1. The molecular formula of the antifreeze ethylene glycol is $C_2H_6O_2$. What is the empirical formula?

2. Calculate the molecular mass of tetraphosphorus decaoxide, P_4O_{10}, a corrosive substance which can be used as a drying agent.
    a) 469.73 g/mol
    b) 283.89 g/mol
    c) 190.97 g/mol
    d) 139.88 g/mol

3. Household sugar, sucrose, has the molecular formula $C_{12}H_{22}O_{11}$. What is the % of carbon in sucrose, by mass?
    a) 26.7 %
    b) 33.3 %
    c) 41.4 %
    d) 42.1 %

4. What is the percent carbon in CH_3CH_2OH?
    a) 13%
    b) 24%
    c) 46%
    d) 52%

5. Hydroxylamine nitrate contains 29.17 mass % N, 4.20 mass % H, and 66.63 mass % O. Determine its empirical formula.
    a) HNO
    b) H_2NO_2
    c) HN_6O_{16}
    d) $HN_{16}O_7$

6. A well-known reagent in analytical chemistry, dimethylglyoxime, has the empirical formula C_2H_4NO. If its molar mass is 116.1 g/mol, what is the molecular formula of the compound?

7. Nitrogen and oxygen form an extensive series of oxides with the general formula N_xO_y. One of them is a blue solid that comes apart, reversibly, in the gas phase. It contains 36.84% N. What is the empirical formula of this oxide?

8. A sample of indium chloride weighing 0.5000 g is found to contain 0.2404 g of chlorine. What is the empirical formula of the indium compound?

9. What is the average mass, in grams, of one atom of iron ($N_A = 6.022 \times 10^{23}$ mol^{-1})?
   a) 6.02×10^{23} g
   b) 1.66×10^{-24} g
   c) 9.28×10^{-23} g
   d) 55.85 g

10. The number of hydrogen atoms in 0.050 mol of $C_3H_8O_3$ is
   a) 3.0×10^{22} H atoms
   b) 1.2×10^{23} H atoms
   c) 2.4×10^{23} H atoms
   d) 4.8×10^{23} H atoms

11. What is the mass in grams of 0.250 mol of the common antacid calcium carbonate?
   a) 4.00×10^2 g
   b) 25.0 g
   c) 17.0 g
   d) 4.00×10^{-2} g