



## DNA Interaction Studies of Newly Synthesized Mixed Ligand Complexes of Cobalt (III)

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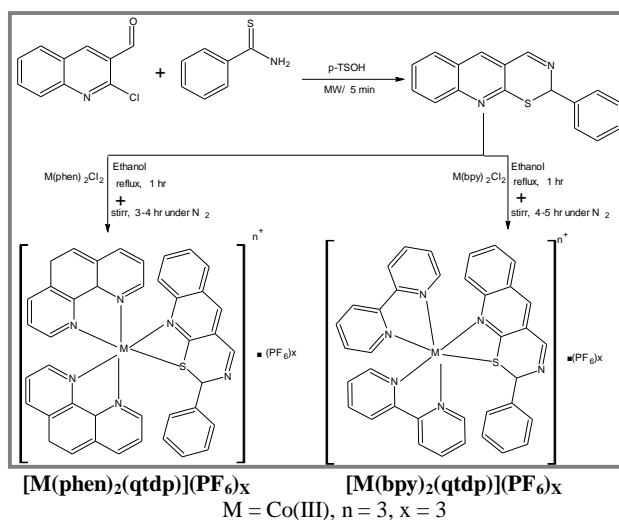
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### ABSTRACT

DNA binding and Oxidative cleavage characteristics of a series of mixed ligand cobalt (III) complexes of bioactive ligands containing N and S donor atoms viz;  $[\text{Co}(\text{phen})_2(\text{qtdp})](\text{PF}_6)_3$  and  $[\text{Co}(\text{bpy})_2(\text{qtdp})](\text{PF}_6)_3$ . 1,10-phenanthroline (phen), 2'2 bipyridene (bpy) have been investigated in detail. Various physico-chemical and biochemical techniques including UV/Visible, viscometric titration, thermal denaturation, and differential pulse voltammeter have been employed to probe the details of DNA binding by these complexes; intrinsic binding constants ( $K_b$ ) have been estimated under a similar set of experimental conditions. Analysis of the results suggests that intercalative ability of the coordinated ligands varies as phen > bpy in this series of complexes. While the Co(III) complexes investigated in this study effect oxidative cleavage of the supercoiled pUC19 DNA. Results of detailed investigations carried out inquiring into the mechanistic aspects of DNA oxidative cleavage by  $[\text{Co}(\text{phen})_2(\text{qtdp})]^{3+}$ ,  $[\text{Co}(\text{bpy})_2(\text{qtdp})]^{3+}$  have also been reported.

### Graphical Abstract



phen = 1,10-phenanthroline; bpy = 2'2-bipyridine; qtdp = quinolino(2,3-b)thiadiazepine

Scheme leading to the synthesis of  $[\text{Co}(\text{phen})_2(\text{qtdp})](\text{PF}_6)_3$ , and  $[\text{Co}(\text{bpy})_2(\text{qtdp})](\text{PF}_6)_3$

**Keywords:** Oxidative cleavage, Binding constant, 2'2-bipyridine, Voltammeter, Supercoiled.

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