

Electronic Supplementary Information

A highly reversible Li-O₂ battery utilizing a mixed electrolyte and a Co₃O₄ catalyzed cathode

J. Zeng, C. Francia, J. Amici, S. Bodoardo*, N. Penazzi

*Group for Applied Materials and Electrochemistry (GAME labs), Department of Applied Science
and Technology (DISAT), Politecnico di Torino, C.so Duca degli Abruzzi 24, 10129 Torino, ITALY*

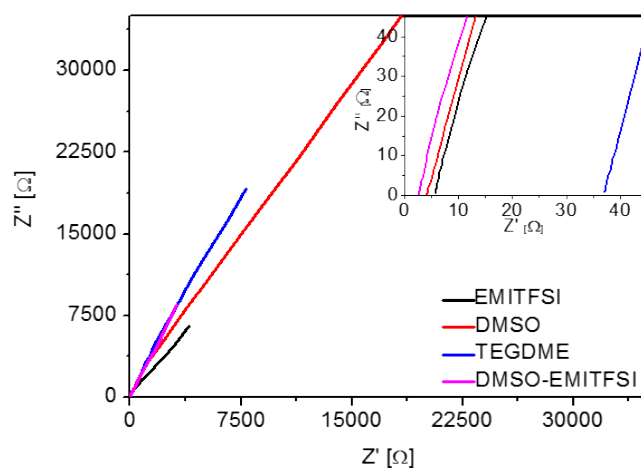


Fig. S1 Nyquist plots of Li/electrolyte/Li symmetrical cells at ambient temperature. Frequency range: 1 Hz to 100 kHz. (Inset: high frequency response).

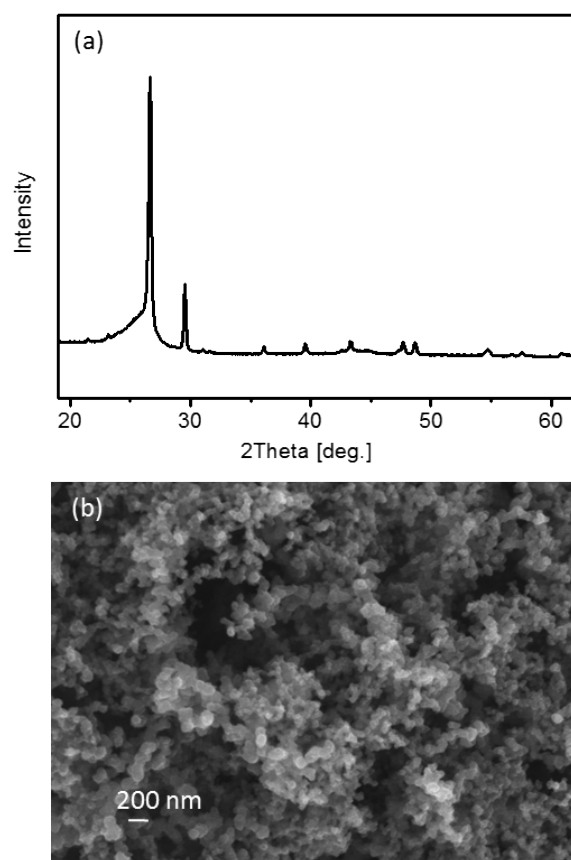


Fig. S2 Analysis of the pristine Csw carbon cathode: (a) XRD; (b) FESEM

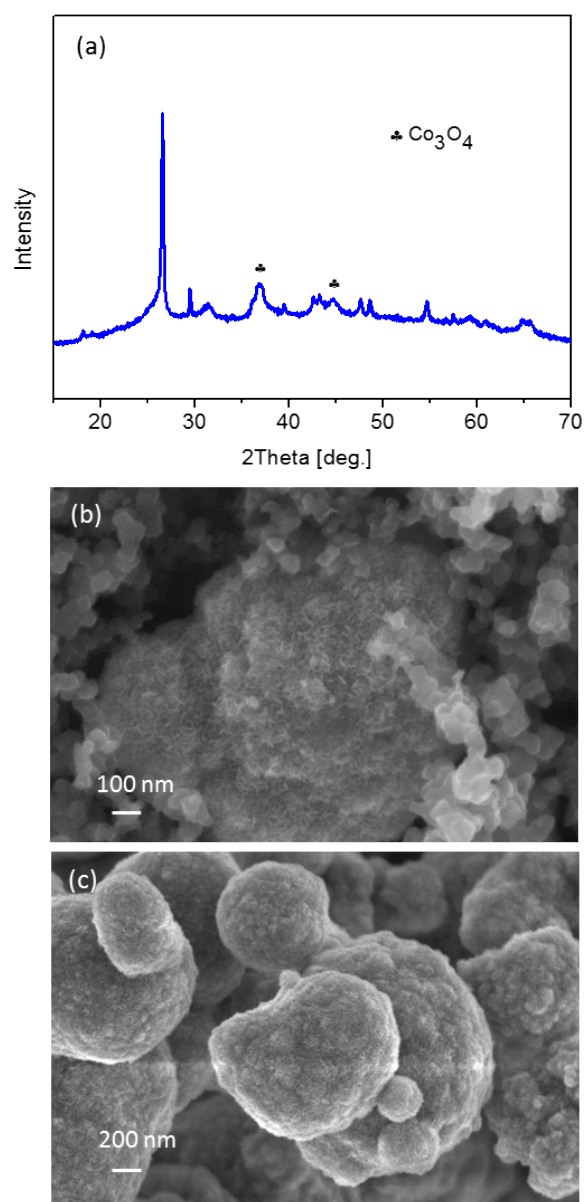


Fig. S3 Characterizations of the cathode with 30 wt. % Co_3O_4 after cycling in the TEGDME electrolyte: (a) XRD pattern; (b) FESEM image. FESEM image of the synthesized Co_3O_4 particles (c).

