Additive Effects on the Electrochemical Property of Amorphous MoO_2 Negative Electrode for Lithium-Ion Secondary Batteries

박종우, 최인수, 이민정, 김명호, 박건호, 오승모, 김재정*
서울대학교 화학생물공학부
(jjkimm@snu.ac.kr*)

Amorphous molybdenum dioxide (MoO_2) is one of the transition metal oxide negative electrodes for lithium-ion secondary batteries. It follows conversion-type de-/intercalation with lithium ions, which is governed by theoretical four-electron redox reaction. However, solid electrolyte interphase (SEI) formation is inevitable. Therefore, the development of thin, stable, and less resistive SEI is essential to enhance the battery performance. In the research, we tried to investigate the effect of reduction-type SEI-former additive, fluoroethylene carbonate (FEC), on the electrochemical property of amorphous MoO_2 by the analysis of SEI. The surface chemistry of MoO_2 active material is modified by the decomposition of FEC. To the best of our knowledge, this is the first report on identifying SEI and its formation mechanism on MoO_2 active material with additive. MoO_2 particles were synthesized *via* chemical reduction method and the half-cell tests were performed with 2032-type coin-cell. The applied analysis tools were FE-SEM, TEM, XPS, and EIS to estimate the thickness, components, and the resistance of SEI, respectively.