

Tuning ionic conductivity to enable all-weather solid-state Li-S batteries with superior performances

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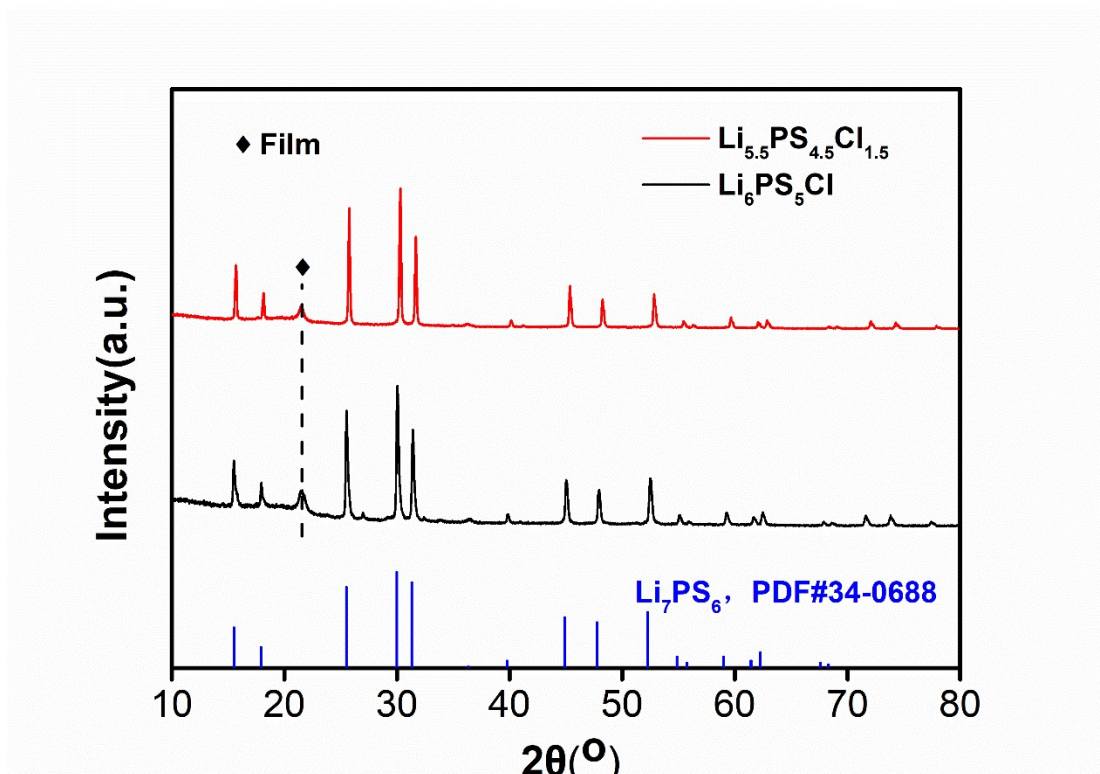


Fig. S1 XRD patterns of $\text{Li}_{5.5}\text{PS}_{4.5}\text{Cl}_{1.5}$ and $\text{Li}_6\text{PS}_5\text{Cl}$ solid state electrolyte.

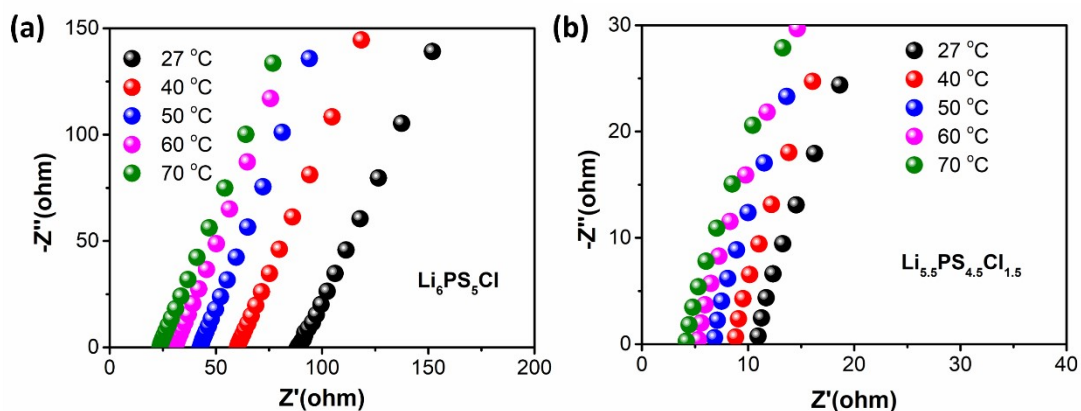


Fig. S2 Complex impedance spectra of (a) $\text{Li}_6\text{PS}_5\text{Cl}$ and (b) $\text{Li}_{5.5}\text{PS}_{4.5}\text{Cl}_{1.5}$ solid electrolytes at different temperatures.

