

KINETICS AND MECHANISM OF OXIDATION OF L-TYROSINE BY THALLIUM(III) IN PERCHLORIC ACID MEDIUM

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ABSTRACT

The kinetics of oxidation of L-tyrosine by thallium(III) was studied at 50 °C in perchloric acid medium titrimetrically using iodometric method. The reaction was found to be first order dependent on [thallium(III)] and fractional order on [tyrosine]. Rate of the reaction increased considerably with increase in ionic strength whereas change in $[H^+]$ and [thallium(I)] did not show any significant effect. The main product of oxidation was confirmed as 4-hydroxyphenyl acetaldehyde. A plausible mechanism was proposed invoking complexation between the substrate and oxidant. The energy of activation, E_a and entropy of activation, ΔS^\ddagger for the rate determining step were calculated using linear least squares method and were found to be $109.92 \pm 15.24 \text{ kJmol}^{-1}$ and $16.83 \pm 47.18 \text{ JKmol}^{-1}$ respectively.

KEYWORDS: Kinetics, Mechanism, Oxidation, L-Tyrosine, Thallium(III)