

Supporting Information for

## Pancake-Like MOF Solid-State Electrolytes with Fast Ion Migration for High-Performance Sodium Battery

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### Supplementary Tables and Figures

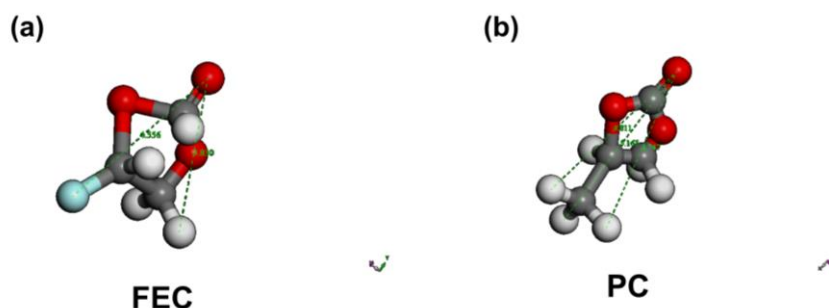


Fig. S1 Molecular model of **a** FEC and **b** PC

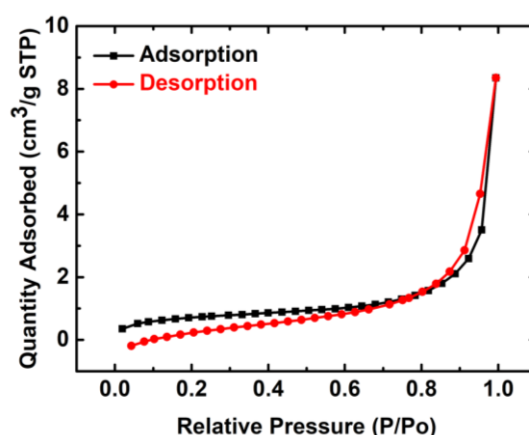
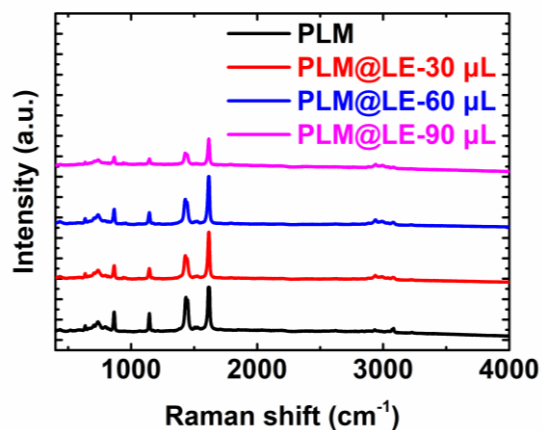
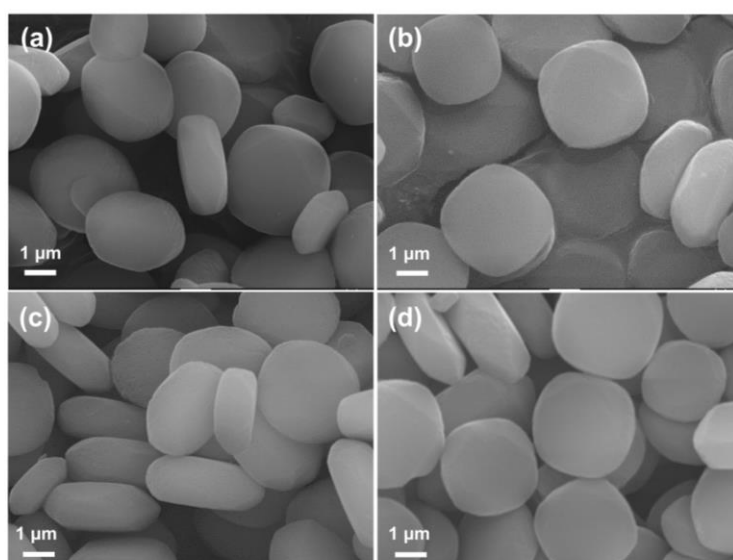


