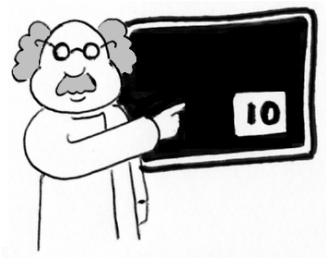
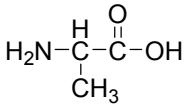
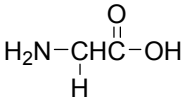


STARTER FOR 10...

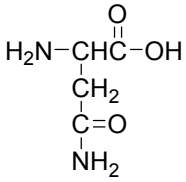
6.4. Amino acids



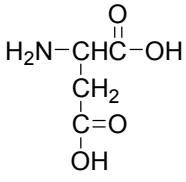
A



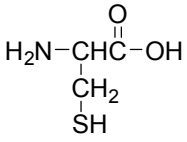
B



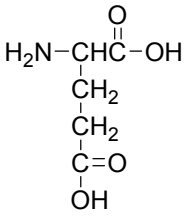
C



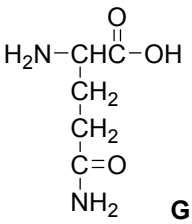
D



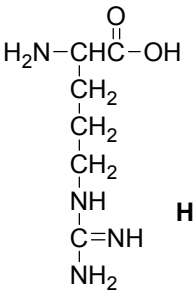
E



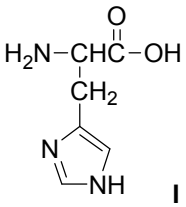
F



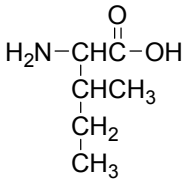
G



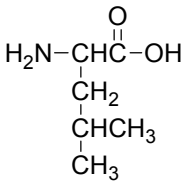
H



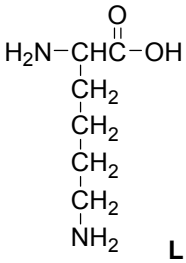
I



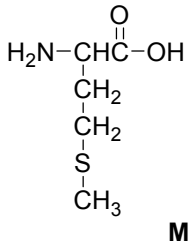
J



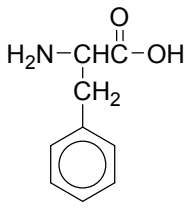
K



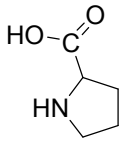
L



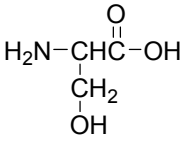
M



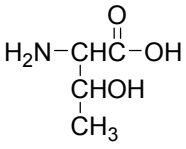
N



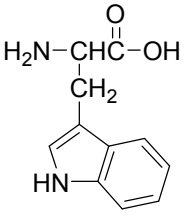
O



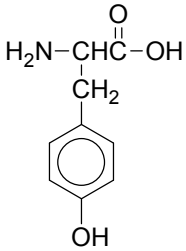
P



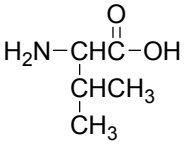
Q



R



S

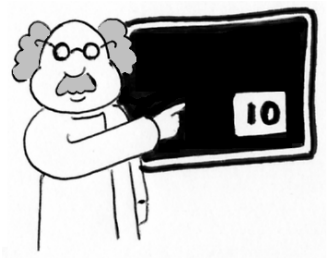


T

Above are diagrams of the 20 naturally occurring amino acids. The clues describe 10 of them. Give the letter of the alphabet for the structure being described.

Alanine is a major source of energy for muscles. It has a molecular weight of 89.

Arginine is an amino acid necessary for wound healing and has an imine in its R group.



STARTER FOR 10...

6.4. Amino acids

Aspartic acid is an amino acid that can be transformed into aspartame, an artificial sweetener. It has 2 acid groups in its structure.

Cysteine is an amino acid which is abundant in the keratin proteins that make up curly hair through the formation of disufide bridges. It has a thiol in its structure.

Glutamic acid is an amino acid which is used to build GABA neurotransmitters. It has the same structure as aspartic acid but with the addition of an extra CH_2 in the R side chain.

