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The Kinetics and Mechanism of Oxidation of Vanillin by Diperiodatonickelate(IV) in Aqueous Alkaline Medium

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Abstract: The title reaction was investigated in aqueous alkaline medium. A first order dependence in diperiodatonickelate (IV) (DPN) and an apparent fractional order in both vanillin and alkali were obtained. Periodate has a retarding effect on the reaction. The effect of added products and the ionic strength of the reaction medium have no significant effect on the reaction rate. A decrease in the dielectric constant of the medium decreases the rate of reaction. Effects of temperature on the rate of reaction were studied. A mechanism based on experimental results was proposed, and constants involved in the mechanism were evaluated. A good agreement between the observed and calculated rate constants at different experimental conditions was obtained.

Key Words: Oxidation; Vanillin, Kinetics, DPN

Keywords
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