Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Simple synthesis of MoO_2/Carbon aerogels anodes for high performance lithium ion batteries from seaweed biomass

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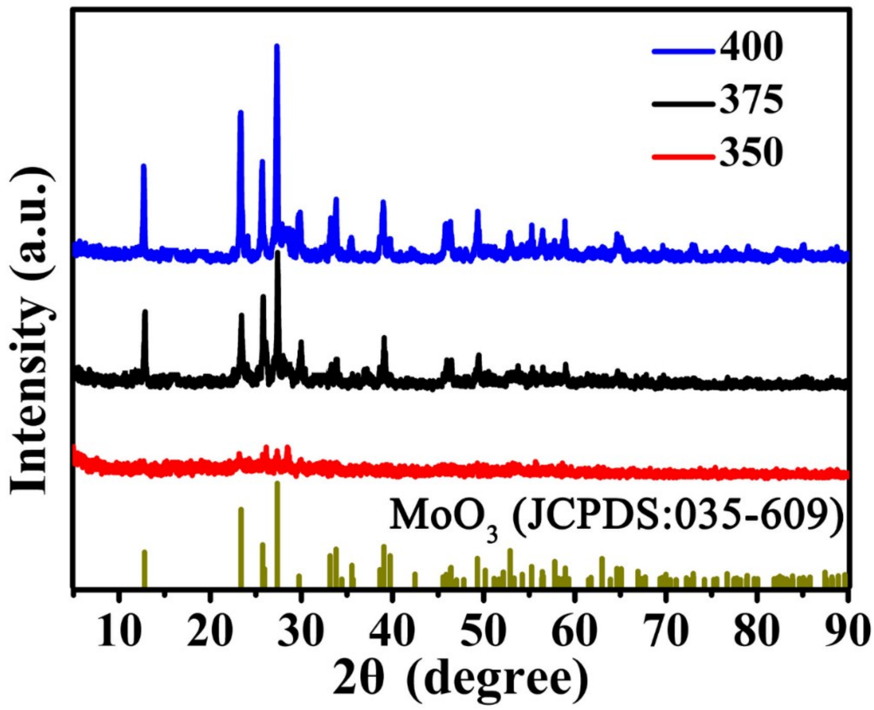


Fig. S1 XRD patterns of AMM aerogels stabilized at 350, 375 and 400 ^{o}C in air for 1 h.