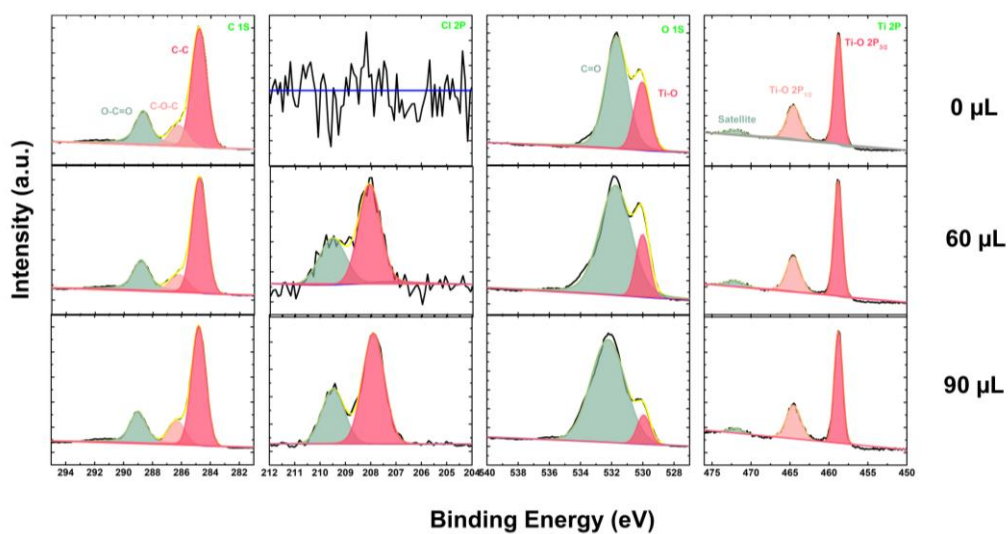
Fig. S2 N<sub>2</sub> adsorption/desorption isothermal linear plots of PLM@LE (0.1 g PLM : 90 μL LE)



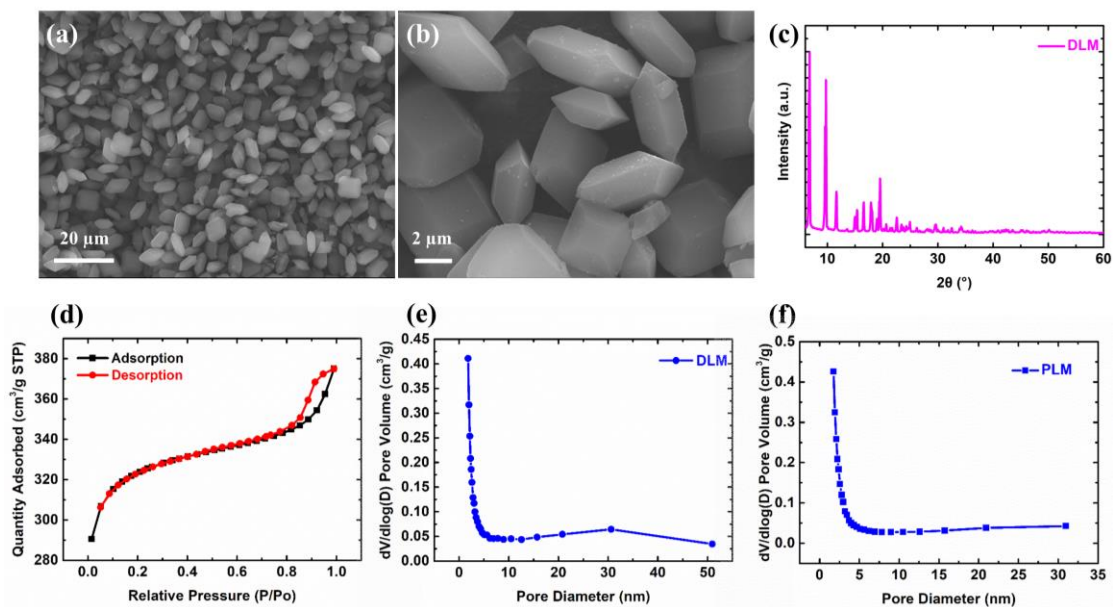
**Fig. S3** Raman spectra of PLM and PLM with different LE contents



