

Amino acids

Chapter 4 Learning Objectives

By the end of the chapter you should be able to:

- 1) Know the name and three letter designation for each of the amino acids and recognize the structure for each amino acid
- 2) Define each of the amino acids by their chemical characteristics (hydrophobicity, chemical reactivity, charge at pH 1, 7, and 11 (know if the amino acids are acidic basic or neutral), hydrogen bonding capacity, hydrophilic nature and size).
- 3) Further subdivide those classifications into nonpolar and simple, nonpolar and branched chain, nonpolar and S-containing, nonpolar and aromatic, nonpolar and cyclic. Polar and neutral (note the amino acids that contain alcohol, phenol, thiol and amide groups in the side chains), basic (positively charged in physiological pH), and acidic (negatively charged in physiological pH). Remember that these classifications describe the side chains in the physiological pH range (6.5-8).
- 4) Define the amino acids based on pH and pKa. Use these concepts to predict the ionization of any given amino acid or its side chain in a protein
- 5) Be able to draw the titration curve for any of the amino acids and show the pKa for each of the ionizable groups
- 6) List the examples of protein modification and examples of their importance (both the book and my examples)
- 7) Draw the structure of an amino acid and label the common features, such as the side group, alpha carbon, and other functional groups
- 8) Draw a peptide bond and describe its conformation. List the N and C terminal residues, main chain, back bone, and side chain.
- 9) Define the role of intra-molecular forces (including that of the amino acid cysteine) have in maintaining structure.