



## Mechanistic and Thermodynamic study of Iridium (III) Catalyzed Oxidation of Paracetamol Drug by Acidic Solution of Potassium Bromate (KBrO<sub>3</sub>): A Kinetic Study

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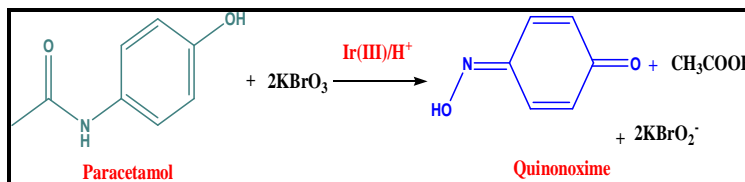
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### ABSTRACT

Mechanistic and thermodynamic study of Iridium(III) Catalyzed Oxidation Of Paracetamol drug by Acidic solution of Potassium Bromate (KBrO<sub>3</sub>) at 35°C. The reaction followed first order kinetics with respect to Ir(III) and potassium bromate (KBrO<sub>3</sub>). Rate of reaction exhibits zero order and fractional positive order kinetics with respect to [KCl] and [PA] respectively. The rate of reaction decreased with increasing [H<sup>+</sup>] was observed for the oxidation of paracetamol. Negligible effect of [Hg(OAc)<sub>2</sub>] and ionic strength of the medium was observed at different temperature (30°C to 45°C) were utilized to calculate the activation parameters. The reaction between potassium bromate and paracetamol in acid medium exhibits 1:2 stoichiometry. Quinoneoxime and acetic acid have been identified as main oxidation products of the reactions. Feasible mechanism has been proposed conforming with the kinetics, stoichiometry and product of the reaction. The rate law has been derived from obtained kinetic data.

### Graphical abstract



**Keywords:** Kinetics, oxidation, Potassium bromate, Ir(III) chloride, Acidic medium.