

The proper name is then α -D-glucopyranosyl(1 \rightarrow 2) β -D-fructofuranoside.

Sucrose is common sugar.

Maltose is a disaccharide of two D-glucose units joined by an α 1 \rightarrow 4 linkage.

Cellobiose is a disaccharide of two D-glucose units joined by a β 1 \rightarrow 4 linkage.

Note that the second glucose unit is drawn upside down in order that the bond from C-4 to the bridging O has an appropriate angle.

Lactose is a disaccharide of galactose and glucose joined by a β 1 \rightarrow 4 linkage.

Lactose is the sugar found in milk. Lactose intolerance is associated with the absence of the enzyme which hydrolyzes the β 1 \rightarrow 4 linkage to give galactose and glucose.

Starch is a mixture of amylose and amylopectin which are polysaccharides of D-glucose joined by α 1 \rightarrow 4 and α 1 \rightarrow 6 linkages.

Cellulose is a polysaccharide of D-glucose joined by β 1 \rightarrow 4 linkages.

Animals do not have enzymes to hydrolyze the β 1 \rightarrow 4 linkage between glucose units in cellulose such that cellulose is not a digestible food source for man.

Begin a discussion of lipids.

Lipids are one of the four major classes of biological molecules.

Lipids are a heterogeneous group of compounds which share the common property of being insoluble in water but soluble in organic solvents such as ethers, CCl₄, CHCl₃, etc..

Fig 11.1 describes the major types of lipids including fatty acids, steroids, lipid vitamins and terpenes.

We will consider the structure of fatty acids and three lipids which contain fatty acids- triacylglycerols, glycerophospholipids and sphingolipids.

The structures of some common fatty acids are shown in Table 11.1.

Fatty acids are long chain carboxylic acids.

Most fatty acids contain an even number of carbon atoms because they are derived from two carbon units.

Some fatty acids contain one or more double bonds (unsaturated). In the IUPAC nomenclature the position(s) of the double bond(s) is indicated by the number of the first carbon atom as a superscript to the symbol Δ .

The naturally occurring configuration of the double bond is almost exclusively *cis* as shown for oleate and linolenate in Fig 11.3.

As shown in Table 11.1 the melting points of saturated fatty acids increase as the number of carbon atoms increases due to increased van der Waals interactions between molecules.