Supporting Information

Hierarchically Nitrogen-Doped Carbon Wrapped $Ni_{0.6}Fe_{0.4}Se_2$ Binary-Metal Selenide Nanocubes with Extraordinary Rate Performance and High Pseudocapacitive Contribution for Sodium-Ion Anodes

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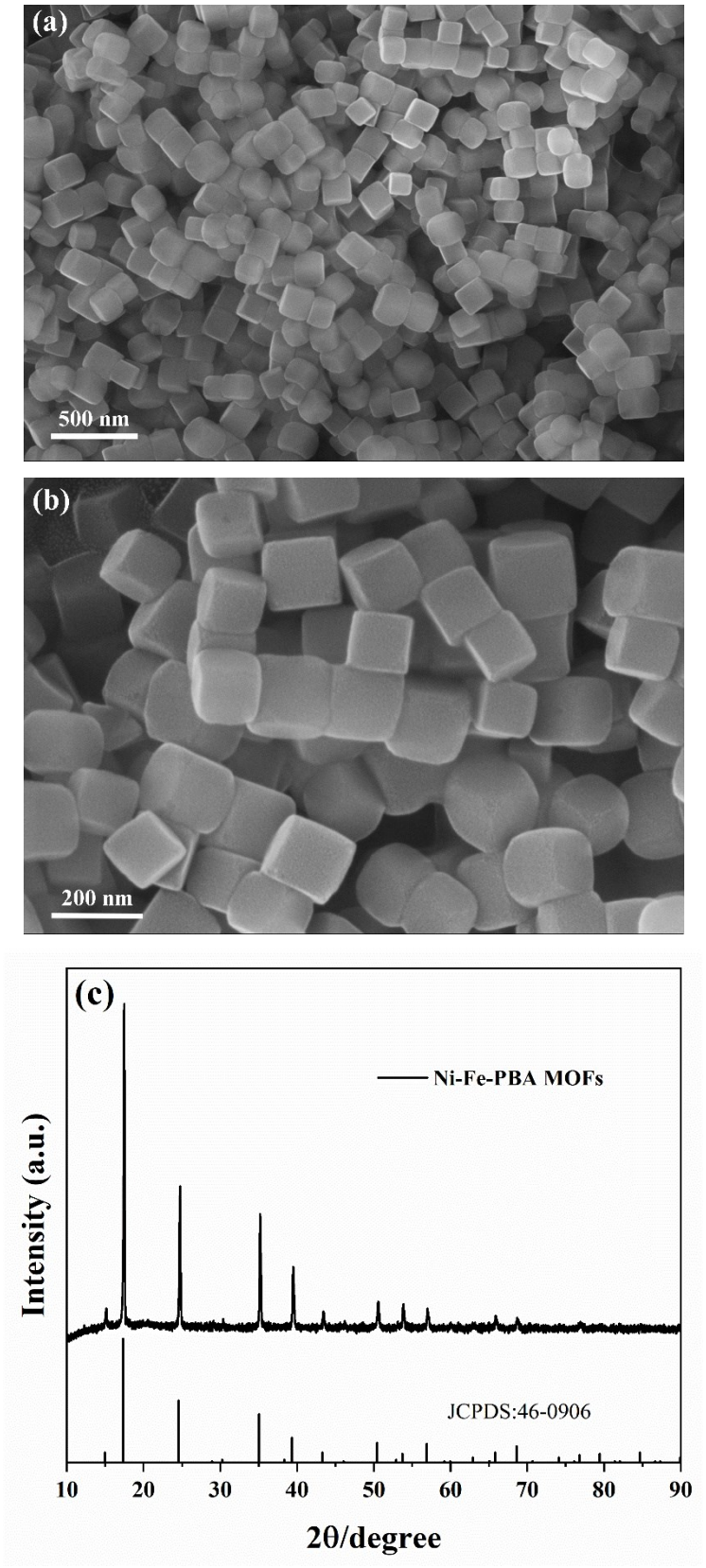

Fig. S1. (a, b) SEM image and (c) XRD pattern of Ni-Fe-PBA precursors.

