Supporting Information for

Realizing outstanding electrochemical performance with $Na_3V_2(PO_4)_2F_3$ modified by ionic liquid for sodium-ion batteries

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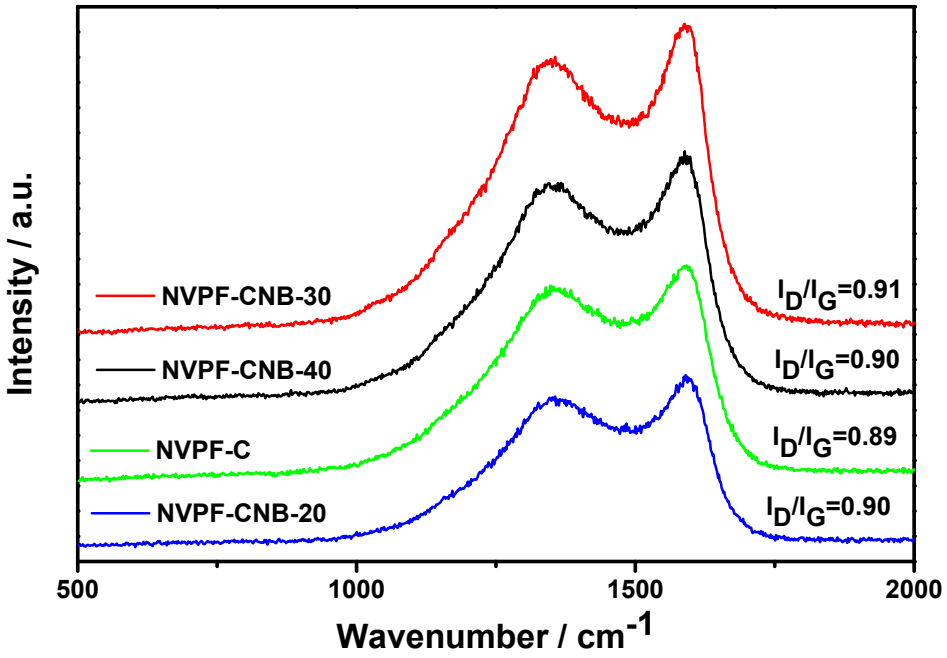


Fig. S1 Raman spectra of all samples.

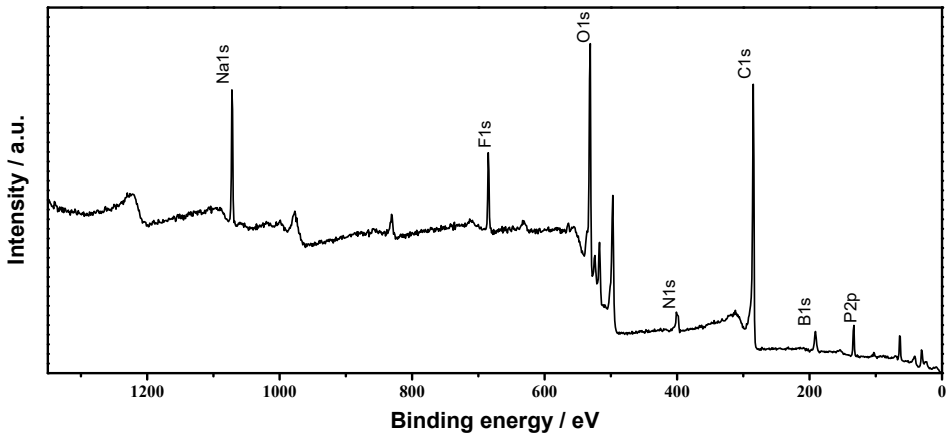


Fig. S2 Full XPS spectra of NVPF-CNB-30.

