Electronic supplementary information

Efficient Polysulfide Trapping in Lithium-Sulfur Batteries Using Ultrathin and Flexible $BaTiO_3$/Graphene Oxide/Carbon Nanotube Layers

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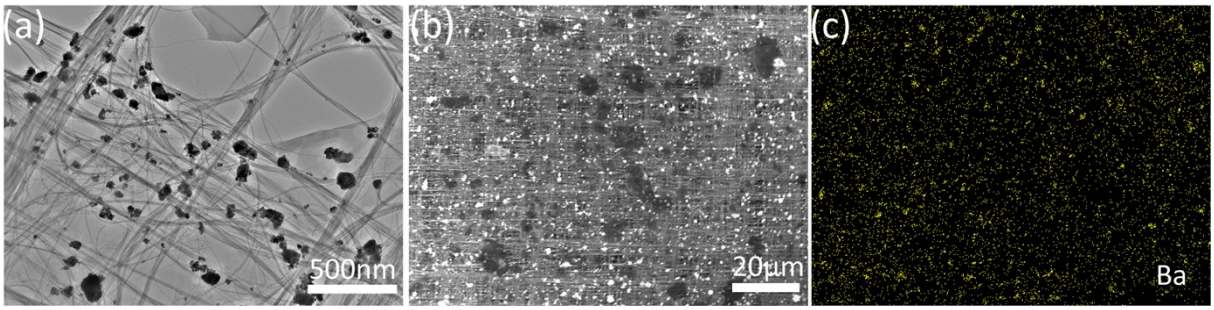

Fig. S1 (a) TEM and (b) SEM images of a fBTO/GO@CNT layer. (c) Ba elemental mapping of (b).

