



Mechanistic Studies of Ru(III) Chloride Catalyzed Oxidation of Lactose by Sodium Metaperiodate in Alkaline Medium

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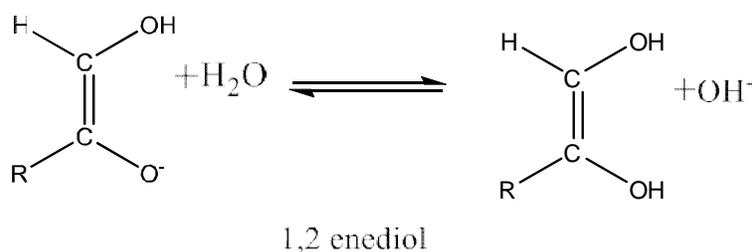
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Accepted on 3rd March 2018

ABSTRACT

Kinetics of oxidation of lactose by sodium metaperiodate in the presence of Ruthenium(III) chloride as homogeneous catalyst in alkaline medium has been carried out at 40°C. Reaction follows first order kinetics in the lower concentration range of sodium metaperiodate, lactose and OH⁻ ion while the order shifts from first to zero at their higher concentrations range. The reaction follows first-order kinetics in Ru(III) chloride concentration. Negligible effect of chloride ions was observed. Change in the ionic strength of the medium did not bring about any appreciable change in the rate of oxidation of lactose. The reaction rate enhanced significantly on increasing the temperature. HIO₅²⁻ and HRuO₅ have been postulated as the reactive species of sodium metaperiodate and Ru(III) respectively in alkaline medium.

Graphical Abstract



Keywords: Alkaline medium, Lactose, Mechanism, Ru(III)chloride, Sodium metaperiodate.