Chapter 19 Section Review Answer Key

Assignments:

- Section Review questions 1-15 on page 686
- Section Review questions 1-14 on page 695
- Section Review questions 1-12 on page 701

Section 1 Review Assignment

1. 1) covalent bonds between carbon atoms are quite strong 2) carbon compounds are not extremely reactive 3) wide variety of possible compounds due to possibility of four covalent bonds per carbon
2. allotropes are elements which form different bonding arrangements
3. All three are compounds made up of only carbons and hydrogens, however alkanes contain only single bonds, alkenes involve at least one double bond and alkynes involve at least one triple bond.
4. See page 682 of the online textbook
5. oxygen, nitrogen, sulfur, phosphorus and the halogens
6. aromatic compounds are compounds that include cyclic conjugated carbon atoms (like benzene)
7. a functional group is the portion of a molecule that is active in a reaction and that determines the properties of many organic compounds
8. Isomers are compounds that have the same chemical composition but different structures. The two molecules have the same number of atoms.
9. CH_3-CH=CH_2 - alkene
10. no - one has oxygen and the other does not
11. CH $\equiv$ C - CH_2 -CH_2 - CH_2 - CH_2 - CH_3
12. Isomers will vary, but must have two shown.
13. benzene is an aromatic
14. C5H12 - alkane; C5H10 - alkene; C5H8 - alkyne - they have different numbers of atoms
15. see page 682 for an example

Section 2 Review Assignment

1. In a saturated hydrocarbon, each carbon atom forms only single covalent bonds, while in an unsaturated hydrocarbon, double and/or triple bonds can be found.
2. 10
3. - CH = O
4. The longest chain is numbered so that the triple bond is attached to the carbon with the lowest possible number.
5. functional groups
6. 2-ethyl-3-methyl-1-butene
7. methyl benzene
8. Cl - CH_2 - CH_2 - Cl

9. $CH_3 - CH - CH_2 - CH - CH_2 - CH_2 - CH_3$
   Br Cl
10. $C_{11}H_{14}N_2$
11. The functional group for the acid is always bonded at the end of the chain.
12. no number for the location of double bond
13. Methanal has a double bond, methanol has only single bonds. Both are alcohols made up of only one carbon.
14. Two double bonds and they can be found between carbons 1 & 2 and carbons 3 & 4.

Section 3 Review Assignment

1. Addition increases the number of singly bonded hydrocarbons.
2. water
3. substitution
4. Examples of polymers and its' monomers will vary as there are numerous examples throughout the section in the textbook. One example is nylon - made up of monomers: hexanediamine and adipic acid
5. water molecule is lost in a condensation reaction
6. elimination
7. alkane is already saturated
8. addition reaction results in added single bond, while elimination results in added double bond
9. - CH2 - CH2 - CH2 - CH2 - CH2 - CH2 - CH2 - CH2 - CH2 -
10. Yes - as long as the unsaturated molecule does not become fully saturated after the first addition.
11. Needs both - H and - OH functional groups to form the water
12. alkane is already totally saturated and the halogen would only be able to form a single bond