The direct deposition of thermally treated graphene oxide/TiO_2 porous material on the coin cell anode for lithium-ion battery anode

Balasubramaniyan, 김병수[1], 손혜정[1], 정진석[1,†]
울산대학교; [1]울산대학교 화학공학부
(jschung@mail.ulsan.ac.kr†)

The anatase-TiO_2, it has been identified as the most promising anode material for lithium-ion batteries (LIB) due to its negligible volume change, and no solid electrolyte interface formation. Recently, the drawbacks of poor electronic conductivity and lower electrolyte diffusion of the TiO_2 has been resolved by doping, or hybrid with carbon based materials. Herein, the thermally treated graphene oxide/TiO_2 (TGO/TiO_2) is prepared through the calcination of the poly (methylmethacrylate)-GO/TiO_2 (PMMA-GO/TiO_2) on the coin cell anode. The decomposition of PMMA increased the surface area of pristine TiO_2 of 10.3 m^2 g^{-1} to 182.3 m^2 g^{-1} of TGO/TiO_2. In LIB anode, the TGO/TiO_2 porous electrode exhibited much higher specific capacity of 354 mAh g-1 at 0.2C than pristine TiO_2 of 159.2 mAh g^{-1} and showed an excellent rate capabilities at all the C-rates. The higher specific capacity of TGO/TiO_2 electrode can be attributed that the highly porous characteristics and their resulting pseudocapacitive effect of the nanocomposite electrode during the Li-ion insertion/extraction reactions.