

Lithium Bis(fluorosulfonyl)imide/Poly(ethylene oxide) Polymer Electrolyte for All Solid-State Li–S Cell

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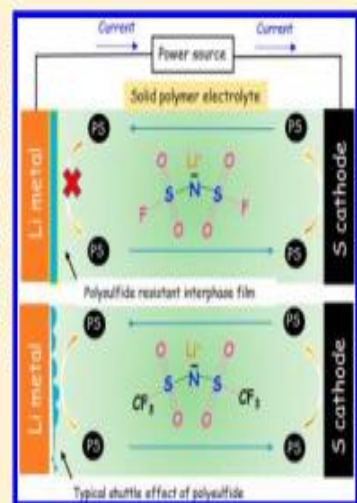
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Supporting Information

ABSTRACT: Solid polymer electrolytes (SPEs) comprising lithium bis(fluorosulfonyl)imide (Li[N(SO₂F)₂], LiFSI) and poly(ethylene oxide) (PEO) have been studied as electrolyte material and binder for the Li–S polymer cell. The LiFSI-based Li–S all solid polymer cell can deliver high specific discharge capacity of 800 mAh g_{sulfur}⁻¹ (i.e., 320 mAh g_{cathode}⁻¹), high areal capacity of 0.5 mAh cm⁻², and relatively good rate capability. The cycling performances of Li–S polymer cell with LiFSI are significantly improved compared with those with conventional LiTFSI (Li[N(SO₂CF₃)₂]) salt in the polymer membrane due to the improved stability of the Li anode/electrolyte interphases formed in the LiFSI-based SPEs. These results suggest that the LiFSI-based SPEs are attractive electrolyte materials for solid-state Li–S batteries.



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