SYNTHESIS & CHARACTERIZATION OF A NOVEL SCHIFF BASE FOR ITS BIOLOGICAL ACTIVITY

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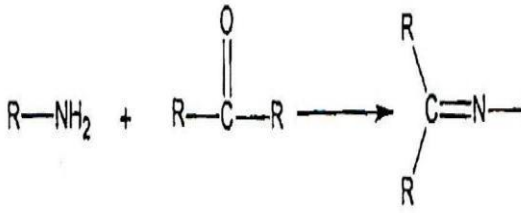
ABSTRACT

Schiff base synthesis is usually acid-catalyzed and usually require refluxing the mixture of aldehydes (or ketone) and amine in organic medium. However, assistance of stirring for synthesis of Schiff base is introduced. In the present study stirring promoted condensation reaction of vanillin and m-toluidine are displayed. The method was also compared with conventional method for determination of production efficiency and production economic. Characterization of these Schiff base were done by TLC and IR spectra. From the study, it was concluded that this method is very rapid, reliable and economic method for production of schiff base.

Keywords: -Vanillin, m-toluidine, Ethyl alcohol, Glacial Acetic acid.

Introduction

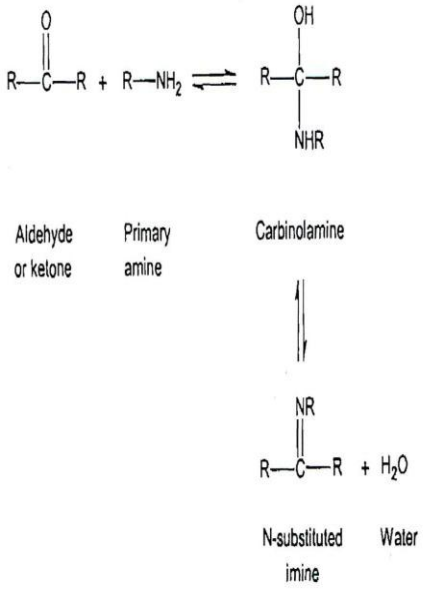
- Ugo (Hugo) Joseph Schiff ,one of the founders of modern chemistry, was born in Frankfurt on the 26 April 1834, into a wealthy Jewish family of merchants, Joseph Moses Schiff(1784–1852) and Henriette Trier (1798–1888).
- He studied chemistry and physics in Frankfurt with Professors Böetteger and Löwe, and continued his studies in Göttingen, where he got his degree in 1857 under the supervision of professorWölher.
- A Schiff base is a nitrogen analog of an aldehyde or ketone in which the C=O group is replaced by C=N-R group.
- It is usually formed by condensation of an aldehyde or ketone with a primary amine according to the following scheme:



Primary amine Aldehyde or ketone Schiff bas

Where R, may be an alkyl or an aryl group.

- Schiff bases that contain aryl substituents are substantially more stable and more readily synthesized, while those which contain alkyl substituents are relatively unstable**.**



Aldehyde or kelone Primary amine Carbinolamine

N-substituted imine Water

Experimental Methods

- All the chemicals were purchased from Loba company in high quality standard & purity.
- The product was recrystallised & melting point was noted using basic melting point apparatus.
- Then characterization was done by IR spectroscopy.

Procedure for preparation of Schiff base:-

The Schiff base was prepared using two ways:-

1. Microwave Irradiation.
2. Manual Stirring.

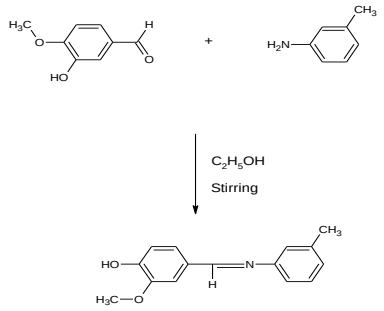
1. Microwave Irradiation:-

- Take 1gm of Vanillin & 1ml of m-toluidine in a clean dry 50ml conical flask. Add about 1.5ml of ethyl alcohol to the flask.
- Then irradiate this in a microwave with 360 watts for 10 mins.Then pour this solution to a ice cold water.
- Filter it &dry.Determine its melting point.

