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SYNTHESIS AND CHARACTERIZATION OF NEW SCHIFF BASES

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A series of new five Schiff bases are derived by the condensation of Atomoxetine as a common amine by condensing with different carbonyls like aldehydes and ketones (Ortho hydroxyl Acetophenone, 2, 4di hydroxyl Acetophenone, 3,4,5tri methoxy Benzaldehyde, Ortho-Vannilline & Salicylaldehyde). The characterization has been done by UV-VISIBLE, FT-IR and Elemental Analysis. The characteristic peaks of >C=N is obtained in between 1630 cm^{-1} to 1627 cm^{-1} for different carbonyls, this data suggested the formation of Schiff Bases. The absorption values in UV spectrum obtained between 233cm^{-1} to 277cm^{-1} shows the formation of various ligands with Atomoxetine and different carbonyls. These were further used for the synthesis of Schiff Base Metal Complexes, test for biologicalactivity activity and DNA studies.

KEYWORDS : Atomoxetine, FT-IR Spectroscopy, UV-VISIBLE spectroscopy.

INTRODUCTION

Schiff bases are formed by the condensation of primary Amine with different Aldehydes and ketones. These were first discovered by Hugo Schiff in 1864 [1]. These are also called as Imines, Azomethines & Anils. Schiff bases exhibit a common property to participate in the formation of covalent bond with metals, because of this easy participation Schiff bases can act as intermediates in the formation of metal complexes. Schiff bases comes under the category of organic compounds containing the characteristic functional group >C=N. Schiff bases or Anils show biological activities like anti bacterial[2], tuberculostical [3, 4], growth regulating agents [5], antifungal [6–8], antiviral [9, 10], anti-inflammatory [11], antitumor [12], herbicidal [13] anti cancer, anti diabetic activities [14] and also have important in technical fields like automobile [15], Photography[16], textile and detergents [17], electro plating[18], artificial tannings [19] and printing technology [20].

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Schiff bases with metal complexes possess high biological activity than free Imines, not only that they play an important role in our daily life and act as intermediates in the synthesis of natural products etc. in this point of we report five Schiff bases and characterized by elemental analysis, UV-VISIBLE & IR. In this paper we prepared bases were new to literature.

EXPERIMENTAL SESSION

All chemicals used were of Anala A Grde, all used without purification

Materials:

Atomoxetine (AT), 2, 4 di Hydroxy Aceto phenone (2, 4 DHAP), Ortho Vanilline (OV), Salicylaldehyde (SA), 3, 4, 5 tri Methoxy Banzaldehyde (3, 4, 5 TMB), Con HCl & Methanol as a solvent.

Synthesis of Ligands :

Schiff Bases are the condensed products of Amines and different carbonyls like Aldehydes and ketones. In their synthesis aromatic aldehydes and ketones plays an important role because of the conjugation.

