Chapter 11: Introduction to Organic Chemistry

1. *Alkanes* have the general formula
   A) C_nH_{2n-4}. B) C_nH_{2n-2}. C) C_nH_{2n}. D) C_nH_{2n+2}. E) C_nH_{2n+4}.

3. *Alkynes* have the general formula
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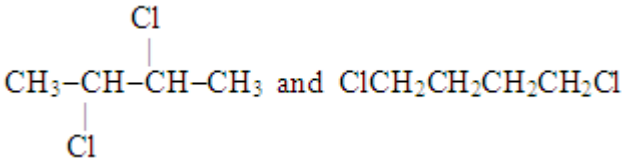
5. *Unsaturated* hydrocarbons
   A) contain at least one double or triple carbon-carbon bond.
   B) contain at least one element other than hydrogen and carbon.
   C) contain the maximum number of hydrogens that can bond with the carbon atoms present.
   D) cannot form structural isomers.
   E) cannot undergo addition reactions.

7. The formula $CH_3CH_2CH_2CH{=}CH_2$ represents
   A) an alkane.
   B) a cycloalkane.
   C) an alkene.
   D) an alkyne.
   E) an aromatic compound.

9. How many structural isomers are there of C_4H_{10}?
   A) 4 B) 6 C) 2 D) 8 E) 10

11. Which of these pairs are *geometric isomers*?
    A) $CH_3CH_2–O–CH_2CH_3$ and $CH_3CH_2CH_2CH_2OH$
    B)



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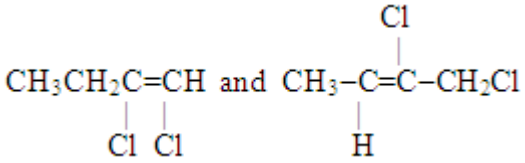

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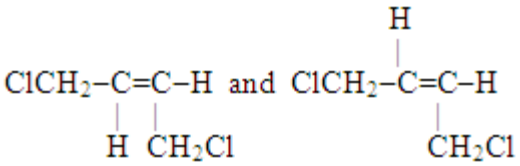
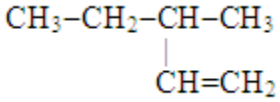


13. The two molecules represented below are examples of
    $CH_3–CH_2–O–CH_2CH_3$ $CH_3CH_2CH_2CH_2–OH$
    A) geometric isomers.
    B) structural isomers.
    C) optical isomers.
    D) stereoisomers.
    E) None of these.

15. The octane rating of gasoline refers to its
    A) percentage C_8H_{18} by volume.
    B) radiation dose.
    C) alcohol level.
    D) ability to resist engine knocking.
    E) percentage of unsaturated hydrocarbons.

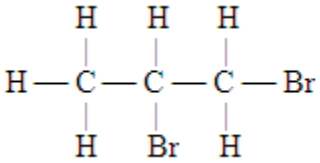
17. The compound that has a triple bond between one pair of carbon atoms is called a/an
    A) alkane. B) chlorofluorocarbon. C) alkyne. D) alkene. E) alcohol.

19. Which of these is the systematic name for the compound represented below?



A) 2-ethylbutane
B) 3-methylpentene
C) 3-methyl-1-pentene
D) 3-methyl-1-hexene
E) 2-methylhexane

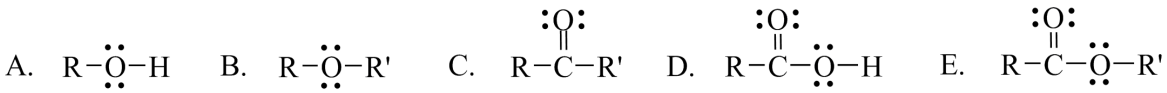
21. Which of these is the systematic name for the compound represented below?