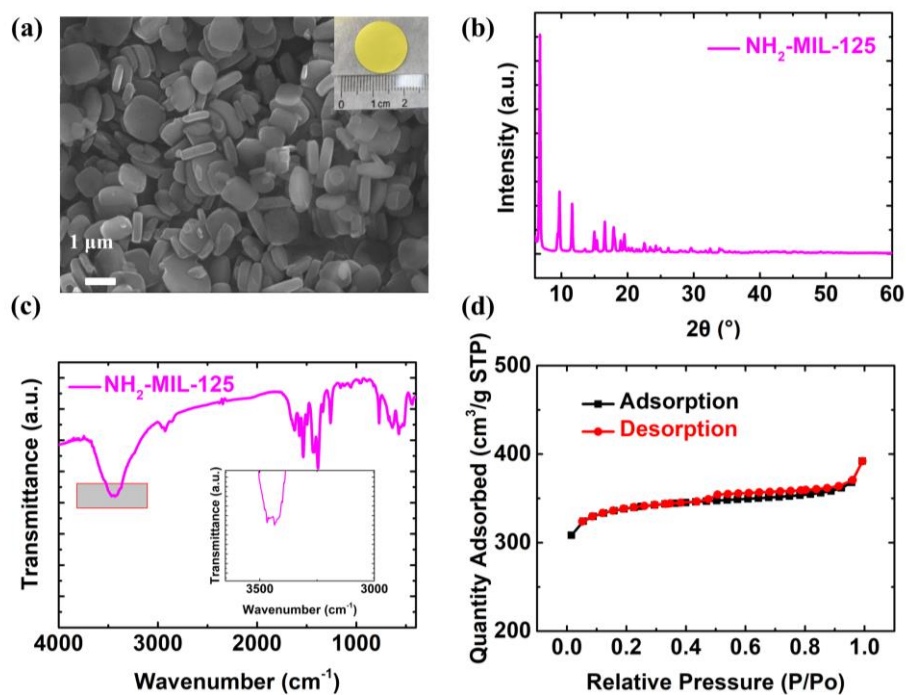
**Fig. S4** SEM images of 0.1 g PLM with different contents of LE. **a** 0  $\mu\text{L}$ , **b** 60  $\mu\text{L}$ , **c** 90  $\mu\text{L}$  and **d** 120  $\mu\text{L}$



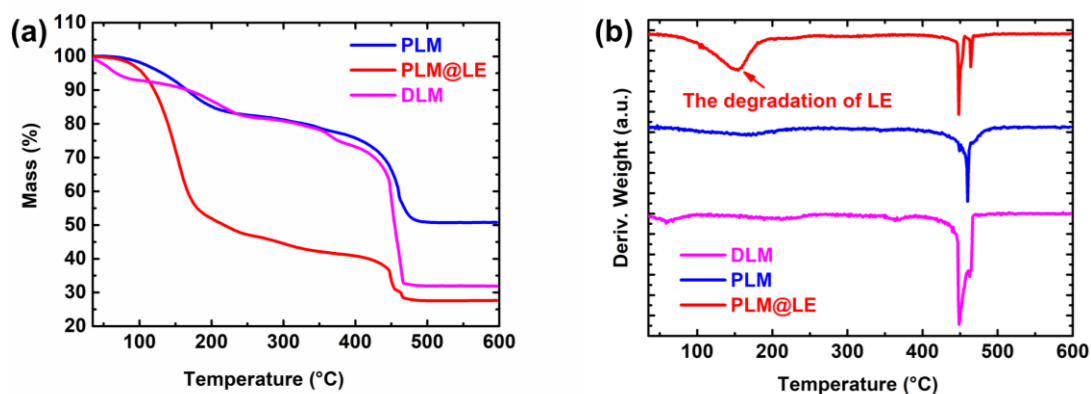
**Fig. S5** XPS spectra of 0.1 g PLM with different contents of LE



