

# Moles and Formulas Quiz Review

# Moles

1. How many moles are in 45 grams of barium hydroxide?
2. How many molecules are in 5.0 moles of dinitrogen tetroxide?
3. How many grams are in  $3.49 \times 10^{22}$  molecules of potassium oxide?
4. What is the volume (L) of 60.0 g carbon dioxide gas at STP?

# Moles

1. How many moles are in 45 grams of barium hydroxide? **.26 mol**
2. How many molecules are in 5.0 moles of dinitrogen tetroxide?  **$3.0 \times 10^{24}$  molec**
3. How many grams are in  $3.49 \times 10^{22}$  molecules of potassium oxide? **5.46 g**
4. What is the volume (L) of 60.0 g carbon dioxide gas at STP? **30.5 L**

# Percent Composition

5. Determine the percent composition of iron (II) nitrate.
6. What is the percent composition of mercury (II) oxide?

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Fe: 31.05%, N: 15.58%, O: 53.37%

6. What is the percent composition of mercury (II) oxide?

Hg: 92.61%, O: 7.387%

# Empirical Formulas

7. Determine the empirical formula of a compound that is 52.2% carbon, 17.4% hydrogen, and 30.4% nitrogen.
8. Penicillin is 53.8% carbon, 6.41% hydrogen, 8.97% nitrogen, 10.3% sulfur, and 20.5% oxygen. Determine the empirical formula.

# Empirical Formulas

7. Determine the empirical formula of a compound that is 52.2% carbon, 17.4% hydrogen, and 30.4% nitrogen.  $C_2H_8N_1$
8. Penicillin is 53.8% carbon, 6.41% hydrogen, 8.97% nitrogen, 10.3% sulfur, and 20.5% oxygen. Determine the empirical formula.



# Molecular Formulas

9. A compound has the molecular mass of 150.15 g/mol and the empirical formula  $\text{CH}_2\text{O}$ . What is the MF?
10. A compound is composed of 39.95% carbon, 13.44 % hydrogen, and 46.61% nitrogen. What is the empirical formula? If this compound has a molar mass of 60.12 g/mol, what is its MF?
11. Caffeine is 49.48% carbon, 5.15% hydrogen, 28.87% nitrogen, and 16.49% oxygen and has a molar mass of 194.2 g/mol. Determine the EF and MF.



# Molecular Formulas

9. A compound has the molecular mass of 150.15 g/mol and the empirical formula  $\text{CH}_2\text{O}$ . What is the molecular formula?  $\text{C}_5\text{H}_{10}\text{O}_5$
10. A compound is composed of 39.95% carbon, 13.44 % hydrogen, and 46.61% nitrogen. If this compound has a molar mass of 60.12 g/mol, what is its molecular formula?  $\text{EF} = \text{CH}_4\text{N}$ ;  $\text{MF} = \text{C}_2\text{H}_8\text{N}_2$
11. Caffeine is 49.48% carbon, 5.15% hydrogen, 28.87% nitrogen, and 16.49% oxygen and has a molar mass of 194.2 g/mol. Determine the EF and MF.  $\text{EF} = \text{C}_4\text{H}_5\text{N}_2\text{O}$ ;  $\text{MF} = \text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$