MAGNETO SPECTRA STUDIES OF LANTHANIDE NITRATE COMPLEXES OF 2-ETHOXY CARBONYL AMINO 6-METHYL BENZOTHIAZOLE N-OXIDE

Dr. S.K. Gupta, Dr. V.K. Jain*, Brajesh Sharma* and A.K. Sharma
Department of Chemistry P.G.V. College Jiwaji ganj, Lashkar, Gwalior 474001. *Department of Chemistry, Ambah P.G. College, Ambah, Morena 476111(India).

The present paper covers the preparation on characterization 2-ethoxy carbonyl amino 6-methyl benzothiazole N-oxide (ECAMBTNO) complexes with Lanthanide chloride

Introduction:-The complex behavior of aromatic bases with lanthanide ions studies extensively by many researchers (1-5). In the present study, we report the magneto spectra studies of lanthanide nitrate complexes of 2-ethoxy carbonyl amino 6-methyl benzothiazole N-oxide.

Experimental and discussion

The metal salt and the ligand in Methanol were mixed in molar ratio 1:6 and heated on water bath for 30 min. and kept overnight. The fine crystals so obtained were washed with di-ethyl ether and dried over P_2O_5.

On the basis of analytical data (table 1). The general formula $LnCl_3(ECAMBTNO)_6$. Whre Ln = La,Ce,Pr,Sm,Gd,Dy and Yb has been assigned.

The low value of molar conductivity (table 1), measured at room temperature in freezing nitrobenzene, suggest that all the three chloride ions are within the coordination sphere which is further supported by data (Table 2). By molecular weight data (table 1) magnetic moment values shows little deviation from Van Vleek values, indicating non participation of 4f electrons in band formation . as expected lanthanide salts are paramagnetic (6).

Table1 Lanthanide Chloride 2-ethoxycarbonylamino 6-methylbenzethiazole N-oxide Elemental

Complexes	% Found (Calculated)					Ω mohm^{-1}, cm^2 mole^{-1}	Electromagnetic	Molecular Weight
	M			N	Anion			Found (Calculated)
$LaCl_3(ECAMBTNO)_6$	8.03 7.90	45.16 45.06	4.18 4.09	9.67 9.56	6.14 6.05	3.8	Non electrolyte	1751 1757.5
$CeCl_3(ECAMBTNO)_6$	8.01 7.96	45.16 45.04	4.17 4.09	9.65 9.55	6.16 6.05	4.6	Non electrolyte	1751 1758.5
$PrCl_3(ECAMBTNO)_6$	8.12 8.01	45.11 45.01	4.17 4.09	9.67 9.54	6.14 6.05	3.5	Non electrolyte	1750 1759.5
$SmCl_3(ECAMBTNO)_6$	8.61 8.53	44.87 44.76	4.16 4.07	9.59 9.49	6.11 6.02	3.9	Non electrolyte	1761 1769.5
$GdCl_3(ECAMBTNO)_6$	8.98 8.89	44.68 44.58	4.14 4.05	9.58 9.46	6.12 5.99	4.4	Non electrolyte	1765 1776.5
$DyCl_3(ECAMBTNO)_6$	9.21 9.12	44.55 44.46	4.15 4.04	9.57 9.43	6.18 5.98	4.2	Non electrolyte	1769 1781
$YbCl_3(ECAMBTNO)_6$	9.74 9.66	44.32 44.21	4.13 4.02	9.49 9.38	6.12 5.94	3.6	Non electrolyte	1788 1791.5

Table 2 IR absorption frequencies (cm^{-1}) of Lanthanide chloride 2-ethoxycarbonylamino 6-methylbenzethiazole N-oxide

Complex	ῡNH	ῡ(C=O)	ῡ(N-O)	ῡNO	ῡ(C-S)	ῡM-O
2-ethoxycarbonylamino 6-methylbenzethiazole N-oxide	3230, 3150	1710	1240	840	760	-
$LaCl_3(ECAMBTNO)_6$	3220	1705	1205	835	755	355
$CeCl_3(ECAMBTNO)_6$	3225 3140	1715	1190	842	768	365
$PrCl_3(ECAMBTNO)_6$	3210	1720	1195	832	752	365
$SmCl_3(ECAMBTNO)_6$	3225	1718	1208	838	758	360

	3145					
$GdCl_3(ECAMBTNO)_6$	3272	1708	1205	835	755	370
$DyCl_3(ECAMBTNO)_6$	3215	1722	1203	832	760	345
$YbCl_3(ECAMBTNO)_6$	3225	1715	1205	820	750	350

In the IR spectra of ECAMBTNO the N-O stretching band appears at 1240 cm^{-1} (table 2) shows a significant negative shift on complexation indicating coordination of oxygen atom of ligand to the metal ion (7). Supported by small shifting of N-O bending frequencies of ligands which appears at 840 cm^{-1} .

The N-H stretching and carbonyl stretching frequencies of urethane part of the ligands are positive to coordination which appears at 3230 cm^{-1} and 1710 cm^{-1}

respectively (8). The overall IR spectra suggests that ECAMBTNO acts as monodentate ligand. In far IR spectra of complexes a new band appears at 355-370 cm^{-1} which is tentatively assigned to $\bar{\upsilon}$ (M-O). the spectra of free ligands is relatively transparent in this region. A tentative coordination number 9 has been assigned to the complexes.

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