Supplementary Information

A Li-O_2 battery cathode with vertical mass/charge transfer pathways

Zhaoming Huang,[a] Zhe Deng,[a] Yue Shen,[a] Wanqi Chen,[a] Wei Liu,[ab] Meilan Xie,[a] Yankai Li[a] and Yunhui Huang*[a]*

[a] State Key Laboratory of Material Processing and Die & Mould Technology, School of Materials Science and Engineering, Huazhong University of Science and Technology, Wuhan, Hubei 430074, China.

[b] Hubei Collaborative Innovation Center for Advanced Organic Chemical Materials, Ministry-of-Education Key Laboratory for Synthesis and Applications of Organic Functional Molecules, Hubei University, Wuhan 430062, China.

* Corresponding author.

E-mail address: huangyh@hust.edu.cn; shenyue1213@hust.edu.cn

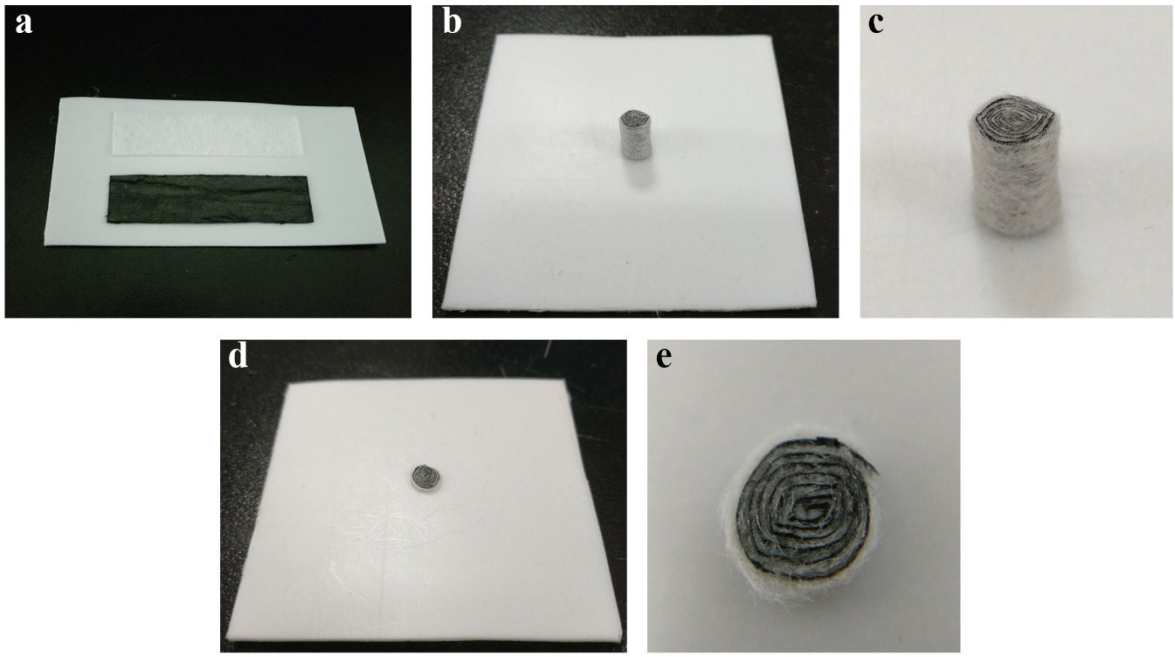

Fig. S1 (a) Raw materials including thin cotton piece and CNT film; (b, c) As-rolled cylinder and corresponding amplified image; (d, e) Finally cathode (before gelation) and corresponding amplified image.

