Synthesis of 1, 3-Dimethylimidazolium Chloride and Saturated Vapor Pressure of Its Aqueous Solution

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Recently, the combination of an ionic liquid and a refrigerant has been proposed to be used for absorption refrigeration. In this paper, the synthesis and the saturated vapor pressure of ionic liquid 1, 3-dimethylimidazolium chloride ([Mmim]Cl) aqueous solution were studied. Adopting a high-pressure reaction kettle, the method of gas-liquid phase reaction was used to synthesize the [Mmim]Cl under the conditions of 348.15 K in temperature and 0.7MPa in pressure. The ^{1}HNMR spectrum shows the structure of the product matches the structure of [Mmim]Cl. The measurement of the saturated vapor pressures of [Mmim]Cl aqueous solution were carried on the mass fraction range at 0.4, 0.55, 0.7, 0.8, 0.85, , and 0.9 respectively, with a set of apparatus on the boiling point method, which is made in Tokyo Rika Kikai Co. of Japan. The saturated vapor pressure range measured is from 1kPa to 100kPa. An Antoine type function was used to regress the experimental data and parameters were obtained. The properties of [Mmim]Cl aqueous solution show the potential to be used as a alternative working pair for absorption cooling cyclea.