

## Electrodeposition of Tin Alloys from Room Temperature Ionic Liquid Based on the 1-methyl-3-ethylimidazolium Chloride/Urea System

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Room temperature ionic liquids (RTILs) have become increasingly popular in the past decade for various electrochemical applications such as electrodeposition of metals or alloys used in high energy density battery. In addition to exhibiting interesting solvent properties such as wide electrochemical window and high thermal stability, RTILs are also known as ‘green electrolytes’ due to their low vapor pressure and non-toxic properties as compared to conventional organic solvents [1]. For high energy density battery application, the LiCl buffered neutral molten salts produced by the addition of excess solid LiCl into the Lewis acidic RTMS, had been used as an electrolyte for rechargeable lithium battery while materials intercalated with lithium ions such as LiCoO<sub>2</sub>, LiMn<sub>2</sub>O<sub>4</sub> and LiNiO<sub>2</sub> had been used successfully as positive electrode materials in previous studies [2,3]. The use of tin alloys as negative electrode materials have shown in previous work to be capable to form lithium alloys reversibly [4]. A new RTIL based on 1-methyl-3-ethylimidazolium Chloride and urea is investigated in the present work as medium for the electrodeposition of tin and alloys. The new ionic liquid system provides a promising system for tin electrodeposition than traditional RTIL containing AlCl<sub>3</sub> as the inevitable co-deposition of Al can be avoided. Related physical-chemistry properties, such as conductivity, viscosity and melting points of the new ionic liquid with various compositions are determined. The effect of various conditions for electrodeposition on the chemical composition, the particle sizes and morphologies of tin and its alloys deposits will be discussed at the meeting.

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