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**SYNTHESIS OF N,N'-ETHYLENEBIS(ACETYLACETONEIMINATO) AND
DITHIOOXAMIDO TRANSITION METAL COMPLEXES
AND INVESTIGATION OF THEIR POTENTIAL FOR
BINDING ANION, CATION AND SMALL MOLECULES**

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A.M.K.S.P. Adhikari

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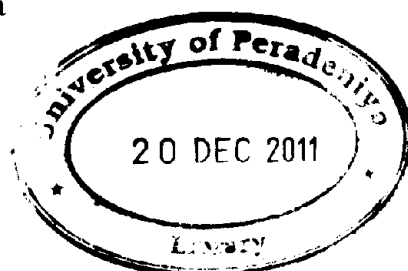
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Macrocyclic ligand complexes play a significant chemical role in many systems. Such complexes are typically very stable and show unusual structural, electronic and electrochemical properties. Recently, a novel dinickel macrocyclic complex synthesized has shown a significant affinity towards trapping halide ions. Extension of such a study to synthesize a new simple metal macrocyclic systems capable of trapping simple hazardous molecules and ions present in the environment was the major concern of this research project. In this regard, a few macrocyclic metal complexes of copper(II), nickel(II) and iron(III) were synthesized by the metal template synthesis method and characterized by using UV-visible, FTIR, NMR, XRD and CV techniques. Their binding ability with anions such as SCN^- , Br^- , Cl^- , I^- and cations such as Ag(I) , Pb(II) , Cd(II) , Zn(II) and Ni(II) were studied.

The nano-structured blackish complex of copper(II) synthesized with dithiooxamide (rubeanic acid) and acetylacetonone (acac) shows significant affinity towards silver(I) ions. Therefore, this complex is suitable for trapping silver ions in water. The X-ray structure of the copper(II) and nickel(II) complexes synthesized with ethylenediamine (en) and acetylacetonone (acac) were determined with the support of Wayne State University, USA. The copper(II) complex with en and acac shows the ability of binding with anions such as SCN^- , Br^- , Cl^- and I^- . Carbon dioxide (CO_2) trapping capability of the complex was studied

using a CO₂ sensor probe and it was observed that the complex is capable of trapping CO₂ up to 50 % at room temperature in methanolic medium.

A similar iron(III) complex (Fe-en-acac-R) synthesized also shows the anion binding capability and similar type of acid-base properties. Although the structures were not determined, a few attempts were made to synthesize two dimeric metal complexes of copper(II) and nickel(II) using dibromo-ortho-xylene for bridging ligand of the two monomers.