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MICROWAVE ASSISTED SYNTHESIS AND SPECTRUM CHARACTERIZATION OF ACETAMIDE DERIVATIVE COMPOUNDS

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ABSTRACT

This study explores the microwave -assisted synthesis of acetamide derivative compounds, employing an efficient and rapid methodology. The microwave irradiation technique proves to be a valuable tool for accelerating the synthesis process, enhancing yields, and promoting eco-friendly conditions. The synthesized compounds are systematically characterized through spectral analysis, providing insights into their structural properties. This research contributes to the advancement of microwave -assisted synthesis methods and the comprehensive characterization of acetamide derivative compounds, with potential applications in various fields such as pharmaceuticals and materials science. The synthesis of new acetamide derivative based on the reaction of between 3,4-dichloroaniline, triethylamine, chloroacetyl chloride and benzene .The synthesized compound was determined by spectrum characterization .

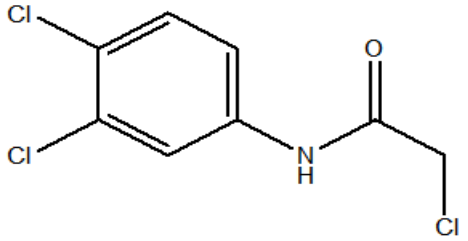
Keywords: 3, 4 Dichloroaniline, Triethylamine, Chloroacetyl Chloride And Benzene, Acetamide Derivative, Spectrum Characterization.

I. INTRODUCTION

In the branch of organic chemistry ,the medicinal chemistry occupies the chief position because it involves design, development and synthesis of many new drugs .It is the major field of pharmaceutical science which the applies the principle of the chemistry and biology to the creation of knowledge leading to introduction of new drugs. The main objective of this field is to discover a new lead compounds or drug derivatives for use as a drugs.

Microwave assisted synthesis is a technique in chemistry that utilizes microwave irradiation to expedite and improve the efficiency of chemical reactions. Here are some concise notes on microwave -assisted synthesis: accelerated reactions, uniform heating, energy efficacy, broad applicability, enhanced selectivity, improved yield and purity, safety benefits.[1]

Acetamide derivative compound such as the 2-chloro-N-(3,4-dichlorophenyl) acetamide is a chemical compound characterized by its structure, which includes a chlorinated phenyl group attached[2] to an acetamide moiety. The compound is derived from the reaction between 3,4-dichloroaniline and chloroacetyl chloride. This synthetic process typically involves the use of a base and is often accelerated by microwave irradiation.



2-chloro-N-(3,4-dichlorophenyl) acetamide

Figure 1:

II. METHODS

Preparation of new acetamide derivatives 2-chloro-N-(3,4-dichlorophenyl)acetamide are dissolve 5 mmol of 3,4-dichloroaniline and 5mmol of triethylamine in 30 ml dry benzene. And also prepare separate solution of

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chloroacetyl chloride in 20 ml of benzene. Add the chloroacetyl chloride solution to the above mixture. Maintain a slow addition rate for half an hour. Extract the layer with 3 portions of 50 ml ether. Wash the combined ether extract with 3% sodium bicarbonate solution followed by vigorous shaking. Take organic layer and add anhydrous sodium sulfate and evaporate the solvent by heating and after drying it should be recrystallized with ethanol.

MATERIALS

All the materials such as 3,4-dichloroaniline, triethylamine, chloroacetyl chloride,were purchased from DOLPIN PHARMACY INSTRUMENT Pvt limited, Mumbai. The IR spectra of the coumpounds were recorded on FT-IR spectrometer 4100 type A with potassium bromide pellets (BRUCKER ALPHA). The absorption of compounds to be visualized in UV-chamber (systronics AU 2701 DOUBLE BEAM).

