Supporting Information

High-performance 3 V "water in salt" aqueous asymmetric supercapacitors based on VN nanowires electrode

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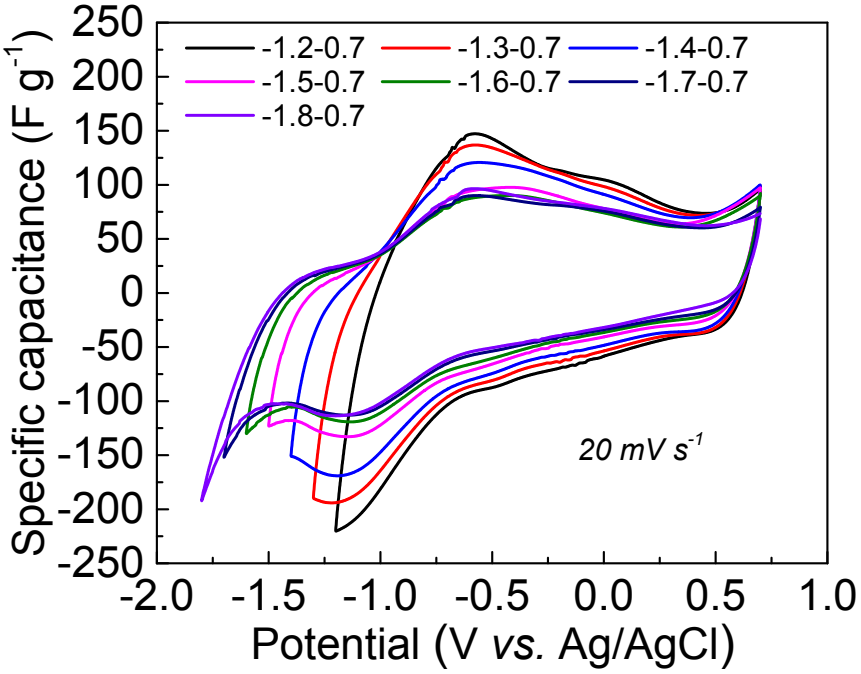

Figure S1. the CV curves of VN-NWs@CC in 21 m LITFSI aquesou electrolyte at different potential ranges

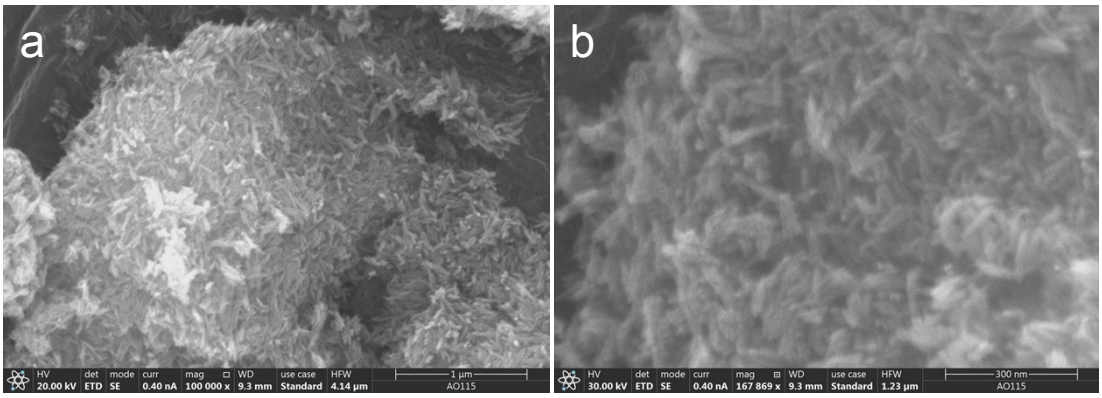

Figure S2. The SEM images of magnification of (a) 100000× and (b) 167869 × for the α-Fe_2O_3 materials.

