Supporting information

A Straightforward, Efficient, and Environment-Friendly Lithium Storage Tactic: Solventless fabrication of N/S Co-doped SiO_x/C with Carbon Encapsulation

Haohui Zhang[1], Zhiyuan Wang[1], Kaize Si, Xinxin Sun, Jianing Zong, Xiaomei Wang, and Xu Zhang**

Hebei key Laboratory of Functional Polymers, School of Chemical Engineering and Technology, Hebei University of Technology, Tianjin 300130, P.R. China

*Corresponding author: E-mail: xmwang@hebut.edu.cn and xuzhang@hebut.edu.cn

[1]These two authors equally contributed to this work.

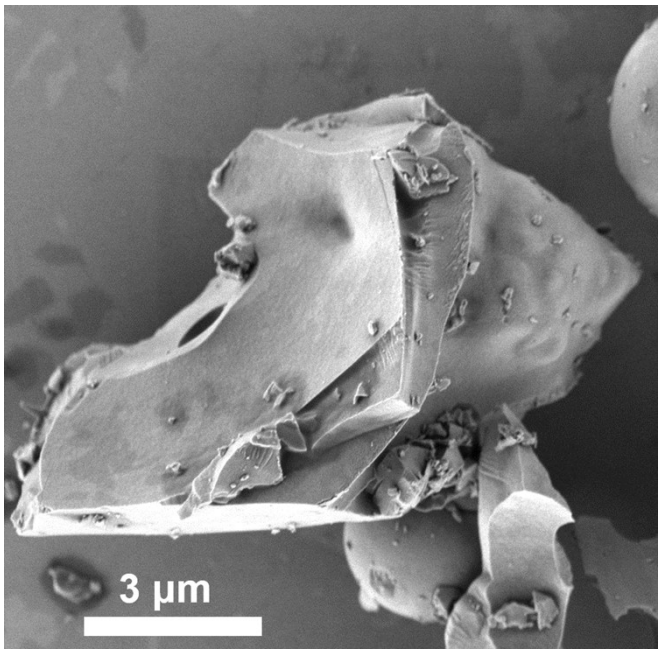

Figure S1. SEM image of N/S-Bulk-vinly-SiO_2-2.

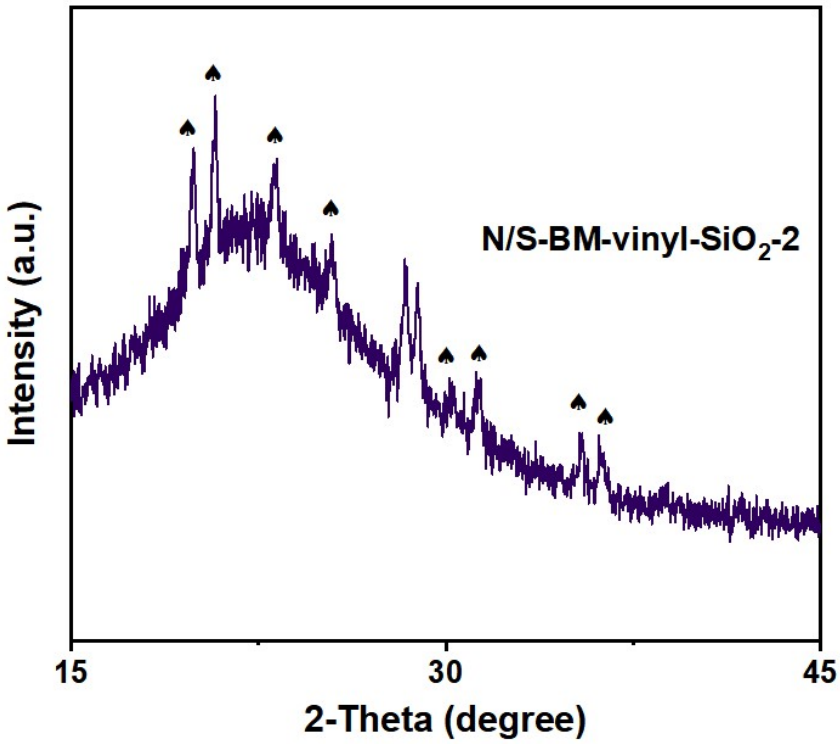

Figure S2. XRD pattern of N/S-BM-vinly-SiO_2-2.

