

**MICROWAVE-ASSISTED SYNTHESIS OF PYRIDINYL SUBSTITUTED QUINOLINE THROUGH BISMUTH NITRATE-CATALYZED DIELS-ALDER REACTION**

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**Abstract:**

Microwave-assisted bismuth nitrate-catalyzed synthesis of multicyclic quinoline has been accomplished by the reaction of aromatic amine, pyridine aldehyde and indene.

**Keywords:** Microwave, Bismuth Nitrate, Diels-Alder Reaction, Polycyclic Quinoline

**Introduction:**

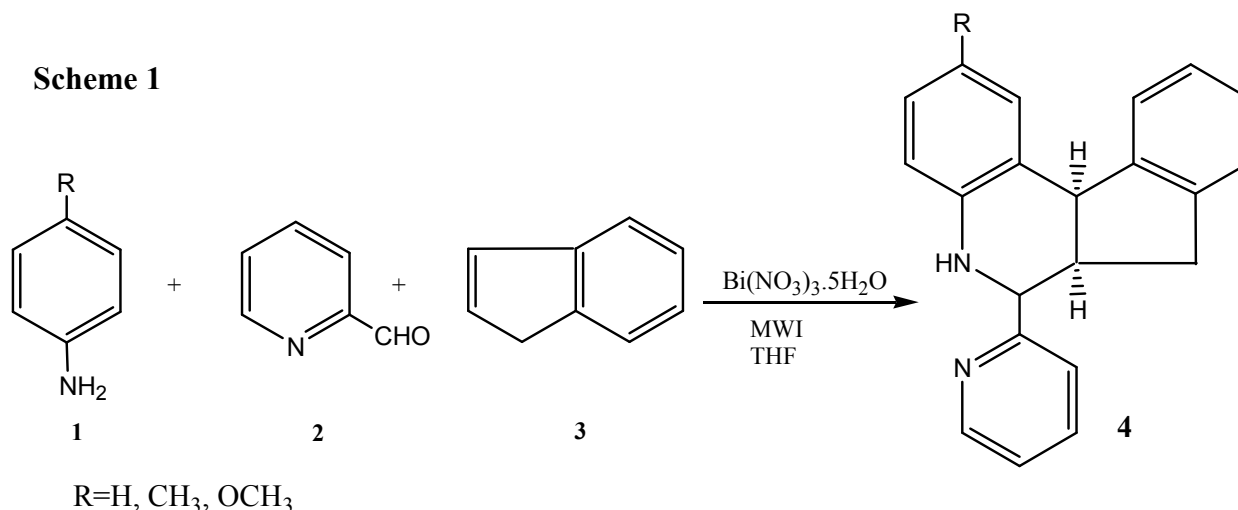
Pyridinyl substituted indeno quinoline derivatives have demonstrated important biological activities. The available approaches for the synthesis of these types of molecules are complex. However, we envision that Diels-Alder reaction with appropriately substituted starting compounds can be used for the construction of these types of molecules in a single step.

**Results and Discussion:**

In our earlier reactions, we have reported the use of bismuth nitrate for the synthesis of dihydropyrimidinones.<sup>1</sup> Our research on microwave-induced chemistry and bismuth nitrate-catalyzed process has culminated in a variety of procedures.<sup>2,3</sup>

Reaction of aromatic amine **1** with pyridine aldehyde **2** and indene **3** using catalytic amounts of bismuth nitrate (10 mol%) in THF at reflux temperature produced pyridinyl substituted indenoquinoline in 40% yield after 3h. Microwave irradiation of these reactants produced an identical product within 5 minutes and the yield of the product could be increased to 80%. It is important to maintain the temperature of the reaction mixture below the boiling point of THF. It can be done by placing a large Erlenmeyer flask (500 mL capacity with 200 mL of water) inside the microwave oven during irradiation. Further control of the temperature can be achieved using the on-off cycle present in the microwave oven. The reaction did not proceed in the absence of bismuth nitrate (**Scheme 1**).

### Scheme 1



We believe an imine is first formed by the reaction of amine and aldehyde. This imine then undergoes cycloaddition reaction with indene.

### Conclusion:

In conclusion, this method produces pyridinyl substituted indenoquinoline in good yield following a very simple procedure. Our method using microwave-irradiation with bismuth nitrate is excellent for the synthesis of these types of molecules.

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