Supplementary Information for

**Hollow SnO2 nanosphere coated separators for dendrite-free lithium metal batteries**

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Fig. S1 Cl 2p XPS spectra of hollow SnO2 nanospheres.



Fig. S2 The size distribution of hollow SnO2 nanospheres.

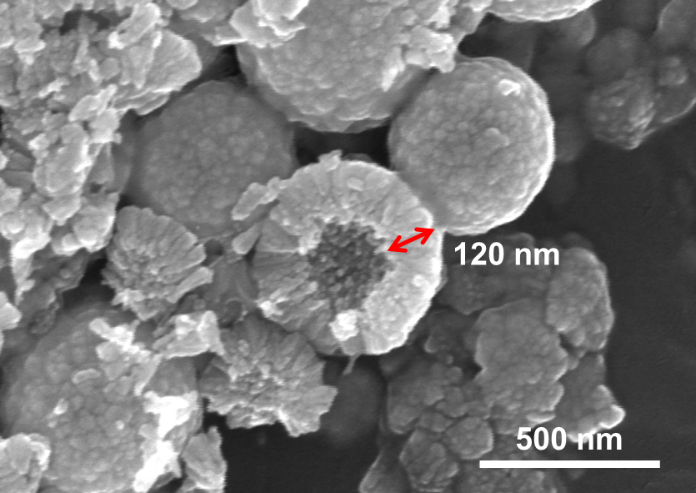


Fig. S3 The SEM image of broken hollow SnO2 nanospheres.



Fig. S4 The pore distribution of hollow SnO2 nanospheres.

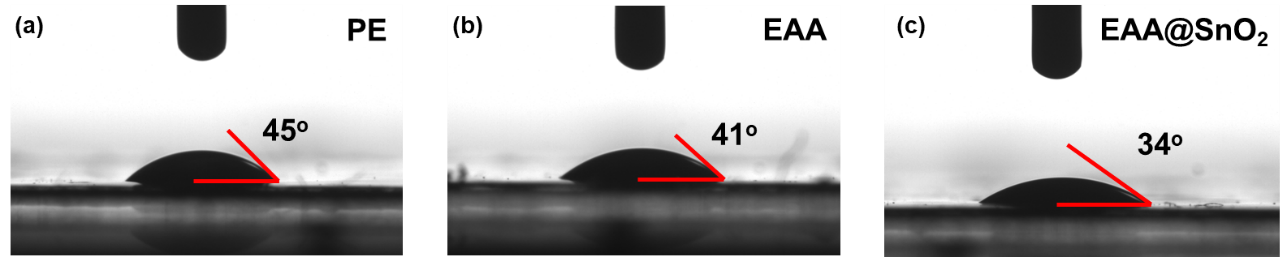


Fig. S5 The contact angle of (a) PE, (b) EAA and (c) EAA@SnO2 separators, respectively.

图表

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Fig. S6 The TGA curves of PE, EAA and EAA@SnO2 separators.

