The Effect of Metal–Oxide Coating on the Electrochemical Properties in Thin–Film LiCoO₂ Cathodes

To improve the electrochemical properties of thin–film LiCoO₂ cathodes, metal oxides were coated on the LiCoO₂ thin films using rf sputtering. Galvanostatic charge–discharge experiments showed the enhanced cycling behaviors in the metal–oxide coated LiCoO₂ thin films than the uncoated ones. These results are because the metal–oxide coating layer suppresses the degradation of Li–diffusion kinetics during cycling, which is related to the protection of cathode surface from the electrolytes [1–3]. The variation in the metal–oxide coating thickness ranging from 10 to 300 nm did not affect the electrochemical properties. Changes of lattice constants in the coated and bare LiCoO₂ thin films at different charged states will also be discussed.