Supplementary Information (SI) for Inorganic Chemistry Frontiers.

Supplementary Information

Enabling Preferential Mg (0002) orientation electrodeposition via constructing SnS_2-engineering host for dendrite-free Magnesium metal battery

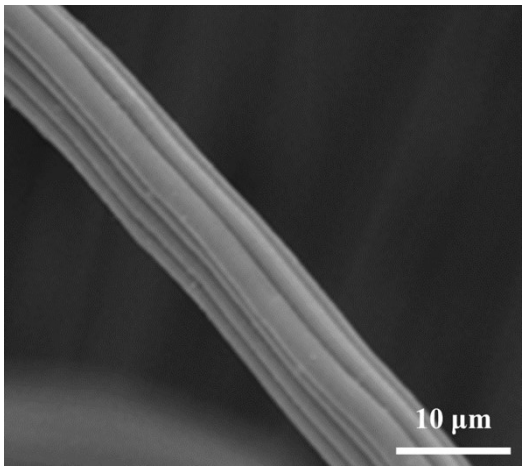

Figure S1. SEM morphology of pure CC surface.

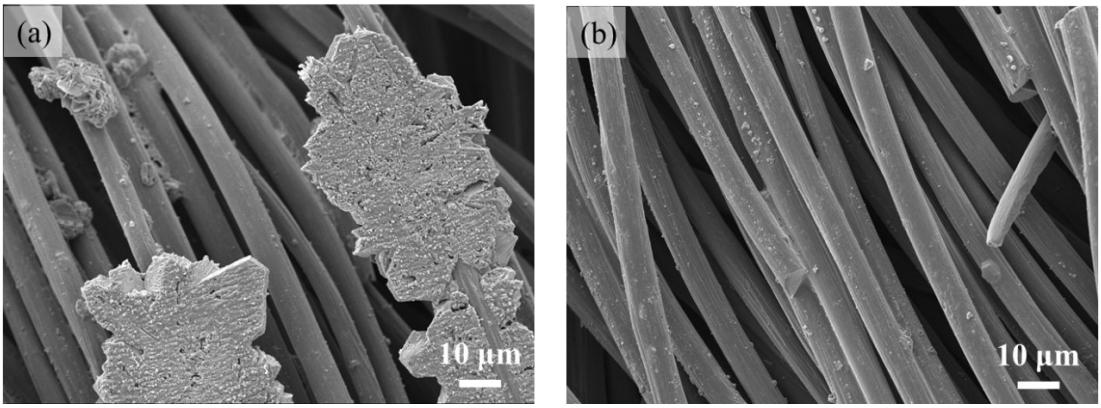

Figure S2. SEM images for Mg plating and stripping on CC substrate at area capacity of 0.5 mAh cm^{-2}.

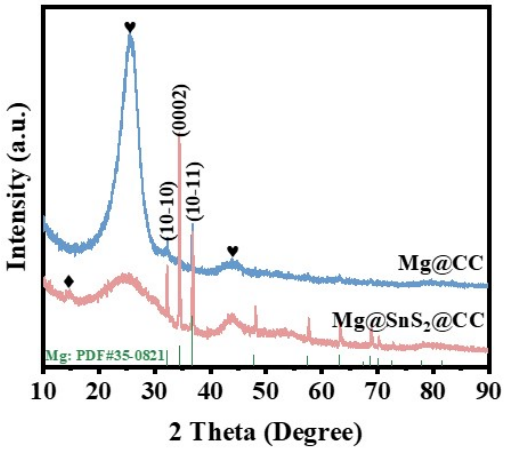

Figure S3. XRD pattern for Mg plating on two substrates at current density of 5 mA cm^{-2} with area capacity of 5 mAh cm^{-2}.

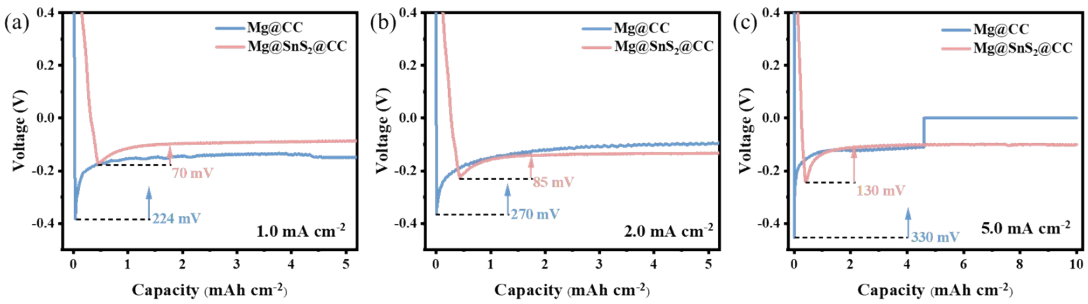

Figure S4. The curves of Mg plating on two substrates at different current densities: (a)1.0, (b)2.0, and (c) 5.0 mA cm^{-2}.

