

Polygonal-stacked  $\text{Cu}_2\text{O}$  synthesized by surfactant-controlled Benedict's reaction for advanced anode materials lithium-ion batteries

배재진, 안현우, 김민호, 김원배<sup>†</sup>  
포항공과대학교  
(kimwb@postech.ac.kr<sup>†</sup>)

Nowadays, many metal oxide based materials proposed for advanced Li-ion battery to overcome limited capacity and rate performance of current commercialized Li-ion batteries. In this work, new polygonal-stacked  $\text{Cu}_2\text{O}$  (P- $\text{Cu}_2\text{O}$ ) with different morphologies has been synthesized via modified Benedict's reaction for advanced anode material in Li-ion batteries. The morphology of P- $\text{Cu}_2\text{O}$  is successfully controlled with modifying the concentration of hexadecyltrimethylammonium bromide (CTAB) surfactant. Discharge capacity of the P- $\text{Cu}_2\text{O}$  with sharp tip (P- $\text{Cu}_2\text{O}$ -ST) is approximately  $255 \text{ mAhg}^{-1}$  at 0.2 C rate, along with a superior rate capacity of approximately  $156 \text{ mAh g}^{-1}$  even at 5 C rate in comparison those of the P- $\text{Cu}_2\text{O}$  with round edge (P- $\text{Cu}_2\text{O}$ -RE) and P- $\text{Cu}_2\text{O}$  with strait edge (P- $\text{Cu}_2\text{O}$ -SE). The different electrochemical rate performances might be attributed to their unique morphologies and large surface area. We believe that the results of this research can confirm that morphology effect on electrochemical performance of anode materials for lithium-ion batteries.