Chapter No.

14 Biomolecules

Subtopics

Straight or curly?

Hair is primarily composed of keratin, a protein, which grows from a sac called the follicle. Cells in the hair follicle generate keratin, and various other proteins, which become a part of the hair shaft. These proteins contain sulfur atoms, and when two of these sulfur atoms pair up and bond, they form a disulfide bond. If the two sulfur atoms in the same protein are at a distance, and join to form the disulfide bond, the protein will bend.

The greater the number of links, the curlier the hair, and the fewer the number of links, the straighter the hair.

Quick Review

➢ **Classification of carbohydrates:**

Carbohydrates (Saccharides)

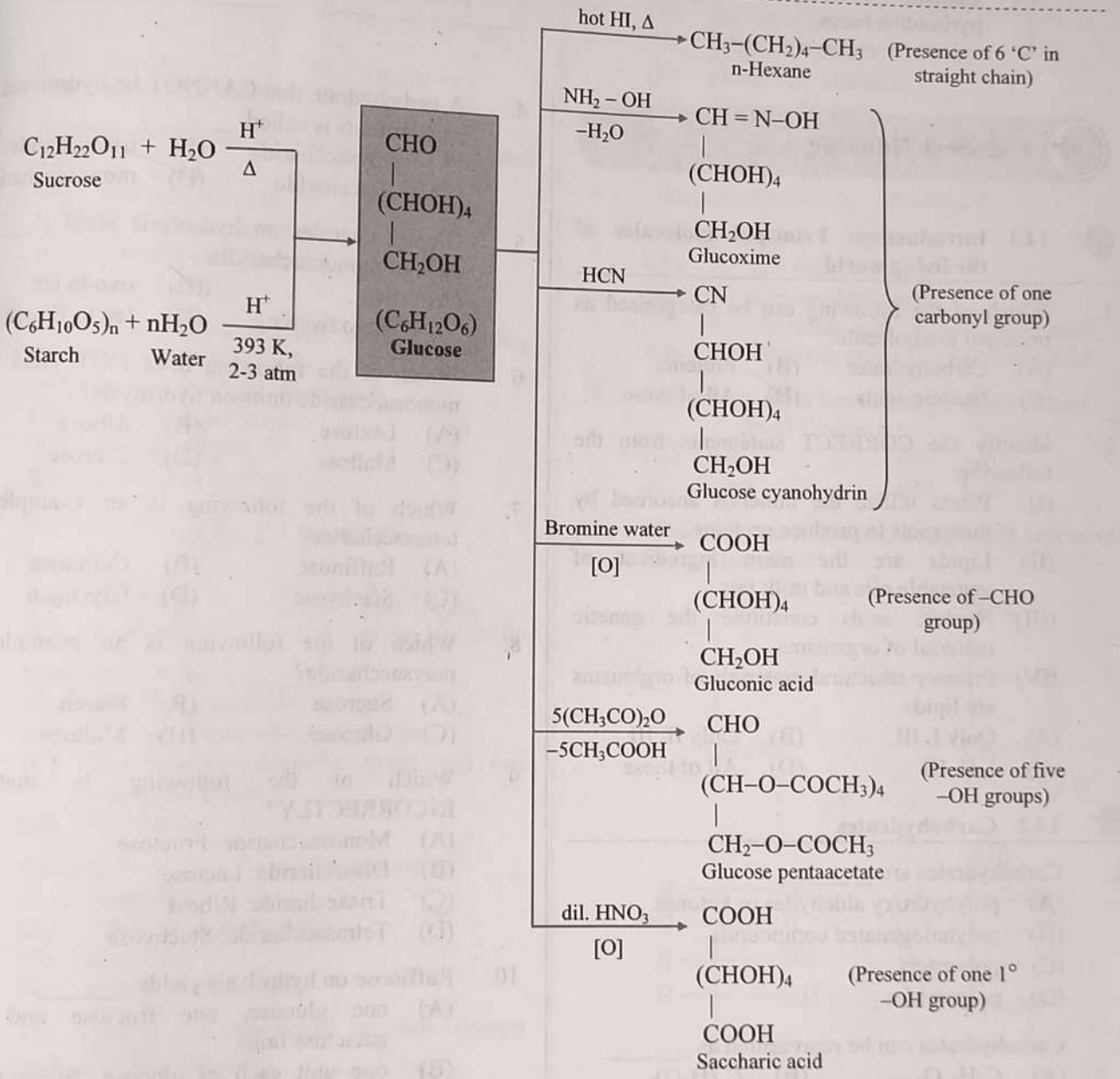
- **Monosaccharides** (Do not hydrolyse further) **e.g.** Glucose, fructose, ribose
- **Oligosaccharides** (Yield two to ten monosaccharide units on hydrolysis)
  - **Disaccharides** Yield two monosaccharide units on hydrolysis **e.g.** Sucrose, maltose, lactose
  - **Trisaccharides** Yield three monosaccharide units on hydrolysis **e.g.** Raffinose
  - **Tetrasaccharides** Yield four monosaccharide units on hydrolysis **e.g.** Stachyose
- **Polysaccharides** (Yield large number of monosaccharide units on hydrolysis) **e.g.** Starch, glycogen, cellulose

➢ **Constituent monosaccharides and glycosidic linkage of some carbohydrates:**

Carbohydrates	Examples	Constituent monosaccharides	Glycosidic linkage
Disaccharides	Sucrose	One unit each of α-D-Glucopyranose and β-D-fructofuranose	α, β-1,2-Glycosidic linkage
	Maltose	Two α-D-glucopyranose units	α-1,4-Glycosidic bond
	Lactose	One unit each of β-D-Galactopyranose and β-D-glucopyranose	β-1,4-Glycosidic linkage
Trisaccharides	Raffinose	One unit each of glucose, fructose and galactose	-

Tetrasaccharides	Stachyose	One unit of glucose + one unit of fructose + two units of galactose	-
Polysaccharides	Starch	Polymer of α-D-glucopyranose [Two components: Amylose and amylopectin]	Unbranched chains: α-1,4-Glycosidic linkage Branched chains in amylopectin: α-1,6-Glycosidic linkage
	Cellulose	Polymer of β-glucopyranose units	β-1,4-Glycosidic bonds

➢ **Glucose:**



➢ **Classification of proteins:**

Proteins

Globular proteins
- Soluble in water.
- Folded to form spherical shape.
- Shape results from coiling around polypeptide chains.

e.g. Insulin, egg albumin, serum albumin, legumelin, etc.

Fibrous proteins
- Insoluble in water.
- Have elongated, rod like shape.
- Polypeptide chains of protein are parallel to each other.

e.g. Keratin, myosin, etc.

➢ **Nucleic acids:**

Nucleic acids

DNA

- Double stranded α-helix structure
- Sugar: D-2-deoxyribose
- Contains cytosine and thymine as pyrimidine bases

RNA

- Single stranded α-helix structure
- Sugar: D-ribose
- Contains cytosine and uracil as pyrimidine bases