

# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Sc. DEGREE EXAMINATION – CHEMISTRY

THIRD SEMESTER – NOVEMBER 2022

PCH 3601 – APPLIED ORGANIC CHEMISTRY

Date: 02-12-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

## Part-A

Answer ALL questions.

(10 × 2= 20)

1. Illustrate the different types of flow.
2. Define Leaching and extraction methods.
3. Mention any two applications of organoselenium compounds.
4. Schematically represent Barbier reaction.
5. Write any two best polymer support for a reaction and justify with reason.
6. How is polystyrene carbodiimide synthesized?
7. Give the chemical reaction responsible for Bhopal gas tragedy.
8. What is meant by the term “atom economy”? Give an example.
9. Define the term “phase transfer catalyst”.
10. List any four advantages of microwave assisted organic synthesis.

## Part-B

Answer any EIGHT questions.

(8 × 5= 40)

11. Explain the significance of Reynold’s number in predicting the nature of a flow system.
12. Describe the industrial nitration process.
13. Compare the reactivities of butyl lithium with organocopper reagents.
14. Analyze the mechanism of Suzuki reaction.
15. Exemplify the application organocobalt reagents in Pauson-Khan reaction.
16. Explain the characteristic requirements of a polymer support for an organic synthesis.
17. Write the mechanism of Wittig reaction and acylation with polystyrene anhydride..
18. Write short note on “greener solvents”.
19. Compare the synthesis of adipic acid by conventional method and greener approach.
20. Explain any five examples of organic reactions in supercritical carbon dioxide.
21. Explain the advantages of phase transfer catalysts.
22. Illustrate the instrumentation and applications of sonochemistry.

## Part-C

Answer any FOUR questions.

(4 × 10= 40)

- 23a. How would you scale up a sulphonation reaction from the laboratory to the pilot plant and to an industrial level?
  - b. Assess the separation methods used for solid and liquid mixtures.
- 24a. Describe the types of reactions involved in a typical organopalladium reaction with examples. (5)
  - b. Demonstrate the application of Grignard reagents in C-C bond-forming reactions. (5)
- 25a. Establish the versatility, predictable selectivities, and functional group tolerance of samarium iodide reagents in organic synthesis. (5)
  - b. Compare the scheme of procedure for polymer supported synthesis with conventional method.
26. Explain the following polymer supported organic synthesis with an example for each.
  - (i) Intramolecular cyclisation
  - (ii) Moffatt oxidation
  - (iii) Diazo transfer reaction
  - (iv) Oxidation by polymer supported peracid
  - (v) Oxidation by polymer supported chromic acid
27. Illustrate the twelve principles of green chemistry in detail.
- 28a. Write the mechanism of a phase transfer catalyzed reaction using suitable example.
  - b. Explain the effects of ultrasound in the following reactions:
    - (i) Esterification
    - (ii) Diels-Alder addition
    - (iii) 1,3-dipolar cycloaddition

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