

Si content effect on the performance of the thin film
anodes for rechargeable lithium ion batteries
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In order to improve the cycle life and the capacity retention properties of the anode material different compositions of Cu-Si thin films (30%at-70%at, 20%at-80%at, 10%at-90%at) were deposited on copper substrate by magnetron sputtering. The surface morphologies, compositions, thicknesses and the electrochemical behaviors of the deposited thin films are characterized by scanning electron microscopy (SEM), X-ray diffraction (XRD), cyclic voltammetry (CV) and galvanostatic charge/discharge (GC) measurements. The results show that magnetron sputtering deposition technique might represent a good alternative production method to fabricate high performance anode material since the adhesion of the thin film is improved, reducing coating delamination and pulverization issue. In addition comparison of thin films having different Si amount reveal that the presence of copper in the thin film improves the cycle performance of the anode material, but an optimization in Si content is required to get high capacity values for longer cycle duration.

Keywords: CuSi thin film; Anode; Cycling performance; magnetron sputtering