

### 论文摘要

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## 铝基离子液体(BMIM)Br-AlCl<sub>3</sub>的制备与电沉积应用

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**摘要:** 在高纯氩气氛下, 将AlCl<sub>3</sub>与溴化1-丁基-3-甲基咪唑(BMIM)Br反应合成透明的铝基离子液体(BMIM)Br-AlCl<sub>3</sub>; 采用红外光谱仪、扫描电镜及X射线能谱仪对其结构进行表征。在298.15 K下进行16 h铝电沉积实验, 通过循环伏安曲线法测定其电化学窗口。研究表明: 铝基离子液体(BMIM)Br-AlCl<sub>3</sub>的电化学窗口为3.40 V; 扫描电镜分析表明, 阴极新生态的铝晶粒生长完整、晶界完善; X射线能谱分析阴极表面新生态铝的结果显示主元素为铝, 微量元素为氧。

**关键字:** 离子液体; (BMIM)Br-AlCl<sub>3</sub>; 电沉积

## Preparation and electrodeposition of Al-based ionic liquid (BMIM)Br-AlCl<sub>3</sub>

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**Abstract:** An ionic liquid was prepared by mixing AlCl<sub>3</sub> and 1-methyl-3-butylimidazolium bromide (BMIM) under dry argon atmosphere. The structure of (BMIM)Br-AlCl<sub>3</sub> was confirmed by IR. Aluminum electrolysis was conducted at 298.15 K for 16 h by the ionic liquid. The electrochemical window was measured at 298.15 K by cyclic voltammetry. Cathode surface was analyzed by SEM and EDS. The results show that the electrochemical window is 3.40 V, the crystal grain of new deposit aluminum is ideal, and the boundary of crystal grain is perfect. The main element is aluminum and trace element is oxygen on the surface of cathode.

**Key words:** ionic liquid; (BMIM)Br-AlCl<sub>3</sub>; electrodeposition

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