

SYNTHESIS AND CHARACTERISATION OF NEW SCHIFF BASES

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Five new Schiff bases synthesized from 4-Morpholinoaniline as a common amine and different type of carbonyl compounds (4-hydroxy benzophenone, 2, 4-di hydroxy benzaldehyde, Vanillin, isovanillin, O-Vanillin). Their characterization has been done by elemental analysis and IR Studies. The stretching vibrations of the characteristics peak $>C=N$ of Schiff base was observed at 1600 to 1650 Cm^{-1} for new different synthesized compounds.

KEYWORDS : 4-Morpholino aniline, 4-hydroxy benzophenone, 2, 4-di hydroxy benzaldehyde, Vanillin, isovanillin, O-Vanillin, Sodium hydroxide, Methanol.

INTRODUCTION

Many Organic compounds used in medicine do not have a purely organic mode of action, some are activated or bio transformed by metal ions metabolism, so Inorganic elements play essential role in biological and biological medical process. Schiff bases are considered as a very important class of organic compound because of their ability to form complex with transition metal ions [1, 2]. Schiff base are the compound containing azomethine group ($>C=N-$). They are the condensation products of carbonyl compound (aldehyd or ketone) with primary amines and where first reported by Hugo Schiff in 1864 [3]. The complexes of transition metal ions with Schiff base have been the subject of intensive research. Because they not only have interesting spectral and magnetic properties but also posses a diverse spectrum of biological activity.

Schiff base complexes are used as drugs. The Azomethines were used as anticancer [4, 5], tuberculostically [6, 7], anti-inflammatory [8], antiviral [9], anticatract [10], fungicidal [11], pesticidal [12], bactericideal [13], insecticidal [14], herbicidal [15], and growth regulating agent [16], and also found a place in the technological fields like automobile [17], electroplating [18], photography [19], polymer technology [20], hair spray, cosmetic and perfumes [21], paints and pigments [22], textile and detergents [23], preservatives [24], artificial tannings [25], printing technology [26], and environmental science [27]. Different schiff bases derived from 4-Morpholinoaniline as a commen amine with varies aldehydes and ketones have been reported by number of authors [4-6]. In the present study, we report the syntheses and characterization of five Schiff bases which are new to the literature.

Schiff bases or azomethines come under important class of organic compounds containing characteristic group like $>C=N$. As they contain basic site namely $>C=N$, they can

exhibit spectacular applications in many important fields of interest. In this Article, we describe the synthesis of four Schiff bases and characterization and biological activity of Schiff bases.

Table 1. Analytical and Spectral Data of the Ligands

S. No.	Compound	Molecular formula	Colour	M.P °C	Elemental analysis						Yield %	IR band cm^{-1}
					Carbon %		Hydrogen %		Nitrogen %			
					Found	Calc.	Found	Calc.	Found	Calc.		
1	PHBPMA	$\text{C}_{23}\text{H}_{22}\text{N}_2\text{O}_2$	Brown	134-136	74.2	74.4	5.91	5.93	8.60	8.62	85	1631
2	DHBPMA	$\text{C}_{23}\text{H}_{22}\text{N}_2\text{O}_3$	Light green	149-151	73.7	73.8	5.87	5.88	7.47	7.48	86	1627
3	VMA	$\text{C}_{18}\text{H}_{20}\text{N}_2\text{O}_3$	Brown	175-178	69.14	69.2	6.40	6.41	8.96	8.97	90	1600
4	IVMA	$\text{C}_{18}\text{H}_{20}\text{N}_2\text{O}_3$	Green	203-205	69.14	69.2	6.40	6.41	8.96	8.97	92	1620
5	OVMA	$\text{C}_{18}\text{H}_{20}\text{N}_2\text{O}_3$	Yellow-orange	158-160	69.14	69.2	6.40	6.41	8.96	8.97	91	1635

MATERIALS

4-Hydroxy benzophenone, 2, 4-Dihydroxy benzophenone, Vaniline, O-Vaniline, Iovaniline, 4-morpholino aniline purchased from Sigma-Aldrich. Dimethyl ether and methanol are purchased from Merck

