Synthesis, Spectral and biological studies of transition metal complexes of Cu(II), Ni(II), Co(II), Ru(III), Pd(II) and Pt(II) of novel Schiff’s base, derived from 3-Chloro benzohydrazide, ketones, amines and aromatic aldehydes

Introduction:

The golden age of antibiotics began with the production of Penicillin in 1941. Common usage of antibiotics includes synthetic antibacterial agents, such as Sulphonamides and Quinolones, which are not products of microbes. Antibiotics differ markedly in physical, chemical and pharmacological properties, antibacterial spectra and mechanism of action. Antifungal, antibacterial, anti-HIV activity of Schiff, and mannich bases derived from Isatin derivatives and N-[4-(4'-Chlorophenyl)thiozole-2-yl] thiosemicarbazide. Recently the number of diseases caused by multidrug resistant gram positive microorganism has been continuously increasing. Increasing antimicrobial resistance (AMR) present major threats to public health because it reduces the effectiveness of antimicrobial treatment leading to increase morbidity, mortality and health care expenditure. The growing field of metal complexes with biologically active ligands deserves as a separate section because of the different rationale involved. In these cases the activity of metal centre is usually subordinate to the activity of the ligands, and the metal ions rather serve to modulate this activity or make potent organic ligands applicable that are not particularly sited for drug development in an uncoordinated form for various reasons. Therefore meaningful research in this direction might generate novel models for biologically occurring molecules and thus is helpful in further understanding of biological systems.

Schiff Bases and their transition metal complexes have been investigated extensively since these type of molecules are important in chemistry and have many applications [1-4]. A great deal of work has been done reported on the synthesis, structural investigations, various crystallographic features, mesonic characteristics, structure-redox relationships and catalytic properties of different types of Schiff bases and their complexes with transition and non transition elements[5-
In recent years, a variety of artificial metal ligand complexes have been prepared to study the effects of cooperatively on reactions as diverse as hydrolysis of phosphate esters[8], and carboxylic acid amides [9], the magnetic behaviour[10]. Some of these metal complexes (Pt, Au, Ru, Bi) have been reported to be potential anticancer drugs[11-13]. There are three main properties that ruthenium complexes well suited for medicinal applications (i) the rate of ligand exchange, (ii) the range of accessible oxidations and the ability of ruthenium to mimic iron in binding to certain biological molecules. There has been considerable interest in ruthenium complexes in recent years, because of their redox stability, excited state reactivity and excited state life time. Ru\textsuperscript{II} complexes are currently used as antileukaemic and antiviral agents, and for treatment against several types of other serious disorder such as Crohn’s disease. Transition metal complexes also used in DNA binding and photocleavage [14, 15], ruthenium based are much less toxic than the world wide approved, Pt based drugs. There are a large number of works on coordination chemistry, analytical application and biological activity of semicarbazones and thiosemicarbazones, hydrazones[16-18].

Because of considering all these beneficial points about transition metal complexes, the main aim which is planned in this synopsis is to design and development of metal complexes of novel Schiff bases, the investigation of the interaction between ligands and transition metal ions present in the complexes and biological activities against bacteria and fungi.