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Short Communication

Synthesis of various Biological active Thiazines

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Abstract

Pharmaceutical and biological active material Thiazines has been synthesized by nencki reaction followed by aldol condensatation. The overall yield found to be in range 55%.The all reactions are in mild condition. All steps are easy in handling.

Keywords: Nencki Reaction, Aldol Condensatation, Chalcone.

Introduction

A number of biological activities are associated with Thiazines[1]. Heterocyclic containing sulfur atoms has turned out to be potential chemotherapeutic and pharmacotherapeutic agents[2]. Various compounds with improved therapeutic properties can be obtained from Thiazine derivatives. Hence, this class of compounds has been extensively studied and still attracts the attention of organic chemist. Compounds with Thiazines structure was known to possess a wide spectrum of activities antifungal, anticancer, antiviral, insescticidal and is also precursors of different natural products[3]. Pyrimidine derivatives exhibit antagonistic activities on nuclic acid metabolism and several antifolic, antineoplastic and antimicrobial activities[4]. Thiazines and oxazines show anti-inflammatory and analgesics properties[5].

In view of various pharmological and biological activities of Isoxazolines, Pyrimidines, Thiazines and Oxazines, it proposed to synthesize different Isoxazolines, Pyrimidines, Thiazines and Oxazines. Ghiya et.al[6] studied the reaction of chalcone with hydroxyl ammonium chloride in dilute acetic acid and pyridine ethanol containing a few drops of HCl. In view of the above studies it was thought interesting to study the reaction of thiourea with chalcones in ethanolic solution[7].

Materials and Methods

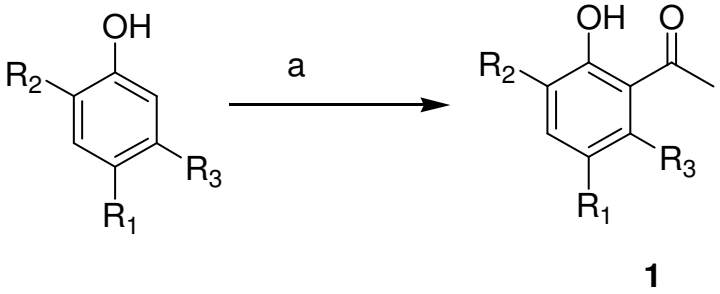
Synthesis of Ketone: In round bottom flask add (0.05 mol) and dissolved in 60ml of acetic acid. The reaction was refluxed till disappearance of starting material. The reaction mixture was dissolved in cold water. And product was separated in 25ml ethyl acetate. The organic layer was separated by separating funnel. Solvent was evaporated under reduced pressure and chromatographed over silica gel (100-200).

Synthesis of Chalcone: In the 100 ml round bottom flask a mixture of 0.05 mol of 1 and 0.06 mol 2 was added 10% KOH solution. The reaction was stirred for overnight. After completion of reaction the product was extracted by diethyl ether in separating funnel. The product was purified by crystallization in hot methanol.

Synthesis of Thiazines: In a round bottom flask was added 0.01mol of compound 3 and 0.02mol of thiourea in ethanolic KOH solution. The reaction mixture was stirred for 6hr. The compound was purified by recrystalization in petroleum ether: Benzene (50:50) to afforded pure Thiazine 4 is formed.

Results and Discussion

In view of synthesizing the desired compound the synthetic pathway involved the reaction of the *p*-t-butyl phenol with glacial acetic acid and zinc chloride. The reaction mixture refluxed till complete disappearance of the substituted phenol. The reaction mixture was refluxed with stirring for 8 hr, then cools the reaction mixture and poured in diluted acid in water containing ice. The formed compound 1 was purified and characterized. The characteristics appearance of 3350 cm^{-1} for phenolic –OH and 1780 cm^{-1} of compound 1 in IR spectroscopy confirm the formation of compound. This was observed due to intra molecular hydrogen bonding of phenol with ketone. With this further compound 1 was reacted with substituted aldehyde 2, in which 10% ethanolic KOH was added. The reaction mixture was stirred over night. The reaction mixture was poured in crushed ice, which was resulted in the formation of chalcone 3. The compound was characterized and used for further reaction[8]. The compound 3 was further treated with thiourea in ethanolic KOH solution. The reaction mixture was stirred for 6hr. The compound was purified by recrystalization in petroleum ether: Benzene (50:50) to afforded pure Thiazine 4 is formed.



