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SYNTHESIS OF CO-ORDINATION COMPOUNDS OF PB^{II} WITH BIS (2-ACETYL PYRROLE CYCLOHEXANLDIAMINE

SHARAT SRIVASTAVA
DEPT. OF CHEMISTRY, D. V. COLLEGE, ORAI

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ABSTRACT

Some co-ordination compounds of Pb^{II} have been prepared as $MX_2.L$ [L= bis (2-acetyl pyrrole cyclohexanldiamine)], (x= Cl/Br/I), M= Pb^{II}. The co-ordination compounds have been characterised on the basis of elemental analysis, conductivity, IR and x-ray photoelectron spectra.

The structure of synthesized co-ordination compounds is Trigonal bipyramidal.

Keywords : Co-ordination Compounds, IR, X-Ray photoelectron spectra.

Introduction :

A literature survey reveals that many Pb(II) compounds have been reported but Pb(Ii) compounds with Schiff-base Macrocyclic schiff-base ligands are less known.[1,2]

Bidentate Schiff-base ligand prepared from aromatic aldehyde or ketone (2-acetyl pyrrole) with cyclohexanediamine have been synthesized.

The N atom have one lone paln of electron hence it act as good donor atom for metal.

This paper deals with synthesis of Pb(II) co-ordination compounds with bis 2-acetyl pyrrole cyclohexanediamine as ligand with PbX_2.

Result :

The newly synthesized Pb^{II} co-ordination compounds were light yellow solid and stable at room temp.

The elemental analysis were with in ± 0.5% from C, H, N, X, Pb.

The molar conductance data in DMF (20-30 Ohm^{-1} cm^2 mol^{-1}) of these compounds indicates that all these are non-ionic.[3]

All the prepared molecular adducts the $\nu_{C=N}$ modes shift to higher wave number from ligand $\nu_{C=N}$ 1610 – 1620 cm^{-1} to molecular adduct $\nu_{C=N}$ 1635-1670 cm^{-1}, suggesting the co-ordination from N atom of the ligands.[4,5]

The Pb2p and N1s binding energies (eV) data of PbX_2 and $PbX_2.L$ (where X= Cl, Br, I, L= bis (2-acetyl pyrrole cyclohexanldiamine) are listed in table.

Table : Pb2p, N1s binding energies (eV) in PbX_2 and $PbX_2.L$ co-ordination compounds.

S.No.	Ligands, Salts, and Complexes	Pb2p	N1s Ligand
1	Ligand L		400.8
2	$PbCl_2$	764.8	
3	$PbCl_2.L$	763.6	403.6
4	$PbBr_2$	764.6	
5	$PbBr_2.L$	763.4	403.6
6	PbI_2	764.4	
7	$PbI_2.L$	763.2	403.6

It is observed that the binding energies of Pb2p in starting material PbX_2 was higher than in the synthesized co-ordination compound [$PbX_2.L$]. These observation suggest that the electron density on Pb(II) metal ion increased due to co-ordination of ligand with Pb(II) metal ion.[6]

The value of N1s binding energy for N1s in co-ordination complexes is increased. This also concluded co-ordination of N atom with metal ion of PbX_2.[7]