Electronic Supplementary Material (ESI) for RSC Advances

Supporting Information For: The Li-CO_2 Battery: A Novel Method for CO_2 Capture and Utilization

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DEMS Characterization of gas phase product

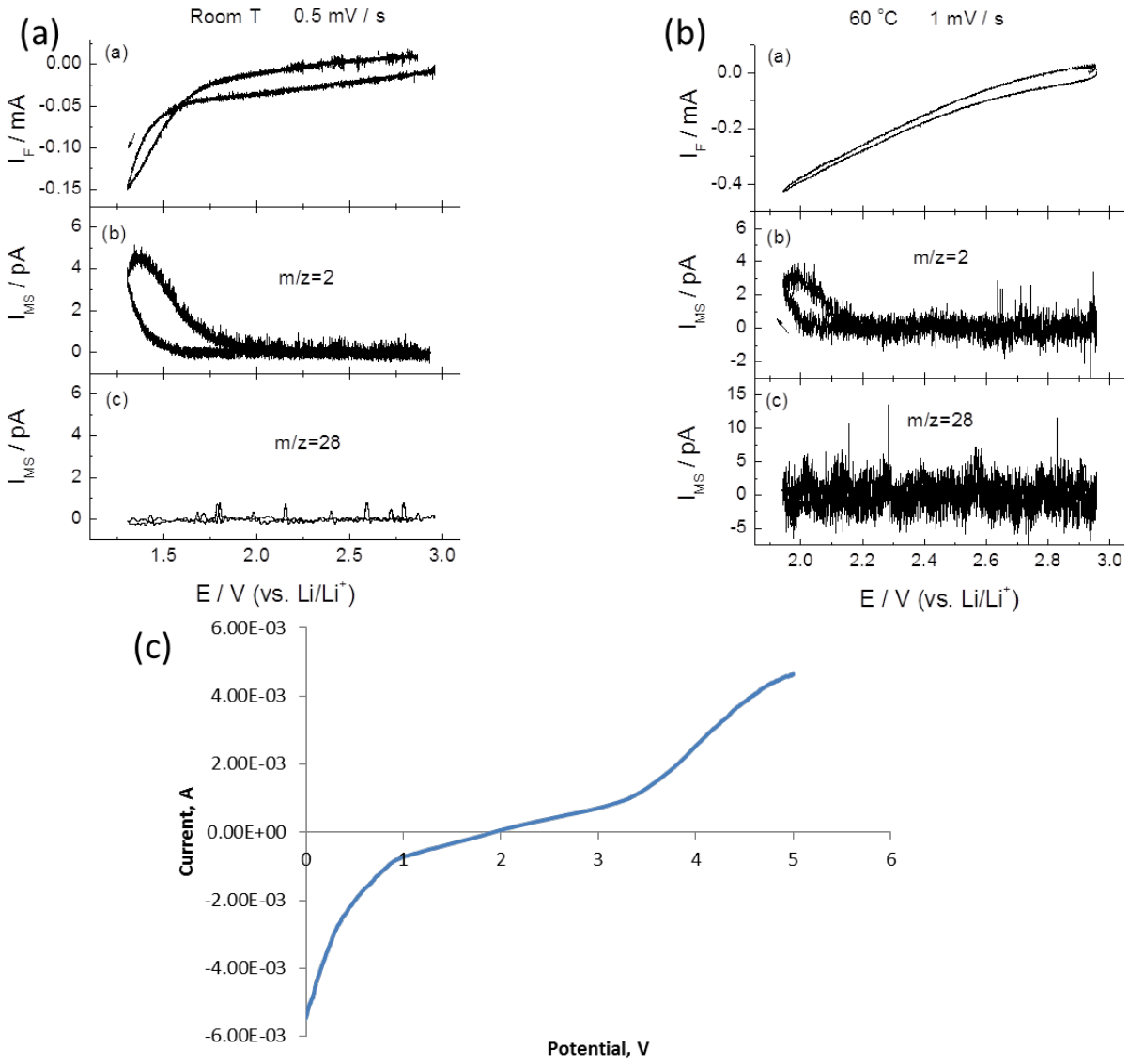

Fig. S1 DEMS analysis of gas phase products for Li-CO2 battery. at (a) room temperature (b) 60°C and (c) cyclic voltammetry of Li-CO_2 battery

From Figure S2(a) and (b), it can be easily seen that there is no CO (MW=28) evolution. However, the evolution of H_2 was detected at low potential. This is caused by the decomposition of the electrolyte, as shown in the cyclic voltammetry (Figure S2(c)).