A) 2,3-dibromopentane
B) 1,2-dibromopentane
C) 2,3-dibromopropane
D) 1,2-propane dibromide
E) 1,2-dibromopropane

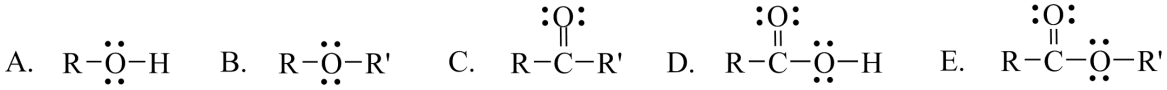
23. The group of atoms that is responsible for the characteristic properties of a family of organic compounds is called a/an
A) reaction center.
B) functional group.
C) binding site.
D) enzyme.
E) polyatomic ion.

25. Which one of the following functional groups is found in *carboxylic acids*?



A) A B) B C) C D) D E) E

27. Which one of these structures represents an *ester* functional group?



A) A B) B C) C D) D E) E

29. “Wood alcohol” is the common name for
A) methanol. B) ethanol. C) propyl alcohol. D) ethylene. E) acetylene.

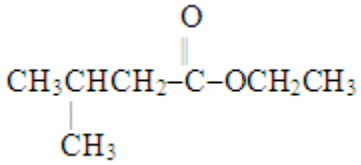
31. Which type of organic compound does *not* contain a carbonyl group?
A) ethers B) carboxylic acids C) ketones D) aldehydes E) esters

33. The expected product from the addition of HCl to $CH_3–CH_2–CH=CH_2$ is
A) $CH_3–CH_2–CH=CHCl$.
B) $CH_3–CH_2–CCl=CH_2$.
C) $CH_3–CHCl–CH=CH_2$.
D) $CH_3–CH_2–CH_2–CH_2Cl$.
E) $CH_3–CH_2–CHCl–CH_3$.

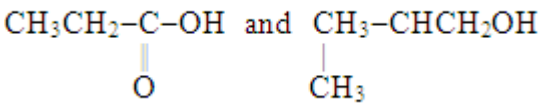
35. The reaction of an alcohol and a carboxylic acid yields
A) a hydrocarbon. B) an ester. C) an ether. D) an aldehyde. E) a ketone.

37. Oxidation of the 2-propanol will produce a/an
A) aldehyde. B) amine. C) alkene. D) ketone. E) carboxylic acid.

39. Which choice gives the structures of the reaction products when the ester below is hydrolyzed in acid solution?



A)



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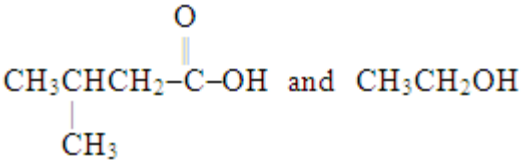

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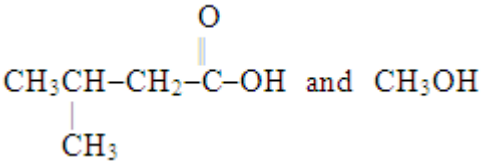
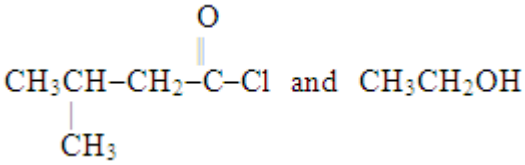


D)



41. Which of these statements describes a *condensation* reaction?
    A) addition of H_2O to a double bond
    B) linking an acid and an alcohol to make an ester and water
    C) addition of H_2 to an alkene
    D) oxidation of ethanol to acetaldehyde
    E) hydrolysis of an ester

43. *Amines* are
    A) organic bases that react with water to produce ammonia.
    B) organic acids that react with water to produce ammonia.
    C) organic bases that react with acids to form ammonium salts.
    D) organic acids that react with bases to form ammonium salts.
    E) None of the above.

45. Which functional group, when present in a compound that is allowed to stand in air, poses a danger of slowly yielding explosive peroxides?
    A) ether
    B) alcohol
    C) carboxylic acid
    D) ketone
    E) unsaturated hydrocarbon

47. Which of the following compounds are isomers of each other?
    I. pentane
    II. 2-methylbutane
    III. 2,3-dimethylbutane
    IV. 2,2-dimethylpropane
    V. 1-hexene