

Worksheet 7-3

Percent Composition & Empirical Formulas

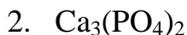
Glencoe Chemistry pp.328-337

Name _____

Period _____

Show your work to receive credit. Circle your final answer.

A. Calculate the *percent composition* for the following compounds.



B. Calculate the *percent by mass* of iron in each of the following compounds.

3. iron (III) oxide

4. iron (II) oxide

C. Determine the *empirical formula* for each compound.

5. A compound contains 0.0130 mol carbon, 0.0390 mol hydrogen, and 0.0065 mol oxygen.

6. A compound consists of 72.2% magnesium and 27.8% nitrogen by mass.

7. Glucose contains 40.0% carbon, 6.7% hydrogen, and 53.3% oxygen by mass.

8. Phosphoric acid is found in some soft drinks. A sample of phosphoric acid contains 0.3086 g of hydrogen, 3.161 g of phosphorus, and 6.531 g of oxygen.

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D. Determine the *molecular formula* for each compound described.

9. A compound has an empirical formula of NO_2 and a molar mass of 92.02 g/mol.

10. A compound has an empirical formula of $\text{C}_2\text{H}_3\text{O}$ and a molar mass of 172 g/mol.

11. Ibuprofen, a common headache remedy, has an empirical formula of $\text{C}_7\text{H}_9\text{O}$ and a molar mass of approximately 215 g/mol.

12. Nicotine is 74.1% carbon, 8.6% hydrogen, and 17.3% nitrogen by mass. Its molar mass is about 160 g/mol.

13. Epinephrine (adrenaline) is a hormone secreted into the bloodstream in times of danger and stress. It is 59.0% carbon, 7.1% hydrogen, 26.2% oxygen, and 7.7% nitrogen by mass. Its molar mass is about 180 g/mol.

E. Questions

14. Can the molecular formula of a compound ever be the same as the empirical formula? Explain your answer.

15. What is the empirical formula of a compound that has three times as many hydrogen atoms as carbon atoms, but only half as many oxygen atoms as carbon atoms?