

Disaccharides are a type of carbohydrate composed of two monosaccharide units linked together through a glycosidic bond.

Definition:

Disaccharides are a type of sugar (carbohydrate) composed of two monosaccharide molecules. Monosaccharides are the simplest form of sugars, and they include glucose, fructose, and galactose.

Formation:

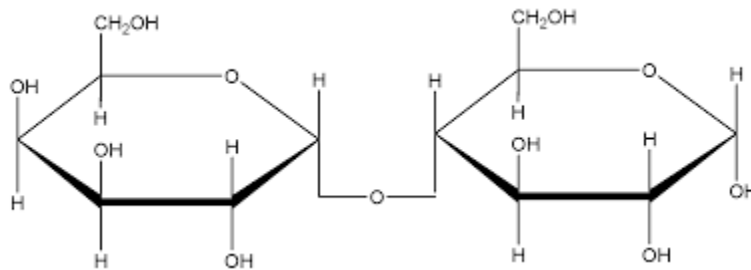
Disaccharides are formed when two monosaccharides undergo a condensation reaction (also known as dehydration synthesis).

During this reaction, a molecule of water is eliminated, and the remaining oxygen atom forms a glycosidic bond between the two sugar molecules.

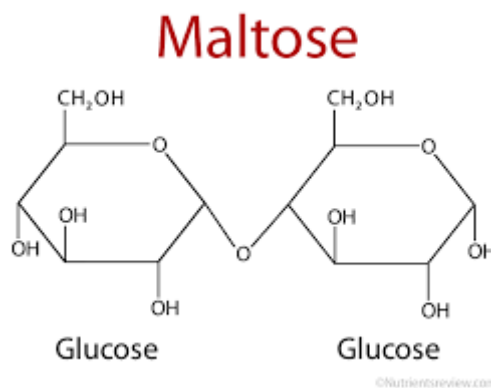
Common Disaccharides:

Sucrose: Composed of glucose and fructose. It is commonly known as table sugar and is found in sugarcane, sugar beets, and many fruits.

Lactose: Composed of glucose and galactose. It is the sugar found in milk and dairy products.



Maltose: Composed of two glucose molecules. It is found in germinating seeds and is a product of starch digestion.



Glycosidic Bonds:

The type of glycosidic bond in a disaccharide depends on the specific sugars involved.

For example, sucrose has an α,β -1,2-glycosidic linkage, while lactose has a β -1,4-glycosidic linkage.

Digestion and Absorption:

Disaccharides need to be broken down into monosaccharides before absorption in the digestive system.

Enzymes like sucrase, lactase, and maltase are responsible for breaking the glycosidic bonds in sucrose, lactose, and maltose, respectively.

Role in Energy Storage:

Disaccharides serve as a source of readily available energy.

When broken down into monosaccharides (such as glucose), they can be used in cellular respiration to produce ATP.

Sweetness:

Disaccharides like sucrose are sweet-tasting, contributing to the flavor of many foods.

Common Uses:

Sucrose is commonly used as a sweetener in various foods and beverages.

Lactose is found in dairy products.

Maltose is involved in the brewing and fermentation processes, as it is a product of the breakdown of starch.