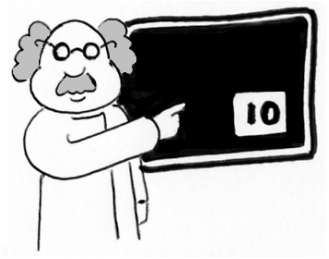
Glycine is the simplest amino acid and forms part of the haemoglobin structure.

Histidine is an amino acid that is associated with allergic responses. It has 3 nitrogen atoms in its structure.

Phenylalanine plays an important role in the production of collagen and has a benzyl R side chain.

Proline is a critical component of cartilage tissue. It is a relatively simple amino acid with no R side chain and its amine group is part of a 5 membered ring.

Tryptophan is used by the body to produce the key calming neurotransmitter serotonin. Its R side chain contains a bicyclic aromatic heterocycle (2 rings, joined together and one or more containing an atom other than carbon).

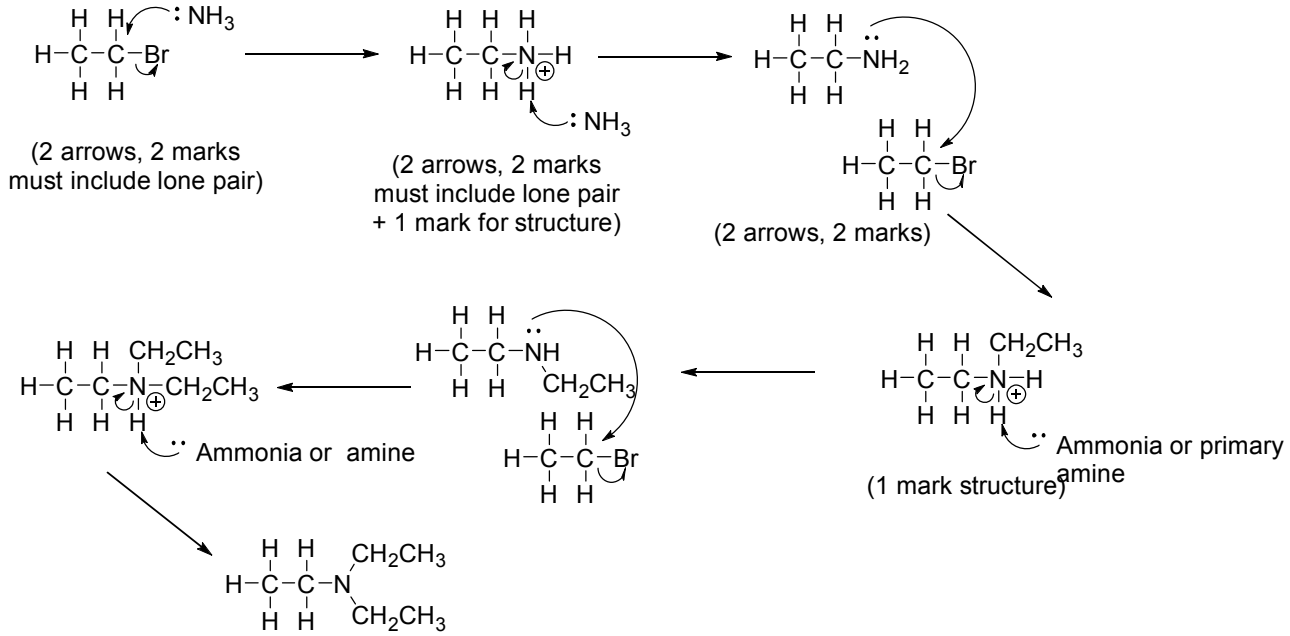


STARTER FOR 10...

6. Answers

6.3 Amine mechanisms

1



2 Substituted amines are more nucleophilic than ammonia (due to the inductive effect) (1 mark)

3 Use an excess of ammonia

6.4 Amino acids

Alanine A

Arginine H

Aspartic acid D

Cysteine E

Glutamic acid F

Glycine B

Histidine I

Phenylalanine N

Proline O

Tryptophan R

This starter is a good opportunity to discuss some chemistry beyond the curriculum.