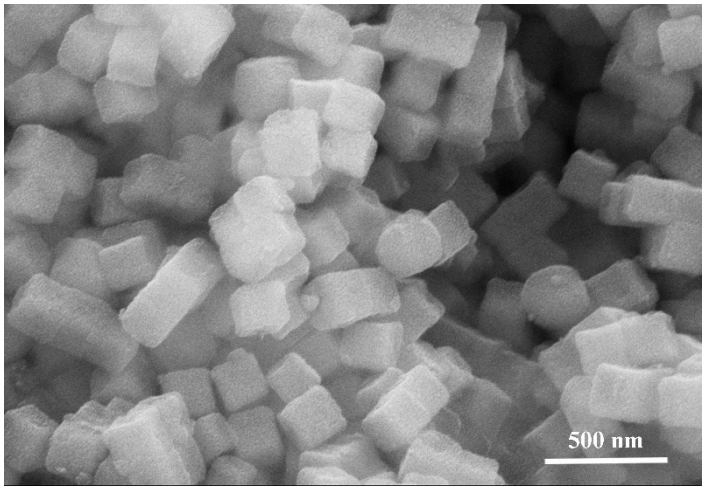

Fig. S2. SEM image of Ni-Fe-PBA@PDA.

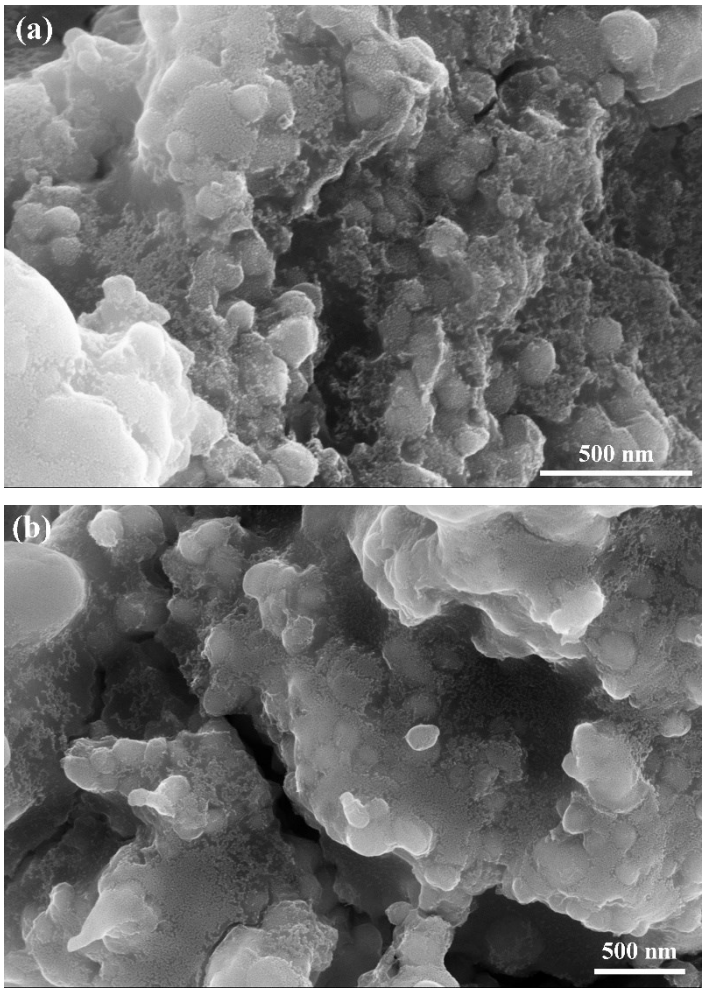

Fig. S3. (a, b) SEM images of NFS.

