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Synthesis and characterization of Co(II) complexes with ester semicarbazone

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ABSTRACT - Complexes of cobalt (II) of general composition $[ML_2X_2]$, $[ML_2X]X$ were prepared with semcarbazones (L^1, L^2, L^3 and 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 formulated $[M(L)_2X_2]$. All the complexes are of high-spin and show octahedral geometry.

Key words - Acetoacetic ester semicarbazone, Isopropyl ester semicarbazone, 6-methyl Pyran-2-one-4 hydroxy 3 diacarboxylic acid ester semicarbazone, Biological activity

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The biological and medicinal properties of these ligands and their derivatives have gained much interest. Semicarbazones 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]. Semicarbazides 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 semicarbazide 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 diacarboxylic acid, sodium acetate different metalic salts.

Preparation of ligands:

Preparation of Acetoacetic ester semicarbazone (L^1):

Aqueous solution of semicarbazide hydrochloride (.01 mol, 1.12 g) and acetoacetic ester (0.01 mol. of 1.83 ml) were mixed in the presence of sodium acetate (.01 mol, 1.36 g). This solution was stirred with the help of mechanical stirrer for an hour. On cooling a white product was formed, filtered, washed with cold ethanol and dried under vaccum over P_4O_{10} (mt. 180^{0}C yield 68%).