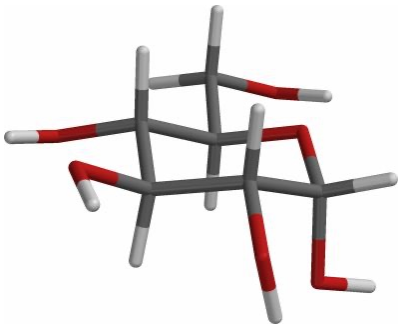
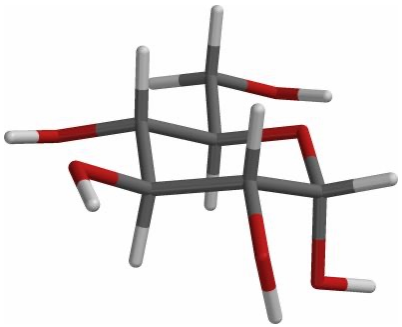




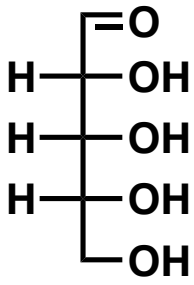
Chem 109 C
Bioorganic Compounds

Armen Zakarian
Office: Chemistry Bldn 2217

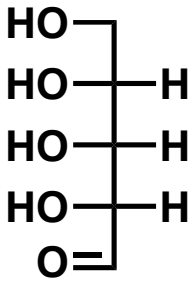
http://labs.chem.ucsb.edu/~zakariangroup/courses.html

Carbohydrates: Fischer projections

manipulation of Fischer projections:



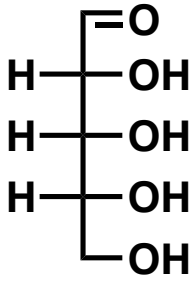
D-ribose



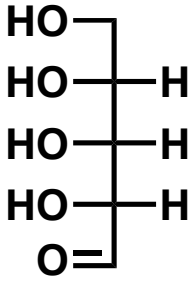
also D-ribose

Carbohydrates: Fischer projections

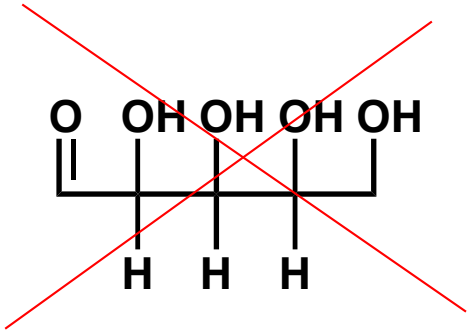
manipulation of Fischer projections:



