

Protein hydrolysis

Answer all the questions below as fully as you can then check your answers

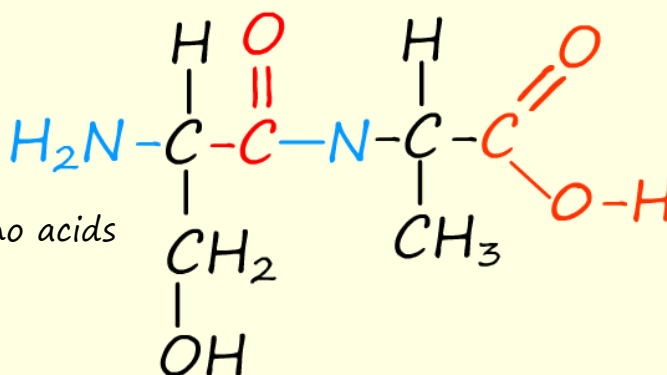
1. What is hydrolysis?
2. The image opposite shows a dipeptide molecule.

a. What is a dipeptide?

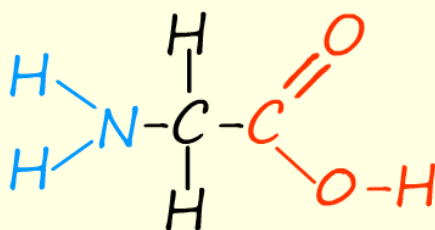
b. Name 4 functional groups present in this dipeptide molecule.

c. Draw the structure of the two amino acids that reacted together to form this dipeptide molecule.

d. The amino acid glycine is shown below:

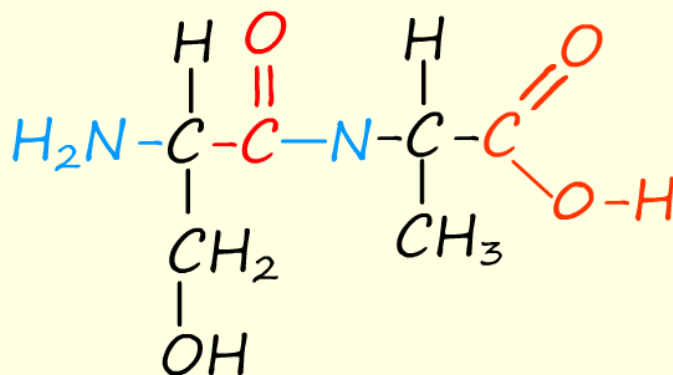


i. Write an equation to show the product of the reaction of glycine with hydrochloric acid.



ii. Write an equation to show the product of the reaction of glycine with sodium hydroxide solution.

e. The dipeptide molecule opposite was hydrolysed with refluxed with 6M hydrochloric acid at 100°C for 24 hours.



i. Draw the structure of the two amino acids produced.

ii. Draw the structures of the 2 amino acids if 6M sodium hydroxide solution had been used to carry out the hydrolysis reaction instead of the 6M hydrochloric acid.

Answers

1. What is hydrolysis?

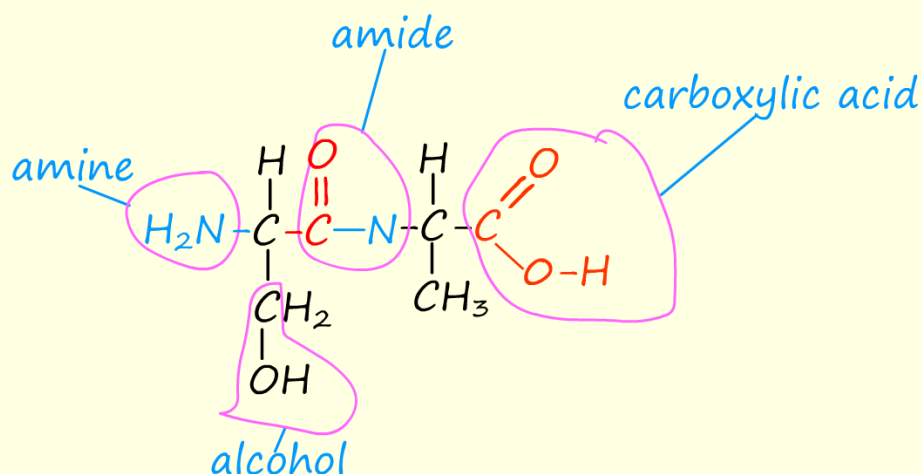
The breaking up of a substance using water. Normally hydrolysis is carried out using either an acid (which contain one of the elements found in water (H^+) or using an alkali such as potassium or sodium hydroxide, which again contains the hydroxide ion (OH^-) also found in water! Hydrolysis is usually carried out under reflux conditions.

