

1. Complete the following:

a. Carbon always forms 4 bonds. Oxygen always forms 2 bonds.

2. Indicate the type of compound or compounds for which each of the following can apply. The choices are alkanes, alkenes, cycloalkanes, cycloalkenes or alkynes. More than one choice may apply to each of the following:

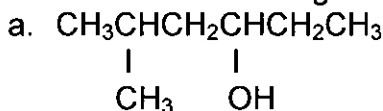
a. C_nH_{2n+2} alkanes b. C_nH_{2n} alkenes, cycloalkanes c. C_nH_{2n-2} alkynes, cycloalkenes

3. Give two properties of hydrocarbons: a. insoluble in water b. nonpolar c. combustible

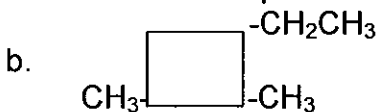
4. What is the shape of carbon and the groups directly attached to it in each of the following?

a. carbon has four single bonds tetrahedral b. carbon has one double bond and two single bonds trigonal planar (flat) c. carbon has one triple bond and one single bond linear

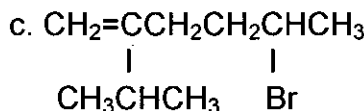
5. Name the following:



5-methyl-3-hexanol

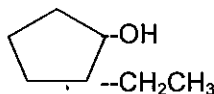


1-ethyl-2,3-dimethylcyclobutane



5-bromo-2-isopropyl-2-hexene

d.



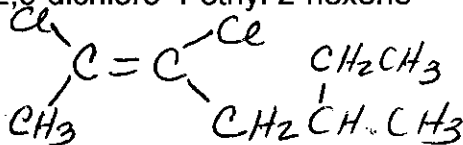
2-ethylcyclopentanol



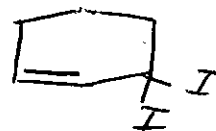
5-bromo-2-hexyne

6. Draw the structure for each of the following:

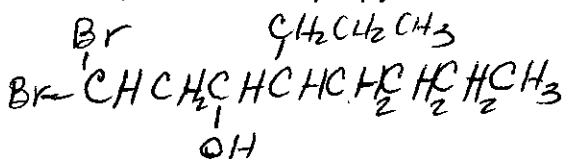
a. cis-2,3-dichloro-4-ethyl-2-hexene



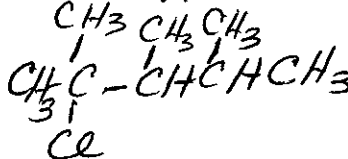
b. 3,3-diiodocyclohexene



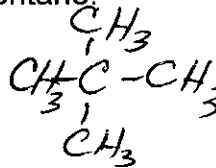
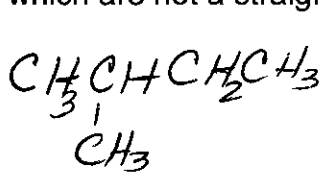
c. 1,1-dibromo-4-propyl-3-octanol



d. 2-chloro-2,3,4-trimethylpentane

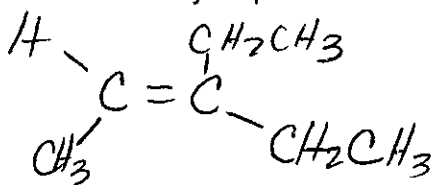


7. Draw two isomers which are not a straight line for pentane.



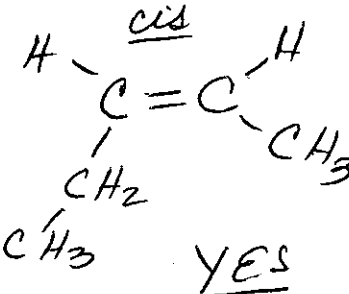
8. Which of the following has cis-trans isomers? Draw all the structures and label each.

a. 3-ethyl-2-pentene



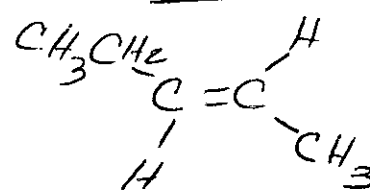
NO

b. 3-hexene



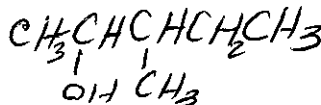
YES

trans



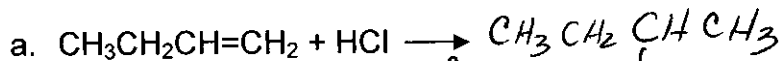
8. Identify the following alcohols as primary, secondary or tertiary. Draw each:

a. 1-methylcyclohexanol tertiary b. 3-methyl-2-pentanol secondary

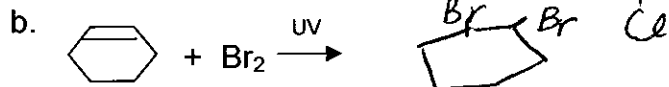


b. ethanol primary
 $\text{CH}_3\text{CH}_2\text{OH}$

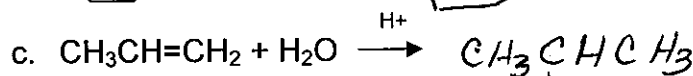
9. Complete each of the following reactions and indicate the name of the reaction for each:



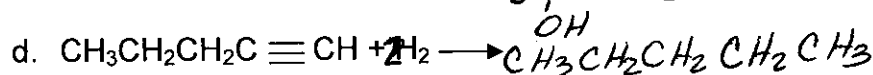
Name of Reaction:
hydrohalogenation



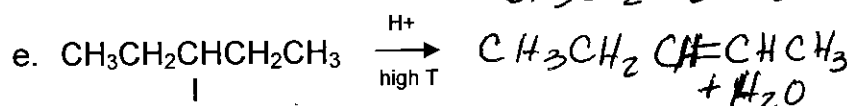
halogenation



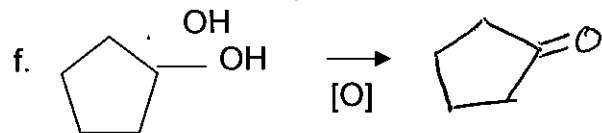
hydration



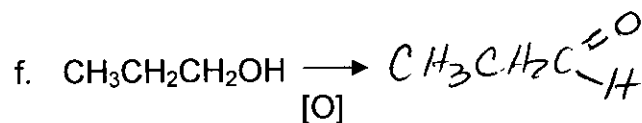
hydrogenation



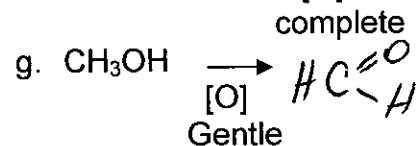
dehydration



oxidation



oxidation



oxidation

10. Which of the following would you expect to be soluble in water?

a. ethanol Yes b. cyclohexane No c. octanol No

d. $\text{CH}_3\text{CH}_2\text{C}(=\text{O})\text{H}$ Yes e. $\text{CH}_3\text{C}(=\text{O})\text{CH}_3$ Yes

11. Organic compounds that are soluble in water is because of hydrogen bonding with the water molecule.