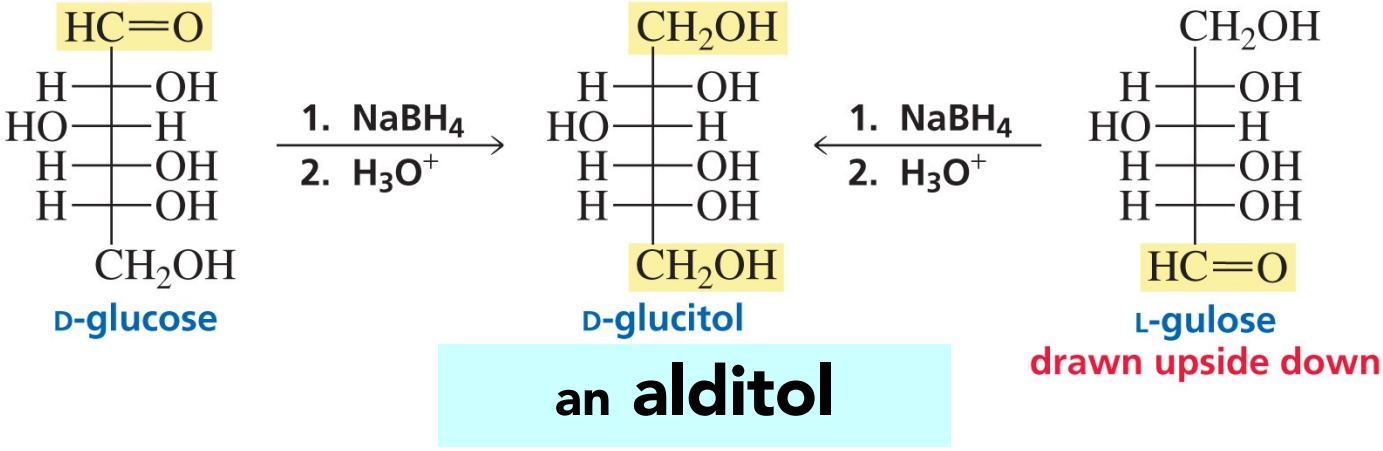
D-ribose



also D-ribose



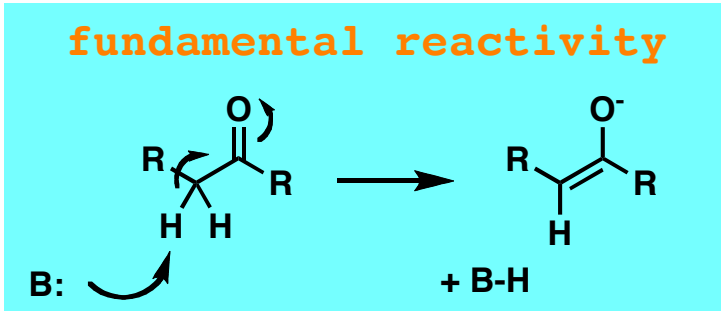
not D-ribose



an alditol

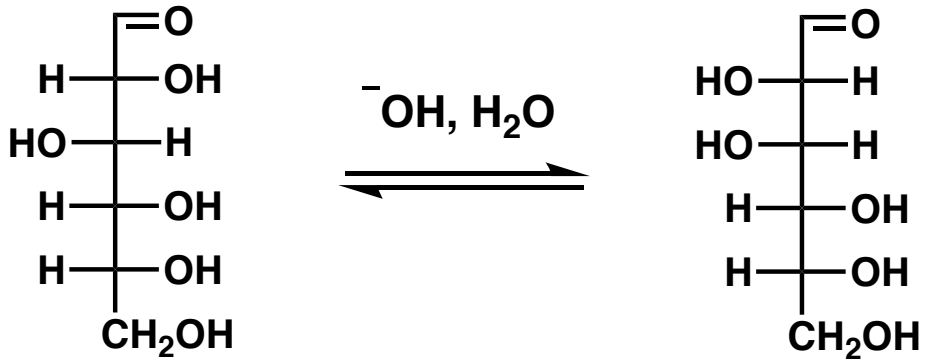
Carbohydrates: Reactions with Bases

fundamental reactivity



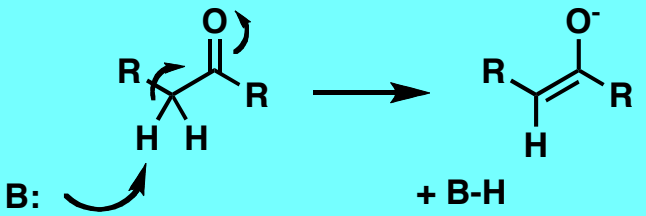
enolate formation: Section 17.3

