

Supporting Information:

**Engineering Metal Sulfide with Hierarchical Interfaces towards
Advanced Sodium-ions Storage**

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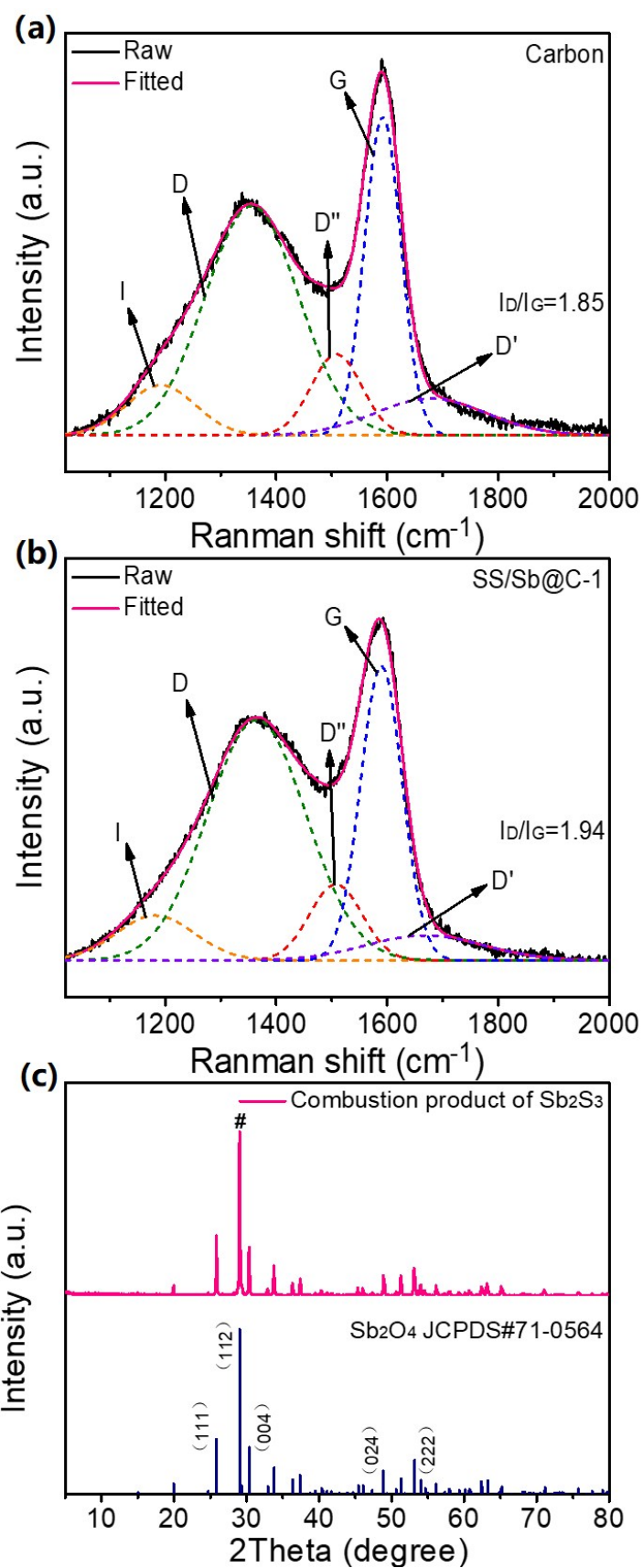
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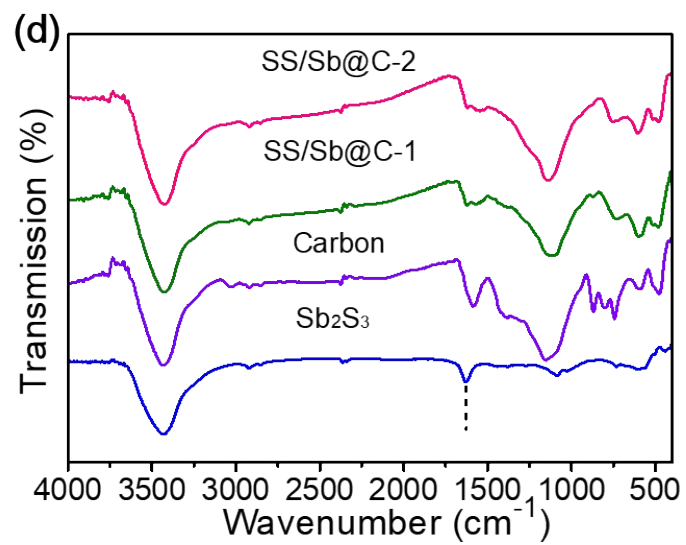


