

Physical and electrochemical properties of 1-hydroxy ethyl-3-methyl imidazolium and N-hydroxy ethyl-N-methyl morpholinium ionic Liquids

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New ILs based on imidazolium and morpholinium cation were prepared. N-hydroxyethyl-N-methyl-imidazolium([h-emim]⁺)/N-hydroxyethyl-N-methyl-morpholinium ([h-emMor]⁺) hexafluorophosphate ([PF₆]⁻) / tetrafluoroborate ([BF₄]⁻) were prepared by methathesis reaction from the corresponding chloride or bromide salts. The respective salts were characterized by ¹H NMR, FAB mass spectra. The Br⁻, Cl⁻, and water contents were examined by ionic chromatography and Karl Fisher coulometry, respectively. Thermal stabilities and phase behaviors depending on temperature were determined by TGA and DSC analyses respectively. The suggested ILs exhibit high thermal stabilities and wide liquid range. The electrochemical characteristics were investigated by ionic conductivity and electrochemical window measurements. The conductivities of prepared salts appeared to be high, and also the cyclic voltammogram indicates an electrochemical window of ~5 V. In this study, we present a different effect of the hydroxy group on the cation compared to common alkyl chain.