

NATIONAL TSING HUA UNIVERSITY

Department of Chemistry

Organic Reactions and Syntheses

CHEMISTRY 4530

Professor Reuben Jih-Ru Hwu

CONTENTS

- Chapter 1 Condensations and Related Reactions**
- I. Acyloin Condensation
 - II. Benzoin Condensation
 - III. Aldol Condensation
 - IV. Claisen Condensation
 - V. Dieckmann Condensation
- Chapter 2 Formation of Three-membered Rings: Epoxides and Cyclopropanes**
- I. Darzen's Condensation
 - II. Sharpless Epoxidation
 - III. Simmons-Smith Cyclopropanation
- Chapter 3 Reactions Involving Nitroso and Nitro Group**
- I. Barton Reaction
 - II. Nef Reaction
- Chapter 4 Reactions for the Formation of C-C Double Bonds**
- I. Knoevenagel Reaction
 - II. McMurry Olefination Reaction
 - III. Wittig Reaction
 - IV. Arbuzov Reaction
 - V. Peterson Olefination
 - VI. Corey-Winter Olefination Reaction
 - VII. Ramberg-Backlund Reaction
 - VIII. Chugaev Reaction

Chapter 5 Fragmentation Reactions

- I. Hofmann Degradation
- II. Cope Elimination
- III. Grob Fragmentation
- IV. Criegee Glycol Cleavage
- V. Bamford–Stevens Reaction
- VI. Eschenmoser Fragmentation
- VII. Wharton Reaction

Chapter 6 Sigmatropic Rearrangements

- I. Cope Rearrangement
- II. Claisen Rearrangement
- III. Carroll Rearrangement
- IV. Wittig Rearrangement

Chapter 7 Reductions and Oxidations

- I. Birch Reduction
- II. Bouveault–Blanc Reduction
- III. Clemmensen Reduction
- IV. Wolff–Kishner Reduction
- V. Meerwein–Ponndorf–Verley Reduction
- VI. Cannizzarro Reaction
- VII. Jones Oxidation
- VIII. Pfitzner–Moffatt Oxidation
- IX. Baeyer–Villiger Reaction

Chapter 8 Rearrangements and Migrations

- I. Bechmann Rearrangement
- II. Bamberger Reaction
- III. Benzidine Rearrangement
- IV. Favorskii Rearrangement
- V. Pinacol Rearrangement
- VI. Pummerer Rearrangement
- VII. Wagner–Meerwein Rearrangement
- VIII. Arndt–Eistert Synthesis
- IX. Wolff Rearrangement
- X. Lossen Rearrangement
- XI. Schmidt Rearrangement
- XII. Curtius Rearrangement

Chapter 9 Ring Formation

- I. Nazarov Cyclization
- II. Robinson Annulation

- III. Diels–Alder Reaction
- IV. Vinylcyclopropane Cyclopentene Rearrangement

Chapter 10 Syntheses of Class Compounds

- I. Furan Syntheses
- II. Pyrrole Synthesis
- III. Indole Synthesis
- IV. Pyridine Synthesis
- V. Malonic Ester Synthesis