Supporting Information

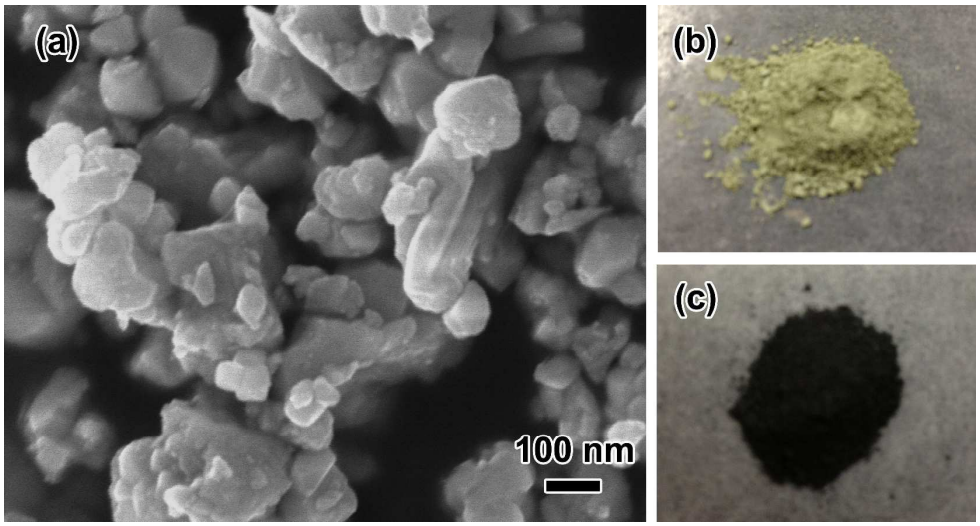

Figure S1. SEM image of ITO (a) and pictures of ITO (b) and Ru/ITO (c).

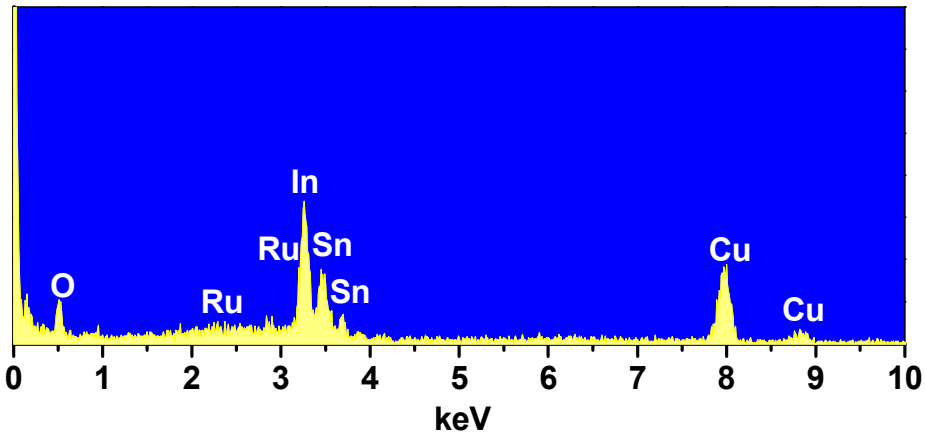

Figure S2. EDX of Ru/ITO.

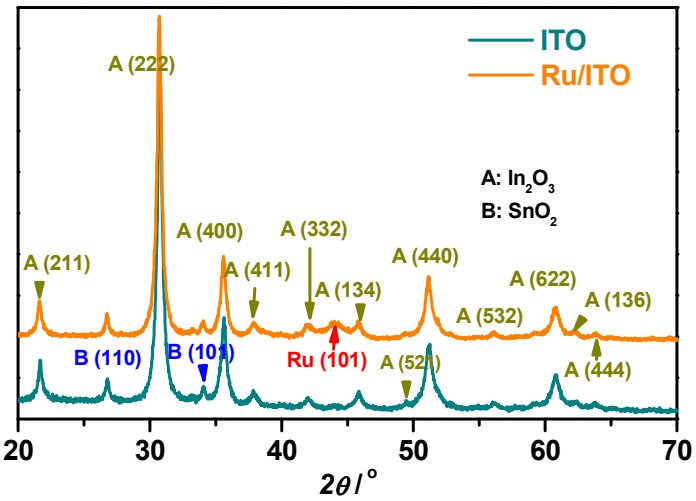

Figure S3. XRD Patterns of ITO and Ru/ITO. These patterns were obtained with step length of 0.02° and step during of 1s.

