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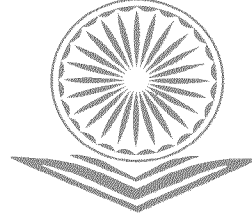
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18. PPST Covid-19 Situation in a Facile Approach for the Synthesis and Spectral Characterization of Coumarin derivatives

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Abstract

An effective approach was recognized using lanthanum chloride as catalyst to obtain Coumarine derivatives under ambient temperature condition. The synthesis of Coumarine has been achieved via one pot reaction of Resorcinol, EAA using lanthanum chloride as catalyst in solvent ethanol. All the synthesized derivatives were characterized by $^1\text{H NMR}$, IR.

Keywords- β - Coumarine, Schiff's base, EAA.

Introduction

Azomethine Group (-C=N-) Containing Compound typically known as Schiff base have been synthesized by the condensation of primary amine with active carbonyl. Schiff base has the significant class of compound in medicinal and pharmaceutical industry with several biological application that include antibacterial and antitumor activity they have been studied extensively as a class of ligand and are known to co-ordinate with metal ion through the azomethine nitrogen atom.

Similarly Coumarine derivative has been a great interest because of their role in natural and synthetic organic chemistry in many products which contain Coumarine subunit exhibit biological activity such as molluscicides¹⁻⁴, anthelmintic, hypnotic, insecticidal⁵ activities and some are serving as anticoagulant agent³ and fluorescent brightness. Coumarine containing Schiff base are expected to have enhanced antitumor and biological activities. It is well established that the biological activity associated with the hydrogen compound attributed to the presence of active pharmacophore.

Experimental

All solvents were laboring as commercial anhydrous mark without further Refining. The column chromatography was carried out over silica gel (100120 esh). Melting points determined by open capillary tube. ^1H NMR spectra were recorded on a Bruker 300 MHz spectrometer in DCI_3 solvent.

General Procedure for the Synthesis of Coumarin

The Mixture of resorcinol (0.01 mole) and EAA (0.01 mole) and 0.2 gm of ZnCl_2 was added in 20 ml of ethyl alcohol in round bottom flask the reaction mixture was stir for 45 min. The reaction mixture was cool with stirring. The formation of product was monitor on thin layer chromatography. The isolated crude product Coumarin is further purified by the washing in acetone.

General Procedure for the One Pot Synthesis of Schiff's Base Coumarin Derivatives

The Coumarin and Chloroacetyl chloride taken in round bottom flask congaing 15 ml ethyl alcohol, along with hydrazine and aromatic amine, the reaction mixture was stir for 60 min. the purity of product was monitor on TLC, the solid final product was isolated and recrystallize using ethyl alcohol.

General Scheme

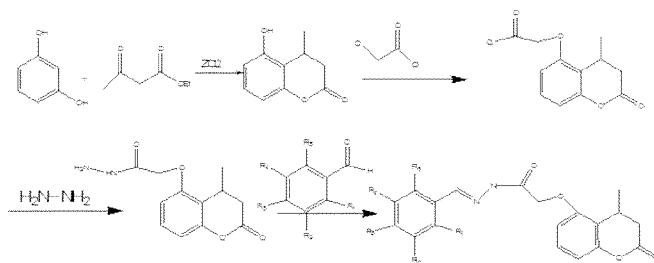


Table - Synthesis of 1a to 5f derivatives in terms of M. P. and Yield

| Sr. No. | R ₁ | R ₂ | R ₃ | R ₄ | R ₅ | M.P. °C | % Yield |
|---------|------------------|-----------------|-----------------|----------------|----------------|---------|---------|
| 1a. | H | H | NO ₂ | H | H | 276 | 65 |
| 2b. | OCH ₃ | H | NO ₂ | H | H | 280 | 60 |
| 3c. | Cl | H | Cl | H | H | 296 | 55 |
| 4d. | H | NO ₂ | H | H | OH | 258 | 60 |
| 5f. | NO ₂ | H | NO ₂ | H | H | 266 | 80 |

1. 1a :-M.P.276⁰C

FT-IR 770 cm^{-1} for aromatic C-C stretching, 1190 cm^{-1} for $-\text{NO}_2$ for stretching 1630 cm^{-1} for C=O stretching, 1090 cm^{-1} for C-N stretching, 2350 cm^{-1} for CN stretching,

NMR : δ 3.2,d for 2H, δ 5.9 s for 1H, δ 2.1 t for 2H,1.9 d for 3H, δ 6.6to 8.0 m for 7H.

2. **2b :-M.P.280 °C.**

FT-IR754 cm^{-1} for aromatic C-C stretching, 1120 cm^{-1} for C-O-Cstretching, 1160 cm^{-1} for C-N stretching ,1230 cm^{-1} for-NO₂for stretching, 1690 cm^{-1} for C=O stretching, 1610 cm^{-1} for C=O amide stretching,

NMR δ 3.8 t, for 3H, δ 3.9d for 2H, δ 2.1m for 1H, δ 4.5 s for 2H, δ 5.3 s for 1H δ 7.6to 8.4 m for 6H.

3. **3CM.P.296 °C**

FT-IR: 770 cm^{-1} for aromatic C-C stretching, 890 cm^{-1} for C-Cl stretching,1150 for C-O-C stretching, 1650 cm^{-1} forC=Ostretching , 1140 cm^{-1} for C-N stretching, 1590 cm^{-1} for C=O Amide stretching.

NMR: δ 3.2,d for 2H, δ 3.9t for 1H, δ 5.1 s for 1H δ 6.9to 8.5 m for 6H.

4. **4dM.P.258 °C.**

FT-IR 746 cm^{-1} for aromatic C-C stretching, 1260 cm^{-1} for-NO₂for stretching, 1710 cm^{-1} for C=O stretching ,1610 cm^{-1} for C=O Amide stretching,1160 cm^{-1} for C-N stretching.

NMR δ 3.8d, for 1H, δ 2.5m for 3H, δ 2.1 d for 3H, δ 5.6 s for 1H, δ 6.6to 8.4 m for 6H.

5. **5f M.P.266°C.**

FT-IR 660 cm^{-1} for aromatic C-C stretching, 1190 cm^{-1} for-NO₂for stretching, 1730 cm^{-1} for C=O stretching ,1570 cm^{-1} for C=O Amide stretching,1780 for -NO₂double bond stretch, 1160 cm^{-1} for C-N stretching.

6. **NMR** δ 3.8 d, for 1H, δ 2.7m for 3H, δ 2.6 d for 3H, δ 5.9 s for 1H, δ 7.6to 8.9 m for 6H.

Result and Discussion

Herein an effective approach was developed for the synthesis of o-substituted Schiff's Base Coumarin derivatives in simple method with good yield, by using a simple and non-hazardous solvent ethyl alcohol at room temperature. The ¹H NMR and IR Spectra of the intact five derivatives show above is good with respect to the structure. The synthesized derivatives may be implicated as an informative resource for pharmaceutical industry, Agriculture Field and poultry Science.

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