

Tracking the confinement effect of highly dispersive carbon in a tungsten oxide/carbon nanocomposite: conversion anode materials in lithium ion batteries

임원광, 이진우<sup>†</sup>  
포항공과대학교

(jinwoo03@postech.ac.kr<sup>†</sup>)

A variety of transition metal binary compounds, whose reaction mechanism involves intercalation-initiated conversion, have been extensively studied as anode materials in lithium ion batteries (LIBs). Although the introduction of carbonaceous materials such as carbon nanotubes, graphene, or a carbon layer solved issues arising from the conversion reaction during repetitive cycles, a perfect electrical contact of the carbonaceous material with the discharge products on a few-nanometer scale has been rarely accomplished. Moreover, most of the previous studies have focused on maximizing the electrochemical performance without an in-depth understanding of the fundamental effect of each component in the nanocomposite. Herein, an ordered mesoporous tungsten oxide/carbon composite with ultra-highly dispersed carbon over a few-nanometer scale is prepared by the self-assembly of a block copolymer with inorganic/carbon precursors. The confinement effect of tungsten oxide within the nanowalls (~10 nm) provides an excellent cycle and rate performance owing to the highly conductive and stable matrix that endures repetitive conversion reactions.