Empirical formula HW

8) What is the empirical formula for C_4H_{10}?

9) What is the empirical formula for $C_2H_4O_2$?

10) Is CO_2 an empirical formula, a molecular formula, or both? Explain.

11) A pure sample of a hydrocarbon (a compound that contains only hydrogen and carbon) is found to be 74.5 % carbon by mass.
    a. Find the empirical formula for the compound.
    b. If the molar mass of the compound is 16.05 g/mol, find its molecular formula.

12) It was found that a pure sample of a compound contains 68.1% carbon, 13.7% hydrogen, and 18.2% oxygen by mass.
    a. Find the empirical formula for the compound.
    b. If the molar mass of the compound is 176.34 g/mol, what is its molecular formula?

13) A pure sample of a hydrocarbon was analyzed and found to contain 12.00 g of carbon and 1.5 g of hydrogen.
    a. Find the empirical formula of the compound. (Hint: as the masses are known, you do not need to assume you have a 100 g sample.)
    b. If the molar mass of the hydrocarbon is found to be 54.10 g/mol, what is its molecular formula?

14) A pure sample of a hydrocarbon was analyzed and found to contain 6.0 g of carbon and 1.100 g of hydrogen.
    a. Find the empirical formula of the compound.
    b. If the molar mass of the compound is found to be 142.36 g/mol, what is its molecular formula?

15) A 1.0857 gram pure sample of a compound containing only carbon, hydrogen, and oxygen was burned in excess oxygen gas. 3.190 g of carbon dioxide and 0.9360g of water were produced. Find the empirical formula of the compound.

16) A 1.638 gram pure sample of a compound containing only carbon, hydrogen, and oxygen was burned in excess oxygen gas. 3.117 g of carbon dioxide and 1.911g of water were produced. Find the empirical formula of the compound.