Modulation of MoS_2 interlayer dynamics by in situ N-doped carbon intercalation for high-rate sodium-ion half/full batteries

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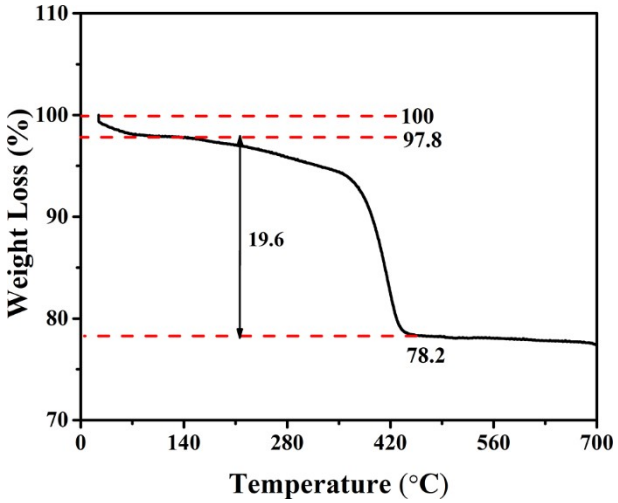

Fig. S1. TGA curve of MoS_2/NC.

The accurate loading of C in MoS_2/NC was calculated according to the Equation below, and the mass percentage of carbon in MoS_2/NC is 7.79%.

$$\text{Wt \% (C)} = 1 - \text{Wt \% } (H_2O) - \text{Wt \% R} \times \frac{M\ (MoS2)}{M\ (MoO3)}$$

where Wt % (C) and Wt % (H_2O) is respectively the mass percentage of carbon and water molecules in the sample, and Wt % R is the mass percentage of the remains.

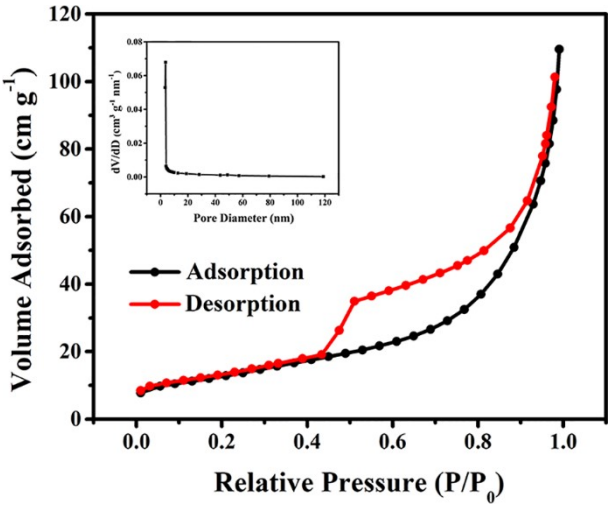

Fig. S2. The nitrogen adsorption-desorption isotherms curve of MoS_2/NC composite.

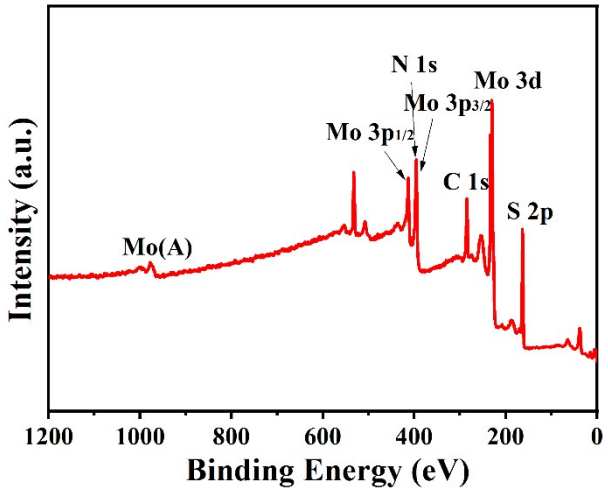

Fig. S3. The XPS survey spectrum of MoS_2/NC.