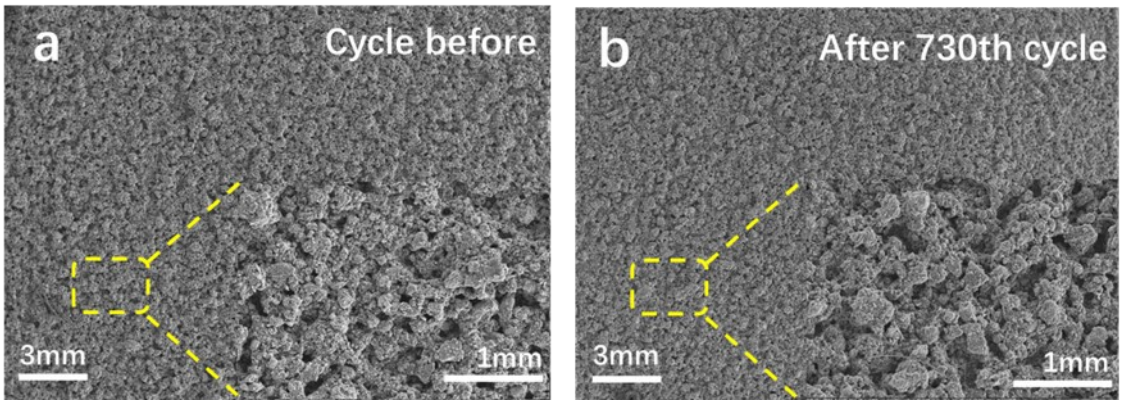
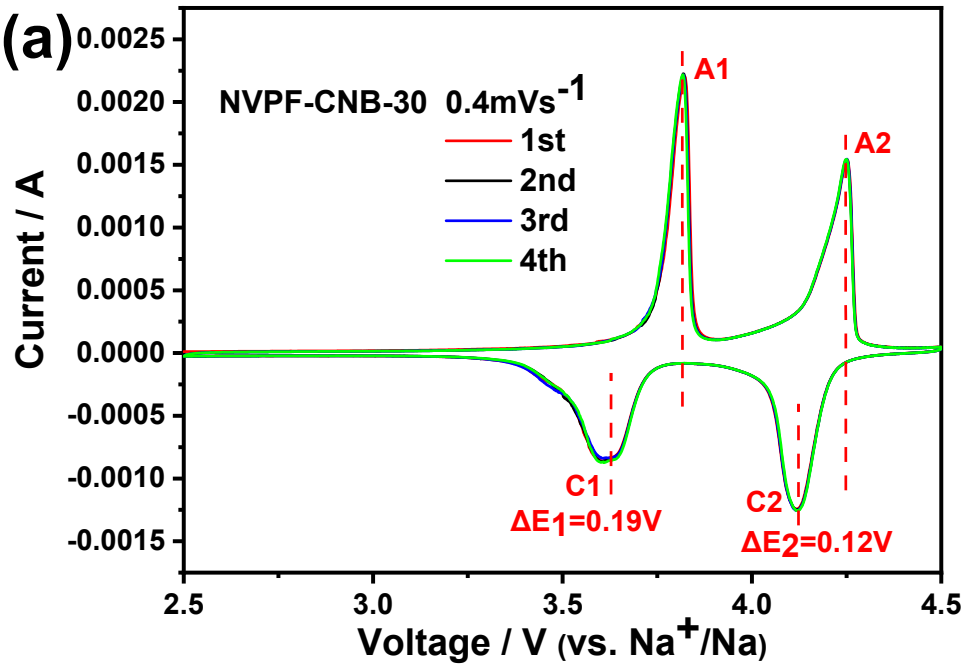


Fig. S3 (a) SEM images of NVPF-CNB-30 anode before cycle, (b) SEM images of NVPF-CNB-30 anode after 730th cycle.



