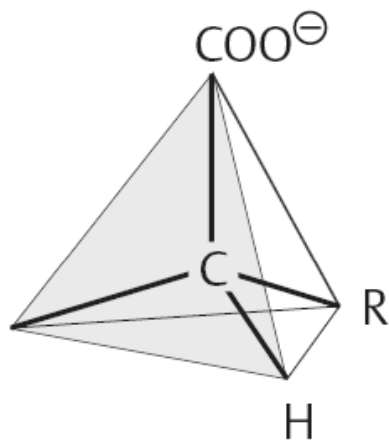


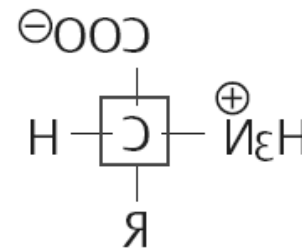
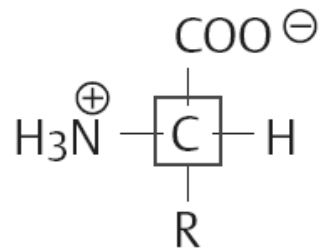
PROTEINS

-
- × Aminoacids (1)
 - × Oligopeptide (2-10)
 - × Polypeptide (10-50)
 - × Protein (more than 50)

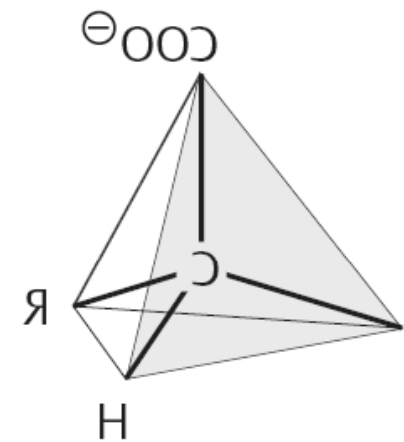
AMINOACIDS



L-Amino acid



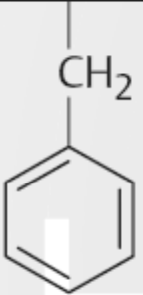

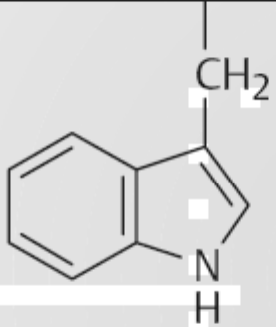
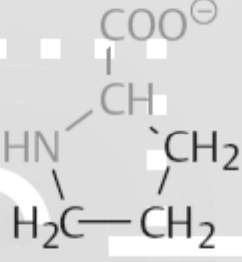
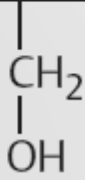
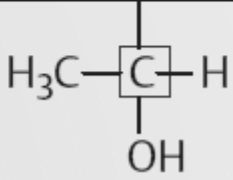
Fischer projections



D-Amino acid
(mirror image)

Aliphatic					Sulfur-containing	
Glycine (Gly, G)	Alanine (Ala, A)	Valine [☆] (Val, V)	Leucine [☆] (Leu, L)	Isoleucine [☆] (Ile, I)	Cysteine (Cys, C)	Methionine [☆] (Met, M)
H	CH ₃	H ₃ C—CH CH ₃	CH ₂ H ₃ C—CH CH ₃	H ₃ C—C—H CH ₂ CH ₃	CH ₂ SH 8.3	CH ₂ CH ₂ S CH ₃
-2.4	-1.9	-2.0	-2.3	-2.2	-1.2	-1.5

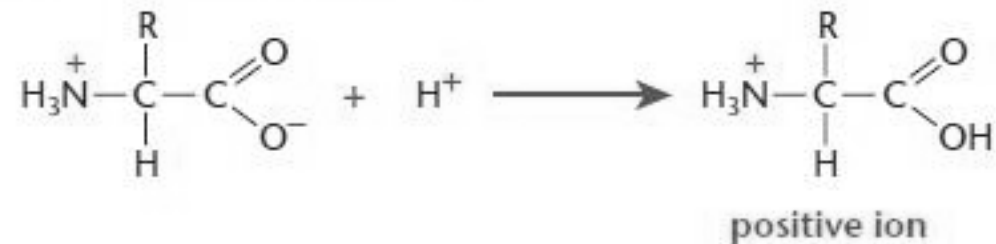
Polarity (pointing to -2.4)
 pK_a value (pointing to 8.3)
 - (pointing to -1.2)

