



Kinetics and Mechanism of Pd(II)-Catalyzed Oxidation of L-Proline by N-bromoacetamide in Perchloric Acid Medium

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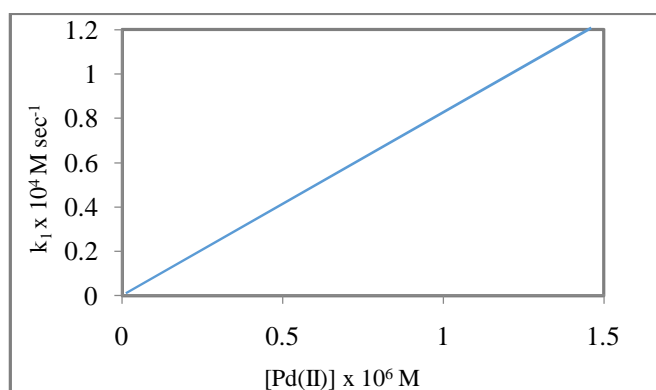
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ABSTRACT

Kinetic study of oxidation of proline, a biologically active organic compound, by N-bromoacetamide (NBA) using Pd(II) as homogeneous catalyst in acidic medium have been made at $35\text{ }^{\circ}\text{C} \pm 0.1\text{ }^{\circ}\text{C}$. The kinetic results shows first-order kinetics with respect to [NBA], [Proline] and [Pd(II)] throughout their variations. Inverse fractional order with respect to $[\text{H}^+]$ was observed. Variations of mercuric acetate, acetamide (NHA), $[\text{Cl}^-]$, ionic strength (μ) and dielectric constant (D) show nil effects on rate of the reaction. Further increase in temperature markedly increased the reaction velocity. On the basis of observed kinetic data proline and NBA as such and $[\text{PdCl}_4]^{2-}$ have been reported as the reactive species of proline, NBA and Pd(II) chloride respectively in acidic medium. Kinetic results and proposed mechanism are well supported by spectrophotometric evidences.

Graphical Abstract



Plot between k_1 and [Pd(II)] at 35°C.

Keywords: Bromoacetamide, Mechanism, Pd(II)chloride, Perchloric acid medium, Proline.