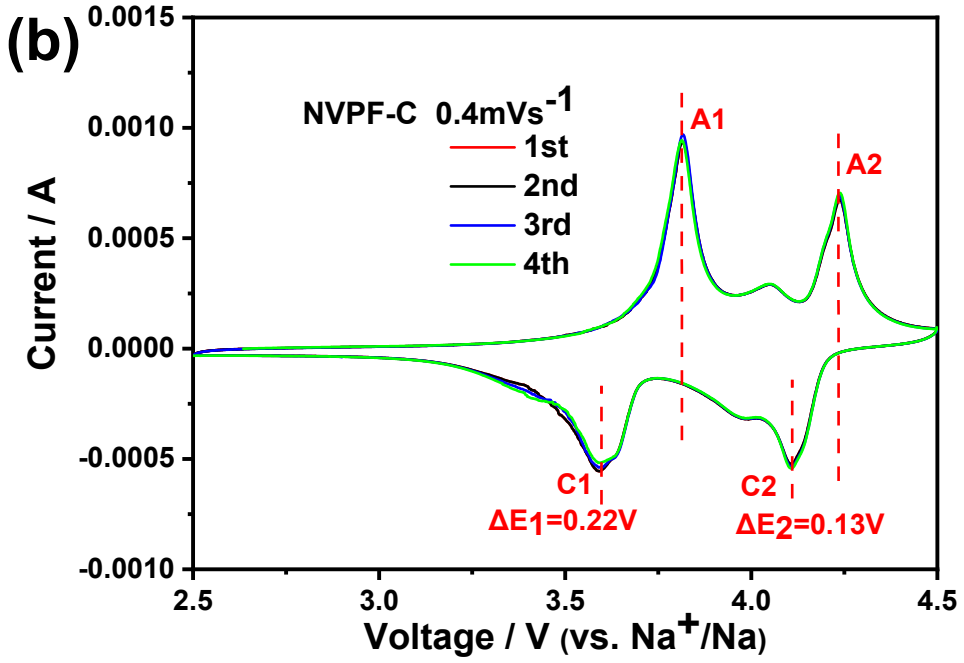
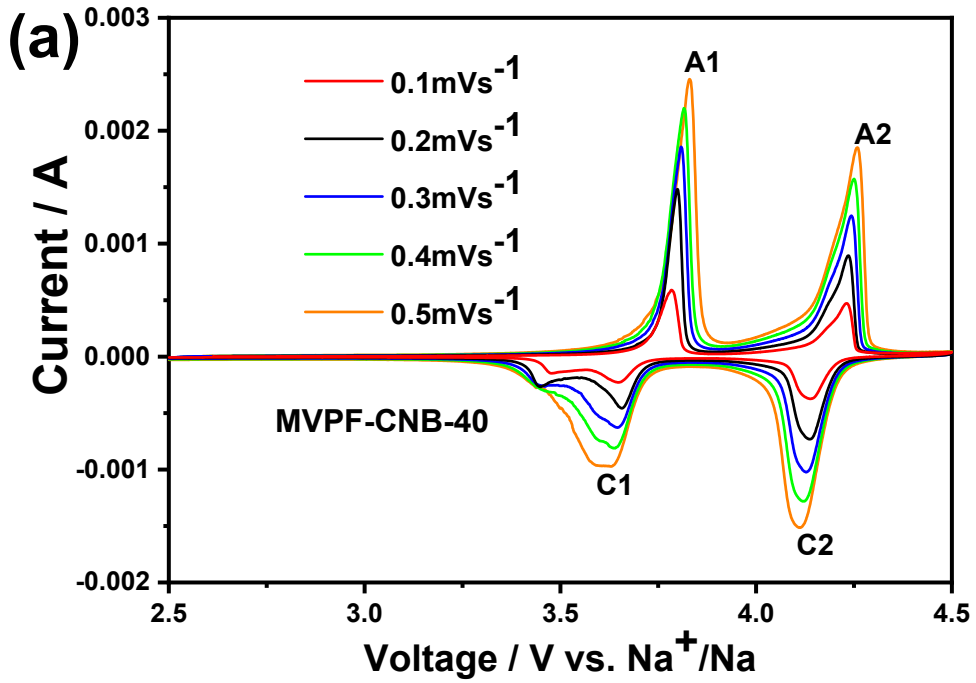
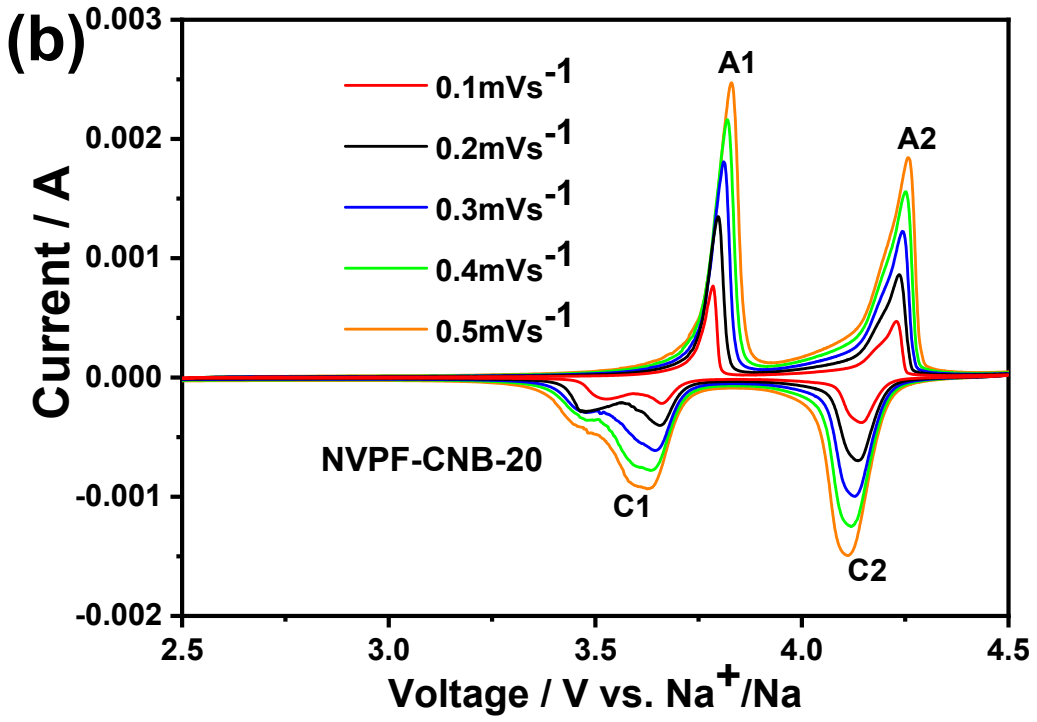


Fig. S4 CV curves of the four cycles of NVPF-CNB-30 and NVPF-C at a scanning rate of 0.4 mV s^{-1} between 2.5-4.5 V: (a) NVPF-CNB-30, (b) NVPF-C.




