# Synthesis and Electrochemical Properties of Iron Oxide Nanoparticles *in situ* Formed in Mesoporous Carbons for High Performance Li-ion Battery Anodes

윤태균, 이정규*
동아대학교
(jklee88@dau.ac.kr*)

Iron oxide ($Fe_3O_4$, $Fe_2O_3$) nanostrucutres are promising anode materials for lithium ion batteries (LIBs) due to their high theoretical capacities (924, 1,004 mAh/g) since six to eight Li ions can be stored per formula unit by the "conversion reaction" process in which full utilization of all the oxidation states of trivalent iron can be achieved. They are also abundant and have high densities and low toxicities. Their applications in practical lithium-ion batteries, however, are still hampered by the poor cycling performance caused by the severe aggregation and huge volume changes that inherently accompanies conversion reaction process. Herein we report a facile and scalable strategy to prepare homogeneously dispersed iron oxide ($Fe_3O_4$, $Fe_2O_3$) nanocrystals directly in the pre-formed carbon nanostructures. As anode materials for LIBs, the as-prepared iron oxides/C nanocomposites exhibited very high reversible capacity and remarkably enhanced cycling performances compared with conventionally fabricated electrodes with $Fe_3O_4$ nanocrystals.