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"GREEN SYNTHESIS OF SUBSTITUTED PHENYL PYRAZOLINE DERIVATIVE FROM CHALCONE"

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Abstract:

Chalcone and their derivatives are so useful nowadays because of their anti-inflammatory activities. Chalcone and their derivatives are so many use in so many drugs and medicine, chalcone and their derivatives have so many properties against many bacterial and microbial diseases therefore grab attention of hygiene department, chalcone are forms by using aldehyde and ketone with use of base as a catalyst and then use as part of a broad search for new and effective antibacterial agents. We have successfully synthesized substituted pyrazoline from chalcone made by the reaction 3-bromo benzaldehyde with acetophenone. Infrared spectroscopy was used to study the structures of these compounds.

Key words :-

Chalcone, benzaldehyde, acetophenone, phenyl hydrazine, NaOH

Introduction:

The pharmacological capacity of natural products is gaining popularity, and chalcones are one of the most important groups of natural compounds. Chalcone structure have two ring and one keto group. A system of unsaturated carbonyls the presence of a reactive, unsaturated keto function in chalcones has been discovered to be the source of their antibacterial activity.[1]

chalcones have a lot of applications in medicinal and chemical chemistry. Many methods for the synthesis of chalcones have been devised due to their importance as active functional group chemicals or as heterocyclic compounds in organic synthesize.the reaction between an aromatic ketone and an aldehyde is the most important method for synthesizing these compounds under a variety of conditions, including acid, and base.[2]

Because of their usage in heterocyclic synthesis and medicine, n-phenylpyrazoline derivatives are important molecules in organic chemistry. Pyrazolines have been shown to have anti-bacterial[3] , anti-oxidative[4] , anti-inflammatory[5,6] , anti-cancer[7] ,anti –hiv[8],anti- malerial[9,10], and antidepressant properties . Because the pyrazoline function is more stable, chemists have been inspired to use the stated stable fragment in bioactive moieties to create novel compounds with biological activity. [11]

The strength of microbial illnesses has risen in recent years. Infectious diseases caused by bacterial infections have become a serious public health concern as a result of this growth in treatment resistance. As a result of treatment failures, antimicrobial resistance has raised health concerns and resulted in illness and death. Due to a scarcity of antibacterial medications, certain bacterial kinds that cause infectious diseases that thought to be under control are suddenly causing cause infectious diseases that thought to be under control are suddenly causing death every year. [12]

Materials :- 3-Bromo Benzaldehyde, Acetophenone, NaOH, $KMnO_4$, K_2CO_3, EtOH, CH_3COOH

