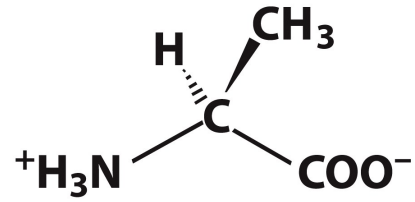


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1



**Stereochemical rendering
of alanine**

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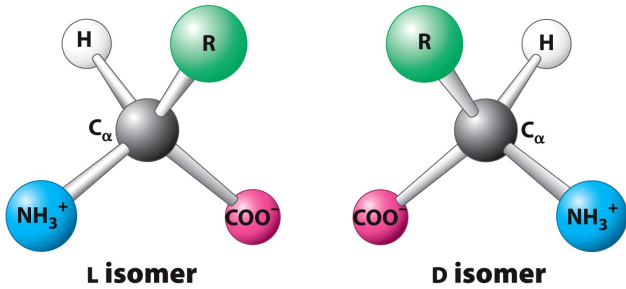


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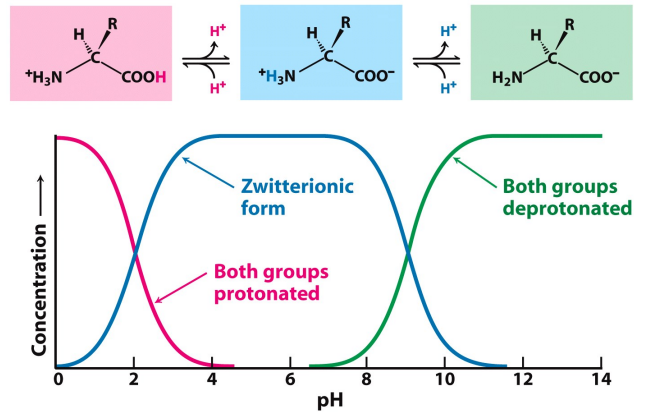


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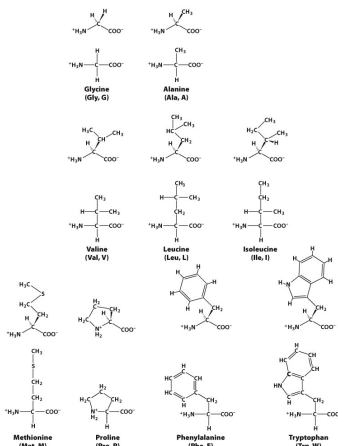


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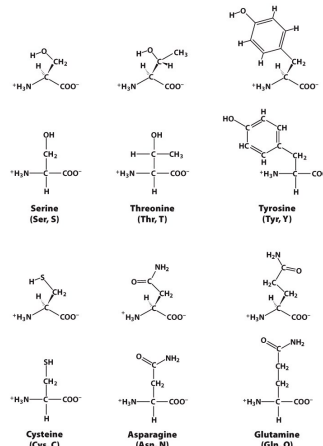
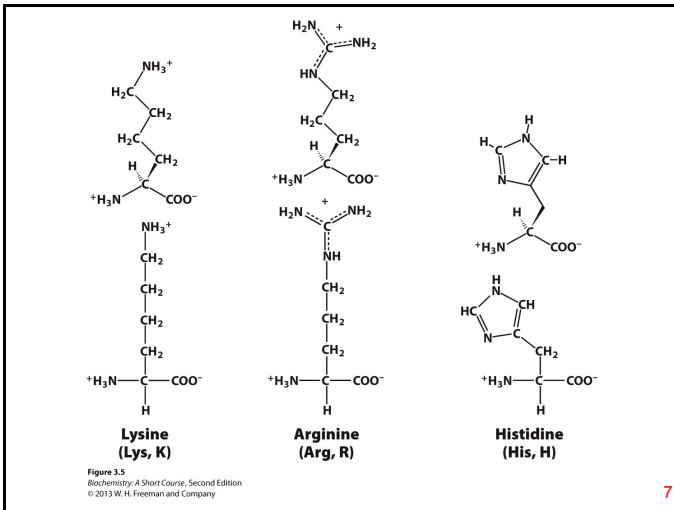
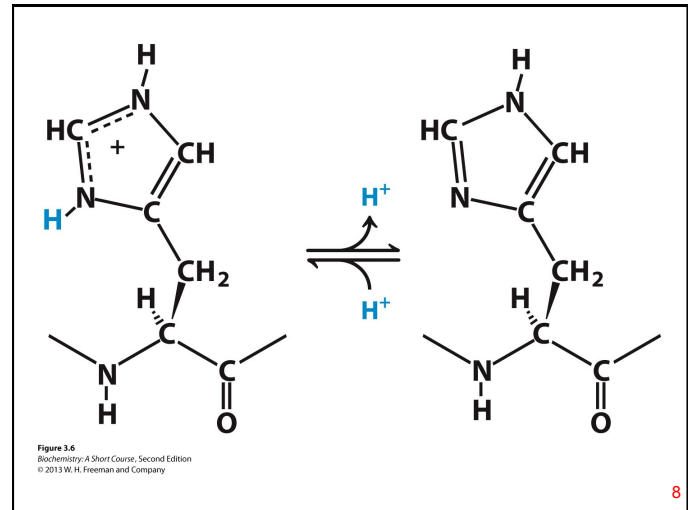


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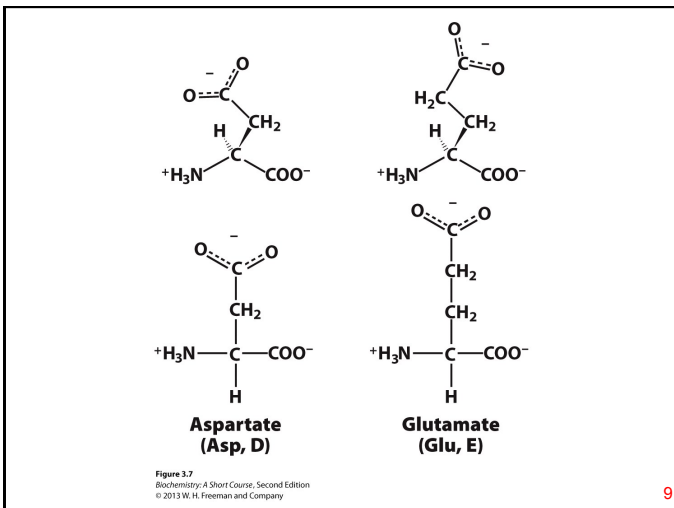
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Table 3.1 Typical pK_a values of ionizable groups in proteins

Group	Acid	Base	Typical pK _a
Terminal α-carboxyl group			3.1
Aspartic acid Glutamic acid			4.1
Histidine			6.0
Terminal α-amino group			8.0
Cysteine			8.3
Tyrosine			10.9
Lysine			10.8
Arginine			12.5

Note: Values of pK_a depend on temperature, ionic strength, and the microenvironment of the ionizable group.

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Table 3.2 Basic set of 20 amino acids

Nonessential	Essential
Alanine	Histidine
Arginine	Isoleucine
Asparagine	Leucine
Aspartate	Lysine
Cysteine	Methionine
Glutamate	Phenylalanine
Glutamine	Threonine
Glycine	Tryptophan
Proline	Valine
Serine	
Tyrosine	

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