Electronic Supplementary Information

Ternary-doped carbon electrodes for advanced aqueous solid-state supercapacitors based on a "water-in-salt" gel electrolyte

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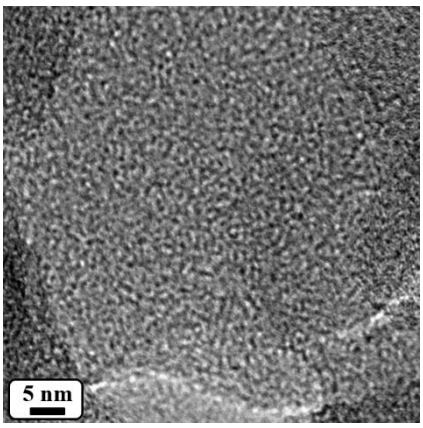

Fig. S1. A high-resolution TEM image of NSOC-2.

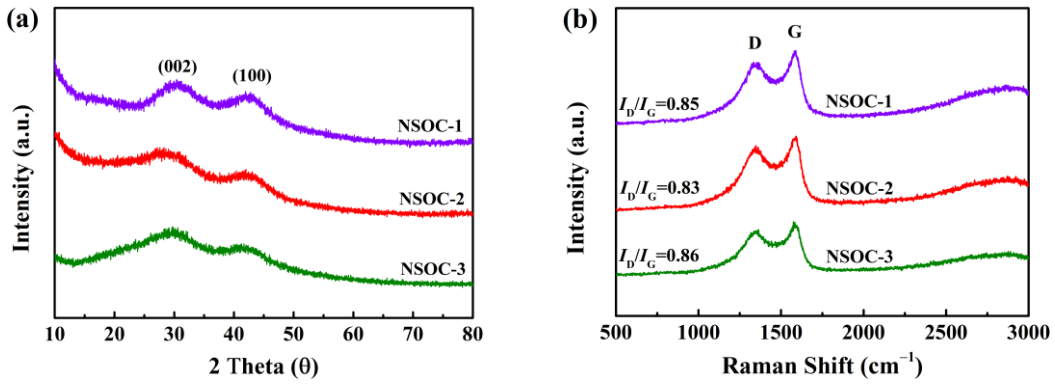

Fig. S2. (a) XRD patterns and (b) Raman spectra of NSOCs.

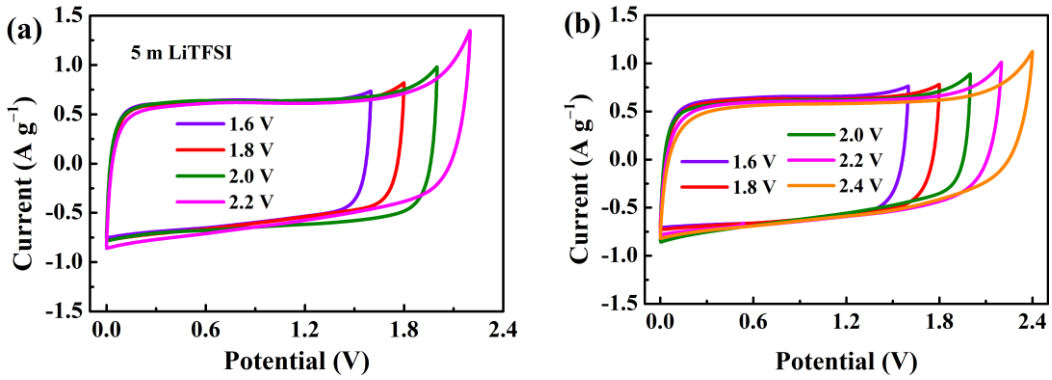

Fig. S3. CV curves of NSOC-2 based supercapacitors using (a) 5 and (b) 10 m LiTFSI electrolyte, respectively.

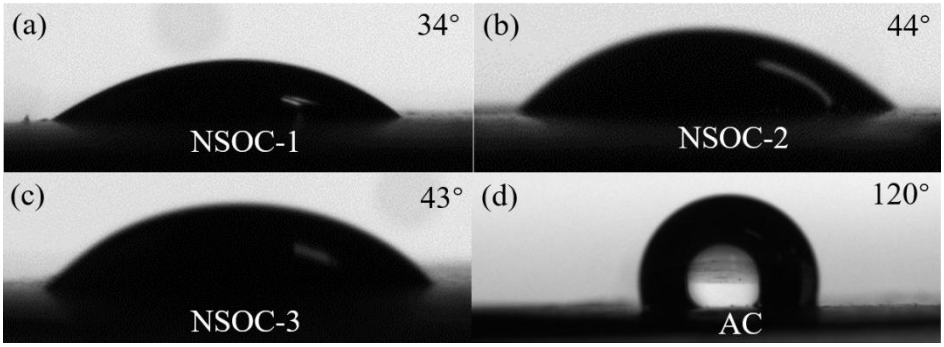

Fig. S4. The contact angles of WIS electrolyte on the surface of NSOCs and commercial activated carbon (AC).

