

传递现象

离子液体中的相互作用对硝基苯扩散系数的影响

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摘要

应用紫外吸收光谱法和循环伏安法研究了离子液体中的相互作用及对离子液体中硝基苯的扩散系数的影响。结果表明,硝基苯的紫外光谱受离子液体EMimBF₄(1-甲基-3-乙基咪唑四氟硼酸盐)与其相互作用的影响,硝基的吸收峰红移,210 nm以下的末端吸收消失,而苯环的吸收基本不变;离子液体与硝基苯之间的作用主要发生在硝基上。在离子液体中电还原,硝基苯的扩散系数受硝基苯与离子液体、水与离子液体的相互作用的影响。同一离子液体中,随硝基苯浓度增加,扩散系数减小。相同硝基苯浓度时,不同离子液体的咪唑阳离子侧链越长扩散系数越小,但扩散系数减小得越缓慢;同一离子液体中,随着水浓度增加,硝基苯扩散系数增大;不同离子液体中,咪唑侧链越长,随着水的浓度增加,硝基苯扩散系数增加越快。

关键词

[硝基苯](#) [离子液体](#) [紫外光谱](#) [电还原](#) [扩散系数](#)

分类号

Effect of interaction in ionic liquids on diffusion coefficient of nitrobenzene

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Abstract

The effect of interaction in ionic liquids on diffusion coefficient of nitrobenzene was investigated with ultraviolet spectroscopy and cyclic voltammetry. The results showed that compared with the ultraviolet spectrum in cyclohexane and water, red shift effect of absorption peak of nitro group was observed in EMimBF₄(1-ethyl-3-methylimidazolium tetrafluoroborate), and no end absorption was found when the wavelength was smaller than 210 nm, while the absorption of benzene ring had little change. These phenomena could be ascribed to the strong interaction between EMimBF₄ and nitro group. The interaction between EMimBF₄ and nitrobenzene as well as between EMimBF₄ and water had a complicated effect on diffusion coefficient of nitrobenzene electrochemically reduced in EMimBF₄. With increasing concentration of nitrobenzene, diffusion coefficient of nitrobenzene decreased. Increasing the carbon number of imidazolium side chain had a similar effect, but the trend of decrease was slower. At the same nitrobenzene concentration, with increasing water concentration, the value of diffusion coefficient of nitrobenzene increased in the same ILs. In different ILs, at a larger carbon number of imidazolium side chain, increasing water concentration caused a faster trend of increase of diffusion coefficient.

Key words

[nitrobenzene](#) [ionic liquids](#) [ultraviolet spectroscopy](#) [electrochemical reduction](#) [diffusion coefficient](#)

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