

Supporting Information

Amphipathic Emulsion Binder for Enhanced Performance of Lithium-Sulfur Batteries

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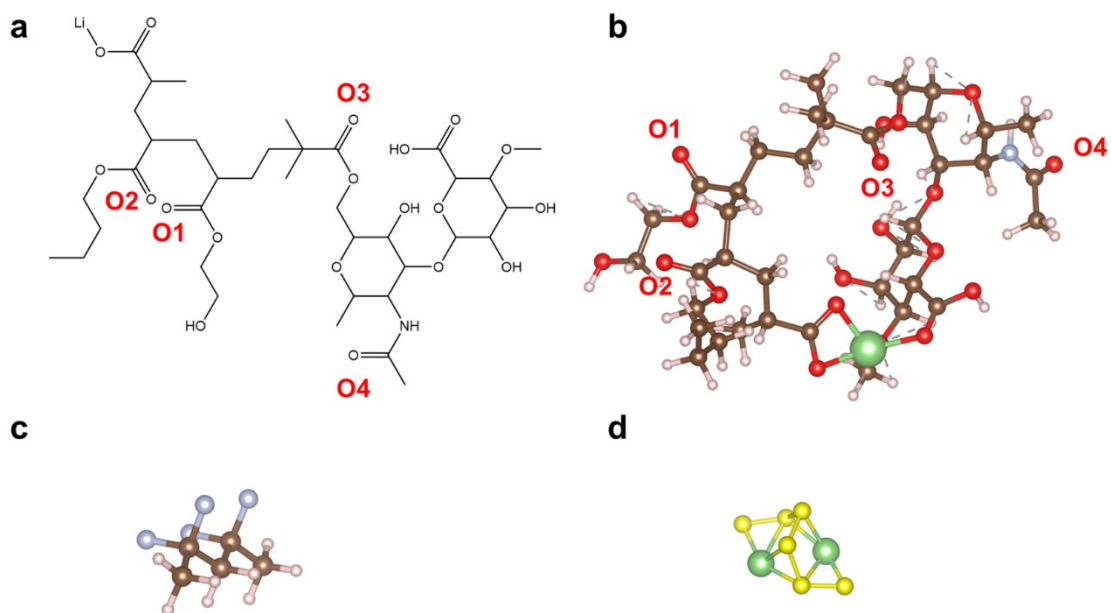


Figure S1. (a) The chemical structure of simplified HBEA. Relaxed structures of (b) HBEA, (c) PVDF, and (d) Li_2S_6 .

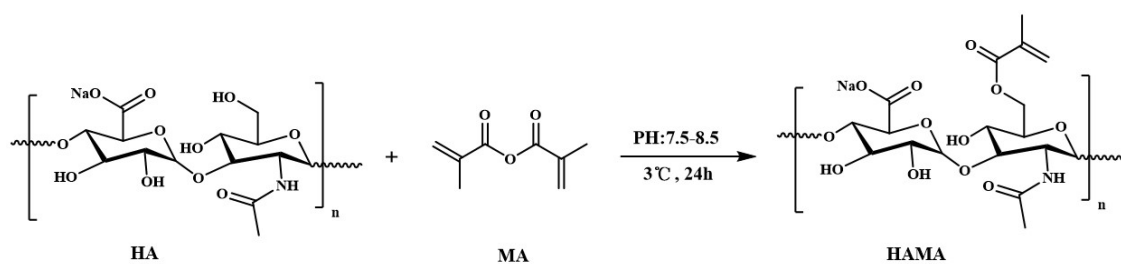


Figure S2. Synthesis process of HAMA.

