Construction of A bis(benzene sulfonyl)imide based single-ion polymer artificial layer for steady lithium metal anode

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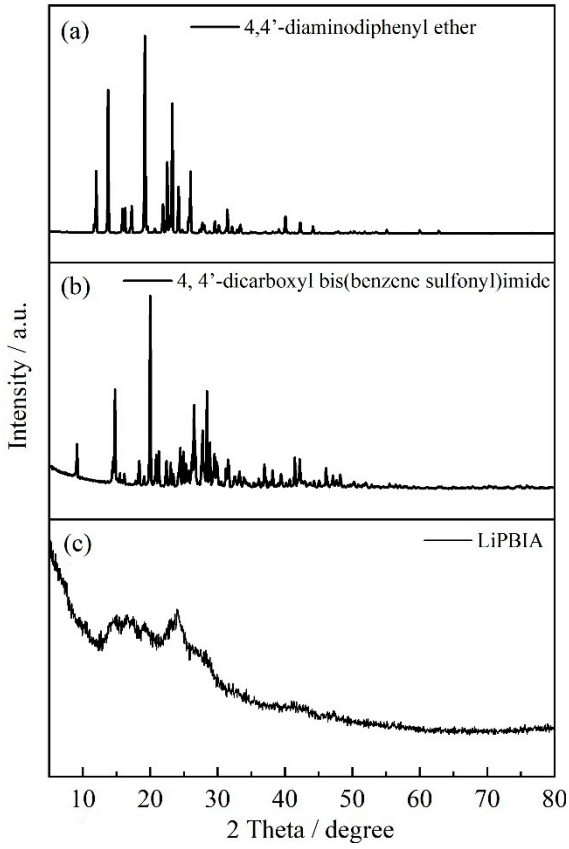

Figure S1. The XRD spectra. (a) 4, 4'-dicarboxyl bis(benzene sulfonyl)imide. (b) 4,4'-diaminodiphenyl ether. (c) LiPBIA copolymer.

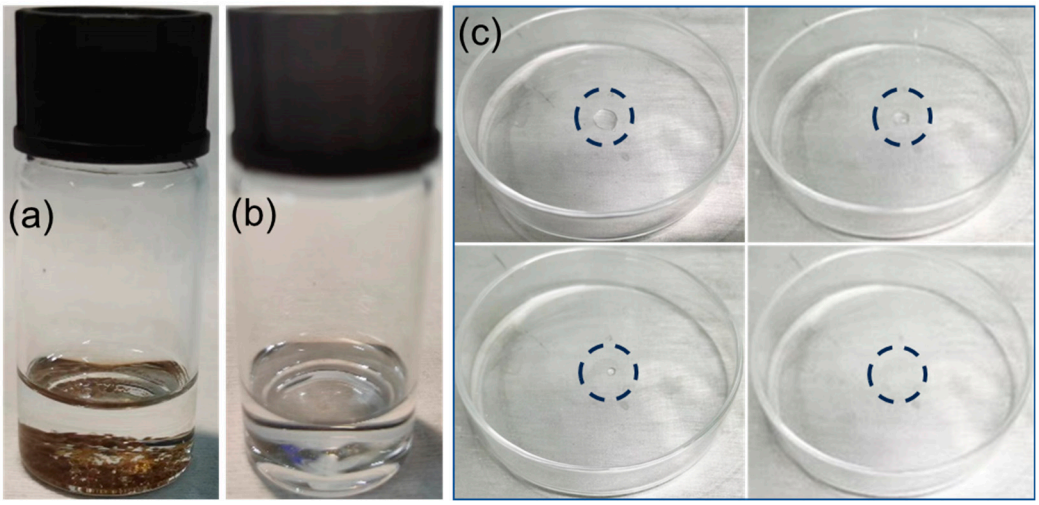

Figure S2. The optical photograph of (a) the LiPBIA dissolved in EC/DMC mixture solvent, (b) the EC/DMC mixture solvent after removed the LiPBIA particles and (c) the residual condition after the EC/DMC mixture solvent evaporation.

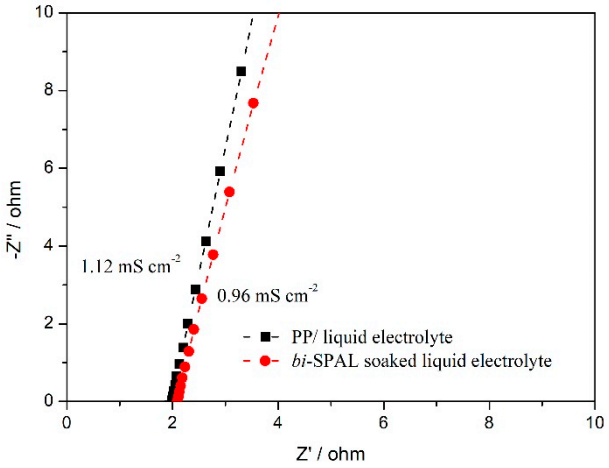

Figure S3. Ionic conductivity characterization of liquid electrolyte and *bi*-SPAL soaked liquid electrolyte.