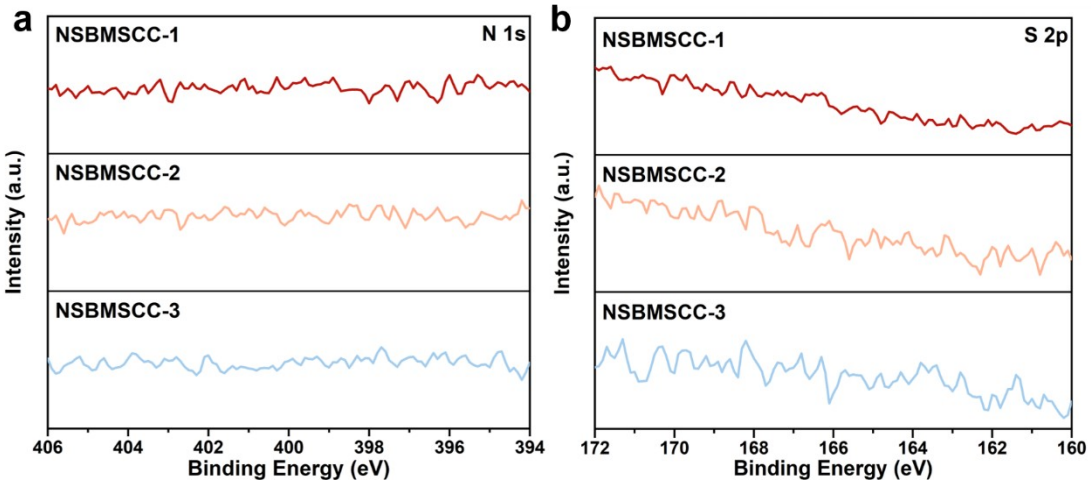

Figure S3. (a) N 1s spectra of NSBMSCC-1, NSBMSCC-2, and NSBMSCC-3. (b) S 2p spectra of NSBMSCC-1, NSBMSCC-2, and NSBMSCC-3.

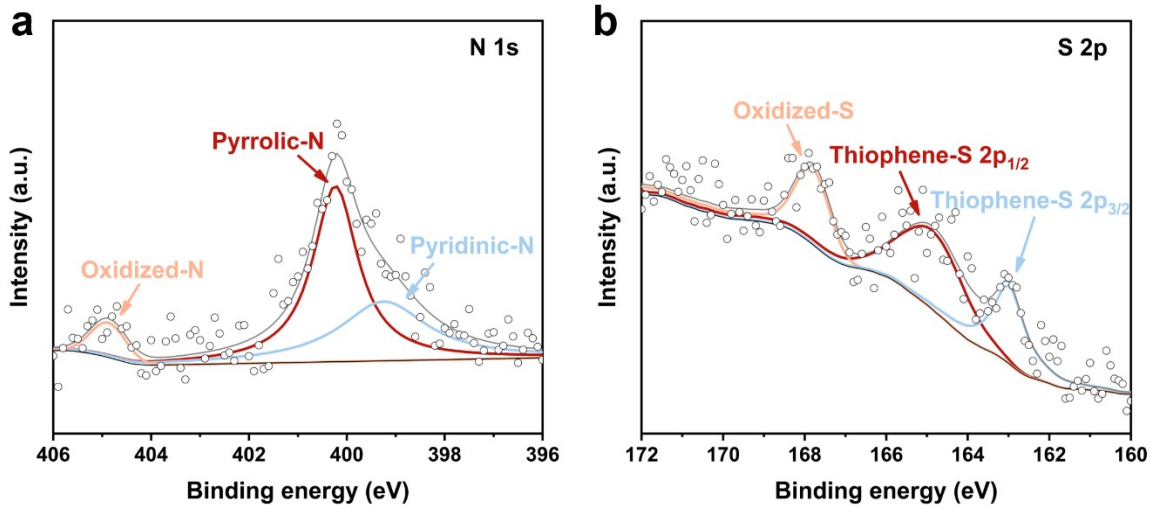

Figure S4. (a) N 1s spectra of N/S-BM-vinly-SiO_2-2. (b) S 2p spectra of N/S-BM-vinly-SiO_2-2.