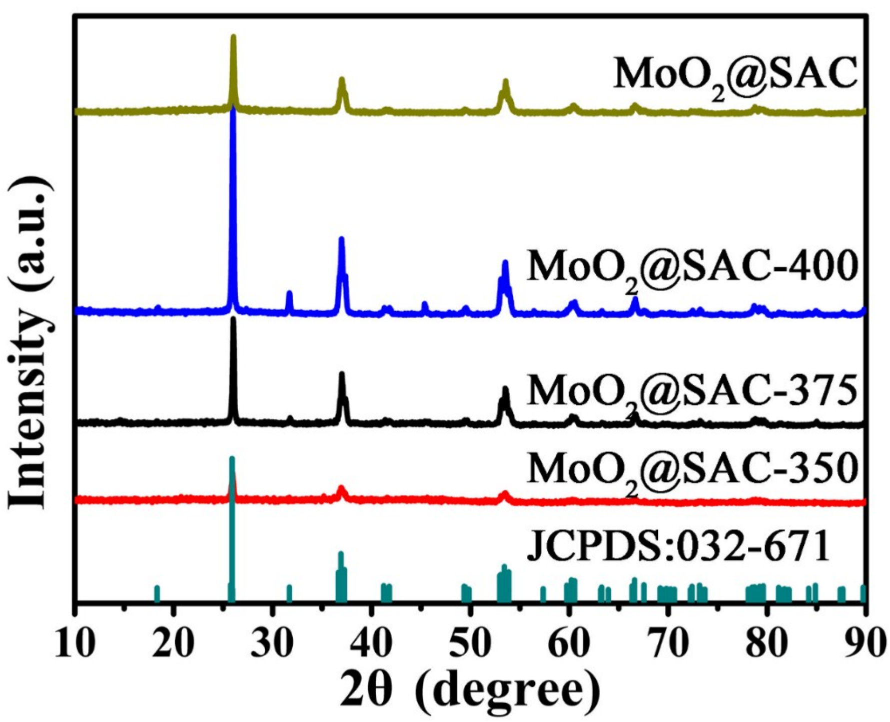


Fig. S2 XRD patterns of MoO_2@SAC-X aerogels and MoO_2@SAC aerogels which were synthesized by annealing the AMM aerogels at 600 ^{o}C under N_2 without a stabilization process.

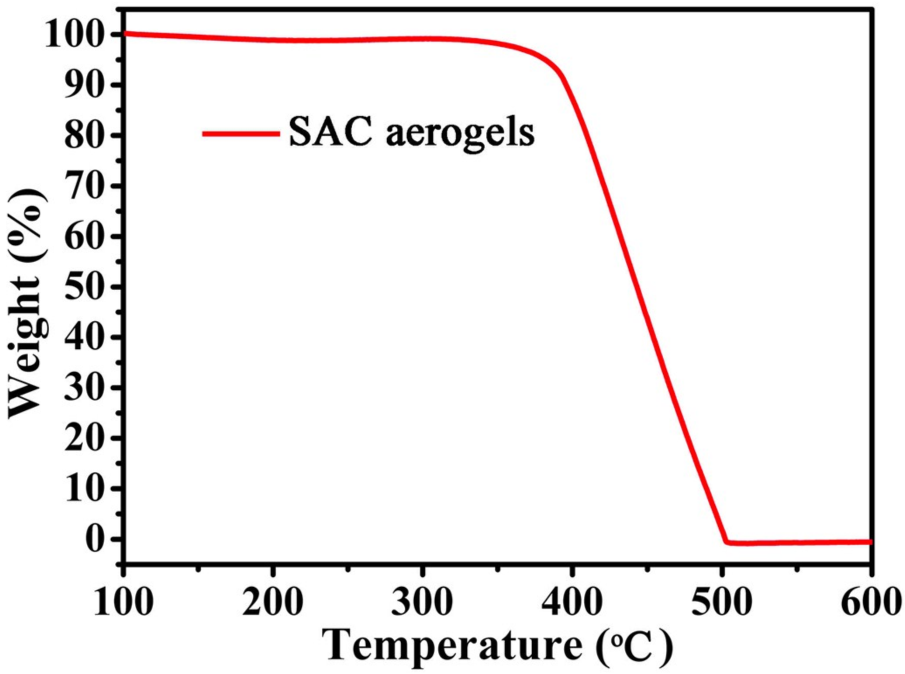


Fig. S3 TG curve of SAC aerogels synthesized by pyrolysis of alginic acid aerogels at 600 ^{o}C under N_2 without a stabilization process.

