Synthesis, Characterized and Biological Evaluation of Some Novel Schiff Bases

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Abstract

In this study we have Synthesized, Characterized the Biological Evaluation of some Novel Schiff Bases. The present work deals with the synthesis of Schiff bases and metal complexes. 4, 4'-dimethoxybenzoin and free amine group were taken. The all 10 Schiff base compounds were synthesized, characterized and evaluated using procedure described by all literature survey. The Schiff bases and metal salt (cobalt, ferric chloride and bismuth) were taken in 2:1 ratio which was dissolved in according the solubility then continuous stirring and colour was observed then solid was separated and washed. After completion of reaction, the synthesized products were dried and Recrystallized by using suitable solvent/mixture. Thus, approach selected for the study have paved the way for generating useful Schiff base analogues in future studies as antimicrobial agent.

Keywords: ***Novel Schiff bases[1], Metal Complex[2], ligands[3], Recrystallization[4], 4, 4' – dimethoxybenzoin[5]***

1. Introduction

Schiff bases are the broadly utilized organic synthetic compounds. They are used as catalysts, dyes, pigments and organic synthesis, and as polymer stabiliser agent [Dhar, D. N, *and et.al*. (1982)]1. Schiff bases have also show to good range of antimicrobial and anti oxidant activities, including ant proliferative, antibacterial, antifungal, Antimalerial, anti- antiviral, inflammatory, and antipyretic properties Przybylski, P., *et al* (2009)]2. Imines or azomethine groups are divided in various natural-derived and non-natural compounds. The amine group involved in these compounds has been determined to be effective biological processes. [Bringmann, G., *et al* (2004)] 3–5.

The imines basis on amino acid is rarely

investigating their purifying difficulty in column. When compare with the classified Schiff bases, have a more stable and high solubility in (organic solvents like cyclohexane, benzene, water), also, newly compounds could be derived in easy co-ordination forms owed to the conformational flexible compound [Kursunlu, A. N., *et al* (2013)] 6-8. A d-group of metal complexes having O and N donor atoms have a huge number of papers is available on the antimicrobial activities. [Rauf, A., *et al* (2017)] 9-11 The research efforts all the world wide is going on, in order to explore affective metal based biologically active compounds as near biological drugs like antimicrobial drugs. Encompassed by the different therapeutic approaches to clean out microbial hazard, the assessment of used transition metal complexes, and metalloid-drugs is believed to have a great thesaurus compound. [Dhanaraj, C. J., *et al* (2016)] 20,21 Metals complexes is utilize for effect by inhibition, interaction of enzymes catalyst with intracellular Bio molecules, raise (fat-linking), alteration of cell functions and impression of cell cycle etc

2. Experimental:

Result and Discussion

Synthesis

The procedure for the preparation of Schiff bases were followed by the exhaustive literature survey. All chemicals aldehyde, ketone, amines and were taken in equimolar amount. The amine containing group (semicarbazide, thiosemicarbazide, and nicotinamide etc.) of compounds were dissolved in alcohol (ethanol or methanol. Glycine / alanine / arginine (amino acids, amine containing group) were added to the ethanol heated until the clear solution obtained. Separately the 4, 4'-dimethoxybenzoin (ketone) were dissolved in ethanol/methanol. Slowly the both solution were added into the 4, 4'-dimethoxyenzoin solution with stirring condition. Then the reacting mixtures were refluxed in involvement of GAA (few ml). The refluxed mixture was either poured into the ice cooled water or kept onto the ice bath or kept until the solvent evaporate. Then the synthesized Schiff bases were filtered and wash out along with suitable alcohol and then dried.

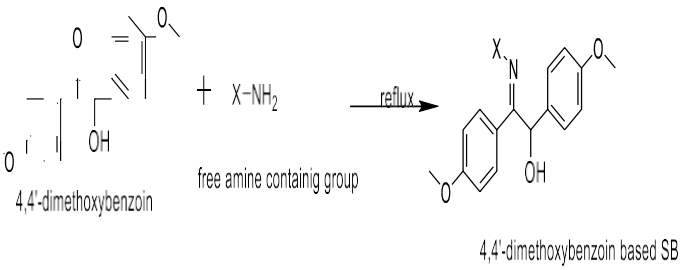
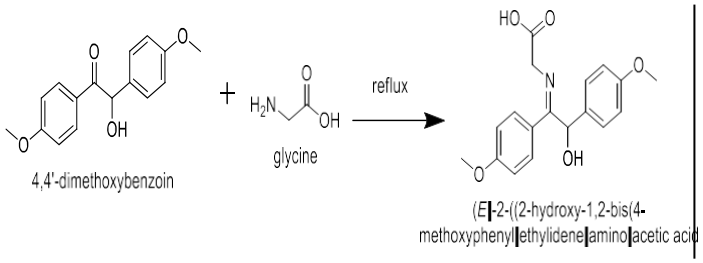


Fig: 1 GENERAL SCHEME FOR SCHIFF BASE SYNTHESIS

Table1: Starting materials for 4, 4' imethoxybenzoin Schiff Bases.