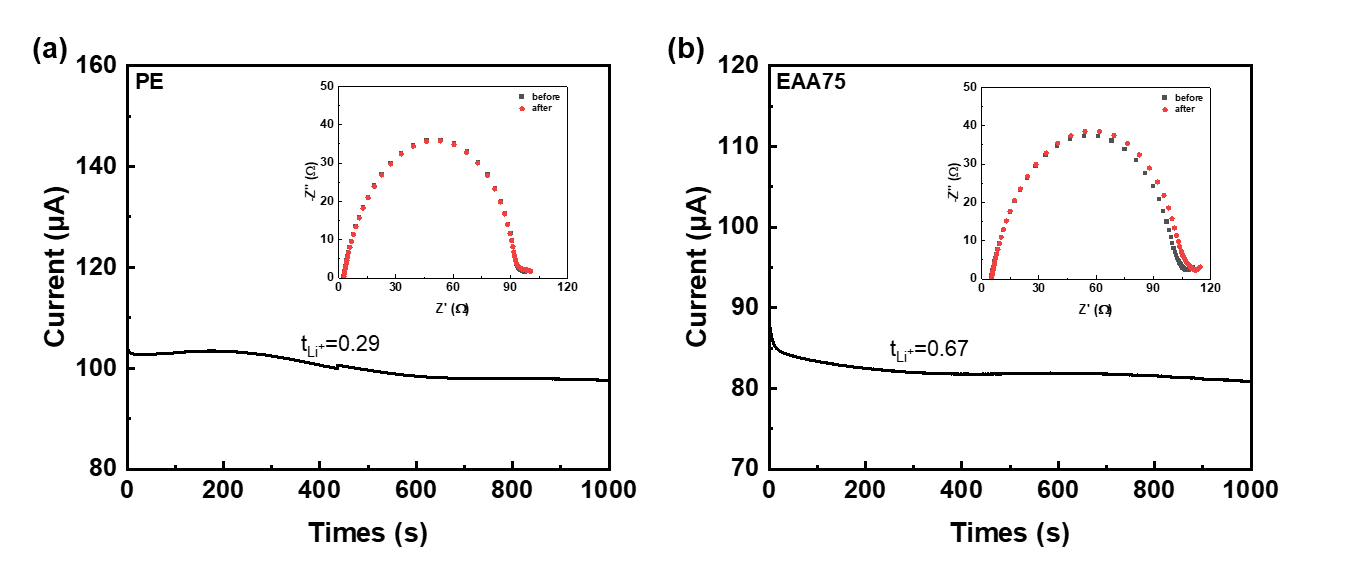


Fig. S7 Chronoamperometry profiles of (a) PE separator and (b) EAA75 separator. Insets are the EIS spectra before and after polarization.

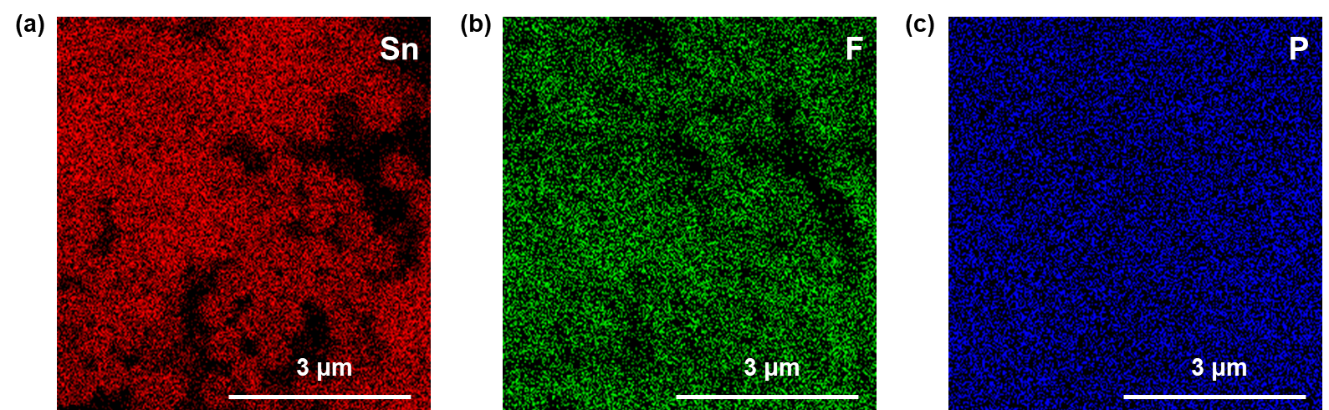


Fig. S8 The (a) Sn, (b) F and (c) P EDX mapping of EAA@SnO2 separators after cycling for 100 h at 0.5mA cm-2.

