

SYNOPSIS

The dissertation entitled, "STUDIES IN SYNTHESIS OF NEW POLYMETHINE NITRILE DERIVATIVES ", presented to the faculty of Science, Shivaji University Kolhapur, in partial fulfillment of the degree of the MASTER OF PHILOSOPHY in chemistry.

The dissertation consists of three chapters. The former part of Chapter I covers the Introduction, in which the basic aspects of cyano compounds such as structures, reactivity, synthesis of MDN and [-I] and [-M] effect of two CN groups on -CH₂ group of MDN are mentioned in brief. The later part of the same chapter includes a brief survey of the literature on use of MDN as a powerful synthon. The reactions involving Knoevenagel's condensation to give the derivatives with respect to method of synthesis, biological and industrial importance are predominantly mentioned. The chapter is finally concluded by, " Scope of the present work ". The last but not the least part of the chapter covers the reference work in support of Introduction and literature survey.

Chapter II is an experimental work and is divided in to three distinct parts, Part I : It describes the details of experimental methods used for the synthesis of 1,1 - Dicyano-2-phenyl-4-phenyl substituted -1,3- butadiene derivatives. The strategy employed for the synthesis of desired compound involves the reaction of acetophenone or substituted acetophenone with malononitrile [MDN] in CH₃COONH₄ and acetic acid in benzene acting as a solvent to form α -methyl benzylidene malononitrile or its derivatives [IIa]. The compound [IIa] again refluxed with Benzaldehyde or substituted Benzaldehyde in

CH₃COONH₄, acetic acid and benzene acting as a solvent to form derivatives of 1,1 - Dicyano-2-phenyl-4-substituted-1,3-butadienes, [SCHEME 1]. Both the steps in this reaction are carried out by using Dean and Stark trap to remove water quickly formed in the reaction. Both the reactions are Knoevenagel's condensation type. Further the physical, elemental and spectral analysis of the synthesised compounds is mentioned in detail.

Part II deals with the IR, UV, ¹HNMR spectra of newly synthesised derivatives of 1,1 Dicyano-2-phenyl, -4-substituted -1,3- butadienes This is the core part of the work.

Part III includes the detailed mechanistic path of the condensation reaction of our synthesis. The discussion of the condensation reaction such as role of CH₃COONH₄, ACETIC ACID etc. are mentioned in this part.

The structures of these newly synthesised compounds have been confirmed by M.P., UV, IR, ¹HNMR and elemental analysis. Percentage yield of the reaction is also mentioned.

Chapter III deals with evaluation of the antimicrobial screening of the newly synthesised compounds by Agar Plate diffusion assay method against Gram +ve and Gram -ve bacteria using tetracycline [Streptomycine] as standard compound. The work is further extended for carrying out antifungal activity of the same compounds by using *Aspergillus niger* fungi.

The bacterial species selected for antimicrobial screening were *Bacillus subtilis* [Gram +ve] and *E. coli* [Gram -ve] bacteria. Most of the compounds included in the present study have found to exhibit moderate to good antimicrobial activity against

Bacillus subtilis and *E. coli*. The activity of the compounds against bacteria may be due to increase in electron density of the structures due to [+M] and [-I] effect of the substituent groups. The activity may also be due to [-M] effect of the substituent groups responsible for little ionisation to reach the effective ionic concentration. Sabroud's agar plate diffusion assay method was used for the fungicidal activity. However, these compounds show slight activity against *Aspargilus niger* but is not up to the expectations.

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Research Guide

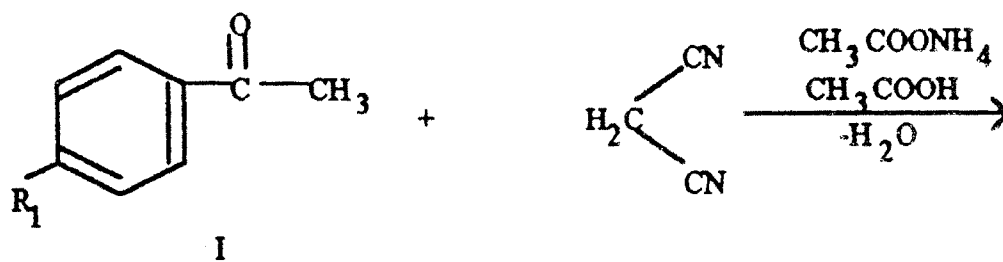
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SCHEME I



I	R ₁
a	H
b	OMe