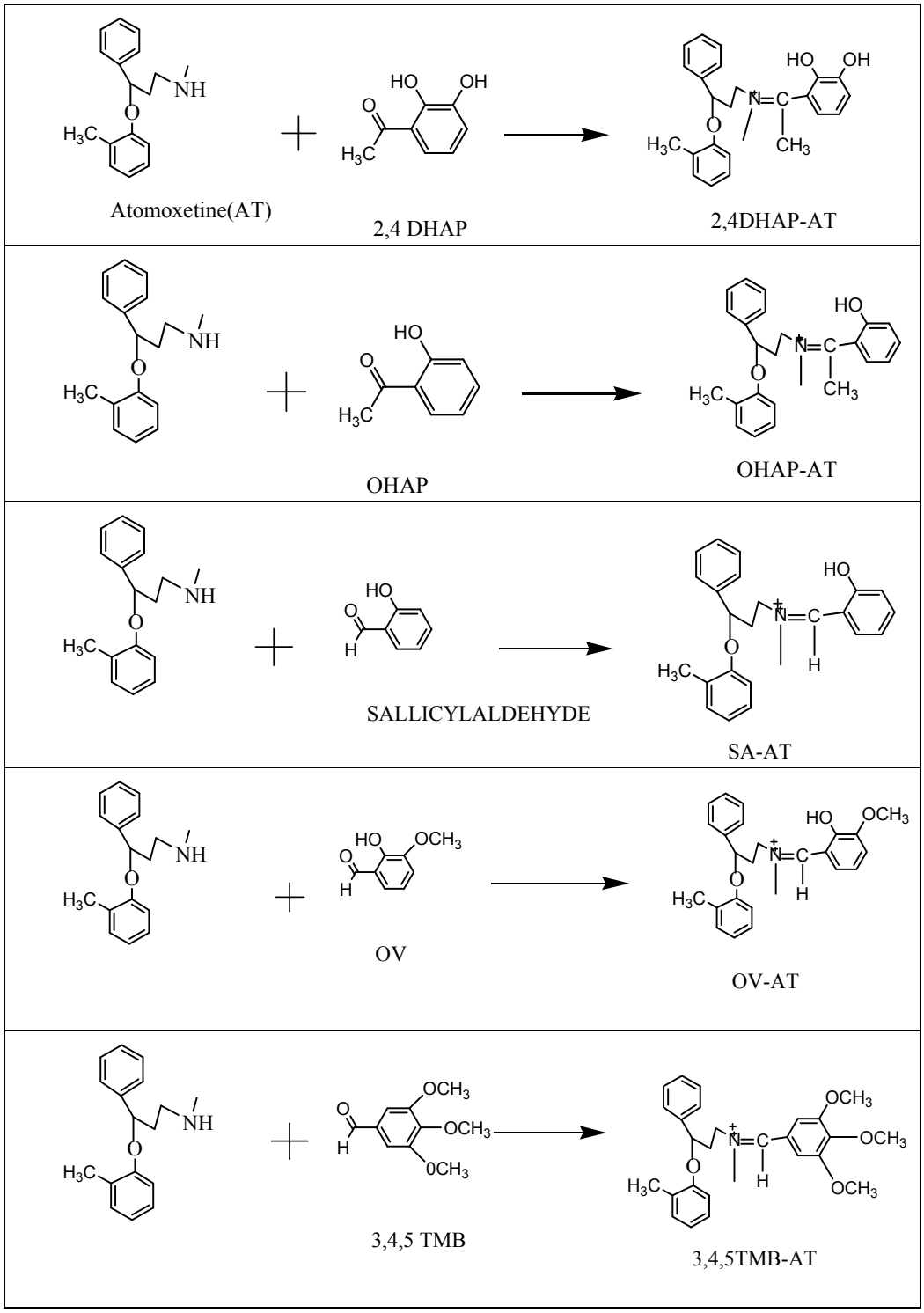
Equi molar concentration of Atomoxtine with different aldehydes and ketones were mixed individually in 20 ml of Metanol and refluxed on water bath for 2-hours, during the reaction few drops of con. HCl was added to get more yield. On cooling, different color of ligands were obtained depends on the nature of the compound & recrystallisation was performed with methanol. The Molecular Weight, color & molecular formula data were presented in the table 1. The preparation of Schiff bases were presented in table 2.

Table 1

S. No.	Name of the ligand	Color	M.W	Molecular Formula							
				% of"C"		% of "H"		% of "N"		% of "O"	
1	OH-AT	Light pink	389.53	80.17	**80.15**	8.02	**8.00**	3.60	**3.59**	8.21	**8.19**
2	2,4DHAP-AT	Dark brown	405.53	77.01	**76.99**	7.71	**7.69**	3.45	**3.43**	11.84	**11.82**
3	3,4,5TMB-AT	Yellow	401.58	83.78	**83.76**	8.78	**8.76**	3.49	**3.47**	3.98	**3.96**
4	SA-AT	Black	375.5	79.96	**79.94**	7.78	**7.76**	3.73	**3.71**	8.52	**8.50**
5	OV-AT	Dark brown	405.23	77.01	**76.99**	7.71	**7.96**	3.45	**3.43**	11.82	**11.80**

Bold values are calculated values.

Table II. Preparation of Schiff Bases


Atomoxetine(AT)
2,4 DHAP
2,4DHAP-AT
OHAP
OHAP-AT
SALLICYLALDEHYDE
SA-AT
OV
OV-AT
3,4,5 TMB
3,4,5TMB-AT

RESULTS AND DISCUSSION

IR SPECTRAL DATA:

An IR spectrum was performed by using KBr pellets in JNTUA College of Engineering & Technology, Pulivedula-Ap. IR Spectral data of the lignands of different carbonyls with Atomoxetine shows the characteristic absorption peaks in between 1627 cm^{-1} to 1630 cm^{-1} indicates the formation of azo metine (>C=N) group, between 3180 cm^{-1} to 3363 cm^{-1} indicates the formation of Phenolic OH group, between 2727 cm^{-1} to 2927 cm^{-1} indicates the formation of C-H stretching vibrations, between 1607 cm^{-1} to 1450 cm^{-1} indicates Aromatic C=C stretching vibrations, between 2727 cm^{-1} to 2927 cm^{-1} indicates the formation of C-H stretching vibrations, between 2727 cm^{-1} to 2927 cm^{-1} indicates the formation of C-H stretching vibrations between 1221 cm^{-1} to 1214 cm^{-1} indicates the formation of C-O stretching vibrations & OH deformations. To verify the chemical reaction between different carbonyls & amine, it was also checked by standard tests.IR data is represented in the table III and graph is represented in Fig. I.