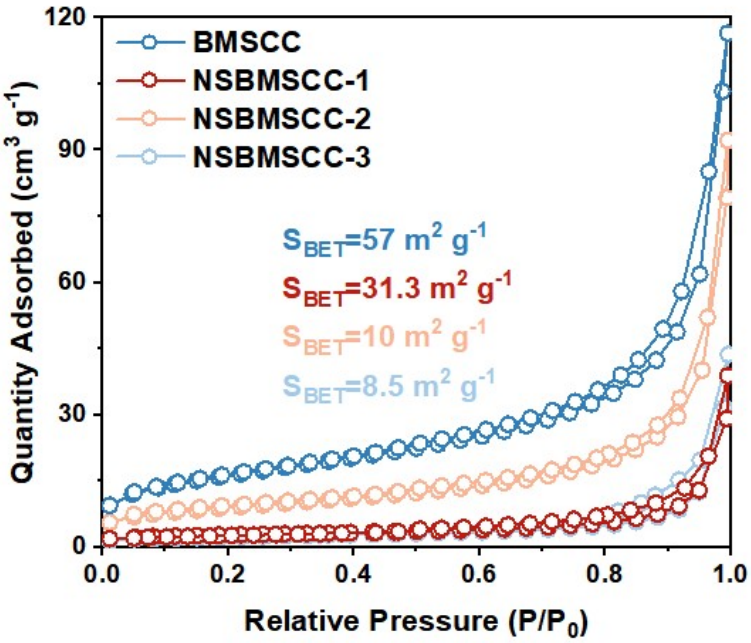

Figure S5. N_2 adsorption-desorption isotherms of BMSCC, NSBMSCC-1, NSBMSCC-2, and NSBMSCC-3.

