

# 생유기화학 (*Bioorganic Chemistry*)

## 전단원 요약정리

Soonchunhyang University

Department of Chemical Engineering

Prof. Jungkyun Im

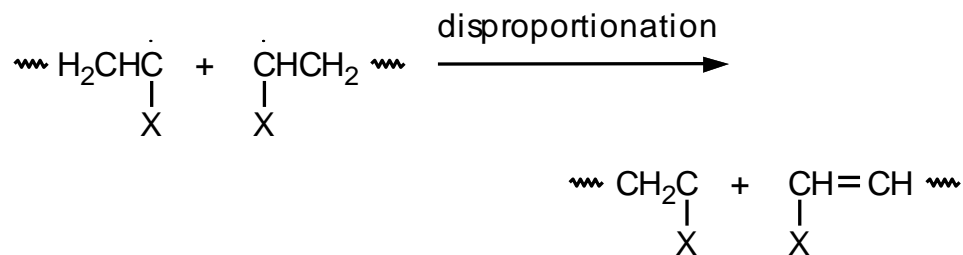
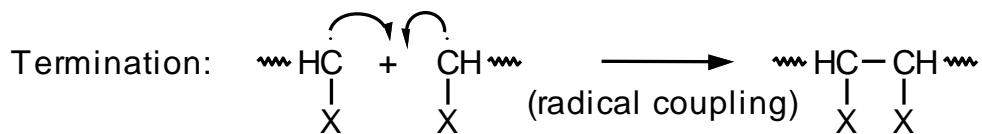
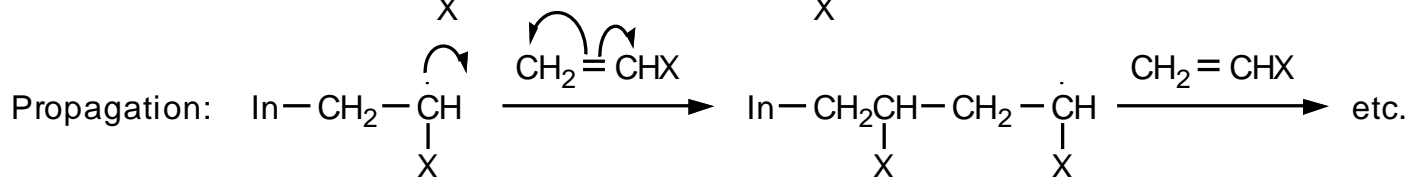
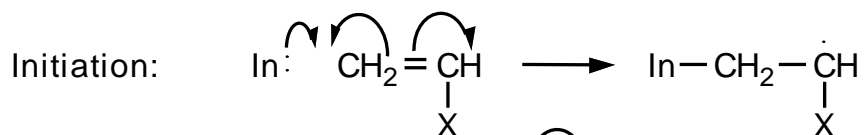
순천향대

나노화학공학과

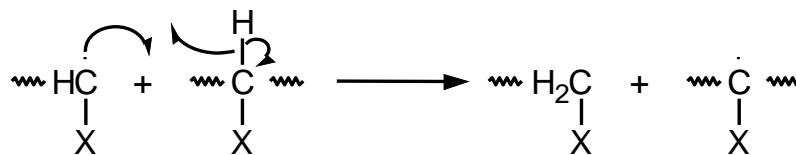
임정균 교수



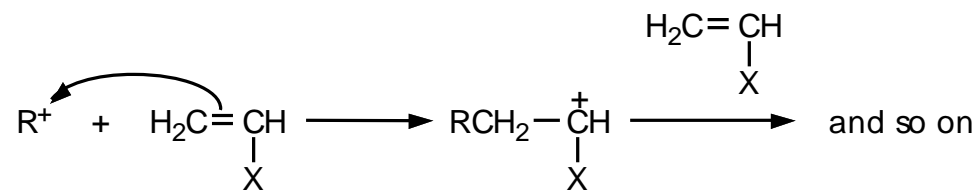
## Free-Radical Chain-Growth Polymerization



