In-situ Synthesis of SnO_2/Graphite Composite and Its application to LIB

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

Graphite has been used as anode active materials for lithium ion batteries(LIBs). Owing to its low theoretical capacity, however, many researchers have investigated metallic active materials such as Sn, Si, Sb and Al for possibility to increase the capacity of LIB. Of those, much attention has been given to metallic tin and tin oxides (Sn: 994 mAh/g, SnO: 876 mAh/g, SnO2: 781 mAh/g) [1]. However, the application of SnOx has been a little frustrated by their rapid capacity decay during charging/discharging processes, due to their extreme volume changes [2]. One possible way is to use Sn based active materials in graphite which are able to accommodate significant volumetric change during charging/discharging processes [3].
In this work, SnO2 nano-particles were supported on commercial graphite by a solvothermal reduction method. Eethylene glycol was used as a solvent. We've observed SnO2 supported on graphite through X-ray diffractometer (XRD) and transmission electron microscopy (TEM). To examine a possibility of SnO2/graphite anode active materials for lithium ion batteries, we carried out coin-half cell tests including several electrochemical tests.