Towards electron mediator generation in ionic liquid: An electrochemical study on Cobalt ion addition into different ionic liquids and their redox analysis

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Because of wide potential window and high solubility of gas pollutants, the ionic liquids medium can be a good choice in air pollutant removal process. In order to use the ionic liquid, electron mediator contained ionic liquid more effective. Here in, cobalt ion added in different ionic liquids such as BMIM PF_6^-, BMIM$CF_3SO_3^-$, BMIM $(CF_3SO_3)^{2-}$ and BMIMBF_4^-. The FTIR analysis confirms the cobalt ion presence in the ionic liquid. The redox behavior of the different ionic liquids with cobalt ion investigated using Pt electrode. Cyclic voltammetry results demonstrates redox potential of Co^{2+}/Co^{3+} varied with various anionic groups containing ionic liquid. The found Co^{2+}/Co^{3+} redox potential poses the following potential order found at 1.4V, 1.8 and 2 V for CF3SO3- (1.4 V)< (CF3SO2)-2 (1.8 V) < PF-6 (2 V)..

Key words: redox potential, metal ion containing ionic liquid, electron mediator