

Kinetics and Mechanism of Oxidation of Co (II) Ternary Complexes Involving N-(2-Acetamido) Iminodiacete and Some Amino Acids Acid by Periodate

Authors : Ahmed A. Abdel-Khalek, Reham A. Mohamed

Abstract : The kinetics of oxidation of the cobalt (II) complexes, $[\text{CoII}(\text{ADA})(\text{Gly})(\text{H}_2\text{O})_2]^-$, (ADA = N-(2-acetamido) iminodiacetic acid and Gly = Glycine) by periodate in aqueous acetate medium to cobalt (III) have been studied spectrophotometrically at 530 nm over the 30–50°C and a variety pH 4.57-5.25 range and $I = 0.50 \text{ mol dm}^{-3}$ under pseudo first order condition by taking large excess of oxidant $[\text{IO}_4^-]$ and it obeys the following rate law: $\text{Rate} = [\text{CoII}(\text{ADA})(\text{Gly})(\text{H}_2\text{O})_2]^- [\text{H}_5\text{IO}_6] \{k_4K_6 + (k_5K_7K_5/[\text{H}^+])\}$. Also, the kinetics of oxidation of the cobalt(II) complexes, $[\text{CoII}(\text{ADA})(\text{Val})(\text{H}_2\text{O})_2]^-$ (ADA = N-(2-acetamido) iminodiacetic acid and Val = valine) by periodate in aqueous medium to cobalt (III) have been studied spectrophotometrically at 580 nm over the 30–50°C and a variety pH 4.3-5.12 range and $I = 0.50 \text{ mol dm}^{-3}$ under pseudo first order condition by taking large excess of oxidant $[\text{IO}_4^-]$ and it obeys the following rate law: $\text{Rate} = [\text{CoII}(\text{ADA})(\text{Val})(\text{H}_2\text{O})_2]^- [\text{H}_5\text{IO}_6] \{k_4K_6 + (k_5K_7K_5/[\text{H}^+])\}$

Keywords : periodate, oxidation, cobalt (II), glycine, valine acid, n-(2-acetamido imino-diacetato)

Conference Title : ICMSMM 2014 : International Conference on Materials Science, Metal and Manufacturing

Conference Location : Barcelona, Spain

Conference Dates : August 18-19, 2014