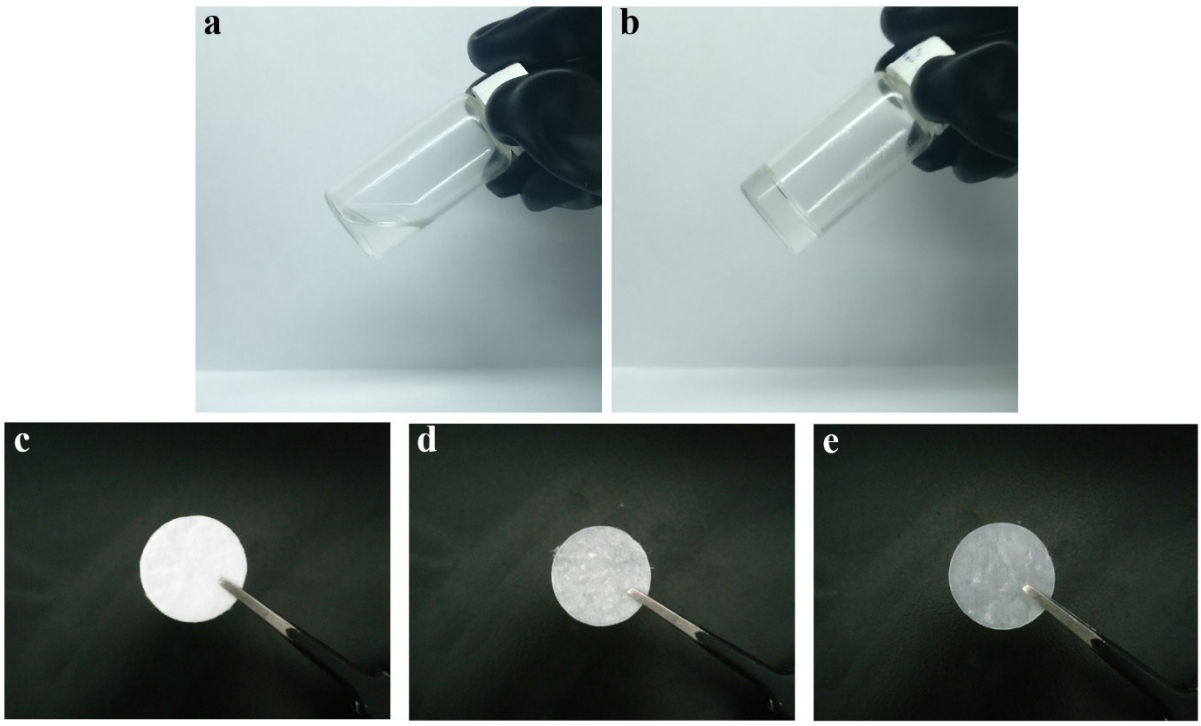

Fig. S2 (a) Precursor solution of gel polymer electrolytes (GPEs) before heating; (b) Solidified gel after heating at 80 °C for overnight; (c-e) Photographs of (c) pristine glass fiber, (d) GPE and (e) LE.

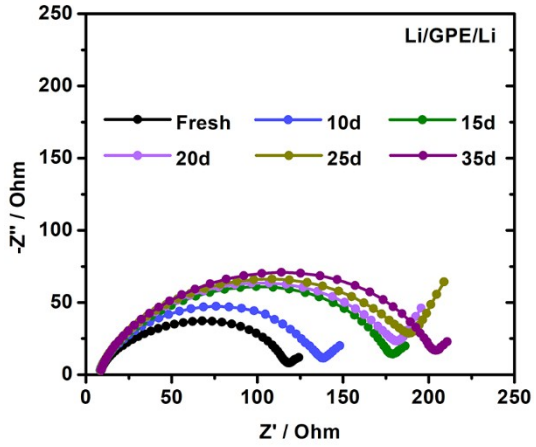

Fig. S3 Evolution of interfacial resistance of symmetrical Li/GPE/Li cell with the lapse of time.

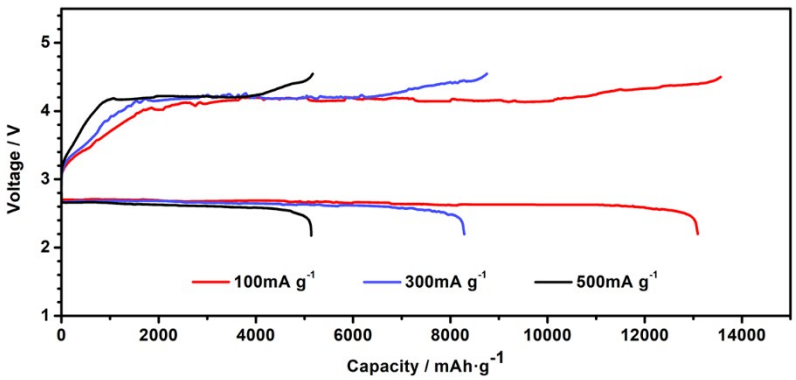

Fig. S4 The full discharge-charge curves of the cell with R-CNT + GPE cathode at different current densities.