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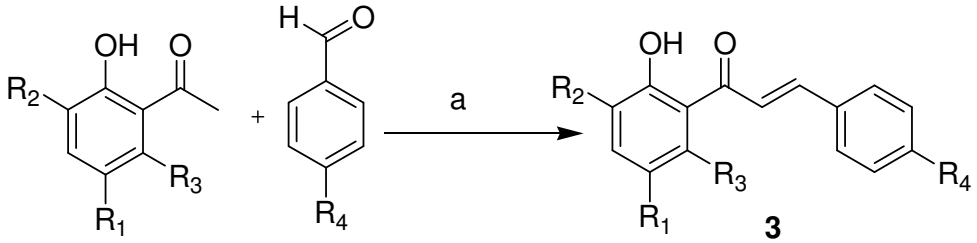
Scheme-1
CH_3COOH, $ZnCl_2$, 8hr, 70%



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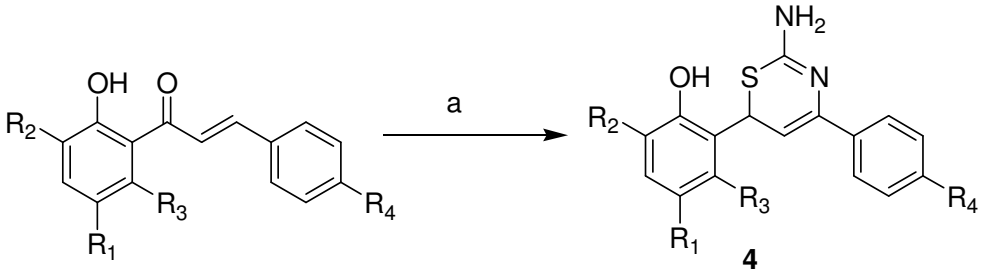
Scheme-2
10% KOH in Ethanol, 90%



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Scheme-2
Thiourea, Ethanol, KOH 6hr, 85%

Table-1
Reaction with substituted Phenol

Sr. No.	Comp.	R1	R2	R3	R4	M.P.	Yield in %
1	A1	t-Butyl	H	Cl	H	130°	70
2	A2		H	Br	Cl	135°	65
3	A3		H	F	Cl	148°	60
4	A4		H	H	Cl	120°	65
5	A5		H	CH_3	Br	132°	62
6	A6		H	H	Br	136°	70
7	A7		H	H	Br	140°	65

The substituted effect of phenol is listed in Table above. The structures were confirmed by IR (Perkin-Elmer 1800) and ^{1}NMR (Bruker AC 300F) data. The identity of the products was confirmed by the Knorr`s test and m.p with the authentic samples and their IR and ^{1}H NMR data.

Conclusion

In conclusion, we have synthesized various substituted ketones, which are useful for construction of various substituted thiazines. All products are having good yield. The various reactions required less reaction time at optimum reaction temperature.

References

1. Verma S.C. and Nasim M. (2002). Synthesis and characterization of new l-organy lsilatranes. *Indian Journal of Chemistry,* (41), 608-613.

2. Shim S.C., Youn Y.Z, Lee D.Y. and Kim T.J. (1996). Synthesis of indoles from n-substituted anilines and triethanolamine by a homogeneous ruthenjum catalyst. *Synthetic communications*, 26(7), 1349-1353.

3. Gevorgyan V., Larisa Borisova Vyater A., Ryabova V. and Lukevics E. (1997). A novel route to pentacoordinated organylsilanes and –germanes. *Journal of Organometallic Chemistry*, 548(2) 149-155.

4. Desai N.C., Bhatt N.B., Somani H.C. and Bhatt K.A., (2016). Synthesis and antimicrobial activity of some thiazole and 1,3,4,-oxadiazole hybrid heterocycles. *Indian Journal of Chemistry,* 55B(1)**,** 94-101.

5. Solankee A. and Patel R. (2014). Synthesis of some novel chalcone, pyrazolines, aminopyrimidines and their antimicrobial study. *Indian Journal of Chemistry,* 53B(11), 1448-1453.

6. Remers W.A. (1972). Heterocyclic Compounds; Houlihan, WJ, Ed. Interscience Publishers, New York, 25, 317.