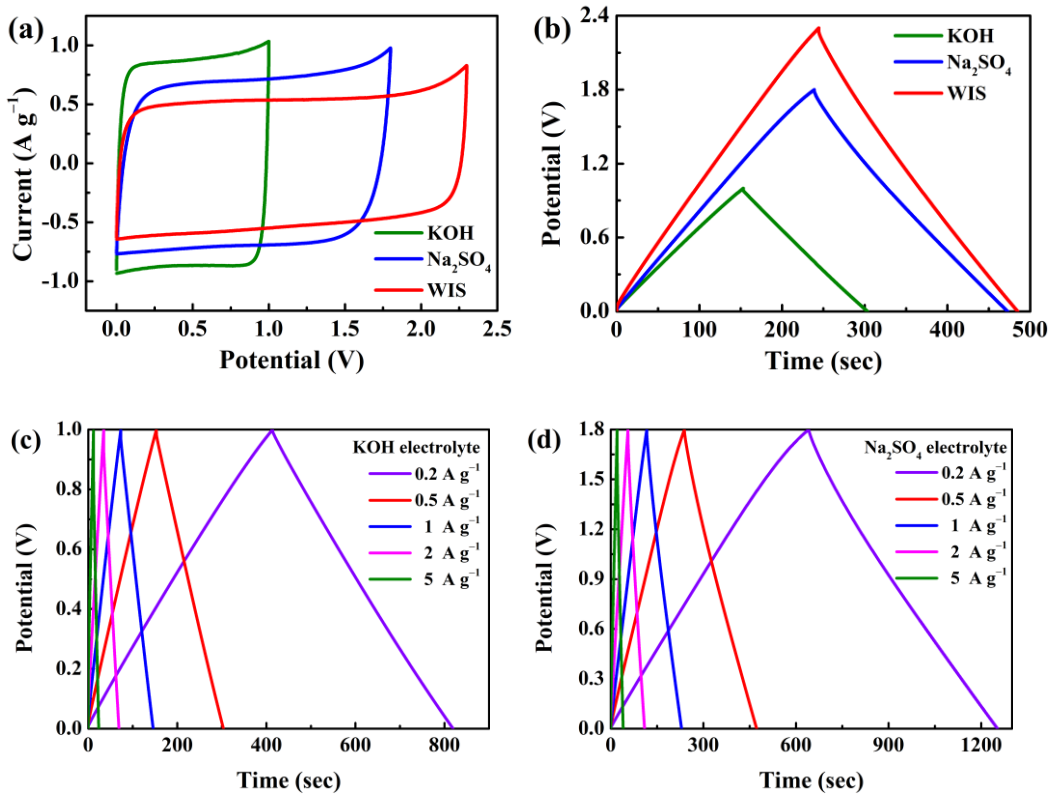

Fig. S5. Electrochemical performances of symmetrical supercapacitors using aqueous electrolytes: (a) CV curves and (b) GCD profiles of NSOC-2 based device in KOH, Na_2SO_4, and WIS electrolyte, respectively. GCD curves of NSOC-2 loaded supercapacitor in (c) KOH and (d) Na_2SO_4 electrolyte.

