

Homework

p. 310 #36-37

p. 312 #45

36. a) 94.1% O, 5.9% H

$$94.1 \text{ g O} \times \frac{1 \text{ mol O}}{16.00 \text{ g O}} = \frac{5.88 \text{ mol O}}{5.84 \text{ mol}} = 1$$

$$5.9 \text{ g H} \times \frac{1 \text{ mol H}}{1.01 \text{ g H}} = \frac{5.84 \text{ mol H}}{5.84 \text{ mol}} = 1$$

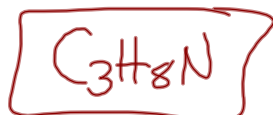


37. 62.1% C, 13.8% H, 24.1% N

$$62.1 \text{ g C} \times \frac{1 \text{ mol C}}{12.01 \text{ g C}} = \frac{5.17 \text{ mol C}}{1.72 \text{ mol}} = 3$$

$$13.8 \text{ g H} \times \frac{1 \text{ mol H}}{1.01 \text{ g H}} = \frac{13.66 \text{ mol H}}{1.72 \text{ mol}} = 8$$

$$24.1 \text{ g N} \times \frac{1 \text{ mol N}}{14.01 \text{ g N}} = \frac{1.72 \text{ mol N}}{1.72 \text{ mol}} = 1$$



④ 58.8% C
9.8% H
31.4% O

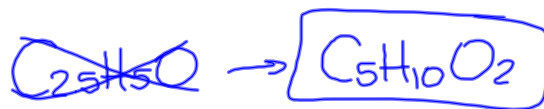
102 g/mol

"Smells like apples"

$$58.8\text{g C} \times \frac{1\text{ mol C}}{12.01\text{g C}} = \frac{4.90\text{ mol C}}{1.96\text{ mol}} = 2.5$$

$$9.8\text{g H} \times \frac{1\text{ mol H}}{1.01\text{g H}} = \frac{9.70\text{ mol H}}{1.96\text{ mol}} = 5$$

$$31.4\text{g O} \times \frac{1\text{ mol O}}{16.00\text{g O}} = \frac{1.96\text{ mol O}}{1.96\text{ mol}} = 1$$



Empirical

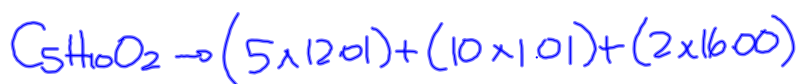


102.15 g/mol

Molecular



102^g/mol





Quiz Topics

22.4L/mol

- Avagadro's Number calculations
- Mole-Mass and Mole-Volume Calculations
- Percent Composition
- Empirical and Molecular Formulas

Section 10.1

- 342.3 g/mol
- a. 208.2 g/mol b. 352.0 g/mol
- a. 158.0 g/mol b. 310.2 g/mol
- 5.85 mol H₂O
- 3.6×10^{23} atoms
- 32.0 g

Section 10.2

- a. 180.2 g/mol c. 96.2 g/mol
b. 84.0 g/mol d. 153.2 g/mol
- a. 1.8×10^3 g
b. 26 g
c. 3.20×10^{-2} g
d. 0.480 g or 4.80×10^{-1} g
e. 1.43×10^2 g
- 1.87×10^2 g
- 204.1 g
- a. 4.9×10^{-3} mol d. 1.98×10^{-5} mol
b. 9.10×10^{-2} mol e. 1.97×10^{-5} mol
c. 1.08×10^{-2} mol
- 5.43 mol
- 15.1 g
- 59.6 L CH₄
- 6.03 mol NH₃

Section 10.3

- Percent C = $\frac{5.34 \text{ g C}}{52.84 \text{ g cpd}} \times 100 = 10.1\% \text{ C}$
Percent H = $\frac{0.42 \text{ g H}}{52.84 \text{ g cpd}} \times 100 = 0.79\% \text{ H}$
Percent Cl = $\frac{47.08 \text{ g Cl}}{52.84 \text{ g cpd}} \times 100 = 89.1\% \text{ Cl}$
- Mass of Cl
= total mass of compound – mass of Sn
= 18.35 g of compound – 5.74 g Sn
= 12.61 g Cl
Percent of Sn = $\frac{5.74 \text{ g Sn}}{18.35 \text{ g cpd}} \times 100$
= 31.3% Sn
Percent of Cl = $\frac{12.61 \text{ g Cl}}{18.35 \text{ g cpd}} \times 100$
= 68.7% Cl
- Percent C = $\frac{3.907 \text{ g C}}{4.781 \text{ g cpd}} \times 100 = 81.7\% \text{ C}$
Percent H = $\frac{0.874 \text{ g H}}{4.781 \text{ g cpd}} \times 100 = 18.3\% \text{ H}$
- Percent C = $\frac{48.0 \text{ g C}}{158.1 \text{ g Ca(C}_2\text{H}_3\text{O}_2)_2} \times 100$
= 30.4% C
Mass C = 30.4% C \times 65.3 g = 19.8 g
- 13.2 g Al
- 15.11 g Fe
- a. CCl₄
b. CHCl₃

Sample Problems

How many moles are in 9.80×10^{25} molecules of H_2O ?

How many atoms are in 3.40 moles of CO_2 ?

How many moles are in 24.0 g of CH_4 ?

What volume of gas will 1.08 moles of O_2 occupy?

Calculate the percent composition of $\text{C}_{12}\text{H}_{22}\text{O}_{11}$.

A compound is made up of 2.06% H, 32.69% S, and 65.25% O. The molar mass of the compound is 196.16 g/mol. What is the empirical formula and molecular formula for the compound?

Quiz - Tomorrow