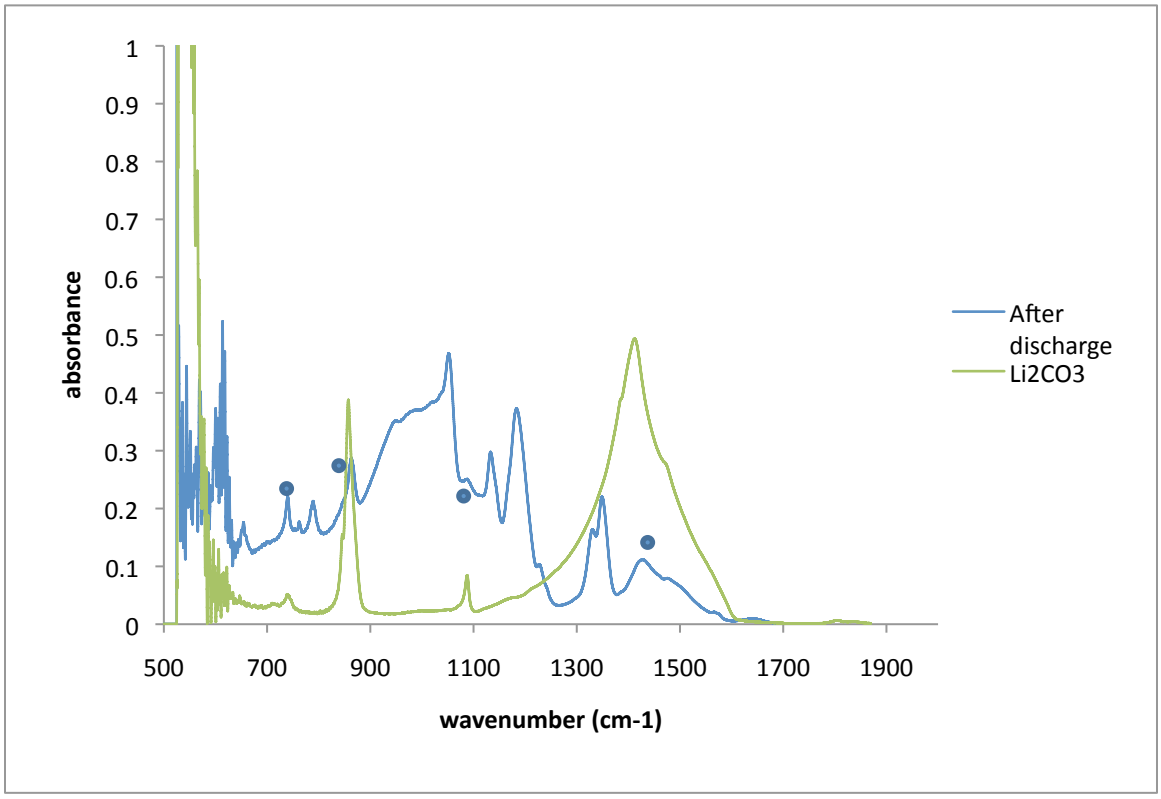

Figure S1: Ex-situ FTIR spectrum of the electrode after discharge at 100°C

The peaks emphasized with a blue dot are from the discharge product, Li_2CO_3. The other peaks are from the electrolyte. [1]

Reference:

1. Das, S. K., Xu, S., Emwas, A., Lu, Y., Srivastava, S. and Archer, L. A., "High Energy

Lihium-Oxygen Batteries – Transport Barriers and Thermodynamics", *Energy Environ. Sci.,* **5**, 8927 (2012)