Supporting Information

Macroporous C@MoS_2 composite as anode for high-performance sodium-ion batteries

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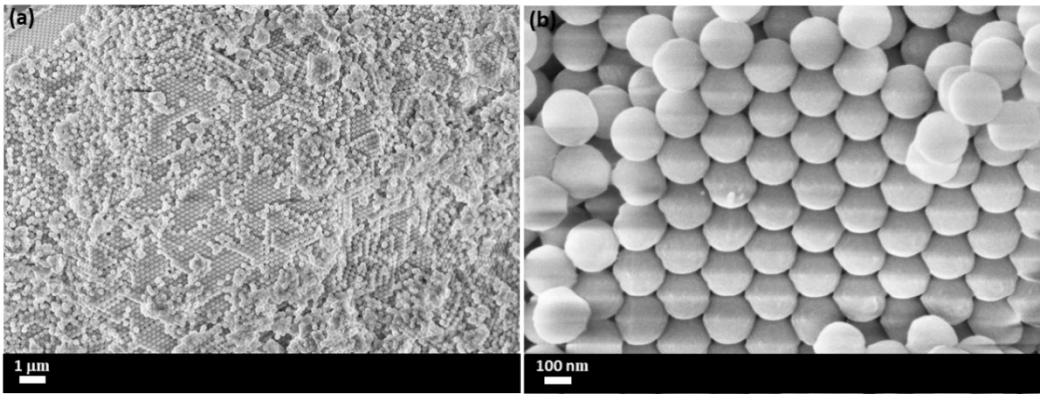

Fig. S1. SEM images of PS nanospheres with ordered 3D structure (a-b).

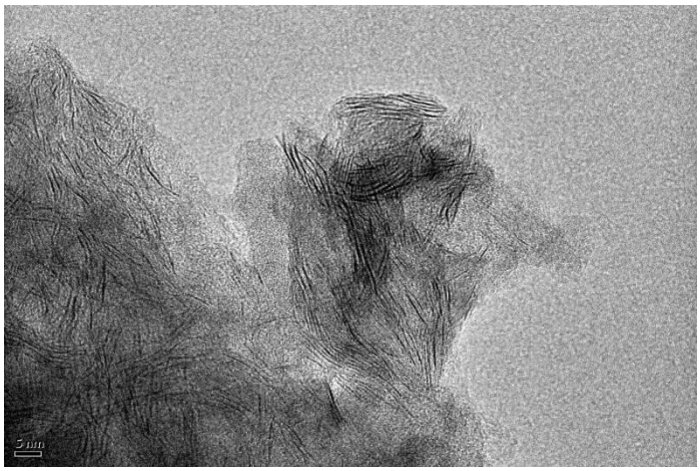

Fig. S2. Structure characterization of Porous C@MoS_2, HRTEM image.