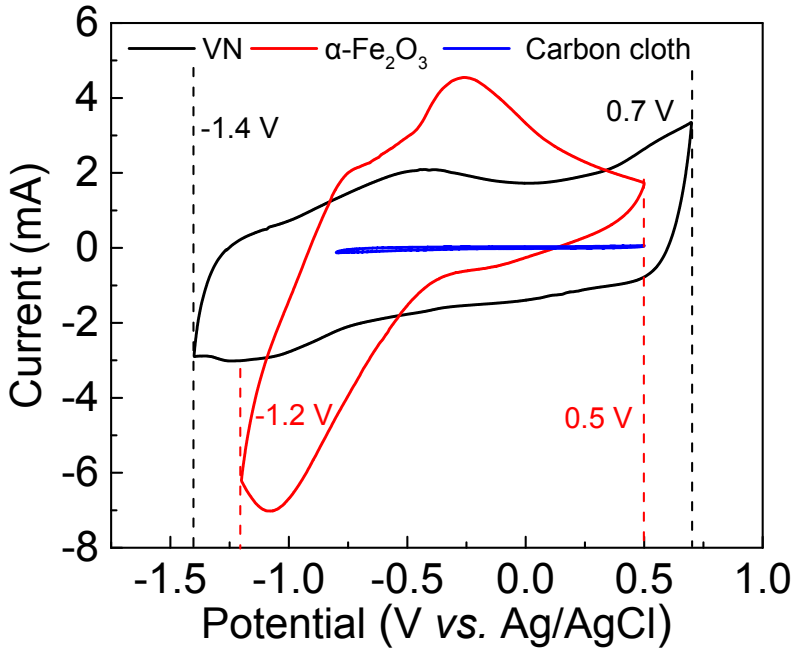

Figure S3. The CV curves of VN, α-Fe_2O_3, and Carbon cloth electrode in 21m LITFSI electrolyte at a scan rate of 20 mV s^{-1}.

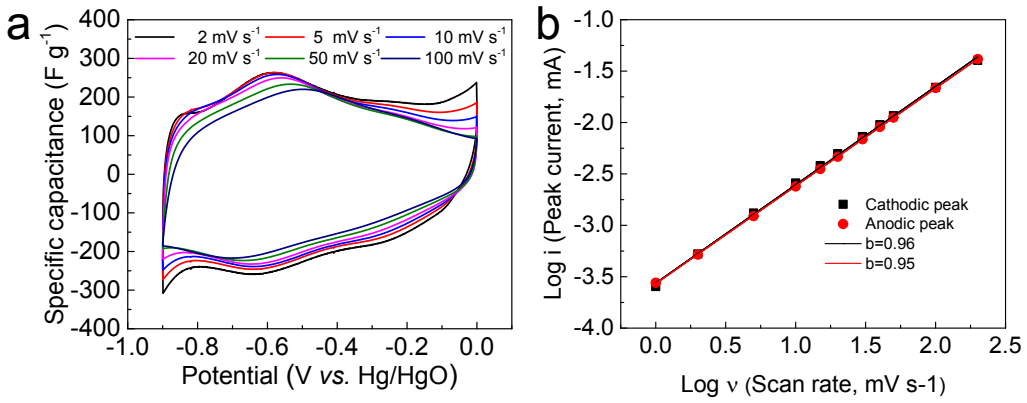

Figure S4. (a) CV curves of VN-NWs@CC at various scan rates in aqueous electrolyte; (b) b-value analysis using the relationship between the peak currents and the scan rates.