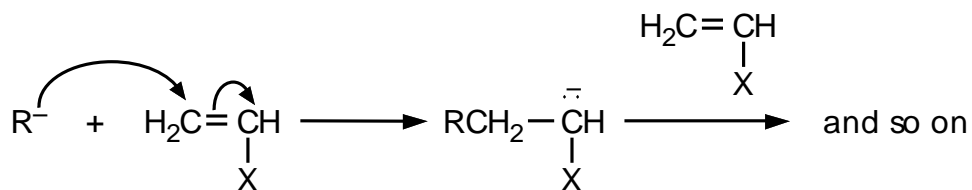
## Chain Transfer (Hydrogen Abstraction)



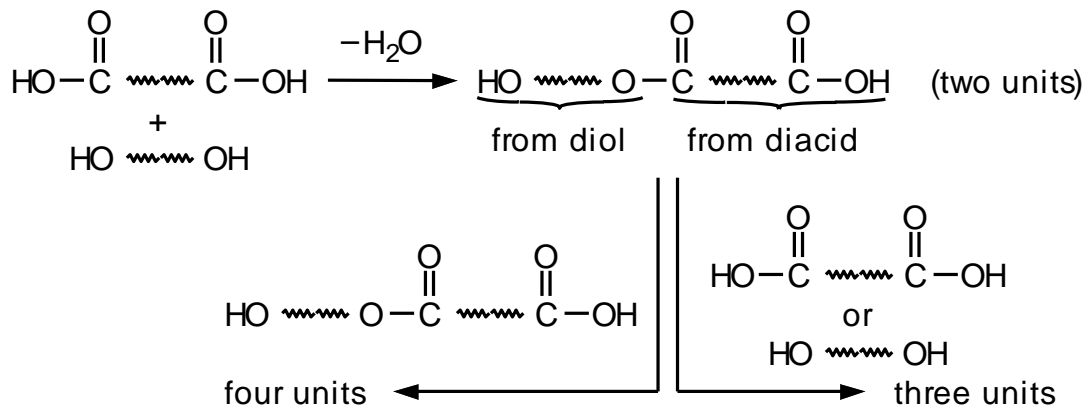
## Cationic Chain-Growth Polymerization

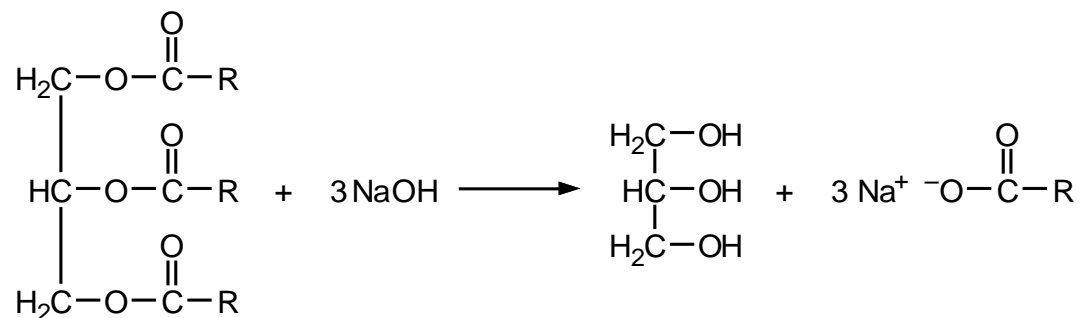
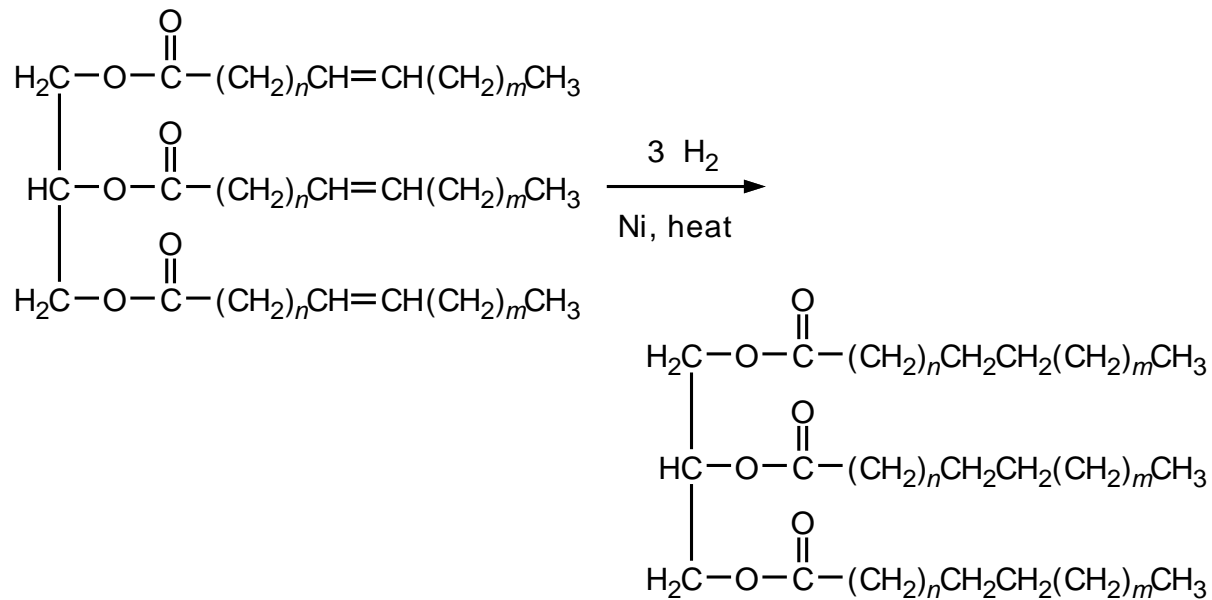


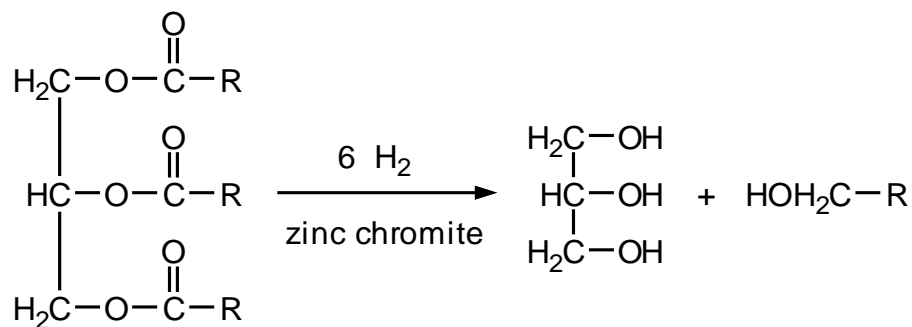
## Anionic Chain-Growth Polymerization



## Step-Growth Polymerization (illustrated for polyesters)



Saponification of a TriglycerideHydrogenation of a Triglyceride (Hardening)