base-catalyzed epimerization: *D-glucose and D-mannose*

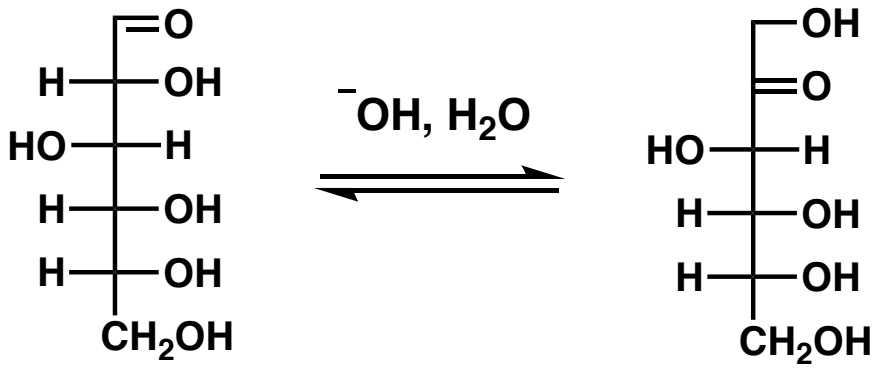


Carbohydrates: Reactions with Bases

fundamental reactivity

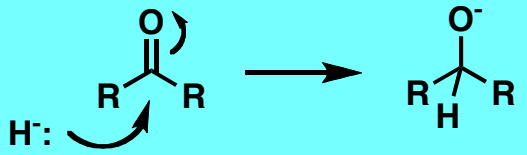


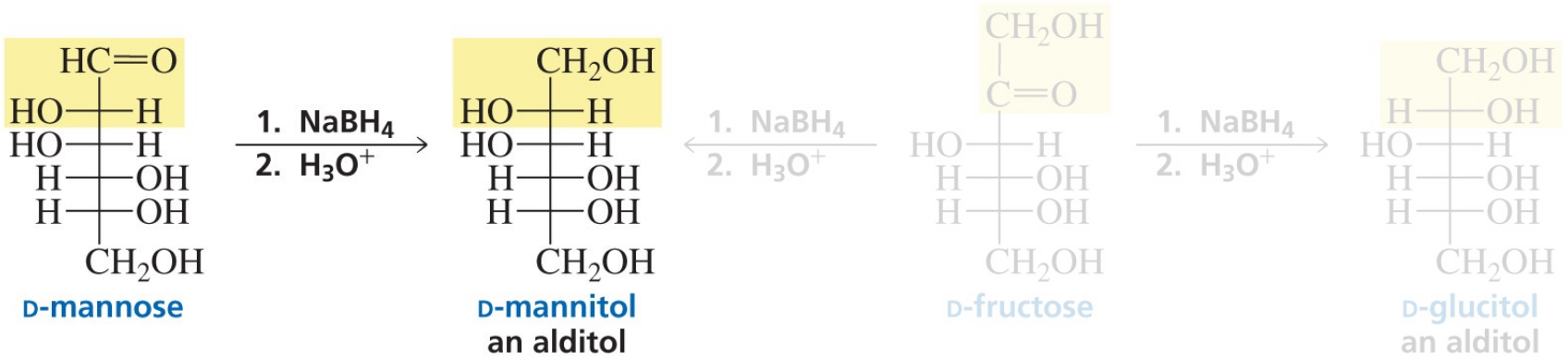
base-catalyzed enediol rearrangement: *D-glucose and D-fructose*