Aromatic			Cyclic	Neutral	
Phenylalanine [☆] (Phe, F)	Tyrosine (Tyr, Y)	Tryptophan [☆] (Trp, W)	Proline (Pro, P)	Serine (Ser, S)	Threonine [☆] (Thr, T)
					
+0.8	+6.1	+5.9	+6.0	+5.1	+4.9
☆ Essential amino acids				□ Chiral center	

Amino acids as bases

In strongly acidic conditions a positive ion forms:

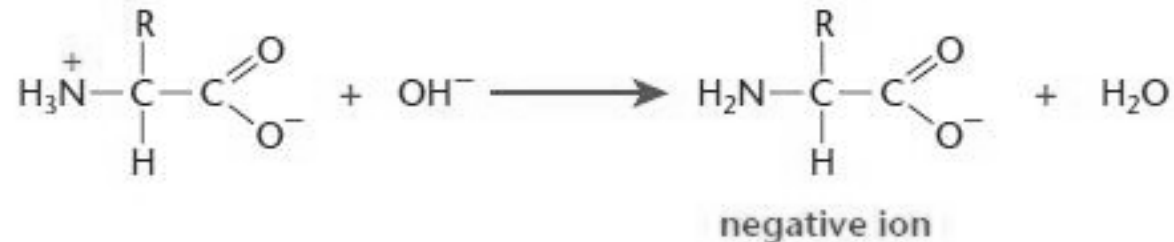
- an amino acid behaves as a base
- the COO^- ion gains a proton.

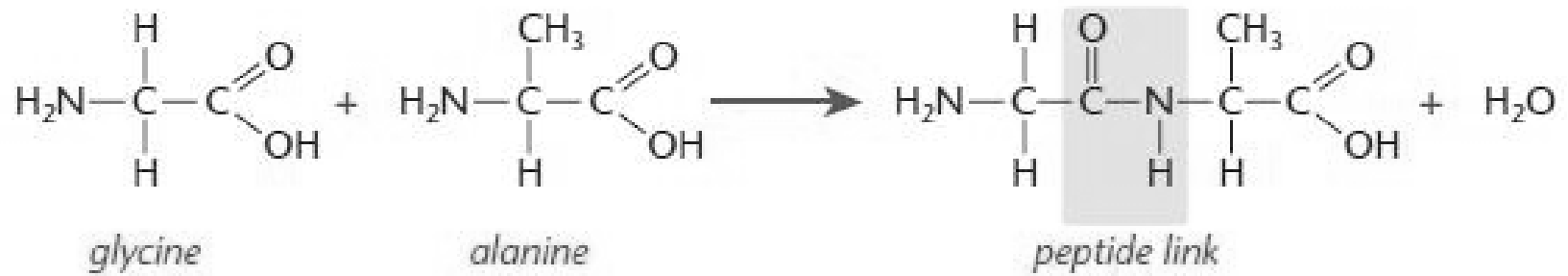


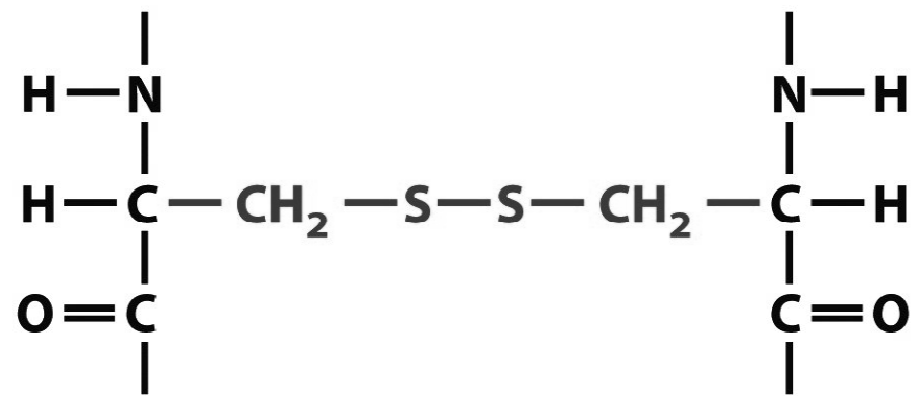
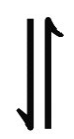
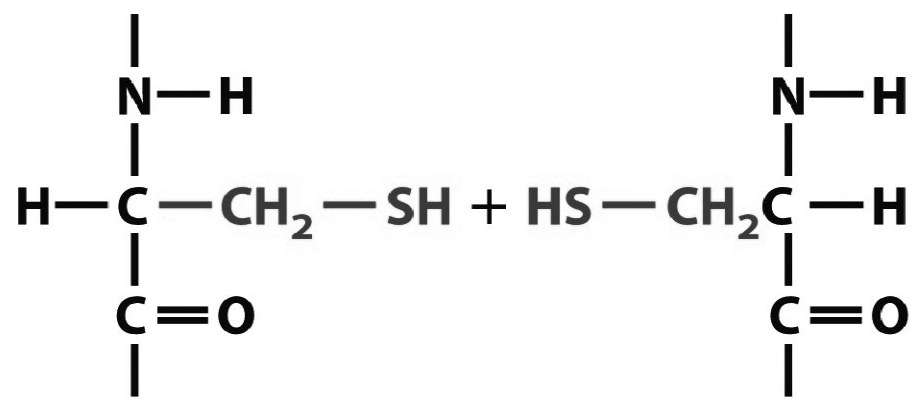
Amino acids as acids