Hydrogenolysis of a Triglyceride

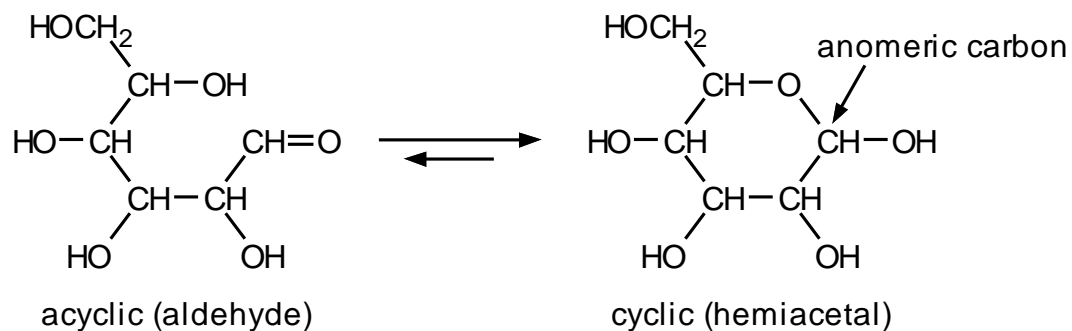
## 요점 사항

1. Know the meaning of: triglyceride, fatty acid, fat, oil, hardening of a vegetable oil, hydrogenolysis, soap, saponification.
2. Know the structures and common names of the acids listed in Table 15.1.
3. Given the name of a glyceride, write its structure.
4. Given the name or structure of a carboxylic acid, write the formula for the corresponding glyceride.

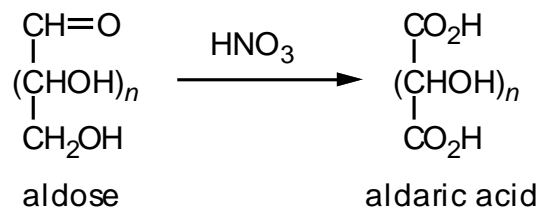
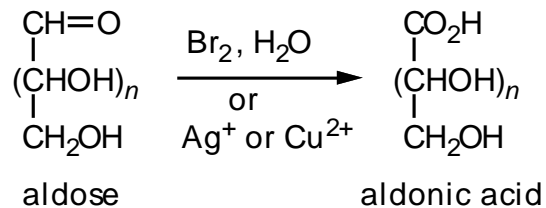
## Hydrolysis

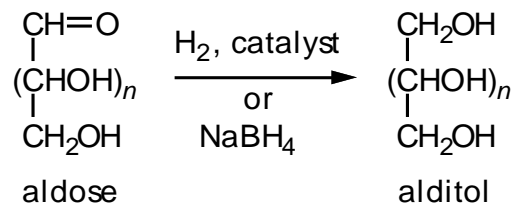
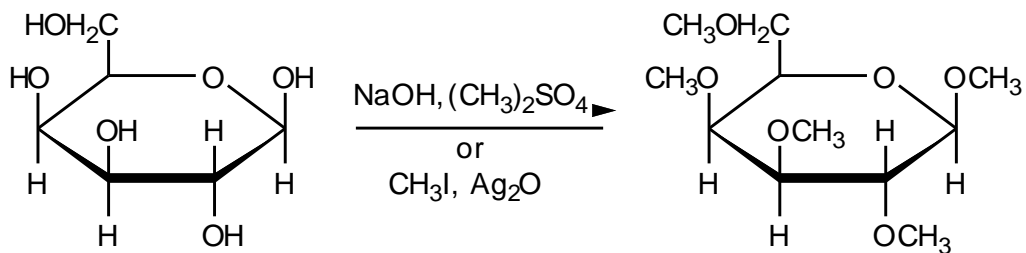
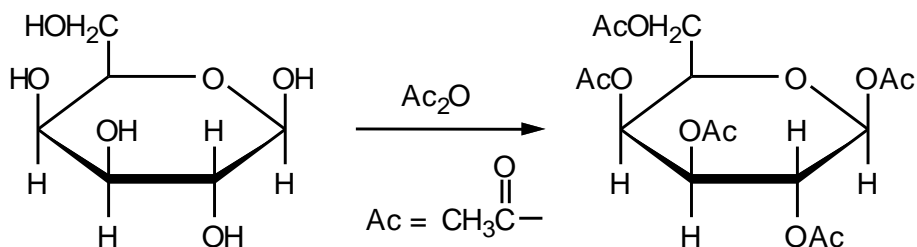
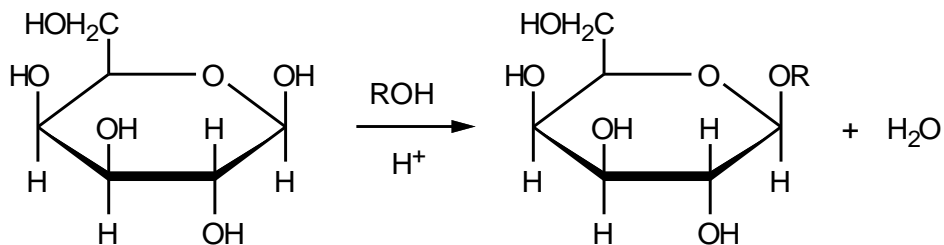


