

Chapter 19 and 20  
**Organic and Biochemistry**  
Learning Objectives

11.21.2021

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To satisfy the minimum requirements for this course, you should be able to:

1. Distinguish the differences between alkanes, alkenes, alkynes and aromatic hydrocarbons.
  - be able to name the straight-chained alkanes from one to ten carbons
  - compare the strengths of the intermolecular forces in various alkanes and be able to predict relative boiling points for alkanes
2. Discuss the importance of functional groups in organic chemistry and recognize the following functional groups: carboxylic acids; amines; amides; alcohols; esters.
  - understand/recognize how the condensation reaction is used to make esters and amides.
3. Explain what a polymer is and why they are important. Be able to:
  - define, with examples, the terms polymer, monomer and repeat unit
  - recognize what polymers are formed from monomers via addition and condensation polymerizations
4. Explain what a biopolymer is and why they are important. Be able to:
  - define the terms peptide, protein, backbone and side chain
  - write the condensation reaction that forms a peptide bond given two amino acids
  - list the four levels of protein structure hierarchy and know what forces or bonds stabilize each level
  - explain the importance of hydrogen bonding in determining 3-dimensional structure of proteins
5. Discuss the function of proteins. Be able to:
  - list several functions of proteins
  - explain how enzymes act as biological catalysts and how they interact with specific substrate molecules within their effective temperature range.
6. *Naval Application: Chemical Warfare (see handout)*
  - recognize selected classes of toxic agents of military importance: blister agents, (mustard, lewisite), nerve agents (sarin, VX), choking agents (chlorine, phosgene), blood agents (HCN), riot control agents
  - explain the mechanism by which sarin inhibits acetylcholinesterase

**N.B. We will not be doing Sections 19.8 and 20.3-20.6**