Review: Hemiacetals



Both α and β forms of the cyclic pyranose exist in an equilibrium, switching between anomers via the linear form of D-glucose.

Nomenclature

Pyranose: 6-membered ring sugar (Eg. those formed by glucose) *Furanose*: 5-membered ring sugar (Eg. those formed by fructose)







Refer back to the previous examples:

Is β -D-glucopyranose reducing or non-reducing? It is an acetal, therefore non-reducing. Is D-fructose reducing or non-reducing? It contains a ketone, therefore it is reducing.

Sugars form Acetals with Each Other



Nomenclature

The number of sugar units in the chain dictates the name: 2 sugar units – disaccharide *(Eg. sucrose above)* 3 sugar units – trisaccharide 4 sugar units – tetrasaccaride 5 sugar units – pentasaccaride, etc. many sugar units – oligosaccharides very long chain of sugar units – polysaccharides

Examples of polysaccharides

Cellulose

β-linked glucose chain



Where do you mostly find it? Cotton, in grass, wood, paper.

Amylose

 α -linked glucose chain; very easily metabolized by humans, unlike the β -linked





Branched polysaccharides

The chains of sugar units are not always linear; sometimes they can be bound together at different carbons and 'branch' off from the main chain. Some examples of these branched polysaccharides include glycogen, amylopectin, and starch.

Glycogen

- α -linked glucose chain, with both 1-4 and 1-6 linkages causing branching



Why do we store glucose this way? Regulating osmotic pressure within cells.