

Evaluation of triiodide ion and tribromide ion as redox mediators in lithium oxygen batteries

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In the lithium oxygen(Li-O₂) battery field, redox mediators have been intensively studied for increasing the energy efficiency and cycle life of cell by reducing the high overpotential, which induces degradation of cell components. Lithium halides have been explored as representative redox mediators in Li-O₂ batteries because of their low redox potential under 3.6 V. However, there is still controversy about the proper form of halide materials as redox mediators to decompose the discharge product of Li-O₂ batteries, lithium peroxide (Li₂O₂). Therefore, we conducted quantitative analyses such as UV-Vis and GC-MS to confirm the ability of different halide materials to decompose Li₂O₂ as redox mediators in Li-O₂ batteries. By controlling the byproducts during discharge and exempting the misunderstandings when using commercial Li₂O₂ powder, we clearly demonstrated that triiodide (I₃⁻) and tribromide (Br₃⁻) have sufficient ability to decompose Li₂O₂ in Li-O₂ batteries.