HW05 - Organic Fundamentals

These questions will get you started on some organic chemistry.

1 5 points

The inline formula for an ingredient in certain types of nail polish remover is $CH_3CO_2CH_2CH_3$. What type of compound (classification) is this?

- ◯ an ether
- ◯ an ester
- ◯ an aldehyde
- ◯ a ketone
- ◯ a carboxylic acid

2 5 points

What is the name of C_6H_{14}?

- ◯ hexane
- ◯ propane
- ◯ heptane
- ◯ hexene
- ◯ pentane

3 5 points

Which of the following has the greatest molar mass?

- ◯ heptane
- ◯ pentane
- ◯ propane
- ◯ butane
- ◯ hexane
- ◯ nonane
- ◯ octane

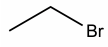
4 5 points

Which of the following has the greatest molar mass?

- ◯ propane
- ◯ butene
- ◯ pentene
- ◯ butane
- ◯ methane
- ◯ pentane

5 5 points

What is the carbon chain product of the elimination reaction beginning with the reactant shown below?

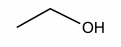


Hint: the eliminated product is HBr. What is left?

- ◯ HC≡CH
- ◯ CHBr=CHBr
- ◯ $H_2C=CH_2$
- ◯ $CH_2Br–CH_2Br$

6 5 points

What best describes the functional group on this molecule?



- ◯ primary alcohol
- ◯ amine
- ◯ secondary alcohol
- ◯ ether
- ◯ carboxylic acid

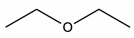
7 5 points

What is the functional group on this molecule?

- ◯ ketone
- ◯ amine
- ◯ alcohol
- ◯ aldehyde

8 5 points

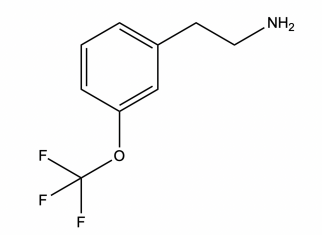
What is the functional group on this molecule?



- ◯ aldehyde
- ◯ ketone
- ◯ ether
- ◯ alcohol

9 5 points

Look at this big molecule. What is the functional group on the top right?



- ◯ primary amine
- ◯ ketone
- ◯ secondary amine
- ◯ aldehyde
- ◯ carboxylic acid

10 5 points

You are asked to identify the ketone on a large organic molecule. What characteristics are you looking for?

- ◯ a carbon-carbon double bond
- ◯ an oxygen double bonded to a non-terminal carbon
- ◯ an oxygen bonded to carbon and hydrogen
- ◯ a carbon with a double bond to oxygen and a single bond to an alcohol group
- ◯ an oxygen double bonded to a terminal carbon

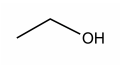
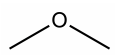
11 5 points

Which of the following is a carboxylic acid functional group?

- ◯ R-CHO
- ◯ R-COOH
- ◯ R-OH
- ◯ R-CO
- ◯ $R-NH_3$

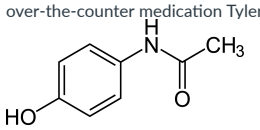
12 5 points

The following two choices both have the formula, C_2H_6O. Which is dimethyl ether?

- ○ 
- ○ 

13 6 points

This is the condensed structural formula for acetaminophen, the active ingredient in the over-the-counter medication Tylenol.

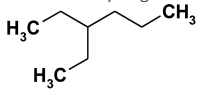


What is the molecular formula of acetaminophen?

- ○ C_8H_8NO
- ○ $C_8H_{11}NO_2$
- ○ $C_8H_9NO_2$
- ○ $C_8H_5NO_2$

14 6 points

The following structure is the carbon skeleton for a structural isomer of octane with most of the hydrogen and carbon atoms omitted.

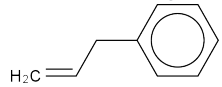


What is the molecular formula of this structure?

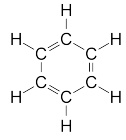
- ○ C_8H_{18}
- ○ C_8H_{16}
- ○ C_8H_{24}
- ○ C_8H_8

15 6 points

Consider the following structure:



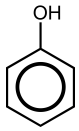
How many single bonds and double bonds (respectively) are represented by this condensed formula?
Note: the group on the far right can also be read as a phenyl group, similar to what you would see in benzene:



- ○ 12, 14
- ○ 15, 14
- ○ 11, 7
- ○ 12, 4
- ○ 15, 4

16 6 points

Consider the structural formula of phenol.

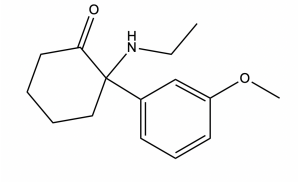


The active ingredient in some oral anesthetics used in sore throat sprays. What is the molar mass of phenol?

- ○ 89 g/mol
- ○ 50 g/mol
- ○ 17 g/mol
- ○ 94 g/mol

17 9 points

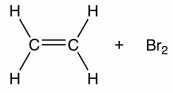
What are three functional groups in the following molecule?

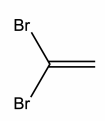
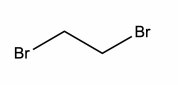
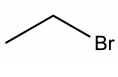
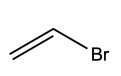


- ☐ indole
- ☐ aldehyde
- ☐ carbonyl
- ☐ alcohol
- ☐ ether
- ☐ secondary amine
- ☐ primary amine

18 5 points

The following addition reaction will proceed when bromine forms two radicals via homolytic cleavage. The radicals then react with ethene to form which product?



- ○ 
- ○ 
- ○ 
- ○ 

19 2 points

An alkyl halide is placed in solvent and breaks apart to form a carbocation and a halide anion. What type of process is this?

- ○ homolytic cleavage
- ○ heterolytic cleavage