

Monosaccharides

The simplest of the carbohydrates are the **monosaccharides**, which can be classified according to the number of carbon atoms they contain. Those with three carbons are called **trioses** (for example, *glyceraldehyde* and *dihydroxyacetone*); four, **tetroses** (for example, *erythrose*); five, **pentoses** (for example, *ribose*); and six, **hexoses** (for example, *glucose*).

Monosaccharides with an aldehyde as their most oxidized functional group are called **aldoses** (for example, *glyceraldehyde*); those with a keto group as their most oxidized functional group are called **ketoses** (for example, *dihydroxyacetone*). **Monosaccharides with five, six, seven, or eight carbon atoms occur as cyclic rings in nature** (i.e., *ribose, glucose, fructose, galactose*)

Remember: The naming of configurations of **simple sugars** (*monosaccharides*) and amino acids is based on the **absolute configuration** of glyceraldehyde. The symbols **L** and **D** refer to the absolute configuration of the four constituents around a specific **chiral carbon** (*asymmetric carbon*) in **monosaccharides** and **amino acids** (See *D-Glyceraldehyde* diagram below). In a Fisher projection, the D form has the hydroxyl group on the right; the L form has the hydroxyl group on the left. Sugars of the **D form**, which are related to D-glyceraldehyde, are the most common in nature.

Other **monosaccharides** include: mannose, ribose, and xylose.

