

Topic: Amino Acid(Structure & Classification)

Class: B.Sc Part –III (Hons.)

Paper- V

Group – A

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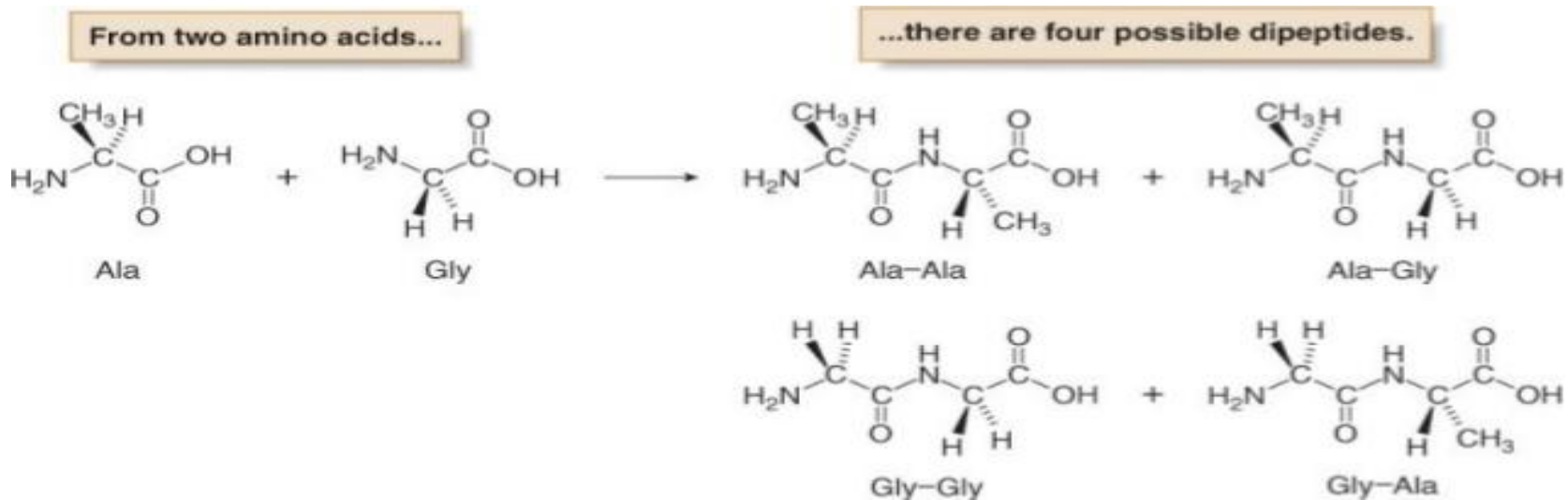
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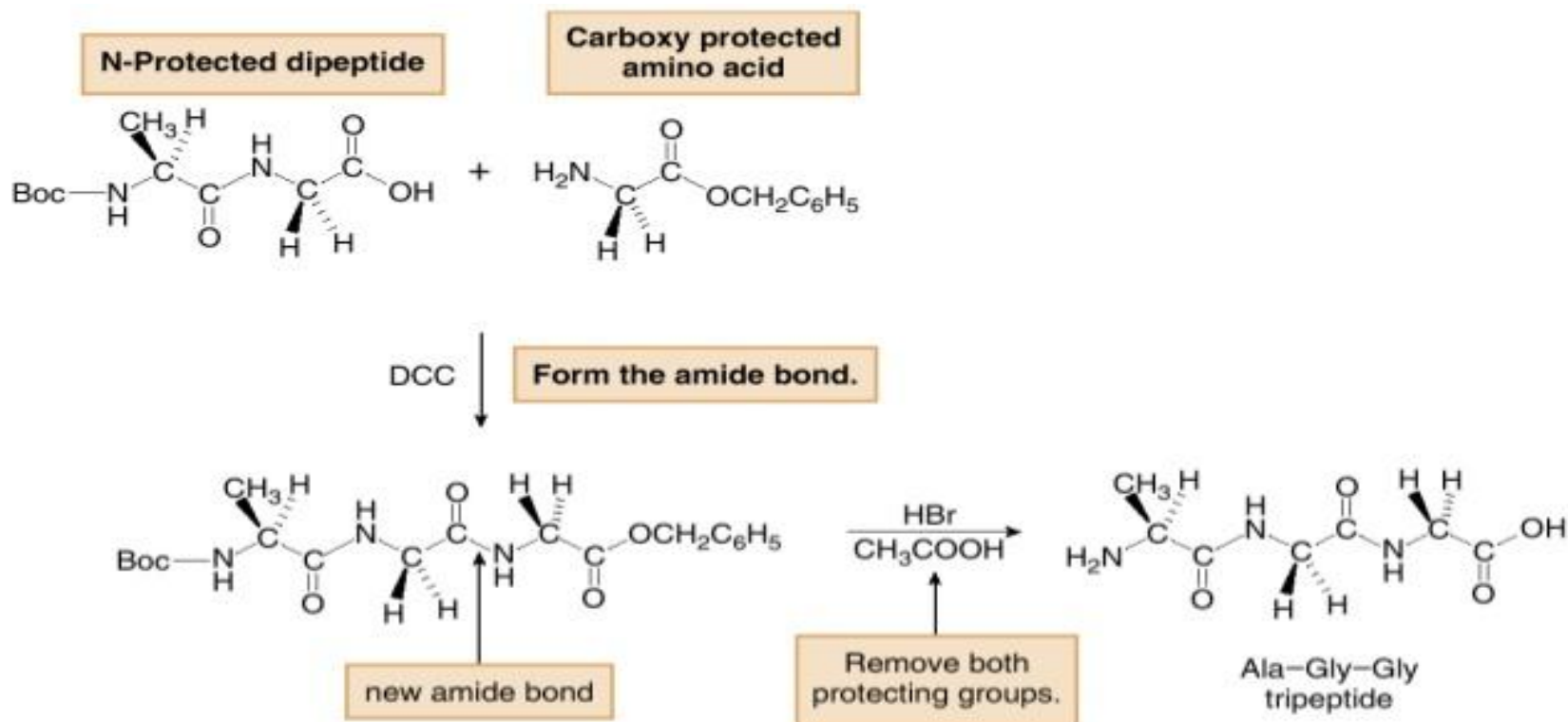
The Amide Bond

