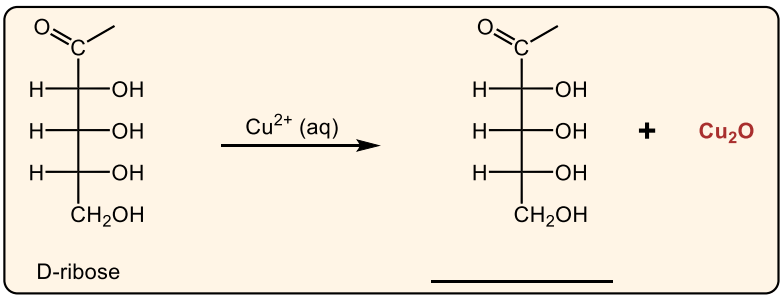
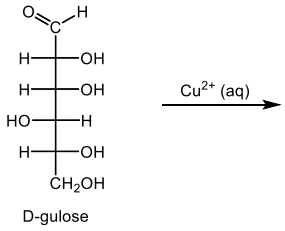
CONCEPT: OXIDATION OF MONOSACCHARIDES

- **Recall:** In Benedict's test an aldehyde undergoes oxidation to a carboxylic acid and forms a _____ precipitate.
- Ald_____ monosaccharides produce ald_____ _____ (*sugar acids*) upon oxidation.



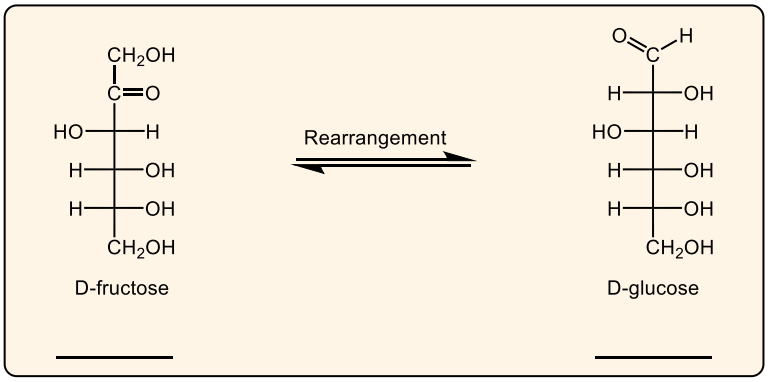
- **Reducing Sugar:** a carbohydrate that produces a *sugar acid* upon oxidation.
  - □ Benedict's test can be used to _____ a reducing sugar in solution.

EXAMPLE: Draw and name the product of the reaction when D-gulose is treated with a basic copper (II) solution.



Ketoses as Reducing Sugars

- In basic solutions, ketoses undergo _____ to form aldoses.



- Thus, all aldose and ketose monosaccharides are _____ sugars in basic solutions.

EXAMPLE: Which of the following statements is incorrect about oxidation of monosaccharides?

a) All monosaccharides are reducing sugars.

b) Ketoses undergo rearrangement to produce aldoses in basic solutions.

c) Some ketose monosaccharides are reducing sugars.

d) All reducing sugars produce a brick-red precipitate in Benedict's test.

CONCEPT: OXIDATION OF MONOSACCHARIDES

PRACTICE: Write common names for the reduction and oxidation products of D-allose.

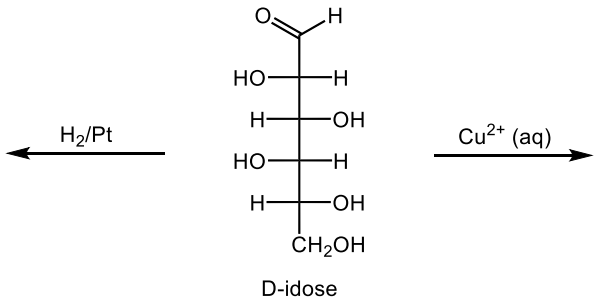
a) D-allosol and D-allonic acid

b) D-allitol and D-allinic acid

c) D-allitol and D-allonic acid

d) D-allositol and D-allitonic acid

PRACTICE: Complete the following reduction/oxidation reaction of D-idose.



D-idose