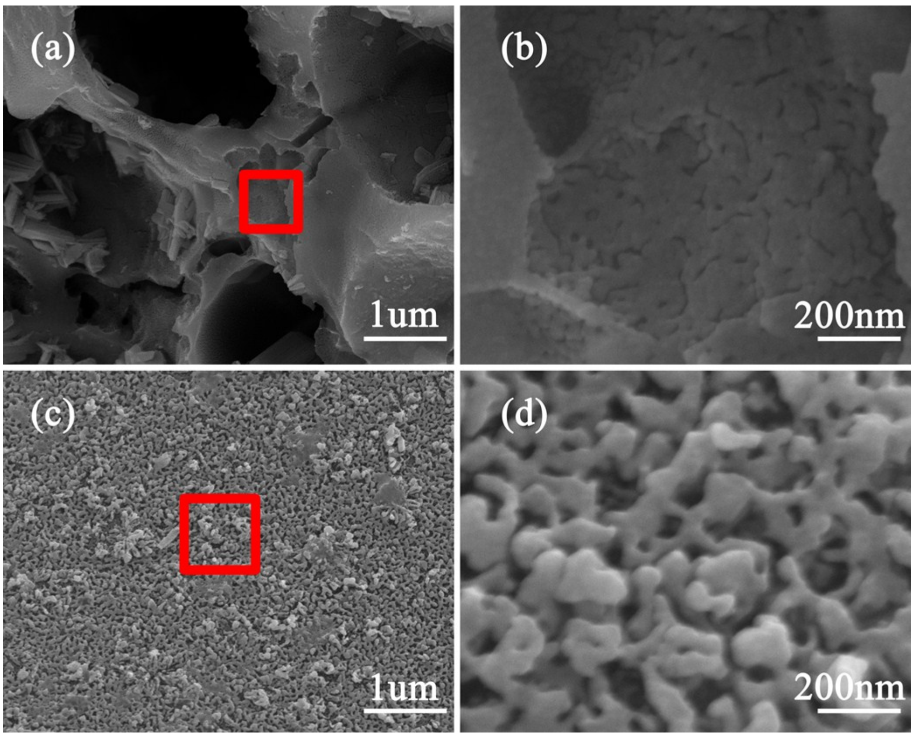


Fig. S4 SEM images of (a, b) MoO_2@SAC-350 and (c, d) MoO_2@SAC-400. (b) and (d) Images showing a magnified view of the area enclosed by the red box in (a) and (c).

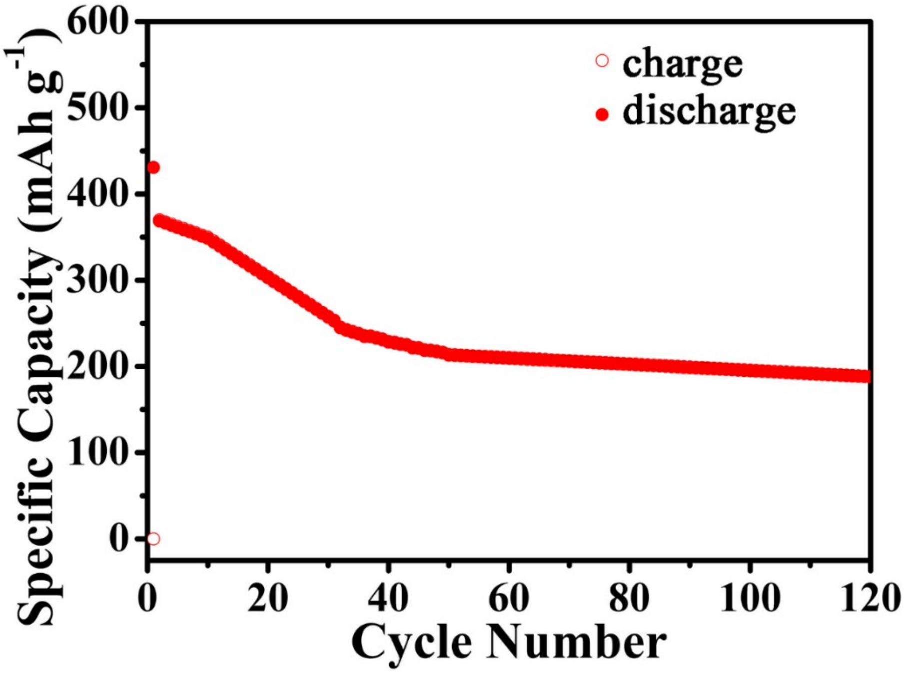
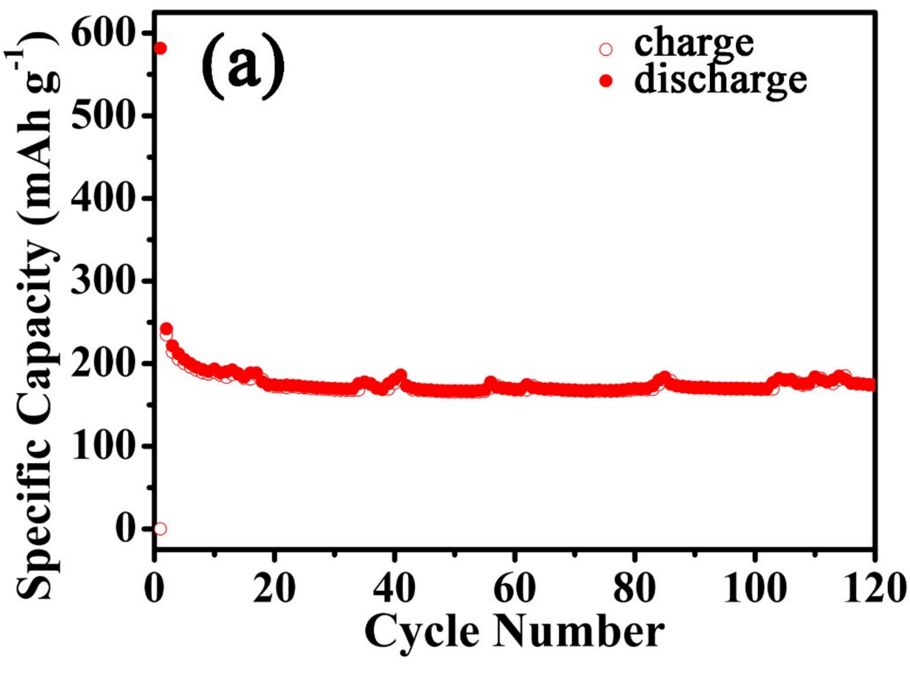