In_2O_3, JCPDS 00-006-0416; SnO_2, JCPDS 00-001-0657; Ru, JCPDS 03-065-7645.

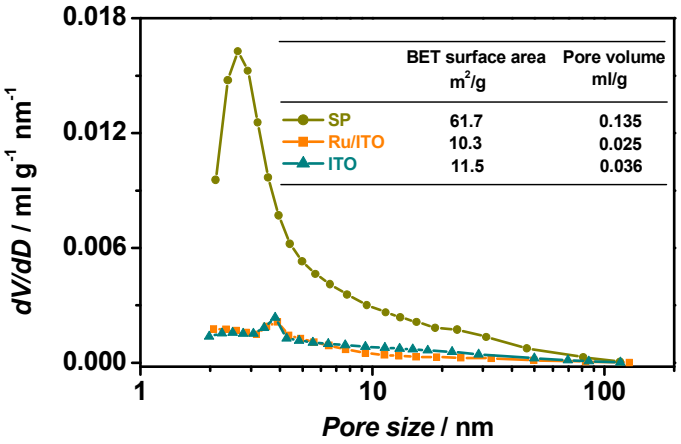

Figure S4. Pore size distributions of SP, Ru/ITO, and ITO, and their BET surface area and pore volume (inset).

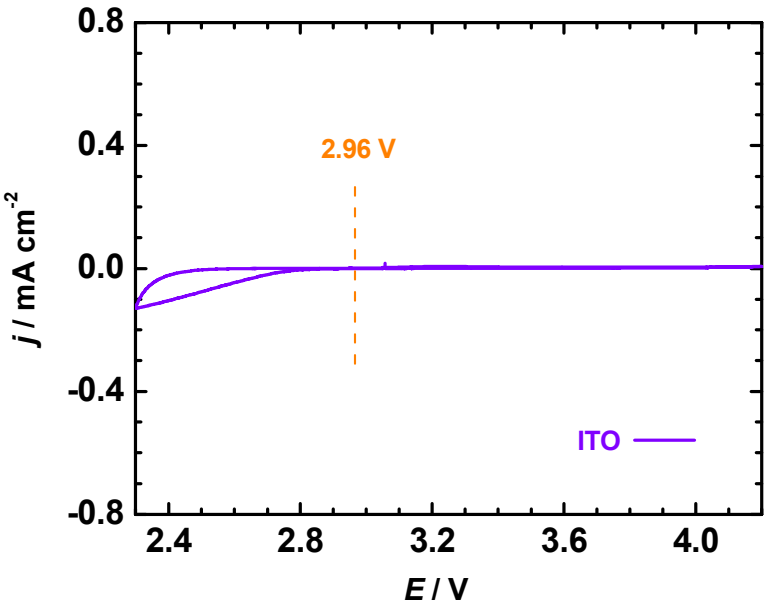

Figure S5. CV curve of the Li-O_2 cell with ITO as cathode in the electrolyte of LiTFSA and G3 with a molar ratio of 1 to 5 and under O_2 atmosphere at 0.1 mV/s from 2.3 to 4.2 V.

