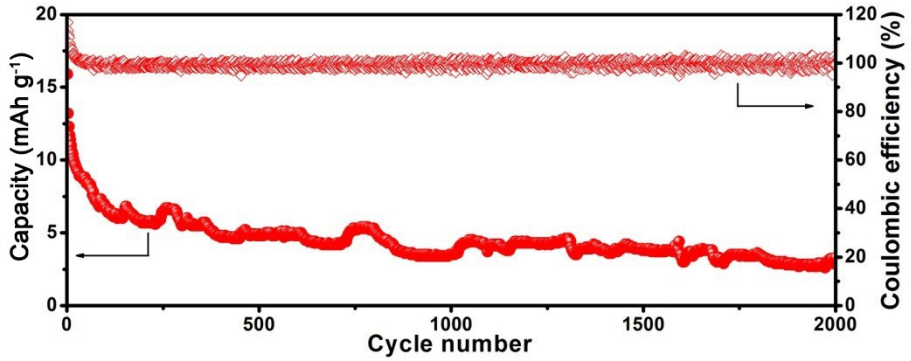

Fig. S8. The cycling performance of pure rGO at a current density of 0.1 A g^{-1}.

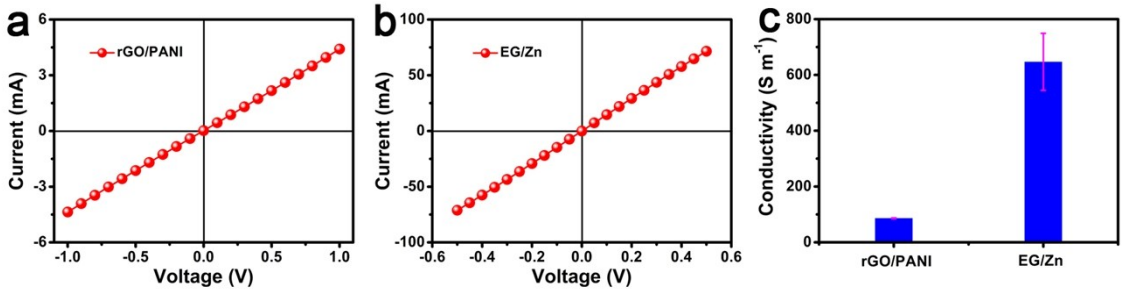

Fig. S9. I-V curves of (a) rGO/PANI cathode and (b) EG/Zn anode. (c) The conductivity of the rGO/PANI cathode and EG/Zn anode.

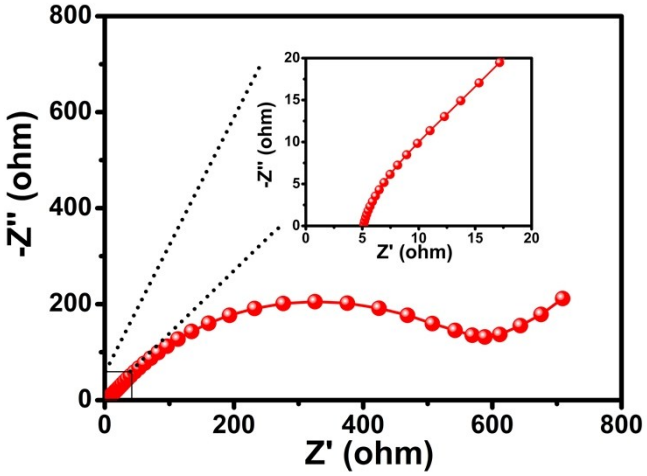

Fig. S10. EIS spectra of the all-in-one ZIBs.

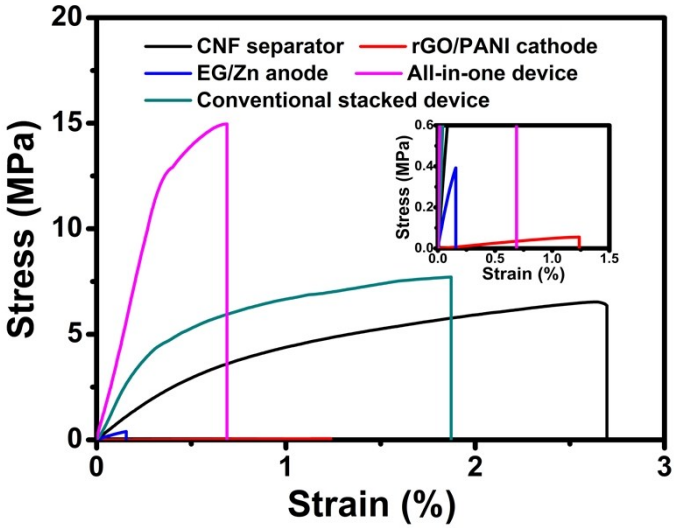

Fig. S11. Stress-strain curves of rGO/PANI cathode, CNF separator, EG/Zn anode, conventional stacked device, and all-in-one device.

Table S1. The tensile strength and Young's modulus of individual rGO/PANI cathode, CNF separator, EG/Zn anode, conventional stacked device, and all-in-one device.

	Stress (%)	Tensile strength (MPa)	Young's modulus (GPa)
EG/Zn anode	0.16	0.4	0.3
rGO/PANI cathode	1.23	0.1	4.0×10^{-3}
CNF separator	2.70	6.4	0.6
Conventional stacked device	1.87	7.7	1.6
All-in-one device	0.69	15.0	3.7