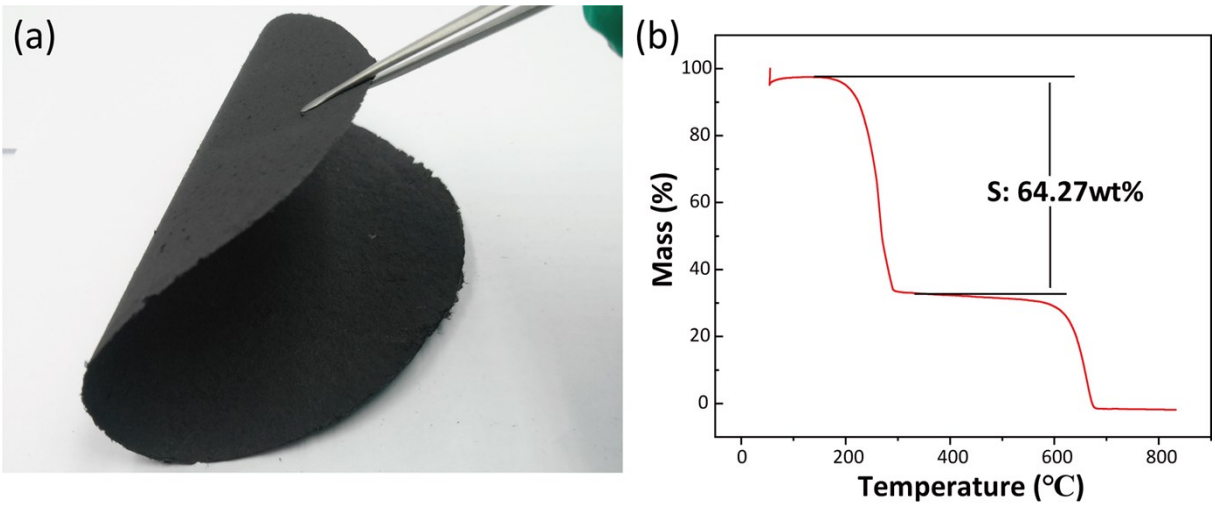

Fig. S2 (a) Photograph and (b) TGA curve of a flexible CNT@S electrode

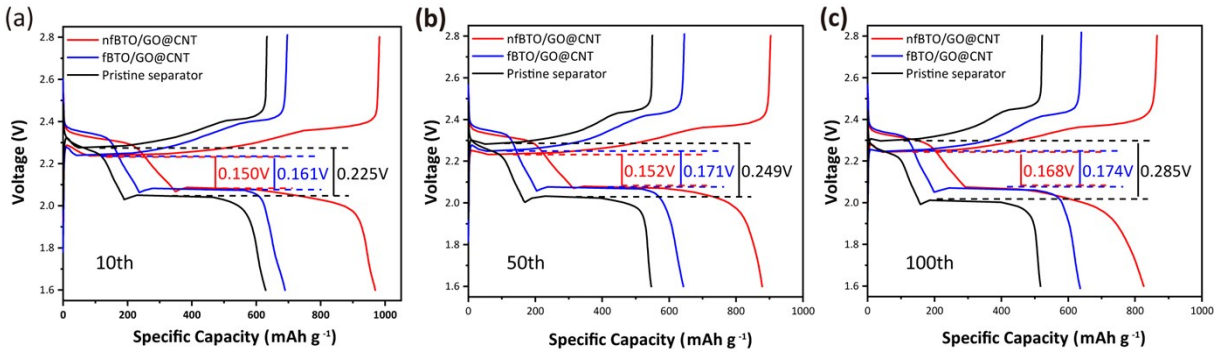

Fig. S3 Charge-discharge curves of the electrodes with the nfBTO/GO@CNT layer, fBTO/GO@CNT layer, and pristine separator in the (a) 10th, (b) 50th, and (c) 100th cycles.

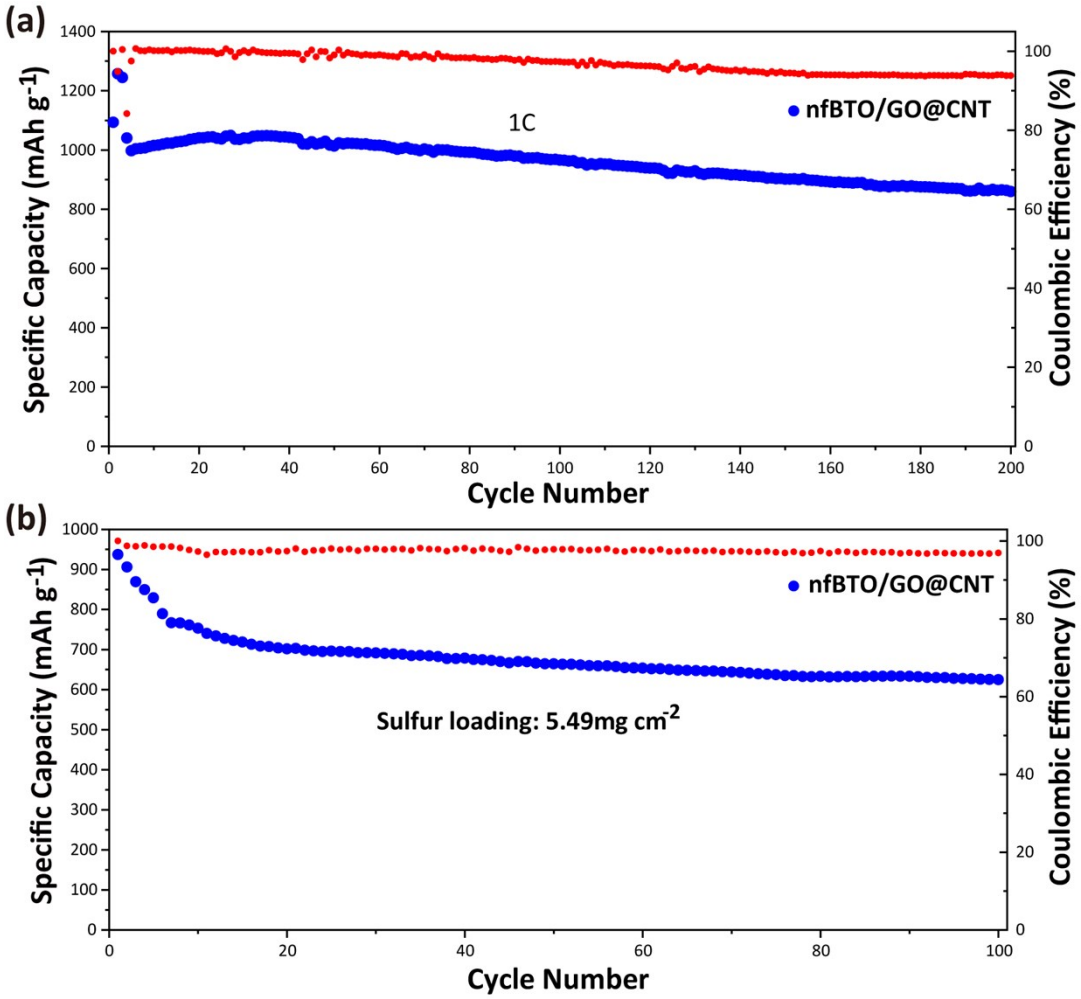

Fig. S4 Cycling performance of (a) an electrode with the nfBTO/GO@CNT functional layer at 1 C and (b) a high-sulfur loading electrode with the nfBTO/GO@CNT functional layer at 0.2 C.

