

Grade-8

Biology

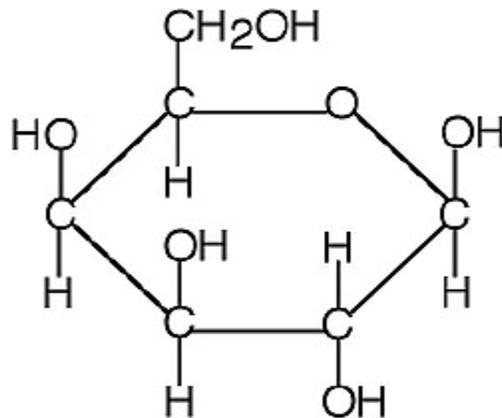
Ch-4- The Chemicals of Life


19/11/2020

Q1. Write the structure and functions of carbohydrates.

A1. Carbohydrates may be simple, soluble (glucose and sugar) complex insoluble (starch and cellulose).

They are classified into monosaccharide, disaccharide and polysaccharide.



Monosaccharides: Glucose, fructose, galactose

Functions: 1. Quick energy source in respiration.

2. They are used to make disaccharides and polysaccharides.

Disaccharides: Sucrose, maltose, lactose

Functions: 1. Energy source in respiration.

2. Phloem tubes carry dissolved sucrose to different parts of the plant.

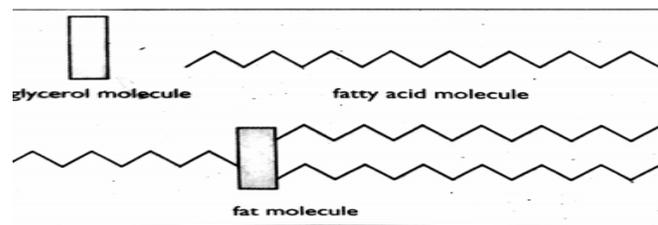
Polysaccharides: Starch, glycogen, cellulose

- Functions:
1. Animals store food as glycogen.
 2. Cellulose is used to make plants cell wall.
 3. Starch is used as storage food of plants.

Lactose: Galactose, glucose

- Functions: 1. Mainly energy source in infants.

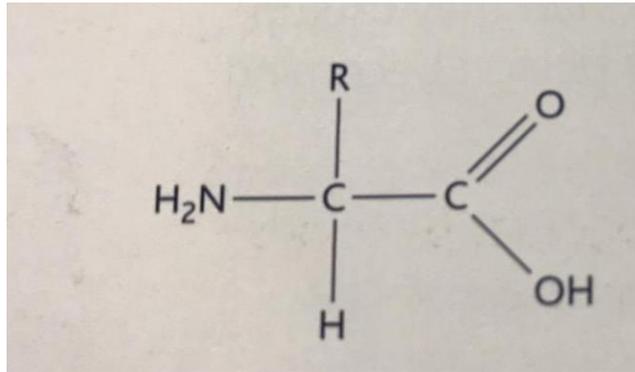
Q2. Describe the chemical structure and functions of fats.



A2. Fats are liquids and are made up of carbon, hydrogen and oxygen. When lipids are liquid they are known as oil. One molecule of fats is made up of three molecules of fatty acids and one molecule of glycerol.

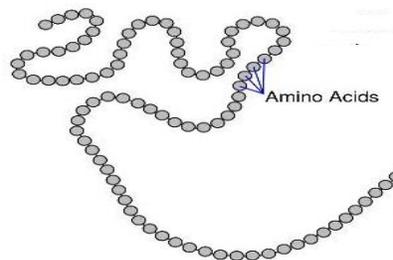
- Functions:
1. Used to store energy for the body.
 2. Fats are used to insulate the body temperature by being under the skin.
 3. Used to make cell membrane and nuclear membrane.
 4. Fats act as an insulator by surrounding the axon in nerve cells.
 5. It protects the internal organs of animals by surrounding them.

Q3. Describe the chemical structure and functions of proteins.



General structure of an amino acid

A3. Proteins contain the elements carbon, hydrogen, oxygen, nitrogen and sometimes sulphur. Protein molecules are made up of long chains of smaller molecules joint end to end. These molecules are called amino acids. There are 20 different types of amino acids in animal proteins. A small protein molecule might be made from 100 or more amino acids linked together by peptide bon. Different sequences of amino acids may give different shapes of protein molecules. Some proteins are soluble in water like haemoglobin and some are insoluble in water like keratin.



