

# Empirical and Molecular Formula Problems

LT: 3.7 I can **calculate** empirical and molecular formulas from appropriate data.

If you need a reminder or encounter difficulty, work through the guided examples at

[http://michele.usc.edu/105a/105afall98/bau\\_mak/tutorials/emp\\_form.html](http://michele.usc.edu/105a/105afall98/bau_mak/tutorials/emp_form.html).

## **Level 1 Problems**

- 1) Find the empirical formula for the compound given: 77.7% Fe, 22.3% O
- 2) Find the empirical formula for the compound given 21.8% Mg, 27.9% P, 50.3% O
- 3) Find the empirical formula for the compound given a compound that is composed of 0.2g of H, 3.3g S, and 6.5g of O.
- 4) Find the molecular formula for the compound given the empirical formula  $\text{CH}_2$  and a molar mass = 140.20 g/mol

## **Level 2 Problems**

- 5) Find the molecular formula for the compound given: 92.4% C, 7.6% H, molar mass = 65.10g/mol
- 6) Find the molecular formula for the compound composed of 2.0g of C, 0.34g H, 2.66g O with molar mass = 180.12g/mol.

## **Level 3 Problems**

- 7) Serotonin is a compound that conducts nerve impulses in the brain. It contains 68.2 mass percent C, 6.86 mass percent H, 15.9 mass percent N, and 9.08 mass percent O. Its molar mass is 176 g/mol, determine its molecular formula.
- 8) The koala dines exclusively on eucalyptus leaves. Its digestive system detoxifies eucalyptus oil, a poison to other animals. The chief constituent of eucalyptus oil is a substance called eucalyptol, which contains 77.92% C, 11.68% H, and the remainder O. What is the empirical formula of this substance?