Fig. S5 Cycling performance of MoO_2@SAC electrode at current density of 200 mA g^{-1}.



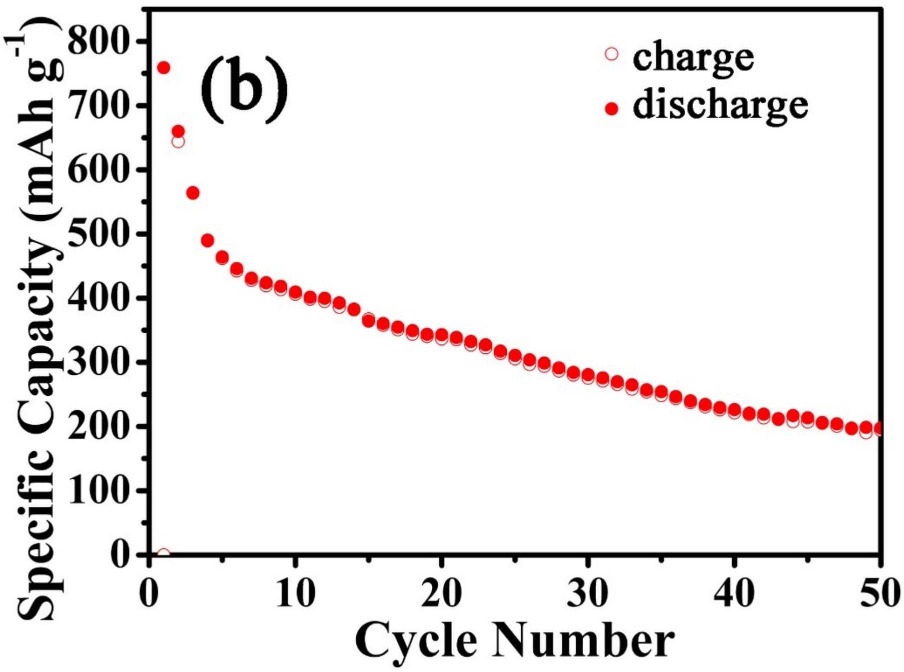


Fig. S6 Cycling performance of (a) SAC aerogels and (b) commercial MoO_2 at current density of 200 mA g^{-1}.

