Reactivity Trends and Kinetic Inspection of Hydroxide Ion Attack and DNA Interaction on Some Pharmacologically Active Agents of Fe(II) Amino Acid Schiff Base Complexes at Different Temperatures

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ABSTRACT: The reactivity of few novel high-spin Fe(II) complexes of Schiff base ligands derived from 2-hydroxynaphthaldehyde and some variety of amino acids with the OH^- ion has been examined in an aqueous mixture at the temperature range from 10 to 40°C. Based on the kinetic investigations, the rate law and a plausible mechanism were proposed and discussed. The general rate equation was suggested as follows: rate $= k_{obs}$[complex], where $k_{obs.} = k_1 + k_2[OH^-]$. Base-catalyzed hydrolysis kinetic measurements imply pseudo–first-order doubly stage rates due the presence of mer- and fac-isomers. The observed rate constants k_{obs} are correlated with the effect of substituent R in the structure of the ligands. From the effect of temperature on the rate base hydrolysis reaction, various thermodynamic parameters were evaluated. The evaluated rate constants and activation parameters are in a good agreement with the stability constants of the investigated complexes. Moreover, the reactivity of the investigated complexes toward DNA was examined and found to be in a good agreement with the reported binding constants. © 2014 Wiley Periodicals, Inc. Int J Chem Kinet 46: 543–553, 2014

INTRODUCTION

Schiff base complexes have extensive importance as radiotracers [1], biologically active reagents [2–5],

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