

G11 Chemistry: Class 7 Homework**MULTIPLE CHOICE: Circle the correct answer. [10 marks]**

1. What is the molar mass of acetaminophen, $C_8H_9NO_2$?
A) 43 g/mol
B) 76 g/mol
C) 151 g/mol
D) 162 g/mol
E) 125 g/mol
2. The molecular formula of aspirin is $C_9H_8O_4$. How many aspirin molecules are present in one 500-milligram tablet?
A) 2.77 molecules
B) 2.77×10^{-3} molecules
C) 1.67×10^{24} molecules
D) 1.67×10^{21} molecules
E) None of these is correct.
3. How many sodium atoms are there in 6.0 g of Na_3N ?
A) 3.6×10^{24} atoms
B) 4.6×10^{22} atoms
C) 1.3×10^{23} atoms
D) 0.217 atoms
E) 0.072 atoms
4. The empirical formula of a compound of uranium and fluorine that is composed of 67.6% uranium and 32.4% fluorine is
A) U_2F
B) U_3F_4
C) UF_4
D) UF_6
E) UF_8
5. The percent composition by mass of a compound is 76.0% C, 12.8% H, and 11.2% O. The molar mass of this compound is 284.5 g/mol. What is the molecular formula of the compound?
A) $C_{10}H_6O$
B) $C_9H_{18}O$
C) $C_{16}H_{28}O_4$
D) $C_{20}H_{12}O_2$
E) $C_{18}H_{36}O_2$

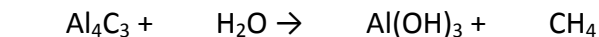
6. A compound was discovered whose composition by mass is 85.6% C and 14.4% H. Which of the following could be the molecular formula of this compound?

A) CH₄
B) C₂H₄
C) C₃H₄
D) C₂H₆
E) C₃H₈

7. An organic thiol compound is 38.66% C, 9.73% H, and 51.61% S by mass. What is the empirical formula of this compound?

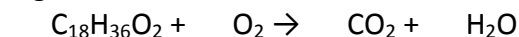
A) C₂H₆S
B) C₃H₈S
C) C₄H₁₀S
D) C₄H₁₂S
E) C₅H₁₄S

8. What is the coefficient of H₂O when the following equation is properly balanced with smallest set of whole numbers?



A) 3
B) 4
C) 6
D) 12
E) 24

9. What is the coefficient preceding O₂ when the following combustion reaction of a fatty acid is properly balanced using the smallest set of whole numbers?



A) 1
B) 8
C) 9
D) 26
E) 27

10. The percent composition by mass of an unknown chlorinated hydrocarbon was found to be 37.83% C, 6.35% H, and 55.83% Cl by mass. What is the empirical formula of this compound?

A) C₂H₄Cl
B) C₃H₇Cl
C) C₃H₆Cl₂
D) C₄H₉Cl
E) C₅H₁₁Cl

SHORT ANSWER: Answer the following questions.

1. What is the empirical formula of a compound that is 15.9% boron and 84.1% fluorine?
[3 marks]
2. Muscle soreness from physical activity is caused by a buildup of lactic acid in muscle tissue. Analysis of lactic acid reveals it to be 40.0% carbon, 6.71% hydrogen, and 53.3% oxygen by mass. Calculate the empirical formula of lactic acid. **[4 marks]**
3. The empirical formula of codeine is $C_{18}H_{21}NO_3$. If the molar mass is 299g/mol, what is its molecular formula? **[1 mark]**
4. The empirical formula of butane, the fuel used in disposable lighters, is C_2H_5 . In an experiment, the molar mass of butane was determined to be 58 g/mol. What is the molecular formula of butane? **[2 marks]**

5. A 0.539 g sample of a compound that contained only carbon and hydrogen was subjected to combustion analysis. The combustion produced 1.64 g of carbon dioxide and 0.807 g of water. Calculate the percentage composition and the empirical formula of the sample. **[5 marks]**
6. A 3.34 g sample of a hydrate has the formula $\text{SrS}_2\text{O}_3 \cdot x\text{H}_2\text{O}$, and contains 2.30 g of SrS_2O_3 . Find the value of x . **[4 marks]**
7. 0.487 grams of quinine (molar mass = 324 g/mol) is combusted and found to produce 1.321 g CO_2 , 0.325 g H_2O and 0.0421 g nitrogen. Determine the empirical and molecular formulas. **[5 marks]**