

Empirical + Molecular Formula Problems – Set II

1. What is the empirical formula of the following compounds:

(a) C_4O_{12} _____ (b) SiO_2 _____ (c) $N_4H_8Cl_2$ _____

2. A 10.00 g sample of vitamin C was analyzed and found to contain 4.092 g of C, 0.458 g of H, and 5.450 g of O. Given that the molar mass of the compound is 176g, determine the molecular formula of vitamin C. (answer: $C_6H_8O_6$)

3. Cyclopropane has the empirical formula CH_2 . Its molar mass is 42g. What is its molecular formula? (answer: C_3H_6)

4. The amino acid Histidine has a molar mass of 154g. Is the molecular formula of Histidine C_3H_4NO or $C_6H_8N_3O_2$?

5. The major air pollutant of coal-burning power plants is a colorless, pungent gaseous compound containing only sulfur and oxygen. Chemical analysis of a 1.078 g sample of this gas showed that it contained 0.540 g of S and 0.538 g of O. What is the empirical formula of this compound? (answer: SO_2).

6. Determine the empirical formula of a compound containing: 29.2% N, 8.3% H, 12.5% C, and 50.0 % O. (answer: $N_2H_8CO_3$)

7. Benzene has the empirical formula CH. Its molar mass is 78g. What is its molecular formula? (answer: C_6H_6)