

# Biochemistry assignment



**ASSIGN  
BUSTER**

The amide bond twine the carbonyl group of one amino acid and the nitrogen in the amino group of the next amino acid in the peptide chain is called a peptide bond. \* The amide bonds between amino acids always involve the central amino and central carbonyl groups. The side chains are not involved in the bonding. Lipids Triglycerides \* Fats, oils, and other water-insoluble compounds are called lipids. The difference between fats and oils is simply that fats are solid at room temperature and oils are liquids. Most fats are obtained from animals. Lipids provide an efficient way for your odd to store energy. They are also needed to keep your cell membranes healthy.

Lipids tend to dissolve readily in organic solvents, such as ether and chloroform, rather than in highly polar solvents such as water. This property sets them apart from most biological substances such as carbohydrates and proteins. \* Natural fats and oils exist as trimesters of glycerol with fatty acids, which are long chained carboxylic acids. This form of lipid is known as a triglyceride. Triglycerides are important as the long- term storage form of energy in the human body. Phosphoric Phosphoric are lipids that contain phosphate groups, are abundant in cells. In water, phosphoric spontaneously form a spherical double layer, called a lipid bilateral, in which the hydrophobic tails of phosphoric molecules are sandwiched between two layers of hydrophilic heads. The lipid bilateral of a cell membrane acts as a barrier against the passage of molecules and ions into and of the cell. Protein Electrophoresis \* Used to identify amino acids and the arrangement of those amino acids in a protein \* Is an analytical technique which separates charged substances based on he deterrent rate at which they move when applied to a potential deterrence (volts \* The rate of movement of amino acids depends

on their size (molecular mass) and electrical charge (+ or -). \* The electrical charge can be found using colorimetric point. \* Colorimetric point: is the pH value at which the amino acid carries no net electrical charge, egg. It occurs as a extension. In Page Method (Polysaccharide Gel Electrophoresis): A tiny sample of protein solution is placed into a well in the center of a polysaccharide gel. The gel is moistened with a buffer solution and a voltage power pack) is applied. Depending on the pH of the buffer solution, the amino acids separate according to their mass and charge. \* If the buffer solution pH colorimetric point of an amino acid This acid has no charge and will not move. \* If an amino acid  $pH > pH$  of buffer solution it is + lay charged and moves towards the negative terminal \* If an amino acid  $pH < pH$  of buffer solution its -lye charged and moves towards the positive terminal \* The larger the molecular mass of an amino acid the slower it moves \* The gel is normally sprayed with an organic due, nitride.

That changes the color of the amino acid and the amino acid will appear as bonds on the gel \* The bands are then compared with standard (known as amino acid) to be identified Worked Example 1: A mixture of five amino acids (glycerin, cytosine, lysine, phenylalanine and histamine) is separated by gel electrophoresis in a buffer solution of  $pH = 6.0$ . Draw the finished gel after the amino acids have been separated. Amino Acid | Colorimetric points |  $pH$  buffer | Molecular mass | Charge an amino acid in buffer of  $pH = 6.0$  | Move towards terminal | Cytosine | 5.1 | 6.0 | 121 | Negative | + | Glycerin | 6.0 | 6.0 | 175 | 1 | Neutral | stay | Histamine | 7.6 | 6.0 | 155 | positive | - | Lysine | 9.7 | 6.0 | 146 | positive | - | Phenylalanine | 5.5 | 6.0 | 165 | Negative | + | The colorimetric point of glycerin is equal to the  $pH$  of the buffer solution.

Glycerin will not be charged and so will not move from the starting position in the center of the Enzymes \* Most enzymes are proteins. They are capable of speeding up biochemical reactions and are therefore called biological catalysts. Enzymes act on one or more compounds. They may break a single substrate molecule down into simple substances, or join two or more substrate molecules chemically together. Its presence merely allows reactions to take place rapidly. Enzymes also have the ability to lower the activation energy. How they work: Enzymes work through either the lock and key model or the induced fit model. Enzymes catalyze most of the chemical changes that occur in a cell. Substrates are the molecules on which an enzyme acts.

In a typical enzymatic reaction, the substrate interacts with side chains of the amino acids on the enzyme. These interactions cause the making or breaking of bonds. A substrate molecule must make contact with and bind to an enzyme molecule before the substrate can be transformed into product. The place on an enzyme where a substrate binds is called the active site. An active site is usually a pocket formed by folds in the peptide chains of the enzyme protein. The peptide chain is folded in a unique way to accommodate the substrate at the active site. Because the active site of each enzyme has a distinctive shape, only one specific substrate molecule can fit into the enzyme, in the same way that only one key will fit into a certain lock. Active sites: These attraction points draw the substrate to the enzyme's surface. Substrate molecules are positioned in a way to promote a reaction: either joining two molecules together or splitting them up.

Consumes \* Some enzymes can directly catalyze the transformation of biological substrates without assistance from other substances. Other

enzymes need no protein consumes, to assist the transformation. Consumes are metal ions or small organic molecules that must be present for an enzyme- catalyzed reaction to occur. Many water-soluble enzymes, such as B Vitamins, are consumes. Metal ions that act as consumes include the actions of magnesium, potassium, iron and zinc.