RESULTS AND DISCUSSION

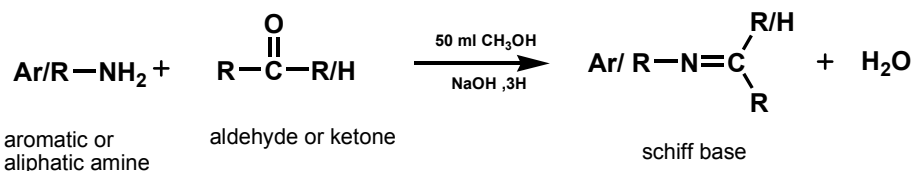
Schiff bases synthesized in the present studies are new in the sense that no reference has been cited in the literature for their existence. The characterization of Azomethines have been carried out by chemical reactions like elemental analysis and infrared studies. In order to verify whether chemical reaction has taken place between various aldehydes and 4-morpholinoaniline individual tests for functional groups namely, carbonyl and amine group have been performed by standard tests [20].

Infrared spectra of the azomethines obtained from the reaction of 4-Morpholinoaniline and different carbonyl compounds showed peaks ranging from $1600\text{-}1650\text{ cm}^{-1}$ indicating the existence of $>\text{C}=\text{N}$ group in all compounds. Peaks were also obtained in the region of $3012\text{-}3070\text{ cm}^{-1}$ (broad, OH-stretching) $1600, 1604, 1558, 1500, 1450\text{ cm}^{-1}$ (aromatic $>\text{C}=\text{C}<$ vibrations) and $1234\text{-}1203\text{ cm}^{-1}$ C–O stretching coupled phenolic OH deformation). The above IR data clearly suggested that the chemical reaction between the amine varies carbonyl compounds has taken place resulting in the formation of respective Schiff base compounds. The other groups in the compounds remain unaffected during conversion into azomethines. The elemental analysis and IR spectra are tabulated in the Table-1.

SYNTHESIS OF AZOMETHINES

Schiff bases are the condensation product of primary amine and carbonyl compound. Aromatic aldehydes are especially with an conjugation system, Form a stable Schiff bases, where as aliphatic aldehydes are unstable and readily polymerize [28]. Schiff base ligand with aldehydes are formed more readily than the ketones. Schiff bases are very flexible, different

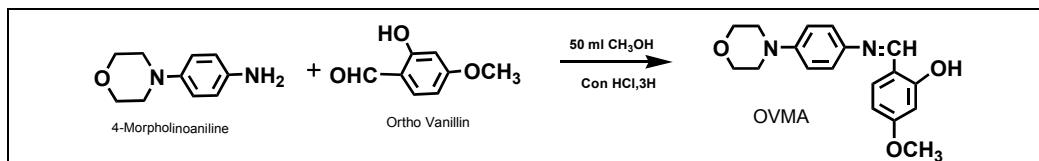
structure and easily form complexes with transition metal ions. The formation of a Schiff base reaction was reversed and generally takes place under acid or base catalysis or up on heating.



In my work Schiff base prepared, Equimolar concentrations of 4-Morpholinoaniline and various carbonyl compounds were mixed individually in 50 ml of methanol and refluxed on a water bath with constant stirring for about 3 hours. On cooling, brown or yellow or green crystalline solid was separated out depending upon the nature of the compound. During the preparation of azomethine small pinch of sodium hydroxide or hydrochloric acid was added to get more yields. Refluxed mixture were washed with ether and dried. Recrystallization was performed in methanol. The yield, colour, melting point and molecular formula data of the compound were presented in the Table-1. The preparation of schiff base equations are posted in the Table-2.

Table 2. Preparation of Schiff base equations:

1.	<p style="text-align: center;">4-Morpholino aniline + 4-Hydroxy benzophenone → PHBPMA + H₂O</p>
2.	<p style="text-align: center;">4-Morpholinoaniline + 2,4-Di hydroxy benzophenone → DHBPMA + H₂O</p>
3.	<p style="text-align: center;">4-Morpholinoaniline + Vanillin → VMA + H₂O</p>
4.	<p style="text-align: center;">4-Morpholinoaniline + IsoVanillin → IVMA + H₂O</p>
5.	



Analysis of IR:

The IR each ligand conforms the formation of imines bond and the absences of the carbonyl bond. The actual stretching vibration of imines group in the range $1643\text{-}1530 \text{ cm}^{-1}$. All the newly synthesized ligands imines range is between $1600 \text{ to } 1650 \text{ cm}^{-1}$. The synthsed schiff bases are very new and further the ligands are used in the structural eluscation of various tranciation metal complexes.

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