### Acyclic and Cyclic Equilibration

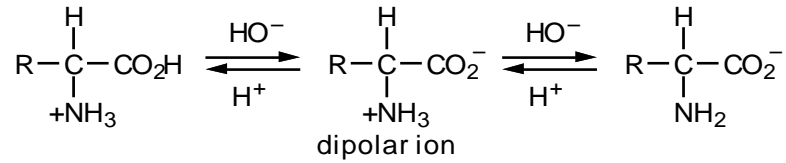


### Oxidation

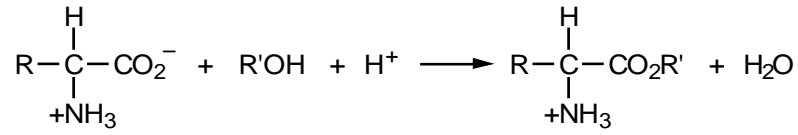


ReductionEsterification and EtherificationFormation of Glycosides

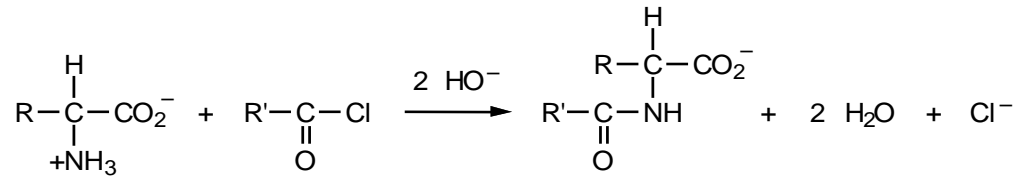
