

Boron-doped $\text{Li}_4\text{Ti}_5\text{O}_{12}$ as an anode material for lithium ion batteries with high rate capabilities and long-term cyclability

정재훈, 한상욱, 정동원, 오은석*
울산대학교 화학공학부
(esoh1@ulsan.ac.kr*)

$\text{Li}_4\text{Ti}_5\text{O}_{12}$ (LTO) is expected as the most promising anode materials for lithium ion batteries (LIBs) because of several unique advantages such as zero-strain during charging-discharging, long-term cycling stability, good high-rate performance, and a wide voltage plateau around 1.55 V with enhanced safety. Simultaneously, the LTO has a several disadvantage such as poor electronic and Li ionic conductivities, resulting in low performance at high current rates. To overcome the drawbacks, a doping method has been proposed to improve the electrochemical performance.

In this work, doping with appropriate element such as boron improves the electronic conductivity of LTO. Boron-doped LTOs with various contents (0, 5, 10, 20 at %) were synthesized via a sol-gel method. These materials as anode materials for LIBs were evaluated through a variety of physical and chemical characterization techniques.