

Support

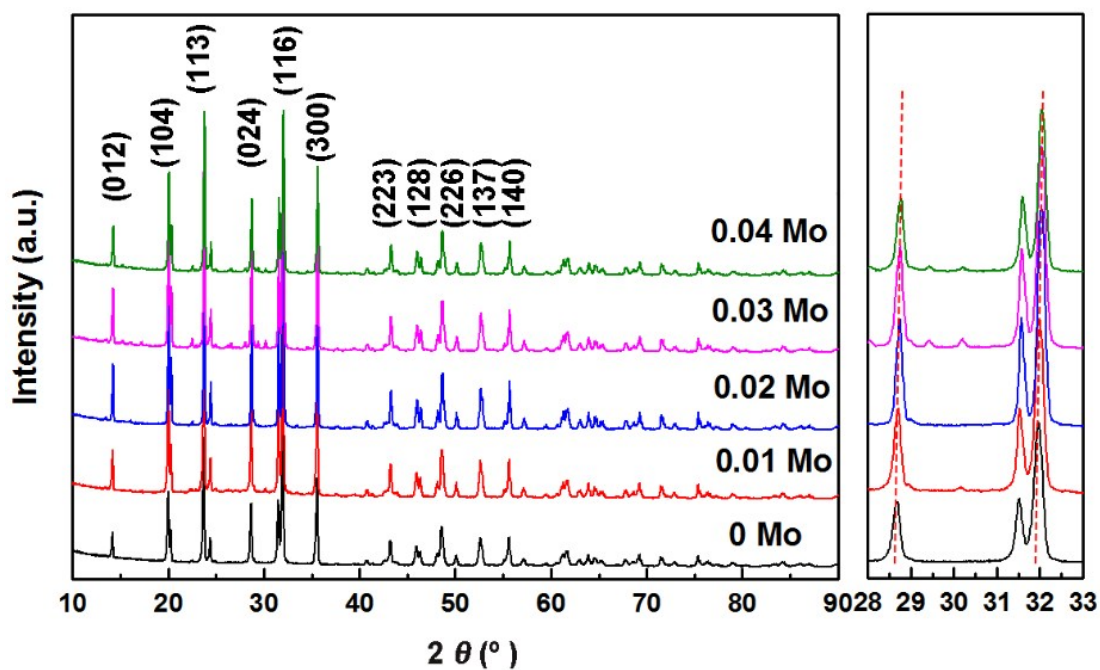


Fig. S1 XRD patterns of $\text{Na}_{3-5x}\text{Mo}_x\text{V}_{2-x}(\text{PO}_4)_3$ ($x=0 - 0.04$).

