

**Empirical and Molecular Formula Worksheet**

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**SHOW YOUR WORK ON YOUR OWN PAPER**

Your answers also are recorded on this worksheet.

1. Identify the following as molecular formulas, empirical formulas or both.

- a. Ribose,  $C_5H_{10}O_5$ , a sugar molecule in RNA. \_\_\_\_\_
- b. Ethyl butanoate,  $C_6H_{12}O_2$ , a compd w/ the odor of pineapple. \_\_\_\_\_
- c. Chlorophyll,  $C_{55}H_{72}MgN_4O_5$ , part of photosynthesis. \_\_\_\_\_
- d. DEET,  $C_{12}H_{17}ON$ , an insect repellent. \_\_\_\_\_
- e. Oxalic acid  $H_2C_2O_4$ , found in spinach and tea. \_\_\_\_\_

2. Calculate the empirical formula of each compound with the following percent composition.

- a. 94.1% O, 5.9% H \_\_\_\_\_
- b. 79.9% C, 20.1% H \_\_\_\_\_
- c. 67.6% Hg, 10.8% S, 21.6% O \_\_\_\_\_
- d. 27.59% C, 1.15% H, 16.09% N, 55.17% O \_\_\_\_\_
- e. 17.6% Na, 39.7% Cr, 42.7% O \_\_\_\_\_

3. The compound methyl butanoate smells like apples. Its percent composition is 58.8% C, 9.8% H, and 31.4% O. If its gram molecular mass is 102 g/mole, what is its molecular formula?

4. You find that 7.36 g of a compound has broken down to give 6.93g of oxygen. The rest of the compound is hydrogen. If the molecular mass of the compound is 34.0 g/mole, what is its molecular formula?

5. What is the total mass of a mixture of  $3.50 \times 10^{22}$  molecules of  $Na_2SO_4$ , 0.500 mole of  $H_2O$  and 7.23g of  $AgCl$ ?