Electrochemical Behavior of Cu^{2+}-Histidine Complexes on a Glassy Carbon Electrode

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The electrochemical behavior of Cu^{2+}-L-histidine complexes on a glassy carbon electrode with various coordination environments in aqueous solution has been investigated. The Cu^{2+}-histidine complexes are more easily reduced and oxidized at low pH (pH = 3 $\sim$ 4) than at high pH (pH = 8 $\sim$ 10). Both reduction and oxidation reactions of the Cu^{2+}-histidine complexes are controlled by mass transfer at medium (pH = 5 $\sim$ 7) and high pH (pH = 8 $\sim$ 10) solutions. Even if the molar ratio of histidine to Cu^{2+} ions is as high as 100 : 1 at low pH of 4, the complexes are easily reduced to form Cu metal directly on the electrode surface. Glassy carbon rotating disk electrode experiments have shown that the electron transfer of the reduction reaction of the Cu^{2+}-histidine complexes is close to 2.

Key words: Cu^{2+}-L-Histidine, Copper Complexes, Glassy Carbon Electrode, Electrochemistry, Histidine Complexes