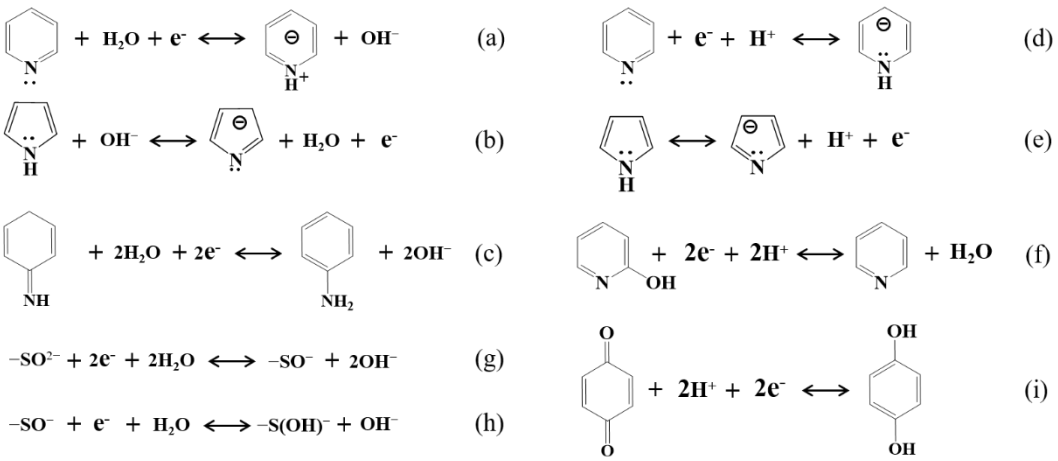

Fig. S6. Redox reactions and effects of N, S, O-related functional groups.

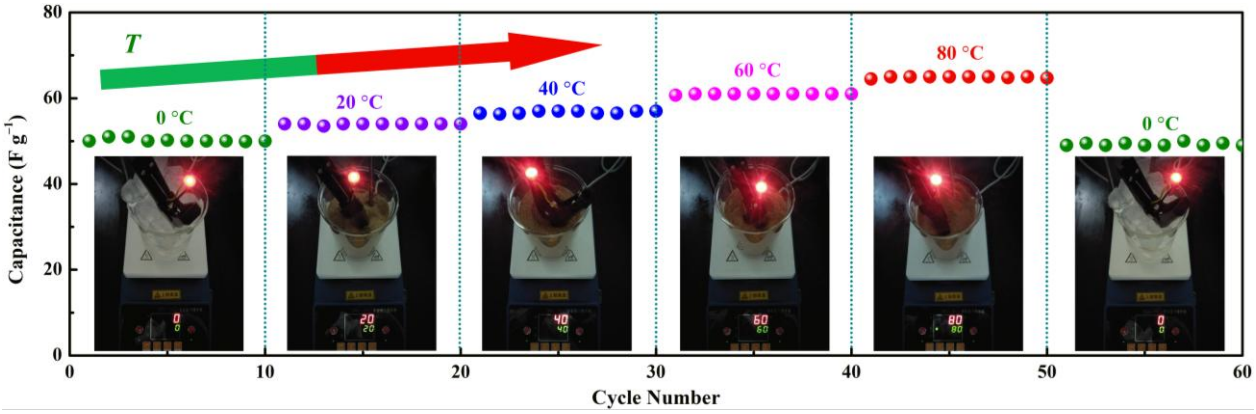

Fig. S7. Capacitance enhancement as a function of the temperature from 0 to 80 ℃ (the insets depict the images of lighted red LED lamps powered by a supercapacitor).

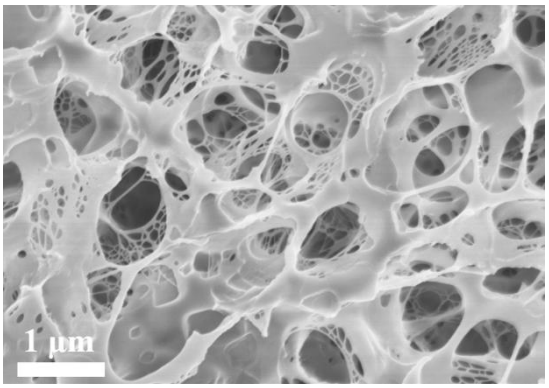

Fig. S8. A typical SEM image of the gel support.

Table S1. Comparison of the energy densities (*E*) between our assembled aqueous solid-state supercapacitor and the relative references.

Electrode Materials	Electrolyte Voltages	*E* (Wh kg^{-1})	*P* (W kg^{-1})	Ref.
Commercial activate carbon	PVDF-HFP/[emim][NTf_2] (2.5 V)	21.9	6250	26
MnO_2 nanosheet/carbon fiber	PVA/LiCl (1.5 V)	27.2	979.7	69
Carbon nanotube/graphene aerogel	PVA/Na_2SO_4 (1.8 V)	18.42	2320	68
Carbon nanosheet/graphene	PVA/KOH (1 V)	6.3	2400	42
Carbon foams	PVA/LiCl (2 V)	1.35	2900	59
Carbon nanofibers	PVA/KOH (1 V)	10.96	250	47
Graphene quantum dots	H_2SO_4/PVA (1 V)	18.75	108.7	70
Graphene oxide sheets	H_3PO_4/PVA (1 V)	4.4	24	67
Ternary-doped carbons	WIS/gel (2.3 V)	37.7	230	This
		31.1	979.7	Work
		24.7	6250	