

This worksheet is **due Wednesday, October 20 by 11:59 PM**. 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.*

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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% <sup>6</sup>Li and 92.51% <sup>7</sup>Li*

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Problem 2: A given sample of xenon fluoride contains molecules of a single type XeF<sub>n</sub>, where *n* is a whole number. If  $9.35 \times 10^{20}$  molecules of XeF<sub>n</sub> weigh 0.322 g, calculate the most likely value of *n*.

*Answer to Problem #2: n = 4*

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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 cm<sup>2</sup>. The density of zinc is approximately 7.13 g/cm<sup>3</sup>. How many zinc atoms are used in the coating?

*Answer to Problem #4:  $2.5 \times 10^{22}$  atoms*

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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: **Cu<sub>2</sub>S***

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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 CO<sub>2</sub> 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: **C<sub>4</sub>H<sub>7</sub>** and **C<sub>8</sub>H<sub>14</sub>***