Fig. S1. Peak deconvolution of D-band and G-band for carbon (a) and SS/Sb@C-1 (b), XRD of combustion product at 800°C in air atmosphere (c), FTIR spectra from 400-2000cm⁻¹.

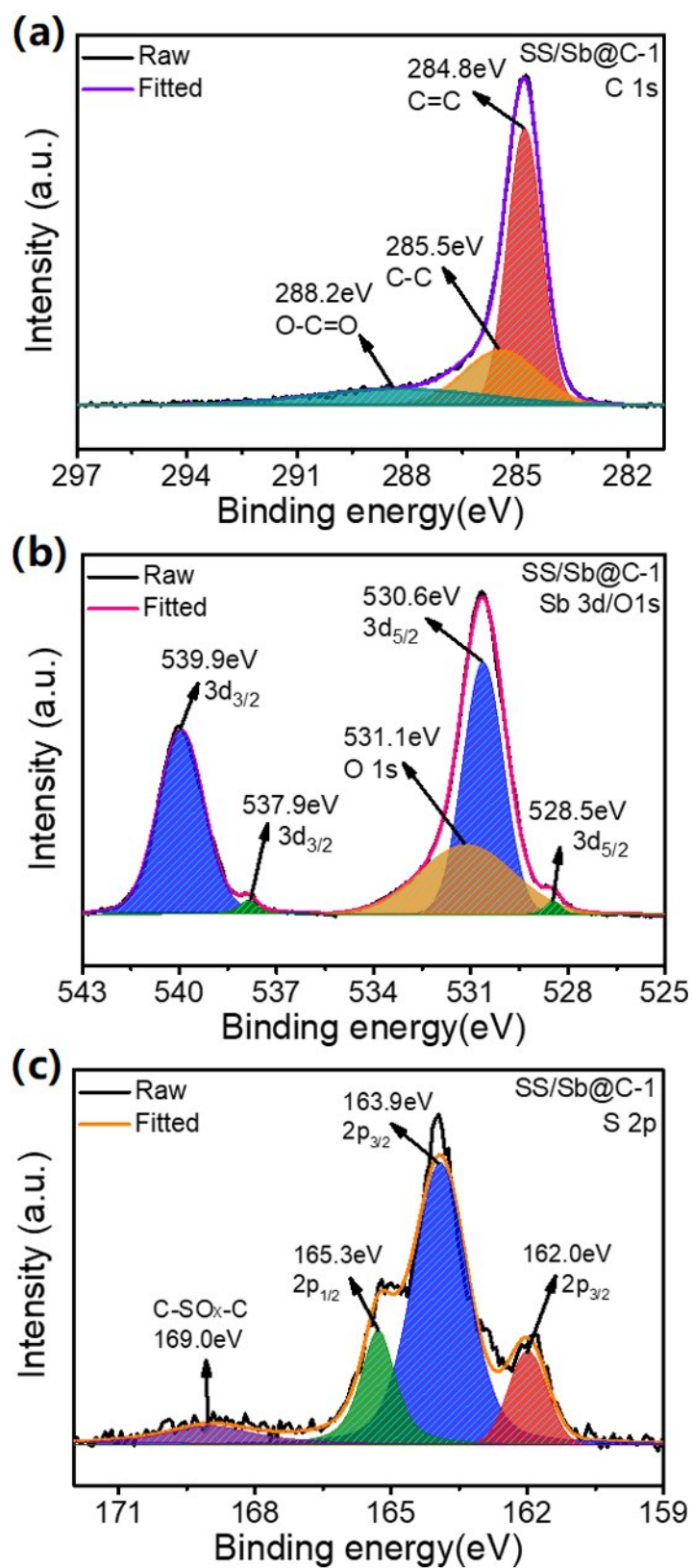


Fig. S2. High-resolution XPS spectra for SS/Sb@C-1 of C1s (a), Sb3d (b), S2p (c).

