

Lithium Ion Battery Coin Cell Test with Lotus-root shaped TiO₂ Anode

최성일, 이현철, 임준혁, 허 성¹, 원용선[†]
부경대학교; ¹한국외국어대학교
(yswon@pknu.ac.kr[†])

As an alternative of graphite-based anode in lithium ion batteries (LIBs), TiO₂-based anode has drawn attention with its stability and long operation life especially in the field of electric vehicles (EVs). Lithium titanate (LTO, Li₄Ti₅O₁₂) is very commercial, but there are constant needs to improve the anode capacity with TiO₂-based materials because they have much higher capacities compared to LTO theoretically. In this study, a lotus-root shaped TiO₂ material was synthesized using a cetyltrimethylammonium hydroxide (CTAOH) template, which is expected to have larger surface area for lithium insertion and thus show better electrical property. Coin cell tests were then carried out with the anodes prepared from LTO, granular TiO₂ (also known as P25), and lotus-root TiO₂ for comparison by charging and discharging at 0.5 C. The capacities were 180, 100, and 200 mAh/g respectively, and the value of 200 mAh/g with the lotus-root TiO₂ anode is larger than the theoretical discharge capacity of 175 mAh/g of LTO.