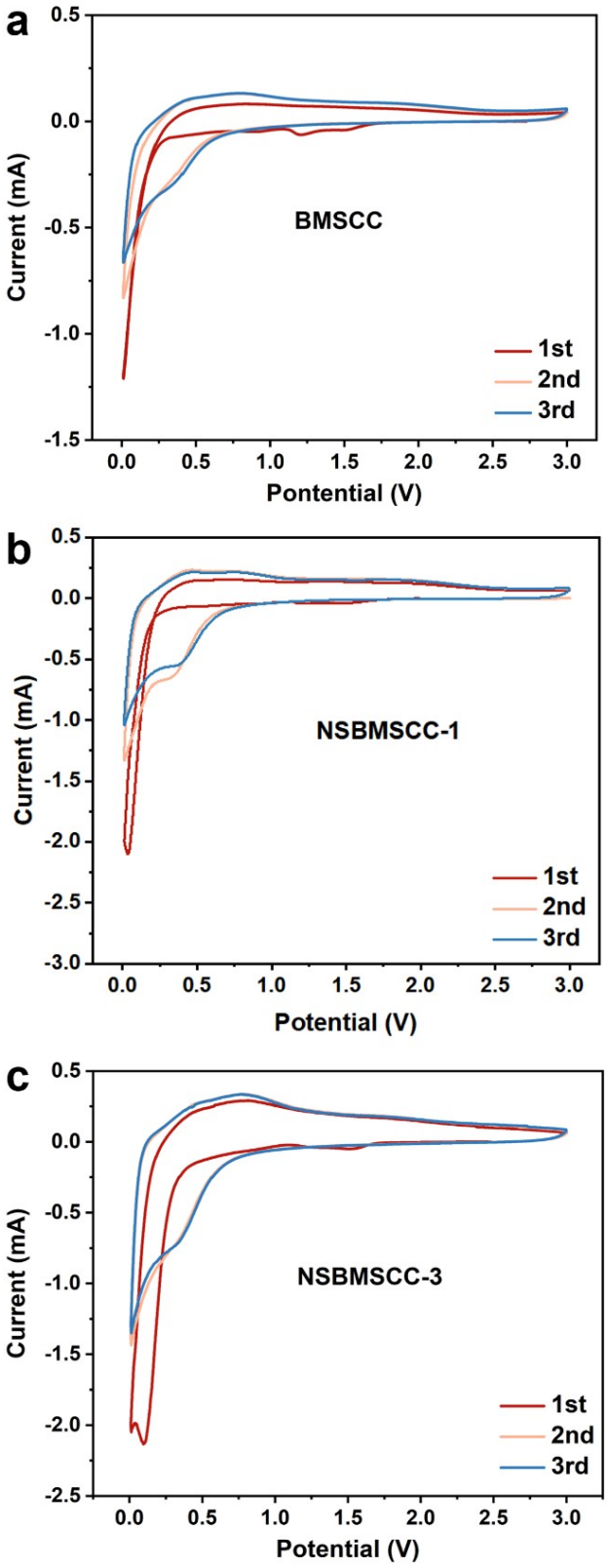

Figure S6. CV curves of (a) BMSCC, (b) NSBMSCC-1, and (c) NSBMSCC-3.

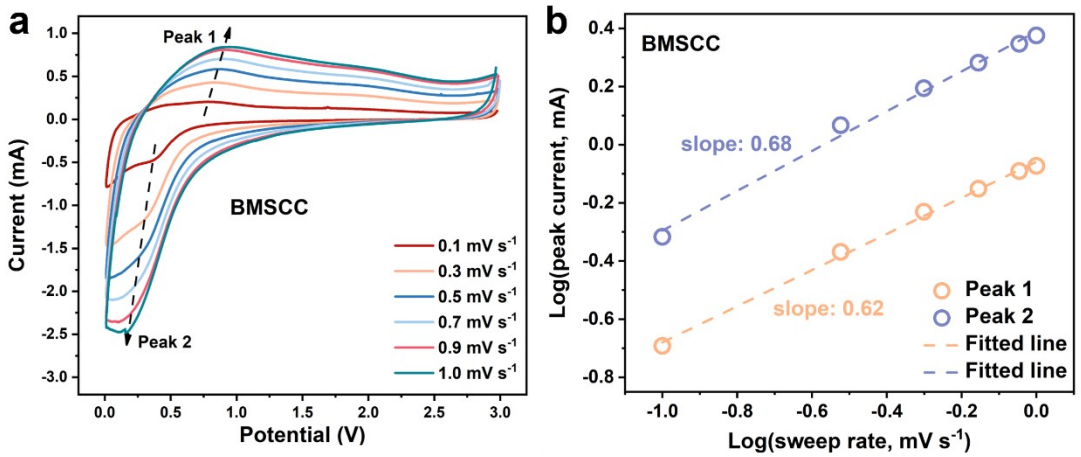

Figure S7. (a) CV curves and (b) log *i* vs log *v* plots at different scan rates of BMSCC.

