

Influence of cation in RTIL on electrode to generate electron mediator: An Co(II) redox behavior study

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Disclosure of the cationic effect of an ionic liquid on the electrode in generation of an electron transfer active mediator can be an added advantages towards the removal of air pollutants. The present investigation, 1-butyl-3-methylimidazolium-bis-trifluoromethylsulfonylimide ([BMIM]NTF₂) and 1-butyl-3-methylpyrrolidinium-bis-trifluoromethylsulfonylimide [BMPyr]NTF₂ ionic liquids were used for the oxidation/reduction of Co(II) by cyclic voltammetry and impedance analyses. The redox behavior of Co(II) in the above two ionic liquids was identified and compared with that of the pure ionic liquids. The [BMPyr]NTF₂ ionic liquid showed stronger adsorption on a Pt electrode than [BMIM]NTF₂. The charge transfer resistance (RCT) during the oxidation of Co(II) was determined to be higher in the [BMPyr]NTF₂ ionic liquid. Through the capacitance variations with the applied potential, the electrode charge in presence of [BMIM]NTF₂ and [BMPyr]NTF₂ ionic liquids was identified and discussed.

Key words: Ionic liquid, cationic effect, mediator generation, interfacial charge, capacitance