

***Dedicated***  
***to***  
***My Beloved Parents***

## **DECLARATION**

I declare that the thesis entitled **Some Novel Transition Metal Complexes of Polydentate Ligands: Synthesis, Physico-Chemical Characterization and DNA Interaction Study** has been prepared by me under the supervision of Prof. Biswajit Sinha, Department of Chemistry, University of North Bengal. No part of this thesis has formed the basis for the award of any degree or fellowship previously.

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## CERTIFICATE

I declare that **Mr. DIPU KUMAR MISHRA** has prepared the thesis entitled **Some Novel Transition Metal Complexes of Polydentate Ligands: Synthesis, Physico-Chemical Characterization and DNA Interaction Study** for the award of Ph. D degree of University of North Bengal under my supervision. He has carried out the work at the Department of Chemistry, University of North Bengal.

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## **PREFACE**

I started the research work presented in this thesis entitled **Some Novel Transition Metal Complexes of Polydentate Ligands: Synthesis, Physico-Chemical Characterization and DNA Interaction Study** in the year 2013 under the supervision of Prof. Biswajit Sinha in the Department of Chemistry, University of North Bengal, India. In recent times, research on the detection and fixing of DNA defects at initial phase has received much attention and to diagnose / fix such defects various probes have been examined. Researchers to solve this issue have visualized the idea of binding event of any foreign molecule with biomolecules just like the Guest-Host interaction and Lock and Key Concept. In early studies researchers primarily used various organic molecules to facilitate such interaction with DNA. But ever since the establishments of cis-platin as chemotherapeutic agent, transition metal complexes have accessed much attention as they have the superiority of showing different geometries: the reactivity of transition metal complexes can be modulated by simply altering the metal ions and their oxidation states. Despite the success of cisplatin as anticancer agent, its clinical usefulness is limited by its severe side effects. The necessity of alternatives to cisplatin has inspired the researcher to do further work towards the improvement of novel metal-based drugs with superior properties.

The present dissertation focused on the synthesis, Physico-Chemical characterization and DNA interaction ability of newly synthesized transition metal complexes.

## **Acknowledgement**

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Only words are not adequate to translate my thanks to my senior and junior lab mates for their valuable suggestions and cooperation at during my experiments and data analysis. I am extremely thankful to Department of zoology and Department of Tea science, N.B.U for providing me to access their lab regarding some biological analyses.

I owe a special thanks to my parents, **Mrs. Mina Mishra** and **Mr. Surendra Mishra** for their love, understanding, encouragement and belief in me. They are my source of motivation and patience. Throughout my research journey I was lucky to have support from of my brother-in-law (**Mr. Koushikinath Misra**) in all respects. My loving thank to **Miss. Ritu Mishra** (didi) and **Mr. Santosh Mishra** (elder brother), for their support and guidance. I would also like to convey my heartfelt thanks to my **in-laws** (**Mr. Prodyut Chakraborty, Mrs. Prativa Chakraborty**) for their moral support, vibrant love and affection throughout my research period.

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## LIST OF TABLES

<b>Table</b>	<b>Page No.</b>
<b>2.1.</b> List of chemicals and reagents.	39-41
<b>3.1.</b> Analytical and Physical data of Schiff base ligand and its Zn(II) complex	59-59
<b>3.2.</b> Binding affinity of the Zn(II) complex with different proteins	70-70
<b>3.3.</b> Percentage of inhibition at highest concentration and IC <sub>50</sub> values (in parentheses) of Zn(II)-Complex and standard for different antioxidant and free radical scavenging assays.	72-72
<b>4.1.</b> Analytical and Physical data of Schiff base ligand and its Co(II) complex	85-85
<b>4.2.</b> Binding affinity of the Co(II) complex with different proteins	95-95
<b>5.1.</b> Crystal data collection and structure refinement for the complex	105-105