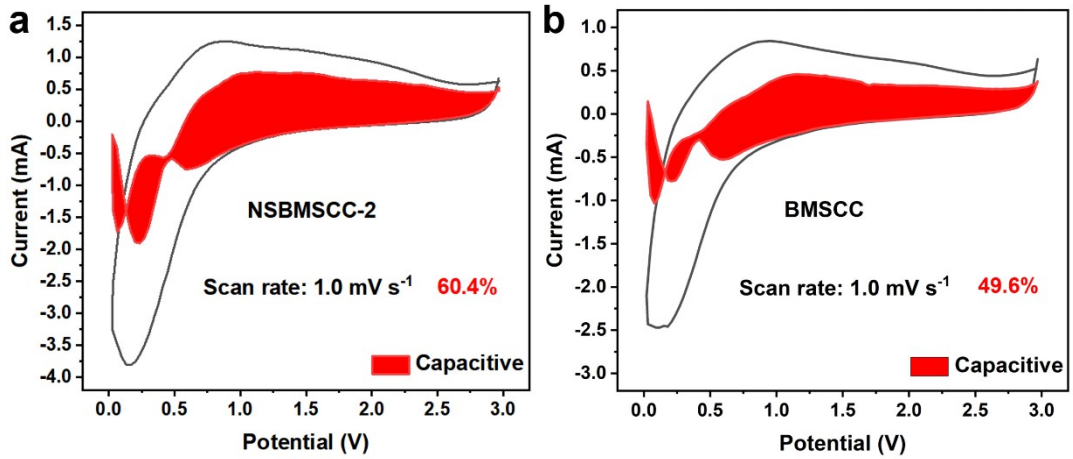

Figure S8. The capacitive contribution at 1.0 mV s^{-1} of (a) NSBMSCC-2 and (b) BMSCC.

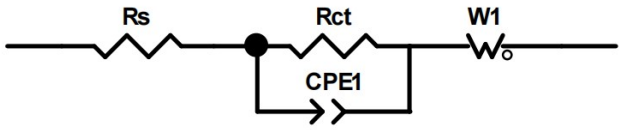

Figure S9. The equivalent circuit for data fitting.

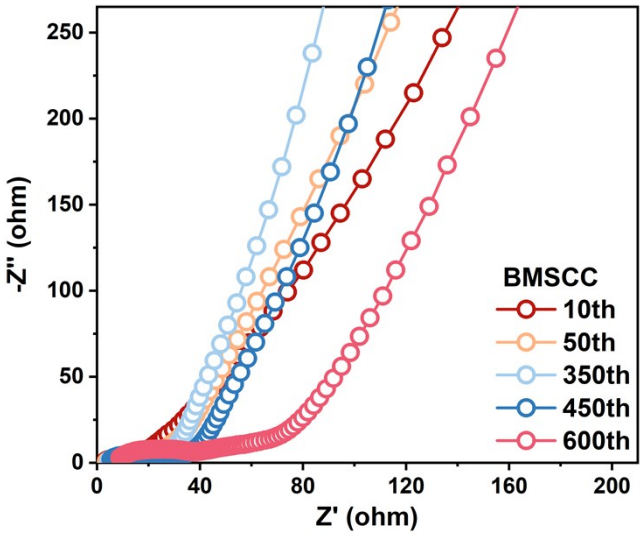

Figure S10. Nyquist plots after different cycles of BMSCC.

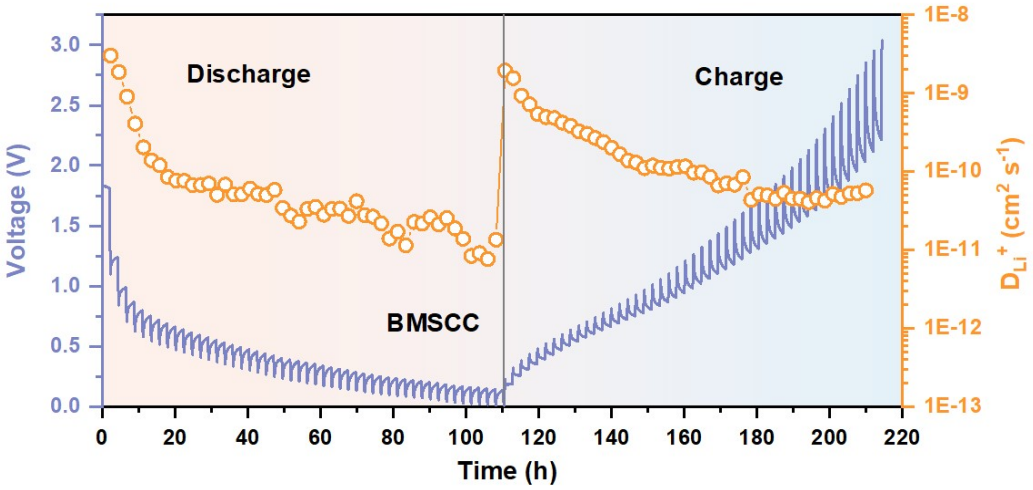

Figure S11. GITT plot of BMSCC.

