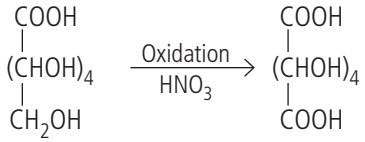
CHAPTER
14

Biomolecules

TRY YOURSELF

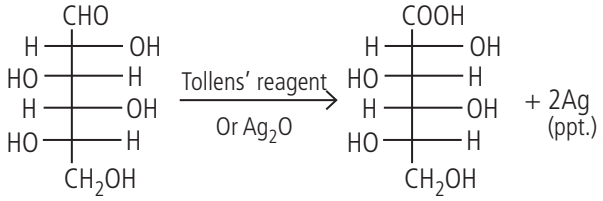
ANSWERS

1. On oxidation with nitric acid gluconic acid yields a dicarboxylic acid, saccharic acid.



Gluconic acid Saccharic acid

2.



L-Glucose Gluconic acid

3. Despite having the aldehyde group, it does not form the hydrogen sulphite addition product with $NaHSO_3$, this could not be explained by open chain structure of glucose.

4. Lactose ($C_{12}H_{22}O_{11}$) on hydrolysis with dilute acid yields an equimolar mixture of β-*D*-glucose and β-*D*-galactose.

5. Glucose or sucrose contain several hydroxyl groups in their molecules which form hydrogen bonding with water molecules due to which they dissolve in water. On the other hand compounds like benzene or cyclohexane cannot form hydrogen bonds with water molecules, so they are insoluble in water.

6. Prosthetic group is the non-amino acid component that is part of the structure of the conjugated protein being tightly linked to the protein.

Glycoprotein → Sugar present as prosthetic group.

Nucleoprotein → Nucleic acid present as prosthetic group.

7. Two characteristics features of enzymes are:

(i) They are highly specific in nature.

(ii) They show maximum efficiency at an optimum pH(6-7.7) and temperature (15-40°C)range.

8. The boiling of an egg is a common example of denaturation of protein present in the white portion of an egg.

The albumin present in the white of an egg gets coagulated when the egg is boiled hard. The soluble globular protein present in it is denatured resulting in the formation of insoluble fibrous protein.

9. Enzymes are often referred as biocatalysts. They catalyse reactions that are taking place in the body.

10. The amino acids exist as zwitter ions, $H_3N^+ - CH(R) - COO^-$. Because of this dipolar salt like character they have strong dipole-dipole attractions. So, their melting points are higher than halo acids which do not have salt like character. Moreover, due to this salt like character, they interact strongly with H_2O. Thus, solubility of amino acids in water is higher than that of the corresponding halo acids which do not have salt like character.

11. Deficiency of vitamin D causes rickets (deformation of bones).

12. Vitamin C is a water-soluble vitamin. Water-soluble vitamins when supplied regularly in the diet cannot be stored in our body because they are readily excreted in urine.

13. Vitamin C causes bleeding of gums.

14. Phosphate is attached to sugar at C_5 and C_3 position.

15. Sequence of nucleotides in the chain of a nucleic acid is called its primary structure.

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