Table III. IR Spectral Data of the Ligand

S. No.	Name of the Ligand	C=N(cm^{-1})
1	2, 4 DHAP-AT	1630
2	OHAP-AT	1626
3	OV-AT	1627
4	SA-AT	1627
5	3, 4, 5TMB-AT	1626

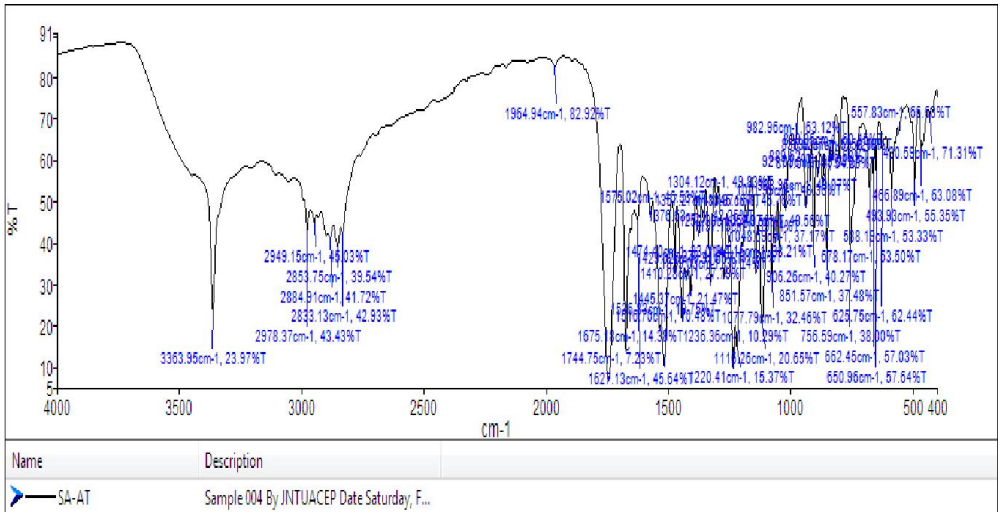


Fig. I. IR GRAPH OF SA-AT LIGAND

UV-SPECTRAL DATA:

UV Spectral data performed using Schimazdu UV-1800 spectophotometer at Santhiram College of Pharmacy, Nandyal. UV spectrometer used to find out the saturation and Co-ordination between the metal complexes. In this point of view we characterized UV spectroscopy to understand the Co-ordination between metals & their complexes. The

characteristic values found between 230nm-277nm, these values represented in the table IV and one of the graph is represented in the fig. II .