Carbohydrates: Reduction

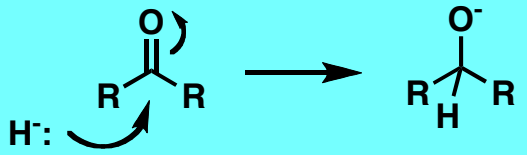
fundamental reactivity

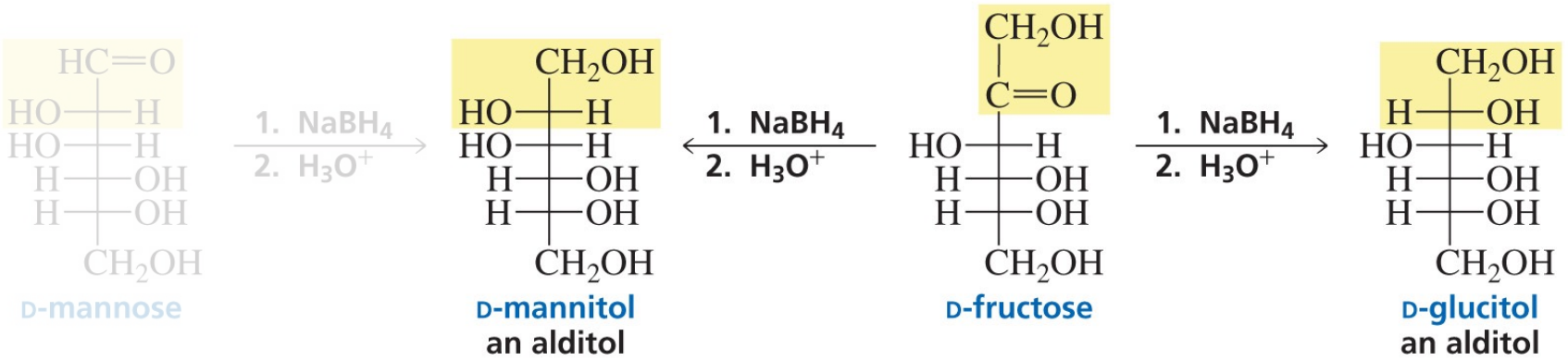




Carbohydrates: Reduction

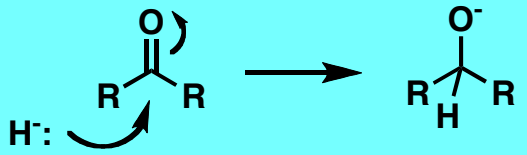
fundamental reactivity

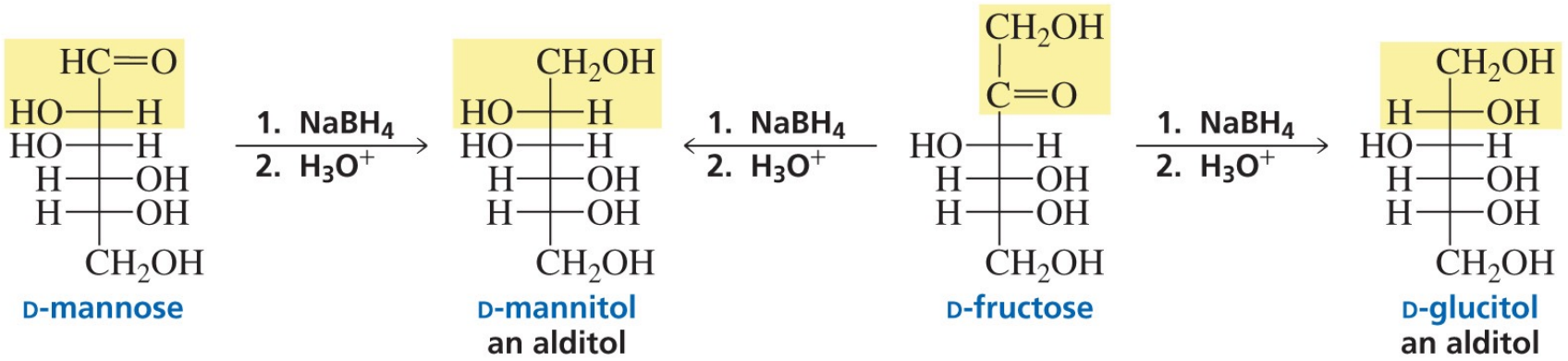




Carbohydrates: Reduction

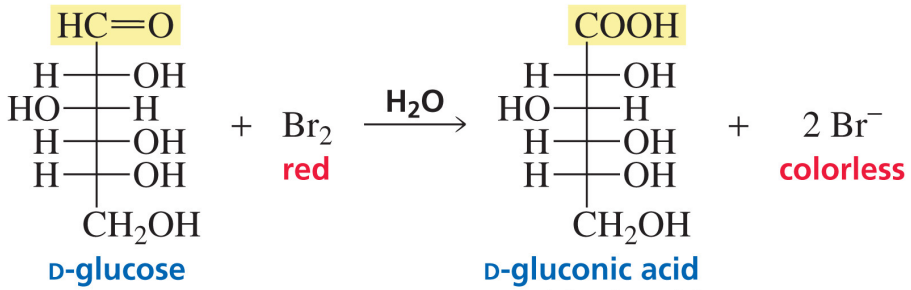
