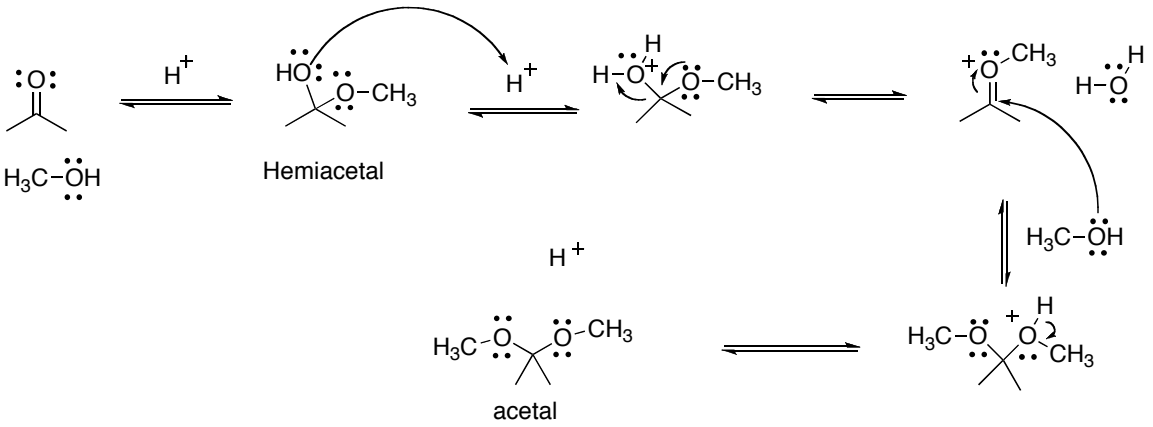
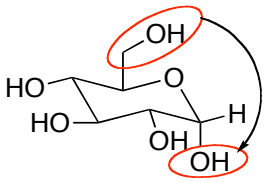
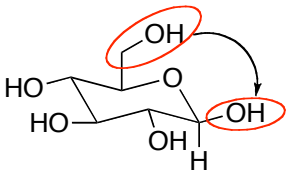




the two groups are opposite sides, so α-isomer

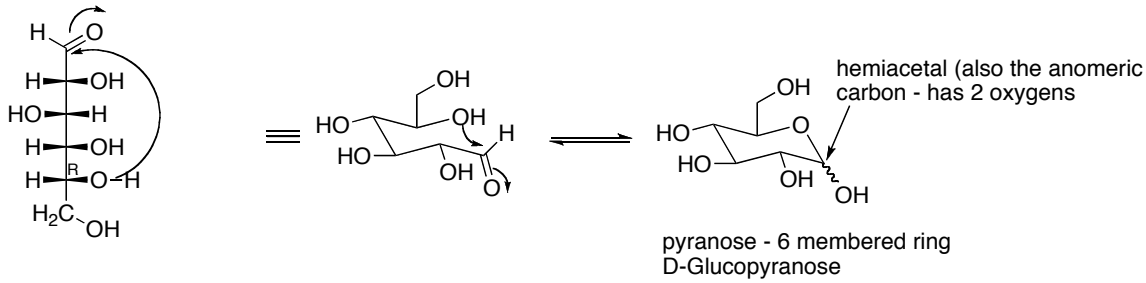
α-D-glucopyranose



the two groups are the same side, so β-isomer

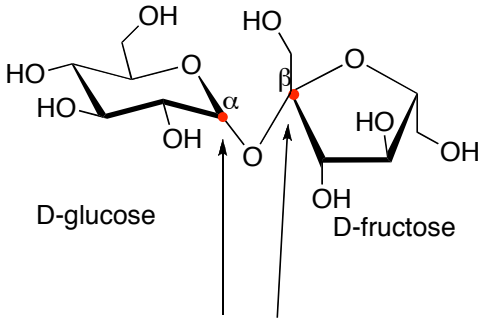
β-D-glucopyranose

* in the above case, the hemiacetal formation could give both isomers (α and β), depending on which face of the carbonyl is attacked. Usually α favoured (anomeric effect)



pyranose - 6 membered ring
D-Glucopyranose

- Sucrose – disaccharides (glucose + fructose)

