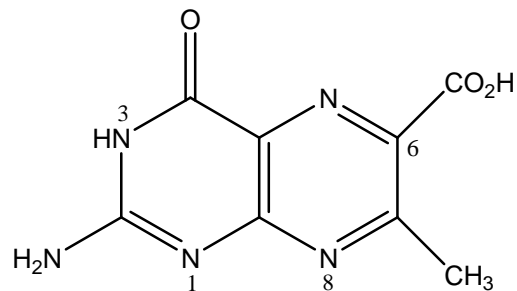


PREFACE

The research work embodied in this thesis entitled, “*Coordination chemistry of pteridine ligands with transition and d^{10} metals*”, has been carried out in the laboratory of Professor Parag S. Roy, Department of Chemistry, University of North Bengal. The thesis consists of six chapters, followed by concluding remarks. In Chapter I, a general introduction stresses the importance of the works reported here, along with the highlights of the available knowledge in these fields and the necessary references (indicated by superscript numbers), which are collected together at the end of this treatise. The aims and objectives of this work as described in Chapter I (Introduction), point out the scope of the present work, research goals to be achieved and the outlines of the experimental techniques used for realizing them. Chapter II and Chapter III are concerned with the investigations on two mixed ligand coordination compounds of copper(II) and cobalt (II) with a pterin ligand [H₂L.1.5H₂O] [Scheme-1] and 1,10-phenanthroline (phen). Chapter IV deals with the mixed ligand coordination compounds of nickel(II) and the pterin ligand [H₂L.1.5H₂O]; the ancillary ligand being 1,2-diaminoethane (en) . Chapter V is concerned with the study of mixed ligand coordination compounds of nickel(II) with the pterin ligand (H₂L. 1.5H₂O) along with optically active R-(+)-diaminopropane[R-(+)-pn]/ S-(-)-diaminopropan [S(-)-pn] as ancillary ligands. Chapter VI deals with four mixed ligand complexes, e.g., of zinc(II), cobalt (II), nickel(II) and copper (II), with a pterin ligand [H₂L.1.5H₂O], where the ancillary ligands are 1,10-phenanthroline (phen) and 1,2-bipyridile (bipy). The highlights of observations of the entire thesis, are grouped together at the end of the thesis in the form of concluding remarks. Schematic structures of the tautomeric forms, IUPAC and trivial nomenclature of the pterin ligand (H₂L) used in this thesis, along with their abbreviations, are indicated below. The ancillary ligands are also indicated here (Scheme -1 to Scheme-9).

Tables, Figures and Schemes in each chapter have been numbered using a combination of Roman and Arabic numerals; for example, the first Table of Chapter I is numbered I-1, the second Table is numbered I-2, whereas the first Table of Chapter II is numbered II -1, the second Table as II-2 and so on. In each Chapter the compounds have been assigned serial numbers (in bold letters) and referred to them by these numbers during discussion.



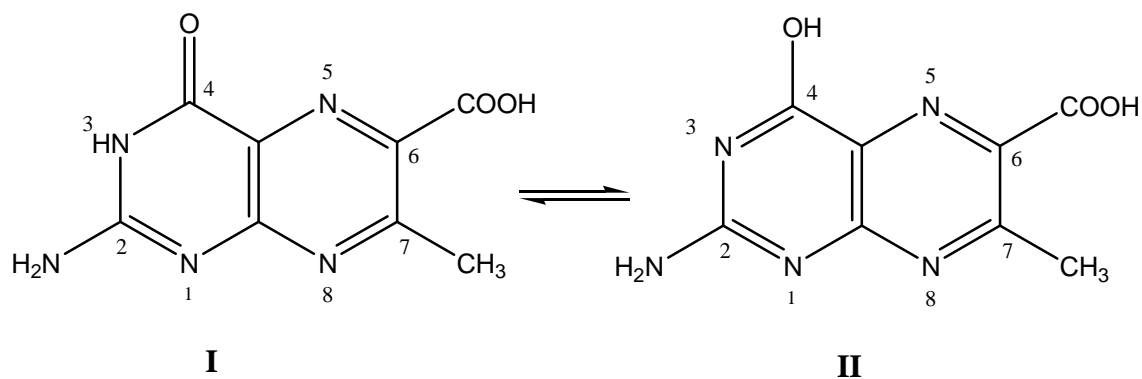
Scheme -1

2 - Amino -7- methyl - 4- oxidopterin - 6- carboxylic acid (IUPAC)