Functions: 1. Proteins are used for growth and repair.

2. Antibodies are proteins which destroy the foreign particles.

3. Hair and nails are made from proteins.

4. Enzymes are also proteins which controls the chemical reactions that keeps the cells alive.

5. Some proteins act as a hormone like insulin.

Q4. Write the functions of water.

A4. 1. In green plants water combines with CO_2 to form sugar.

2. In animals water helps to breakdown and dissolve food molecules.

3. It is the main component of cytoplasm and blood plasma.

4. Plasma contains 90% of water and acts as a transport medium for many dissolved substances CO_2 , urea, digested food and hormones.

5. Water also acts as a transport medium in plants.

6. Water passes up the plant from the roots to the leaves in xylem vessels and carries dissolved mineral ions.

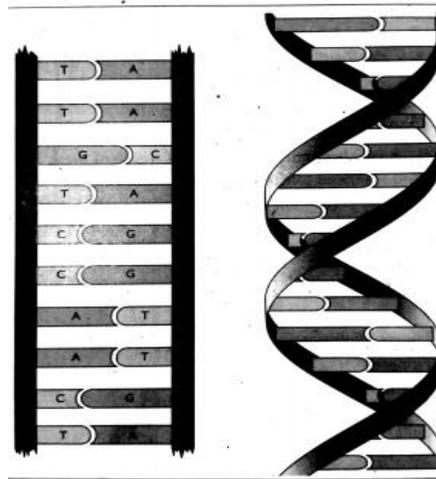
7. Phloem vessels transport sugar and amino acids in solution from the leaves to their places of use or storage.

8. Water acts as powerful solvent for excretory materials like urea, salt and drugs.

9. Water secreted in the form of sweat is necessary for regulating the body temperature.

10. Exchange of gases in lings takes place easily in presence of water.

Q5. Describe the structure of DNA.



A5. 1. DNA stands for deoxyribonucleic acid. DNA is the chemical that makes up our genes and chromosomes. We inherit it from our parents which gives up many of our characteristics.

Structure of DNA:- A DNA molecule is made up of long chains of nucleotides formed into two strands. Two strands coiled together to for a double helix.

2. A nucleotide is 5 carbon sugar molecules joined to phosphate group and an organic base.

3. In DNA the sugar is deoxyribose and organic base is either adenine (A), thymine (T), cytosine (C) or guanine (G).

4. Adenine and thymine always links up with 2 hydrogen bond and cytosine always links up with 3 hydrogen bond.

FOOD TEST

1. Test for starch: -

Procedure: 1. Shake a little starch powder with warm water to make a suspension.

2. Add 3-4 drops of iodine solution. A dark blue-black color will produce.

Result: Blue-black color shows the presence of starch.

Test for fat: -

Procedure: 1. Take a dry test tube. Add four drops of cooking oil to 5cm³ ethanol.

2. Shake the test tube slowly until the fats dissolve.

3. Pour this Solution in a tube containing water.

4. A milky white emulsion will form.

Result: White emulsion shows that the solution contains fats.

Q6. Write the names of the factors that affects the concentration of vitamin C in fruits and vegetables?

A6. Temperature, light intensity, oxygen, storage time, maturity.

Test for vitamin C

Procedure: 1. Take 2 cm³ fresh lemon juice into a plastic syringe.

2. Take 2 cm³ of 0.1% solution of DCPIP (a blue dye) in a test tube.

3. Add the lemon juice drop by drop into the test tube.

4. The DCPIP solution will become colorless as the lemon juice is added.

Result: Blue DCPIP solution will turn colorless. Shows the presence of vitamin C in lemon juice.

Test for reducing sugar:

Procedure: 1. Take 2 cm³ of food sample in a test tube with 2 cm³ of water.

2. Add two drops of Benedicts solution to the test tube and heat the test tube carefully in the water bath.

3. The color of the solution will change from blue to green, to yellow, to orange and finally to brick red if sugar is present.

Result: Brick red color shows the presence of sugar. There is no reducing sugar remain blue.

Test for protein or Biuret test

Procedure: 1. Take 1% solution of albumen (egg white) in a test tube.

2. Add 5 cm³ solution of sodium hydroxide followed by 5 cm³ of copper sulphate solution.

3. A purple or violet color appears.

Result: A purple color indicates the presence of proteins.

