

## CU(II) AND MN(II) COMPLEXES CONTAINING MACROACYCLIC LIGAND: SYNTHESIS, DNA BINDING, AND CLEAVAGE STUDIES

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□ The two new metal complexes of Cu(II) and Mn(II) containing macroacyclic ligand of the type [Cu(hpn)](PF<sub>6</sub>)<sub>2</sub> (**1**) and [Mn(hpn)](PF<sub>6</sub>)<sub>2</sub> (**2**) [where hpn = [1-{[2-{[2-hydroxynaphthalen-1-yl)methylidene]amino}phenyl]imino}methyl]naphthalene-2-ol]] have been synthesized and characterized by employing analytical and spectral methods. The DNA binding properties of the complexes with calf thymus-DNA were studied by using absorption spectra and viscosity measurements, as well as thermal denaturation experiments. The absorption spectra indicated that the complexes intercalate tightly between the base pairs of the DNA with intrinsic DNA binding constants of  $1.8 \times 10^4$  M<sup>-1</sup> for (**1**) and  $3.7 \times 10^4$  M<sup>-1</sup> for (**2**) in 5 mM Tris-HCl/50 mM NaCl buffer at pH 7.2, respectively. The enhancement in the relative viscosity of DNA on binding to the ligand supports the proposed DNA binding modes. The oxidative cleavage activity of complexes (**1**) and (**2**) were carried out on double-stranded pUC19 circular plasmid DNA using gel electrophoresis. The complexes show significant nuclease activity.

**Keywords** Cu(II); Mn(II) complexes; DNA; oxidative cleavage

### INTRODUCTION

Many studies<sup>[1–3]</sup> have indicated the relationship between the metal ions and their complexes as antitumor<sup>[4–9]</sup> and antibacterial<sup>[10,11]</sup> agents. In recent years, metal-containing drugs that interact with DNA have been designed and studied for their anticancer activity. Some of them have shown promising antineoplastic activity against cancer cells as well as tumors both

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