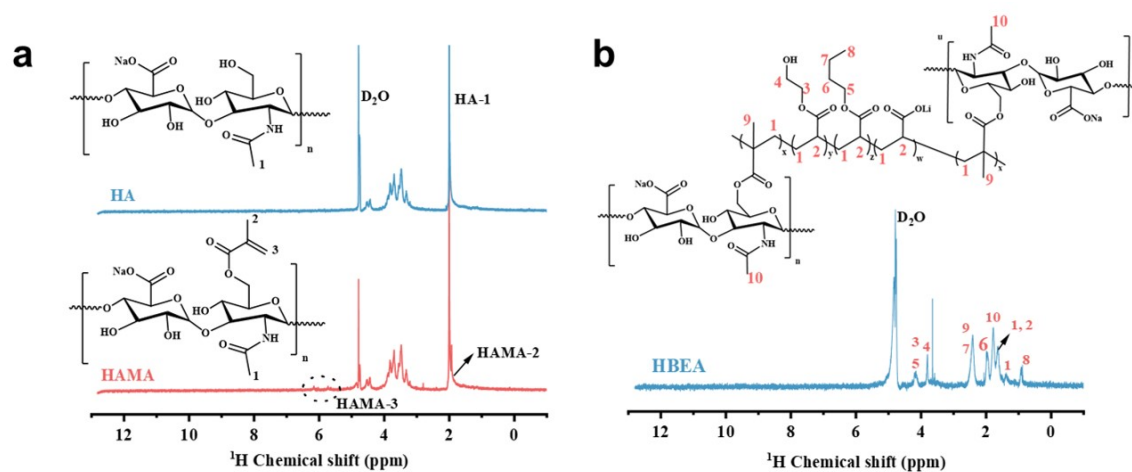


Figure S3. ^1H NMR spectra of HA(a), HAMA(a) and HBEA (b) composite.

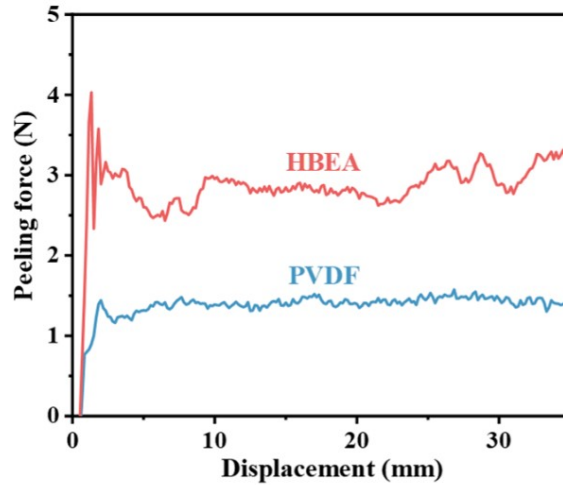


Figure S4. Peeling force-displacement curves of HBEA and PVDF binders.

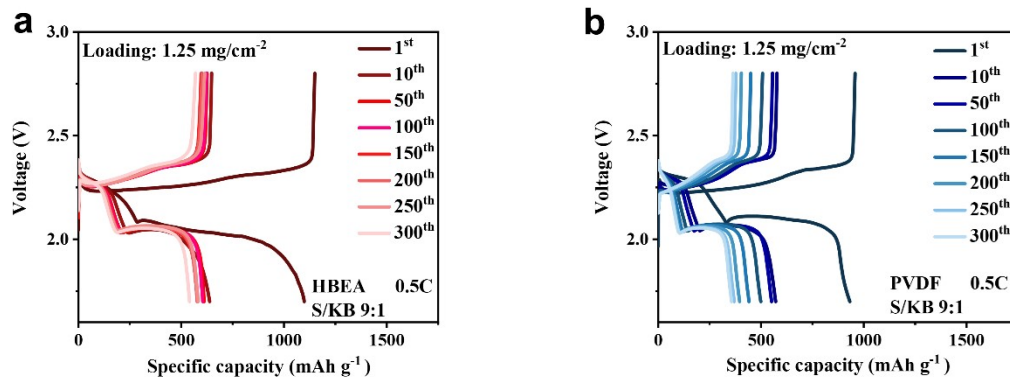


Figure S5. Charge /discharge voltage profiles of (a) S/HBEA and (b) S/PVDF.