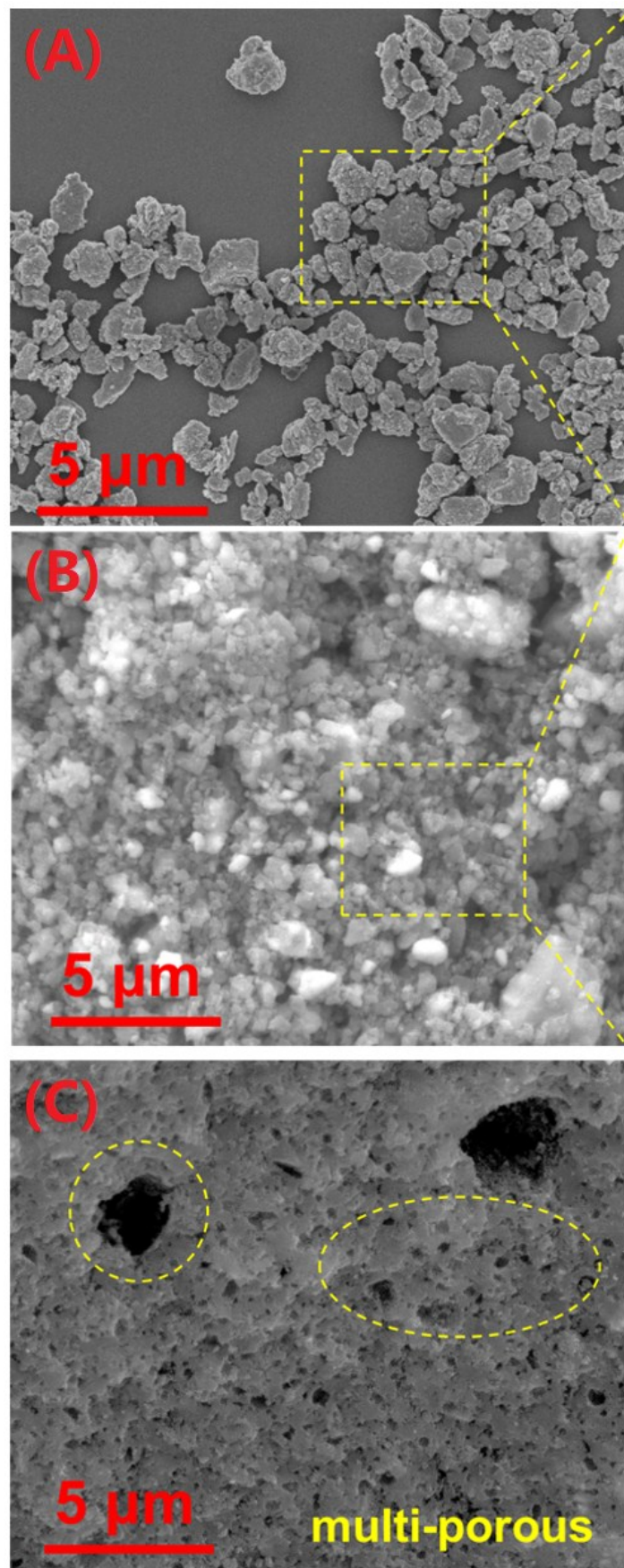


Fig. S3. SEM images of Sb_2S_3 (A), SS/Sb@C-1 (B), SS/Sb@C-2 (C).

