Electronic Supplementary Information

Significantly Improve the Lithium-Ion Conductivity of Solid-State Electrolytes via Fabricating Large Pore Volume Hollow ZIF-8

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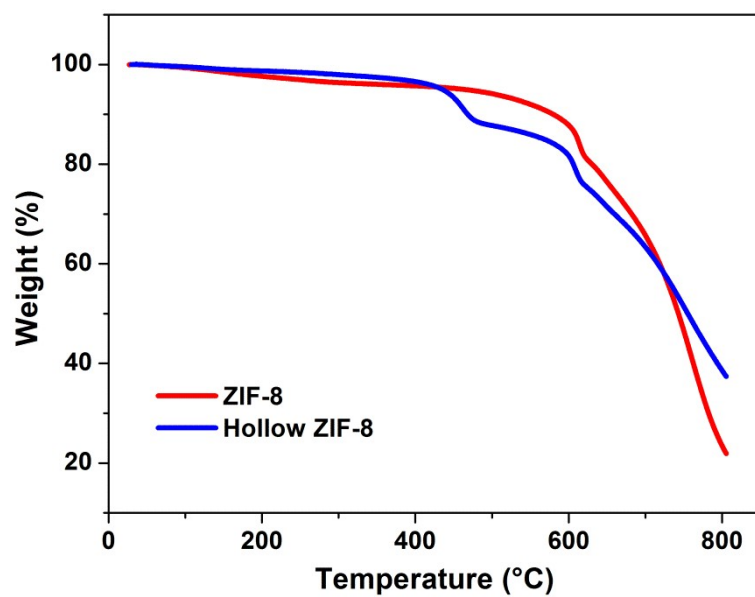**Figure S1.** Optical photographs of electrolyte membrane

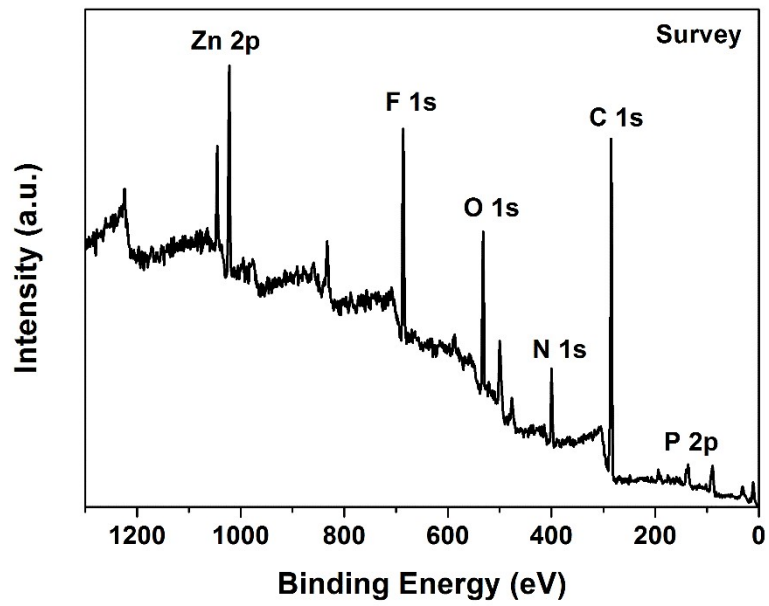**Figure S2.** TGA curves of ZIF-8 and hollow ZIF-8.

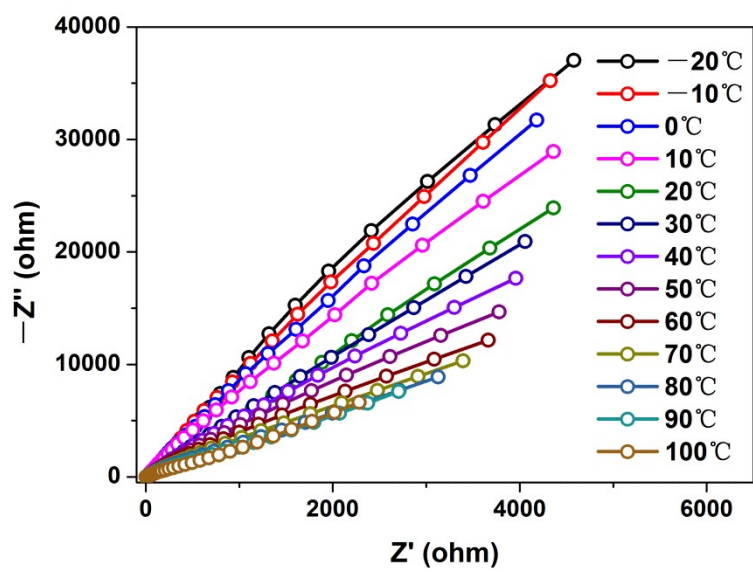**Figure S3.** XPS spectra of survey of hollow ZIF-8

