

Constant potential electro-oxidation behavior of metal ions in room temperature ionic liquids

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The mediator redox couples for organic waste mineralization and pollutant destruction is usually carried out in acidic solutions. In order to replace the environmentally harmful acidic electrolytes ionic liquids seems to be possible alternative for these applications. Ionic liquids can solubilize the metal ion species like electrolytes but remain in liquid phase at room temperature. These electrolyte solvents possess many desirable properties such as moderate viscosity, high conductivity, and larger potential window. Therefore they are employed in the present investigation as solvent electrolytes for metal ion oxidation and reduction. In the present investigation we provide the results of electrochemical oxidation and reduction behaviors of Cobalt metal ion in room temperature ionic liquids with various working electrodes (Pt, Ti, DSA etc.) as anodes using an undivided and divided electrolytic cells. The extent of metal ion oxidation was estimated by UV-Vis spectral studies and the metal ion interaction with IL was characterized by FTIR spectroscopic method. Based on metal ion oxidation and reduction yields, current efficiency of the process was calculated and compared in order to optimize the electrode combination.