Dissociation of Amino Acids



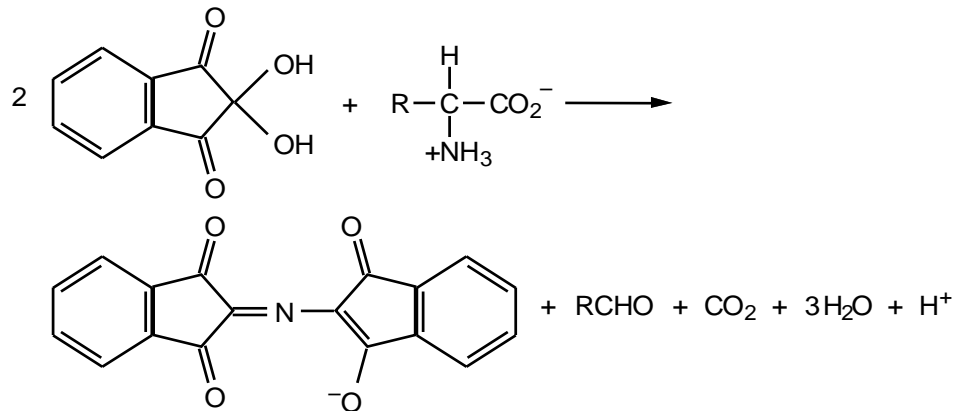
Esterification



Acylation



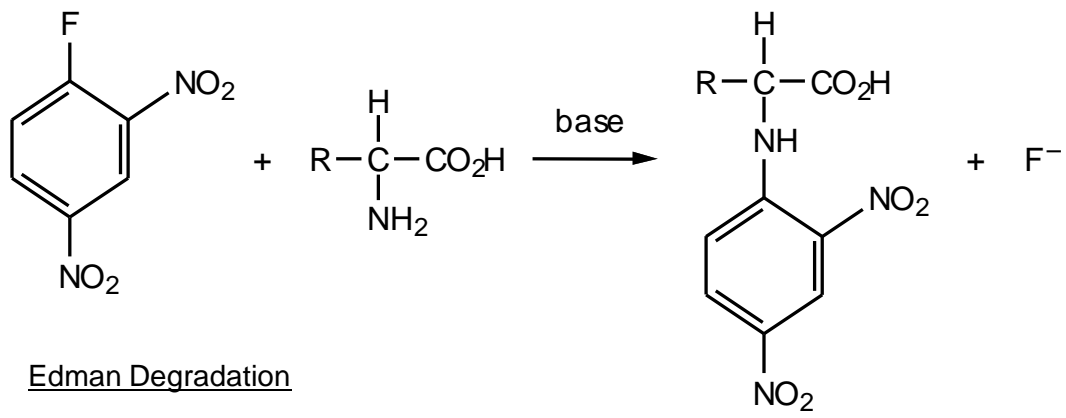
Ninhydrin Reaction



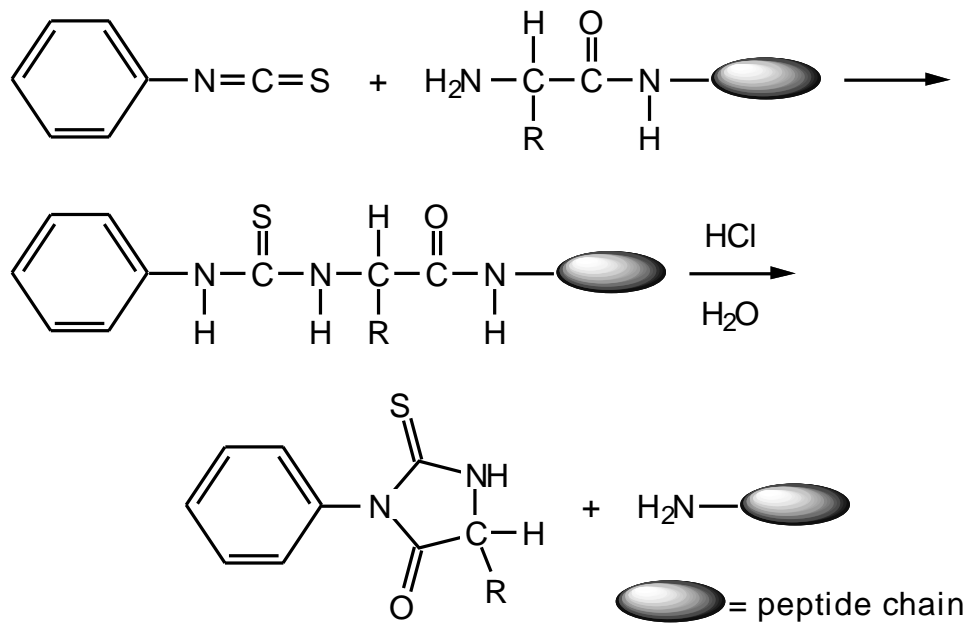