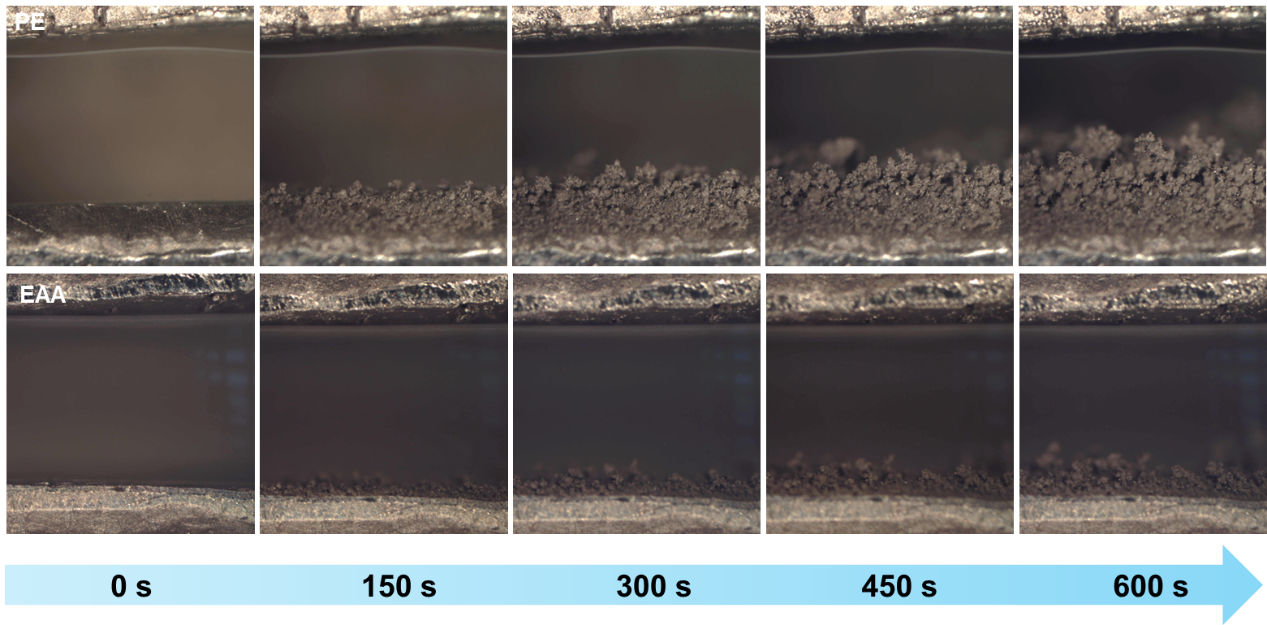


Fig. S9 The morphology evolution of the in-situ Li||Li symmetric cells with the PE and EAA separators at a current of 3 mA.



Fig. S10 The CV curves of LFP|EAA@SnO2|Li cells.

图表, 散点图

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Fig. S11 The rate capacity of LFP||Li cells assembled with EAA@SnO2 separators with different SnO2 thickness from 0.5 C to 5 C.

图表, 折线图

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Fig. S12 The long-term cycling performance of PE, EAA and EAA@SnO2 separators assembled LFP||Li cells with a LFP loading of 11.25 mg cm-2 at 1 C.

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Fig. S13 The cross-section SEM images of Li anode with EAA@SnO2, EAA and PE separators.

