

Carbohydrates and Polymers

Questions:

- Q1. Name an aldohexose other than D-glucose that is oxidized to D-glucaric acid by nitric acid. What is the another name for D-glucaric acid. Name another pair of aldohexoses that are oxidized to identical aldaric acids. Explain with reactions involved.
- Q2. What monosaccharides would be formed in a modified Kiliani-Fischer synthesis starting with D-xylose and L-threose. Write all the steps involved.
- Q3. Explain Amadori rearrangement in the case of Glucose and Fructose. How can we distinguish chemically between 2-deoxy-D-glucose and 3-deoxy-D-glucose
- Q4. How is glucose prepared from sucrose? Also discuss briefly the evidences which led to the open and cyclic structure of D-glucose.
- Q5. Write all the stereoisomeric structures possible for aldopentoses and aldohexoses . How are their configuration established.
- Q6. What are polysaccharides? Discuss briefly the structures of starch and cellulose. Also enumerate their uses to the mankind.
- Q7. Discuss the various methods used for methylating sugars? Taking glucose as an example, how can methylated sugar be used to determine the ring size of monosaccharide.
- Q8. Discuss the mechanism of free radical vinyl polymerization. Illustrate the role of chain transfer reactions in controlling the average molecular mass of a polymer.
- Q9. Give brief description of natural and synthetic rubbers. What is Vulcanization? How does it improve the properties of natural and synthetic rubbers?
- Q10. What do you understand by step growth polymerization? Illustrate the process of condensation polymerization with particular emphasis on the formation of polyesters and polyamides.
- Q11. What are the polymers manufactured by condensation of formaldehyde with urea and phenols? What is their significance?
- Q12. What is Ziegler-Natta polymerization? How many types of head-to-tail polymers are possible in vinyl polymerisation? Discuss the significance of some important vinyl polymers.

Q13. What do you mean by chain growth polymerization? With suitable example, discuss the mechanism of anionic and cationic polymerization.