Methods:-

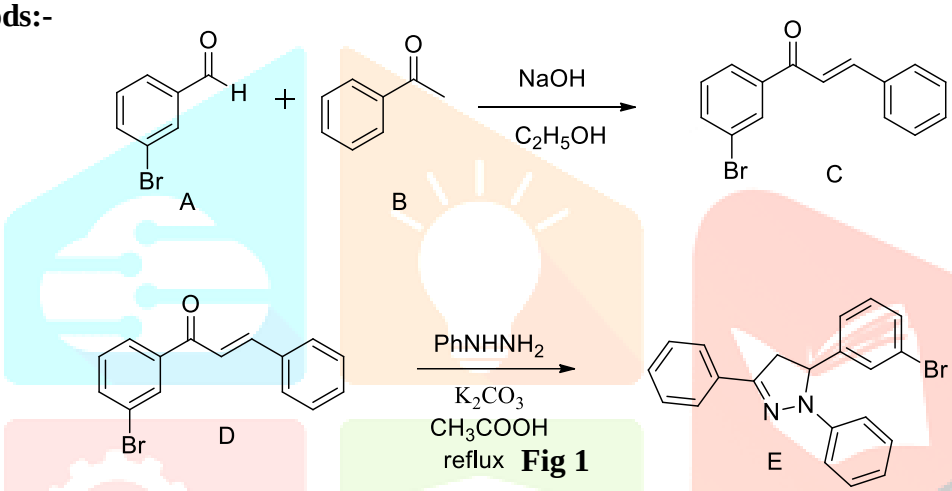

Fig 1

Synthesis of Chalcone :-

Solution of 5 ml sodium hydroxide in 10 ml 95 percent alcohol was taken in a round bottom flask, which is loosely covered with a perforated disc of paperboard, given with an efficient stirrer, and supported in a bigger vessel so that cooling with split ice can be done. 1 ml (1mole) pure acetophenone is put into the alkaline solution, the bottle is wrapped in broken ice, and the stirrer is turned on.1 ml. (1 moles) 3- bromo benzaldehyde is added at once. During the process, the reaction temperature should not drop below 15°C and should not rise above. The reaction was monitored by thin layer chromatography in hexane and ethyl acetate (8:2)and it was charred in $KMnO_4$ charring solution. bright yellow spot observed.
and after the completion of reaction, mixture was acidified with HCl in an ice bath and the solid was then filtered and crystallized byethanol. The yellow white crystal form that is the result is then recrystallize withethanol[13] .

Fig 2: Synthesis of Chalcone

Synthesis of chalcone N-Phenylpyrazolinederivatives :-

Fig 3: Synthesis of N-Phenylpyrazoline derivative

In 15 ml of acetic acid, phenyl hydrazine (1.5 ml) was added to a chalcone (1gm) and $K_2CO_3$was added as base catalyst.The reaction was refluxed with constant stirring for 3hrs. The reaction was monitored by thin layer chromatography in hexane and ethyl acetate(9:1) and clear yellow spot of n- phenylpyrazoline was observed in $KMnO_4$ charring solution.After the completion of the reaction, mixture was diluted with ice-cold water.The solid was collected, washed with water and recrystallized from ethanol as paleyellow plates.[14]. This reaction involves the Michael addition reaction followed by intramolecular cyclizations in which nucleophilic attack on the carbonyl group to form pyrazoline derivatives.

FT-IR Analysis

IR spectra of prepared chalcone showed frequencies (cm^{-1}) at 3311, 1650,1705 and 770 indicating carbonyl, C-Br, alkenes . Fig 1 represent IR analysis of chalcone

