**Quiz 3**

# 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. A sample is found to have 1.651 g Ag and 0.1224 g O (8 points).
	1. Calculate the empirical formula for the compound.

$$1.651 g Ag ×\frac{1 mol Ag}{107.868 g Ag}=0.015305744 mol Ag$$

$$0.1224 g O ×\frac{1 mol O}{15.999 g O}=0.007650478 mol O$$

$$Ag\_{\frac{0.015305744 mol}{0.007650478 mol}}O\_{\frac{0.07650478 mol}{0.007650478 mol}}=Ag\_{2.000625803}O\_{1}=Ag\_{2}O$$

* 1. If the molar mass of the compound is approximately 230 g/mol, what is the molecular formula?

$$empirical mass=2\left(107.868\frac{g}{mol}\right)+1\left(15.999\frac{g}{mol}\right)=231.735\frac{g}{mol}$$

The empirical formula and the molecular formula are both Ag2O.

* 1. What is the name of the compound? \_\_\_\_\_\_silver oxide\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Identify each organic compound as a hydrocarbon, alcohol, or carboxylic acid (4 points):
	1. Methane, CH4 \_\_\_\_hydrocarbon
	2. Ethanol, CH3CH2OH \_\_\_\_alcohol
	3. Propane, C3H8 \_\_\_\_hydrocarbon
	4. Acetic acid, CH3COOH \_\_\_\_carboxylic acid

1. You have 22.5 g of oxalic acid dihydrate, H2C2O4 · 2 H2O (8 points).
	1. How many moles of oxalic acid do you have?

$$22.5 g H\_{2}C\_{2}O\_{4}∙2 H\_{2}O×\frac{1 mol H\_{2}C\_{2}O\_{4}∙2 H\_{2}O }{126.064 g H\_{2}C\_{2}O\_{4}∙2 H\_{2}O }×\frac{1 mol H\_{2}C\_{2}O\_{4}}{1 mol H\_{2}C\_{2}O\_{4}∙2 H\_{2}O}=0.178480772 mol H\_{2}C\_{2}O\_{4}≈0.178 mol H\_{2}C\_{2}O\_{4}$$

* 1. How many molecules of water do you have?

$$0.178 mol H\_{2}C\_{2}O\_{4}∙2 H\_{2}O×\frac{2 mol H\_{2}O}{1 mol H\_{2}C\_{2}O\_{4}∙2 H\_{2}O}×\frac{6.022×10^{23} molecules H\_{2}O }{1 mol H\_{2}O}=2.149622414×10^{23} molecules H\_{2}O≈2.15×10^{23} molecules H\_{2}O$$