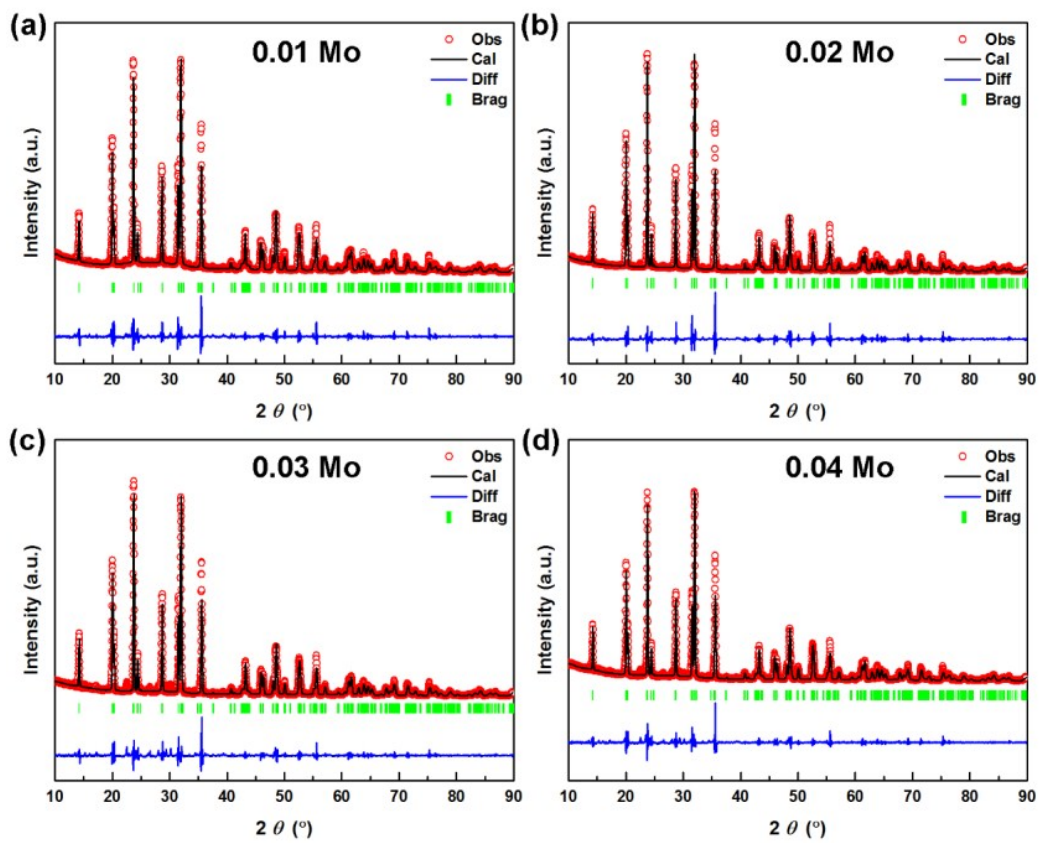


Fig. S2 Rietveld Refinement patterns of $\text{Na}_{3-5x}\text{Mo}_x\text{V}_{2-x}(\text{PO}_4)_3$

(a) $x = 0$; (b) $x = 0.01$; (c) $x = 0.03$; (d) $x = 0.04$.

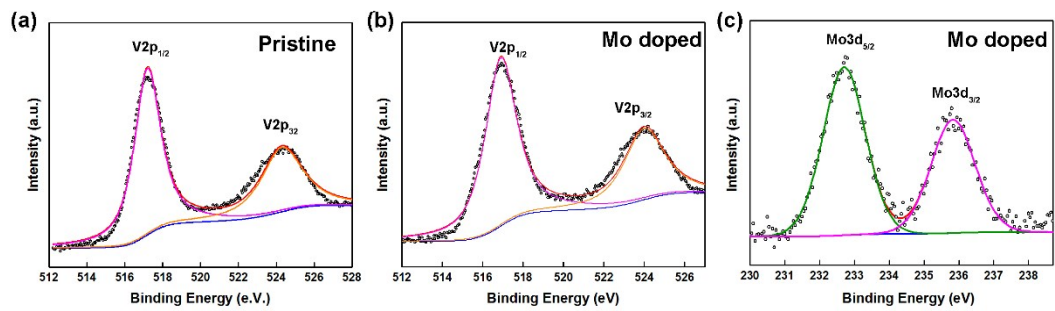


Fig. S3 High resolution X-ray photoelectron spectra of pristine NVP and Mo doped NVP: (a) V 2p, V 2p (a) and Mo 3d (b).

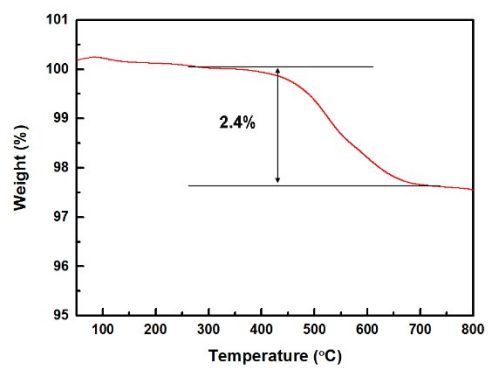


Fig. S4 Thermogravimetry patterns of the NVP/C.