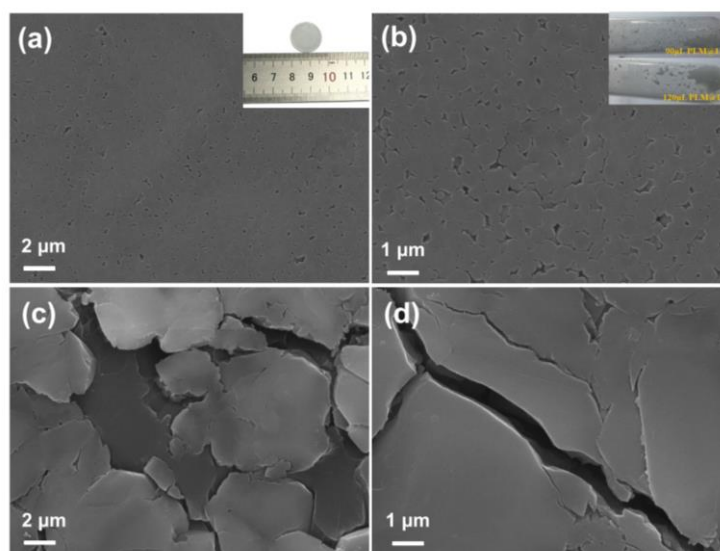
**Fig. S6** **a** Low magnification **b** High magnification SEM images of DLM. **c** XRD pattern of DLM. **d** N<sub>2</sub> adsorption/desorption isothermal linear plots of DLM. Pore size distribution curves of **e** DLM and **f** PLM



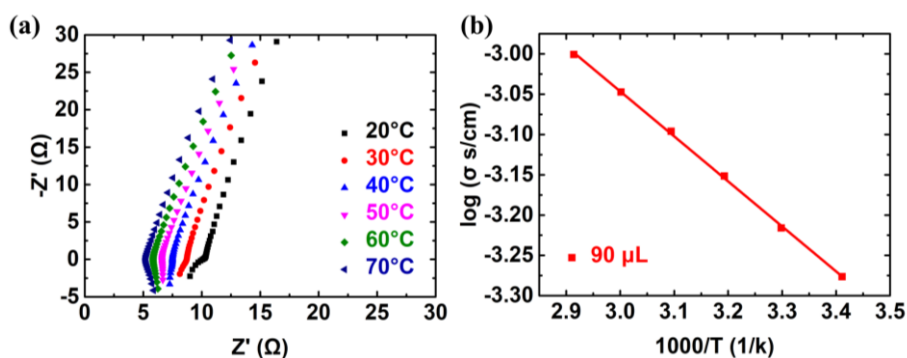
**Fig. S7** **a** SEM image of NH<sub>2</sub>-MIL-125. Inset: the optical image of NH<sub>2</sub>-MIL-125 pellet. **b** XRD pattern, **c** FTIR spectrum and **d** BET plots of NH<sub>2</sub>-MIL-125



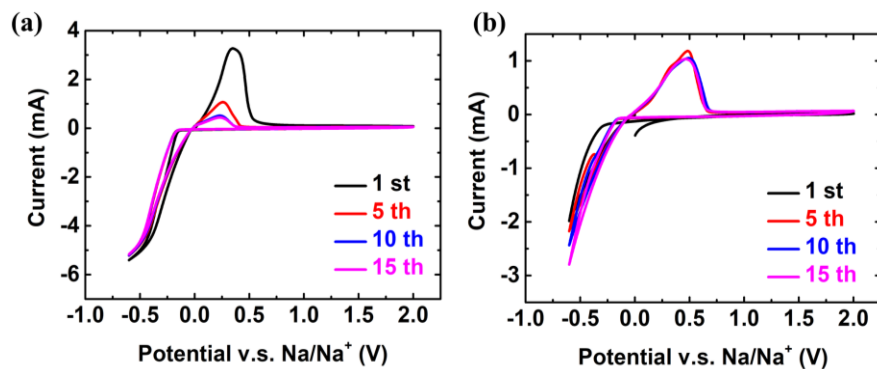
**Fig. S8** **a** TGA and **b** DTG of PLM, PLM@LE and DLM at air atmosphere at a speed of  $10\text{ }^{\circ}\text{C min}^{-1}$



