

Empirical And Molecular Formulas

Atoms combine to form compounds in _____ (John Dalton)

Molecular Formula: _____

Empirical Formula: _____

* It is possible for compounds with different molecular formulas to have the _____ empirical formula.

Benzene molecular: _____ empirical: _____

Acetylene molecular: _____ empirical: _____

Finding Empirical Formulas

Ex 1. Find the empirical formula for a compound that is 81.9% C, 6.12% H and 12.1% O.

Ex 2. An unknown compound has a percent composition of 81.7% C and 18.3% H. What is the compound's empirical formula?

Empirical and Molecular formulas

Remember to show your work, include a therefore statement, units and significant digits

1. Calculate the empirical formula of a compound that, on analysis is found to contain 2.2% hydrogen, 26.7% carbon and 71.15% oxygen.
2. The percentage composition of a compound is 35.9% aluminum and 64.1% sulfur. What is the empirical formula?
3. Write the empirical formula for each of the following molecular formulas:
 - a. $C_2H_4O_2$
 - b. NH_3
 - c. C_6H_6
4. What is the empirical formula of a compound that contains 26.6% potassium, 35.4% chromium and 38.1% oxygen?
5. Find the empirical formula of an antibiotic chloromycetin whose % composition is as follows: 40.87% carbon; 3.72% hydrogen; 8.67% nitrogen; 24.7% oxygen and the rest is chlorine.
6. A combustion analyzer determines the percentage composition of a compound to be 68.54% carbon, 8.63% hydrogen, and 22.83% oxygen. A mass spectrometer determines its molar mass to be 140.20g/mol. What is the molecular formula of the compound?
7. A fat that is used to make soap contains 76.5% carbon, 12.2% hydrogen and 11.3% oxygen by mass. Determine the molecular formula of the fat if its molar mass is 706.3g/mol.
8. The percentage composition of nicotine is 74.0% carbon, 8.7% hydrogen and 17.3% nitrogen. Its molar mass is 162.26g/mol. What is the molecular formula of nicotine?