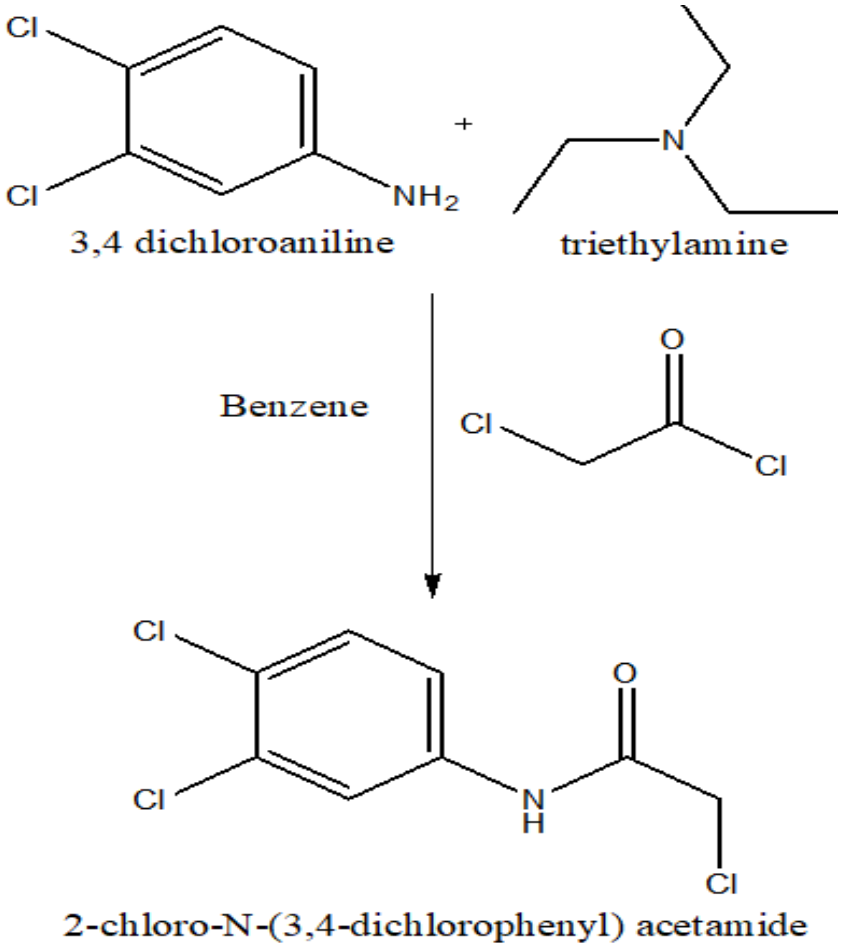

Figure 2:

INSTRUMENTION:

The melting point of newly synthesized product determined by the open capillary tube method .the determined by the open capillary tube method .The completion of the reaction is confirmed by the using TLC method. The UV spectrum of newly synthesized compound is determined by using systronics AU 2701 DOUBLE BEAM spectroscopy .The structure of compound is confirmed by FT-IR spectrometer4100A with KBr (BRUCKER ALPHA).Proper instrumentation is crucial for the successful implementation of microwave -assisted synthesis .Below are the key components of the instrumentation.1.microwave reactor. 2. Reaction vessel. 3.Temperature and pressure controller. 4.microwave generator. 5.stirring system. 6.safety feature. 7.control and monitoring system .

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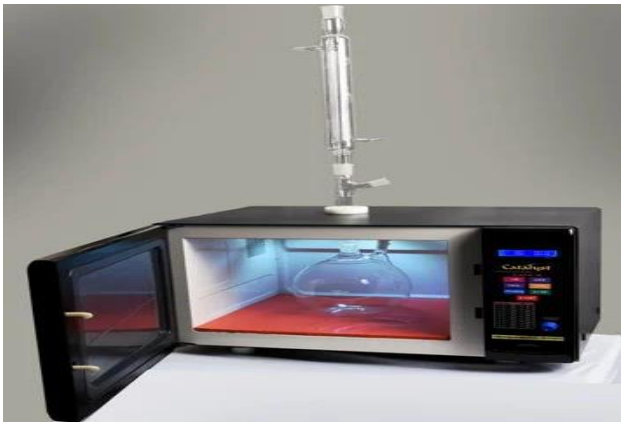

Figure 3:

