

WJEC (Wales) Biology A-level

Topic 1.1 - Biological compounds

Definitions and Concepts

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Alpha glucose - A structural isomer of glucose that exists in a ring form where the hydroxyl group on carbon-1 lies below the plane of the ring.

Amino acids - The monomers containing an amino group (NH_2), a carboxyl group (COOH) and a variable R group that make up proteins.

Benedict's test - A biochemical test used to test for reducing sugars that produces a different colour based on the amount of reducing sugar present.

Beta glucose - A structural isomer of glucose that exists in a ring form where the hydroxyl group on carbon-1 lies above the plane of the ring.

Biuret test - A biochemical test that produces a purple colour when it is added to a solution containing protein.

Calcium ion (Ca^{2+}) - An ion required for the formation of calcium pectate which has a structural role in plant cell walls and membranes.

Cellulose - A linear polysaccharide that is the main component of the cell wall in plants and is made up of many beta glucose molecules joined by β -1,4 glycosidic bonds.

Chitin - A linear polysaccharide that is made up of chains of beta glucose molecules with amino acid side chains and is found in the exoskeletons of insects and crustaceans as well as fungal cell walls.

Cohesion - A property of water molecules that creates an attraction between them and causes them to stick together.

Condensation reaction - A type of reaction that joins two molecules together with the formation of a chemical bond involving the elimination of a molecule of water.

Disaccharides - Molecules formed by the condensation of two monosaccharides e.g. lactose, sucrose, maltose.

Emulsion test - A biochemical test that produces a cloudy emulsion when performed on lipids.

Ester bond - A bond between a fatty acid chain and glycerol formed in a condensation reaction.

Fibrous protein - A class of long chain proteins that are generally insoluble in water and typically have structural roles.

Globular protein - A class of spherical shaped proteins that are generally water soluble and typically have metabolic roles.

Glycogen - A highly branched polysaccharide that is used as the main energy storage molecule in animals and is made up of alpha glucose monomers joined by α -1,4 and α -1,6 glycosidic bonds.



Glycosidic bond - A bond between two monosaccharides formed in a condensation reaction.

Hexose monosaccharide - A simple sugar that contains 6 carbon atoms.

Hydrogen bond - A type of weak intermolecular bond formed between an electropositive hydrogen and an electronegative atom like oxygen or nitrogen.

Hydrolysis - Breaking a chemical bond between two molecules involving the use of a water molecule.

Iodine-potassium iodide test - A biochemical test that produces a blue/black colour when it is added to a solution containing starch.

Iron ion (Fe^{2+}) - An ion found in haemoglobin that is involved in the transport of oxygen.

Lactose - A disaccharide formed by condensation of a glucose molecule and a galactose molecule.

Magnesium ion (Mg^{2+}) - An ion that is used to produce chlorophyll in plants.

Maltose - A disaccharide made of two molecules of glucose joined by a glycosidic bond.

Metabolite - A molecule formed or used in metabolic reactions.

Monomer - An individual unit that can be bonded to other identical monomers to make a polymer.

Monosaccharides - The individual sugar monomers from which larger carbohydrates are made.

Non-reducing sugar - A sugar that does not have a free aldehyde or ketone functional group so cannot act as a reducing agent.

Pentose monosaccharide - A simple sugar that contains 5 carbon atoms.

Peptide bond - A bond formed between the carboxyl group of one amino acid and the amino group of another in a condensation reaction.

Phosphate ion (PO_4^{3-}) - An ion that is required to produce ADP and ATP.

Phospholipid - A type of lipid formed by the condensation of one molecule of glycerol, two molecules of fatty acid and a phosphate group.

Polarity - The uneven distribution of charge within a molecule.

Polymer - A molecule made from many repeating monomers joined together.

Polysaccharides - Molecules formed by the condensation of many monosaccharides e.g. glycogen, starch, chitin, cellulose.



Primary structure - The individual sequence of amino acids in a protein.

Quaternary structure - A structure only applicable to proteins with multiple polypeptide chains that describes the interactions of the different chains.

Reducing sugar - A sugar that has a free aldehyde or ketone functional group so can act as a reducing agent.

Saturated fat - A type of fat found in animals which increases blood cholesterol levels and whose fatty acid molecule constituents contain only single bonds between the carbon atoms.

Secondary structure - The local interactions of the amino acids in the polypeptide chain.

Solvent - A substance which other solutes are dissolved in.

Starch - A polysaccharide used for energy storage in plants that is made up of alpha glucose molecules joined together in the forms of amylose and amylopectin.

Sucrose - A disaccharide formed by condensation of a glucose molecule and a fructose molecule.

Surface tension - The cohesion of molecules on the surface of a liquid to occupy the smallest possible area.

Tertiary structure - Describes the folding of a protein to make a three-dimensional structure.

Triglyceride - A type of lipid formed by the condensation of one molecule of glycerol and three molecules of fatty acid.

Triose monosaccharide - A simple sugar that contains 3 carbon atoms.

Unsaturated fat - A type of fat found in plants which is considered healthy and whose fatty acid molecule constituents contain at least one double bond in the carbon chain.

