OCR (A) Chemistry A-level

Topic 6.2.2 - Amino Acids, Amides and Chirality

Flashcards

What are the two functional groups of amino acids?

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NH_2 and COOH (amine and carboxylic acid)

Draw a general formula for α-amino acids.

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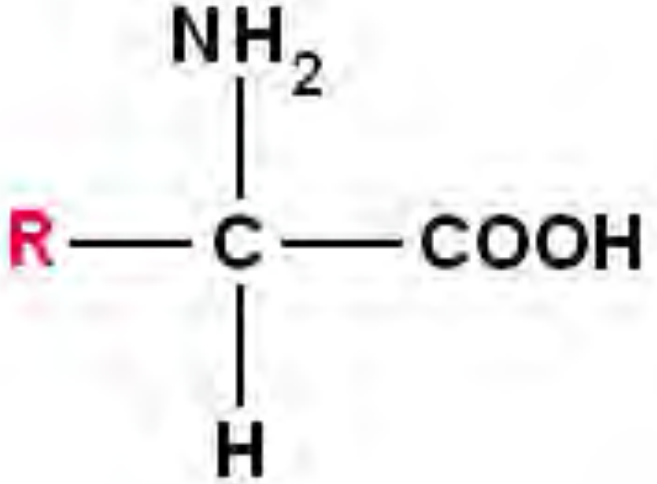

Are α-amino acids chiral? Why?

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Yes, one carbon has 4 different substituents.

Except glycine, where R = H.

Define a zwitterion.

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Ions which have both a permanent positive and negative charge, but are neutral overall.

How do zwitterions occur in amino acids? Draw a general structure of one.

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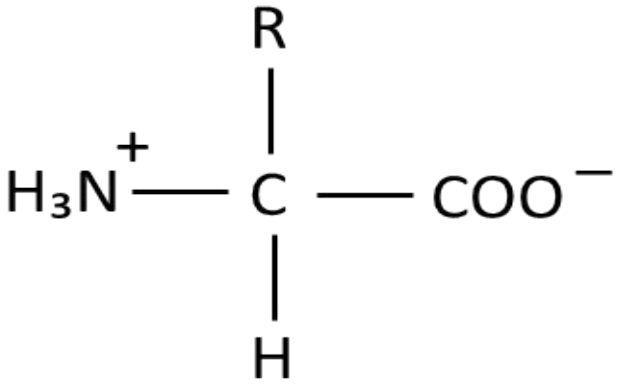
COOH is deprotonated → COO^-

NH_2 is protonated → NH_3^+



What happens to amino acids in acidic conditions? Draw this.

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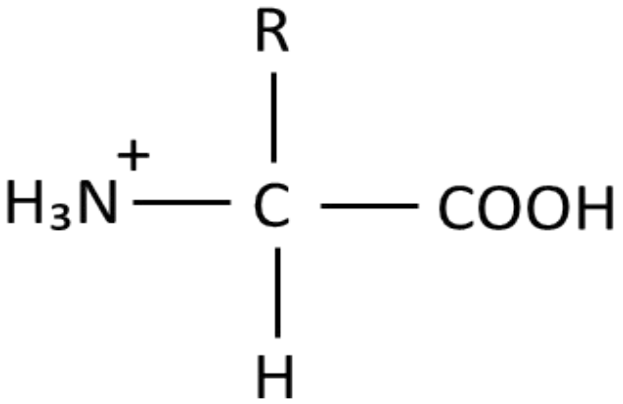
Gains a proton on NH_2 group



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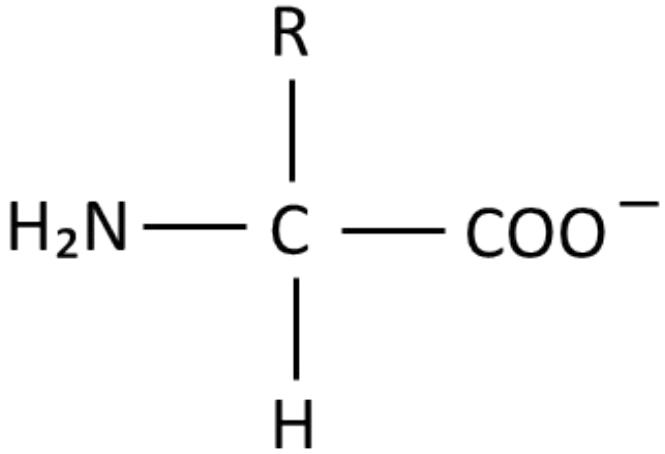
Loses a proton from COOH group



What is the peptide linkage?

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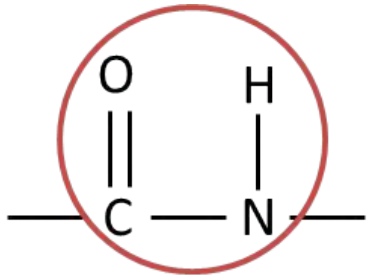
-CONH-



The peptide linkage

What are the structures of primary and secondary amides?

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1 carbon *2 carbons*

Primary (1°) amide

Secondary (2°) amide

What property must a carbon atom have for the molecule to display optical isomerism about that carbon atom?

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4 different substituents attached to one carbon atom

What are the similarities and differences between two optical isomers?

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Same atoms and bonds, but they are non-superimposable mirror images of one another. NOT IDENTICAL in chemical properties necessarily.

Differ in the way they rotate plane polarised light - rotate plane of polarisation by the same angle but in different directions.

What word is used to describe optically active molecules?

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chiral

Give two examples of chiral molecules. Draw one of them (both enantiomers).

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All alpha amino acids, except glycine.

Lactic acid / 2-hydroxypropanoic acid