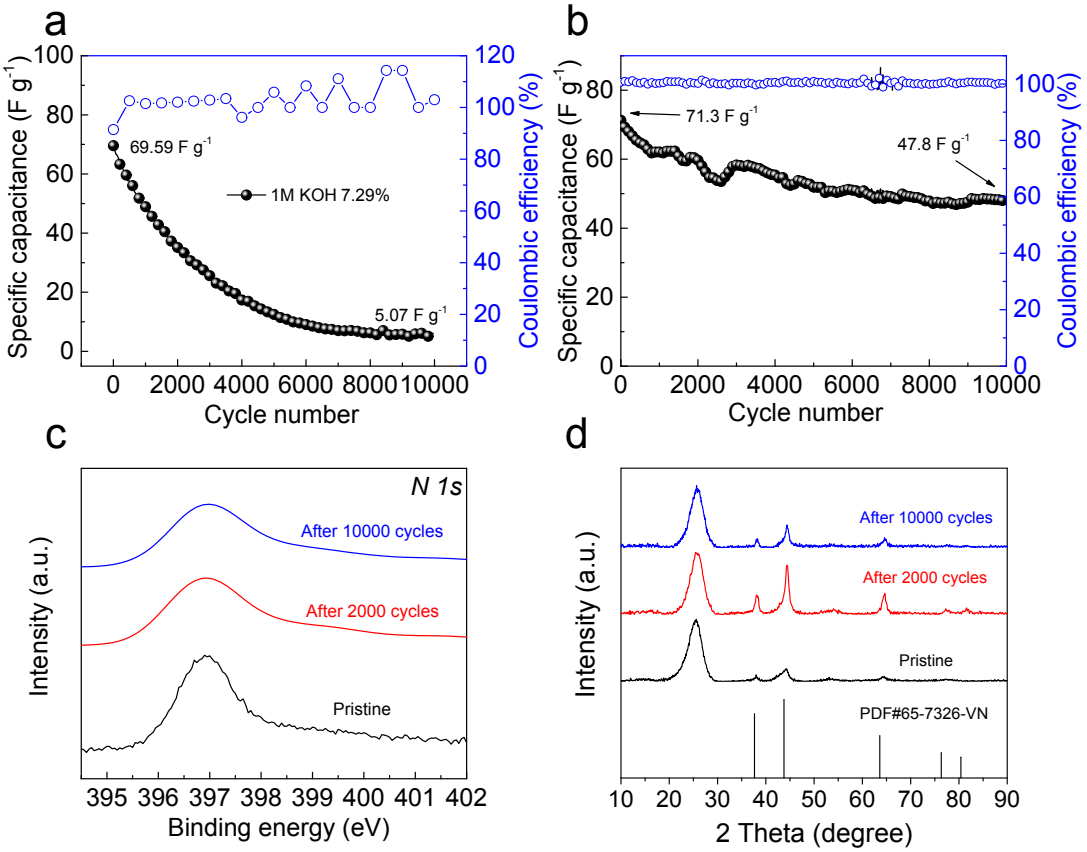

Figure S5. The cycling performance of VN-NWs@CC electrode for 10,000 charge/discharge tests (a) in 1M KOH electrolyte at a current density of 20 A g^{-1}, (b) in 21 m LITFSI electrolyte at a current density of 5 A g^{-1}, (c) the high-resolution XPS spectra of N 1s and (d) XRD patterns for pristine VN, after 2000 cycles, and after 10000 cycles in 21 m LITFSI electrolyte.

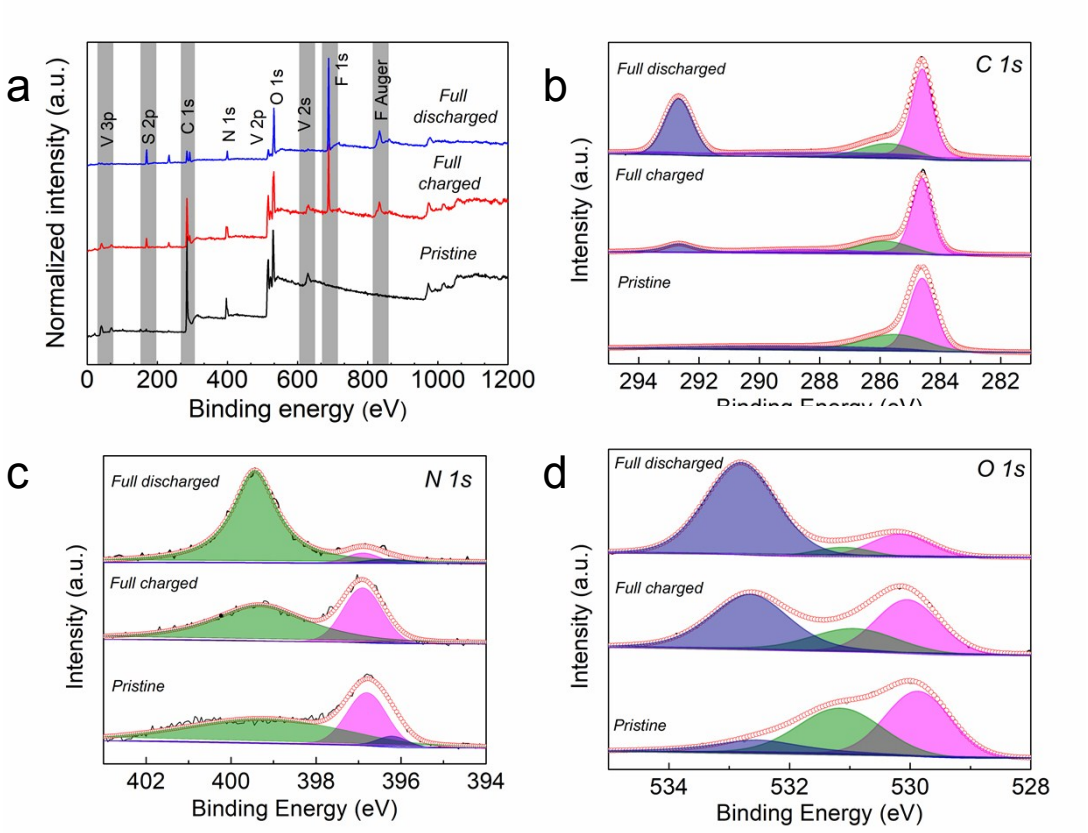

Figure S6. (a) The XPS spectra of full spectrum, high-resolution (b) C 1s, (c) N 1s, and (d) O 1s at pristine, full charge, and full discharge state.