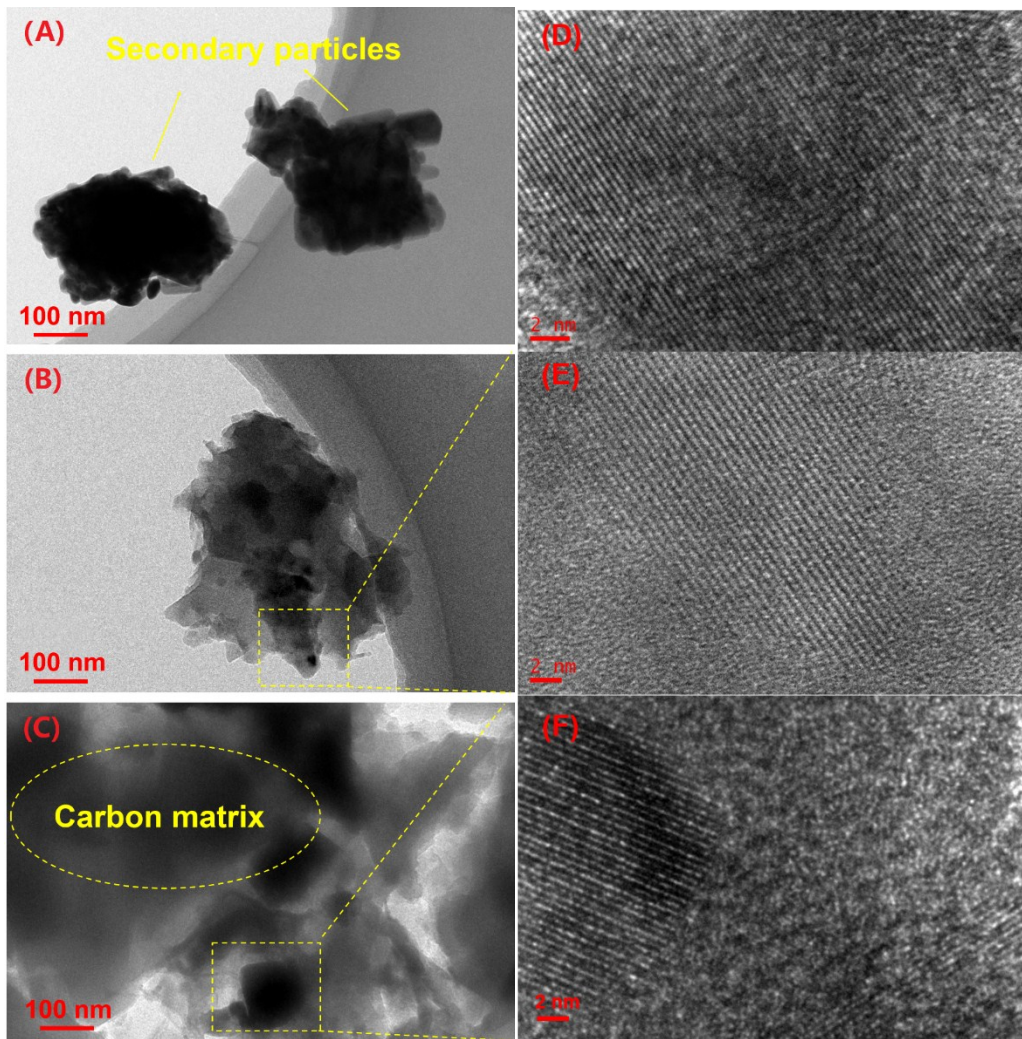


Fig. S4. TEM images of Sb_2S_3 (A,D), SS/Sb@C-1 (B,E), SS/Sb@C-2 (C,F).

