Enhanced Electrochemical Performance of SnO_2 anode material for Lithium-ion Battery via Fluorine Doping and C60 Coating

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Two simultaneous strategies are applied to overcome capacity fading of tin oxide (SnO_2) as anode material for lithium-ion battery (LIB); first one is doping with fluorine atoms into the tin oxide (SnO_2:F or FTO) and second is coating with C_{60} on the surface of the FTO. The thin film electrodes were fabricated in Electron Cyclotron Resonance – Metal Organic Chemical Vapor Deposition (ECR-MOCVD) and Radio-Frequency Plasma Assisted Thermal Evaporation (RF-PATE). The study shows both doping and coating have contributed to a better electrochemical performance due to the enhancement of electronic conductivity of the film and the provision of passivation layer during the electrochemical reaction attributed to the presence of C_{60} coating on FTO surface.