

## Stopped flow kinetics of Mn<sup>II</sup> catalysed Periodate Oxidation of *o*-Anisidine – First Report on Stability constant of the ternary Intermediate complex formation

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**Abstract:** This paper is the first report on kinetic study and evaluation of stability constant of ternary complex forming in the Mn<sup>II</sup> - catalysed periodate oxidation of *o*-Anisidine (OA) in acetone-water medium. The formation of ternary intermediate unstable complex during the oxidation of aromatic amines by periodate ion catalysed by Mn<sup>II</sup> has been proposed in case of some anilines. Stop-flow spectrophotometric method was used to study the ternary complex formation and to determine its stability constant. The stop-flow trace shows the reaction to occur in two steps. The first step, which is presumably the formation of ternary complex, is relatively fast while the second stage is relatively quite slow. The stability constant evaluated for OA - Mn<sup>II</sup> - IO<sub>4</sub><sup>-</sup> ternary complex by determining equilibrium absorbance is  $(2.73 \pm 0.15) \times 10^6$ . Kinetics of ternary complex formation was defined by the rate law (OA) under pseudo first order conditions.

$$d[C_2]/dt = k_{obs} ([C_2]_{eq} - [C_2]) \quad (A)$$

or

$$\ln\{[C_2]_{eq} / ([C_2]_{eq} - [C_2])\} = k_{obs} \cdot t \quad (A)$$

where,  $k_{obs}$  is the pseudo first order rate constant,  $[C_2]$  is concentration of ternary complex at given time  $t$ , and  $[C_2]_{eq}$  is the equilibrium concentration of ternary complex.

**Key words:** Stopped flow kinetics, stability constant, ternary complex, Mn<sup>II</sup> catalysed, Periodate oxidation, *o*-anisidine.