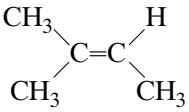
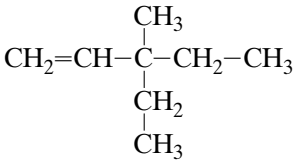
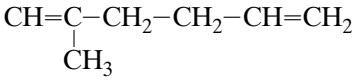
19. Name the following alkenes. (Hint: See Sample Problem B.)

a. $CH_2{=}CH{-}CH_2{-}CH_2{-}CH_3$

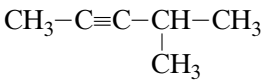
b. 

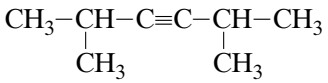
c. 

d. 

20. Name the following alkynes:

a. $CH{\equiv}C{-}CH_3$

b. 

c. 

d. $CH{\equiv}C{-}CH_2{-}CH_2{-}CH_2{-}C{\equiv}CH$

Functional Groups

SECTION 3 REVIEW

21. Write the general formula for each of the following:

a. alcohol

b. ether

c. alkyl halide

22. Based on the boiling points of water and methanol, in which would you expect to observe a greater degree of hydrogen bonding? Explain your answer.

23. a. Why is glycerol used in moisturizing skin lotions?

b. How does this relate to the chemical structure of glycerol?

24. Write the general formula for each of the following:

a. aldehyde

b. ketone

c. carboxylic acid

d. ester

e. amine

25. Aldehydes and ketones both contain the same functional group. Why are they classified as separate classes of organic compounds?

26. How are esters related to carboxylic acids?

27. What element do amines contain besides carbon and hydrogen?

28. Explain why an amine acts as a base.

29. What classes of organic compounds contain oxygen?

Organic Reactions

SECTION 4 REVIEW

30. What type of chemical reaction would you expect to occur between 2-octene and hydrogen bromide, HBr?

31. How many molecules of chlorine, Cl_2, can be added to a molecule of 1-propene? a molecule of 1-propyne?

32. Compare substitution and addition reactions.

33. In a chemical reaction, two small molecules are joined and a water molecule is produced. What type of reaction took place?

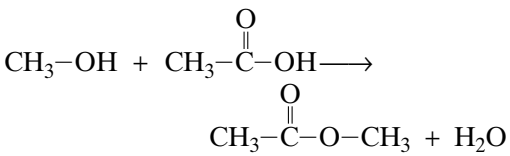
34. What are two reactions by which polymers can be formed?

35. What is the structural requirement for a molecule to be a monomer in an addition polymer?

36. Which of the following reactions is a substitution reaction?

a. $CH_2{=}CH_2 + Cl_2 \longrightarrow Cl{-}CH_2{-}CH_2{-}Cl$

b. $CH_3{-}CH_2{-}CH_2{-}CH_3 + Cl_2 \longrightarrow Cl{-}CH_2{-}CH_2{-}CH_2{-}CH_3 + HCl$

c. 

37. Which of the following reactions is an addition reaction?

a. $CH_3{-}CH_2{-}CH{=}CH_2 + Br_2 \longrightarrow CH_3{-}CH_2{-}\underset{\displaystyle Br}{\underset{|}{C}}H{-}CH_2{-}Br$