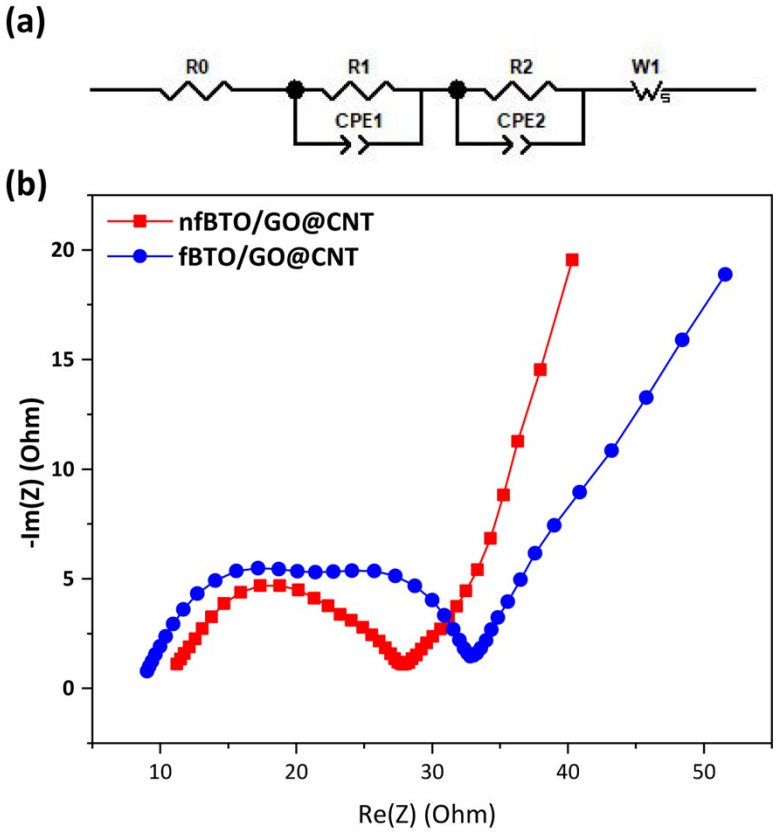

Fig. S5 (a) The equivalent circuit of the EIS tests. (b) The EIS rests of the cells with the nfBTO/GO@CNT and fBTO/GO@CNT layers after 100 cycles.

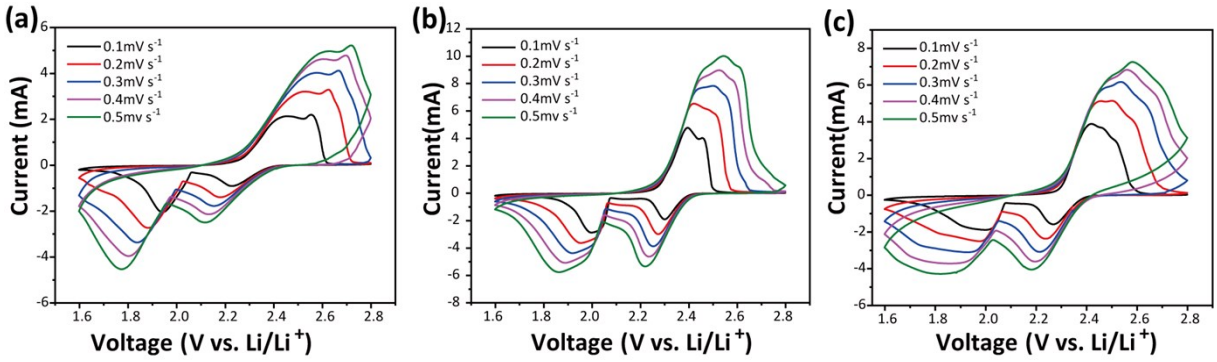

Fig. S6 CV profiles of electrodes with (a) a pristine separator, (b) an nfBTO/GO@CNT layer, and (c) a fBTO/GO@CNT layer at different scan rates