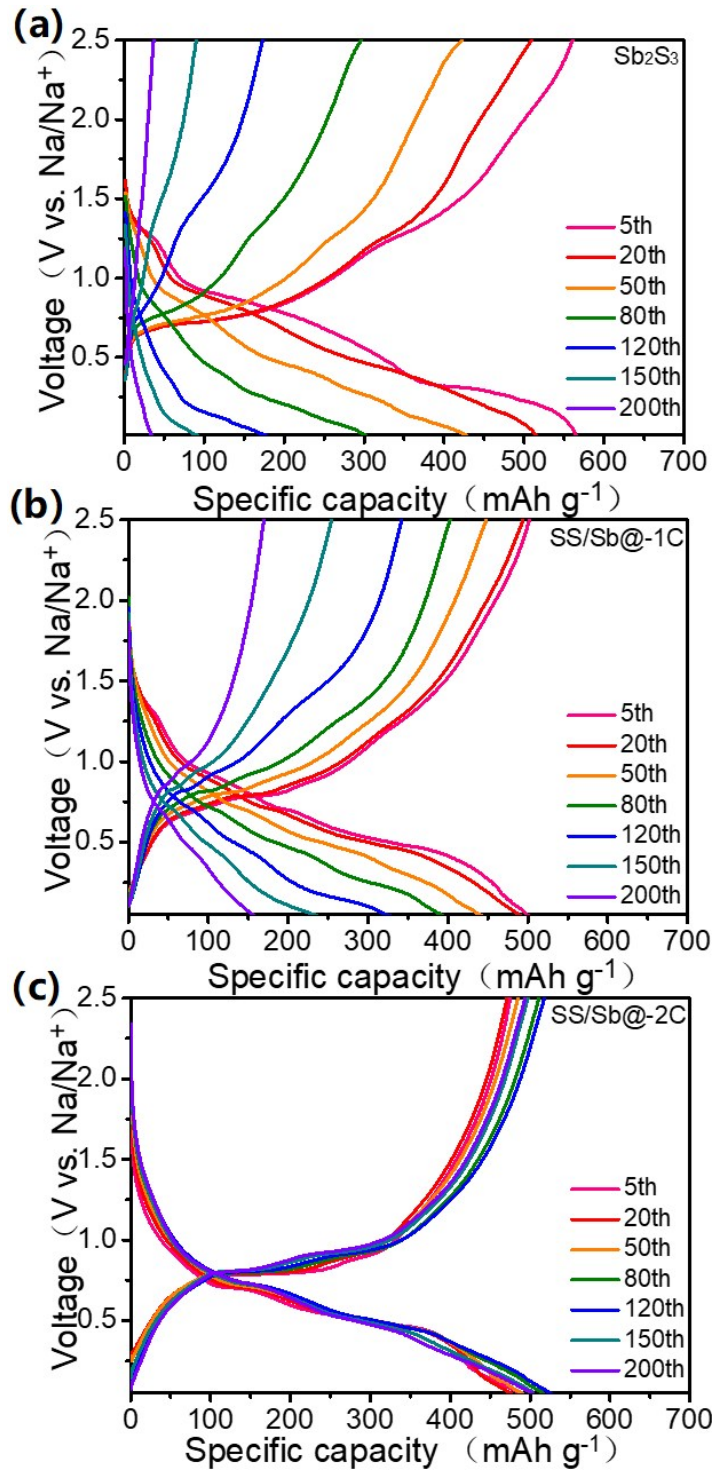


Fig. S5. Charge/discharge platforms at various cycles for Sb₂S₃ (a), SS/Sb@C-1 (b), SS/Sb@C-2 (c).