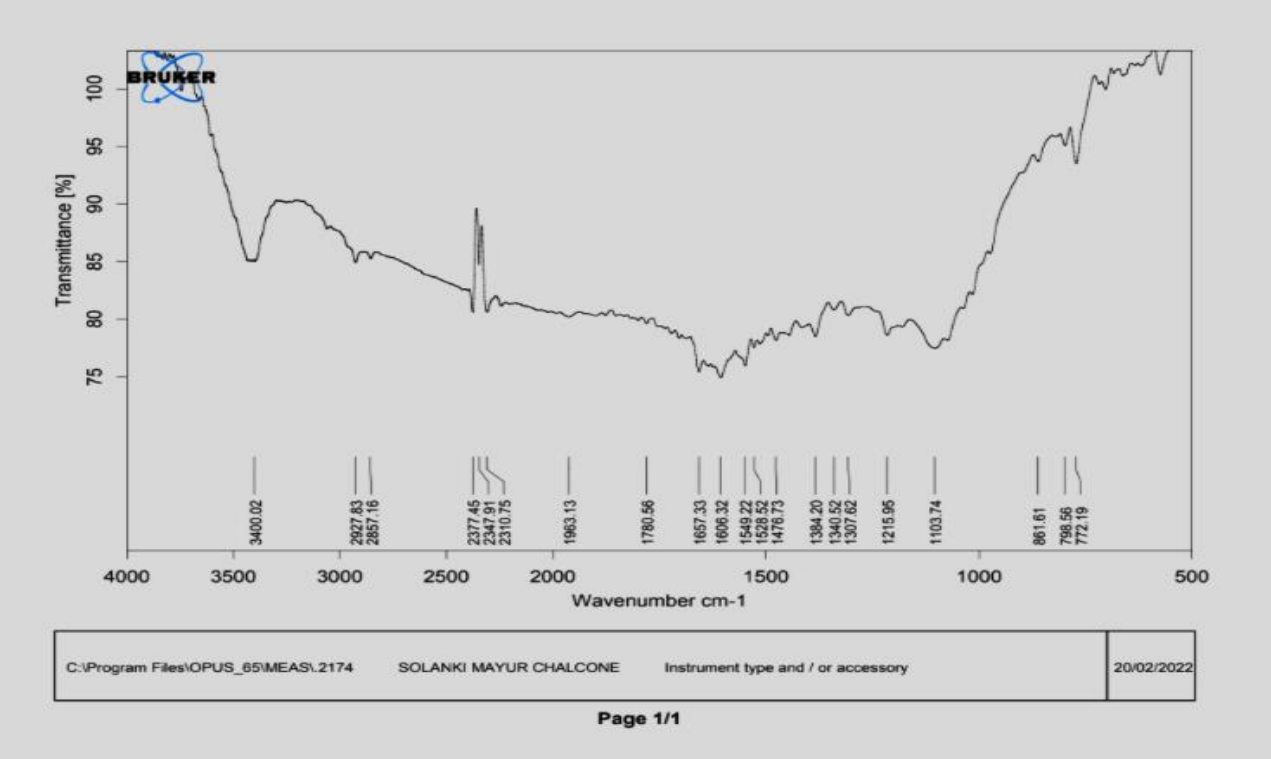

Fig 4: IR analysis of chalcone

FTIR OF N-PHENYL PYRAZOLINE:-IR spectra of prepared pyrazoline showed frequencies (cm^{-1}) at 3400,2927,1780,1652,1102 and 861 indicating the presence of carbonyl, C-Br bond.

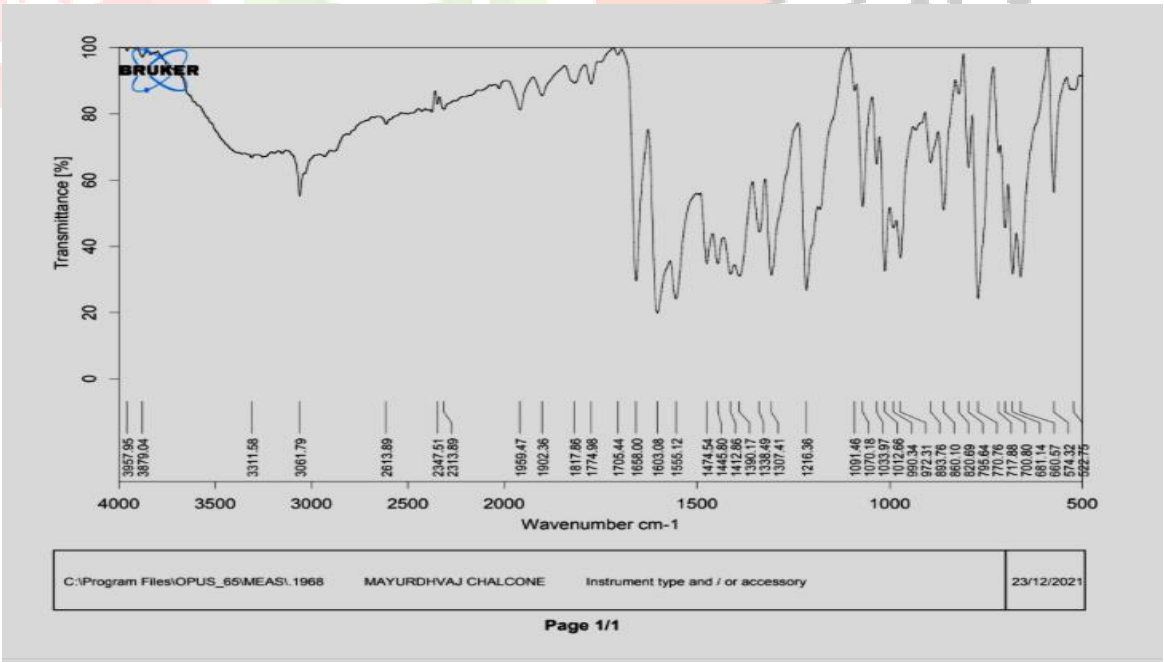

Fig 5: IR analysis of N-Phenyl Pyrazoline.

Conclusion:- We have successfully synthesized the N Phenyl Pyrazoline derivative of chalcone by green synthetic approach protocol. The synthesized compounds are further analyzed by thin layer chromatography and IR.

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