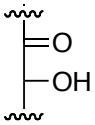


β-D-fructofuranosyl-α-D-glucopyranoside

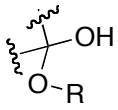
v) **Classification:**

Reducing sugars:

aldehyde



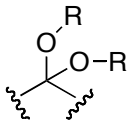
a hydroxy ketone

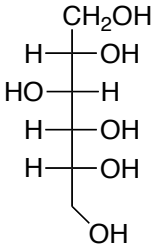


hemiacetal

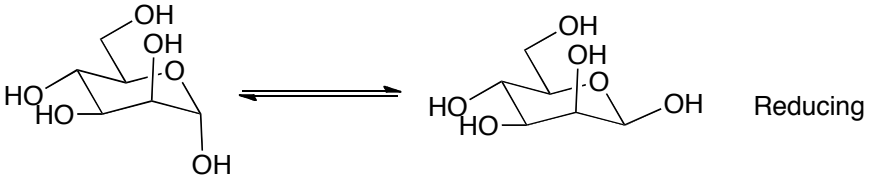
Non-reducing sugars

- all other sugars

- acetal 

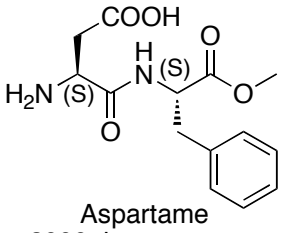


Sorbitol
Non-reducing

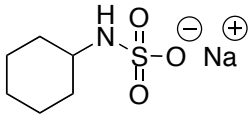


Reducing

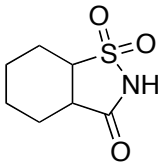
Sweetners:



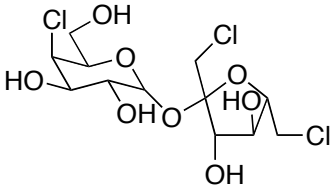
Aspartame
2000 times sweeter
than sugar



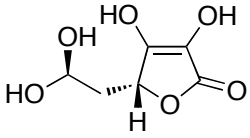
Sodium cyclamate



Saccharin



Sucralose - Splenda

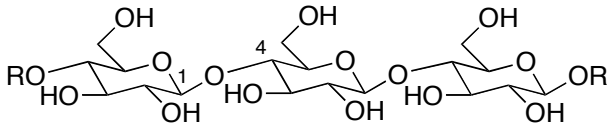


Vitamin C
Deficiency causes
scurvy

Polymers of Sugars:

→ sugar polymers:

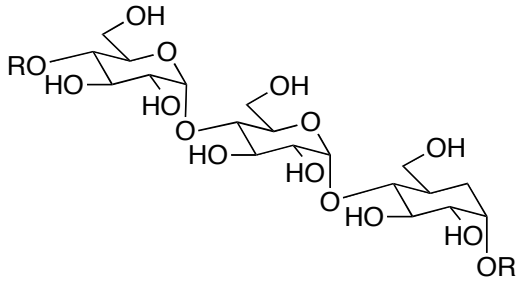
- Cellulose (cotton, paper)



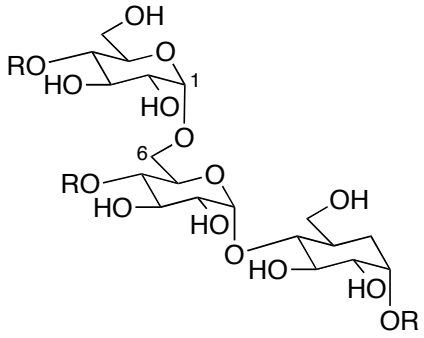
Cellulose (β-1,4-linkages)

Contains acetals (non-reducing sugars)

- Starch (20% amylose and 80% amylopectin)

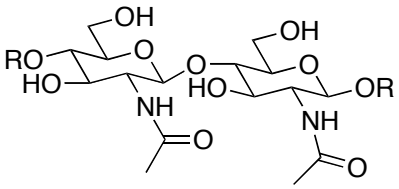


Amylose (1000 units) above, contains a linear chain of Glucose with α-1,4 linkages



Amylopectin (20-30 units in linear chain) above, in starch has additional α-1,6 linkages crosslinking the chains (approx every 20 units) into sheets. MW ~ 1 to 6 million $gmol^{-1}$

Glycogen often has a MW of ≥ 100 million.
-has sheets similar to those of amylopectin.but about 12 units in a chain with 1,6-α-crosslinks every 6 to 12 units



N-acetylglucosamine
Chitin

Chitin – The main constituent of exoskeletons of crustaceans and insects.