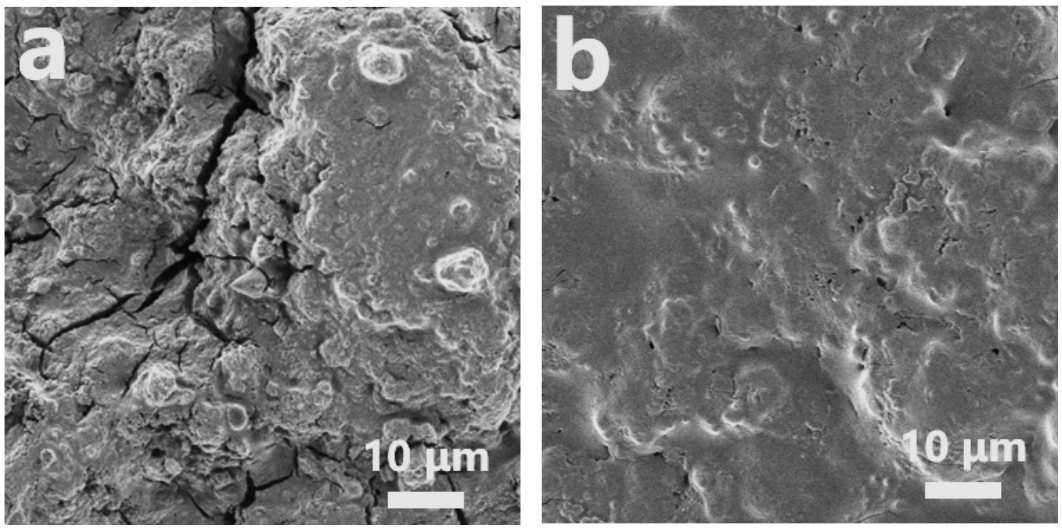

Figure S12. The electrodes SEM images of (a) BMSCC and (b) NSBMSCC-2 at 2 A g^{-1} after 600 cycles.

Table S1. The element mass fraction of NSBMSCC-2.

Element	Mass Fraction (%)
C	30.55
N	0.27
O	39.71
Si	29.24
S	0.22

Table S2. Comprehensive comparison of NSBMSCC-2 with past silicon-based anode materials.

Sample	Ratio of precursor/(precursor+solvent)	ICE	Current density (A g^{-1})	Cycle number	Capacity after cycling (mAh g^{-1})	Capacity retention (%)	Ref
NSBMSCC-2	1	74.2	2.0	600	595	96.1	This work
SiO_x/C@C NTS	0.011	64.6	0.5	450	511	75.7	29
CNT@SiO_x/C@C	0.009	54.2	2	1000	395	71.1	51
SiO_x/C-2	0.043	66.1	0.5	400	689	91	52
SiO_x@ZrO_2@C	0.14	50	0.5	500	413	72.2	53
SiO_x/G/C	0.021	84.3	0.12	350	524	81.3	54
SiO_x@C@Graphite	0.25	82.6	0.2	100	524	75.7	55
SiO_x-6/C	0.003	63.5	0.1	150	534	70.2	56
SiO_x/C	0.044	82.2	0.325	500	580	90	57
Hp-SiOC@VG	0.068	74.7	1	600	335	98	58
$HSiO_2$@CN	0.015	50	0.2	600	587	82	59
H-SiO_2/C	0.015	69.5	2	400	564	88.3	60