(b)
0.003
0.002
0.001
0.000
-0.001
-0.002
Current / A
0.1mVs-1
0.2mVs-1
0.3mVs-1
0.4mVs-1
0.5mVs-1
A1
A2
NVPF-CNB-20
C1
C2
2.5
3.0
3.5
4.0
4.5
Voltage / V vs. Na+/Na

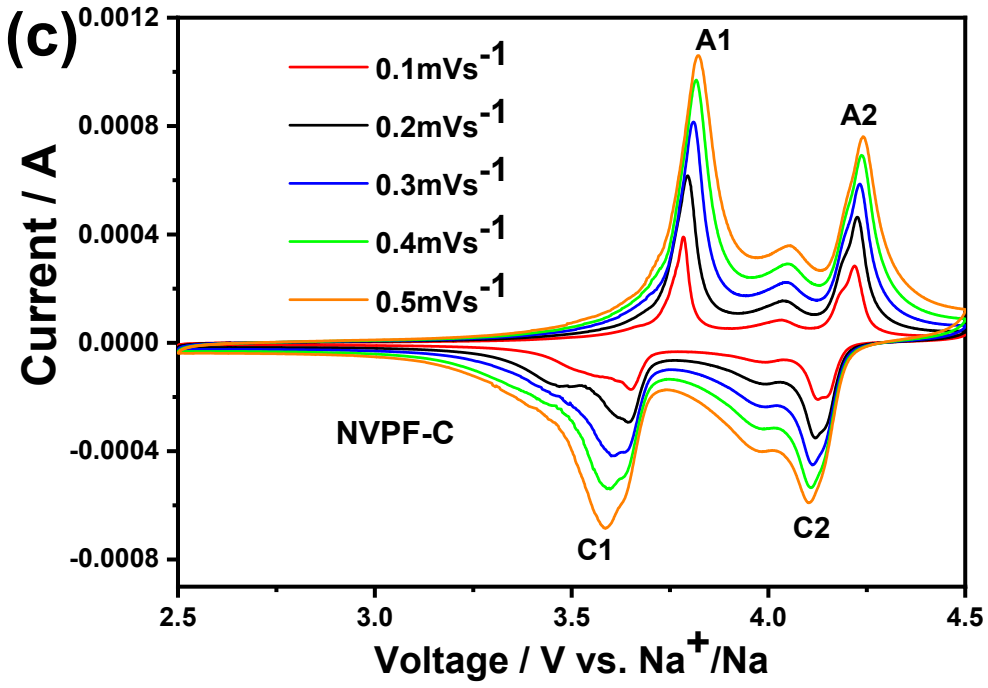

(c)
0.0012
0.0008
0.0004
0.0000
-0.0004
-0.0008
Current / A
0.1mVs-1
0.2mVs-1
0.3mVs-1
0.4mVs-1
0.5mVs-1
A1
A2
NVPF-C
C1
C2
2.5
3.0
3.5
4.0
4.5
Voltage / V vs. Na+/Na

Fig. S5 CV curves of NVPF-CNB-40, NVPF-CNB-20, NVPF-C at various scan rates, respectively: (a) NVPF-CNB-40, (b) NVPF-CNB-20, (c) NVPF-C.

Table S1 sodium ion diffusion coefficients at peak positions for all samples at a scan rate of 0.5mV·s^{-1}.

Sample	D_{Na^+} (cm^2 s^{-1})
NVPF-CNB-30 (A1)	4.9×10^{-11}
NVPF-CNB-30 (A2)	3.5×10^{-11}
NVPF-CNB-30 (C1)	1.94×10^{-11}
NVPF-CNB-30 (C2)	2.7×10^{-11}
NVPF-CNB-20 (A1)	4.2×10^{-11}
NVPF-CNB-20 (A2)	3.15×10^{-11}
NVPF-CNB-20 (C1)	1.62×10^{-11}
NVPF-CNB-20 (C2)	2.6×10^{-11}
NVPF-CNB-40 (A1)	4.28×10^{-11}
NVPF-CNB-40 (A2)	3.2×10^{-11}
NVPF-CNB-40 (C1)	1.71×10^{-11}
NVPF-CNB-40 (C2)	2.62×10^{-11}
NVPF-C (A1)	1.85×10^{-11}
NVPF-C (A2)	1.32×10^{-11}
NVPF-C (C1)	1.2×10^{-11}

NVPF-C (C2)	1.03×10^{-11}