Supplementary Materials

Oxygen Vacancies in Bismuth Tantalum Oxide to Anchor Polysulfide and Accelerate the Sulfur Evolution Reaction in Lithium–Sulfur Batteries

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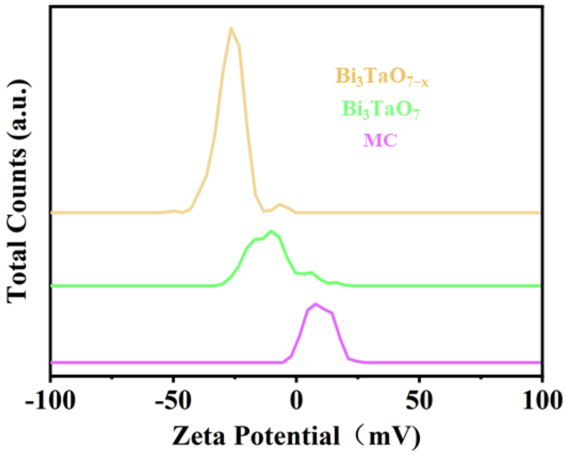

Figure S1. Zeta potentials of the dispersed three samples in water at pH value of 7.0.

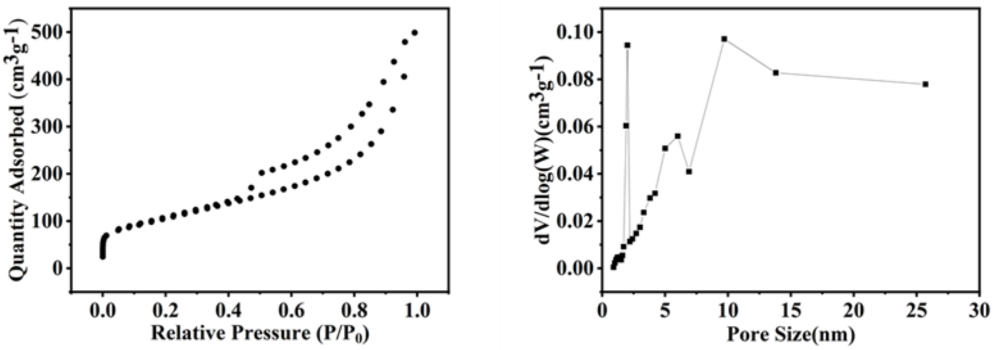

Figure S2. N_2 adsorption–desorption isotherm curves and the pore size distribution of Bi_3TaO_{7-x}.

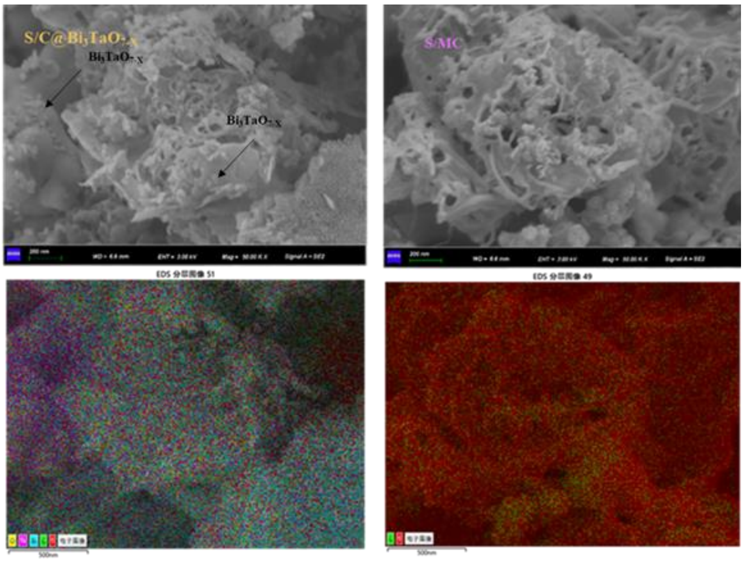

Figure S3. Characterization of SEM images and corresponding EDS elemental mappings of S/C and S/C@Bi$_3$TaO$_{7-x}$.

