**abstract**

Lithium metal is a promising anode for the next generation lithium batteries owing to its high capacity (3860 mAh g⁻¹) and the large positive electrochemical potential (3.04 V). Commercial produced lithium anodes have a native rough surface which deteriorates the cycling performance of the battery. Here, an attempt has been made to deposit lithium on copper from an electrolytic cell consisting of simple electrolyte of pyridine and lithium chloride at room temperature. Water known to react aggressively with the lithium metal, however in this work it has a significant beneficial effect in catalyzing the electrochemical reactions. The effect of trace amounts of water was investigated in air as well as in controlled atmosphere of argon, nitrogen, breathing grade dry air and ultra-zero dry air. The electrochemical products examined by Fourier transform infrared spectroscopy revealed the deposition might require the reduction of pyridine to facilitate the reduction of the lithium salt. Purity of the lithium film was determined by inductively coupled plasma mass spectrometry.