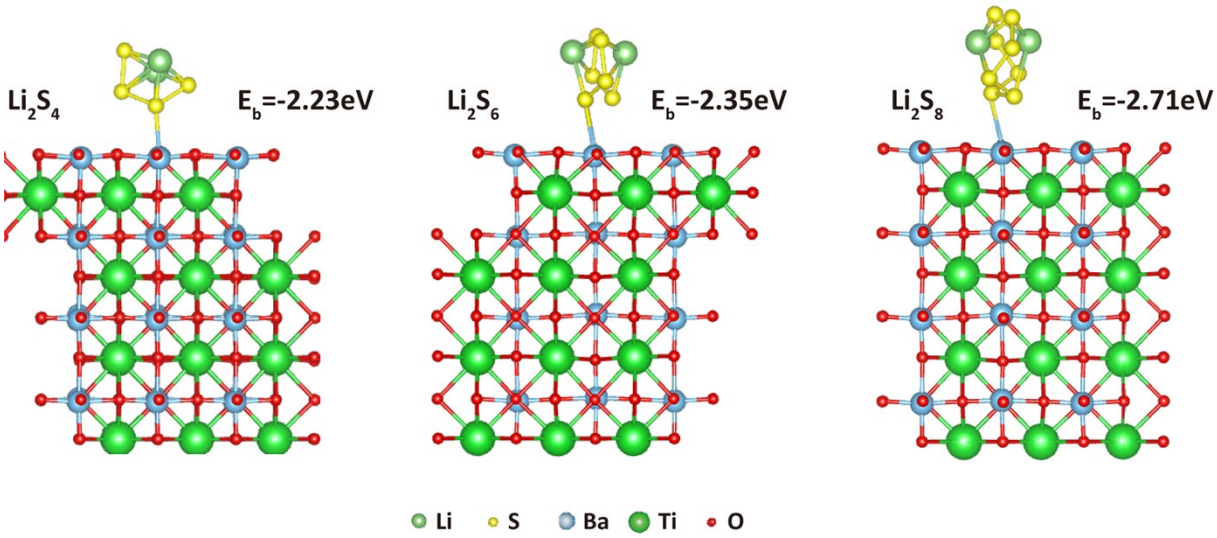

Fig. S7 Binding geometries and DFT calculation of binding energies of fBTO with Li_2S_n

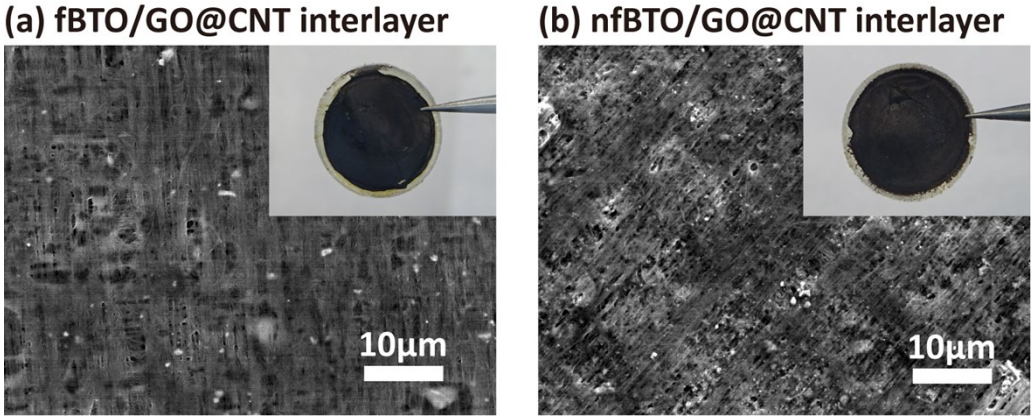

Fig. S8 Photographs and SEM images of (a) fBTO/GO@CNT and (b) nfBTO/GO@CNT layers after 50 cycles at 0.2 C.

Table S1 Comparison of cycle performances of the sulfur electrodes with nfBTO/GO@CNT layer and data in the literature

Functional interlayer	**Sulfur loading (mg cm^{-2})**	**Rate (C)**	**Initial capacity (mAh g^{-1})**	**Areal capacity (mAh cm^{-2})**	**References**
Dipole-aligned BTO coated separator	3	0.1	1122.1	3.37	[1]
rGO/BTO@CNF interlayer	4.616	0.1	917	4.23	[2]
$CoSe_2$/G functional separator	4.35	0.2	1098	4.78	[3]
CeO2@G modified separator	5.03	0.3	589	2.96	[4]
Gra-HsGDY	1.2	0.2	1267	1.52	[5]
WS@SS interlayer	2.4	0.1	1362	3.27	[6]
nfBTO/GO@CNT functional layer	5.49	0.1	937.4	5.15	This work

References

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