# Amino acid, peptide, protein

## Sanger's Reagent



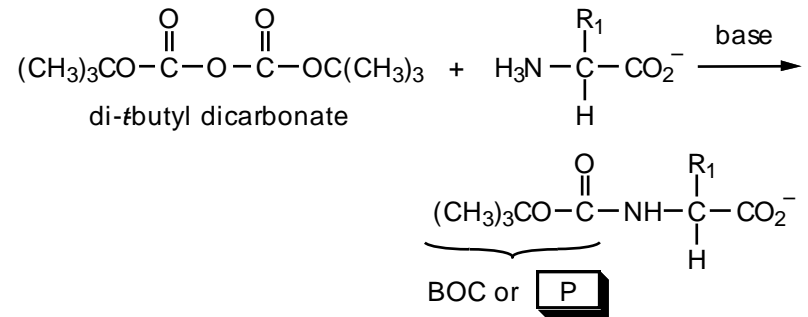
## Edman Degradation



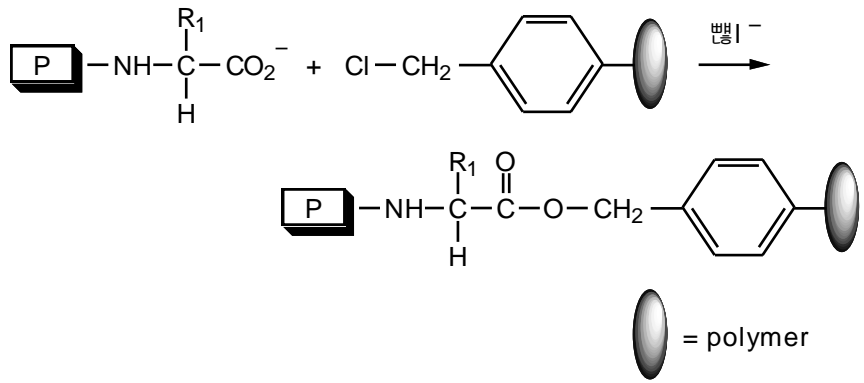
# Amino acid, peptide, protein

## Peptide Synthesis

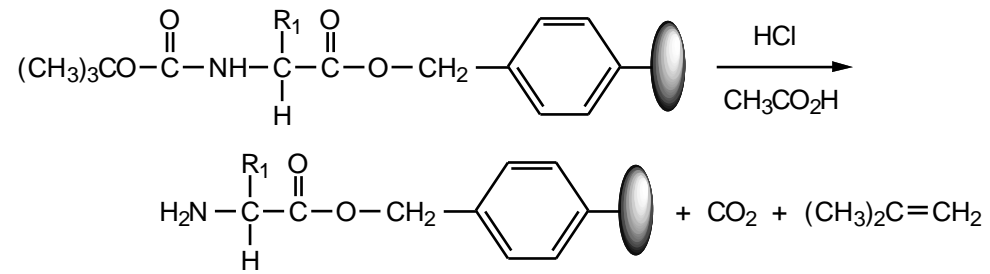
a. N-protection:



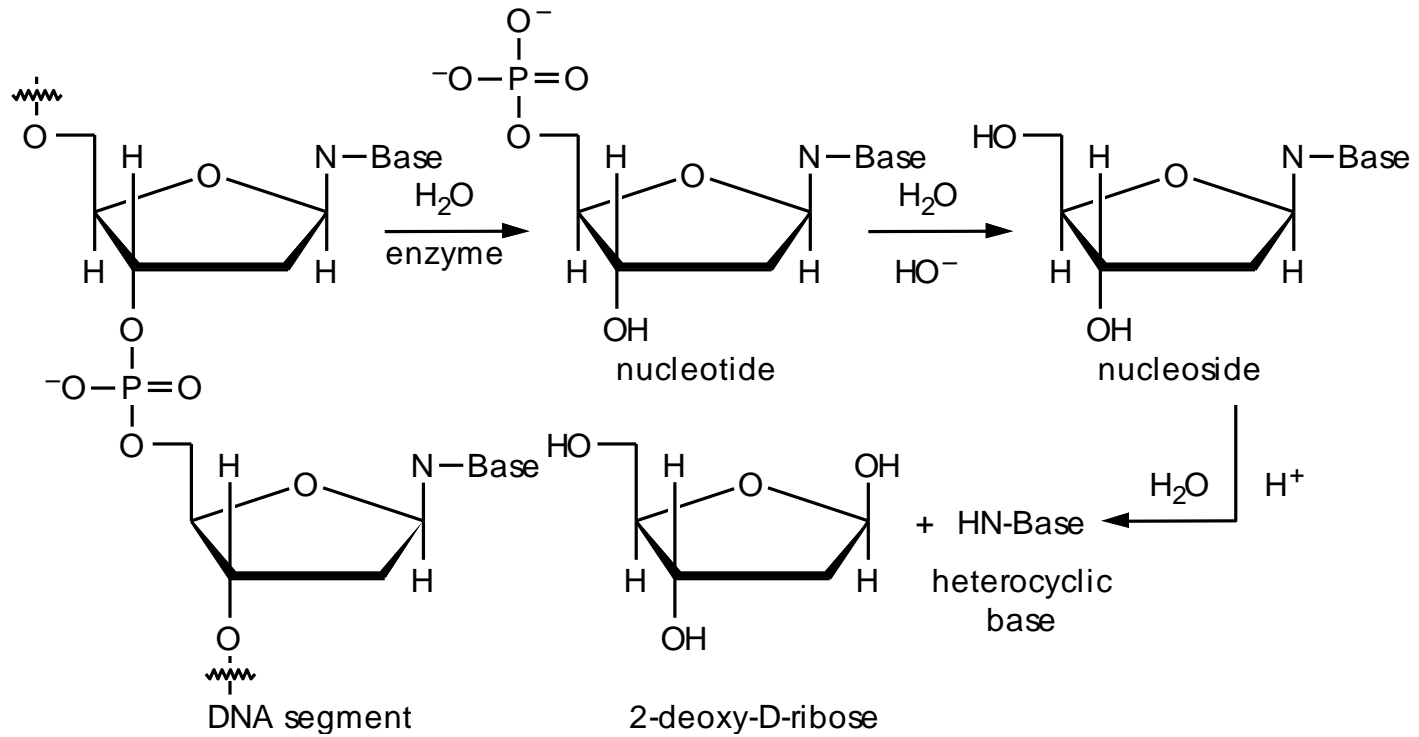
b. Polymer attachment:



c. Deprotection (removal of the protecting group):



# Hydrolysis of Nucleic Acids



1. Know the meaning of: nucleic acid, nucleotide, nucleoside.
2. Know the structures of: cytosine, thymine, adenine, guanine, uracil, 2-deoxy-D-ribose, D-ribose.
3. Know the meaning of: DNA, RNA, N-glycoside, pyrimidine base, purine base.
4. Given the name, draw the structure of a specific nucleoside.
5. Write an equation for the hydrolysis of a specific nucleoside by aqueous acid. Write the steps in the reaction mechanism.
6. Given the name, draw the structure of a specific nucleotide.
7. Write an equation for the hydrolysis of a specific nucleotide by aqueous base.
8. Draw the structure of an N-glycoside and an O-glycoside.
9. Given the name or abbreviation for a DNA or RNA nucleotide or nucleoside, draw its structure.
10. Draw the primary structure of a segment of an RNA or DNA chain.
11. Explain why only pyrimidine-purine base pairing is permissible in the double helix structure.
12. Describe the main features of the secondary structure of DNA.
13. Explain, with the aid of structures, the role of hydrogen bonding in nucleic acid structures.
14. Describe the main features of DNA replication.
15. Given the base sequence in one strand of a DNA molecule, write the base sequence in the other strand, or in the derived *mRNA*. Conversely, given a base sequence for *mRNA*, write the base sequence in one strand of the corresponding DNA.
16. Given a synthetic polyribonucleotide and the peptide sequence in the resulting polypeptide, deduce the codons for the amino acids.
17. Describe the main features of protein biosynthesis.
18. Explain the different functions of messenger, ribosomal, and transfer RNA.
19. Know the meaning of: codon, anticodon, genetic code, transcription, polymerase chain reaction.