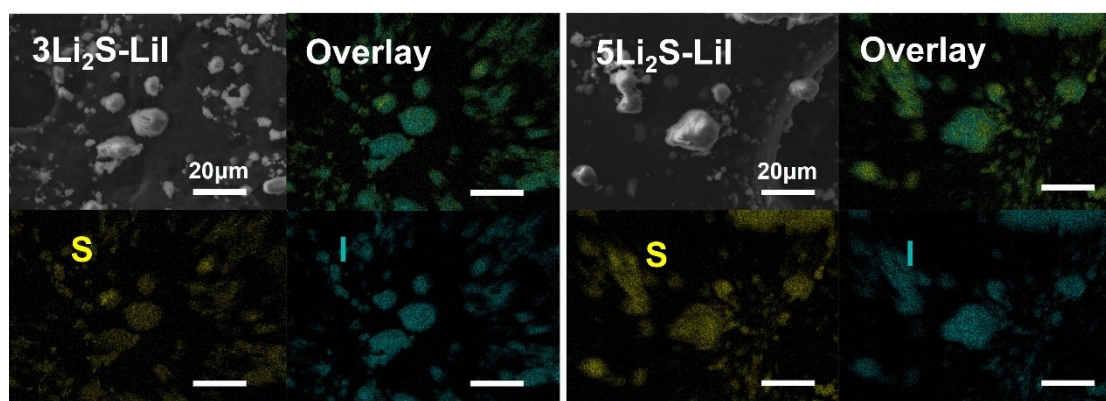


Fig. S3 SEM images and EDX elemental mapping of $3\text{Li}_2\text{S-LiI}$ and $5\text{Li}_2\text{S-LiI}$.

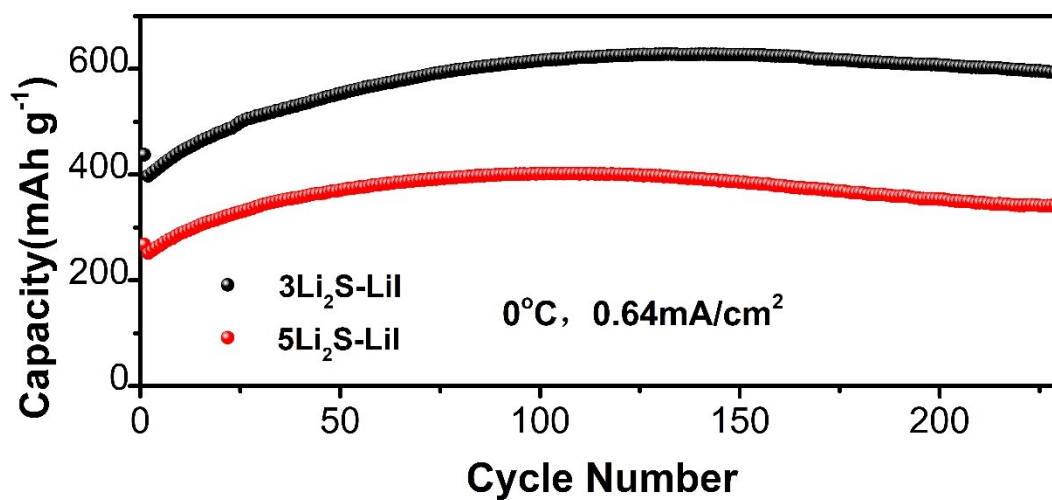


Fig. S4 Cycling performances of $\text{Li}_{5.5}\text{PS}_{4.5}\text{Cl}_{1.5}$ -based solid-state Li-S batteries using

3Li₂S-LiI and 5Li₂S-LiI cathode mixture cycled at 0°C, 0.64mA/cm² (The mass of the cathode mixture is 2 mg).