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

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Muhamad Nor Syafik b Yahya

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ABSTRACT

SYNTHESIS OF TWO CYCLOHEXENONE DERIVATIVES VIA MICHAEL ADDITION AND INTRAMOLECULAR ALDOL CONDENSATION (ROBINSON ANNULATION) OF CHALCONE WITH ETHYL ACETOACETATE

This project was to synthesize two different Robinson products from two different chalcones derivatives. The precursor for Robinson Product 1 is 4-chloro-4'-methoxychalcone and ethyl acetoacetate while the precursor for Robinson Product 2 is 3-nitrochalcone. Preparation of chalcone derivatives involves Aldol Condensation reaction which required basic medium to initiate the reaction. On the other hand, preparation of Robinson product involved reaction of Michael Addition reaction and Intramolecular Aldol Condensation (Robinson Annulation) reaction which also required basic medium to act as the catalyst which responsible to initiate the reaction. In this experiment, we use sodium hydroxide as the catalyst. Upon completion of this project, we have successfully obtained a good yield of both products. This evidence was supported through infrared, ^{1}H NMR and ^{13}C NMR spectroscopy analysis.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This project is to synthesis two cyclohexenone derivatives from 2 constituent chalcones. The products are assigned as Robinson Product 1 and Robinson Product 2 whereby the reactants for Robinson Product 1 are 4-benzaldehyde and 4-methoxyacetophenone. Reactants for Robinson Product 2 are 3-nitrobenzaldehyde and acetophenone. The reaction begins with formation of chalcone as an intermediate compound. The chalcone is formed from reaction of acetophenone and benzaldehyde in certain circumstances. In this project, we are synthesizing two different Robinson Products in the presence of sodium hydroxide. The chalcone derivatives formed are 4-chloro-4'-methoxychalcone and 3-nitrochalcone. This 4-chloro-4'-methoxychalcone and 3-nitrochalcone are the starting materials to synthesize Robinson Product 1 and 2 with ethyl acetoacetate.