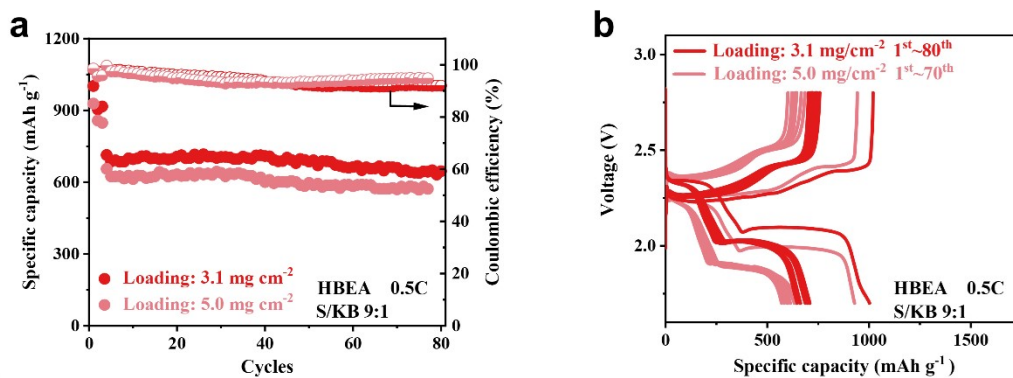


Figure S6. (a) Cycling performances and Coulombic efficiency and (d) Charge /discharge voltage profiles of high mass loading S/HBEA.

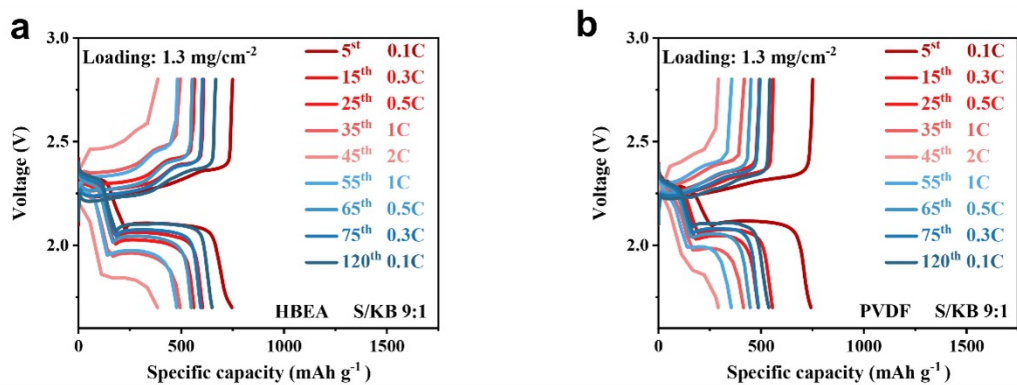


Figure S7. Charge/discharge voltage profiles of (a) S/HBEA and (b) S/PVDF cells at different rate.