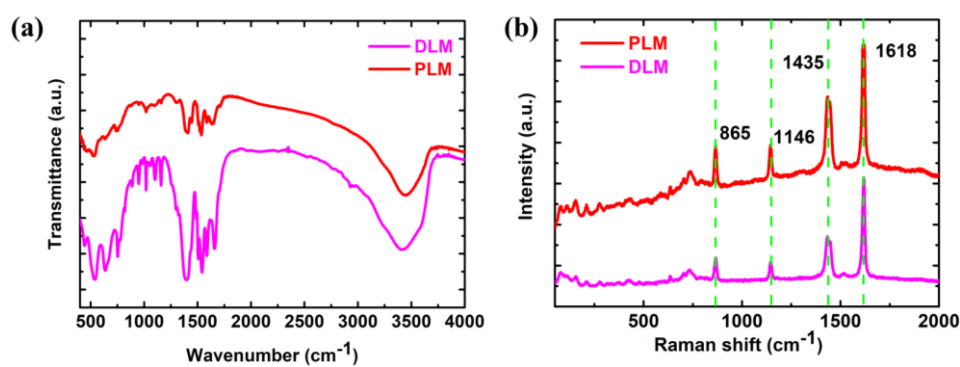
**Fig. S9** **a** Low magnification SEM image of PLM@LE after pressing at 6 T pressure. Inset: the optical image of PLM@LE. **b** High magnification SEM image of PLM@LE. Inset: the optical image of PLM with different contents of LE. **c** Low magnification and **d** High magnification SEM images of DLM@LE after pressing at 6 T pressure



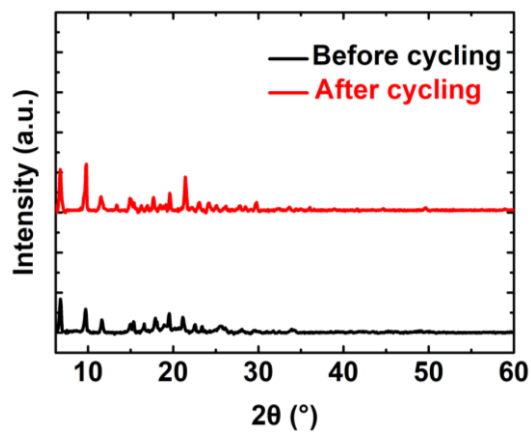
**Fig. S10** **a** EIS at different temperature and **b** Arrhenius plot for the ionic conductivity of  $\text{NH}_2\text{-MIL-125}$  with  $90\text{ }\mu\text{L}$  LE



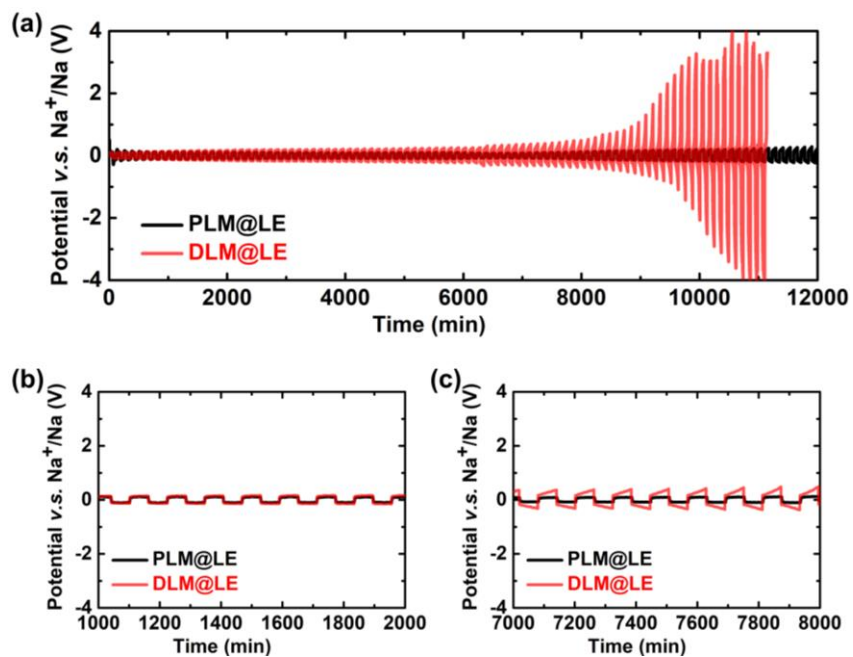
**Fig. S11** CV curves of **a** LE and **b** PLM@LE under 10 mV/s scan rate



