

Exam. Code : 210403

Subject Code : 3821

M.Sc. Chemistry 3rd Semester

ORGANIC SYNTHESIS

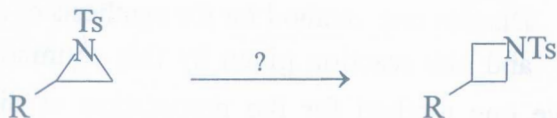
Paper—Course-XVII

Time Allowed—Three Hours] [Maximum Marks—50

SECTION—A

Note :— All questions are compulsory. Each question carries 1 mark.

1. How four-member rings are different in chemical properties from their open chain analogues ? Explain with suitable example.
2. Outline one method for synthesis of (R) muscone.
3. Give one ring opening reaction of thiranes.
4. Discuss the halogenation reaction of anthracene.
5. Cis- butenedioic anhydride adds more readily to anthracene across 9,10 positions rather than 1,4 positions. Why ?
6. What precautions should be taken care of while carrying the Arndt-Eistert synthesis ?
7. Identify the reagents and reaction conditions. Justify the formation of product.



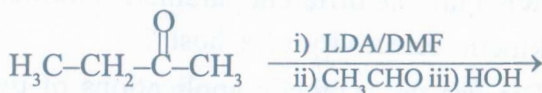
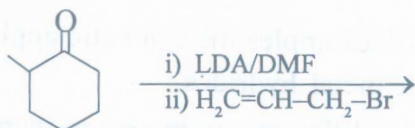
8. Why is water a better hydrogen bond donor than methanol whereas methanol is a better hydrogen bond acceptor ?
9. Suggest a synthesis for 2, 7-diphenyloxepin.
10. Outline the preparation of lithium indenyl compounds. Enlist various precautions to be considered while carrying out the reaction. 10×1=10

SECTION—B

Note :— Attempt any **EIGHT** questions. Each question carries **3** marks.

1. Discuss the inherent migratory aptitude of different groups by taking example of Pinacol-Pinacolone rearrangement.
2. How can you obtain n-butanol from oxirane ? Give suitable reasoning for your answer.
3. What will happen if phenanthrene is mixed with potassium dichromate and concentrated sulphuric acid ? Give suitable reason for your answer.
4. Make a comparative study of aromatic behaviour of linear and non-linear *ortho* fused polynuclear hydrocarbons.
5. (a) Elaborate a synthetic scheme for the synthesis of 2, 4-dimethylazetidine from 3, 5-dimethylisoxazole.
(b) Discuss one method for the synthesis of coumarin and one reaction given by this coumarin.
6. Give one method for the preparation of diazepines and two rearrangement reactions given by diazepines.

- Discuss the synthesis of civiton and catenoids.
- How Wilkinson's catalyst can be used for the hydrogenation of an alkenes? Explain with mechanism.
- Outline the differences between a ligand and a macrocycle. Support your answer with examples.
- Identify the product in each of the following :

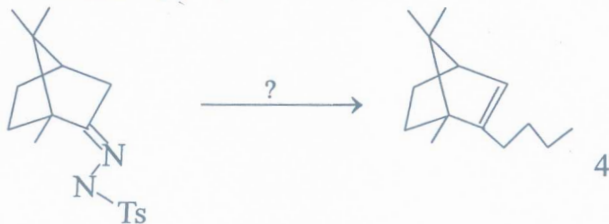


- Discuss the mechanism of a reaction wherein an oxime on treatment with concentrated sulphuric acid furnishes a substituted amine. Name the reaction also.
- An α, β -unsaturated ketone in the presence of dialkyl lithium cuprate is converted to saturated ketone. Why this is so? Explain with mechanism. $3 \times 8 = 24$

SECTION—C

Note :— Attempt any **TWO** questions. Each question carries **8** marks.

- (a) Name the reaction and provide the reagents required and appropriate mechanism.

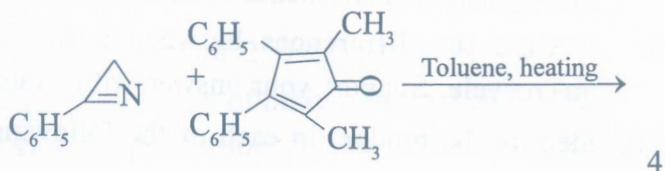


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(Contd.)

- (b) Complete and outline the mechanism of the following reaction :



- 4
2. (a) Discuss with examples the synthetic applications of complex metal hydrides. 4
- (b) What are the different parameters to increase the kinetic selectivity of a host? 4
3. (a) Discuss the synthetic applications of pyrones. 4
- (b) Discuss the role of hydrophobic effect in increasing the binding ability of a host. 4
4. (a) Giving suitable example, discuss the mechanism of Wagner-Merwein reaction. Highlight the memory effect in the mechanistic studies. 4
- (b) With the help of suitable examples, discuss the synthetic applications of :
- (i) Crown ethers and Merrifield resin
- (ii) Baker yeast. 2×2