PSYNTHESIS OF A SUBSTITUTED CYCLOHEXENONE *VIA* MICHAEL ADDITION AND INTRAMOLECULAR ALDOL CONDENSATION (ROBINSON ANNULATION) OF CHALCONE WITH ETHYL ACETOACETATE

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ABSTRACT

SYNTHESIS OF A SUBSTITUTED CYCLOHEXENONE *VIA* MICHAEL ADDITION AND INTRAMOLECULAR ALDOL CONDENSATION (ROBINSON ANNULATION) OF CHALCONE WITH ETHYL ACETOACETATE

Ethyl 6-(4-methoxyphenyl)-4-phenylcyclohex-3-en-2-one-1-carboxylate was synthesized through Michael addition and intramolecular aldol condensation (Robinson annulation) of 4-methoxychalcone with ethyl acetoacetate using a strong base, natrium hydroxyde (NaOH) as catalyst. 4-mthoxychalcone was first prepared by aldol condensation of 4-methoxybenzaldehyde and acetophenone. The percentage yield of 4-methoxychalcone was 98.65% and its melting point is 74-75^{o}C.

Then 4-Methoxychalcone was reacted with ethyl acetoacetate through Michael addition and aldol cyclization to form the final substituted cyclohexenone product in 79% yield. The melting point of the substituted cyclohexenone product is 108 – 110^{o}C.

CHAPTER 1

INTRODUCTION

1.1 Background of study

The Robinson annulation is a tremendously useful procedure for the synthesis of six-membered ring compounds, particularly in the steroid field. The reaction is named after Sir Robert Robinson. It consists of a Michael addition to yield an intermediate (Michael adduct) which undergoes intramolecular aldol condensation to form the annulation product, a cyclohexenone derivative.

Annulation, derived from the Latin word annulatus (ringed) means "the formation of ring". In organic chemistry, this term is used to describe the process of building a ring onto a pre-existing system, cyclic or non-cyclic. The added ring, a 6-membered ring is commonly formed. The annulation reactions have proved themselves to be invaluable aids to synthetic chemists in the syntheses of such complex natural products as steroids, terpenes and alkaloids.