Table IV. Characteristic wave length values

S. No	Name of the ligand	Absorption(nm)
1	2, 4 DHAP-AT	230
2	3, 4, 5 TMB-AT	283
3	OHAP-AT	256
4	OV-AT	251
5	SA-AT	277

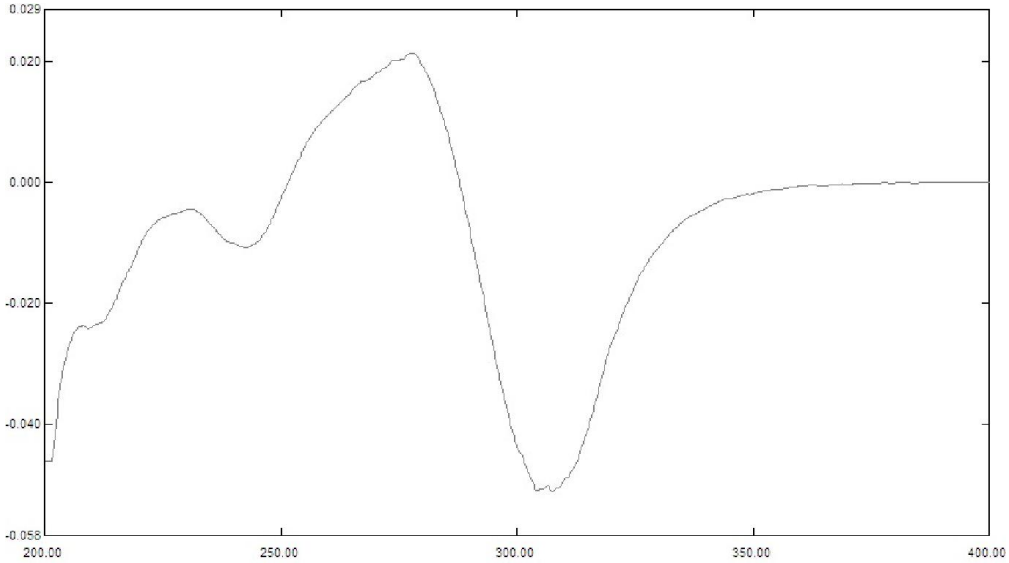


Fig II. UV-SPECTRA OF SA-AT LIGAND

REFERENCES

1. Schif, *Ann. Chem*., **131**, 118 (1864).
2. Ali, Mohammad Akbar, Hanoon, M. and Nazimuddine Mohammad, T.H., *Transition Met. Chem., London*, **17**, 133 (1992).
3. Muslin, L., Roth, W. and Erlenmeyer, H., *Helv. Chim, Acta*., **36**, 886 (1953).
4. Tresilova, L.F. and Postovskn, I., *Ya Dokkady Akad Nauk., USSR*, **114**, 116 (1957).
5. Robert, Nakquier, Miches, Crozet, Patrick Venella and Maldonado, Jose, *Tetahydron Lett*., **26**, 5523 (1985).
6. Bagihalli, G. B., Avaji, P. G., Patil, S. A. and Badami, P. S., "Synthesis, spectral characterization, in vitro antibacterial, antifungaland cytotoxic activities of Co(II), Ni(II) and Cu(II) complexes with 1, 2, 4-triazole Schiff bases," *European Journal of Medicinal Chemistry*, Vol. **43**, No. **12**, pp. 2639–2649 (2008).
7. Raman, N., Sakthivel, A. and Rajasekaran, K., "Synthesis and Spectral Characterization of Antifungal Sensitive Schiff BaseTran- sition Metal Complexes," *Mycobiology*, Vol. **35**, No. **3**, pp. 150–153 (2007).
8. Creaven, B. S., Czegl´edi, E., Devereux, M. *et al*., "Biologicalactivity and coordination modes of copper(II) complexes of Schiff base-derived coumarin ligands," *Dalton Transactions*, Vol. **39**, pp. 10854–10865 (2010).

9. Jarrahpour, A., Khalili, D., De Clercq, E., Salmi, C. and Brunel, J.M., "Synthesis, antibacterial, antifungal and antiviral activity evaluation of some new bis-Schiff bases of isatin and their derivatives," *Molecules*, Vol. **12**, pp. 1720–1730 (2007).
10. Bharti, S.K., Patel, S.K., Nath, G., Tilak, R. and Singh, S. K., "Synthesis, characterization, DNA cleavage and in vitro antimicrobial activities of copper (II) complexes of Schiff bases containing a 2, 4-disubstituted thiazole," *Transition Metal Chemistry* (2010).
11. Manjunatha, M., Naik, V. H., Kulkarni, A. D. and Patil, S. A., "DNA cleavage, antimicrobial, anti inflammatory anthelminticactivities, and spectroscopic studies of Co(II),Ni(II), and Cu(II) complexes of biologically potential coumarin Schiff bases," *Journal of Coordination Chemistry*, Vol. **64**, No. **24**, pp. 4264–4275 (2011).
12. Amer, S., El-Wakiel, N. and El-Ghamry, H., "Synthesis, spectral, antitumor and antimicrobial studies on Cu(II) complexes ofpurine and triazole Schiff base derivatives," *Journal of Molecular Structure*, Vol. **1049**, pp. 326–335 (2013).
13. Kumar, S., Dhar, D.N., Saxena, P.N., *J. Sci. Ind. Res.*, **68**, 181–187 (2009).
14. Osowole, A.A., Kempe, R., Schobert, R., *Int. Res. J. Pure Appl. Chem*., **2 (2)**, 105–129 (2012).
15. Shinya, Omi, Yasutoshi, Serzuki, Hiroshi, Uco and Hara, Kuniko, *Jpn. Tokkyo Kokai Koho. J.P.*, **6**, 107-383 (1986).
16. Shin, Kobayashi, Tsuyoshi, Fenuse, Micro, Ysussa, Stosh, Iwaki, Naka and Askashi, Tomda Yasuko, *Eru. Pat. Appl. Ep. JP Appl*., **78**, 736-890 (1996).
17. Chert, Pan, Eugene, Joseph (Procter and Gamble Co.), *Brit. Uk Pat. Appl. GB, US Appl*., **15**, 2, 281-076 (1995).
18. Adalbert, Philips, Braig and Emyr, *Ger. Offen. DE*, **4**, 141 (1992).
19. Michle, Philippe, Remy, Tuloup, Armelle, Servet, De, Domiel, Sera and Fodopie, RRE (SA), *Eur. Pat. EP*, **20** (CI A61 K7 142), 709-801 (1994).
20. Sugsjuko, Sentoemi, Takaide Fermi, *Jpn. Kokai, Tokkyo JP*, **10**, **05**, 125, 306 (1993).

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