Empirical Formula Practice Problems
PROVIDE FULL SOLUTIONS IN YOUR NOTEBOOK!

1. A 100 gram sample of compound of sodium contains 36.5 grams of sodium, 25.4 grams of sulfur, and 38.1 grams of oxygen. Does the empirical formula for the compound lead you to believe it is sodium sulfite or sodium sulfate?

2. Fat makes up a major portion of all soaps. A fat used in many soaps is 76.5% carbon, 12.2% hydrogen, and 11.3% oxygen

    a. What is its empirical formula?

    b. What is the molecular formula of a fat with a molecular mass of 705g/mol?

3. A sample of a substance is determined to be composed of 0.89 grams of potassium, 1.18 grams of chromium, and 1.27 grams of oxygen. Calculate the empirical formula of this substance.

4. Strychnine, a deadly poison, has a molecular mass of 334g/mol and a percentage composition of 75.42% carbon, 6.63% hydrogen, 8.38% nitrogen, and the balance oxygen. What is the molecular formula of strychnine?
(*Hint: DO NOT round up the number found for carbon in the empirical formula.*)

5. A 10 gram sample of a compound contains 7.22 grams of magnesium and 2.78 grams of nitrogen. What is its empirical formula?

6. An organic compound with a molecular mass of 140g/mol is 68.54% carbon, 8.63% hydrogen, and 22.83% oxygen. What is the molecular formula of the compound?

7. LAB QUESTION: To find the experimental empirical formula of a compound, a student heats a coil of magnesium ribbon 35.00 cm long in a crucible. Water is added to the ash left in the crucible and the crucible is reheated until dry.
Data from the experiment:
    - Mass of empty crucible and cover - 20.74g
    - Mass of one meter of magnesium ribbon - 0.72g
    - Mass of crucible, cover, and final product - 21.17g

    What is the empirical formula for the oxide of magnesium that was the final product?

Empirical Formula Practice Problem Answers
Problem 1 - Na_2SO_3, sodium sulfite
Problem 2a - $C_9H_{17}O$
Problem 2b - $C_{45}H_{85}O_5$
Problem 3 - $K_2Cr_2O_7$
Problem 4 - $C_{21}H_{22}N_2O_2$
Problem 5 - Mg_2N_3
Problem 6 - $C_8H_{12}O_2$
Problem 7 - MgO