

Reducing Sugars

Carbohydrates that reduce Fehling's solution and Tollens' reagent

E.g. all monosaccharides whether aldose or ketose, maltose and lactose, etc.

Anomers

They differ only in the configuration of the hydroxyl group at C1, called the anomeric carbon

The two cyclic hemiacetal forms of glucose, i.e. α -form and β -form

Sucrose

It is a disaccharide

Non-reducing sugar

It gives glucose and fructose on hydrolysis

Two monosaccharides are held together by a glycosidic linkage between C1 of α -D-glucose and C2 of β -D-fructose

Invert sugar

It is produced by the hydrolysis of sucrose

Sucrose is dextrorotatory, but on hydrolysis, the mixture becomes laevorotatory due to the greater laevorotation of fructose

Maltose

It is a disaccharide, made up of two glucose units joined by α -1-4 glycosidic bond

It is a reducing sugar

Lactose

It is a disaccharide, made up of β -D-galactose and β -D-glucose

It is a reducing sugar

Starch

It is a polysaccharide made up of α -glucose units

It contains 15-20% amylose and 80-85% amylopectin

Amylose

Water soluble

It constitutes 15-20% of starch

It is a long unbranched chain polymer of 200-1000 α -D glucose units linked by 1-4 glycosidic bonds

Amylopectin

Water-insoluble

It constitutes 80-85% of starch

It is a branched-chain polymer of α -D glucose units linked by 1-4 and 1-6 glycosidic bonds in the chain and at the branching, respectively

Cellulose

It is a straight-chain polysaccharide made up of β -D-glucose units joined by 1–4 glycosidic bonds

Glycogen

It is a branched-chain polymer of glucose, similar to amylopectin

Non-essential Amino Acids

It can be synthesised in the body

E.g. Glycine, Alanine, Glutamic acid, Aspartic acid, Glutamine, Asparagine, Serine, Cysteine, Proline and Tyrosine

Essential Amino Acids

It cannot be synthesised in the body

Valine, Isoleucine, Leucine, Arginine, Lysine, Threonine, Methionine, Phenylalanine, Tryptophan and histidine

Vitamins and Deficiency Diseases

Vitamin A - Xerophthalmia and Night blindness

Vitamin C - Scurvy

Vitamin D - Rickets and Osteomalacia

Vitamin E - Muscular weakness and increased fragility of RBCs

Vitamin K - Increased blood coagulation time

Deficiency Diseases of Vitamin B

B₁ (Thiamine) - Beriberi

B₂ (Riboflavin) - Cheilosis

B₆ (Pyridoxine) - Convulsions

B₁₂ (Cobalamin) - Pernicious anaemia