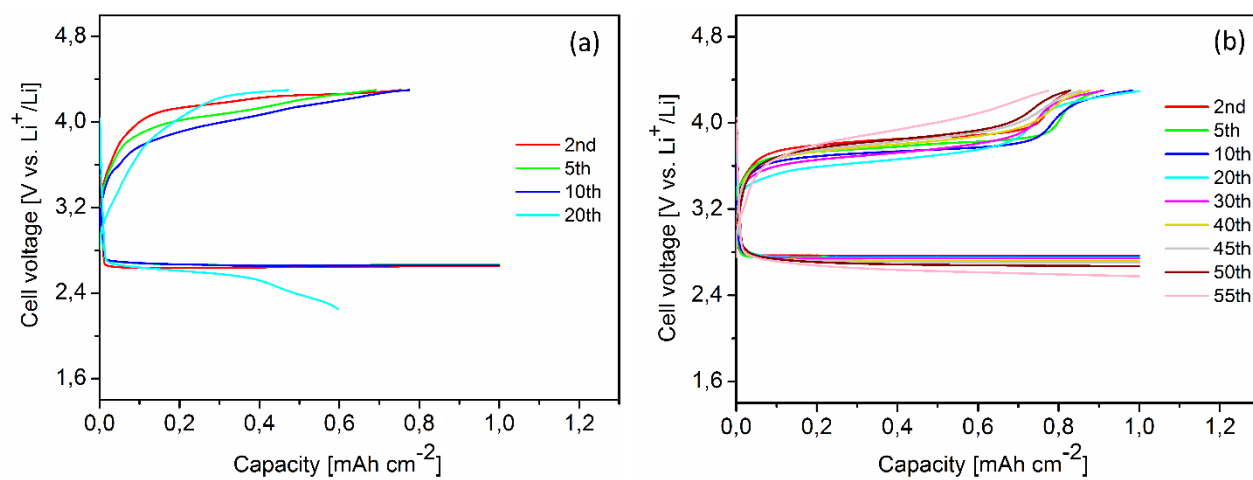


Fig. S4 cyclic performance of Li-O₂ cells with carbon cathodes: (a) in EMITFS-TEGDME electrolyte; (b) in EMITFSI-DMSO electrolyte. Limited discharge capacity: 1.0 mAh cm⁻². Current rate: 0.1 mA cm⁻².

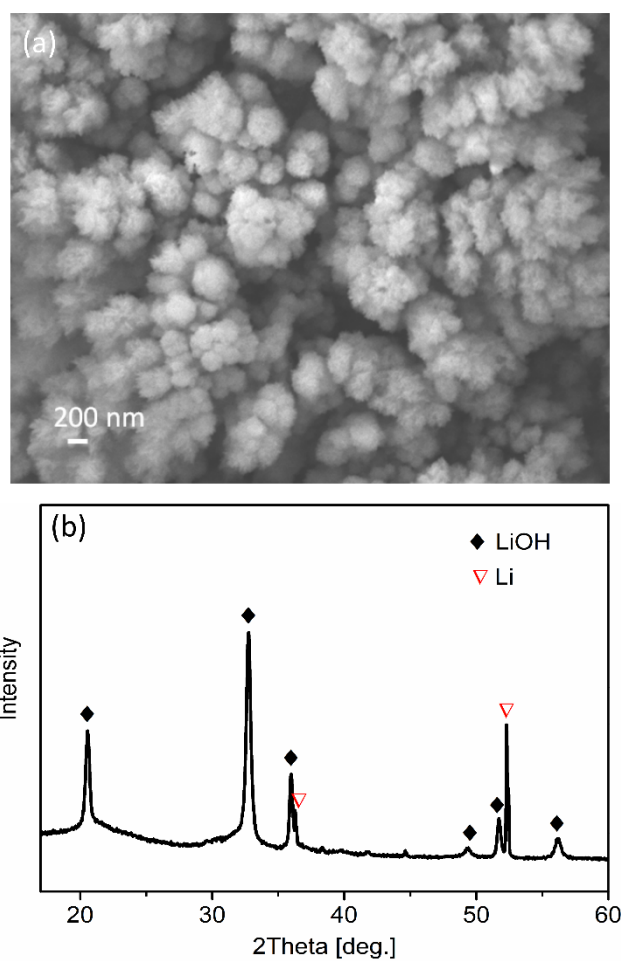


Fig. S5 Analysis on the anode of the cell using DMSO-EMITFSI electrolyte (see Fig. 6b) after cycling test: (a) FESEM image; (b) XRD pattern (ICDD database: Li, 00-001-1131; LiOH, 00-004-0708).