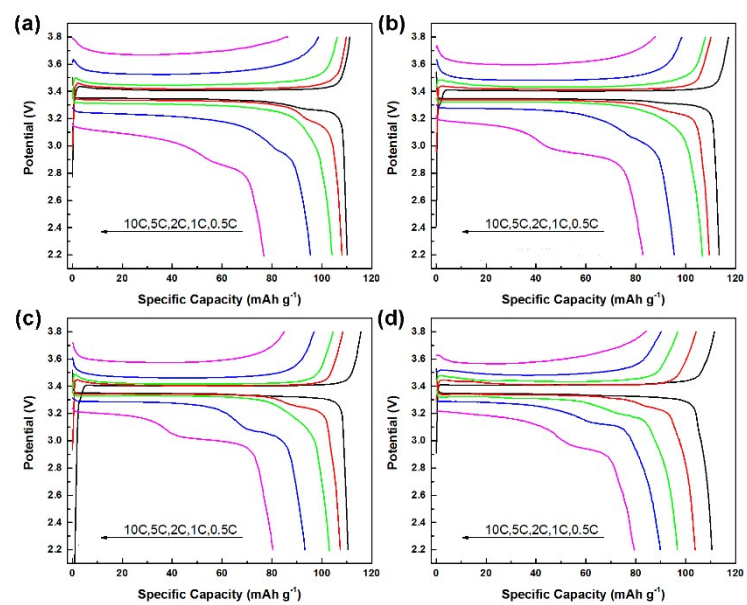


Fig. S5 Charge/Discharge curves of different rate from 0.5C to 10C

(a) $x = 0$; (b) $x = 0.01$; (c) $x = 0.03$; (d) $x = 0.04$.

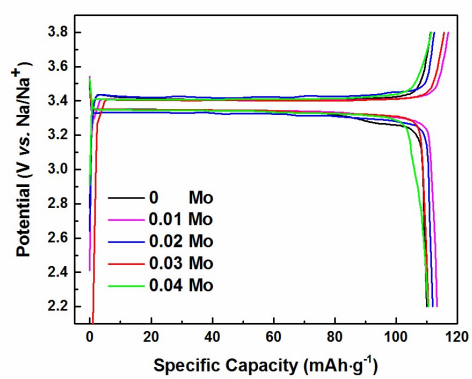


Fig. S6 Comparison charge/discharge curves of $\text{Na}_{3-5x}\text{Mo}_x\text{V}_{2-x}(\text{PO}_4)_3$ at 0.5C

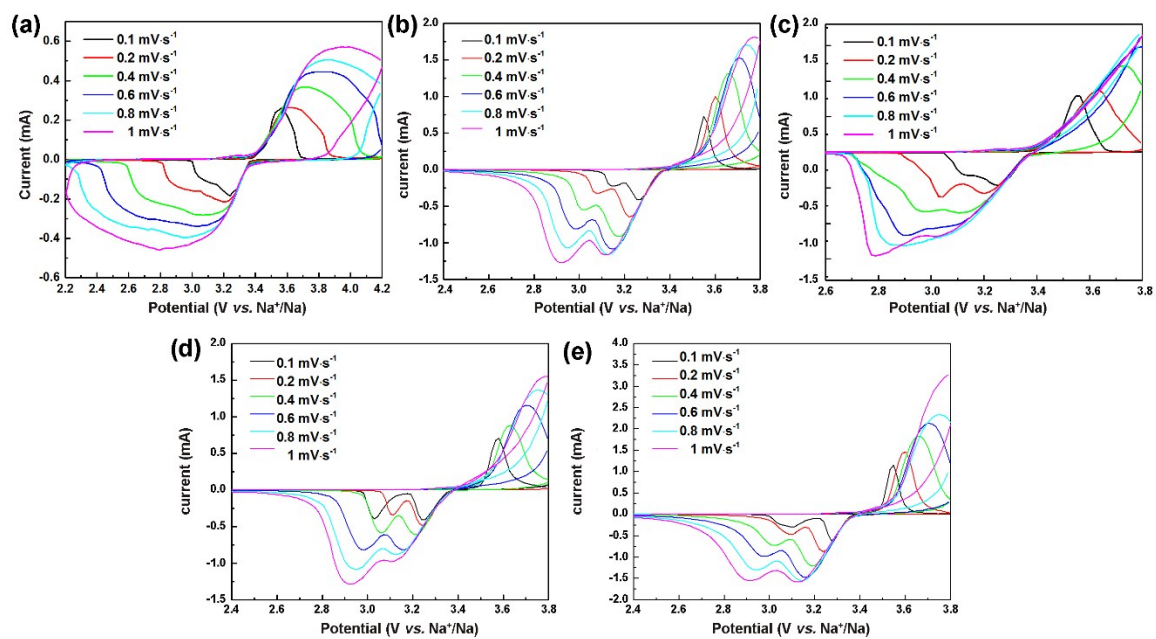


Fig. S7 CV curves of $\text{Na}_{3-5x}\text{Mo}_x\text{V}_{2-x}(\text{PO}_4)_3$

(a) $x = 0$; (b) $x = 0.01$; (c) $x = 0.02$; (d) $x = 0.03$; (e) $x = 0.04$.