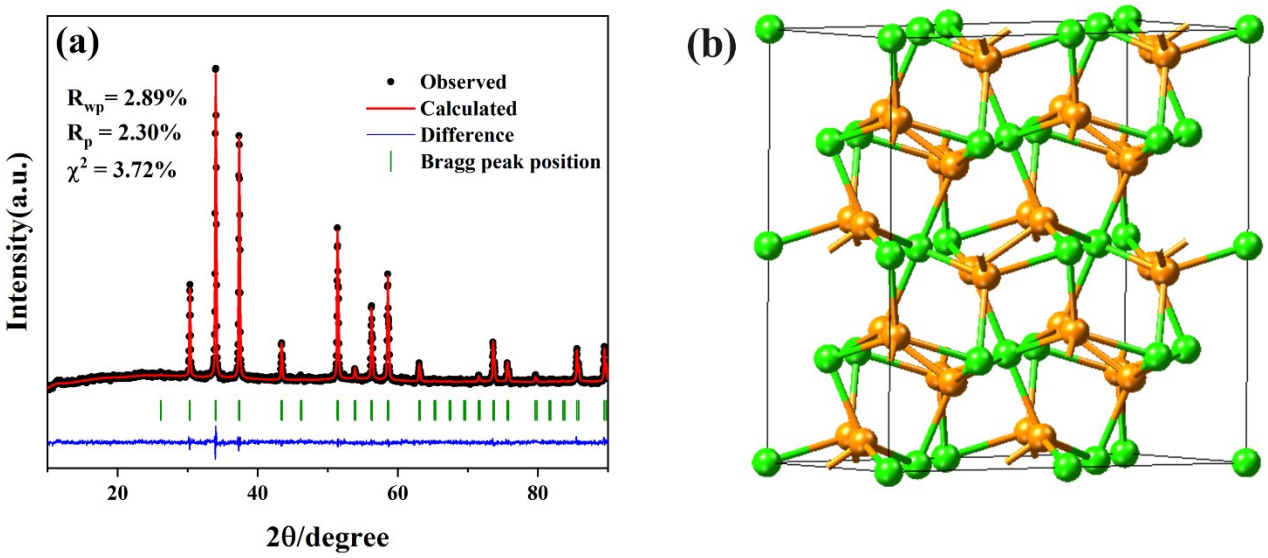

Fig. S4. (a) Rietveld refined XRD pattern of NFS@NC. (b) the crystal structure of the $Ni_{0.6}Fe_{0.4}Se_2$.

Table S1. XRD refined structural parameters of the NFS@NC.

Atom	site	occupancy	x	y	z
Ni	4a	0.6	0	0	0
Fe	4a	0.4	0	0	0
Se	8c	1	0.380738	0.380738	0.380738

Space group: Pa-3. Cell parameter: a=b=c=5.892631; x, y, and z: atomic coordinates.

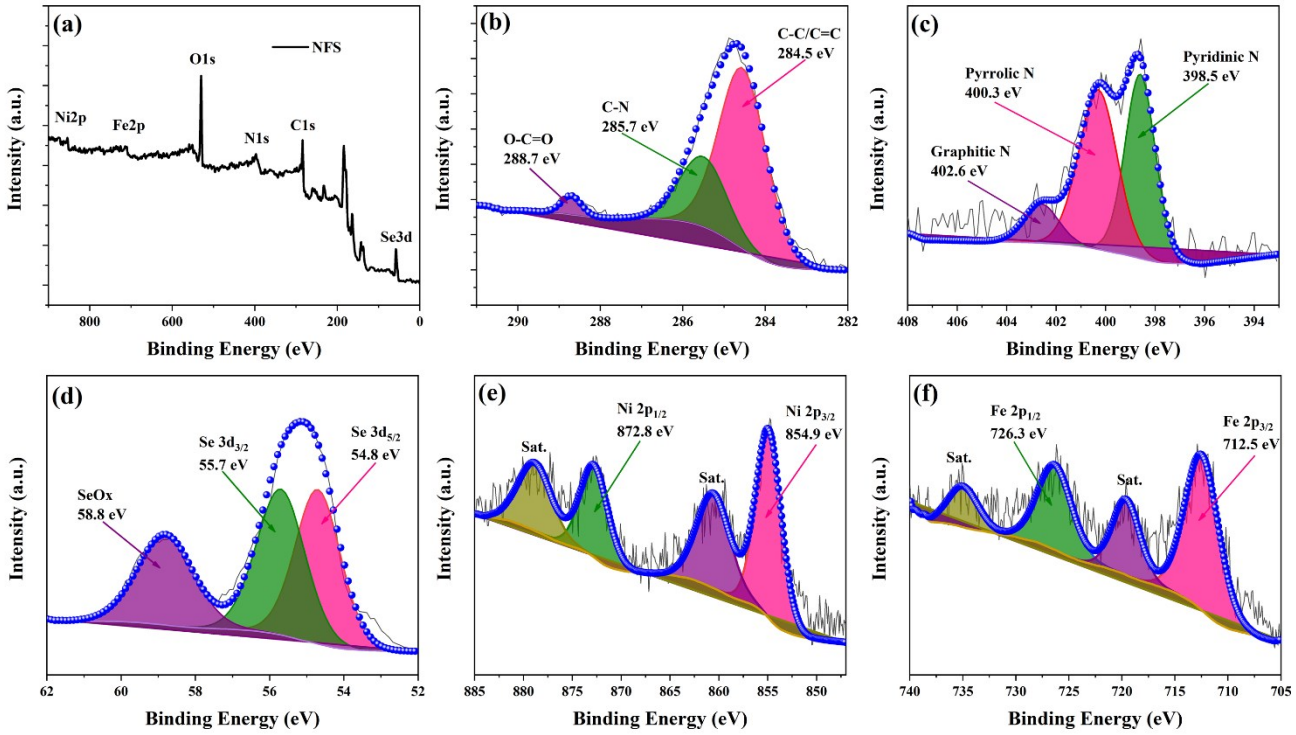

Fig. S5. The full XPS spectrum (a) of NFS and corresponding high-resolution spectra of (b) C1s, (c) N1s, (d) Se 3d, (e) Ni 2p and (f) Fe 2p.