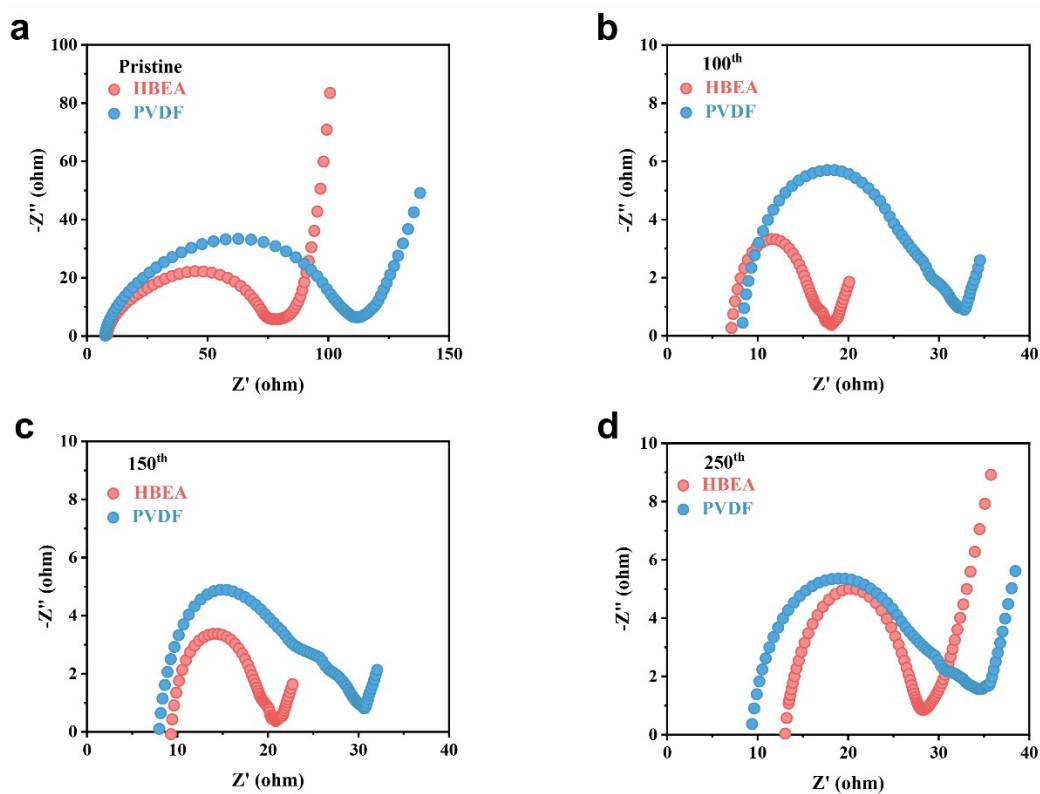


Figure S8. Nyquist plots of S/HBEA and S/PVDF cells (a) before cycling and after (b) 100 cycles, (c) 150 cycles, and (d) 250 cycles.

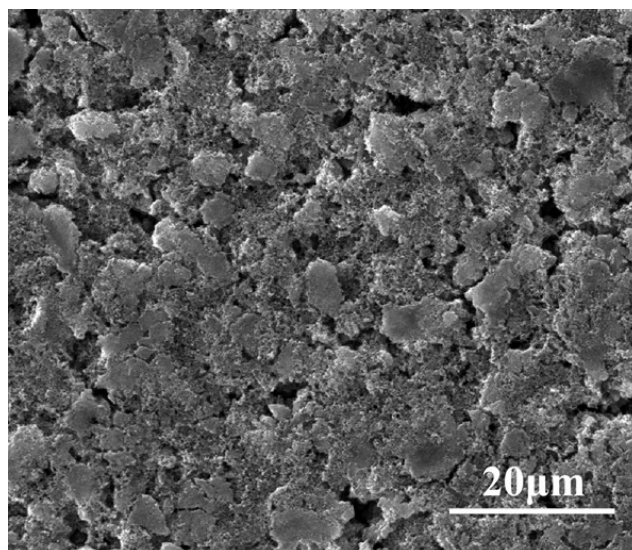


Figure S9. SEM of cycled S/HBEA cathode

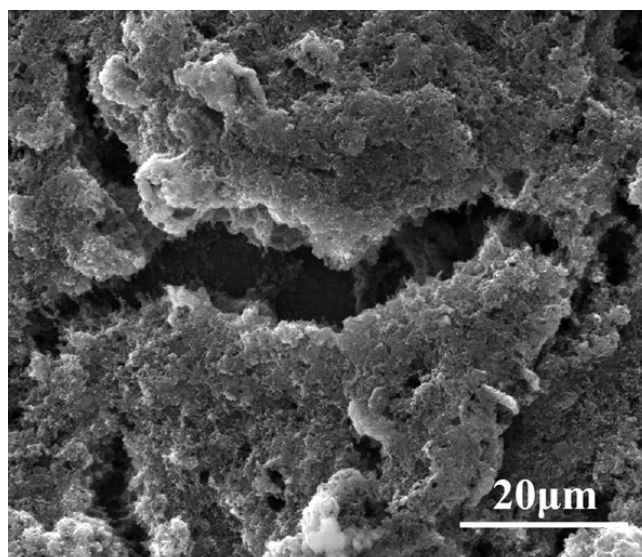


Figure S10. SEM of cycled S/PVDF cathode

Table S1. Li^+ diffusion coefficients of HBEA and PVDF sulfur cathodes calculated from the CV data.

Sample (sulfur cathode)	Li^+ diffusion coefficients (D_{Li^+} , $\text{cm}^2 \text{s}^{-1}$)		
	D_{O}	D_{R}	$D_{\text{R}'}$
HBEA	8.6×10^{-7}	5.5×10^{-7}	1.4×10^{-8}
PVDF	5.5×10^{-7}	2.9×10^{-7}	7.1×10^{-9}