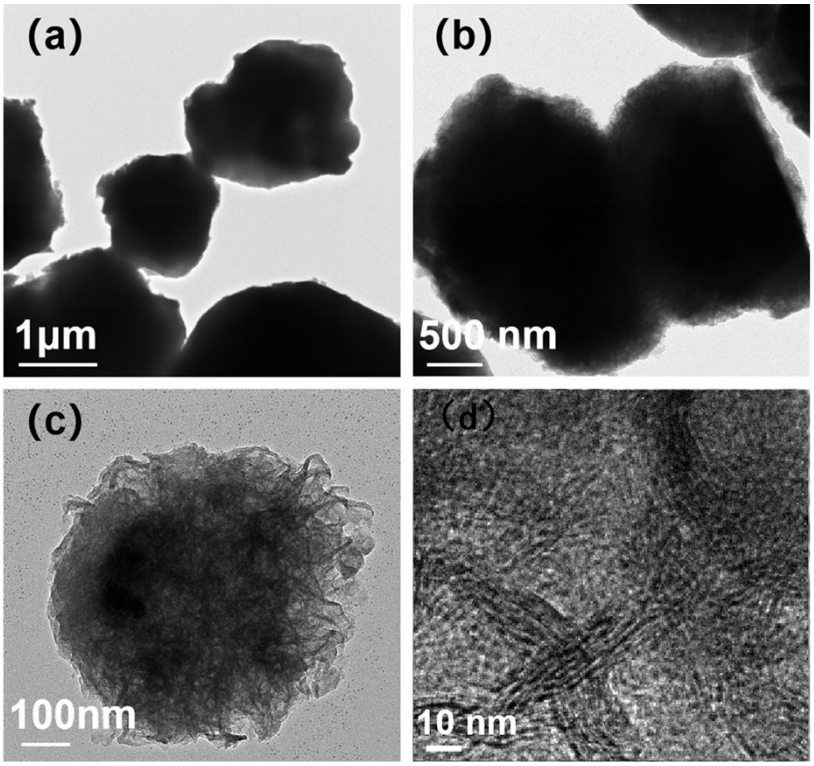

Fig. S3. The nanostructure characterizations of C@MoS_2, TEM images (a-c) and HRTEM image (d).

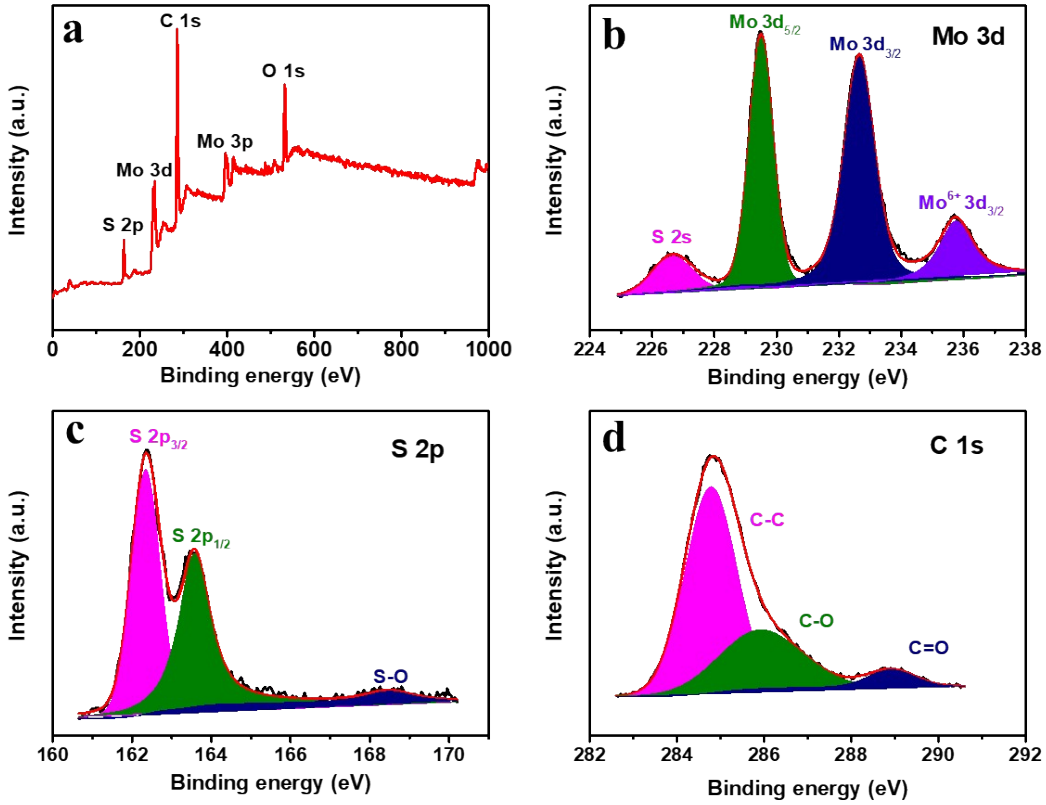

Fig. S4. Composition characterization of Porous C@MoS_2. XPS survey spectrum of C@MoS_2 (a) and high-resolution XPS spectra of Mo 3*d* (b), S 2*p* (c), C 1*s* (d).