fundamental reactivity





Carbohydrates: Oxidation, three methods

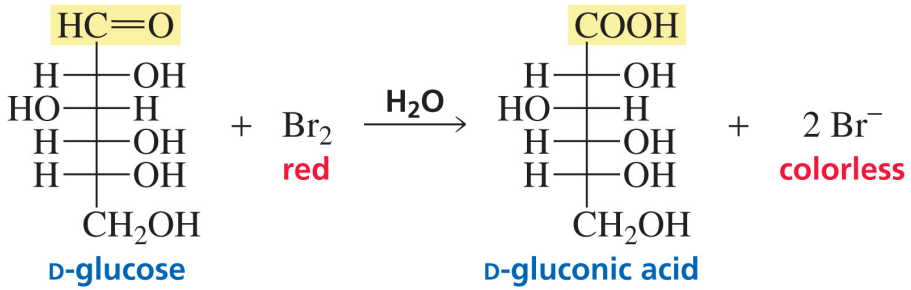
1



an **aldonic acid**

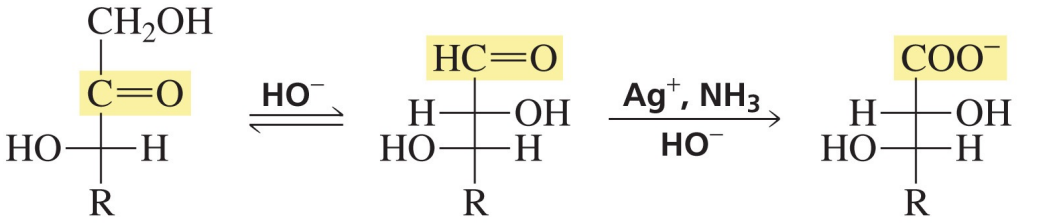
Carbohydrates: Oxidation, three methods

1



an **aldonic acid**

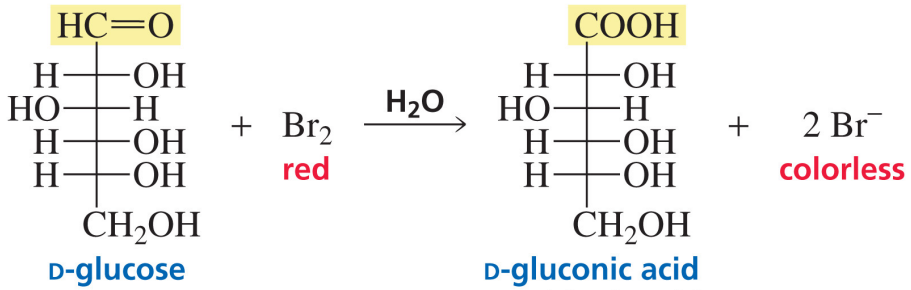
2



"Tollens test"

