Elucidating the origins of limited rechargeability in Li-O_2 batteries

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Nonaqueous Li-air batteries suffer from rechargeability limitations associated with both electrode and electrolyte instabilities.[1-8] These instabilities could arise from various possible reasons, including thermal chemistry of Li_2O_2 with the solvent or electrode during discharge, or Li_2O_2-induced parasitic electrochemistry with cell components during charging. However, the ability to quantify contributions to efficiency losses occurring during either discharge or charge remains elusive. This presentation will highlight our current efforts to quantify Li_2O_2 formation during discharge and Li_2O_2 oxidation during charge. This analysis is combined with quantitative measurements of O_2 consumption and evolution using DEMS, thus allowing us to more completely understand the parasitic processes that lead to limited Li-O_2 cell rechargeability.

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