2. Manual stirring:-

- Take 7 gm of Vanillin & 7ml of m-toluidine in a clean beaker.
- Add about 10 ml of ethyl alcohol to the solution then stir it manually for 5-10 mins.
- A sticky substance is observed.Add a drop of glacial acetic acid to it.
- Then orangish yellow substance is obtained.

- *Reaction:-*



Schiff base

The antibacterial activity of newly synthesized Schiff'sbase was conducted against Gram positive bacteria i.e

Staphylococcus aureus, Corynebacterium diphtheric andGram negative bacteria i.e. Escherichia coli, Salmonella

typhi by using DITCH PLATE TECHNIQUE.Septran tablet was employed as reference standard tocompare the results.STERILE MUELLER HINTON AGAR was used forthe screening methods.

Antibacterial activity

ANTIMICROBIAL ACITIVITY

All the synthesized test compound were screened for their anti-bacterial activity by Ditch Plate Technique Using (Gram positive) organism Such as Staphylococcus aureus and Coryrobacteriu diphtherie (Gram negative) Escherichia coli And Salmonellatyphi. Media used is Sterile Mucller Hinton Agar and Inhibition condition is 37^0 C For 24 Hours

Results were recorded as zone of inhibition as shown in table.

1. Growth on ditch

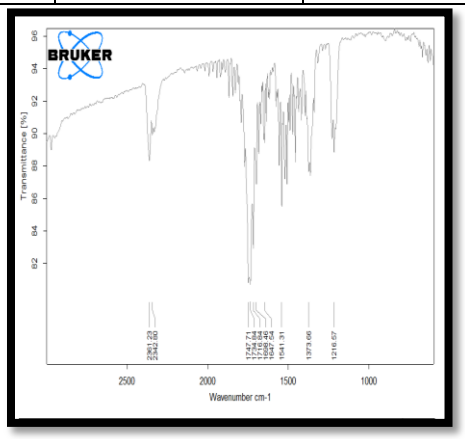
Sample Culture used	Amount added to ditch in gm	Escherichia coli	Salmonella typhi	Staphylococcus aureus	Coryrobacterium diphtherie	Conclusion
Positive control (Septran tablet)	0.05	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	Compound has antibacterial activity and is active against both gram positive as well as gram negative bacteria
	0.1	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	
Vanilline + m-Toludine	0.05	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	
	0.1	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	

2. Growth around ditch

Sample Culture used	Amount added to ditch in gm	Escherichia coli	Salmonella typhi	Staphylococcus aureus	Coryrobacterium diphtherie	Conclusion
Positive control (Septran tablet)	0.05	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	Compound has antibacterial activity and is active against both gram positive and gram negative bacteria
	0.1	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	
Vanilline + m-Toludine	0.05	**No Growth on test culture**	**Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	
	0.1	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	**No Growth on test culture**	

RESULT AND DISCUSSION

- The melting point observed was 85°C of recrystallised product & yield was about 75-80%.



- The sample was characterized by IR & also for biological activity**.**

- **By IR:-**
- The Infra red spectra of the synthesised compounds were scanned in the range of 4000-600cm^{-1} in KBr pellet.
- A narrow band at 2260-2210cm^{-1} is attributed to C=N stretch.
- A band at 1370-1350cm^{-1} is attributed to C-H bend.
- A band at 1335-1250 cm^{-1} is attributed to C-N stretch**.**

CONCLUSION:-

Biological Activity:-

- At 0.05 concentration it showed partial solubility in water.
- The compound showed antibacterial activity & is active against Gram positive as well as Gram negative bacteria at both the concentrations.

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