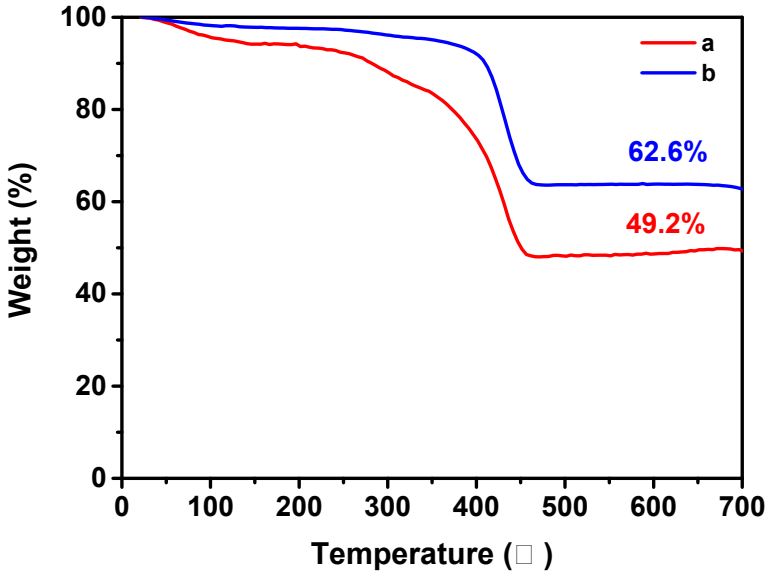

Fig. S5. TGA curves of Porous C@MoS_2 (a) and C@MoS_2 (b) in air at a heating rate of 10 C min^{-1}.

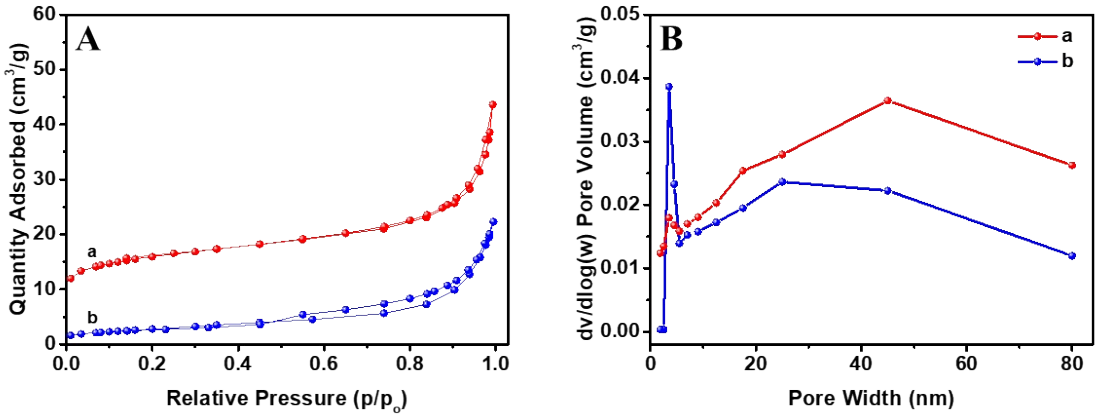

Fig. S6 (A) The nitrogen adsorption-desorption isotherms and (B) pore size distribution plots of Porous C@MoS_2 (a) and C@MoS_2 (b).

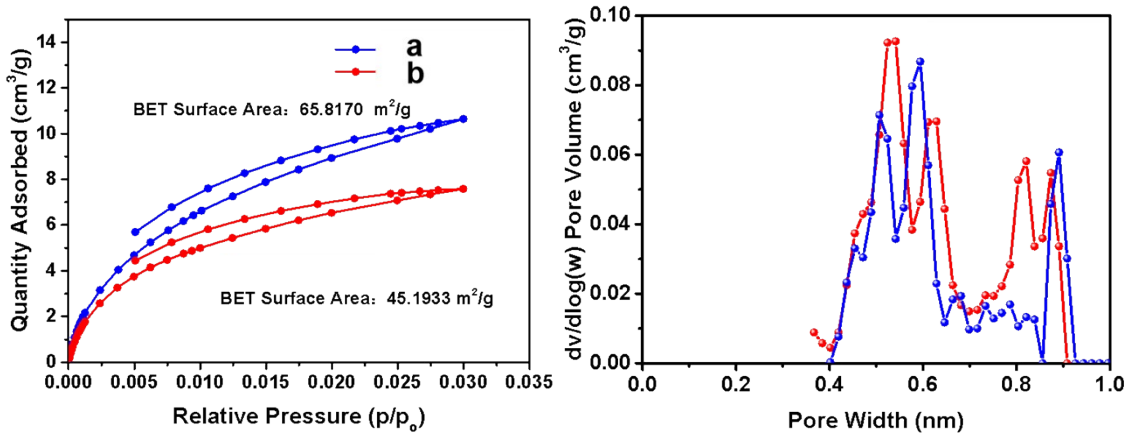

Fig. S7. (A) The CO_2 adsorption-desorption isotherms and (B) pore size distribution plots of Porous C@MoS_2 (a, blue line) and C@MoS_2 (b, red line).

