

**CHEM 110L, Lecture 1**

Experiment 1 – Carbohydrates

- Chemical tests of standards &amp; identifying an unknown

**[C<sub>n</sub>(H<sub>2</sub>O)<sub>n</sub>], Monosaccharide Nomenclature**

Penultimate stereochem - ( FG ) – ( # C's ) – ose

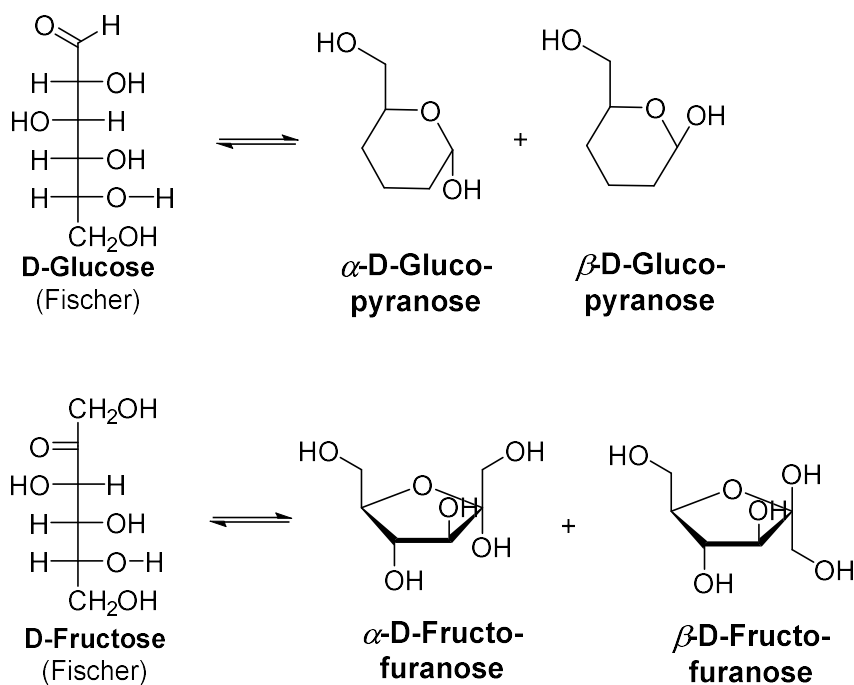
D -    aldo -    - tri –

L -    keto -    - tetr –

- pent –

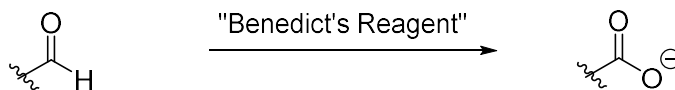
- hex –

Ex. D-Glucose = D-aldohexose

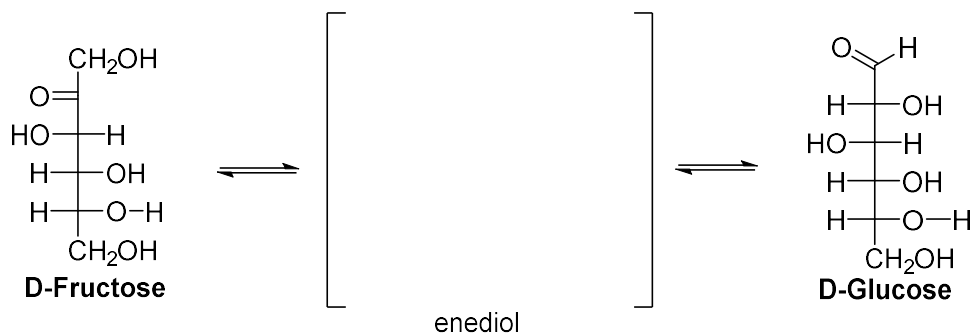
*Mix & Match!* Write the name of a different monosaccharide type and ask a neighbor draw it.**Pyranoses and Furanoses**

**Benedict's Test for Reducing Sugars**

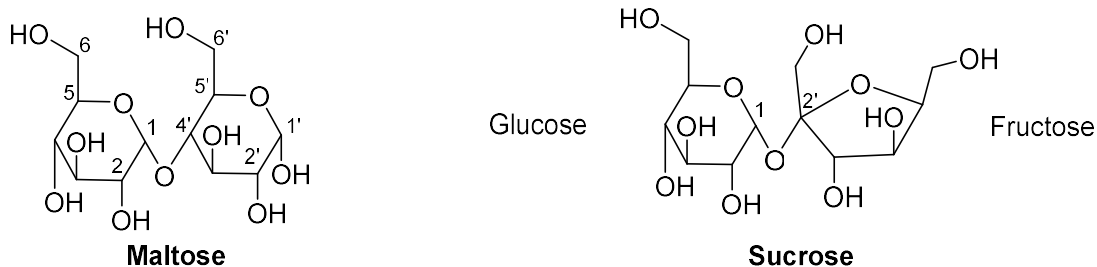
- Aldose can be oxidized to carboxylic acid, positive test