7 - Methylpterin - 6 - carboxylic acid (Trivial)

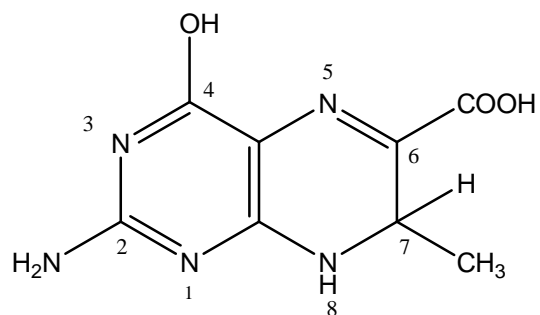
[H₂L]

(abbreviation)



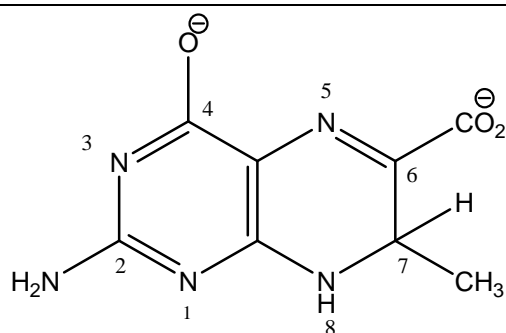
I **II**
Tautomeric forms (amido-imidol system) of the pterin ligand [H₂L]

Scheme -2



7, 8-dihydro pterin

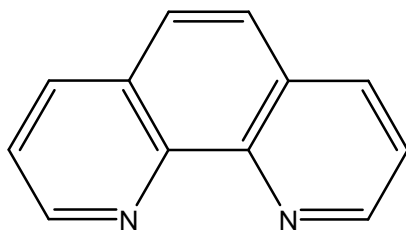
Scheme-3



7, 8-dihydro pterin anion L' ²⁻

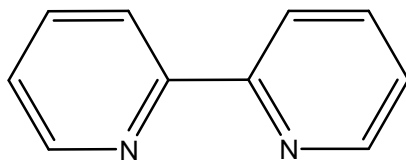
Scheme-4

Ancillary ligands



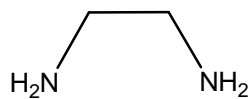
1, 10 - phenanthroline (Trivial)
phen (Abbreviation)

Scheme-5



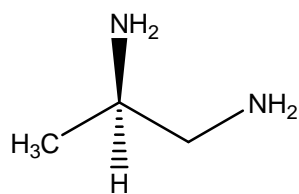
2, 2' - bipyridine (Trivial)
bipy (Abbreviation)

Scheme -6



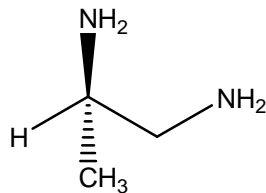
1,2-diaminoethane (Trivial)
en (Abbreviation)

Scheme-7



R-(+)- 1, 2- diaminopropane (Trivial)
[R-(+)-pn] (Abbreviation)

Scheme-8



S-(-)- 1, 2- diaminopropane (Trivial)
[S-(-)-pn] (Abbreviation)

Scheme-9

The multiplicities of NMR spectral signals are indicated by the usual abbreviations, e.g., ‘s’ for singlet ; ‘bs’ for broad singlet, ‘ss’ for sharp singlet, ‘d’ for doublet, ‘dd’ for doublet of doublet, ‘t’ for triplet, ‘o’ for octet, ‘m’ for multiplet, ‘br’ for broad and ‘wb’ for weak broad.

The pterin ring numbering system has been used for the schemes related to the schematic structures and utilized in the discussion part. Most of the compounds have been x-ray structurally characterized, as reported here. Few of the complexes reported in Chapter II and Chapter VI could not be characterized x-ray structurally for those cases DFT optimized molecular structures are reported and the corresponding geometric parameters are incorporated in the relevant tables.

References are mentioned at the end of this thesis following standard international conventions. In spite of taking utmost care, some of the references are repeated and the author expresses regret for this.

Preliminary reports involving parts of this work have been submitted to UGC, New Delhi as annual progress reports as well as final technical report. Five papers have already been published out of the subject matters of this thesis.. Such publications on coordination compounds of pterin ligands reflect the continuing interest of this laboratory on this subject.