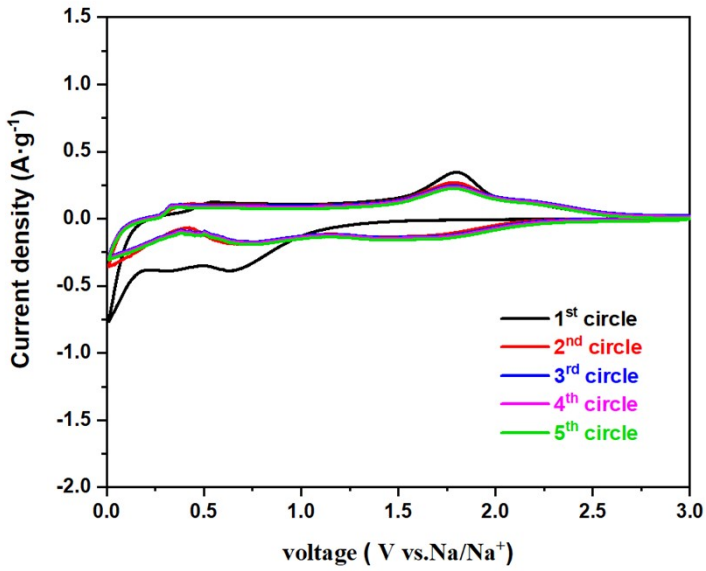

Fig. S8. CV curves of control sample C@MoS_2 for the first five cycles at a scan rate of 0.5 mV s^{-1}.

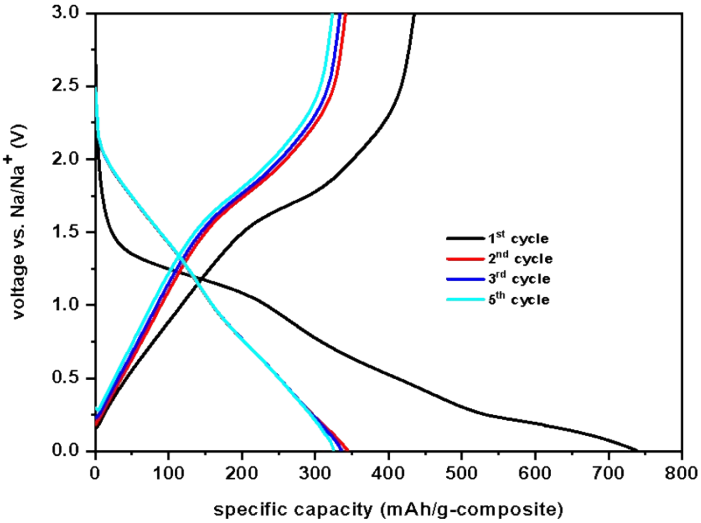

Fig. S9. The galvanostatic discharge-charge curves of C@MoS_2 at 500 mA g^{-1}.

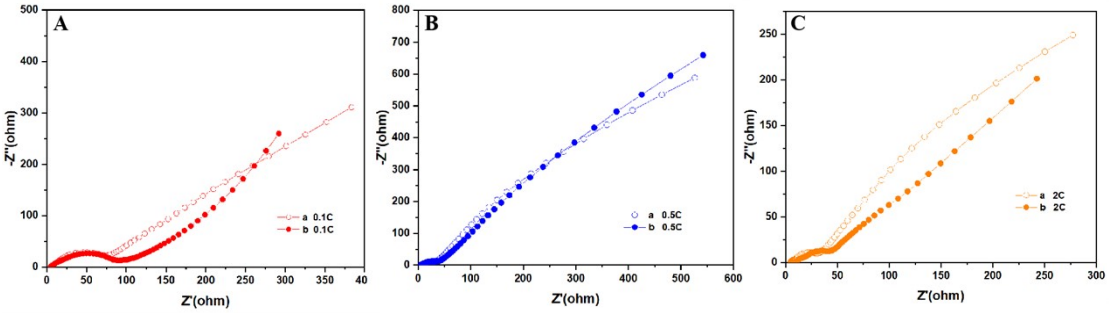

Fig. S10. EIS Nyquist plots of Porous C@MoS_2 (a) and C@MoS_2 (b) after 5 cycles at 0.1 C (A), 0.5C (B) and 2C (C) respectively.

