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Abstract

There are several ways for preparing Schiff bases. The most common way is the condensation reaction between amines and aldehydes.

The Schiff bases were prepared by the reaction of cyclohexylamine with piperonaldehyde and reaction of 2,4-dichloroaniline with salicylaldehyde with mole ratio 1:1 to prepare ligand [L_A] (Piperonaldehyde cyclohexylimine) and ligand [L_B] (Salicylidene-2,4-dichloroaniline) respectively.

Also the reaction of dithiooxamide with salicylaldehyde and reaction of o-phenylenediamine with salicylaldehyde with mole ratio 1:2 to prepare ligand [L_C] (bis salicylidene-dithiooxamide) and ligand [L_D] (bis salicylidene -o-phenylenediamine) respectively

The prepared ligands were characterized by TLC technique, melting points measurement, F.T.IR and UV-Vis spectroscopy

The [L_A, L_B, L_C and L_D] have been used as ligands to prepare a number of transition metal complexes, which include [Cu (II), Co (II) and Rh (III)] ions.

The preparation of complexes of [Cu(II), Co(II) and Rh(III)] with [L_A] and complexes of [Cu(II), Co(II) and Rh(III)] with [L_B] were done with mole ratio 1:2 (metal : ligand)

While the preparation of complexes of [Cu (II), Co (II) and Rh (III)] with [L_C] and complexes of [Cu(II), Co(II) and Rh(III)] with [L_D] were done in mole ratio 1:1 (metal : ligand)

The metal complexes of the prepared ligands have been obtained in solid state. They were characterized by F.T.IR, UV-Vis spectroscopy, metal analysis spectrophotometer, conductivity and magnetic susceptibility measurements

According to the result of the above measurements, the following formula for new complexes were suggested

1) The structural formula of complexes of Cu(II), Co(II) and Rh(III) ions with [L_A] were as follows:

$[Cu(L_A)_2(ONO_2)(H_2O)].NO_3.2H_2O$

$[Co(L_A)_2(ONO_2)_2(H_2O)_2].2H_2O$

$[Rh(L_A)_2(Cl)_2(H_2O)_2].Cl.3H_2O$

2) The structural formula of complexes of Cu(II), Co(II) and Rh(III) ions with [L_B] were as follows

	$[Cu(L_B)_2(H_2O)_2]$ $[Co(L_B)_2(H_2O)_2].3H_2O$ $[Rh_2(L_B)_4(Cl)_2].4H_2O$ 3) The structural formula of complexes of Cu(II), Co(II) and Rh(III) ions with $[L_C]$ were as follows: $[CuL_C(H_2O)_2].2H_2O$ $[CoL_C(H_2O)_2].6H_2O$ $[RhL_C(H_2O)Cl].4H_2O$ 4) The structural formula of complexes of Cu(II), Co(II) and Rh(III) ions with $[L_D]$ were as follows: $[CuL_D(H_2O)_2]$ $[CoL_D(H_2O)_2].6H_2O$ $[Rh_2(L_D)_2(Cl)_2].3H_2O$ Different bonding and structural behavior were related during the study of coordination chemistry of the different new complexes. The **Racah** and other ligand field parameters which illustrate the bonding nature between metal ion and donor atoms of the ligand were calculated for Co (II) and Rh (III) complexes using (Tanabe-Sugano) diagram.