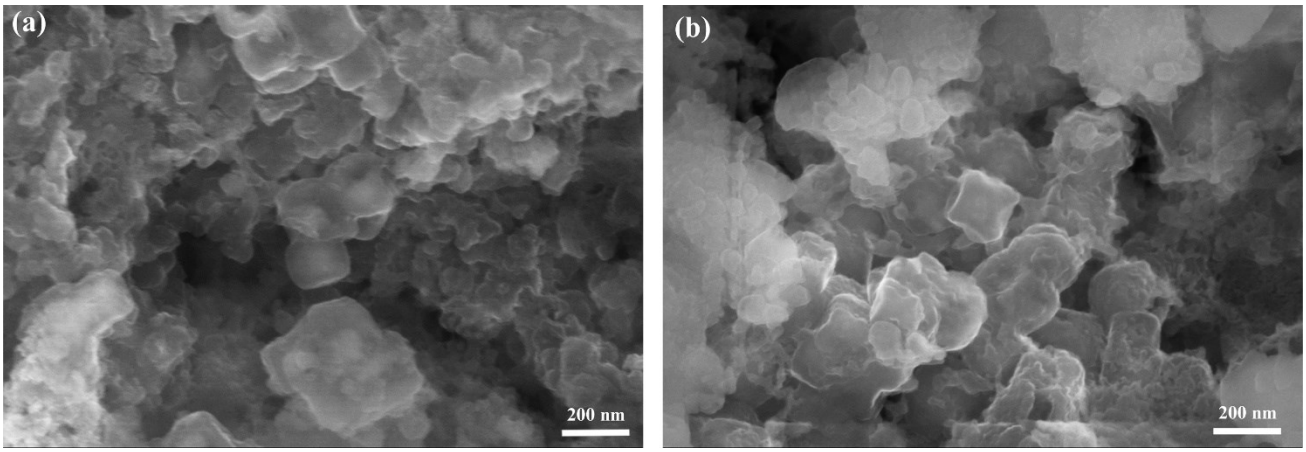

Fig. S6. The SEM images of NFS@NC material after different cycle number: (a) after 500 cycles, (b) after 1000 cycles at 1 A g^{-1}.