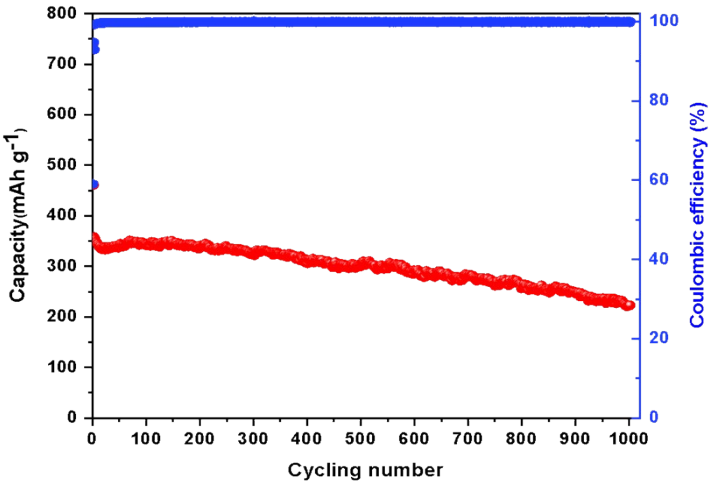

Fig. S11. Long-term cycling property and Coulombic efficiency of C@MoS_2 the at a current density of 1000 mA g^{-1}.

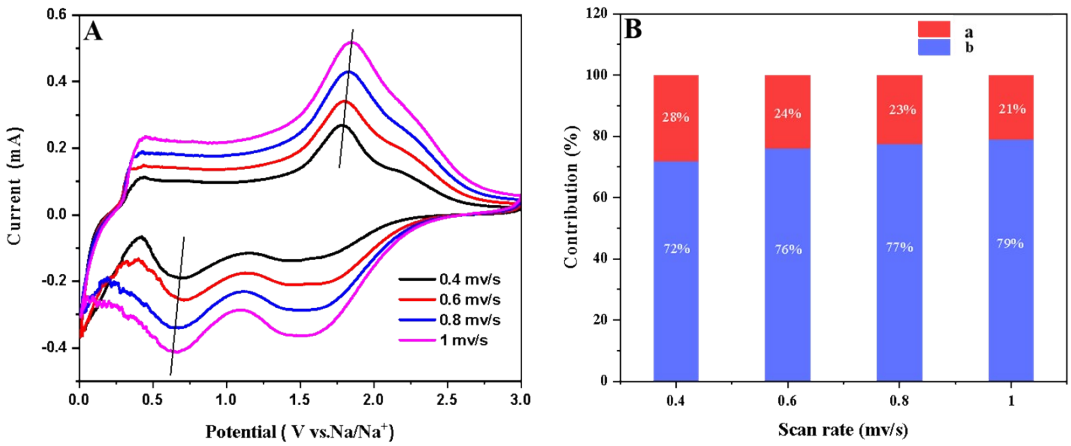

Fig. S12. (A) CV curves of Porous C@MoS_2 with different scan rates. (B) The contributions of the diffusion and capacitive-controlled storage at different scan rates of C@MoS_2.

Table S1. The electrochemical performance comparasion of Porous Porous C@MoS_2 composites with other C/MoS_2-based materials reported in the literature.

MoS_2-base electrodes	Current ($mA.g^{-1}$)	Cycles	Capacity ($mA.h.g^{-1}$)	References
1T MoS_2-graphene	50	200	313	*[1]*
MoS_2-1-nm-TiO_2	500	200	182	*[2]*
MoS_2@C	80	100	184	*[3]*
1T-MoS_2/CC	200	200	576	*[4]*
HC@MoS_2@NC	100	100	321	*[5]*
WS_2-MoS_2-BioC	100	100	362.5	*[6]*
V-MoS_2@CC	1000	100	311.2	*[7]*
Porous C@MoS_2	1000	400	410	This work

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