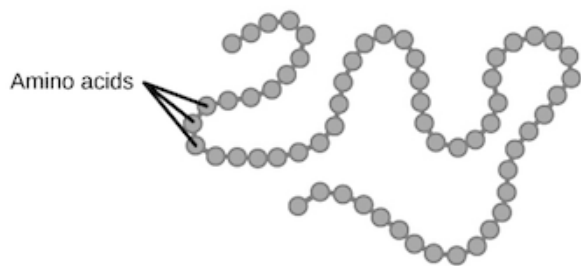
In strongly alkaline conditions a negative ion forms:

- an amino acid behaves as an acid
- the NH_3^+ ion loses a proton.

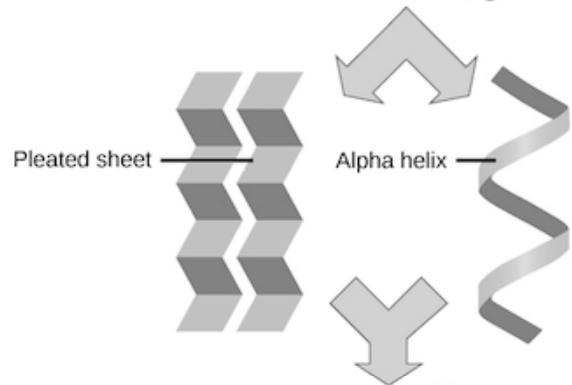








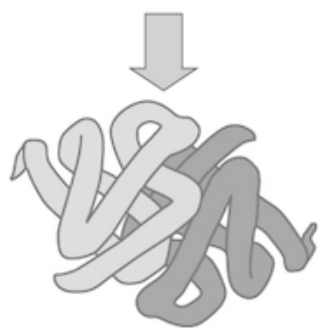
Primary protein structure
sequence of a chain of amino acids



Secondary protein structure
hydrogen bonding of the peptide backbone causes the amino acids to fold into a repeating pattern



Tertiary protein structure
three-dimensional folding pattern of a protein due to side chain interactions



Quaternary protein structure
protein consisting of more than one amino acid chain

PROTEIN CLASSIFICATION

✘ Classification of Proteins

- Based mostly on the solubility of proteins in different solvents

✘ Proteins are divided into the following main groups

∞ Simple Proteins

∞ Conjugated Proteins

∞ Derived Proteins

PROTEIN CLASSIFICATION

Simple Proteins

- + Yield only amino acids on hydrolysis and include the following classes
 - × Albumins
 - × Globulins
 - × Scleroproteins
 - × Histones
 - × Protamines
 - × Plant proteins: Prolamines and Glutelins

PROTEIN CLASSIFICATION

Conjugated Proteins

- + Contain an amino acid part combined with a non-protein material such as a lipid, nucleic acid, or carbohydrate
- + Some of the major conjugated proteins are as follows:
 - × Phosphoproteins
 - × Lipoproteins
 - × Nucleoproteins
 - × Glycoproteins
 - × Chromoproteins

PROTEIN CLASSIFICATION

Derived Proteins

- + These are compounds obtained by chemical or enzymatic methods
- + Metaproteins
- + Proteoses