

表面与界面工程

硝基甲烷在离子液体BMI mP₆中的电化学行为

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摘要

以铂微盘电极为工作电极, 采用循环伏安等测试方法研究了硝基甲烷在离子液体1-正丁基-3-甲基咪唑六氟磷酸盐(BMI mP₆)中的电化学行为, 讨论了温度、扫描速度以及底物浓度等因素对其电化学行为的影响。结果表明, 硝基甲烷在离子液体BMI mP₆中的还原反应是受扩散控制的不可逆过程。估算了不同温度下硝基甲烷在离子液体BMI mP₆中的扩散系数及其与温度的Arrhenius关系, 其扩散活化能 E_a 为22.28 kJ·mol⁻¹。

关键词 [硝基甲烷](#) [离子液体](#) [1-正丁基-3-甲基咪唑六氟磷酸盐](#) [微盘电极](#) [扩散系数](#)

分类号

Electrochemical behavior of nitromethane in ionic liquid BMI mP₆

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Abstract

The electrochemical behavior of nitromethane was investigated using cyclic voltammetry in the room temperature ionic liquid 1-butyl-3-methylimidazolium hexafluorophate (BMI mP₆) on a platinum disk microelectrode. The influences of temperature, scan rate and nitromethane concentration on the electrochemical characteristics of nitromethane were also discussed. The results showed that nitromethane was reduced irreversibly by one electron, and the electrode process was controlled by diffusion. According to the Randles-Sevcik equation, the diffusion coefficients of nitromethane were estimated for each temperature in BMI mP₆, which increased with temperature owing to the diminution of BMI mP₆ viscosity. According to the Arrhenius equation, the activation energy of diffusion of nitromethane in BMI mP₆ was also calculated to be 22.28 kJ·mol⁻¹.

Key words [nitromethane](#) [ionic liquid](#) [1-butyl-3-methylimidazolium hexafluorophate](#) [disk microelectrode](#) [diffusion coefficient](#)

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