Chem.G11-Q3W6-Organic chemistry-H.W

Matching

Match each item with the correct statement below.

a. addition reaction
b. aromatic hydrocarbons
c. cross-linking
d. fractional distillation
e. functional group
f. isomers
g. polymer
h. reforming
i. saturated hydrocarbon
j. substituted hydrocarbon
k. thermosetting

____ 1. Polymers are made when monomers containing double bonds combine with each other in a reaction known as a(n) _____.
____ 2. Hydrocarbons that contain a benzene-like structure are classified as _____.
____ 3. A(n) _____ is a large molecule that is made up of many smaller repeating units.
____ 4. The portion of an organic molecule that is responsible for the properties of that molecule is known as a(n) _____.
____ 5. _____ is the process by which complex organic mixtures can be separated into their constituents.
____ 6. _____ are compounds that have the same molecular formula, but different structural formulas.
____ 7. A(n) _____ plastic is one that remains hard and rigid once it has been formed.
____ 8. A(n) _____ is a compound that contains only carbon and hydrogen atoms joined to each other by single bonds.
____ 9. _____ is a process by which adjacent chains in a polymer join together and strengthen the polymer.
____ 10. In the process known as _____, large hydrocarbons can be converted to other compounds, such as aromatic hydrocarbons.

Short Answer

11. For the following pair of compounds, tell whether a polymerization reaction can or cannot take place and, if it can, what type of polymerization reaction it is. $HOCH_2CH_2CH_2CH_2CH_2OH$ and $CH_2ClCH_2CH_2CH_2Cl$

    A. yes, a condensation reaction
    B. yes, a precipitation reaction
    C. yes, a replacement reaction
    D. NO

12. *Explain what makes the name listed below incorrect.*

    4-propyne

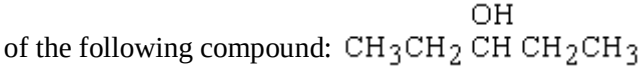
    A. The propyl chain contains only five carbon atoms.
    B. The propyl chain contains only three carbon atoms.

13. As the number of carbon atoms in an alkane increases, what happens to the number of isomers the alkane can form?

    A. The number of isomers increases.
    B. The number of isomers decreases.

14. Identify the following hydrocarbon as alkane, alkene, or alkyne:
    cis-2-pentene

    A. alkane
    B. alkene
    C. alkyne
    D. none

15. Name the family of the following compound: 

    A. alkane
    B. alkene
    C. alkyne
    D. alcohol

16. Do all alkenes have geometric isomers? Explain.

    A. Yes
    B. No; two different groups must be attached to the carbons on the double bond.

17. Name the following hydrocarbon, and identify as an alkane, alkene, or alkyne: $CH_3CH_2C{\equiv}CCH_2CH_3$

A. 3-hexyne, alkyne
B. 3-hexene, alkene

18. Classify the molecule shown in Figure 18-2 as alcohol, ester, ketone, or amide.

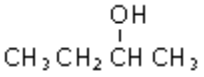


Figure 18-2

A. Ester ,
B. Alcohol
C. Ketone
D. Amide

19. Give the correct name for the following compound: $CH_3CH_2CH_2CH_2CH_2CH_3$

A. butane
B. pentane
C. hexane
D. heptane

20. Give the correct name for the following compound: $CH_3CHFCH_2CH_3$

A. 2-fluoropropane
B. 2-fluoropentane
C. 2-fluorohexane
D. 2-fluorobutane

21. Give the correct name for the following compound: $CH_3CH{=}CHCH_2CH_3$

A. 2-propene
B. 2-butene
C. 2-pentene
D. 2-heptene

Problems

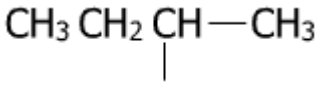
A chemist is studying several unknown compounds. For each one, she has narrowed down the final identification to one of the two choices shown. Use the additional data shown in parentheses to make the correct choice for each.