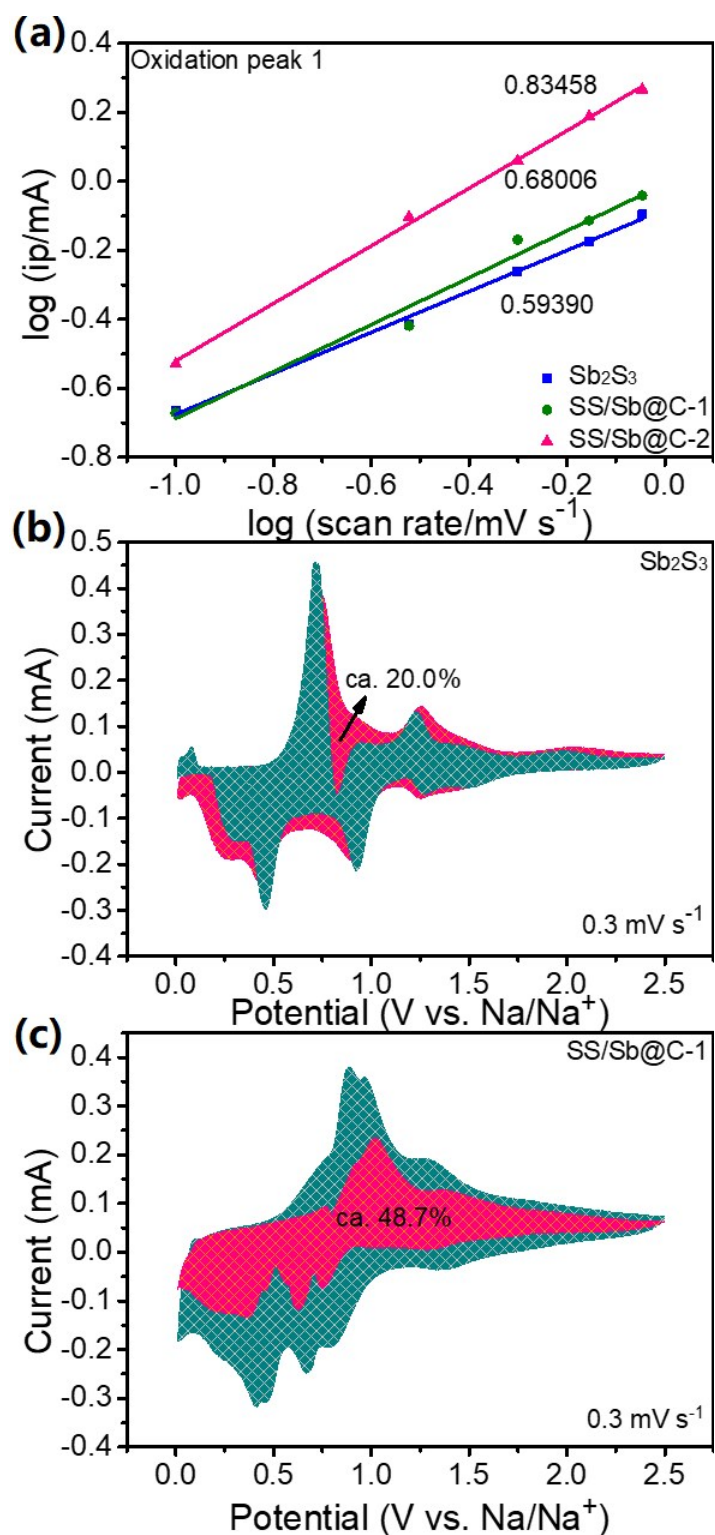


Fig. S6. Linear relation of $\log(i)$ and $\log(v)$ at peak 1 (D) (a), the capacitive contribution (in pink) and the diffusion contribution (in cyan) at $0.3 mV s^{-1}$ of Sb_2S_3 (b), SS/Sb@C-1 (c).

Table S1. Electrochemical reaction mechanism of SS/Sb@C-2.

Process		Chemical equation	Mechanism
Discharging	D1	$\text{Sb}_2\text{S}_3 + x\text{Na}^+ + xe^- \rightarrow \text{Na}_x\text{Sb}_2\text{S}_3$	Intercalation
	D2	$\text{Na}_x\text{Sb}_2\text{S}_3 + (6-x)\text{Na}^+ + (6-x)e^- \rightarrow 2\text{Sb} + 3\text{Na}_2\text{S}$	Conversion
	D3	$2\text{Sb} + 6\text{Na}^+ + 6e^- \rightarrow 2\text{Na}_3\text{Sb}$	Alloying
Charging	C4	$2\text{Na}_3\text{Sb} \rightarrow 2\text{Sb} + 6\text{Na}^+ + 6e^-$	Dealloying
	C5	$2\text{Sb} + 3\text{Na}_2\text{S} \rightarrow \text{Na}_x\text{Sb}_2\text{S}_3 + (6-x)\text{Na}^+ + (6-x)e^-$	Inverse conversion
	C6	$\text{Na}_x\text{Sb}_2\text{S}_3 \rightarrow \text{Sb}_2\text{S}_3 + x\text{Na}^+ + xe^-$	Extraction

Table S2. Capacitive contribution of the as-prepared samples at various scan rates.

Scan rate/ mV s^{-1}	0.1	0.3	0.5	0.7	0.9
Sb_2S_3	13.2	20.0	27.5	29.5	31.3
SS/Sb@C-1	41.4	48.7	59.8	63.6	65.5
SS/Sb@C-2	80.1	81.5	86.6	89.2	93.0

(Capacitive contribution, %)

Table S3. Value of R_{ct} for the target samples at different charge/discharge voltages.

Voltage	-1.0	-0.4	-0.01	0.6	1.5	2.5
Sb_2S_3	109.2	223.7	348.5	216.7	149.5	77.3
SS/Sb@C-1	53.0	129.2	195.6	98.52	60.7	51.3
SS/Sb@C-2	47.7	53.73	88.1	58.4	47.0	42.4

(R_{ct} , Ω)