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Synthesis and characterization of Ni(II) complexes with ester thiosemicarbazone

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ABSTRACT - Complexes of Ni (II) of general composition $[ML_2X_2]$, $[ML_2X]X$ were prepared with thiosemcarbazones (L^1, L^2, L^3 & L^4). These complexes were characterized by elemental analysis, molar conductances measurements, Magnetic moments IR, electronic spectra, and EPR spectral studies. All are the nonelectrolyte in nature therefor these complexes may be formulated $[M(L)_2X_2]$. All the complexes are of high-spin and show octahedral jeometry.

Key words - Acetoacetic ester thiosemicarbazone, Isopropyl ester thiosemicarbazone, 6-methyl pyran 2-one 4 hydroxy 3 dicarboxylic acid ester thiosemicarbazone, Biological activity

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The biological and medicinal properties of these ligands and their derivatives have gained much interest. Thiosemicarbazones and their 3d-metal complexes have been found to exhibit anti-fungal[1], anti-bacterial[2], anti-viral[3], anti-tubercular[4] and anti carcinogenic activities [5]. The anti-fungal activity of these compunds is due to the presence of toxophyrically important N–C=S moiety[6]. Thiosemicarbazides and their Schiff bases also display anti-tumour [7-8] activity. It is expected that thio ligands will also show variability in structure and bonding in its transition metal complexes. It has been reported that thiosemicarbazide and its complexes with 3d-metal ions show *in vitro* and *in vivo* anti-tumour activity[9].

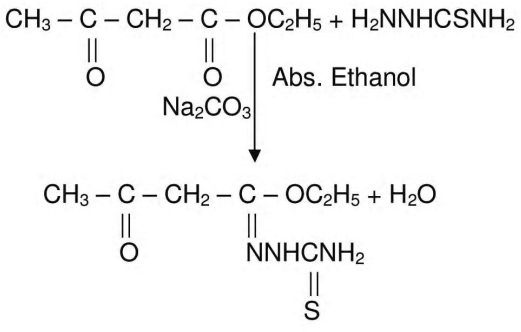
EXPERIMENTAL METHODOLOGY

A.R. Grade chemical and fluka reagents were used in the present study. The solvent were purified before use by processing. Semicarbazide hydrochloride, acetoacetic ester, isopropyl ester, methyl ester of 6-methyl pyran 2-one 4 hydroxy 3 dicarboxylic acid, sodium acetate different metalic salts.

Preparation of ligands (L^1, L^2, L^3 and L^4) :

Preparation of Acetoacetate ester Thiosemicarbazons (L^1):

Hot ethanolic solution of thiosemicarbazide (0.01 mol, 0.91 g) and ethanolic solution of acetoacetic ester (0.01 mol, 1.183 ml) were mixed slowly with constant stirring. This mixture was refluxed at 75^{0}C for 3-4 hr. On cooling cream precipitate was formed. It was filtered, recrystallized with cold ethanol and dried under vacuum over P_4O_{10}. The structure of ligand and scheme for synthesis is shown in scheme 1.



Scheme -1