2. The image opposite shows a dipeptide molecule.

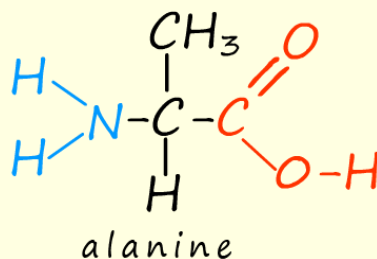
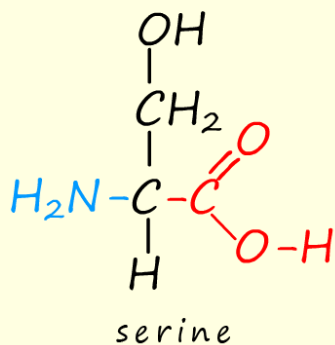
a. What is a dipeptide?

A molecule composed of two amino acid residues.

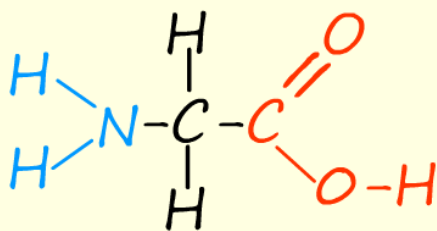
b. Name 4 functional groups present in this dipeptide molecule.



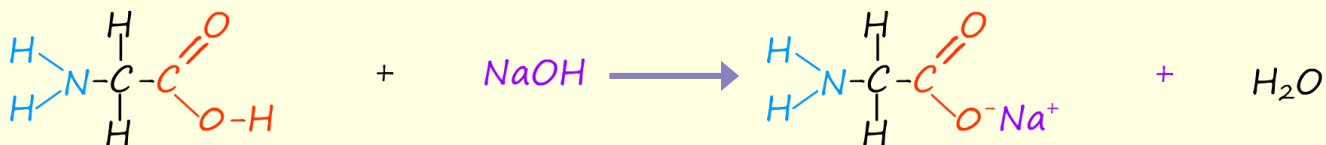
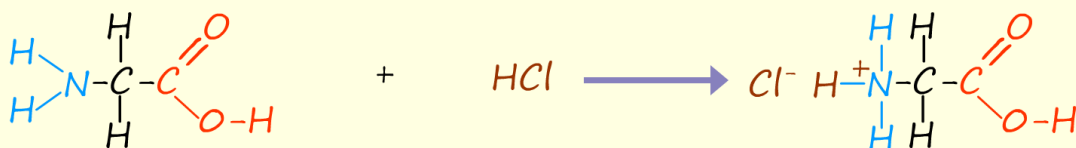
c. Draw the structure of the two amino acids that reacted together to form this dipeptide molecule.



d. The amino acid glycine is shown below:



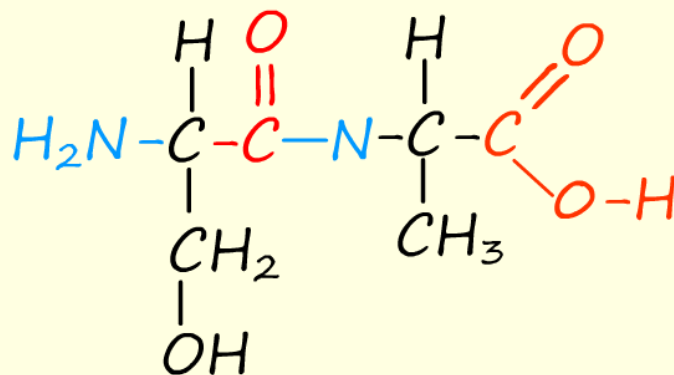
i. Write an equation to show the product of the reaction of glycine with hydrochloric acid.



ii. Write an equation to show the product of the reaction of glycine with sodium hydroxide solution.

See above

e. The dipeptide molecule opposite was hydrolysed with refluxed with 6M hydrochloric acid at 100°C for 24 hours.



i. Draw the structure of the two amino acids produced.

The amino acids serine and alanine react to form this dipeptide molecule, answers in diagram below:

ii. Draw the structures of the 2 amino acids if 6M sodium hydroxide solution had been used to carry out the hydrolysis reaction instead of the 6M hydrochloric acid.

