

22: Peptides, Proteins, and α -Amino Acids

Preview

22.1 Peptides

Peptide Structure (22.1A)

α -Amino Acids in Peptides

α -Amino Acids Can be D or L

The R Groups

Categories of "Standard" Amino Acids

Abbreviated Names

Peptide Synthesis (22.1B)

General Considerations

Automated Peptide Synthesis

22.2 Protein Structure and Organization

Primary (1°) Structure (22.2A)

Content

Sequence

Separation of Individual Peptide Chains

Secondary (2°) Structure (22.2B)

Planarity of Amide Groups

Helical Structures

β -Pleated Sheets

Other Structures

Tertiary (3°) Structure (22.2C)

Fibrous Proteins

Globular Proteins.

Factors that Determine Protein Shape (22.2D)

Hydrophobic Bonding

Electrostatic Interactions and Hydrogen Bonding

Disulfide Bonds

Quaternary (4°) Structure

Denaturation

22.3 Properties of α -Amino Acids

α -Amino Acids Are Polyprotic Acids (22.3A)

Diprotic α -Amino Acids

Diprotic Amino Acid Forms at Different pH Values

Triprotic α -Amino Acids

Aspartic and Glutamic Acid

Lysine, Arginine, and Histidine

Cysteine and Tyrosine

Isoelectric Points (22.3B)

pI Values of Diprotic Amino Acids

pI Values of Triprotic Amino Acids

Laboratory Synthesis of Amino Acids (22.3C)

Amination of α -Bromo acids

Strecker Synthesis

Reductive Amination

Diethylacetamidomalonate Synthesis

Biosynthesis of α -Amino Acids (22.3D)

Non-Essential Amino Acids

Essential Amino Acids

(continued)

22.4 Enzymes and Enzyme Catalysis

General Features (22.4A)

Active Sites

Enzyme Catalysis Mechanism

Substrate Specificity.

Types of Enzymes

α -Chymotrypsin (22.4B)

α -Chymotrypsin Active Site

General Hydrolysis Mechanism

Detailed Hydrolysis Mechanism.

Chapter Review