

Mass Percent and Empirical formula questions

1) Calculate the mass percent of each element in the following compounds:

a) PbS, lead (II) sulfide (ans: Pb = 86.60% and S = 13.40%)

b) C₃H₈, propane (ans: 81.71% C and 18.29% S)

c) C₁₀H₁₄O, carvone (ans: 79.96% C, 9.394% H and 10.65% O)

2) Calculate the weight percent of copper in CuS, copper (II) sulfide. If you wish to obtain 10.0 g of copper metal from copper (II) sulfide, what mass of the sulfide (in grams) should you use? (ans: 15.0 g CuS)

3) Acetylene is a colorless gas used as a fuel in welding torches, among other things. It is 92.26% C and 7.74% H. Its molar mass is 26.02 g/mol. What are the empirical and molecular formulas of acetylene? (ans: empirical: CH, molecular: C₂H₂)

4) Cumene is a hydrocarbon composed of 89.94% carbon and the rest hydrogen. The molar mass of the compound is 120.2 g/mol. What are the empirical and molecular formulas? (ans: empirical: C₃H₄ molecular: C₉H₁₂)

5) A new compound containing xenon and fluorine was isolated by shining sunlight on a mixture of Xe (0.526 g) and F₂ gas. If you isolate 0.678 g of the new compound, what is its empirical formula (assume all the xenon turns into the compound)?

6) Zinc metal (2.50 g) combined with 9.70 g of iodine to produce zinc iodide. What is the formula of this ionic compound?