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SYNTHESIS AND CHARACTERIZATION OF TI (III), V (III),VO (IV), MOO (V), FE (II) AND FE (III) COMPLEXES OF BENZIL- 2,4-DINITROPHENYL HYDRAZONE P-BROMO ANILINE

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Abstract

The complexes of Benzil-2, 4-dinitrophenyl hydrazone-p- bromo aniline with Ti(III),V(III), VO(IV), MoO (V), Fe(II), Fe(III) have synthesized and characterized by elemental analysis, magnetic measurement data, molar conductance, TGA,UV-visible and IR spectra data. The complexes of Ti (III), V (III), Fe (II) and Fe (III) have octahedral geometry while VO (IV) and MoO(V) have distorted octahedral geometry due to the presence of M=O moiety.

Keywords: Schiff base, Synthesis, Molar Conductance, Spectroscopy.

INTRODUCTION

Benzil-2, 4-dinitrophenyl hydrazone chelating agent has been observed to posses several biological properties (1,2).The acetyl carbonyls of DHA reacts with different amines to give the corresponding Schiff base. Literature serve reveals that the complexing behavior of Schiff base derived from benzil-2, 4-dinitro phenyl hydrazone p-bromo aniline has not been investigated. In view of this work little complexes were studies and results are reported here.

Benzyl-2, 4-dinitrophenyl hydrazone was a F.R and other chemicals were used of A.R grade.

Preparation of Metal Complexes:

The metal chelates were synthesized by refluxing the ethanolic solution of the respective metal salts (0.01 mol.) while Fe(II) were synthesized by Aq. Ethanolic ammonium sulphate solution. The precipitate metal chelates were filtered, washed, repeatedly with ethanol followed by petroleum ether (60-70) and dried in vacuo (3, 4).

The I.R spectra of the ligand and metal chelates were recorded in KBR phase in the range of 4000-400 cm-1 on a Perkin Elmer I.R spectrophotometer, conductivity measurement were carried at using a digital direct reading conductivity meter.

The electronic spectra of metal chelates were recorded on a DMR-21 UV- visible spectrophotometer in range on a 13000-300 nm. In nujol at room temperature.

Themogravimetric analysis was carried out on a mutually operated thermobalance with a heating rate of 50 % min. Magnetic susceptibility of the complex were measured at room temperature on a Gouy- balance using CuSO4.5 H2O as calllibrant.

All the complexes are coloured decomposed at high temperature and insoluble in common organic solvents.

The analysis data of the complex indicate 1:2 (M: L) stoichiometry.

RESULT AND DISCUSSION

The analytical data for the complexes of Benzil-2, 4-dinitrophenylhydrazone p-bromo aniline

Complexes(Molecular Formula)	**Calculated (Found) % Age**				**Magnetic moment**
	Metal	C	H	N	
$[TiCl_3(C_{26}H_{14}N_5O_4B_{r2}.H_2O)$	3.75% (3.05)	49.15% (46.0)	2.53% (2.30)	11.02% (10.45)	1.72

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$[VCl_3(C_{26}H_{14}N_5O_4Br)_2.2H_2O)$	3.99% (3.75)	49.02% (46.00)	2.53% (2.41)	10.99% (9.34)	2.83
$[VOSO_4(C_{26}H_{14}N_5O_4Br)_2.H_2O$	4.03% (3.80)	49.50% (46.20)	2.39% (2.28)	11.10% (10.90)	_
$[MoOCl_3(C_{26}H_{14}N_5O_4Br)_2.H_2O]$	7.28% (7.00)	47.41% (45.10)	2.39% (1.99)	10.63% (10.11)	1.74
$[FeCl_2(C_{26}H_{14}N_5O_4Br)_2.2H_2O]$	4.49% (4.25)	50.23 (49.80)	2.49% (2.35)	11.26 (10.94)	5.38
$[FeCl_3(C_{26}H_{14}N_5O_4Br)_2.2H_2O]$	4.36% (4.10)	48.83% (45.80)	2.52% (2.40)	10.95% (10.45)	5.84