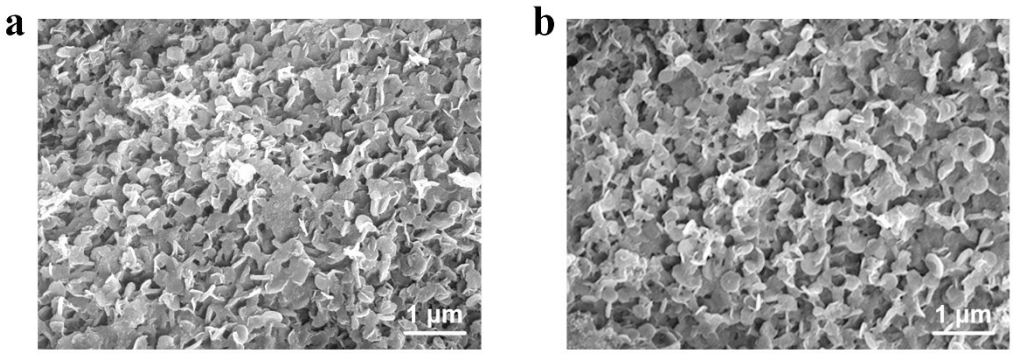

Fig. S5 SEM images on both sides of the R-CNT + GPE cathode after discharge.

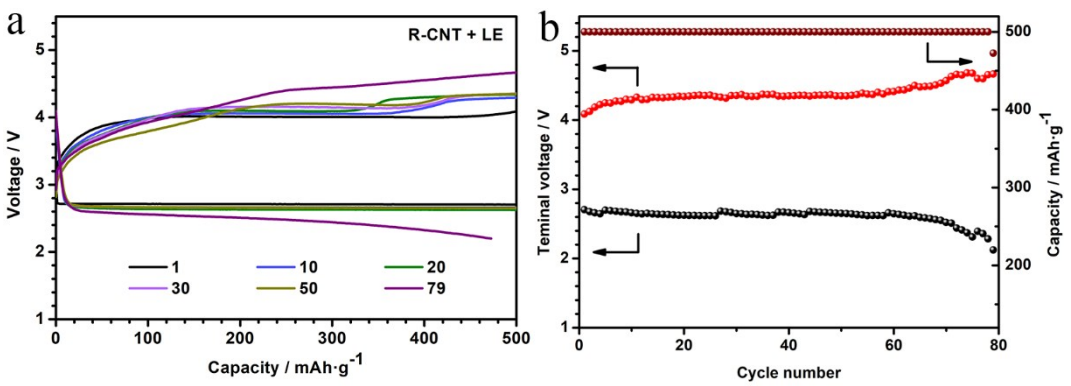

Fig. S6 (a) The discharge-charge curves of Li-O_2 batteries with R-CNT + LE; (b) Profiles of discharge and charge terminal voltages and discharge capacity against cycle number. Current density = 100 mA g^{-1}.

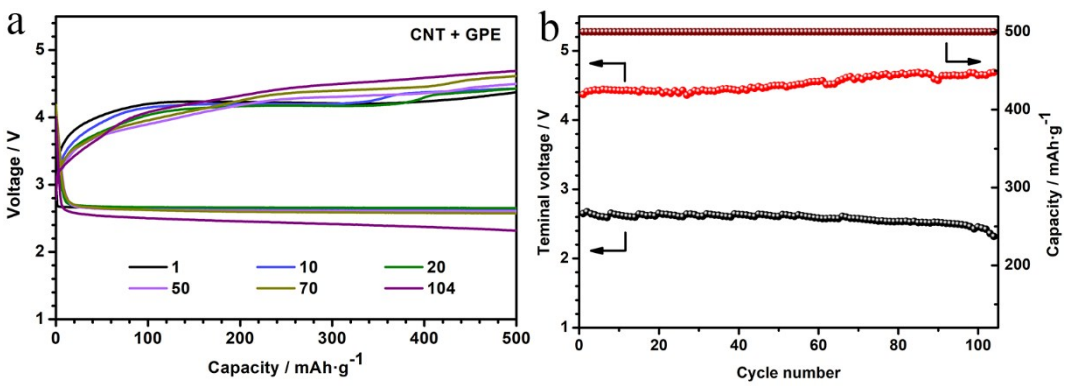

Fig. S7 (a) The discharge-charge curves of Li-O_2 batteries with CNT + GPE; (b) Profiles of discharge and charge terminal voltages and discharge capacity against cycle number. Current density = 100 mA g^{-1}.