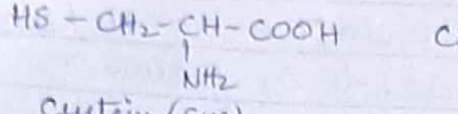
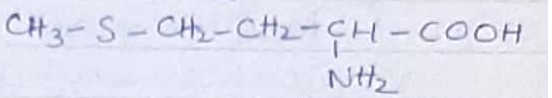
(iii) Sulpher-Containing amino acids :- These posses a sulpher atom in the side chain eg. Cystein and methioni

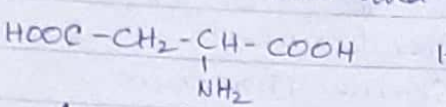


Cystein (Cys)

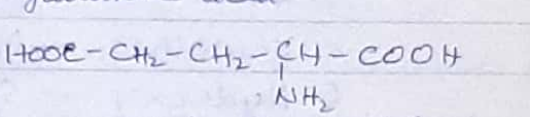


Meiltrionine (Met)

(iv) Acidic amino acid :- These have a Carboxyl group in Sidech eg., asparatic acid and glutamic acid.

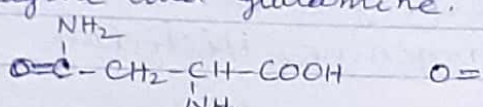


Asparatic acid (Asp)

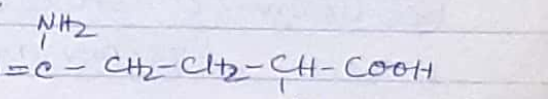


Glutamic acid (Glu).

(v) Amino acid amides :- These are derivative of acidic amino acide in which one of the carboxylic group has been transformed into an amide group (-CO.NH_2) e.g Aspa ragine and glutamine.

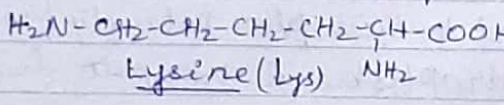


Asparagine (Asn)

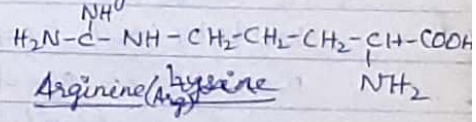


Glutamine (Gln)

(vi) Basic amino acids :- These posses an amino group in the side chain eg. lysine and arginine.

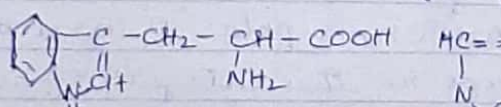


Lysine (Lys)

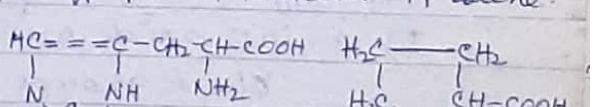


Arginine (Arg)

(vii) Hetrocyclic amino acids :- These amino acids have in their side chain a ring which posses at least one atom other than the carbon eg tryptophan, hestidine, Proline.



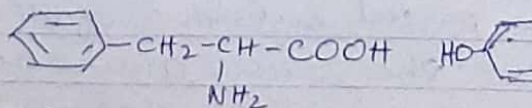
Tryptophan (Trp)



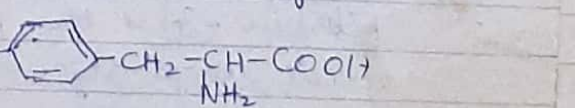
Histidine (His)

Proline (Pro)

(viii) Aromatic amino acide :- These have a benzene ring in their side chain eg. phenyl alanine and tyrosine.



Phenylalanine (phe)



Tyrosine (Tyr)

(B) On the basis of the number of amino and carboxylic groups:-

McCilvery and Goldstein (1979) have classified various amino acids as follows:-

(i) Monoaminomonocarboxylic amino acids

1. Unsubstituted – Glycine, Alanine, Valine, Leucine, Isoleucine
2. Hetrocyclic – Prolin
3. Aromatic – Phenylalanine, Tyrosine, Tryptophan
4. Thioether – Meithionene
5. Hydroxy – Serine, Threonine
6. Mercapto – cystein
7. Carboxamide – Asparagine, Glutamine.

(ii) Monoaminodicarboxylic amino acids

Asparagena Asparatic acid, Glutamic acid.

(iii) Diaminomonocarboxylic amino acids:

Lysine, argenine, Histidine.

(C) On the basis of the polarity of the Side Chain or R-group:-

The side chain or R-groups of amino acids vary widely with respect to their phose polarity from totally non-polar or hydrophobic R group to highly polar or hydrophilic R-groups. This classification of amino acids emphasizes the possible functional roles with they perform in protein. This system have following 4 categories

I). Amino acids with non-polar R-groups:-

The R groups in this category of aminoacids are hydrocarbon in nature and thus hydrophobic. This group includes following amino acids.

(1) Alanine (α-aminopropionate):-

It was first obtained in 1888 from Silk fibroin - It is the parent substance of all amino acids except glycine. The various amino acids may be derived from alanine by replacement of one or two H-atoms of the methyl group present on α-Carbon atom.

② Valine (α-aminoisovalerate): It is branched chain amino acids and can be derived from alanine by introduction of two methyl groups in place of two H-atoms of the methyl group present on α-carbon atom

③ Leucine (α-amineisocaproate) :- It was first isolated from cheese in 19 by Proust. It is also branch chain amino acids and is next higher homologue of valine

④ Isoleucine (α-amino-β-methyl valerate) It is an isomer of leucine and is also a branched chain amino acid. It has two asymmetric carbon atom and thus occurs in four stereo isomeric forms

⑤ Proline (2-Pyrrolidine carboxylate) It is present in almost all protein. It is a cyclized derivative of glutamic acid. Its α-amino group is not free but is substituted by a portion of its R group to yield a cyclic structure.

⑥ Phyn Phenylalanine (α-amino-β-Phenyl propanate). It is benzenoid amino acid. It can not be formed in the animal because of its aromatic ring.

⑦ Tryptophan (α-amino-β-3-indole propionate) It is the most complex amino acid found in protein on acid hydrolysis it completely destroyed.

⑧ Methionine (α-amino-β-methylmercapto butyrate) It is the only common amino acid with possess and ether linkage. Methionine is also important as a donor of activ methyl group.