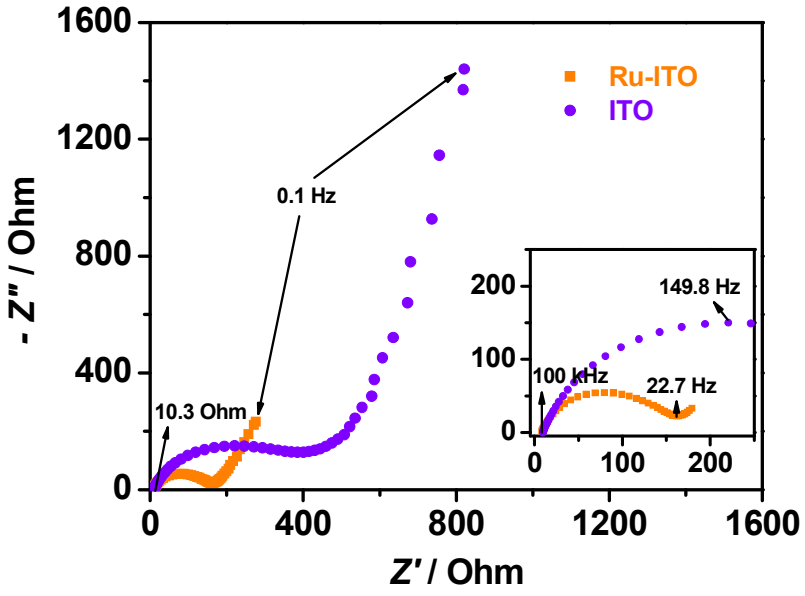

Figure S6. Electrochemical impendence spectroscopy (EIS) of the Li-O_2 cells with ITO and Ru/ITO as cathodes in the electrolyte of LiTFSA and G3 with a molar ratio of 1 to 5 and under O_2 atmosphere at open circuit potentials. The intercept on x-axis, 10.3 Ohm, is the resistance of

the electrolyte and the ITO or Ru/ITO cathode. The charge transfer resistance corresponds to the semicircle in this figure.

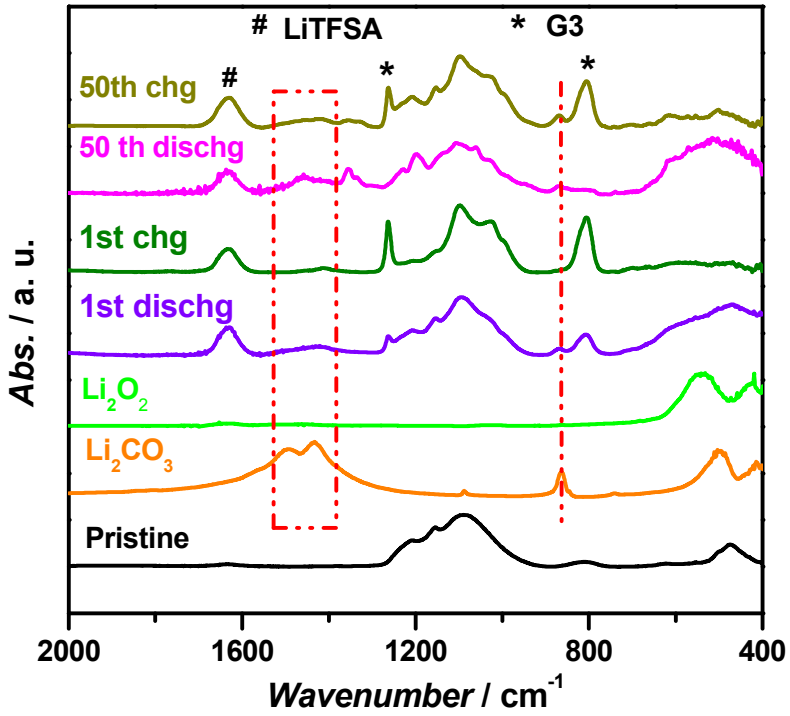

Figure S7. IR spectra of the pristine, discharged and charged cathode with Ru/ITO, standard Li_2O_2, and Li_2CO_3.

The characteristic IR absorbance of Li_2CO_3 is highlighted with red dash-dot-dot lines in the figure.