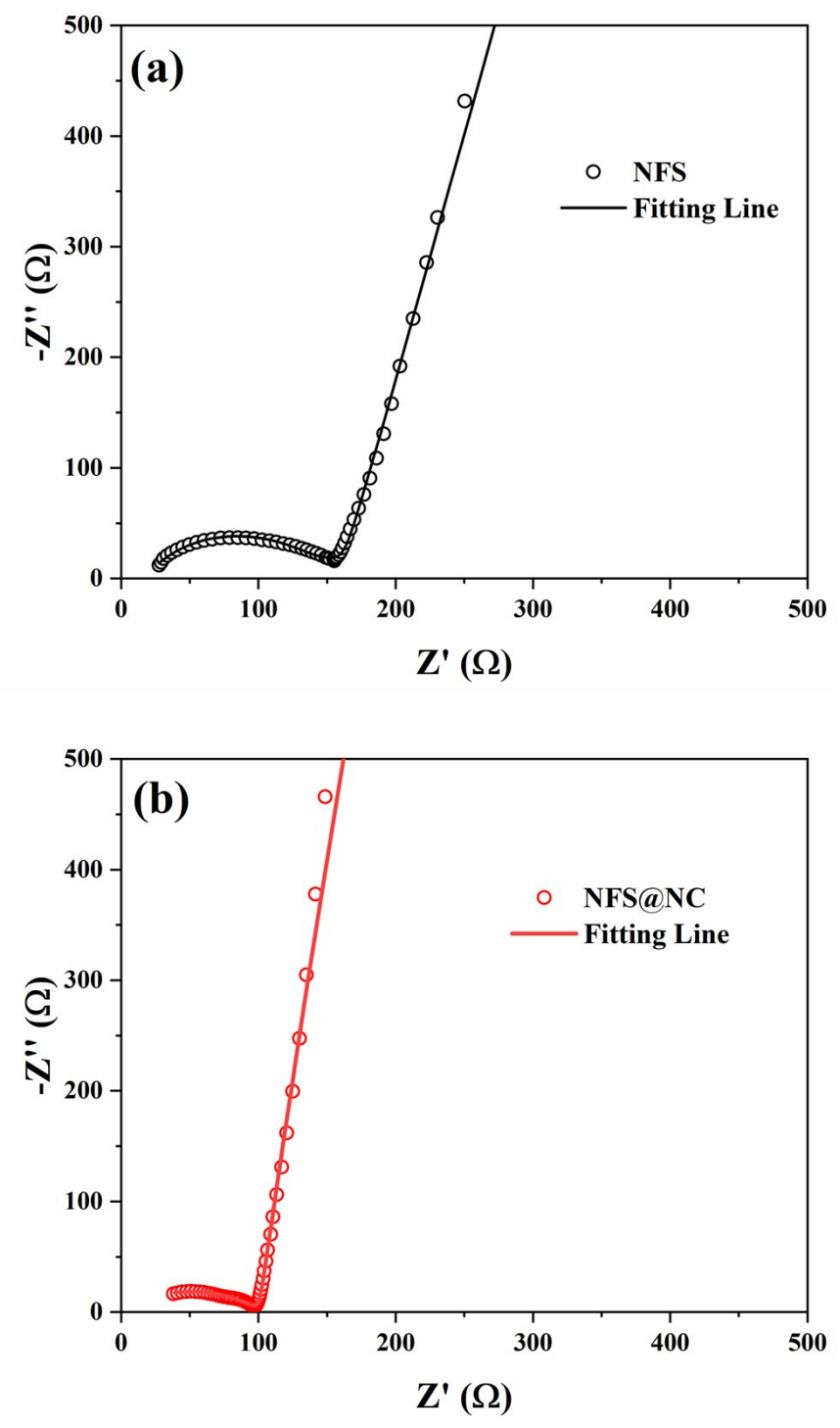

Fig. S7. (a, b) EIS fitting results of NFS and NFS@NC by an equivalent circuit.

Table S2. Fitting result of EIS in Fig. S4 and diffusion coefficients of samples

Samples	Rs (Ω)	Rct (Ω)	D_{Na^+} ($cm^2 s^{-1}$)
NFS	17.36	127.95	3.36×10^{-15}
NFS@NC	9.37	86.27	2.74×10^{-14}

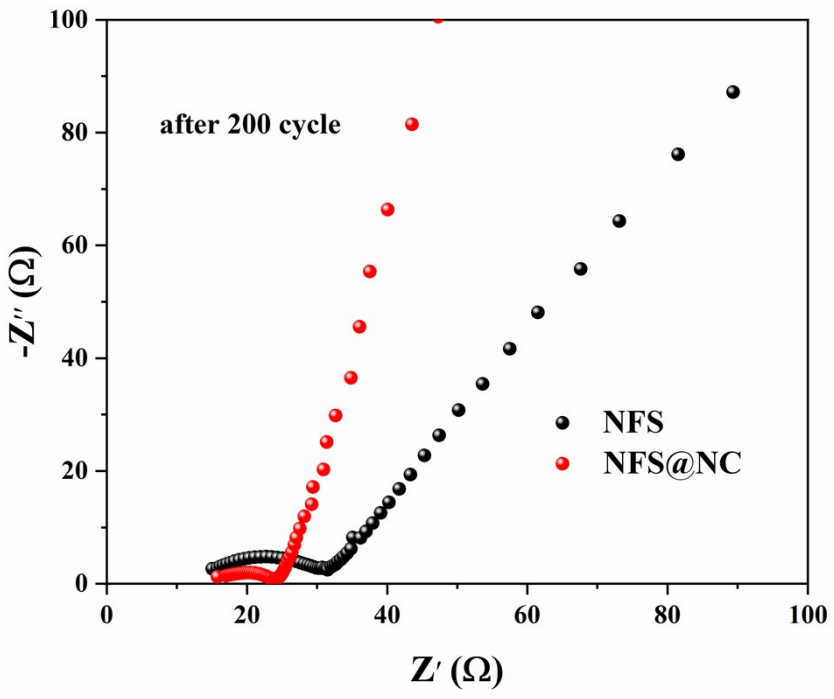

Fig. S8. EIS curves of the NFS and NFS@NC after 200 cycles.