A. 1-butene
B. 2-pentene
C. octane
D. Cellulose

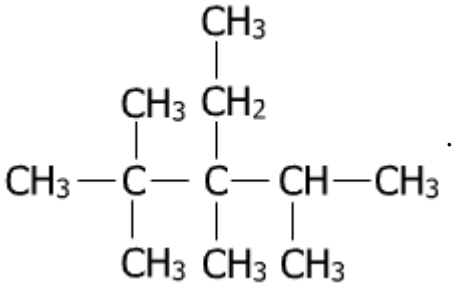
22. 2-pentene or pentyl alcohol (Forms geometric isomers.)
23. cellulose or nylon (Product breaks down to give only glucose.)
24. methane or octane (Has structural isomers.)
25. butane or 1-butene (Reacts readily with chlorine gas.)

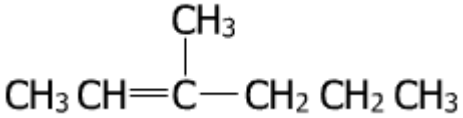
A. natural rubber
B. benzoyl alcohol
C. Ketone
D. CH3CH2CH2CH2CH3

26. benzene or benzoyl alcohol (Forms a polymer.)
27. natural rubber or vulcanized rubber (Melts when heated.)
28. Show the structure of the product of the following reaction: $CH_2=CHCH_2CH_2CH_3 + H_2 \rightarrow ?$
29. Name the functional group present in the following compound.

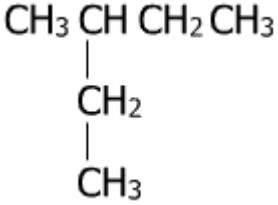


True/False
Indicate whether the statement is true or false.

____ 30. The structure of 3-ethyl-2,2,3,4-tetramethylpentane is  .

____ 31. The IUPAC name of  is 3-methyl-3-hexene.

____ 32. Aldehydes cannot form hydrogen bonds.

____ 33. The IUPAC name of  is 2-ethyl butane.

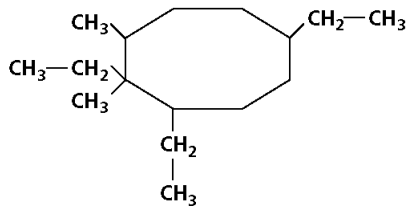
____ 34. Cyclohexane is a cyclic hydrocarbon having six carbon atoms in a straight chain.

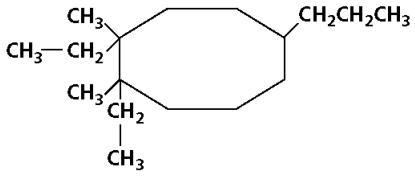
Multiple Choice
Identify the choice that best completes the statement or answers the question.

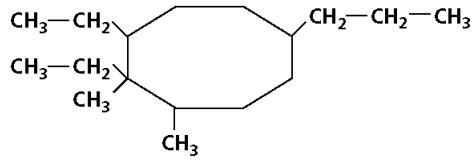
____ 35. Which of the following substances can be remolded without changing the chemical composition?
a. Glycine
b. Bakelite
c. Propanoic acid
d. Polyethylene

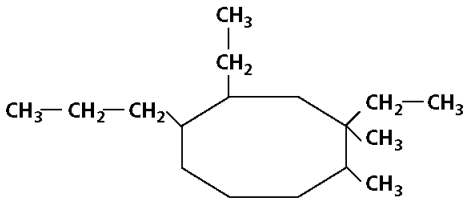
____ 36. A process that typically yields alcohols is _____.
a. cracking
b. polymerization
c. fermentation
d. distillation

____ 37. The correct structural formula of 1,2-diethyl-2,3-dimethyl-6-propylcyclooctane is ____.

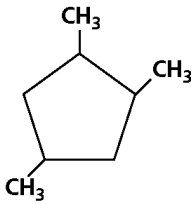
a.


b.


c.


d.


