

## Colloidal Silica Nanoparticle Assisted Synthesis of $\beta$ -Co(OH)<sub>2</sub> Plates and its surface area changes for Li Ion Battery

장윤경, 김지만<sup>1,\*</sup>

성균관대학교; <sup>1</sup>성균관대학교 화학과

(jimankim@skku.edu\*)

Li-ion batteries (LIBs) considered as promising energy storage system for mobile devices, electric vehicles, and other renewable storage systems. In general, graphite is extensively used as anode material in LIB. However, development of alternative anode material is required due to low capacity of graphite. In 2010, Y.-S. He and co-workers reported graphene/cobalt hydroxide Co(OH)<sub>2</sub> composite material could be one of promising candidates for anode material of LIBs.[1] Herein, we report on a synthesis of  $\beta$ -Co(OH)<sub>2</sub> plates with high surface areas by colloidal silica nanoparticle templating approach and its application to anode material for LIBs. The resulting  $\beta$ -Co(OH)<sub>2</sub> exhibit larger surface area of 80.11 m<sup>2</sup>·g<sup>-1</sup> and better electrochemical performance than commercial  $\beta$ -Co(OH)<sub>2</sub> powders (20.15 m<sup>2</sup>·g<sup>-1</sup>), respectively. The physicochemical properties of the  $\beta$ -Co(OH)<sub>2</sub> were characterized by powder X-ray diffraction, Scanning Electron Microscopy, Infrared spectrometry and electrochemical techniques.

Reference

[1] Y.-S. He et al., Electrochem. Commun. 12, 570-573 (2010)