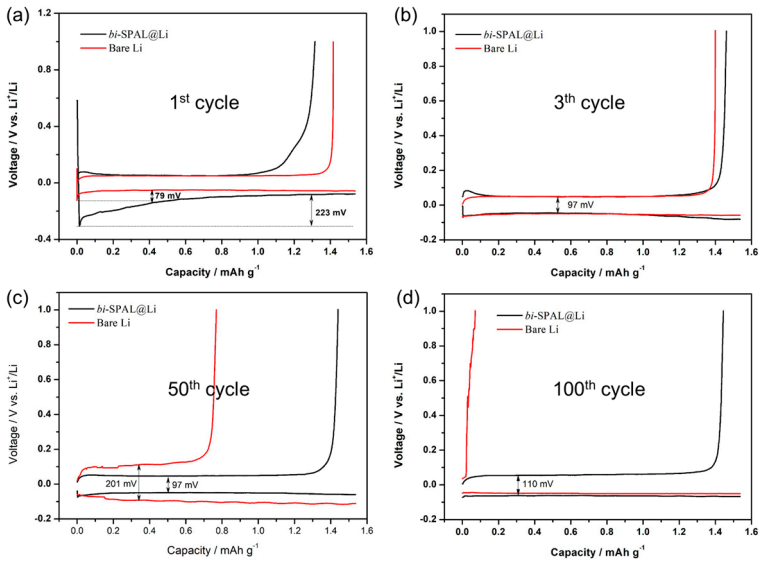

Figure S4. Plating/stripping curves of "Li | bare Cu" and "Li | *bi*-SPAL@Cu" cells. (a) The first cycle; (b) The third cycle; (c) The 50th cycle; (d) The 100th cycle.

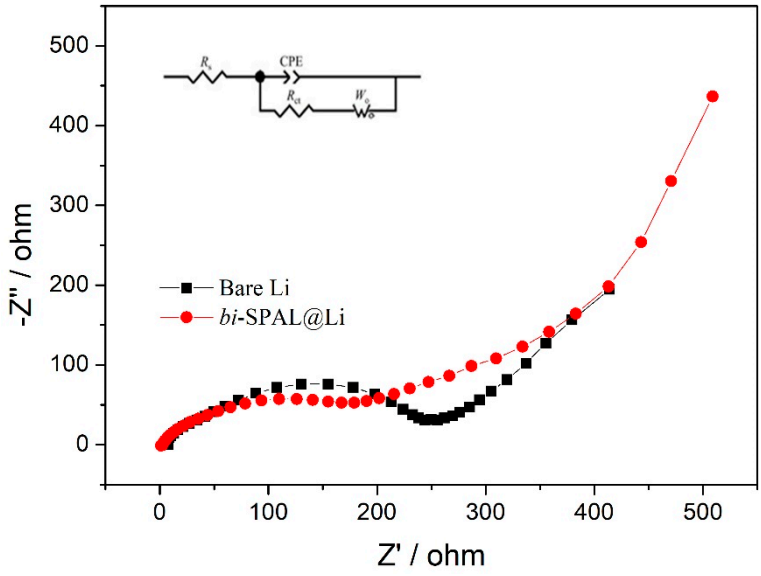

Figure S5. The Nyquist plots of the LFP|Li full cell after 20 cycles at 1 C with or without *bi*-SPAL.

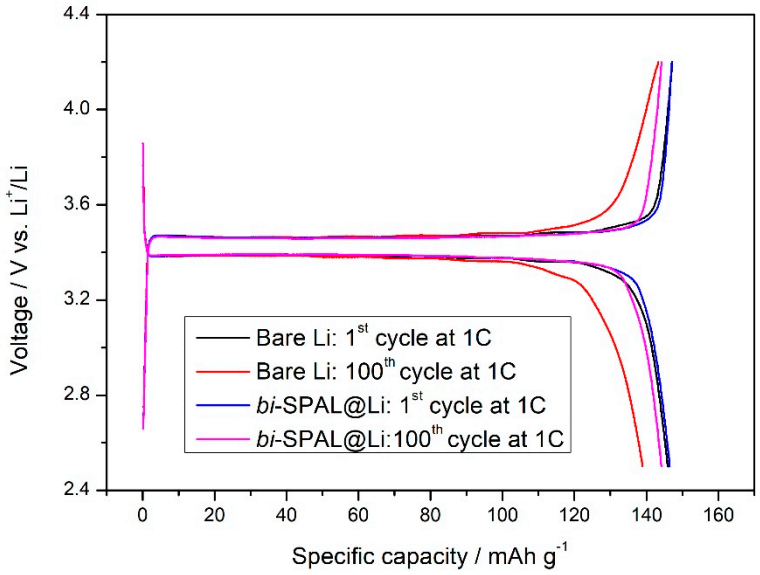

Figure S6. The charge/discharge curves of LFP/Li and LFP/*bi*-SPAL@Li cells at 1st cycle and 100th cycle.