III. RESULT AND DISCUSSION

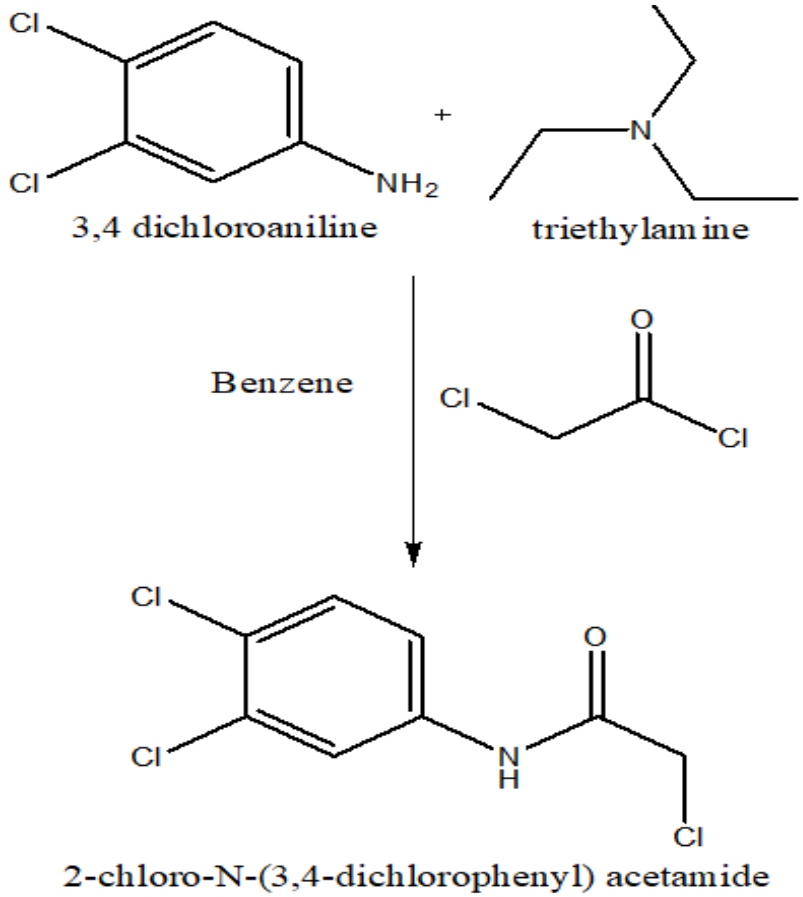

Figure 4: Scheme of Preparation

The preparation of acetamide derivative compound is shown in figure 4. All compounds are chemically named using Chemdraw ultra software . The complete of the reaction is confirmed by the TLC and determination of melting point. The structure of the compound is determined by the spectrum characterization.

Spectrum characterization

UV/VISIBLE Systronics AU 2701 DOUBLE BEAM spectroscopy were used to determine the absorption spectrum. 3, 4 dichloroaniline, triethylamine and 2-chloro-N-(3, 4-dichlorophenyl) acetamide dissolved in methanol and observed in UV in range of 240nm and 490 nm

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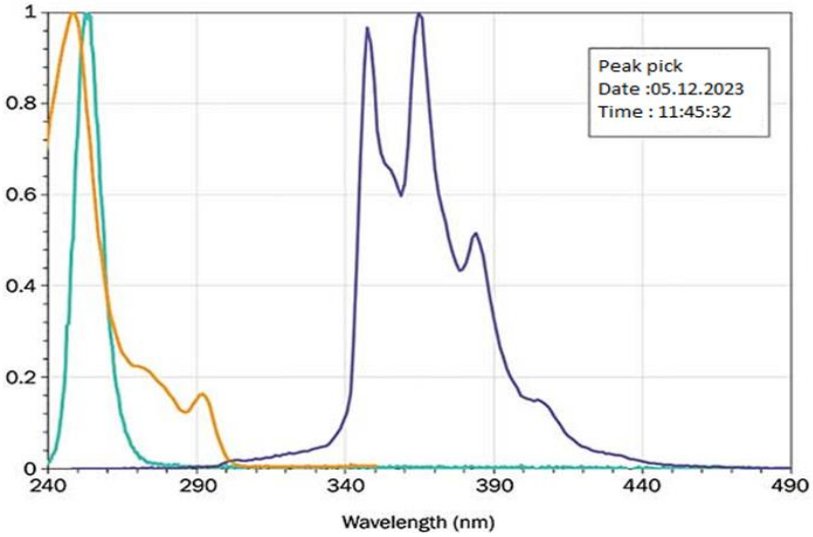

Figure 5: The overlay of 3, 4 dichloroaniline and triethylamine and 2-chloro-N-(3, 4-dichlorophenyl) acetamide.

IR spectrum:

