



Spectro-chemical Studies of Complexes of Pb(II) with Triazole at Different pH(s)

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ABSTRACT

The Pb(II) with 5-mercapto-4-Amino-3-methyl, 1, 2, 4, triazole complexes has been prepared. The Structural assessments of the complexes have been made on the basis of result of IR Studies.

Key words: Pb(II), Triazole, Fungicide, pH, IR.

INTRODUCTION

The triazoles are of great biological¹⁻⁶ significance. It is also powerful fungicide. The present communication reports the results of the spectro-photometric studies of the complexes of Pb(II) with 5-mercapto-4-amino-3-methyl 1, 2, 4 Triazole prepared⁷⁻⁹.

Isolation of the Complexes

A mixture of hot aqueous solution of lead acetate and ligand were taken in the ratio of 1:2. By adding NaOH the pH of the mixture 4, 7 and 11 adjusted. The mixtures were refluxed till complexes were precipitated. The complexes obtained were further treated with ethanolic solution, then ether, then were filtered by suction, washed with ethanol and ether, dried at 100°C in the electric oven for several hours.

The complexes were found insoluble in most of the organic solvents. method using Hg [Co(SCN)₄] as celebrant. IR spectra of the complexes were recorded.

RESULTS AND DISCUSSION

IR. Spectra of the Complexes

A comparison of IR. spectra of ligand and Pb(II) complexes indicates following facts¹⁰⁻¹³.

In all Pb (II) complexes strong bands at 3180 and 3060cm⁻¹ in the spectrum of the ligand are not present in the spectrum of the complexes which shows that there are coordination between N-atom of NH₂ group of the ligand and Pb (II) ion.

The 3120 cm⁻¹ band of the ligand assigned as νNH₂ get shifted to 3080cm⁻¹ in the spectrum of

the complex this further confirm. NH_2 group of the ligand coordinated with Pb (II).

The 2515 cm^{-1} weak band in the spectrum of the ligand is due to $\nu\text{S-H}$ made of vibration this band disappeared in the spectrum of complexes so this form of the ligand in coordinated to Pb(II) ion in the complexes or the hydrogen atom of the SH group has been replaced by Pb(II) ion.

The medium band at 1295 cm^{-1} in the spectrum of the ligand is due to $\nu\text{C=S}$, this band get red shifted to 1255 cm^{-1} in the spectrum of the complex. This further supports coordination of the ligand to its S-atom.

The $\nu\text{C}\cdots\text{S}$ is observed at 984 cm^{-1} in the spectrum of the ligand. This band is red shifted to 965 cm^{-1} in the spectrum of the complex which

Table 1: Analytical and physical data of ligand and complexes

Compounds	Colour	Analytical found/calculated				 M.P.(C)
		N	C	H	S	M	
Ligand (L)5-Mecrepto -4-amino-3-methyl-1-2-4-triazole	Faint	43.07	27.49	4.61	24.61	-	-
[Pb(CH ₃ COO) ₂ L ₂].3H ₂ O	Yellow	42.82	27.69	4.28	24.38		
	White	17.49	18.69	3.67	-	32.39	210 ^o
[Pb(CH ₃ COO) ₂ L ₂].2H ₂ O	White	17.38	18.64	3.75	-	32.41	
		16.80	17.02	2.18	-	40.98	190
[Pb(CH ₃ COO) ₂ L ₂].H ₂ O	White	16.79	17.24	2.10	-	41.6	
		18.56	19.78	3.21	-	34.25	170
		18.46	19.89	3.31	-	34.35	

confirms coordination of the ligand to the Pb (II) ion through sulphur.

In the far IR spectrum of the complexes¹⁴⁻¹⁶ a new band observed at 521 cm^{-1} due to plane mode of vibration of lattice water.

In the IR spectrum of the complexes new bands at $520, 265, 235$ and 215 cm^{-1} assigned as a

$\text{Pb}\cdots\text{N}$, 260 cm^{-1} vs $\text{Pb}\cdots\text{N}$ and 230 & 210 cm^{-1} assigned as $\sqrt{a}\text{ Pb}\cdots\text{S}$.

On the basis of above discussion the octahedral structure of the complexes assigned.

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