SN	X =	SYNTHESIZED SCHIFF BASES	QUANTITY TAKEN IN gm	SCHIFF BASES CODE
01.	Glycine	4,4'-dimethoxybenzoinglycine Schiff base	0.75	B1
02.	Thiourea	4,4'-dimethoxybenzoi Schiff base	0.76	B2
03.	Alanine	4,4'-dimethoxybenzoin alanine Schiff base	0.89	B3
04.	Anthranilamide	4,4'-dimethoxybenzoinantranilamide Schiff base	1.36	B4
05.	Nicotinamide	4,4'-dimethoxybenzoinnicotinamide Schiff base	1.22	B5
06.	Thiosemicarbai-de	4,4'dimethoxybenzointhiosemicarbazide Schiff base	0.91	B6
07.	Urea	4,4'-dimethoxybenzoinurea Schiff base	0.6	B7
08.	Semicarbazide	4,4'-dimethoxybenzoinsemicarbazide Schiff base	1.11	B8
09.	Anthranilic acid	4,4'dimethoxybenzoinanthranilicacid Schiff base	1.37	B9
10.	Arginine	4,4'-dimethoxybenzoinarginine Schiff base	2.10	B10

4, 4'-DIMETHOXYBENZOIN AND GLYCINE SCHIFF BASE (B1)



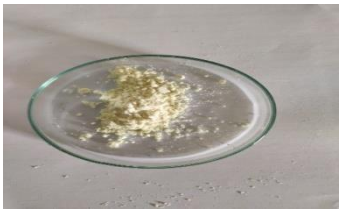
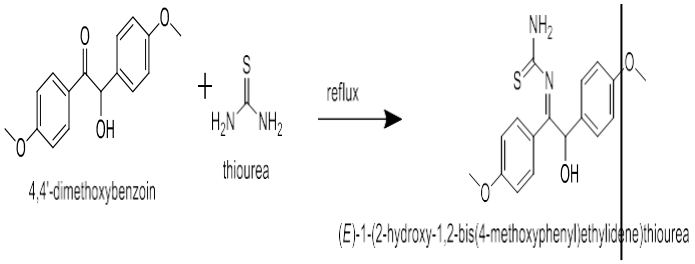


Fig.2- 4, 4'-dimethoxybenzoin and Glycine Schiff base

4, 4'-DIMETHOXYBENZOIN AND THIOUREA SCHIFF BASE (B2)



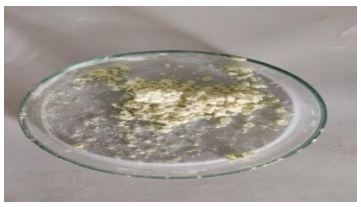


Fig.2- 4, 4'-dimethoxybenzoin and Thiourea Schiff base

4, 4'-DIMETHOXYBENZOIN AND ALANINE SCHIFF BASE (B3)

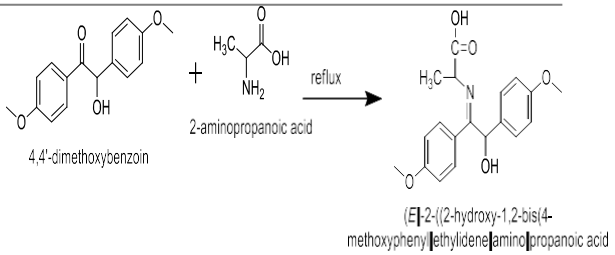


Fig 3- 4, 4'-dimethoxybenzoin and Alanine Schiff base

4, 4'-DIMETHOXYBENZOIN AND ANTHRANILAMIDE SCHIFF BASE (B4)