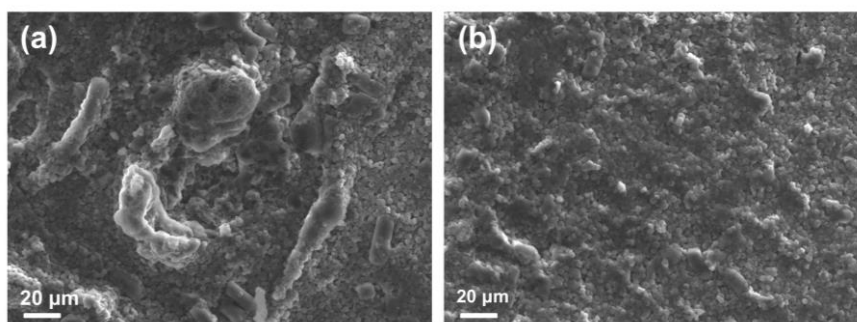
**Fig. S12** **a** FTIR spectra and **b** Raman spectra of PLM and DLM



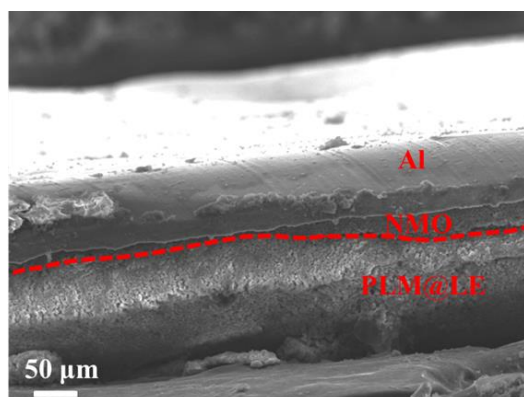
**Fig. S13** XRD patterns of PLM@LE before and after the DC sodium plating/stripping cycle



**Fig. S14** a Direct current Na plating/stripping of Na//PLM@LE//Na and Na//DLM@LE//Na cell. Magnification images of **b** 1000-2000 min and **c** 7000-8000 min



**Fig. S15** SEM images of PLM@LE at different current densities after cycling. **a** 1 mA cm<sup>-2</sup> and **b** 0.4 mA cm<sup>-2</sup>



**Fig. S16** Cross-sectional SEM image of Na<sub>0.44</sub>MnO<sub>2</sub>//PLM@LE after cycling

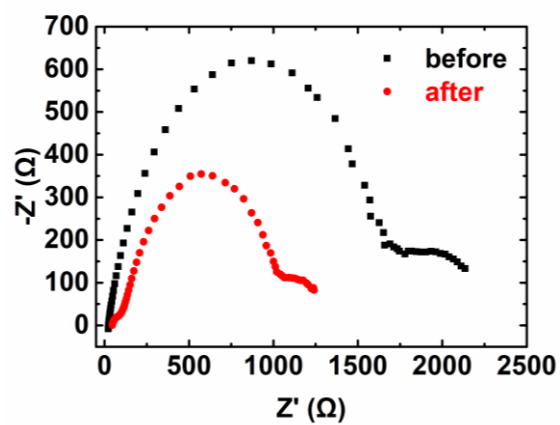


Fig. S17 EIS of PLM@LE before and after 200 cycles