**Quiz 2**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. An automobile gasoline tank holds 20 kg of gasoline. When the gasoline burns, 81 kg of oxygen is consumed, and carbon dioxide and water are produced. What is the total combined mass of carbon dioxide and water that is produced (2 points)?

$$\sum\_{}^{}m\_{reactants}=\sum\_{}^{}m\_{products}=81 kg+20 kg=101 kg $$

1. Common brass is a copper and zinc alloy containing 37.0% zinc by mass and having a density of 8.48 g/cm3. A fitting composed of common brass has a total volume of 122.0 cm3. How many atoms of copper does the fitting contain (8 points)?

$$122.0 cm^{3} brass×\frac{8.48 g brass}{1 cm^{3} brass}×\frac{\left(100-37.0\right)g Cu}{100 g brass}×\frac{1 mol Cu}{63.546 g Cu}×\frac{6.022×10^{23} atoms Cu}{1 mol Cu}=6.18×10^{24} atoms Cu $$

1. Write the chemical symbol for each of the following species (6 points):
	1. a cation with a mass number of 24, an atomic number of 12, and a charge of 2+.

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* 1. a member of group 15 that has a charge of 3+, 48 electrons, and 70 neutrons.

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* 1. a noble gas atom with 48 neutrons.

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1. Are the following statements true or false (4 points)?
	1. Ammonium compounds are generally soluble. \_\_\_\_\_true
	2. Phosphate compounds are generally soluble. \_\_\_\_\_false
	3. Mercury(II) halides are generally insoluble. \_\_\_\_\_false
	4. Nitrate compounds are generally soluble. \_\_\_\_\_true