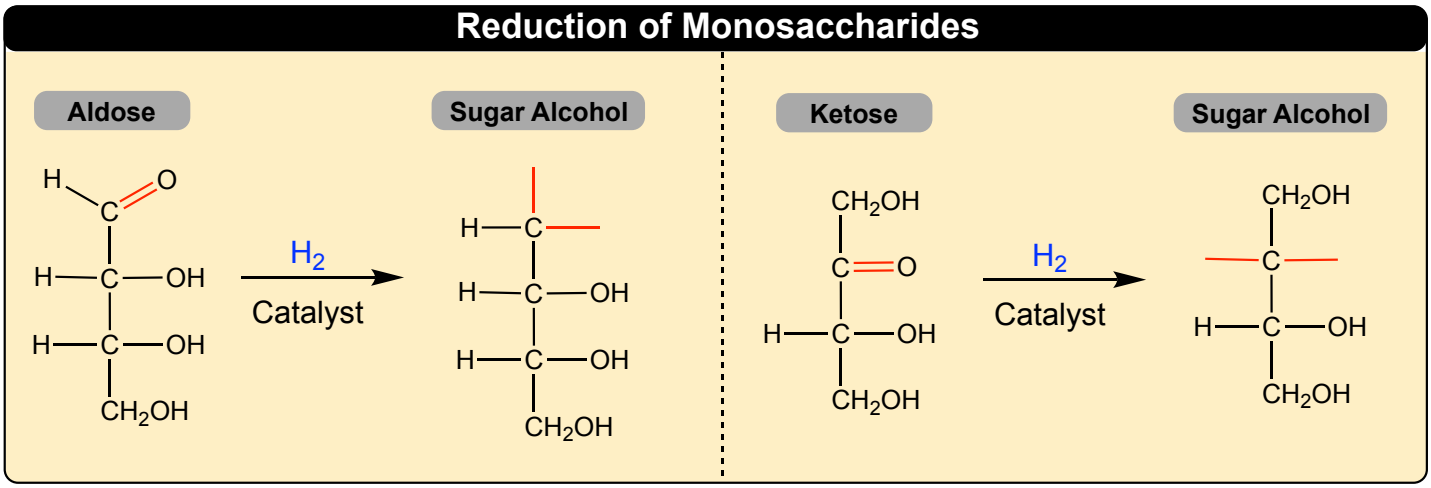
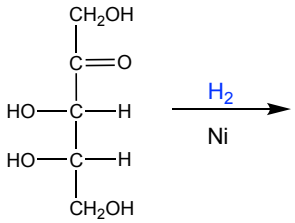
CONCEPT: REDUCTION OF MONOSACCHARIDES

Reduction of Aldose and Ketose Sugars

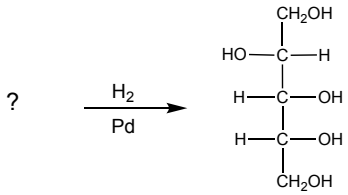
- The carbonyl group is reduced via a reducing agent to a _____ (–OH) group to create a *sugar alcohol*.
  - □ **Sugar Alcohol:** a monosaccharide that has _____ carbons connected to an –OH group.
  - □ **Reducing Agent:** _____ □ **Catalysts:** ____, ____, or ____.
    - The carbonyl oxygen gains a ____ and the carbonyl carbon gains a ____.



EXAMPLE: Determine the sugar alcohol product formed from the reduction of the following monosaccharide.



PRACTICE: Determine which aldose reactant should be used to produce the following sugar alcohol.



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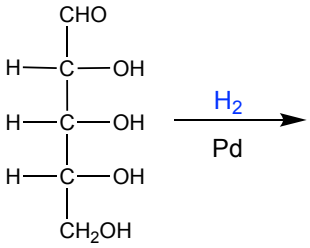
Common Naming of Sugar Alcohols

- Set of rules for naming sugar alcohols are similar to aldose or ketose sugars.
  - □ Modify the ending from -_____ to -_____.

EXAMPLE: Provide the structure and common name for the sugar alcohol created from the reduction reaction.

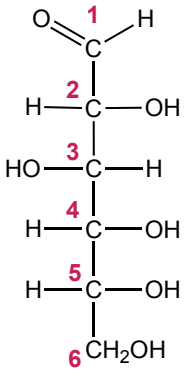


D–Ribose

PRACTICE: What is the common name of the sugar alcohol produced when D-galactose is reduced?

a) L-galactose b) D-galactitol c) D-galactaric acid d) L-galactitol

PRACTICE: Draw the Fischer projection for the reduction product of D-mannose, the C-2 epimer of glucose. What is the structure and common name of the sugar alcohol produced?



D–Glucose