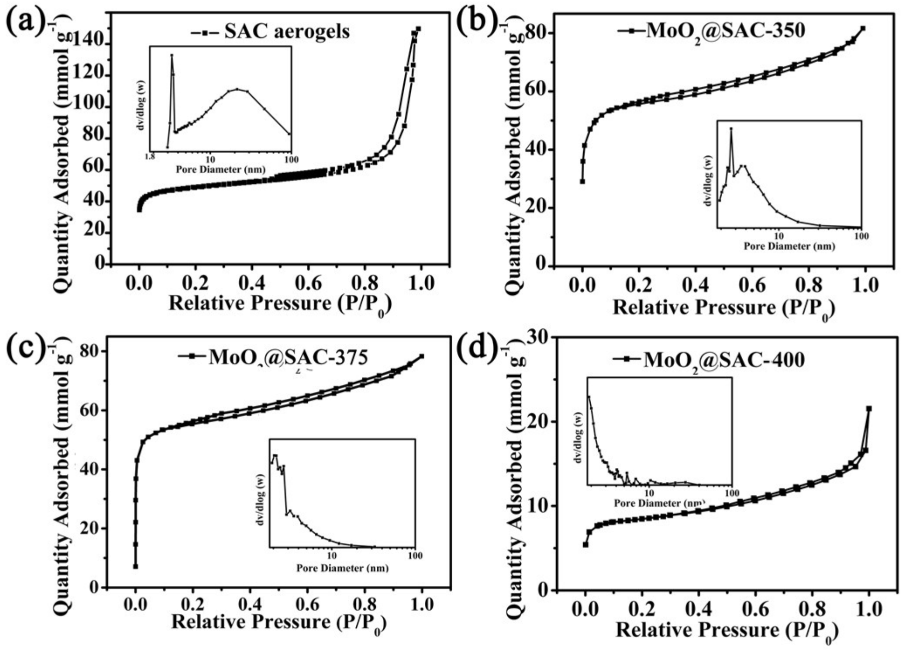


Fig. S7 Nitrogen adsorption-desorption isotherms and the pore diameter distribution of (a) SAC aerogels, (b) MoO_2@SAC-350, (c) MoO_2@SAC-375 and (d) MoO_2@SAC-400.

Table. S1 BET, pore volume and average pore width of SAC aerogels, MoO_2@SAC-350, MoO_2@SAC-375 and MoO_2@SAC-400.

Samples	BET Surface Area /m^2 g^{-1}	Adsorption volume of pores /cm^3 g^{-1}	Adsorption average pore width /nm
SAC aerogels	360.03	0.42	18.90
MoO_2@SAC-350	210.14	0.12	5.21
MoO_2@SAC-375	196.73	0.10	4.06
MoO_2@SAC-400	25.22	0.09	3.59

Table. S2 Comparison of electrochemical performance of MoO_2/carbon composites electrodes prepared by different methods.

Ref	**Materials**	**Synthesis method**	**Cycle numbers**	**Initial coulombic efficiency(%)**	**Reversible capacities (mA h g^{-1})**	**Rates (mA g^{-1})**
	MoO_2/Carbon aerogels	**Present study**	**120**	**72**	**490**	**200**
9	MoO_2/carbon nanocomposites	Hydrothermal and annealing	50	52.2	629	200
11	MoO_2 ordered mesoporous carbon hybrids	Solvothermal	50	63.9	1049.1	100
30	Carbon-coated MoO_2 nanofibers	Electrospinning and annealing	50	--	430.6	200
32	MoO_2/ordered mesoporous carbon nanocomposites	Thermal reduction	50	61.4	689	50
S1	MoO_2/graphene composites	Solution and annealing	50	75	640	200
S2	MoO_2/graphene thin film	Layer-by-layer self-assembly	100	71.5	675.9	47.8
S3	MoO_2/graphene hierarchical nanoarchitectures	In-situ reduction	50	75.4	997.1	167.6

S4	Carbon coated MoO_2 nanobelts	Hydrothermal and annealing	30	60	617.2	100
S5	Ultrafine MoO_2 nanoparticles/carbon composites	Impregnation and annealing	50	62.5	409	800
S6	MWCNTs@MoO_2-C nanocable composites	Electrospinning and annealing	30	--	832.2 425	50 200

Notes and references

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