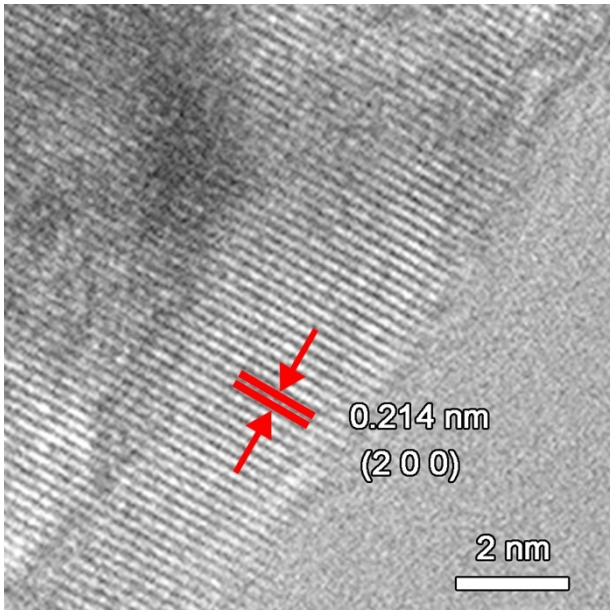

Figure S7. The high-resolution TEM image of VN-NWs@CC of full-discharged state.

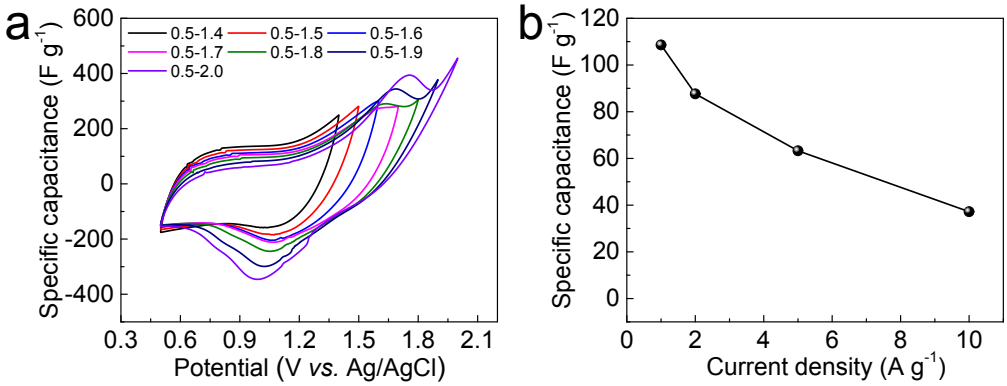

Figure S8. (a) The CV curves of VN-NWs@CC in 21 m LITFSI aquesou electrolyte at different potential ranges, (b) the specific capacitance as a function of current densities for the MnO_2 electrode at 21m LITFSI electrolyte.

Table S1. The comparison of fiting result derived from the impedance spectra with EIS analysis.

Samples	VN	α-Fe_2O_3	Carbon cloth
Rs (ohm)	5.975	6.142	5.523
Rct (ohm)	10.09	9.95	10.02
CPE_{EDL} (S sec^n)	2.89×10^{-7}	6.91×10^{-7}	5.11×10^{-7}
n_{EDL}	0.9682	0.9279	0.9172
CPE_P (S sec^n)	0.1067	0.0025	0.0069
n_P	0.9878	0.8683	0.7879
Zw (ohm $sec^{-1/2}$)	6.96	11.50	17.45

The R_s refers to resistance of electrode and electrolyte, R_{ct} refers to the charge-transfer resistance, Z_w is Warburg impedance corresponding to semi-finite diffusion, and CPE is the constant phase element.

Table S2. The comparison of Warburg coefficient (σ), and chemical diffusion coefficient (D) for VN, α-Fe_2O_3, and Carbon cloth samples, respectively.

Samples	σ (ohm $s^{-1/2}$)	D (cm^2 s^{-1})
VN	15.17	5.20×10^{-14}
α-Fe_2O_3	32.20	3.17×10^{-14}
Carbon cloth	36.40	3.07×10^{-15}