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Kineticstudies of Rh(III)-catalysed oxidation ofpentoxifyllineby potassium iodate in alkaline medium

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Abstract: Thekineticandmechanisticinvestigation of pentoxifyllineby potassium iodate in alkaline medium using Rh(III) as homogeneous catalyst has been carried out at 35^0C. The reaction shows first-order dependence on Rh(III) andpentoxifylline concentration. The order of reaction was found to be fractional positive with respect to $[IO_3^-]$. Variation of $[OH^-]$ and $[Cl^-]$ showed no effect on the rate of the reaction. The reaction remains unaffected by the change in ionic strength and dielectric constant of the medium. Various activation parameters (E_a, $\Delta H^{\#}$, $\Delta S^{\#}$, $\Delta G^{\#}$, and A)were calculated with the help of rate constants obtained at four different temperatures. $[RhCl_3(H_2O)_3]$ was postulated as the reactive species of Rh(III) chloride in alkaline medium. 1-(5-carboxy-pentyl)-3,7-dimethyl-3,7-dihydro-purine-2,6-dione and formaldehyde were identified as the main oxidation products.Asuitable mechanism consistent withkinetic observationsand spectroscopic information has been proposed whichissupported by the observed positive entropy of activation.

Keywords: Pentoxifylline,Rh(III)-catalysis,Spectroscopicinformation, Multiple regression analysis,Alkaline medium.

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