

论文

过渡金属离子液体EMI FeCl<sub>3</sub>的性质研究

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摘要:

在干燥高纯氩气氛的手套箱内, 直接将摩尔比为1:1的高纯无水FeCl<sub>3</sub>与氯化1-甲基-3-乙基咪唑(EMIC)混合, 得到棕色透明的离子液体EMIFeCl<sub>4</sub>. 在293.15~343.15 K温度范围内测定了该离子液体的密度和表面张力. 利用Glasser经验方程和空隙模型研究了EMIFeCl<sub>4</sub>的性质, 并与离子液体EMIAICl<sub>4</sub>进行比较, 指出空隙模型具有一定的合理性.

关键词: 离子液体; 密度; 表面张力; FeCl<sub>3</sub>; 空隙模型

Studies on Properties of Ionic Liquid EMI FeCl<sub>4</sub> Based on Transition Metal

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Abstract:

An ionic liquid(IL) EMIFeCl<sub>4</sub> was prepared by directly mixing FeCl<sub>3</sub> and 1-methyl-3-ethylimidazolium chloride with a molar ratio 1/1 under dry argon atmosphere. The densities, and surface tension of the pure IL were determined in the temperature range from 293.15 K to (343.15±0.1) K. The properties for the ionic liquids were discussed by using Glasser's theory. The crystal energy of ionic liquid is much lower than ionic solid and this is the underlying reason for forming ionic liquid at room temperature. In addition, a new theoretical model of ionic liquid, that is interstice model, was applied to calculating the thermal expansion coefficient of EMIFeCl<sub>4</sub>. And the magnitude order of the thermal expansion coefficient,  $\alpha$ , calculated by the theoretical model is in good agreement with experimental value. The result shows that there is much reasonableness for the interstice model of ionic liquid.

Keywords: Ionic liquid; Density; Surface tension; FeCl<sub>3</sub>; Interstice model

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