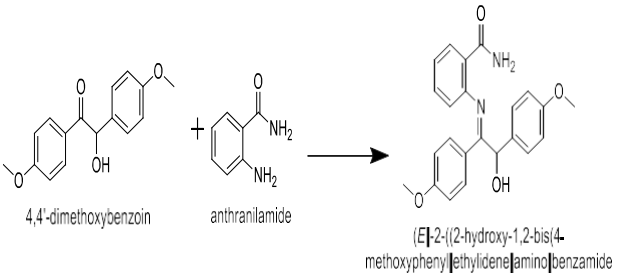
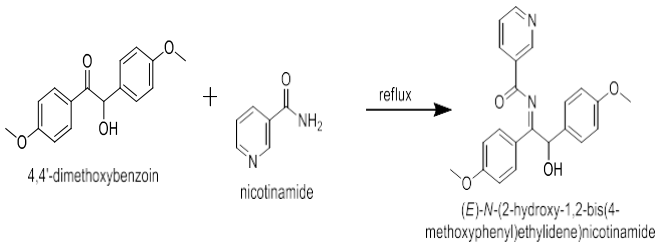


Fig.4 - 4, 4'-dimethoxybenzoin and Anthranilamide Schiff base

4, 4'-DIMETHOXYBENZOIN AND NICOTINAMIDE SCHIFF BASE (B5)



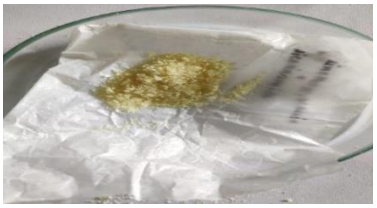


Fig.5- 4, 4'-dimethoxybenzoin and nicotinamide Schiff base

4, 4'-DIMETHOXYBENZOIN AND THIOSEMICARBAZIDE SCIFF BASE (B6)

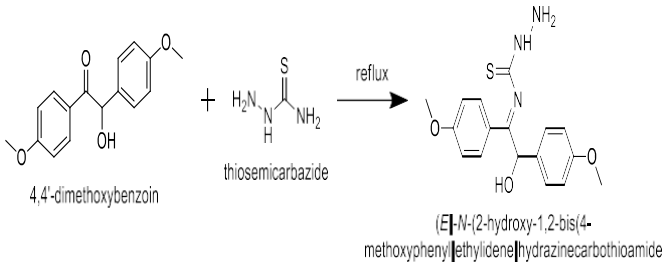
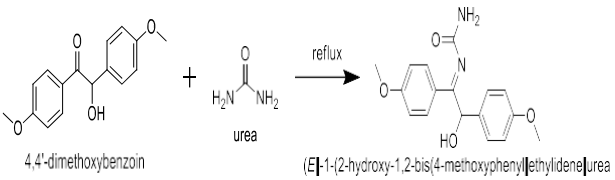


Fig.6- 4, 4'-dimethoxybenzoin and thiosemicarbazide Schiff base

4,4'-DIMETHOXYBENZOIN AND UREA SCHIFF BASE (B7)



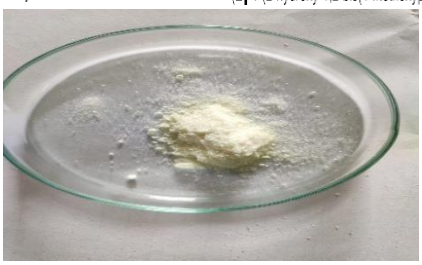


Fig 7- 4, 4'-dimethoxybenzoin and urea Schiff base

4, 4'-DIMETHOXYBENZOIN AND SEMICARBAZIDE SCHIFF BASE (B8)

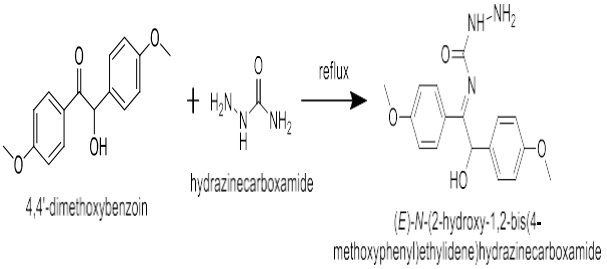


Fig8- 4, 4'-dimethoxybenzoin and Semicarbazide Schiff base

4,4'-DIMETHOXYBENZOIN AND ANTHRANILIC ACID SCHIFF BASE (B9)

