



ORIGINAL RESEARCH PAPER



## CATALYTIC SYNTHESIS OF AZOMETHINES USING ACID MODIFIED BIOCHAR AS CATALYST

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### Abstract:

*Azomethines or schiff bases is an important class of organic compounds. Herein, we report an ecofriendly, inexpensive and catalytic route for the synthesis of these compounds using acid modified biochar as a catalyst. The catalyst offers advantages like simple reaction protocol, easy catalyst separation and high yields of the products.*

**Keywords:** Azomethine, Modified Biochar, Synthesis, Schiff Base.

### 1. Introduction

Biochar is a carbon-rich solid produced through the thermochemical conversion of biomass under oxygen-limited or oxygen-free conditions. Common production techniques include slow and fast pyrolysis, gasification, and hydrothermal carbonization. The choice of feedstock such as agricultural residues, wood waste or sewage sludge and process parameters such as temperature, heating rate, and residence time play a critical role in determining the resulting biochar's structural and chemical properties [1-4].

Biochar catalysts have demonstrated promising performance in diverse applications, including advanced oxidation processes, biomass conversion, wastewater treatment, electrocatalysis and energy storage systems. By valorising waste biomass into functional catalytic materials, biochar bridges green chemistry and circular economy principles. Consequently, the development of biochar as a catalyst represents a compelling strategy for sustainable catalysis and environmentally friendly chemical processes [5-8].

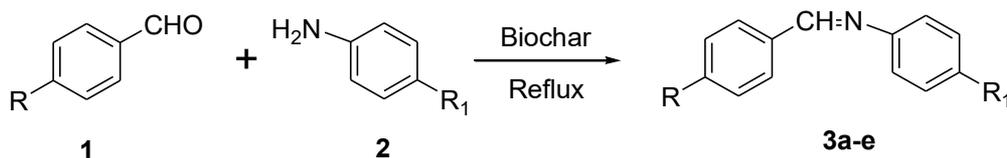
The azomethines constitute one of the most active classes of the compound which possess biological activities such as antitubercular [9], anticancer [10], plant growth inhibitors [11], insecticidal [12], CNS depressant [13], antibacterial [14]. The azomethines can be prepared by the acid catalysed reaction of amine and ketone or aldehyde. These azomethines are used as starting material for the synthesis of various bioactive heterocyclic compound like 2- azetidiones, benzoxazines, thiazolidinones and formazans. Also, these are an intermediate in the biologically important trasamination reactions [15].

## 2. Experimental section

Melting points were determined in open capillary tube using Digital Melting Point Apparatus and are uncorrected. The IR Spectra were recorded on Perkin-Elmer Spectrophotometer instrument using KBr disc. NMR Spectra were recorded on 200 MHz Spectrophotometer instrument using Chloroform solvent and TMS as internal standard.

### 2.1 Synthesis of Azomethines or Schiff bases:

A mixture of amines (0.01M) and different aromatic aldehyde (0.01M) were taken in alcohol, to this added acid modified biochar (0.1gm) and refluxed at room temperature for 30-40 minutes. After completion of reaction, catalyst was filtered and solution was distilled off to get the crude product. Separated solid was washed with water and crystallized from ethyl alcohol.



*Scheme 1*

**Table 1: Physical constant of azomethine compounds**

Sr. No.	R	R <sub>1</sub>	% Yield	M. P. (°C)
3a	H	H	82	50-52
3b	CH <sub>3</sub>	H	73	51-52
3c	OCH <sub>3</sub>	H	60	68-70
3d	OH	H	71	156
3e	Cl	H	67	48-49

### Conclusion

This environmentally benign method is easily accessible, economically and eco-friendly for synthesis of azomethines.

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