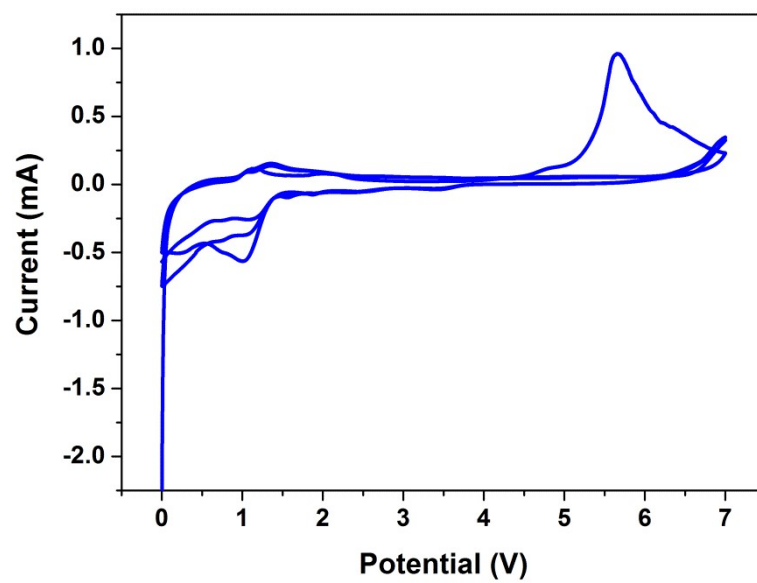**Figure S4.** EIS of hollow ZIF-8 at temperature from –20 to 100ºC.

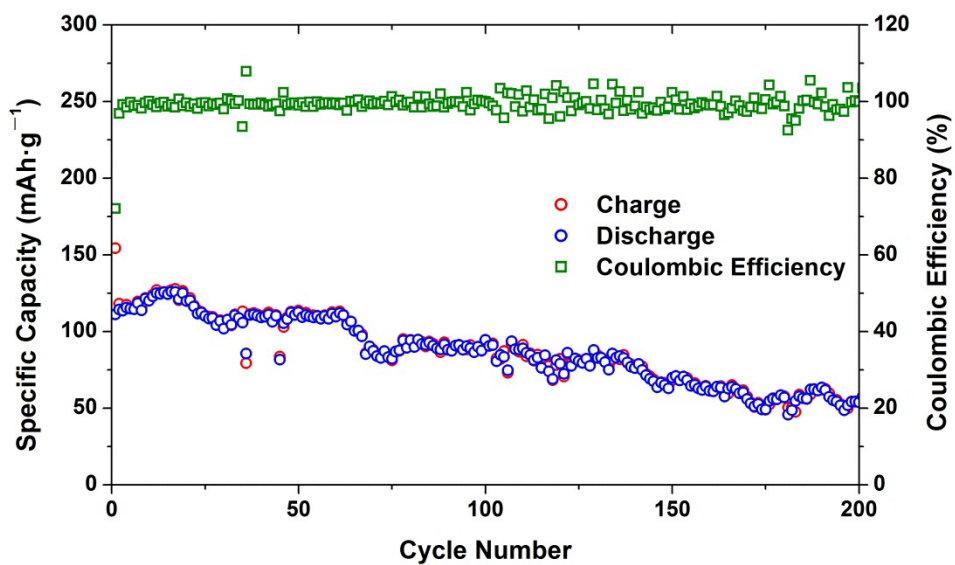**Figure S5.** CV curves of ss/electrolyte membrane/Li cell of hollow ZIF-8.

Figure S6. Specific capacity and coulombic efficiency of LiFePO$_4$/electrolyte membrane/Li cell of hollow ZIF-8 with 0.1 C charge/discharge rate at room temperature.

Table S1. Comparison of MOFs for solid-state lithium ion conduction at room temperature

No.	Materials	ionic conductivity (σ)	transference number (t_{Li^+})	Ref.
1	Li-IL@UIO-67-LLZO [a, b]	1.0×10^{-4} S·cm^{-1}	0.13	1
2	UIO/Li-IL (15/16)	3.2×10^{-4} S·cm^{-1}	0.33	2
3	Al-Td-MOF-1	5.7×10^{-5} S·cm^{-1}	-	3
4	MOF-688	3.4×10^{-4} S·cm^{-1}	0.87	4
5	Li-IL@MOF-525	3.0×10^{-4} S·cm^{-1}	0.36	5
6	**Hollow ZIF-8**	**7.36×10^{-4} S·cm^{-1}**	**0.83**	**This work**

[a] Li-IL = lithium-containing ionic liquid

[b] LLZO = $Li_7La_3Zr_2O_{12}$

References

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