

Activity 23: Glycosidic Bonds

Learning Objectives

Gain familiarity with the disaccharides maltose, lactose, and sucrose

Identify and name glycosidic bonds in carbohydrates

Draw the condensation or hydrolysis products for monosaccharides and disaccharides, respectively

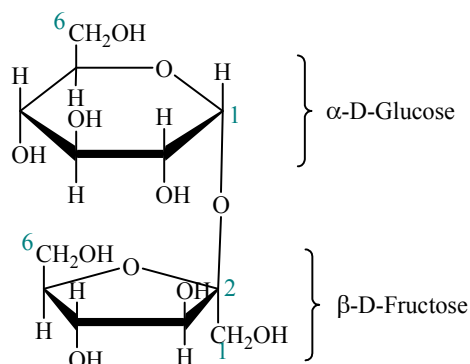
Estimated Completion Time 20–30 Minutes

Instructor Information

Students find this activity very straightforward *except* for understanding the glycosidic bond of sucrose. The anomeric carbon reasoning (question 6) must be reiterated and reinforced.

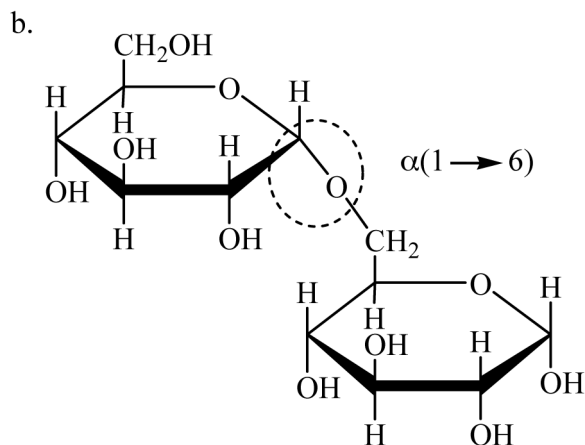
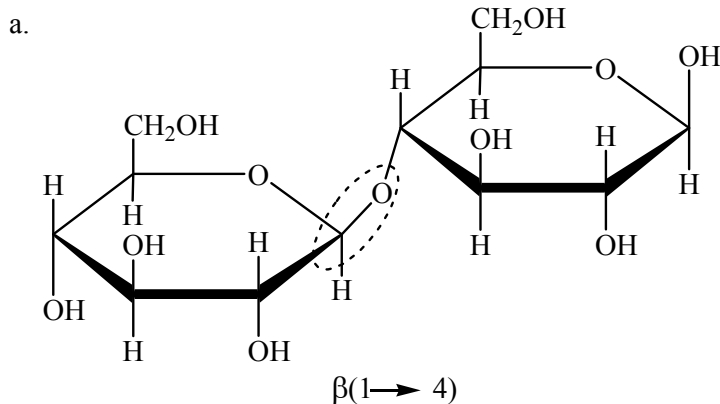
ANSWERS TO QUESTIONS

1. Alpha
2. 1; 4
3. Students should answer yes.
4. $\beta(1 \rightarrow 4)$
- 5.



6. The alpha or beta designation is given for anomeric carbons that are in a glycosidic bond. Only one anomeric carbon is in the glycosidic bond in maltose and lactose.

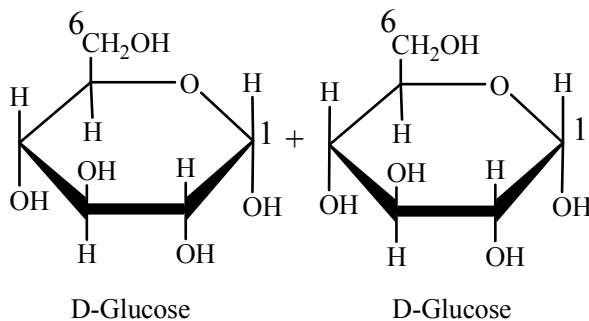
7.



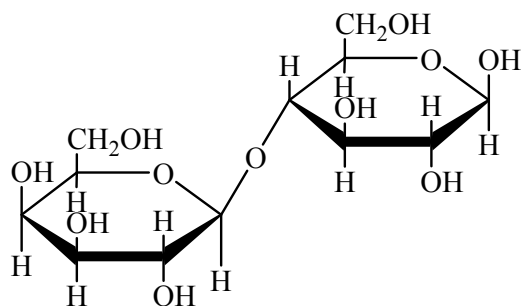
8. Answers will vary.

Activity 23: Skill Development

1. a. Hydrolysis reaction (break with water)



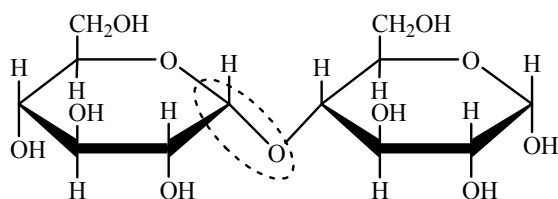
b. Condensation reaction (water is produced)



D-Lactose

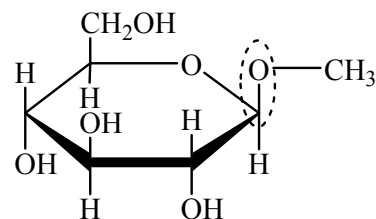
2.

a.



D-Maltose

b.



Methyl β -D-Glucoside

3. a. $\alpha(1 \rightarrow 3)$

b. monosaccharide A is glucose, monosaccharide B is fructose.