



Kinetics and Mechanism of Pd (II) Chloride Catalyzed Oxidation of L-Proline by N-Chlorosuccinimide in Acidic Medium

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ABSTRACT

The kinetics of oxidation of Proline by N-Chlorosuccinimide (NCS) in presence of Pd (II)-chloride as homogeneous catalyst in acidic medium has been investigated at 35^oC. The reaction is found to be first-order with respect to (NCS) and [Pd (II)]. The first order kinetics with respect to amino acid obtained at its lower concentrations changes to zero order at its higher concentrations. Inverse fractional order with respect to [H⁺] and [Cl⁻] were obtained, while [Hg (OAc)₂] and (NHS) variations show negligible effect on the reaction rate. Rate of reaction is not influenced by the change in ionic strength (μ) and dielectric constant (D) of the medium. The reaction has been studied at four different temperatures and observed values of the first-order rate constants were utilized to calculate various activation parameters. [PdCl₄]²⁻, (NCS) itself and Proline as such were considered as the reactive species of Pd (II) chloride, NCS and Proline in acidic medium respectively. A reaction scheme consistent with the kinetic data, spectroscopic information and activation parameters was proposed.

Keywords: Kinetics, Pd (II) chloride, Catalyzed oxidation, N- Chlorosuccinimide, Mechanism.