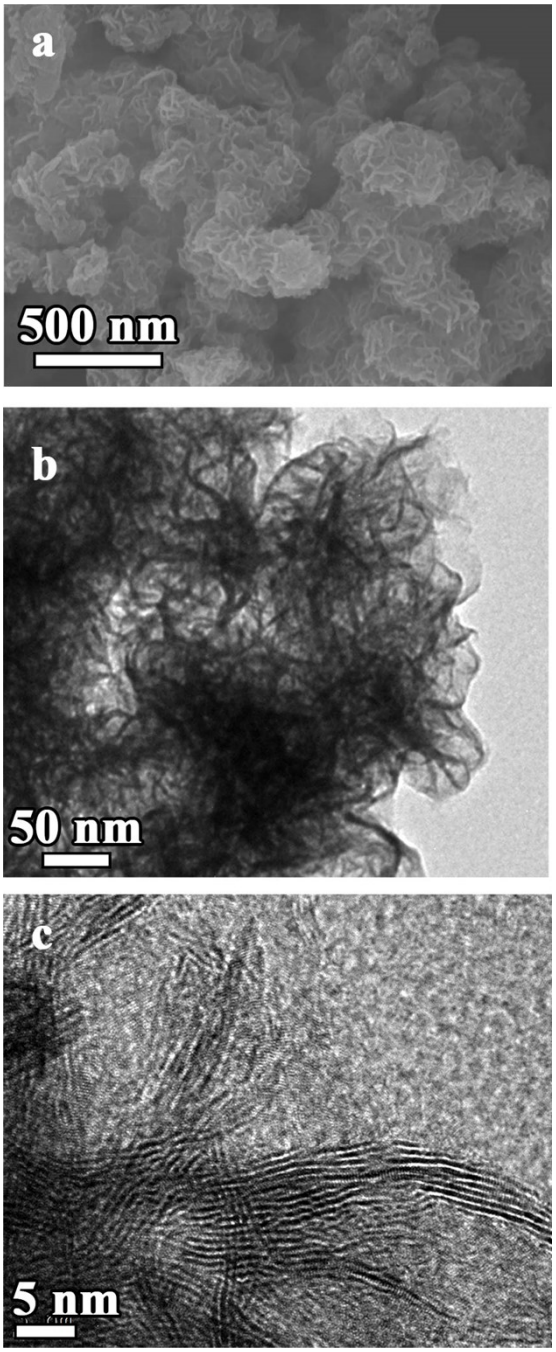

Fig. S4. (a)SEM, (b) TEM and (c) HRTEM images of pristine MoS_2.

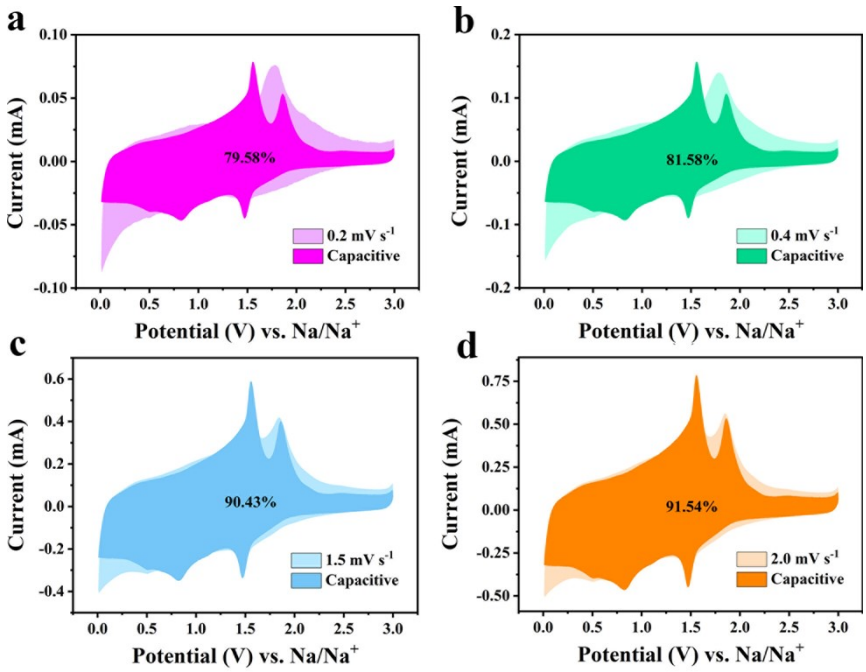

Fig. S5. Capacitive contribution in CV curves under the scan rate of (a) 0.2, (b) 0.4, (c) 1.5 and (d) 2.0 mV s^{-1}.