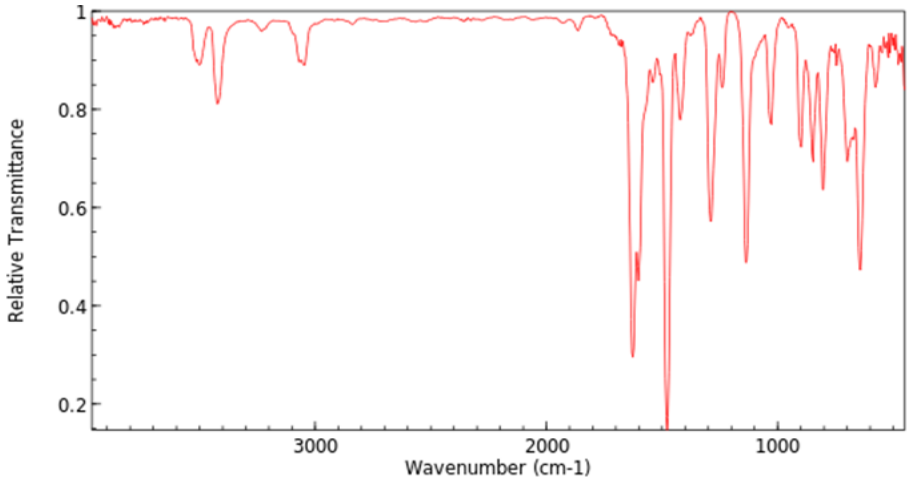

Figure 6: IR spectrum of 3, 4 dichloroaniline

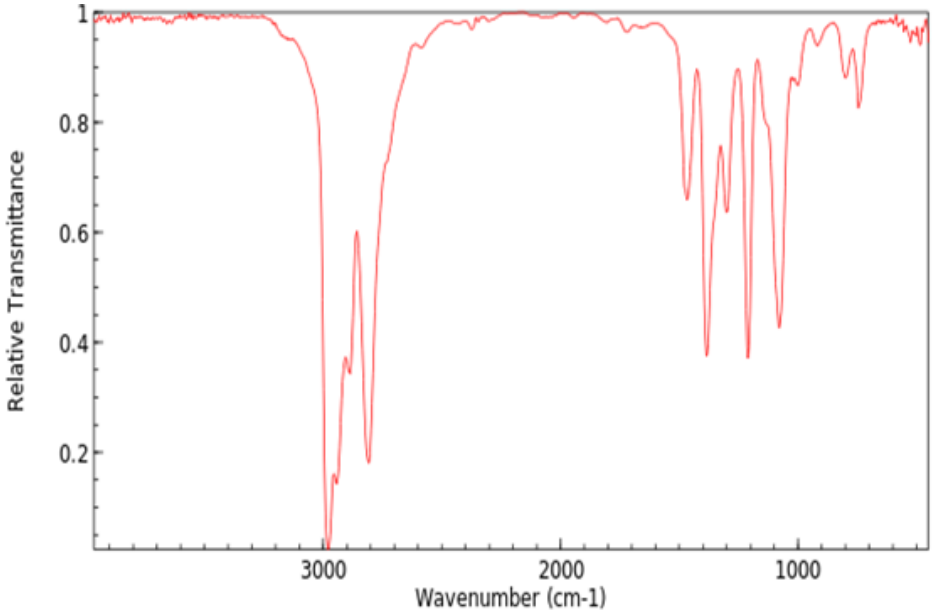

Figure 7: IR spectrum of triethylamine

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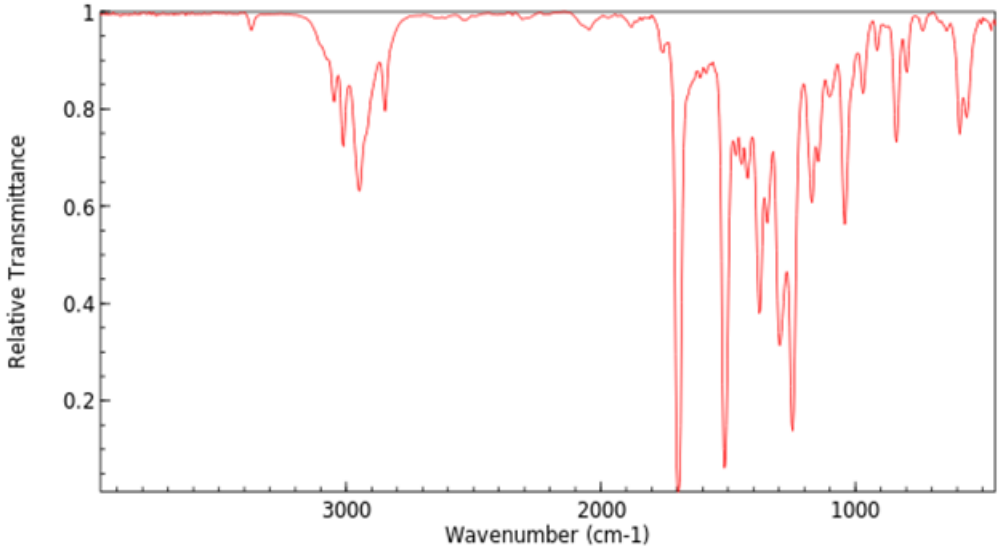

Figure 8: IR spectrum of acetamide derivative compound

IV. CONCLUSION

Successfully synthesized of 2-chloro-N-(3, 4 -dichlorophenyl) acetamide in microwave assisted synthesis method and compared with its marketed drug. As we concluded that synthesized method were eco friendly and cost free simple method and moreover the synthesized product have a similiraty with the marketed drug product in its spectra characterization .Thus a newly synthesized compound ecofriendly synthesized and having pharmacological properties in various sectors.

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