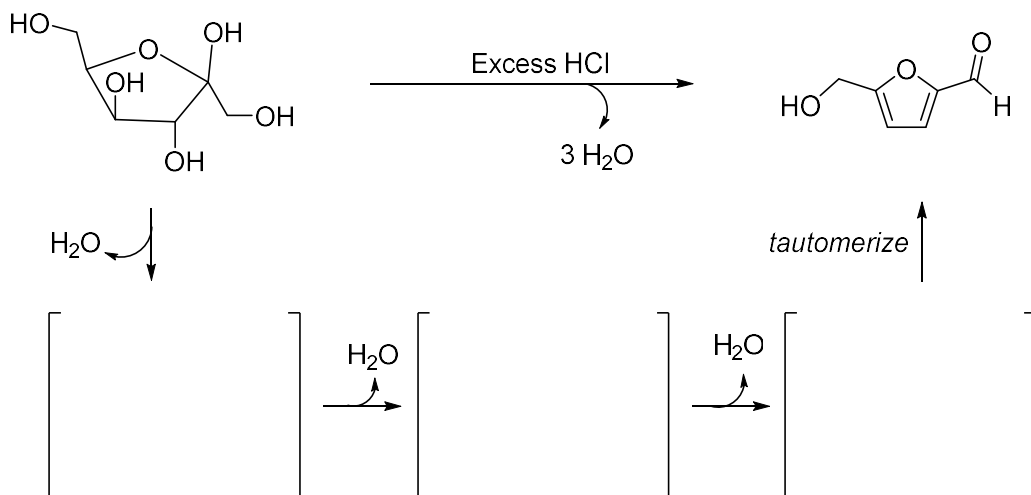
- Ketoses isomerize into aldoses to give positive test, slower reaction



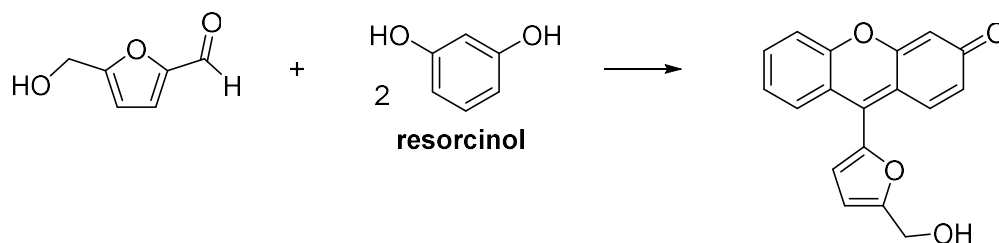
- Sugars without available anomeric carbon give negative test

**Seliwanoff's Test for Ketoses**

- Ketoses undergo dehydration significantly faster than aldoses



- Observable part of Seliwanoff Test



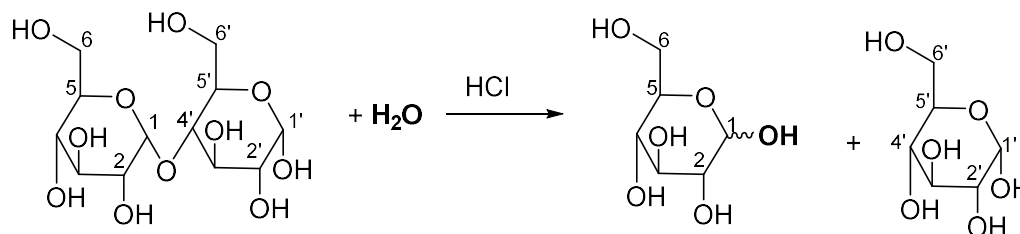
- What do you think will happen to an aldose?

### Iodine Test for Polysaccharides

- What is a polysaccharide?

### Hydrolysis followed by I<sub>2</sub> and Benedict's test

**Maltose - 1,4-glycosidic bond**



*Was hydrolysis successful?*

*Perform I<sub>2</sub> test for polysaccharides & Benedict's test for reducing sugars*

*Experiment 1 Summary:*

**Proton Nuclear Magnetic Resonance ( $^1\text{H}$  NMR)**

– What do you know and (*more importantly*) *what are you unsure of?*

Brainstorm what you know about any or all of the terms below as they relate to NMR:

Chemical Shift	Deshielded	Shielded	Integration
Splitting	Coupling	Electron Withdrawing	Electron Donating
Neighboring Protons	Triplet	Singlet	Proton

*Next time...*Exp 2 – Perkin Condensation