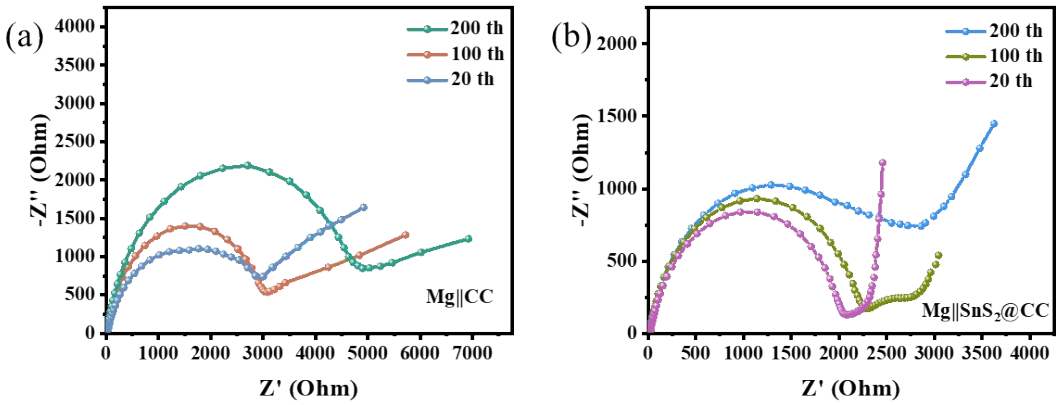

Figure S5. EIS spectroscopies of asymmetric cells after different cycles.

Table S1 Fitting results of EIS curves for asymmetric cells after different cycles.

	$R_s/(\Omega \cdot cm^2)$	$R_{ct}/(\Omega \cdot cm^2)$	$CPE_1/(F \cdot cm^{-2})$	n_1
SnS_2@CC-0	19	3829	$1.16*10^{-5}$	0.80
SnS_2@CC-20	30.12	2738	$7.84*10^{-6}$	0.78
SnS_2@CC-100	32.74	3134	$8.32*10^{-5}$	0.83
SnS_2@CC-200	35.69	3890	$8.17*10^{-5}$	0.85
CC-0	20.14	1350	$1.44*10^{-6}$	0.91
CC-20	23.84	4098	$9.12*10^{-6}$	0.87
CC-100	21.37	4360	$8.67*10^{-6}$	0.86
CC-200	27.69	7376	$7.14*10^{-6}$	0.83

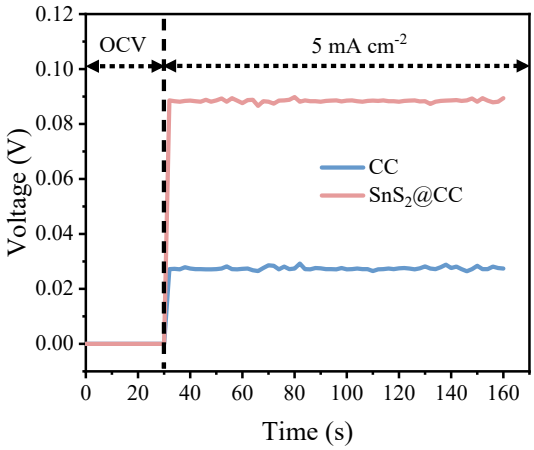

Figure S6. Direct current conductivity test of pure CC and SnS_2@CC.

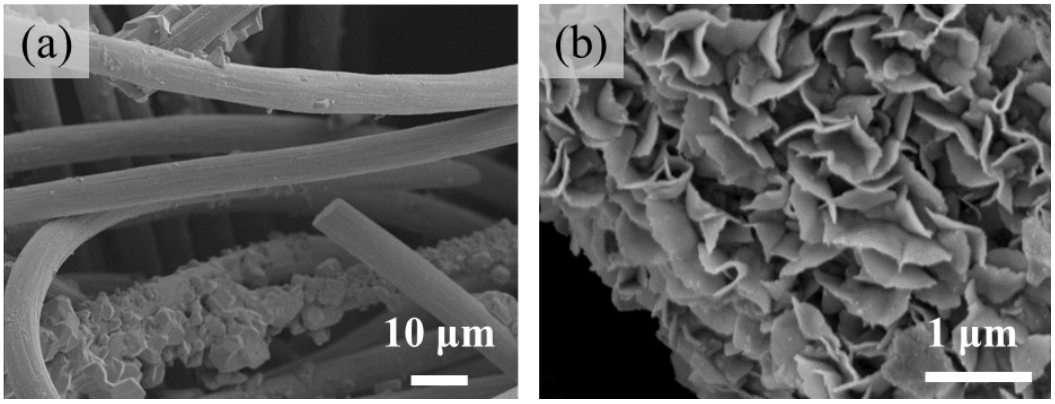

Figure S7. SEM morphologies of two electrodes after 100 cycles at current density of 1 mA cm^{-2} with deposition-stripping capacity of 0.5 mAh cm^{-2}: (a) CC; (b) SnS_2@CC.

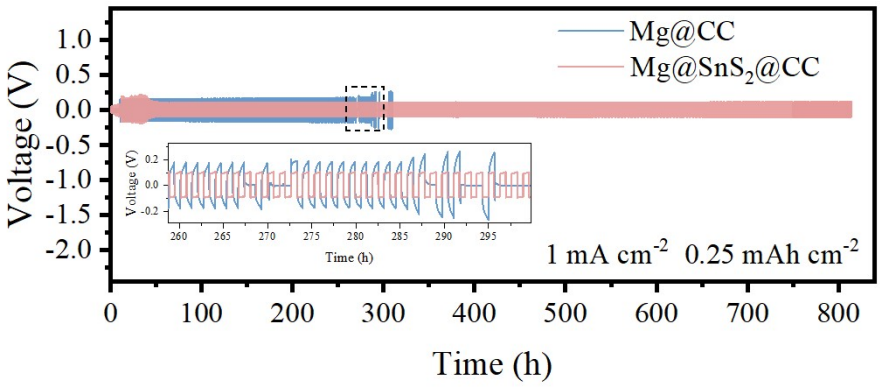

Figure S8. The cycling performance of symmetrical batteries at current density of 1mA cm^{-2} with the capacity of 0.25 mAh cm^{-2}.