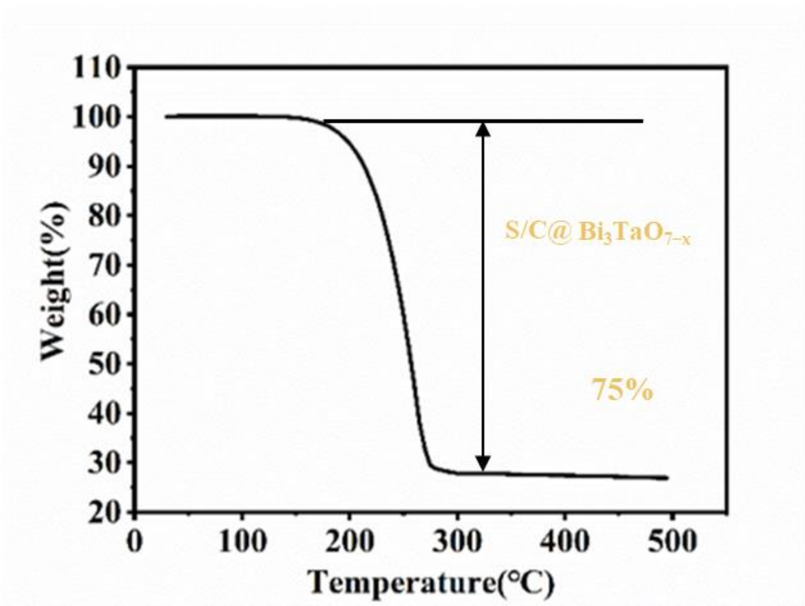

Figure S4. TGA curve of S/C@Bi$_3$TaO$_{7-x}$.

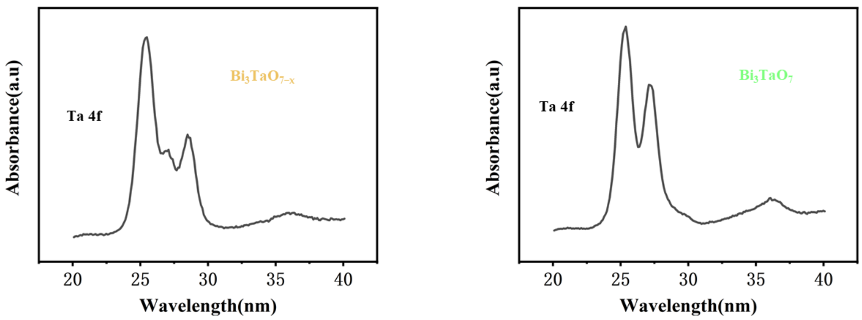

Figure S5. Ta 4f for Bi$_3$TaO$_7$ and Bi$_3$TaO$_{7-x}$.

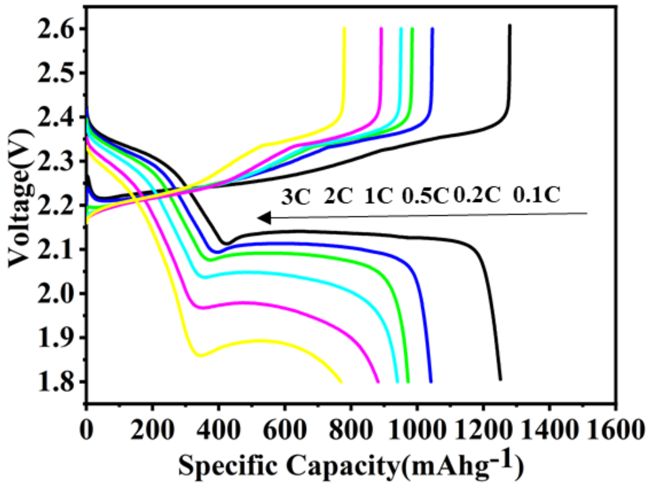

Figure S6. Multi-rate discharge-charge profiles of S/C@Bi_3TaO_{7-x}.

Table S1. The gravimetric energy is calculated based on all active and inactive components, including the packing film, current collectors, and separator.

Parameters	Unit	Value
Sulfur loading	%	80
Carbon content	%	10
Binder content	%	10
Electrolyte/sulfur ratio	μL mg^{-1}	3.3
Number of double-sided coated cathode		6
Weight of tab	g	0.28
Weight of the sulfur	g	2.82
Weight of the packing plus pouch foil	g	2.5
Weight of the anode	g	3.6
Weight of the cathode	g	4.70
Weight of the separator	g	0.64
Weight of electrolyte	g	9.30
Total weight	g	21.02
Energy of cell	Wh	6.3
Energy Density	Wh kg^{-1}	299

Table S2. Comparative table of Li-S pouch cell performance with recently reported works.

S loading (mg cm^{-2})	**Energy density (W h kg^{-1})**	**E/S ratio (μL mg^{-1})**	**Areal capacity (mA h cm^{-2})**	**Capacity retention rate (%)**	**Cycle**	**References**
4.0	206	6.0	4.8	~88	40	[1]
4.1	150	4.5	3.3	51	66	[2]
4.9	301	4.0	6.5	89	30	[3]
5.0	118	7.0	4.5	~77	50	[4]
6.0	317	4.0	7.2	74	80	[5]
6.1	301.4	3.0	7.1	81	23	[6]
6.5	299	2.5	5.9	83	10	[7]
13.6	303	2.4	11.0	78	30	[8]
9.6	**299.0**	**3.3**	**10.20**	**54**	**53**	**This work***

References

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