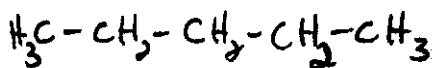


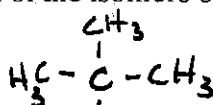
Intro to Organic Chemistry

Name _____

1. Write the structural formulas and names for all of the isomers of pentane.

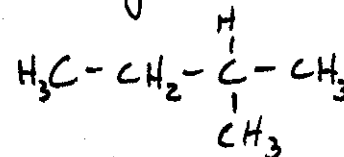


pentane



2,2-dimethylpropane

2-methylbutane



2. Which of the isomers you showed above would have the lowest boiling point? Explain.

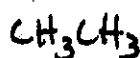
36.0°C

9.5°C

27.7°C

(shortest chain, no functional groups)

3. Write the structural formula and name for all members of the homologous series containing pentane that have lower boiling points. alkanes



methane

ethane

propane

butane

4. Consider the combustion of octane.

a. Write a balanced equation.



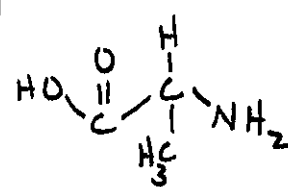
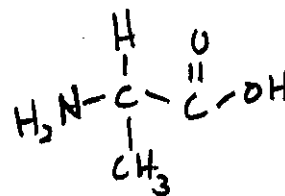
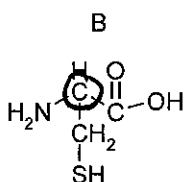
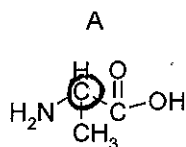
b. Is the combustion of hydrocarbons an exothermic or endothermic process?

exothermic

c. What are the products of incomplete combustion of octane?

CO and C

5. Consider the following amino acids.



a. Use the data booklet to name amino acids A and B.

A = alanine

B = cysteine

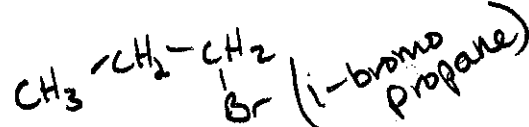
b. Identify the chiral carbon in each amino acid by circling it.

c. Draw the enantiomer (optical isomer) for amino acid A.

d. What device would allow one to identify the presence of optical isomers (enantiomers) in a sample?

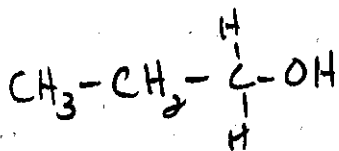
polarimeter

Halide

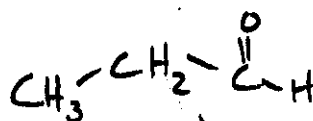


3

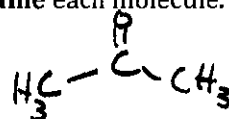
6. Draw molecules containing two carbon atoms, each with a different one of the following functional groups: alcohol, aldehyde, ketone, carboxylic acid and halide. Name each molecule.



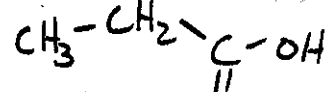
alcohol (1-propanol)



(propanal) aldehyde



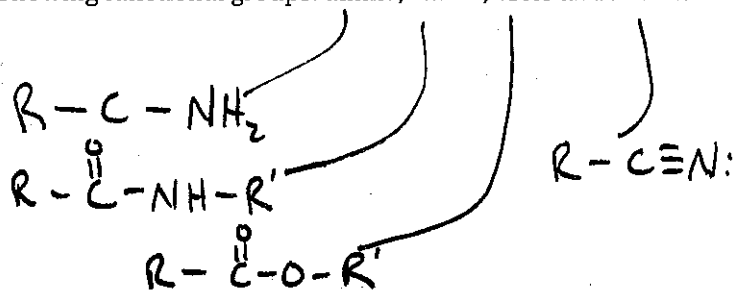
ketone (2-propanone)



(propanoic acid) carboxylic acid

7. Draw one large molecule that contains ALL of the following functional groups: amine, amide, ester and nitrile.

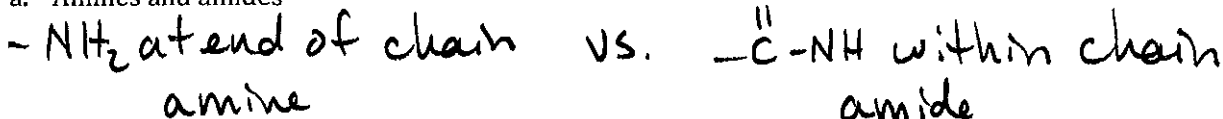
varies for answers



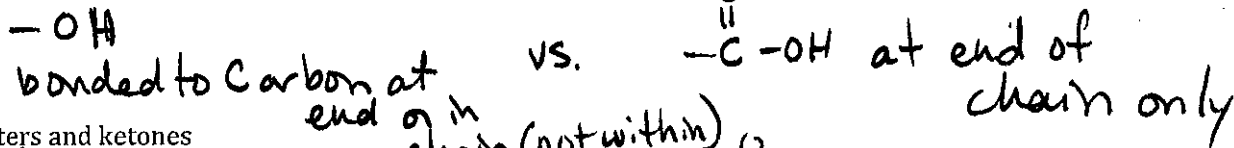
R = hydrocarbon chain
R' = another hydrocarbon chain

8. Explain the differences between each of the following pairs of functional groups that are often mistaken for one another:

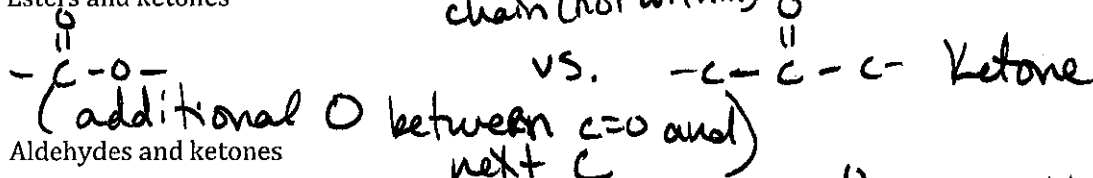
a. Amines and amides



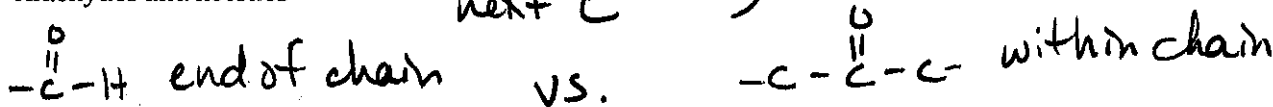
b. Alcohols and carboxylic acids



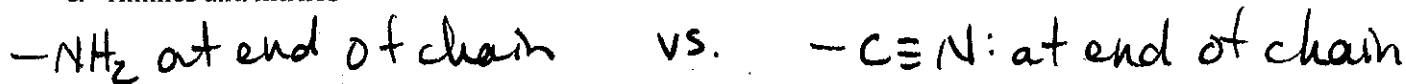
c. Esters and ketones



d. Aldehydes and ketones



e. Amines and nitriles



9. Explain what is meant by the term alkene and how that is different than an alkane.

double bond in hydrocarbon. can have cis/trans orientation, no rotation around dbl bonds, etc.

10. Why is it necessary to include the prefix "di" in some names, such as dichloroethane or pent-1,3-diene?

denotes there are 2 double bonds or 2 of the same functional group/substituent.