

SYNTHESIS, DNA BINDING, AND OXIDATIVE CLEAVAGE STUDIES OF Fe(II) AND Co(III) COMPLEXES CONTAINING BIOACTIVE LIGANDS

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□ The two complexes containing bioactive ligands of the type and $[Fe(L)](PF_6)_2$ (1) (where $L = [1-[2-([2\text{-hydroxynaphthalen-1-yl)methylidene]amino}]\text{phenyl}]\text{imino}]\text{methyl}]\text{naphthalene-2-ol}]$) and $[Co(L_1L_2)](PF_6)_3$ (2) (where $L_1L_2 =$ mixed ligand of 2-seleno-4-methylquinoline and 1,10-phenanthroline in the ratio 1:2, respectively) were synthesized and structurally characterized. The DNA binding property of the complexes with calf thymus DNA has been investigated using absorption spectra, viscosity measurements, and thermal denaturation experiments. Intrinsic binding constant K_b has been estimated at room temperature. The absorption spectral studies indicate that the complexes intercalate between the base pairs of the CT-DNA tightly with intrinsic DNA binding constant of $2.8 \times 10^5 M^{-1}$ for (1) and $4.8 \times 10^5 M^{-1}$ for (2) in 5 mM Tris-HCl/50 mM NaCl buffer at pH 7.2, respectively. The oxidative cleavage activity of (1) and (2) were studied by using gel electrophoresis and the results show that complexes have potent nuclease activity.

Keywords Fe(II) and Co(III) complexes; DNA binding; cleavage studies

INTRODUCTION

The therapeutic and diagnostic properties of transition metal complexes have attracted considerable attention, leading to their application in many areas of modern medicine.^[1] Many coordination compounds of transition metal ions accomplish nucleolytic cleavage.^[2]

Studies of mixed ligand transition metal complexes, which bind at specific sites along a DNA strand as reactive models for protein-nucleic acid

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