SNS COLLEGE OF PHARMACY AND HEALTHSCIENCES

Question Bank - Unit IV

PHARMACEUTICAL ORGANIC CHEMISTRY-I (BP202T,)

Long Answer Questions (10 Marks)

1. **Explain the preparation of alkyl halides from alcohols and alkenes.** Discuss the mechanisms involved in the conversion of alcohols to alkyl halides using hydrogen halides and phosphorus halides, and describe the addition of hydrogen halides to alkenes, including Markovnikov's rule.
2. **Describe the nucleophilic substitution reactions of alkyl halides.** Differentiate between SN1 and SN2 mechanisms, including their kinetics, stereochemistry, and factors affecting the reaction rates, with suitable examples.
3. **Discuss the preparation and reactivity of aryl halides.** Explain why aryl halides are less reactive than alkyl halides in nucleophilic substitution reactions, and describe the Dow process and Sandmeyer reaction for their preparation.
4. **Elaborate on the elimination reactions of alkyl halides.** Compare E1 and E2 mechanisms, including their reaction conditions, stereochemistry, and the role of the base, with examples of products formed.
5. **Explain the Grignard reagent formation from alkyl halides and its applications.** Discuss the preparation of Grignard reagents, their reactivity, and their use in the synthesis of alcohols, with reaction schemes and conditions.

Short Answer Questions (5 Marks)

1. Describe the mechanism of the SN2 reaction for alkyl halides, highlighting the role of the nucleophile and substrate structure.
2. Explain the preparation of alkyl halides using the halogenation of alkanes, including the limitations of this method.
3. Discuss the role of solvent polarity in influencing SN1 and SN2 reactions of alkyl halides.
4. What is the Saytzeff rule? Explain its application in the elimination reactions of alkyl halides with an example.
5. Describe the preparation of aryl halides using the electrophilic aromatic substitution method, with an example.
6. Explain the Williamson ether synthesis involving alkyl halides, including reaction conditions and limitations.
7. Discuss the stereochemistry of SN2 reactions, particularly the concept of inversion of configuration, with an example.

8. Compare the reactivity of primary, secondary, and tertiary alkyl halides in nucleophilic substitution reactions.
9. Describe the role of alkyl halides in the Wurtz reaction, including its mechanism and synthetic utility.
10. Explain the preparation of alkyl halides from alcohols using thionyl chloride, including the reaction mechanism.

Very Short Answer Questions (2 Marks)

1. Define alkyl halides and give one example.
2. What is the key difference between SN1 and SN2 reactions?
3. Name the reagent used in the Sandmeyer reaction for preparing aryl halides.
4. What is the product formed when ethyl bromide undergoes an E2 reaction with a strong base?
5. Why are aryl halides less reactive than alkyl halides in nucleophilic substitution?
6. What is the role of silver nitrate in the preparation of alkyl halides from alcohols?
7. Write the general structure of a Grignard reagent.
8. What is the significance of Markovnikov's rule in the addition of HX to alkenes?
9. Name one catalyst used in the halogenation of alkanes to form alkyl halides.
10. What is the major product of the reaction between 2-chloropropane and sodium ethoxide?