

This worksheet is **due at the time of your first lecture exam**. To complete the assignment, show in *detailed steps* how to get the answer that is given for each of the problems. *Failure to use this form for work and answers will result in a point penalty.*

Problem 1: Lithium has two stable isotopes with masses of 6.0152 amu and 7.0160 amu. The average molar mass of Li is 6.9410 amu. What is the percent abundance of each isotope?

Answer to Problem #1: 7.49% ⁶Li and 92.51% ⁷Li

Problem 2: A given sample of xenon fluoride contains molecules of a single type XeF_n, where *n* is a whole number. If 9.35×10^{20} molecules of XeF_n weigh 0.322 g, calculate the most likely value of *n*.

Answer to Problem #2: n = 4

Problem 3: Complete the following problems using correct significant figures:

$$20.42 + 1.322 + 83.1 = \underline{\hspace{2cm}}$$

$$15.5 \times 27.3 \times 5.4 = \underline{\hspace{2cm}}$$

$$320.5 - 6104.5/2.3 = \underline{\hspace{2cm}}$$

Problem 4: A nail is coated with a 0.042 cm thick layer of zinc. The surface area of the nail is 9.17 cm². The density of zinc is approximately 7.13 g/cm³. How many zinc atoms are used in the coating?

Answer to Problem #4: 2.5×10^{22} atoms

Problem 5: In a chemical reaction, 1.000 g of sulfur combines with 3.963 g of copper to give a pure compound. What is the empirical formula for this compound?

*Answer to Problem #5: **Cu₂S***

Problem 6: Cyclooctene is a hydrocarbon containing only C and H atoms. When burned in oxygen, 1.000 g of cyclooctene produces 3.195 g of CO₂ and 1.144 g of water. Mass spectrometry shows a molar mass value of 110.2 g/mol. What is the empirical and molecular formula of cyclooctene?

*Answer to Problem #6: **C₄H₇** and **C₈H₁₄***