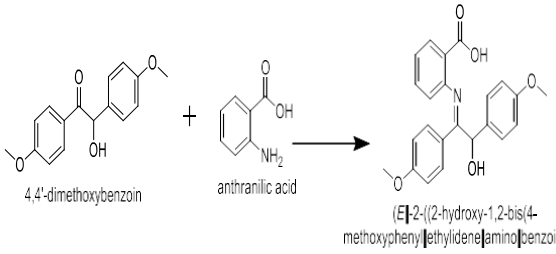


Fig.9- 4,4'-dimethoxybenzoin and Anthranilic acid Schiff base

4,4'- DIMETHOYBENZOIN AND L-ARGINIE SCHIFF BASE (B10)

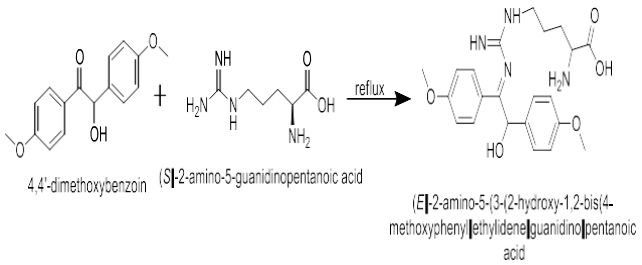


Fig.10- 4, 4'-dimethoxybenzoin and L-Arginine Schiff base

METAL COMPLEX

GENERAL PROCEDURE FOR METAL COMPLEXES

FERRIC CHLORIDE ANHYDROUS

Schiff base (small quantity) was dissolved in hot methanol and ferric chloride anhydrous (yellowish orange) metal was dissolved in ethanol (2:1) and were mixed drop wise with continuous stirring till the colour changed then washed with water and dried the solid.

BISMUTH ACETATE

Schiff base (small quantity) was dissolved in hot methanol and bismuth acetate (white colour) was dissolved in water (clear solution) (2:1) and were mixed drop wise with continuous stirring then precipitate formed and washed with water and solid was dried.

COBALT (lll) CHLORIDE

Schiff base (small quantity) was dissolved in hot methanol and Co (lll) chloride was dissolved in ethanol (blue colour) and were mixed drop wise with continuous stirring then turn to light pink colour solid was washed and dried.

IDENTIFICATION AND CHARACTERIZATION

The synthesized compounds were identified by using following methods:

Solubility Profile

The solubility of synthesized compounds was performed in distilled water (normal and hot), methanol, chloroform, ethanol, benzene, and cyclohexane. Solubility of synthesized Schiff bases was very flexible towards these solvents as

Depicted in the (table 3).

Table 3: For the solubility of ligands in different solvents.

s.no	compound	H_2O		Ethanol	ethanol	loroform	nzene	clohexane
		normal	hot					
1	B1	-	-	++	++	++	+	+
2	B2	-	-	++	++	++	+	+
3	B3	-	-	++	++	++	-	-
4	B4	-	-	+++	++	++	+	-
5	B5	-	-	++	++	++	-	-
6	B6	-	-	++	++	++	+	+
7	B7	-	-	++	++	++	+	+
8	B8	-	-	++	++	+	+	++
9	B9	-	-	++	++	++	+	-
10	B10	-	-	++	+++	++	+	++

Table 4 Physiochemical property of synthesized Schiff bases

01.	B1	73	$C_{18}H_{19}NO_5$	0.6	Y	329.35	115-117
02.	B2	75	$C_{17}H_{18}N_2O_3S$	0.7	Y	330.40	118-120
03.	B3	70	$C_{19}H_{21}NO_5$	0.8	Y	334.37	116-118
04.	B4	69	$C_{23}H_{22}N_2O_4$	0.83	Y	390.43	130-132
05.	B5	65	$C_{22}H_{20}N_2O_4$	0.6	Y	376.14	114-116
06.	B6	71	$C_{17}H_{19}O_3S$	0.81	Y	345.11	132-134
07.	B7	73	$C_{17}H_{18}N_2O_4$	0.7	W	314.34	124-126
08.	B8	77	$C_{17}H_{19}N^3O_4$	0.73	Y	329.35	136-138
09.	B9	59	$C_{23}H_{21}NO_5$	0.64	B	391.42	128-130
10.	B10	60	$C_{22}H_{28}N_4O_5$	0.85	Y	428.21	122-124

Conclusions:

In this research we have synthesized, characterized and evaluate some novel Schiff bases. This approach selected for the study have paved the way for generating useful Schiff base analogues in future studies as antimicrobial agent.

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