

A Thesis for (M.Sc.) Degree in Chemistry

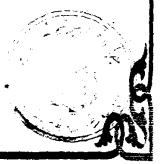
Presented by Naglaa Fawzy Hassan Mahmoud (B.Sc.)

> Supervised By Prof. Dr. M.A.I. Salem Prof. Dr. E.A. Soliman Dr. H. M. F. Madkour

رية المامات الجامية المعربيل ميتوو الجلما " إلى الم

547.06.

Chemistry Department
Faculty of Scinece
Ain Shams University
Cairo - Egypt
1997





``Some Addition Reactions With α,β -Unsaturated Carbonyl Compounds ``

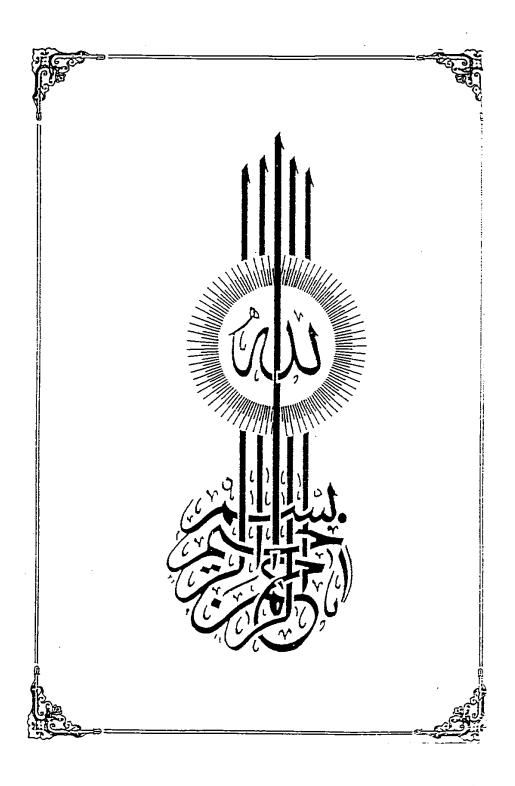
THESIS ADVISORS

Prof. Dr. M. A. I. Salem Prof. Dr. E. A. Soliman Dr. H. M. F. Madkour THESIS APPROVED

Head of Chemistry Department

Prof. Dr. A. F. M. Fahmy

1-For- Fahmy





Contents

Subject page
Acknowledgement
List of abbreviations
Summary
Intoduction1
Michael addition reactions of aliphatic α,β-ethylenic
ketones7
Michael addition reactions of aromatic α,β-unsaturated
ketones26
Michael addition reactions of Chalcones36
Michael addition reactions of heterocyclic α,β-unsaturated
ketones59
Michael addition reactions of cycloalkenes, cycloalkenonones
and steroids66
Michael addition reaction of β-dialkylaminocarbonyl compo-
unds and the corresponding quaternary ammonium salts72
Michael addition reaction of α,β-unsaturated nitriles76
Michael addition reaction of α,β- unsaturated esters79
Michael addition reaction of hydroxymethylene ketones89



Michael addition reaction of α,β-acetylenic ketones, acids	
and esters	91
Miscellaneous Michael addition reactions	93
Intramolecular Michael addition reaction	
Discussion	
Figures	
Experimental	
References	
Arabic summery	

<u>ACKNOWIEDGEMENT</u>

I would like to express may sincere gratitude and indebted to *Prof. Dr. M.A.I. Salem*, Preofessor of organic chemistry, Chemistry Departmet, Faculty of Science, Ain Shams University, He was always kind enough to suggest the line of research and follow the progress of the work with keen interist, guidance and valuable criticism.

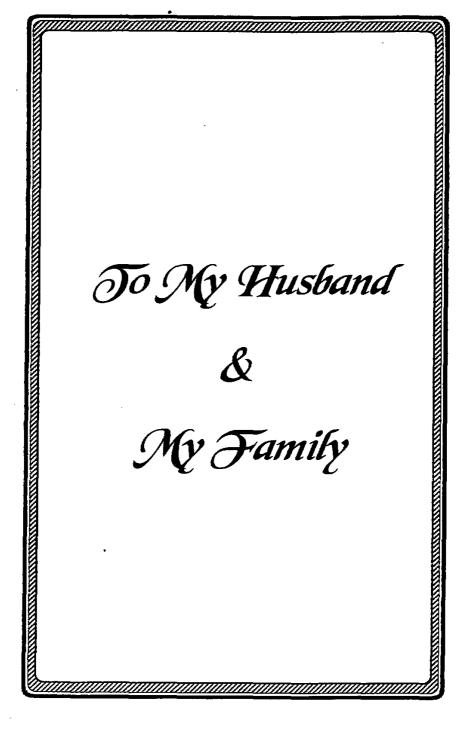
Also, I wish to acknowledge my sincere gratitude to **Prof.** Soliman, Professor of organic chemistry, Chemistry Department, Faculty of Science, Ain Shams University, for his valuable and continuous help during this research work.

I am deep indebted to *Dr. H.M.F. Madkour*, Assistant Prof. of organic chemistry, Chemistry Department, Faulty of Science, Ain Shams University, for his kind help, encouragement, meticulous supervision and continuos advice and for his valuable help and whose efforts made his humbel work to success. Aslo, I would like to thank him for making the chemicals available.

And I can't deny the efforts that paid by my colleagues whom I thank so much too.

Central Library - Ain Shams University

 \exists





List of Abbreviations

A c Acetyl

AIBN Azo-bis-isobutyronitrile

Bn Benzyl

Bu Butyl

DBU 1,8-<u>D</u>iaza<u>b</u>icyclo [5.4.0] <u>u</u>ndec-7-ene

DCC N,N-dicyclohexylcarbodiimide

DDQ 2,3-Dichloro-5,6-dicyano-1,4-benzoquinone

HMPA <u>Hexamethylphosphoramide</u>

Hexamethylphosphorous triamine

LDA <u>Lithium diisopropylamide</u>

LPDE Lithium perchlorate/ Diethyl ether

Lithium <u>h</u>exa<u>m</u>ethyl<u>dis</u>ilazide

PTC Phase transfer catalyst

p-tsa <u>p-toluenesulfonic acid</u>

Tetrabutylammonium fluoride

TEBA <u>Triethylbenzylammonium.</u>

THF <u>Tetrahydrofuran</u>

TMSOTF Trimethylsilyl trifluoromethane sulfonate.

Triton B Benzyl trimethylammoniumhydroxide

Yb(OTF)3 Ytterbium triflate