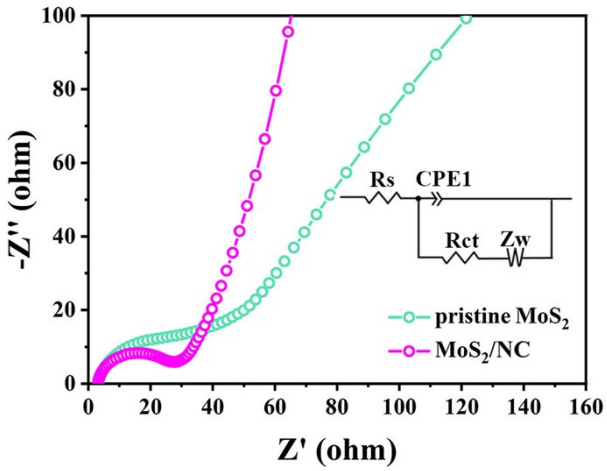

Fig. S6. Nyquist plots of the MoS_2/NC and pristine MoS_2 electrodes. The inset is corresponding equivalent circuit.

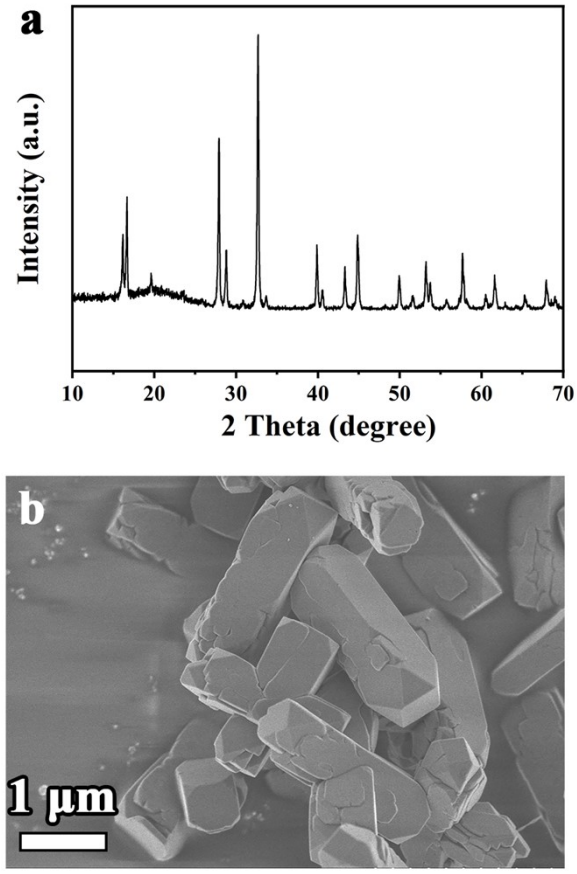

Fig. S7. (a) XRD pattern and (b) SEM image of) $Na_3V_2(PO_4)_2O_2F$.

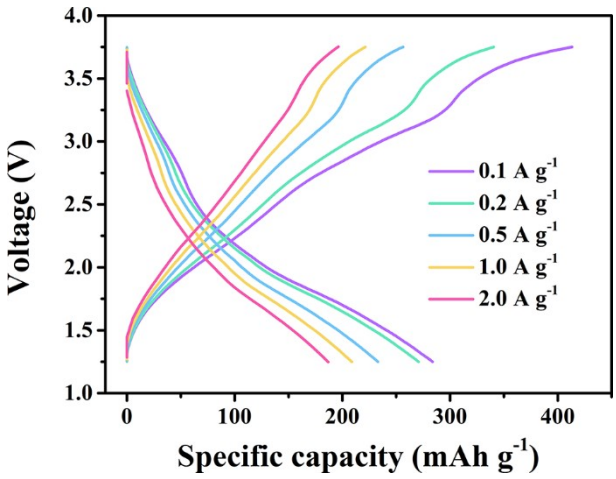

Fig. S8. Charge/discharge curves at current densities from 0.1 to 2 A g^{-1} of MoS_2/NC//NVPOF full battery.