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Synthesis, spectroscopic characterisation, DNA cleavage, superoxidase dismutase activity and antibacterial properties of some transition metal complexes of a novel bidentate Schiff base derived from isatin and 2-aminopyrimidine

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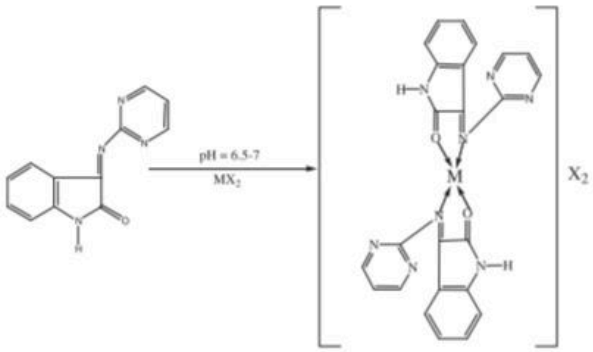
HIGHLIGHTS

- A novel potentially bidentate heterocyclic Schiff base has been synthesised.
- The Schiff base has been used as a promising chelating agent for some 3D metal ions.
- XRD patterns revealed the crystalline nature of the ligand and copper(II) complex.
- DNA cleavage and SOD activities of the metal complexes have been studied.
- Antibacterial activities of the ligand and metal complexes have also been examined.

GRAPHICAL ABSTRACT



where M= Mn(II), Co(II), Ni(II), Cu(II) and Zn(II); X=Cl, OAc

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ABSTRACT

Complexes of manganese(II), cobalt(II), nickel(II), copper(II) and zinc(II) with a Schiff base, formed by the condensation of isatin with 2-aminopyrimidine have been synthesised and characterised through elemental analysis, molar conductance measurements, magnetic susceptibility, IR, UV–Vis, ^{1}HNMR, FAB mass and EPR spectral studies. The spectral data revealed that the ligand acts as neutral bidentate, coordinating to the metal ion through the carbonyl oxygen and azomethine nitrogen. Molar conductance values adequately support the electrolytic nature of the complexes. On the basis of the above observations the complexes have been formulated as $[M(ISAP)_2]X_2$, where M = Mn(II), Co(II), Ni(II), Cu(II) and Zn(II); X = Cl, OAc; ISAP = 2-[*N*-indole-2-one]aminopyrimidine. The ligand and copper(II) complex were subjected to X-ray diffraction studies. The DNA cleavage study was monitored by gel electrophoresis method. The superoxide dismutase (SOD) mimetic activities of the ligand and the metal complexes were checked using NBT assay. The *in vitro* antibacterial activity of the synthesized compounds has been tested against gram negative and gram positive bacteria.

Introduction

Schiff bases form a significant class of compounds in medicinal and pharmacological chemistry due to their varied biological applications such as antibacterial [1–6], antifungal [3–6] and antitumor [7,8] agents. Generation of different heterocyclic derivatives of

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