## LIST OF SCHEMES

<b>Scheme</b>	<b>Page No.</b>
3.1. Synthesis of schiff base ligand and its Zn(II) complex.	58-58
4.1. Synthesis of schiff base ligand and its Co(II) complex	84-84
6.1. Synthesis of ionic liquid tagged azo-azomethine ligand	120-120
6.2. Synthesis of azo-azomethine ligand based Zn(II) complex.	121-121

## LIST OF FIGURES

Figure	Page no.
1.1. Condensation reaction for Schiff base formation.	5-5
1.2. Schiff bases with different denticity.	5-5
1.3. Structure of bis(salicyladimino)Cu(II).	6-6
1.4. Modes of interaction of metal complex with DNA.	9-9
1.5. Representation of DNA cleavage process.	13-13
1.6. <i>Bacillus subtilis</i> bacteria.	15-15
1.7. <i>Staphylococcus aureus</i> bacteria.	16-16
1.8. <i>Pseudomonas aeruginosa</i> bacteria.	7-17
1.9. <i>Escherichia coli</i> bacteria.	17-17
2.1. Atomic Absorption Spectrophotometer (Varian SpectrAA 50B).	44-44
2.2. The magnetic susceptibility balance (Magway MSB Mk1).	45-45
2.3. Perkin-Elmer Spectrum FT-IR spectrometer (RX-1).	46-46
2.4. Jasco V-530 double beam UV-VIS Spectrophotometer.	46-46
2.5. FT-NMR (Bruker Avance-II 400 MHz).	47-47
2.6. ESI-MS (Waters ZQ-4000 spectrometer).	47-47
2.8. Systronic conductivity TDS-308 meter.	48-48
2.9. Digital electronic analytical balance (Mettler Toledo, AG 285).	49-49
3.1. FTIR Spectra of the synthesized ligand and its Zn(II) complex.	60-60
3.2. <sup>1</sup> H NMR spectrum of Schiff base ligand and its Zn(II) complex.	61-61
3.3. <sup>13</sup> C NMR spectrum of Schiff base ligand and its Zn(II) complex.	62-62
3.4. UV-visible spectra of Synthesized ligand and its Zn(II) complex in DMSO.	63-63

<b>3.5.</b> Absorption spectra of Zn (II) complex (orange line) in absence and presence of increasing amount of CT DNA (0–15 $\mu$ M), Inset: plot for binding constant ( $K_b$ ).	64-64
<b>3.6.</b> Emission spectra of EB bound to the DNA in absence and presence of increasing amount of Zn(II) complex (0–30 $\mu$ M), Inset: plot for quenching constant ( $K_{sv}$ ).	65-65
<b>3.7.</b> Plot of absorbance versus temperature ( $^{\circ}$ C) for the melting of 1) CT DNA alone (red line), 2) CT DNA + Zn(II) complex (purple line).	66-66
<b>3.8.</b> Effect of increasing amounts of (a) EB (b) Zn(II) complex on the relative viscosity of CT-DNA.	67-67
<b>3.9.</b> Changes in the agarose gel electrophoretic pattern of pBR322 plasmid DNA induced by $H_2O_2$ for ligand and Zn(II) complex.	68-68
<b>3.10.</b> The molecular surface view of the protein molecule and the docked complex molecule at its binding site.	71-71
<b>3.11.</b> Antioxidant activity of Zn(II) metal complex. (A) DPPH activity. (B) Nitric oxide scavenging activity. (C) Super oxide radical scavenging activity.	73-73
<b>3.12.</b> Antioxidant activity of Zn(II) metal complex. (A) Hydroxyl radical scavenging assay. (B) Hydrogen peroxide scavenging activity. (C) Total antioxidant scavenging assay.	74-74
<b>3.13.</b> Antioxidant activity of Zn(II) metal complex. (A) Iron chelation assay. (B) Lipid peroxidation activity.	75-75
<b>3.14.</b> Antioxidant activity of Zn(II) metal complex. (A) Peroxynitrite scavenging assay. (B) Singlet oxygen scavenging assay. (C) Hemolytic assay (D) Erythrocyte membrane stabilizing activity.	76-76
<b>3.15.</b> Antioxidant activity of Ligand and its Zn(II) metal complex. (A) Hypochlorous acid scavenging assay. (B) Reducing power assay.	76-76
<b>4.1.</b> UV-visible absorption spectra of ligand and its Co(II) complex in DMSO.	86-86
<b>4.2.</b> FTIR Spectra of the synthesized ligand and its Co(II) complex.	87-87
<b>4.3.</b> $^1H$ and $^{13}C$ NMR spectrum of Schiff base ligand.	88-88