____ 38. Name the cycloalkane given below.



a. 1,2,4-trimethylcyclohexane
b. 1,3,5-trimethylcyclopentane
c. 1,2,4-trimethylcyclopentane
d. 1,2,4-dimethylcyclopentane

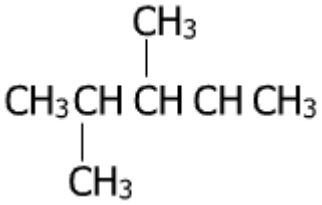
____ 39. A monomer can take part in an addition reaction if it contains _____.
a. two functional groups
b. glucose
c. a double or triple bond
d. a pair of single bonds

____ 40. Which polymer is a condensation polymer?

a. Nylon-6,6
b. Orlon
c. Teflon
d. PET

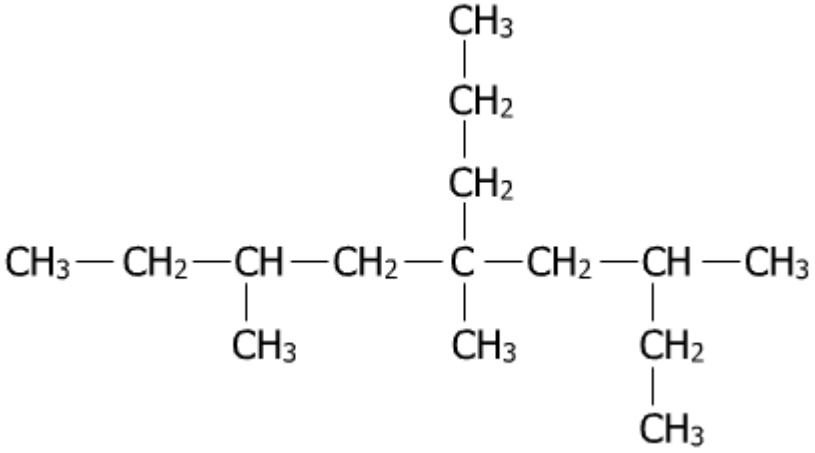
____ 41. An organic compound that contains a carbon atom bonded to a hydrogen atom and double-bonded to an oxygen atom is an _____.

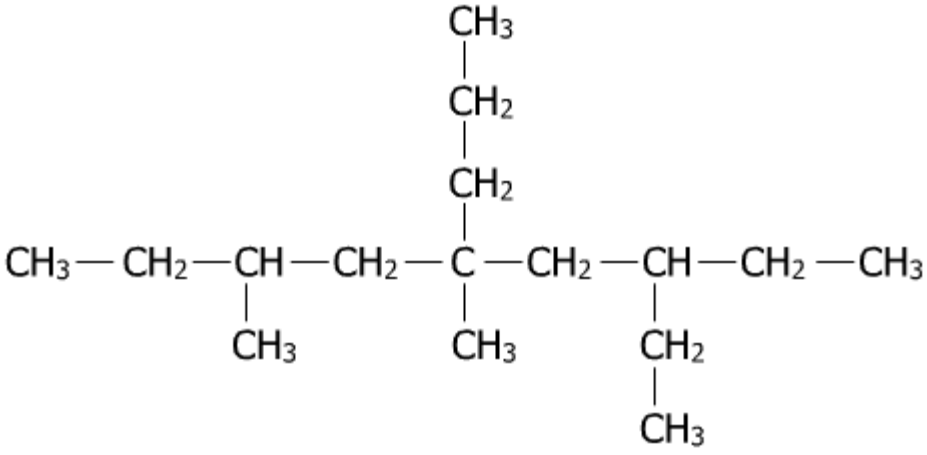
a. ether
b. aldehyde
c. alkene
d. alcohol

____ 42. The correct IUPAC name of the compound  is ____.

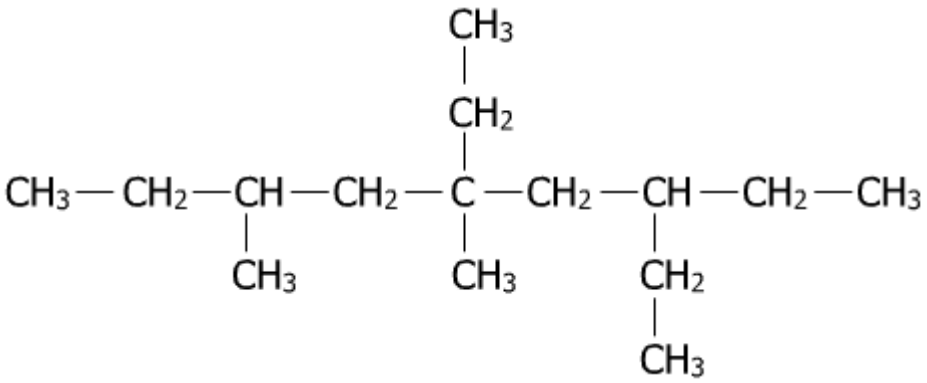
a. 2,3-dimethylbutane
b. 2,3-dimethylpentane
c. 2,2,3-dimethylbutane
d. 3,4-dimethylpentane