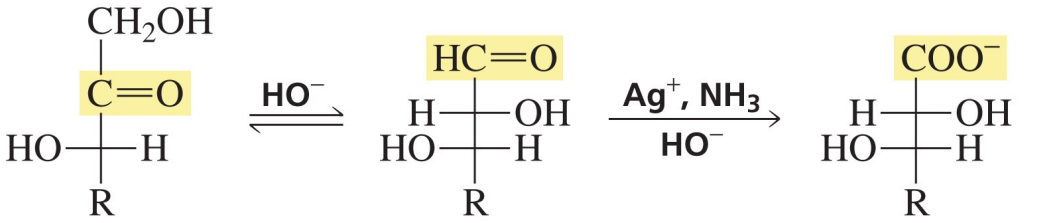
Carbohydrates: Oxidation, three methods

1

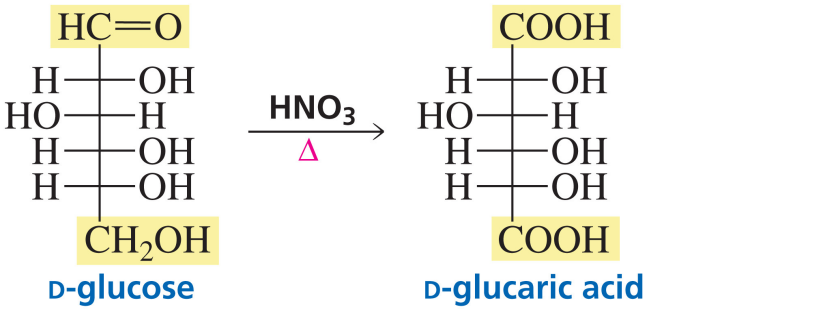


an **aldonic acid**

2



3



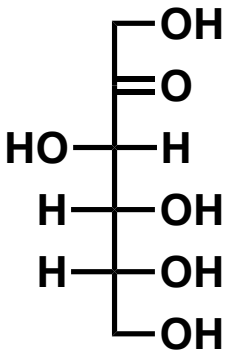
an **aldaric acid**

"Tollens test"

Carbohydrates: Oxidation

PROBLEM 9

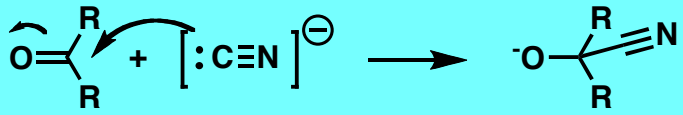
Show how an enediol rearrangement can move the carbonyl group of fructose from C-2 to C-3



D-fructose

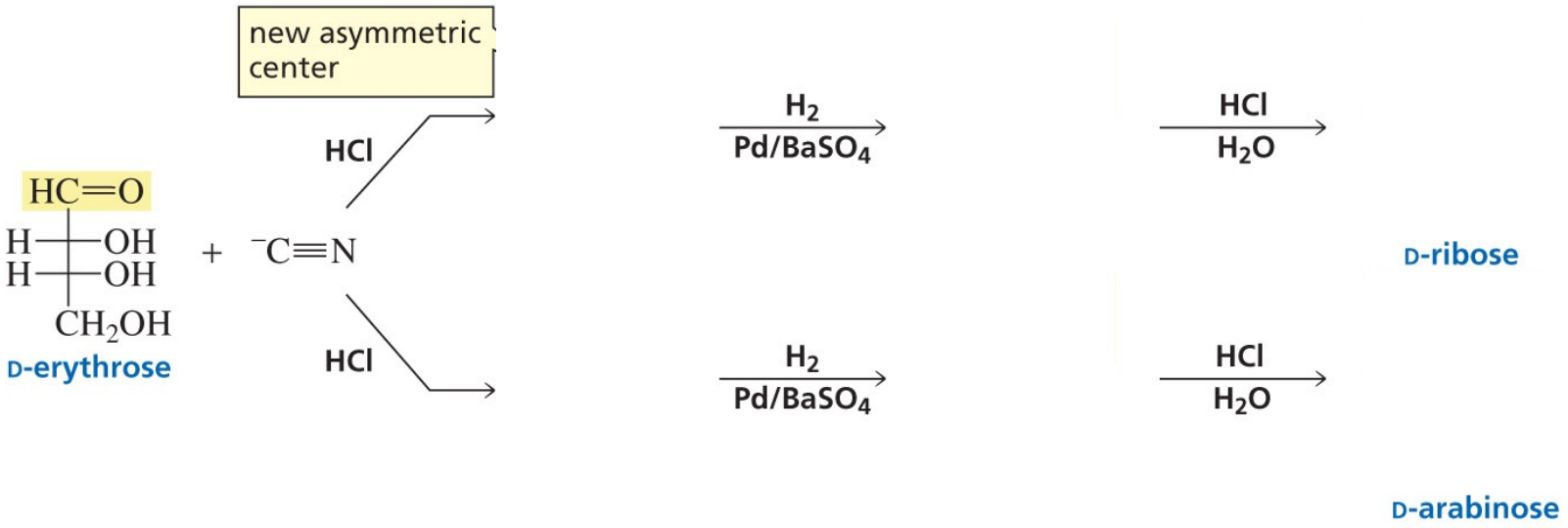
Carbohydrates: Lengthening the Chain

fundamental reactivity



Kiliani-Fischer synthesis:

the modified Kiliani–Fischer synthesis

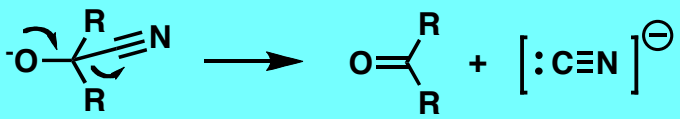


Steps/Reagents:

1. NaCN, HCl;
2. H_2, $Pd/BaSO_4$
3. HCl, H_2O

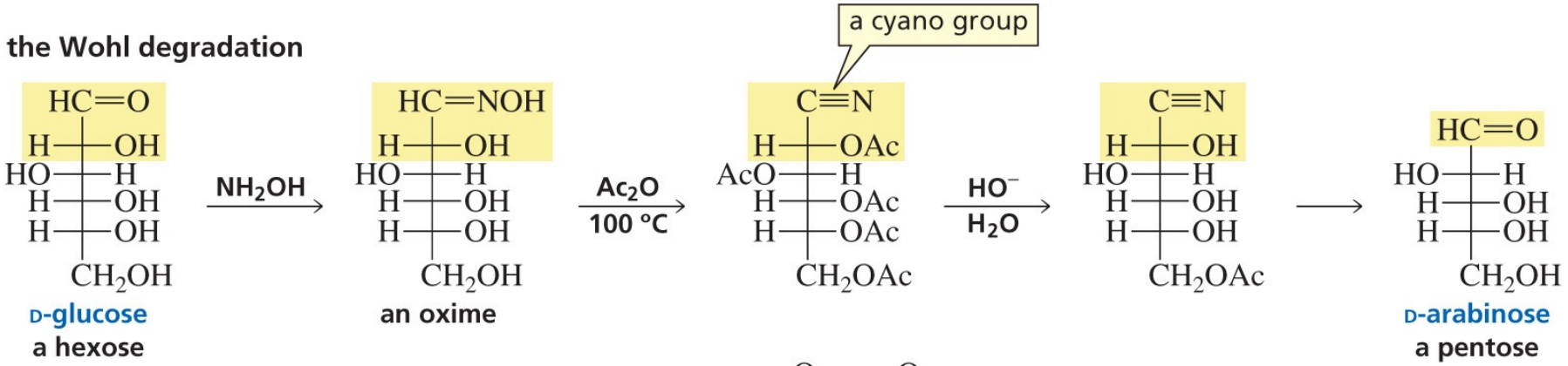
Carbohydrates: Shortening the Chain

fundamental reactivity

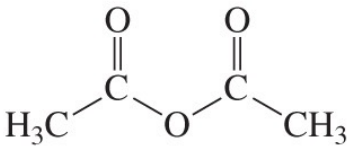


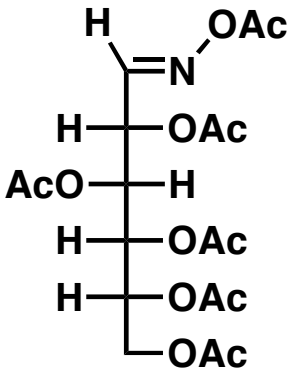
Wohl degradation:

the Wohl degradation



Ac_2O =





Steps/Reagents:

1. NH_2OH; H+
2. Ac_2O, 100 °C
3. NaOH, H_2O

PROBLEM 16. What two monosaccharides can be degraded to

a. D-arabinose

b. D-ribose

c. L-arabinose