<b>4.4.</b> TGA curve of the Co(II) complex in the temperature range 50-1000 °C.	89-89
<b>4.5.</b> PXRD patterns of the ligand and its Co(II) complex.	89-89
<b>4.6.</b> UV–Vis spectra of the ligand in presence of increasing concentrations of Co(II) ions. Inset: Absorbance plot for the ligand with Co(II) ion against $cM:cL$ .	90-90
<b>4.7.</b> Absorption spectra of Co(II) complex (red line) in the absence and presence of increasing amount of CT DNA (0–10 $\mu$ M), Inset: plot for binding constant ( $K_b$ ).	91-91
<b>4.8.</b> Emission spectra from EB bound to the DNA in the absence and presence of increasing amount of Co(II) complex (0–30 $\mu$ M), Inset: plot for quenching constant ( $K_{sv}$ ).	92-92
<b>4.9.</b> Plot of absorbance versus temperature ( $^{\circ}$ C) for the melting of 1) CT DNA alone, 2) CT DNA + Co(II) complex.	93-93
<b>4.10.</b> Effect of increasing amounts of (a) EB (b) Co(II) complex on the relative viscosity of CT-DNA.	94-94
<b>4.11.</b> The molecular interaction of the proteins with Co(II) complex.	96-96
<b>4.12.</b> Anti- bacterial activity of Co(II) complex on (A) <i>B. subtilis</i> , (B) <i>S. aureus</i> , (C) <i>E. coli</i> and (D) <i>P. aeruginosa</i> .	97-97
<b>5.1.</b> Coordination geometry of Cu(II) ion in the complex.	106-106
<b>5.2.</b> Crystal packing and hydrogen bonding within the framework.	106-106
<b>5.3.</b> FTIR spectrum of the complex.	107-107
<b>5.4.</b> Molecular Docking interaction.	108-108
<b>5.5.</b> Changes in the agarose gel electrophoretic pattern of pBR322 plasmid DNA induced by H <sub>2</sub> O <sub>2</sub> Cu(II) complex.	109-109
<b>5.6.</b> Antioxidant activity of Cu (II) complex.	111-111
<b>6.1.</b> Structure of [2-aemim]PF <sub>6</sub> .	117-117

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<b>6.2.</b> FT-IR spectrum of [2-aemim]PF <sub>6</sub> .	118-118
<b>6.3.</b> ESI-MS spectrum of [2-aemim]PF <sub>6</sub> .	119-119
<b>6.4.</b> FTIR spectra of ligand and its Zn(II) complex.	122-122
<b>6.5.</b> NMR spectra of Ligand and its Zn(II) complex.	123-123
<b>6.6.</b> Absorption spectra of azo-azomethine based ligand and its Zn(II) complex.	124-124
<b>6.7.</b> Absorption spectra of Zn(II) complex (in absence and presence of increasing amount of CT DNA; Inset: plot for binding constant ( $K_b$ )).	125-125
<b>6.8.</b> Emission spectra from EB bound to the DNA in the absence and presence of increasing amount of complex (0–30 $\mu$ M), Inset: plot for quenching constant ( $K_{sv}$ ).	126-126
<b>6.9.</b> Molecular docking between the Zn(II) complex and (a) 3hb5, (b)2BEL.	127-127

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## **LIST OF APPENDICES**

<b>Appendix</b>	<b>Page No.</b>
I: List of Publications	133
II: List of Seminar, Symposium and Conventions Attended	134