Electrochemical Behavior of Iron (III) Complexes with Catechol at Different pH

Authors : K. M. Salim Reza, M. Hafiz Mia, M. A. Aziz, M. A. Motin, M. M. Rahman, M. A. Hasem

Abstract : The redox behavior of Fe (III) in presence of Catechol (Cc) has been carried out in buffer solution of different pH, scan rate, variation of Fe (III) concentration and Cc concentration. Uncoordinated Fe(III) or Cc has been found to undergo reversible electrode reaction whereas coordinated Fe-Cc is irreversible. The peak positions of the voltammogram of Fe-Cc shifted with respect to that of free Fe (III) or Cc and also developed a new peak at 0.12 V. The peak current of Fe-Cc decreases significantly compared with that of free Fe(III) or Cc in the same experimental conditions. These behaviors ascribed the formation of complex of Fe with Cc. The complex was formed either by the addition of Cc into Fe(III) or by the addition of Fe(III) into Cc. The effect of pH of Fe-Cc complex was studied by varying pH from 2 to 8.5. The electro chemical oxidation of Fe-Cc is facilitated in lower pH media. The slope of the plots of anodic peak current, Ep against pH of Fe-Cc complexe is 30 mV, indicates that the oxidation of Fe-Cc complexes proceeded via the 2e-/2H+ processes. The proportionality of the anodic and cathodic peak currents with square root of scan rate of suggests that the peak current of the different complexes at each redox reaction is controlled by diffusion process.

1

Keywords : cyclic voltammetry, Fe-Cc Complex, pH effect, redox interaction

Conference Title : ICCIS 2015 : International Conference on Chemical Industry and Science

Conference Location : Jeddah, Saudi Arabia

Conference Dates : January 26-27, 2015