- Some of the main properties of the amide bond is its low basicity, which is useful in purification, and its stability, due to resonance.
- Basic amide synthesis is the reaction of a carboxylic acid and an amine with the loss of water.
- Since the free electrons of the N atom are tied up in forming partial ($\approx 40\%$) double bond, N atom can not accept a proton (H^+).
- This N also has a partial positive charge which will repel protons and prevent them from binding to the nitrogen (thus no ionization). $R-C(=O)-NH_2$ δ^- δ^+

- The synthesis of a specific dipeptide such as Ala-Gly from alanine and glycine is complicated because both amino acids have two functional groups.
- As a result, four products—namely, Ala-Ala, Ala-Gly, Gly-Gly and Gly-Ala—are possible. Peptide Synthesis



- The method can be applied to synthesis of tripeptides and even larger peptides.



Analysis of the amino acid sequence

- Determine number of polypeptide chains (subunits)
- Determine number of disulfide bonds (inter- and intra chain)
- Determine the amino acid composition of each polypeptide chain
- If subunits are too large, fragment them into shorter polypeptide chains
- Determine the amino acid sequence of each fragment using the Edman degradation method

- Number of chains can be determine by identifying the number of N- and C-terminal.

- **N-terminal analysis**

- Dansyl chloride
- Phenylisothiocynate (PITC)/ Edman reagent
- Aminopeptidase

- **C-terminal analysis**

- carboxypeptidase