ELECTRONIC SPECTRA:

Electronic spectra of Ti (III)

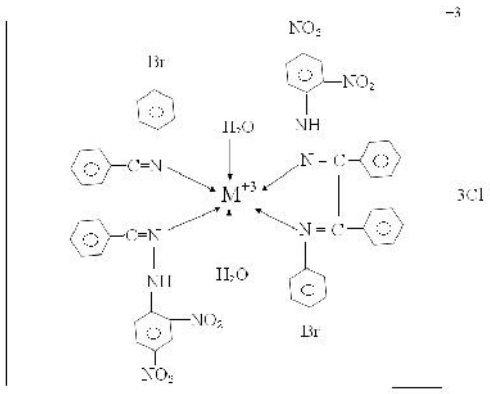
The electronic spectra of the complex (2) showed only one band at 19885 cm_1 which may be derived from d-d transition 2T2g→2Eg is indication of an octahedral geometry for the complex (5).

Electronic spectra of V (III)

The electronic spectra of complex exhibited two bands at 16700 cm-1 and 21800 cm-1 which may be due to 3T1g → 3T2g (P) and 2T1→ 3T2g transition respectively. These are the characteristics of octahedral geometry (6).

Electronic spectra of Fe (III)

The electronic spectra of the complex was recorded three bands at 28000 cm^{-1}, 33900 cm^{-1} and 38850 cm^{-1} corresponding to the transition $6A_1g \rightarrow {}^4T_1g$ (P), ${}^6A_1g \rightarrow {}^4T_2g$ (F) and ${}^6A_1g \rightarrow {}^4T_2g$ (F) respectively(7).



M= Ti (III), V (III), Fe (III).

Electronic spectra of VO (IV)

The electronic spectrum of complex shows four bands at 17790 cm-1, 22885 cm-1, 38655 cm-1.The first two bands corresponds to charge transfer bands. All these are typical for octahedral Oxovanadium complex (8).

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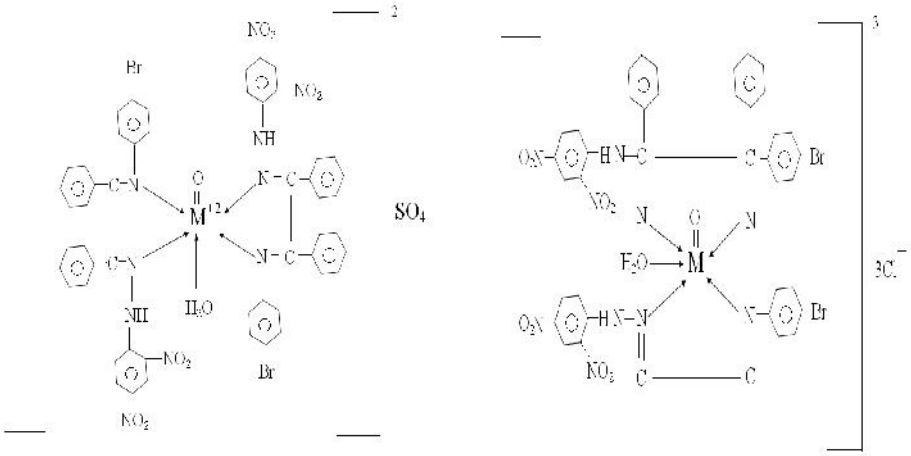
Electronic spectra of MoO (V)

The electronic spectra of complex exhibited three distinct bands. The peak at long wavelength region (12900 cm-1) transition 2B2 → 2A1g (dxy, dxz2). All these transition suggested octahedral geometry with a strong tetrahedral distortion resulting from Mo-O bond (9).



M = Vo **M= Mo**

Electronic spectra of Fe (II)

The electronic spectra of complex shows three bands at 28800 cm-1, 33900 cm-1 and 38850 cm-1 corresponding to the transition 6A1g → 4T1g (P),6A1g→ 4 T2g (F) and 6 A1g→4T2g (F) respectively(7).

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