

INTRODUCTION

- Amino acids are a class of chemicals that contain two functional groups: Amino (NH_2) and Carboxyl (COOH).
- The amino ($-\text{NH}_2$) group is basic, whereas the carboxyl ($-\text{COOH}$) group is acidic [1–6, 7].
- The first amino acid which was discovered is asparagine in 1806, while the last amino acid to be found is threonine in the year 1938.
- All amino acid have trivial names. Eg., $\text{NH}_2\text{CH}_2\text{COOH}$ is better known as glycine rather than α -amino acetic acid or 2-ethanoic acid.
- Amino acids are the building blocks of protein.
- They are joined together with peptides bonds to form proteins.

Condt....

→ Due to Amino group:

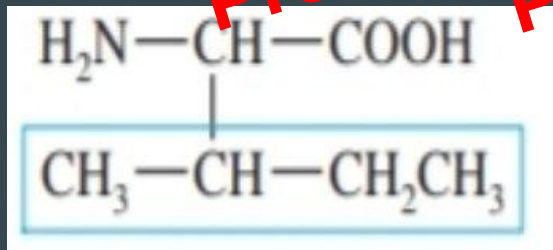
- ◆ When the amino acids are treated with mineral acids like HCl, it forms Acid Salts.

→ Due to Amino and Carboxyl group:

◆ Reaction with Ninhydrin:

- On reaction with ninhydrin molecule, amino acids gives color. When it gives **Purple color** (Ruhemann's Complex) the unknown sample is Amino acids (which have primary amine NH_2) or it gives **Yellow color** the Unknown sample is Imino acid ($-\text{NH}-$).

Isoleucine

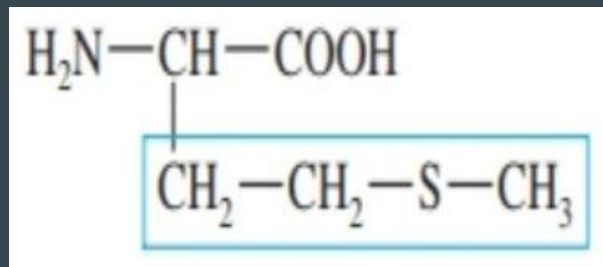


Symbol: **I** Abbreviation: **Ile**

Functional Group: Alkyl group

- Simple
- Essential amino acid.
- Aliphatic side chains.
- Non-Polar amino acid.

Methionine

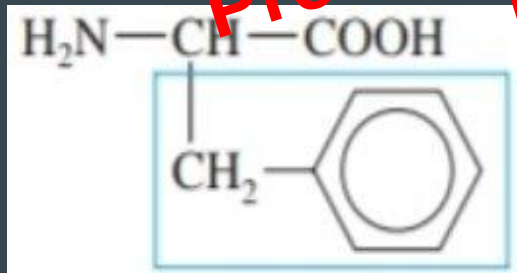


Symbol: **M** Abbreviation: **Met**

Functional Group: Sulfide

- Simple, essential amino acid.
- Aliphatic side chains
- Non-Polar amino acid.
- Containing sulfur in the side chain.

Phenylalanine

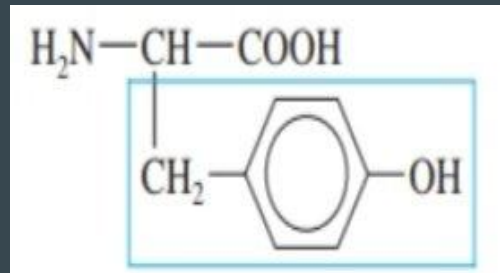


Symbol: **F** Abbreviation: **Phe**

Functional Group: Aromatic group

- Essential amino acid.
- Aliphatic and Non-Polar amino acid.
- Having benzene ring in the side chain.

Tyrosine

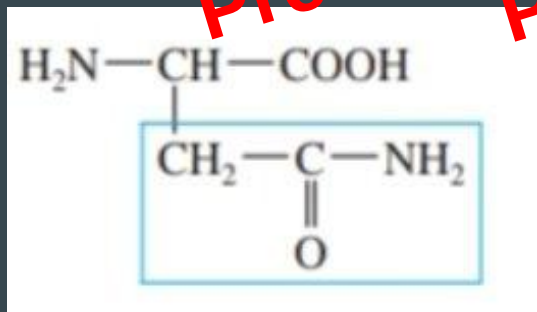


Symbol: **Y** Abbreviation: **Tyr**

Functional Group: Phenolic—OH group

- Conditionally amino acid.
- Aliphatic and Polar with no charge amino acid.
- Having benzene ring in the side chain.

Asparagine

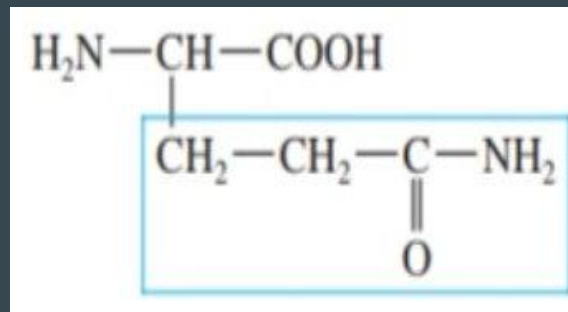


Symbol: **N** Abbreviation: **Asn**

Functional Group: Amide

- Non-essential amino acid.
- Polar with no charge on R-group.
- Containing non-basic nitrogen in the side chain.

Glutamine



Symbol: **Q** Abbreviation: **Gln**

Functional Group: Amide

- Conditionally amino acid.
- Polar with no charge on R-group.
- Containing non-basic nitrogen in the side chain.

ESSENTIAL AMINO ACIDS

→ Isoleucine:

- ◆ Formation of haemoglobin.
- ◆ Prevents muscle in debilitated individuals.
- ◆ It is required for children's optimum growth and the maintenance of nitrogen balance in adults.

→ Methionine:

- ◆ Methionine is used to prevent and cure a variety of ailments, including depression, inflammation, liver illness, and muscle discomfort.
- ◆ It reduces blood cholesterol levels.

SEMI-ESSENTIAL AMINO ACIDS

→ Histidine:

- ◆ Haemoglobin has a high percentage of histidine. As a result, it is used to treat anemia.
- ◆ It can reduce blood pressure. In baby feeding, histidine is critical.

→ Arginine:

- ◆ It boosts nitric oxide production for better blood pressure and blood flow.
- ◆ L-arginine plays an important role for the treatment of cardiovascular diseases.