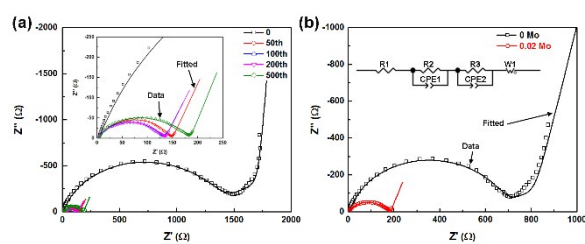


Fig. S8 The Nyquist plots circuit of $\text{Na}_{2.9}\text{V}_{1.98}\text{Mo}_{0.02}(\text{PO}_4)_3$ at different cycles (a) and comparison of $\text{Na}_{2.9}\text{V}_{1.98}\text{Mo}_{0.02}(\text{PO}_4)_3$ and $\text{Na}_3\text{V}_2(\text{PO}_4)_3$ after 500 cycles. (inset: equivalent circuit of $\text{Na}_{2.9}\text{V}_{1.98}\text{Mo}_{0.02}(\text{PO}_4)_3$).

Table S1 parameters of $\text{Na}_{3-5x}\text{V}_{2-x}\text{Mo}_x(\text{PO}_4)_3$ by Rietveld Refinement

	a=b(Å)	c(Å)	Volume(Å ³)	R _{wp}	R _p
NVP	8.7142(1)	21.7908(5)	1433.04(4)	9.27%	6.85%
0.01 Mo	8.7281(1)	21.8194(5)	1439.51(4)	10.25%	7.45%
0.02 Mo	8.7374(1)	21.8423(4)	1444.10(3)	11.75%	8.53%
0.03 Mo	8.7403(1)	21.8588(5)	1446.13(4)	12.22%	9.08%
0.04 Mo	8.7517(1)	21.8895(5)	1451.95(4)	10.79%	7.81%

Table S2 Sodium ion diffusion coefficients (D) of samples (Unit: cm² s⁻¹)

Sample	D _{Na1}	D _{Na2}
Na ₃ V ₂ (PO ₄) ₃	7.1955e ⁻¹³	
Na _{2.95} V _{1.99} Mo _{0.01} (PO ₄) ₃	1.1589e ⁻¹¹	5.8044e ⁻¹²
Na _{2.9} V _{1.98} Mo _{0.02} (PO ₄) ₃	1.2202e ⁻¹¹	6.0116e ⁻¹²
Na _{2.85} V _{1.97} Mo _{0.03} (PO ₄) ₃	1.188e ⁻¹¹	3.3191e ⁻¹²
Na _{2.8} V _{1.96} Mo _{0.04} (PO ₄) ₃	1.7082e ⁻¹¹	7.1728e ⁻¹²

Table S3 EIS fitting results of $\text{Na}_{3-5x}\text{V}_{2-x}\text{Mo}_x(\text{PO}_4)_3$ in different cycle

	0.02 Mo 0	0.02 Mo 50 st	0.02 Mo 100 th	0.02 Mo 200 th	0.02 Mo 500 th
R1	3.137	3.358	2.354	2.457	3.356
R2	1344	32.7	34.8	24.5	22.5
R3	-	108.9	92.9	102.9	151
CPE1-T	2.456E-6	6.036E-6	6.136E-6	6.236E-6	6.536E-6
CPE1-P	0.8505	0.7507	0.7371	0.7426	0.8678
CPE2-T	-	4.2432E-5	4.3576E-5	5.2441E-5	4.3441E-5
CPE2-P	-	0.7229	0.7134	0.7229	0.7183
W1-r	877	16.27	20.27	18.43	26.27
W1-t	1.037	0.086	0.113	0.123	0.155
W1-p	0.4497	0.3866	0.3776	0.3743	0.3998

Table S4 Electronic Conductivities of $\text{Na}_{3-5x}\text{V}_{2-x}\text{Mo}_x(\text{PO}_4)_3$

	Mo 0	Mo 0.01	Mo 0.02	Mo 0.03	Mo 0.04
Powders	$0.2 \text{ S}\cdot\text{m}^{-1}$	$0.015 \text{ S}\cdot\text{m}^{-1}$	$2 \text{ S}\cdot\text{m}^{-1}$	$0.1 \text{ S}\cdot\text{m}^{-1}$	$0.05 \text{ S}\cdot\text{m}^{-1}$
Electrode	$300 \text{ S}\cdot\text{m}^{-1}$	$800 \text{ S}\cdot\text{m}^{-1}$	$1400 \text{ S}\cdot\text{m}^{-1}$	$750 \text{ S}\cdot\text{m}^{-1}$	$600 \text{ S}\cdot\text{m}^{-1}$