1. A compound has an empirical formula of CH2O.
2. Suggest 3 molecules that would have this as an empirical formula
3. 3.5 moles of this compound has a mass of 630 grams. What is the molecular formula of this compound?
4. A compound is made of 92.3% carbon and 7.7% hydrogen. One mole of this compound weighs 26.0 g. What is the compound?
5. A compound containing 24.8% carbon, 2.0% hydrogen, and 73.2% chlorine has molar mass 96.9 g/mol. What is the molecular formula?
6. Caffeine has the following percent composition: carbon 49.48%, hydrogen 5.19%, oxygen 16.48%, and nitrogen 28.85%. If 5.0 mol of caffeine is 970.95 g, what is caffeine's molecular formula?
7. A certain gas contains only oxygen. It is found that 1.2 g of the gas occupies 0.56 L at STP. Find the molecular formula of this gas.
8. An unknown compound is found to contain 40.0% carbon, 6.7% hydrogen, and 53.5% oxygen with a molecular mass of 60.0 g/mol. What is the molecular formula of the unknown compound?
9. A gas has an empirical formula of CH2. A metal container is filled with the gas and found to weigh 1.75 times as much as the same container filled with oxygen gas at the same temperature and pressure. What is the molecular formula of the gas?
10. Mannose is a sugar which has a molecular mass of 180 g/mole, and contains only carbon, hydrogen and oxygen. A 2.36 g sample of mannose was analysed and found to contain 0.994 g of carbon, 0.158 g hydrogen and the rest oxygen. Calculate the molecular formula for the compound.
11. 4.75 grams of uranium combined with exactly 2.28 grams of fluorine to produce 0.0200 moles of a gaseous compound. What is the molar mass, empirical formula, molecular formula, and name of this compound?
12. A gaseous compound was found to contain 65.4% carbon, 9.15% hydrogen, and 25.4% nitrogen. By comparing the masses of equal volumes of oxygen and this compound under the same conditions of temperature and pressure, it was found that the mass of this compound was 6.875 times greater than oxygen. Calculate the molar mass, empirical formula, and molecular formula of this compound.
13. A compound contains C, H, N and O. A 4.500 gram sample was burned to give 6.83 grams of CO2, 2.33 grams of water, and 0.72 grams of N2. Equal volumes of N2 and the gaseous compound were found to have a mass of 0.400 grams for the N2 and 2.48 grams for the gaseous compound under identical conditions. What is the molecular formula for the compound?

**Challenge:** A compound contains C, H, N, S, and O. A 7.58 gram sample was burned to give 8.10 grams of CO2, 1.99 grams of H2O, and 1.03 grams of N2. A separate sample having a mass of 7.58 grams was treated so that all of the sulphur was converted to BaSO4. The resulting BaSO4 had a mass of 17.21 grams. A third measurement indicated that the compound has a molar mass between 200 and 260 g/mole. What is the molecular formula for the compound? (Ans. C5H6N2S2O3)