____ 43. The structure of 3-ethyl-5,7-dimethyl-5-propylnonane is ____.

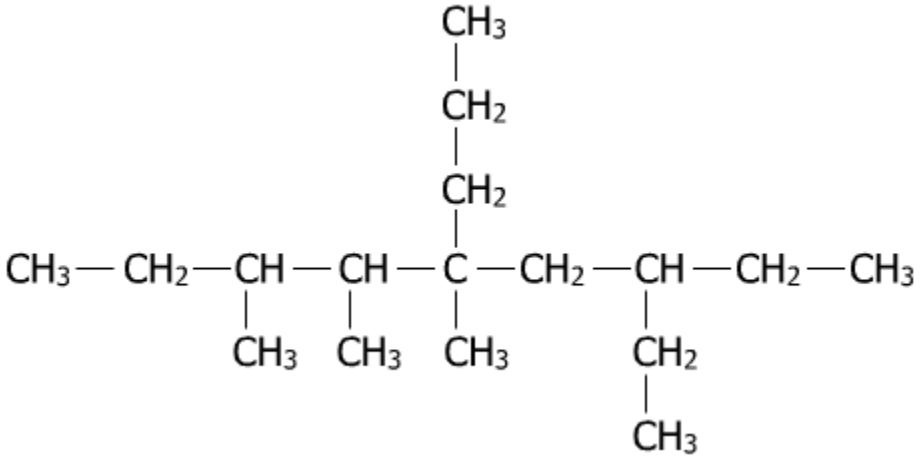
a. 

b. 

c.



d.

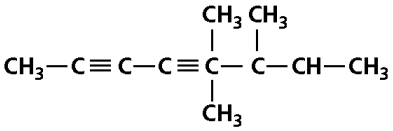


____ 44. Which pair of reactants listed below could take part in a condensation reaction?

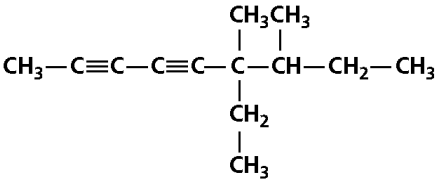
a. an alkane and an alcohol
b. methane and an alcohol
c. an amine and a carboxylic acid
d. water and an alcohol

____ 45. The correct condensed structure of a compound having the IUPAC name 6-ethyl-6,7-dimethyl-2,4-dioctyne is ____.

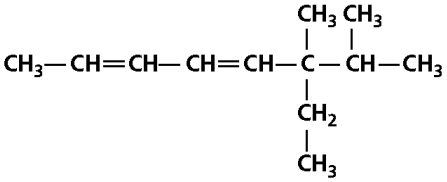
a.



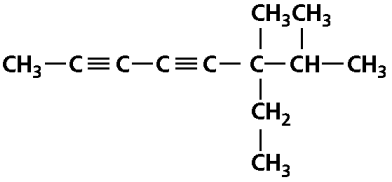
b.



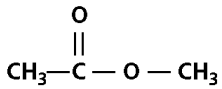
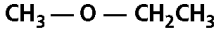
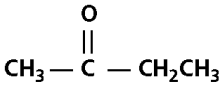
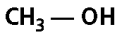
c.



d.



____ 46. The six extra electrons in a benzene molecule are _____.
a. shared equally by all six hydrogen atoms
b. shared equally by all six carbon atoms
c. arranged in alternate single and double bonds
d. arranged in double bonds

____ 47. Which compound has a hydroxyl group?
a. 
c. 
b. 
d. 

____ 48. The term *cis* or *trans* in the name of a compound shows that the compound is a(n) _____.
a. alkyne
b. polymer
c. geometric isomer
d. alkane

____ 49. Isomers have _____.
a. the same chemical and physical properties
b. different chemical properties, but the same physical properties
c. different chemical and physical properties
d. the same chemical properties, but different physical properties

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