Empirical and Molecular Formula Practice

1. A compound contains 18.8% sodium, 29.0% chlorine, and 52.2% oxygen, by mass. If the molar mass of the compound is 122.44 g/mol, determine the empirical and molecular formulas. (Answer: Empirical and molecular formula - NaClO₄)

2. A 4.99 gram sample of a compound contains 1.52 grams of nitrogen atoms and 3.47 grams of oxygen atoms. The molar mass of the compound is between 90.0 g and 95.0 g. Determine the empirical and molecular formulas. Also, calculate the actual molar mass of this compound. (Answer: Empirical formula - NO₂. Molecular formula - N₂O₄. Molar mass = 92.04 g/mol)

3. Ascorbic acid is another name for Vitamin C. It is composed of 40.92% carbon, 4.58% hydrogen, and 54.50% oxygen, by mass. Determine the empirical formula for ascorbic acid. (Answer: Empirical formula - C₃H₄O₃)