ABSTRACT

Coordination compounds, which is the backbone of inorganic chemistry, are now of great importance not only in organic chemistry and analytical chemistry but also in bio-inorganic chemistry, and thus it can be truly considered as interdisciplinary in nature several publications varying from purely scientific to modern physico-chemical and to biochemically relevant coordination compounds, reveal the growing interest in this branch of chemistry. The works, reported by Tassaert, Berzelius, Graham etc., were the very beginning of development in coordination chemistry. The systematic approach on the study of coordination compounds was first done by Alfred Werner in 1893.

The structural aspects of metal-nitrogen bonded compounds occupy prominent positions amongst the recent achievements in the field of coordination chemistry. It is well known that multidentate ligands, with phenolic oxygen and imine like nitrogen donors, can serve as models for biologically occurring protein bound metal complexes. Cytochrome c, a coordination compound of iron, present in fish, terrestrial vertebrates and in some green plants, is one of the oldest chemicals involved in biological processes. Haemoglobin which is also a coordination compound of iron having porphyrin ring with N donors is an essential component of blood. Other naturally occurring coordination compounds are chlorophyll vitamin B$_{12}$ and various enzymes.

Chlorophyll is a magnesium complex which is responsible for the absorption of light for the photosynthesis in plants. Vitamin B$_{12}$ is a cyanocobalamin
complex with 5,6- dimethylbenzimidazole as the nitrogenous base. The structure of vitamin B\textsubscript{12} was first elucidated by Hodkin et. al. in 1948.

Cytochrome c oxidase consists of haeme groups and copper atoms in (1:1) ratio. The first enzymes of this type in which copper was detected were the trustiness. Haemocyanin or blue blood which is a cuproprotein, present in lower species, e.g. snails and crabs also functions as oxygen carrier like haemoglobin. Zinc complexes are found to be present in more than seventy enzymes of the classes aldoses, dehydrogenases, peptidases, phosphates etc. Various perplexities such as isolation of elements with very many similar properties, elimination of incorporated excess metals from organisms have been eradicted through the formation of stable metal chelates. The same has also been employed for cleaning of thermal power engineering equipments. Selective metal derivatives of the complexions such as cyclohex-1, 2-ethylenediaminetetraacetic acid (CDTA), diethylenetriaminepentaacetic acid (DTPA), ethylendediaaminetetraacetic acid (EDTA) etc. are very useful for theses purpose. Chelates of these types have also been used in the removal of toxic metals from the body as well as in the removal of radioactive compounds from various contaminated surfaces one interesting example is D-Penicillamine, HIS\textsubscript{c}(CH\textsubscript{3})\textsubscript{2}CH(NH\textsubscript{2})COOH, the chelates which has been used for the treatment of Wilson’s disease (hepamenticular degeneration), a genetic disease involving the excessive build up of copper in the body.

The present investigations deal with the synthetic studies on bivalent metal complexes using cobalt (II),nickel(II) copper (II) and zinc (II) acetates and Schiff bases derived by nucleophilic addition of asy-triazine and S-triazolesto aldehydes.