

Kinetic and Mechanistic Aspects of Reactivity of the Oxidation of Some Fe(II)–Tris Schiff Base Complexes by Peroxydisulfate: Spectrophotometric Tracer and Solvent Effect on the Reactivity

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ABSTRACT: The kinetics of the oxidation of some Fe(II)–Tris Schiff base complexes by peroxydisulfate was studied spectrophotometrically in the aqueous medium and in the organic–aqua binary mixture. The inspected complexes were derived from the condensation of 2-acetylpyridine and substituted benzylamines. The oxidation reaction of the studied complexes was followed at 303 K under pseudo–first-order conditions. It was found that the oxidation reaction by $S_2O_8^{2-}$ consists of two steps. The first step is the formation of an ion pair from the reactants, and the second step is an electron transfer from the metal center to the peroxydisulfate oxidant, with an associated peroxy bond fission. A mechanism, based on the experimental results, was proposed, and the rate law was derived. The effect of organic solvent on the reaction rate was studied in the presence of different ratios (v/v) of methanol–water and acetone–water mixtures. Moreover, the changes in the activation barrier from water to water–methanol and

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