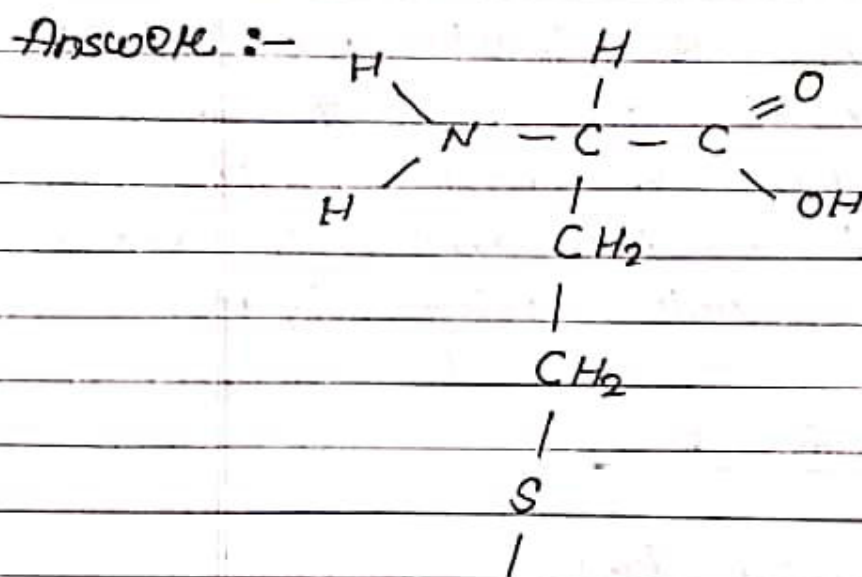


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Dr. Rajesh Verma, Assistant professor and Head, U.G. Department of Zoology, D.K. College, Dumkoon (Buxom). Notes for B.Sc. part 3rd, paper VI, Unit = 2 (3).

Question :- Write Notes on CLASSIFICATION OF AMINO ACID?



Classification of Amino Acids

Classes of Amino Acids	Name of the Amino
Hydroxyl or Sulfur containing	Serine, Cysteine, Methionine

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cyclic	Proline
Aromatic	Phenylalanine, Tyrosine, Tryptophan
Basic	Histidine, Lysine, Arginine

Amino Acids :-

Amino acids are a crucial, yet basic unit of protein, and they contain an amine group and a carbonylic group. They play an extensive role in gene expression process, which includes an adjustment of protein function that facilitate messenger RNA (mRNA) translation (Scott et al., 2006).

Amino Acid	The are over 700 types of amino acids that have been discovered in nature. Almost all them are α -amino acids. They have been found in :
enine,	
thionine.	

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- Bacteria
- Fungi
- algae
- plants.

The amino acids are essential components of peptides and proteins. Twenty important amino acids are crucial for life as they contain peptides and proteins and are known to be the building blocks for all living things on earth. They are used for a protein synthesis. The amino acids are controlled by genetics.

Classification of Amino Acid :-

Experts classify amino acids based on a variety of features, including whether people can acquire them through diet. Accordingly, scientists recognize three amino acid types:

1. Nonessential
- a. Essential

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3. conditionally essential

However, the classification as essential or nonessential does not actually reflect their importance as all amino acids are necessary for human health. Eight of these amino acids are essential (or indispensable) and cannot be produced by the body.

They are :

- leucine
- Isoleucine
- lysine
- ~~threonine~~ Threonine
- Methionine
- Phenylalanine
- valine
- Tryptophan

histidine is an amino acid that is categorized as semi-essential since the human body doesn't always need it to properly function therefore dietary sources of it are not always essential. Meanwhile

conditionally essential amino acids aren't usually required in the human diet, but do become essential under certain circumstances.

Finally, nonessential amino acids are produced by the human body either from essential amino acids or from normal protein breakdowns. Nonessential amino acids include:

- Asparagine
- Alanine
- Arginine
- Aspartic acid
- Cysteine
- Glutamic acid
- Glutamine
- Proline
- Glycine
- Tyrosine
- Serine

An additional amino acid's classification depends upon the side chain

structure, and experts recognize these five as:

- Cysteine and Methionine (amino acids containing sulfur)
- Asparagine, Serine, Threonine, and Glutamine (neutral amino acids)
- Glutamic acid and Aspartic acid (acidic); and Arginine and lysine (basic)
- Leucine, Isoleucine, Glycine, Valine, and Alanine (aliphatic amino acids)
- Phenylalanine, Tryptophan, Tyrosine and Histidine (aromatic amino acids)

One final amino acid classification is categorized by the side chain structure that divides the list of 20 amino acids into four groups - two of which are the main groups and two that are subgroups. They are:

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1. Non-polar
2. Polar
3. Acidic and polar
4. Basic and polar

For example, side chains having pure hydrocarbon alkyl or aromatic groups are considered non-polar, and these amino acids are comprised of Phenylalanine, Glycine, Valine, leucine, Alanine, Isoleucine, Proline, Methionine and Tryptophan. Meanwhile, if the side chain contains different polar groups like amides, acids and alcohols, they are classified as polar. It includes Tyrosine, Serine, Asparagine, Threonine, Glutamine, and Cysteine. If the side chain contains carboxylic acid, the amino acids in the acidic-polar classification are Aspartic Acid and Glutamic Acid.