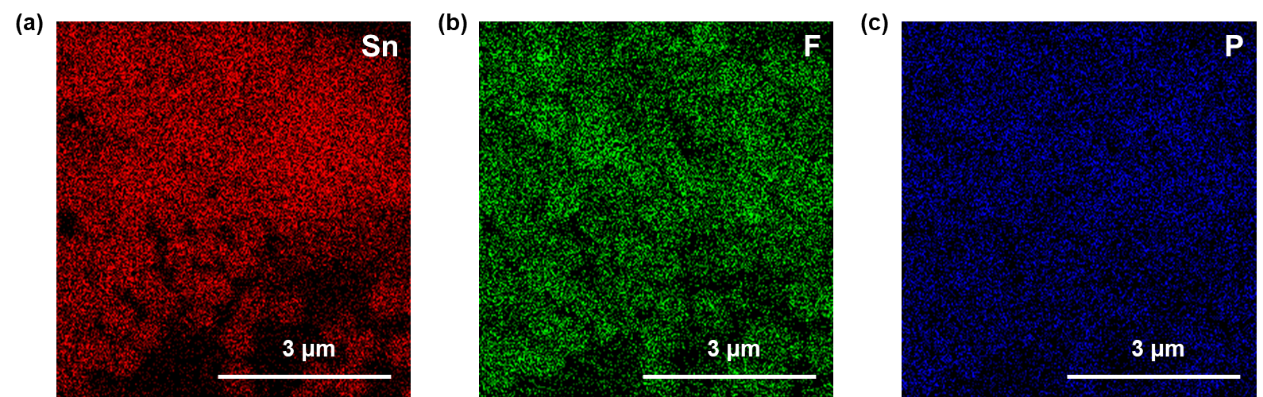


Fig. S14 The (a) Sn, (b) F and (c) P EDX mapping of EAA@SnO2 separators after cycling for 100 cycles at 1 C.



Fig. S15 The Li 1s XPS spectra of EAA@SnO2 separators after cycling for 100 cycles at 1 C in LFP|EAA@SnO2|Li cells.

图表, 直方图

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Fig. S16 The XRD pattern of cycled SnO2 on EAA@SnO2 separators.

图表

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Fig. S17 The Sn 3d XPS spectrum of Li anode after 100 cycles at 1 C.

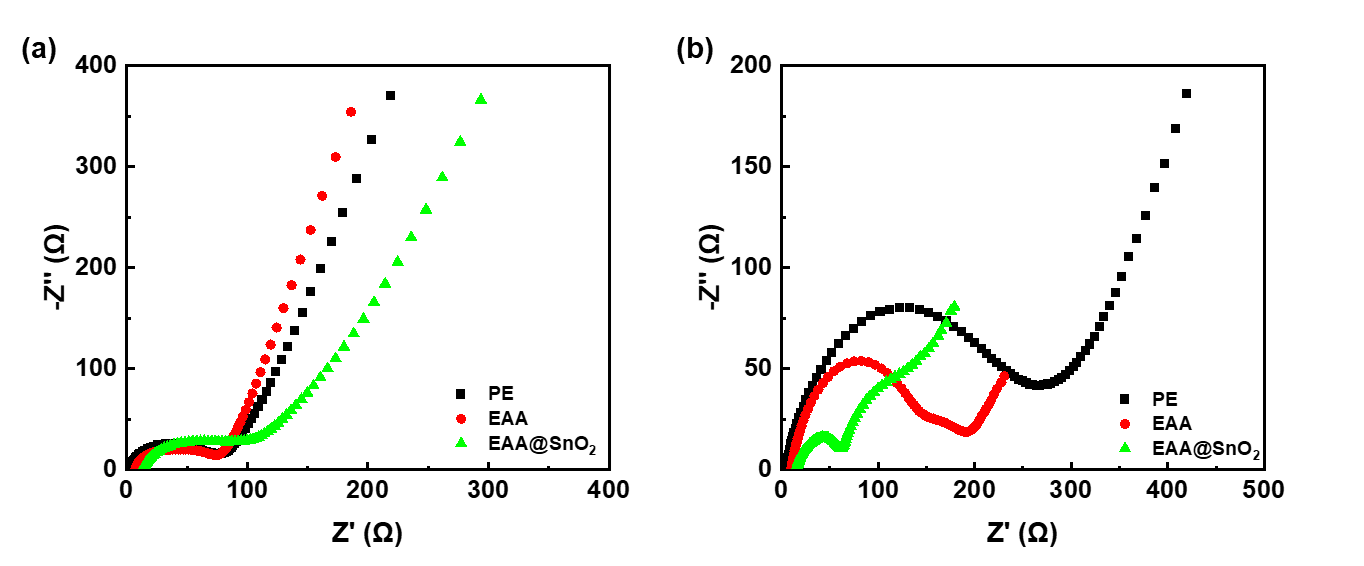


Fig. S18 The EIS spectra of LFP||Li cells with PE, EAA and EAA@SnO2 separators (a) before and (b) after 100 cycles at 1 C.