

P. P. SAVANI UNIVERSITY

Forth Semester of B.Sc. Examination
December-2021

SSCH2100- Reaction Intermediates in Organic Chemistry

22.12.2021, Wednesday Time: 12:00 p.m. to 02:30 p.m. Maximum Marks: 60

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

Section-I (Total Marks - 30)

Q.1 Short Questions

[10]

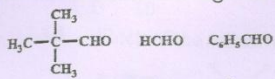
1.1 Objectives

[05]

1.1a The energy gap between S^1 and T^1 is _____.

- A 5 cal/mole
- B 5 kcal/mole
- C 5 J/mole
- D 5 kJ/mole

1.1b Which of the following will not give aldol condensation?



- A 1
- B 2
- C 3
- D All of these

1.1c When bis/vicinal diols are treated with acid, they may be rearrange to give aldehyde or ketone, this reaction is known as _____.

- A Arndt-Estert reaction
- B Pinacol-pinacolone rearrangement
- C Bamford steven's rearrangement
- D Carbylamine reaction

1.1d Carbocations are electron deficient carbon species, which contain ___ electrons.

- A 4
- B 5
- C 6
- D 7

1.1e By treating alkyl bromide with metal, we get _____.

- A Carbocation
- B Carbanion
- C Free radical
- D Carbene

1.1f Cis-2-butene react with singlet carbene gives _____.

- A Cyclopentane derivative

- B Cyclobutane derivative
 - C Cyclopropane derivative
 - D No product
- 1.1g Decomposition of diazonium salt produce _____.
- A Carbocation
 - B Carbanion
 - C Free radical
 - D Carbene
- 1.1h In Yield compound, carbanion is directly attached to ____.
- A Mg
 - B P
 - C Al
 - D O
- 1.1i Grignard behave as _____.
- A Carbocation
 - B Carbanion
 - C Free radical
 - D Carbene
- 1.1j Diazomethane on reaction with acid chloride followed by rearrangement is known as _____.
- A Arndt-Estert reaction
 - B Pinacol-pinacolone rearrangement
 - C Bamford steven's rearrangement
 - D Carbylamine reaction

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) [05]

- 1.2a What is cumene?
- 1.2b Give reaction of Kolbe's electrolysis reaction.
- 1.2c Give factor affecting on stability of Carbocation.
- 1.2d Give order of stability of carbanion.
- 1.2e What is final product of Dinone-Phenol reaction?

Q.2 Short Notes (Attempt any two) [06]

- A Write a short notes on Reimer Tiemann reaction.
- B Discuss in detail - Aldol Condensation.
- C What is Pinacol-Pinacolon? Explain with mechanism.

Q.3 Explain in detail (Attempt any two) [14]

- A Give detail account on chemical reaction of Carbocation.
- B With suitable examples discuss stability of carbanion.
- C Explain how hyperconjugation and inductive effect plays and important role in the stability of carbocation.

Section-II (Total Marks - 30)

Q.1 Short Questions

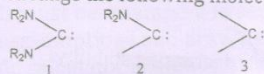
[10]

1.1 Objectives

1.1a Which of the following is used to check primary amine?

- A Arndt-Estert reaction
- B Pinacol-pinacolone rearrangement
- C Bamford steven's rearrangement
- D Carbylamine reaction

1.1b Arrange the following molecule according to their increasing order of stability.



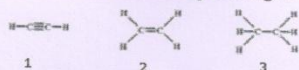
- A 1, 2, 3
- B 2, 1, 3
- C 3, 2, 1
- D All have same stability

1.1c How many π -electron is present in the following structure?



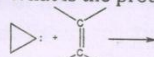
- A 4
- B 6
- C 8
- D 10

1.1d Which of the following has highest s-character?



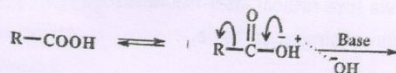
- A 1
- B 2
- C 3
- D 2 and 3

1.1e What is the product for following reaction?



- A
- B
- C
- D

1.1f



- A R^{\cdot}
- B R^{+}
- C R^{\ominus}
- D R^{\ominus}

1.1g Which of the following method produce triplet carbene?

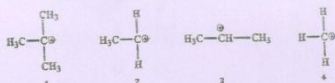
- A From ketene

- B From Acyldiazomethane
- C From Benzophenone
- D From Epoxide.

1.1h Carbocation will not generate by addition of acid to the following compound containing oxygen atom?

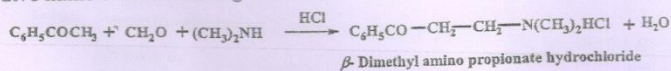
- A Amide
- B Ester
- C Alcohol
- D Ether

1.1i Arrange the following structures according to their decreasing stability.



- A 1>2>3>4
- B 1<2<3<4
- C 1>3>2>4
- D 1<3<2<4

1.1j Give name of the following reaction?



- A Stobbe condensation
- B Mannich reaction
- C Michael reaction
- D Dieckmann condensation

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) [05]

- 1.2a What is auto oxidation?
- 1.2b Give order of stability of free radical.
- 1.2c Give examples of triplet carbene.
- 1.2d What is short lived free radical?
- 1.2e Give examples of different numbers of hyper conjugative forms.

Q.2 Short Notes (Attempt any two) [06]

- A Give final product of Wagner-Meerwein rearrangement with mechanism.
- B What is Sandmeyer reaction? Explain with mechanism.
- C Explain Benzoin Condensation

Q.3 Explain in detail (Attempt any two) [14]

- A How will you Generate long lived free radicals?
- B Explain alicyclic bromination via free radical intermediate.
- C Explain methods of preparation of singlet carbene.