

CHEMISTRY STUDY MATERIALS FOR CLASS 12

(NCERT Based Revision of Chapter -14)

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Biomolecules

1. Structure and shape of protein.

Primary structure	Secondary structure	Tertiary structure	Quaternary structure
The specific sequence of amino acids in the polypeptide chain. Change in amino acids sequence changes the protein completely. They have covalent bonds.	It is the shape in which the long polypeptide chain can exist. It is of two types: α -helix and β -pleated. These structures arise due to regular folding of the backbone of the polypeptide chain due to H-bonding between the C = O and -NH - groups of the peptide bond.	Represents overall folding of the polypeptide chain. It gives rise to the fibrous or globular molecular shapes. Forces stabilizing the 2 ^o and 3 ^o structures are hydrogen bonds, disulphide linkages, van der Waal's and electrostatic forces of attraction.	Protein can be composed of two or more polypeptide chains called sub-units. The spatial arrangement of these sub-units with respect to each other is quaternary structure of the protein.

2. **Native state of protein:** The parental state or the natural state in which the protein is found.

3. **Denaturation of protein:** Destruction of the native state of protein is denaturation. It can be brought by physical and chemical methods. The 2^o and 3^o structures are destroyed; only 1^o structure is retained.

Enzymes: These are biocatalyst and generally globular proteins e.g., invertase, zymase, phenyl, alaninehydroxylase, urease etc.

Main characteristics of enzymes:

- (i) It speeds up the biological reaction up to million times.
- (ii) It is highly specific and work on lock and key theory.
- (iii) It is highly sensitive to pH and temperature.

4. **Vitamins:** They are organic compounds required in the diet in small amounts to perform specific biological functions for maintenance of optimum growth and health of the organism. They are classified as follows :

- (i) **Fat soluble vitamins:** Vitamin A, D, E and K. They are stored in liver and adipose tissues.
- (ii) **Water soluble vitamins:** B group vitamins and vitamin C. They need to supplied regularly in diet as they are excreted in urine and cannot be stored (except vitamin B₁₂) in our body.

Their deficiency causes diseases. Biotin (Vit H) is however neither fat nor water soluble. Its deficiency leads to loss of hair.

5. **Nucleic acids:** These are biomolecules which are long chain polymers of nucleotides. They are of two types :

- (i) **Deoxyribonucleic acid (DNA)** (ii) **Ribonucleic acid (RNA)**

6. **Vitamin Deficiency disease**

A	Xerophthalmia, night blindness
B ₁	Beri-beri
B ₂	Ariboflavinosis, cheilosis, burning sensation of skin
B ₁₂	Pernicious anaemia, inflammation of tongue and mouth
C	Scurvy
D	Rickets & osteomalacia
E	Increased fragility of RBC and muscular weakness
K	Increased blood clotting time
H	Loss of hair

7. Hormones are chemical substances which are produced in ductless glands in the body.
8. Nucleoside = Base + Sugar

Nucleotide = Base + Sugar + Phosphate

DNA

RNA

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|---|---------------------------------|
| (i) Double helical. | (i) Single stranded. |
| (ii) Sugar is 2-deoxyribose. | (ii) Sugar is ribose. |
| (iii) Bases : A, T, G, C. | (iii) Bases : A, U, G, C. |
| (iv) Property of replication. | (iv) Do not replicate. |
| (v) It is responsible for transmission of hereditary character. | (v) Helps in protein synthesis. |