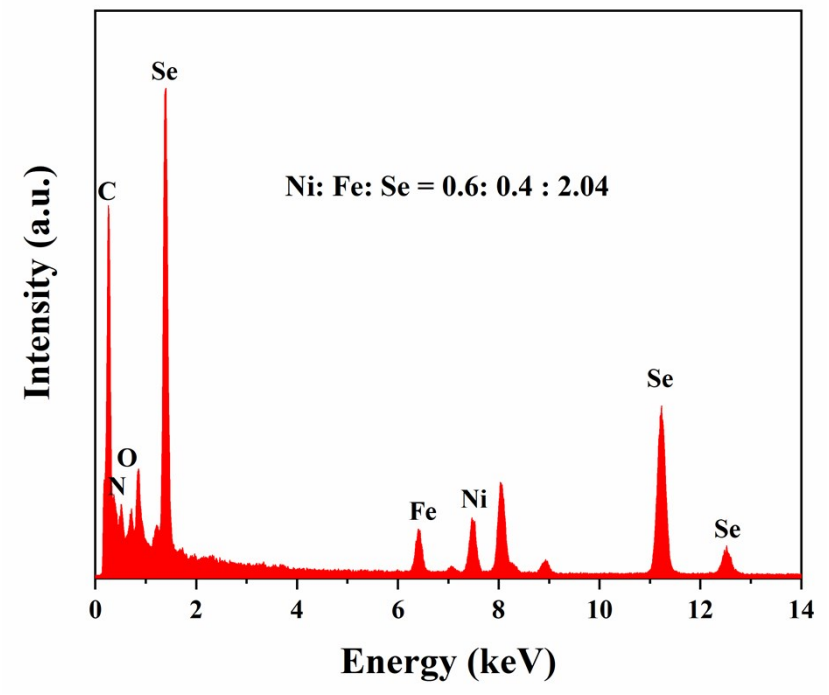

Fig. S9. EDS spectrum of the NFS@NC nanocubes.

Table S3. Weight and atomic percent of C, N, O, Ni, Fe and Se of NFS@NC.

Element	Weight (%)	Atomic (%)
C	41.5	71.4
N	5.8	8.6
O	4.9	6.3
Ni	7.7	2.7
Fe	4.9	1.8
Se	35.2	9.2

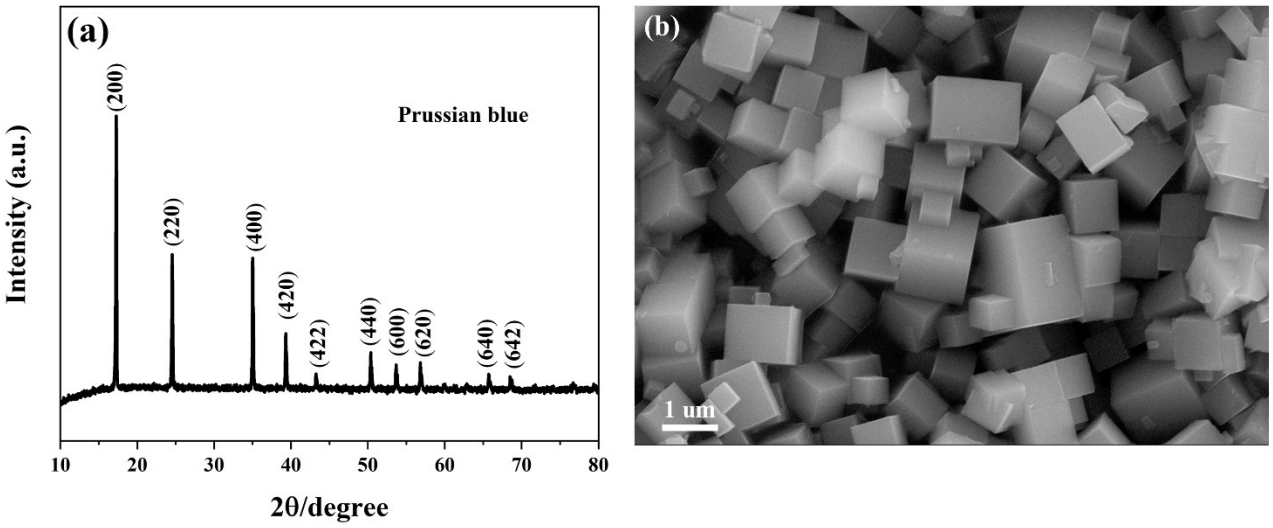

Fig. S10. (a) XRD pattern and (b) SEM image of Prussian blue cathode.