

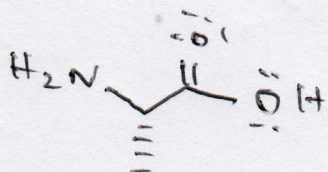
essential amino acids - those amino acids that the body is not able to produce (or produce easily) and must therefore be supplied by food.

L-amino acid

20 "most-common" amino acids

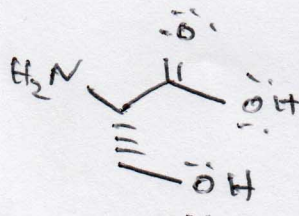
Classes of amino acids - types of side chains

1) R = alkyl



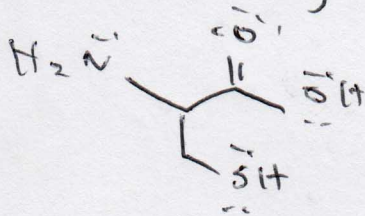
L-alanine

2) R = alcohol-containing



L-serine

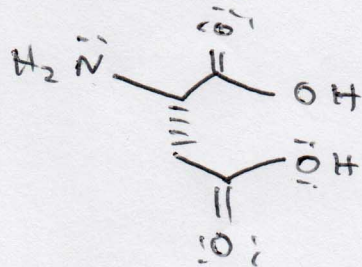
3) R = thiol-containing



L-cysteine

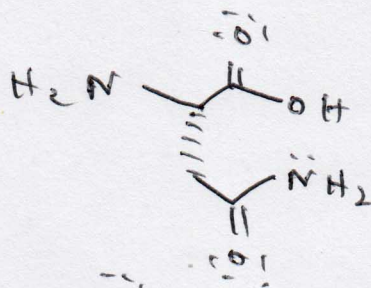
(sulfur analog of serine)

4) R = carboxylic acids



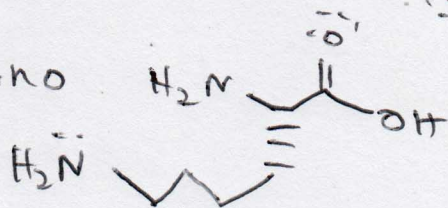
L-aspartate
(aspartic acid)

5) R = amide



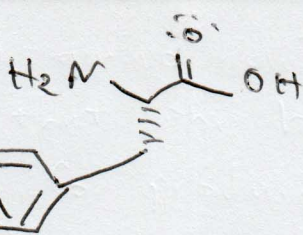
L-asparagine

6) R = amino



L-lysine

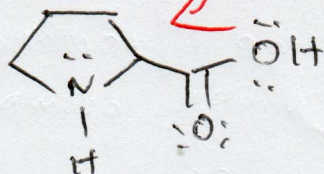
7) R = benzene



L-phenylalanine

L3

8) R = heterocycles

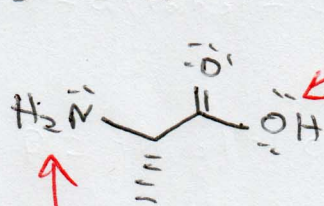


2°-amino group

L-proline

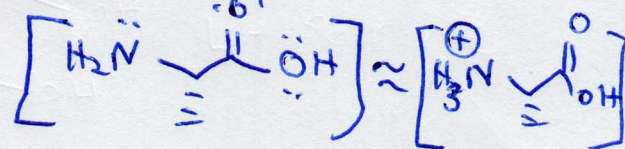
Isoelectric point \rightarrow pH at which ~~the~~

an amino exhibits the greatest percentage of its neutral form,

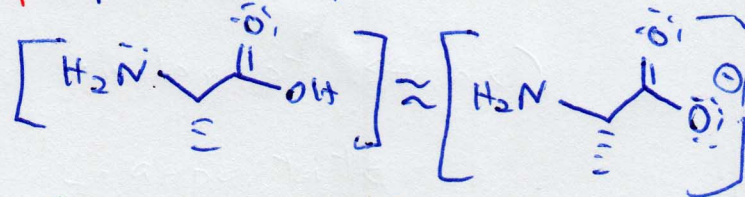
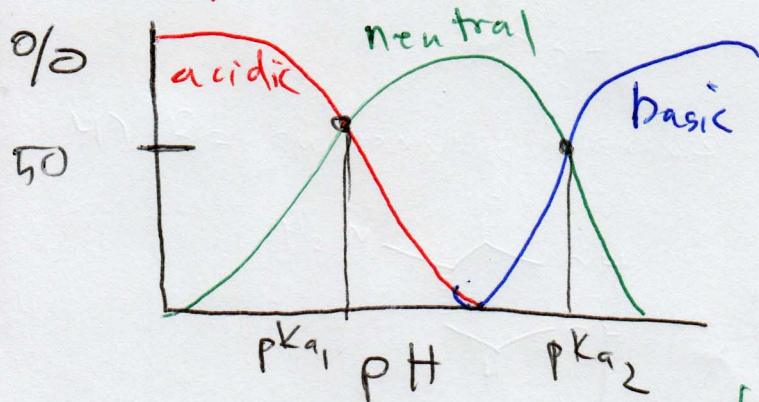


$pK_{a1} = 2.34$

@ pH 2.34

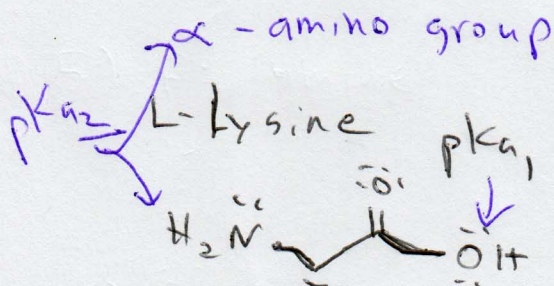


pK_{a2} (conjugate) = 9.69 @ pH 9.69



$$pI^* = \frac{pK_{a1} + pK_{a2}}{2}$$

* For amino acids that do not have an acidic or basic side-chain.



$$pI = \frac{pK_{a2} + pK_{a3}}{2}$$

