

Carbohydrates Keypoints

Definitions

You will not be asked to write a definition of any of these but I do expect you to recognize them when they are used in problems, etc.

Aldose
Anomeric Carbon
Carbohydrates
Cellulose
Chitin
Fructose
Glucose
Glycogen
Glycosidic Bond
Disaccharide
Diastereomer
Enantiomers
Heparin
Ketose
Lactose
Lactase
Monosaccharide
Polysaccharide
Starch
Stereoisomer
Sucrose

Concepts

1. Be able to recognize whether or not a molecule belongs to the carbohydrate class of molecules.
2. Be able to recognize ketone, aldehyde, and hydroxy functional groups.
3. Be able to recognize and alcohol. (CH_3OH , $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$)
4. Be able to distinguish between a ketose and an aldose.
5. Be able to recognize chiral centers in molecules.
6. Be able to number carbons in a sugar chain according to the standard naming conventions.
7. Be able to identify sugar molecules as isomers of stereoisomers.
8. Be able to distinguish between enantiomers and diastereomers when given images of sugar molecules.
9. Be able to give the name of the type, or types, of sugar molecules found in starch and glycogen.
10. Be able to recognize that one linear stereoisomer of a sugar molecule will give rise to 2 cyclic stereoisomers, and draw a diagram showing how this can happen. (When an achiral carbon is turned into a chiral carbon, 2 stereoisomers are generally formed.)

11. Be able to explain what feature of mucopolysaccharides allow them to act as lubricants and cushions in organisms.
12. Be able to explain how glucosamine sulfate might help diminish the impact of osteoarthritis.
13. Be able to explain what feature of heparin's structure allows it to act as an anticoagulant.?
14. Be able to compare and contrast the structures of glycogen, starch and cellulose.
15. Be able to compare and contrast the structures of glycogen and amylopectin.
16. Be able to give the intermolecular force that contributes significantly to the rigidity of cellulose.
17. Be able to describe the differences between soluble and insoluble fiber, and the similarities between them.
18. Recognize that maltose, glucose, glycogen, cellulose, and starch are all composed of glucose.