

The Effect of oxygen concentration on the Li-air battery performances: The importance of air intake system for EV application

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For application in electric vehicles (EVs), the Li-air battery system needs an air intake system to supply dry oxygen at controlled concentration and feeding rate as the cathode active material. To facilitate the design of such air intake systems (AIS), we investigated the effects of O₂ concentration ($\leq 100\%$) on the performance of the Li-air cell, which have not been systematically examined before. The amounts of consumed O₂ and evolved CO₂ from the Li-air cell were measured with a custom in situ differential electrochemical gas chromatography-mass spectrometry (DEGC-MS). The amounts of consumed O₂ suggest that the O₂ concentration does not affect the reaction mechanism during discharge, and the 2e⁻ reaction occurs under all test conditions. On the other hand, the charging behavior varies by the O₂ concentration. In the presentation, the effect of oxygen on the cell performances including the capacity and the cycle as well as the reasons what could have been occurred inside cells in regard to O₂ concentrations will be announced. Also, we will suggest why air intake system supplying controlled O₂ is needed instead of O₂ tank for application of the Li-air battery in EVs.