SNS COLLEGE OF PHARMACY AND HEALTHSCIENCES

Question Bank - Unit III

PHARMACEUTICAL ORGANIC CHEMISTRY-I (BP202T,)

Long Answer Questions (10 Marks)

1. Explain the mechanism of electrophilic addition reactions in alkenes. Discuss the addition of hydrogen halides to unsymmetrical alkenes, including Markovnikov's rule with examples. Provide a detailed account of the reaction mechanism and the role of carbocation stability in determining the product.
2. Describe the free radical addition reactions of alkenes. Explain the peroxide effect leading to anti-Markovnikov orientation with suitable examples. Discuss the factors affecting the stability of free radicals in these reactions.
3. Compare and contrast SN1 and SN2 reactions of alkyl halides. Discuss the kinetics, stereochemistry, and factors affecting the reactivity of alkyl halides in SN1 versus SN2 mechanisms. Provide examples to illustrate each mechanism.
4. Discuss the structure and stability of conjugated dienes. Explain the mechanism of electrophilic addition to conjugated dienes, including 1,2- and 1,4-addition products with examples. How does the stability of conjugated dienes differ from isolated dienes?
5. Explain the nucleophilic substitution reactions of alkyl halides. Discuss the effect of substrate structure, nucleophile strength, and solvent on the rate of SN2 reactions. Provide examples to demonstrate the rearrangement of carbocations in SN1 reactions.

Section B: Short Answer Questions (5 Marks)

Answer any 10 questions. Each question carries 5 marks.

1. Explain Markovnikov's rule with an example of the addition of HBr to propene.
2. Describe the mechanism of the anti-Markovnikov addition of HBr to an alkene in the presence of peroxides.
3. Discuss the stereochemistry of SN2 reactions and why they proceed with inversion of configuration.
4. What are conjugated dienes? Explain their stability compared to isolated dienes with an example.
5. Describe the role of solvent polarity in SN1 and SN2 reactions of alkyl halides.
6. Explain the 1,2- and 1,4-addition reactions in conjugated dienes with an example.
7. Discuss the factors affecting the reactivity of alkyl halides in SN1 reactions.

8. What is the electromeric effect? Explain its role in electrophilic addition reactions of alkenes.
9. Describe the order of reactivity of alkyl halides in SN2 reactions and explain why.
10. Explain the concept of carbocation rearrangement in SN1 reactions with an example.

Section C: Very Short Answer Questions (2 Marks)

Answer all 10 questions. Each question carries 2 marks.

1. Define Markovnikov's rule.
2. What is the peroxide effect in alkene reactions?
3. What is the key difference between SN1 and SN2 reactions?
4. Define conjugated dienes with an example.
5. What is the role of a nucleophile in SN2 reactions?
6. Name two factors that stabilize a carbocation in SN1 reactions.
7. What is meant by 1,4-addition in conjugated dienes?
8. Why are tertiary alkyl halides more reactive in SN1 reactions?
9. What is an electrophilic addition reaction? Give one example.
10. Why do SN2 reactions prefer polar aprotic solvents?