

\*All parts of this AP CHEMISTRY Summer Assignment are to be done individually.

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code: fakxth3

### Significant Figures (Sig Figs)

1. How many sig figs are in the following numbers?

a) 0.0450 \_\_\_\_\_

b) 790 \_\_\_\_\_

c) 32.10 \_\_\_\_\_

2. Solve the following problems. Round your answer to the correct number of sig figs (and use the correct unit on your answer).

a)  $825 \text{ cm} \times 32 \text{ cm} \times 0.248 \text{ cm}$  \_\_\_\_\_

b)  $15.68 \text{ g} \div 2.885 \text{ mL}$  \_\_\_\_\_

### Density (round your answers to correct number of sig figs and show all work with units)

3. A cube of ruthenium metal 1.5 cm on a side has a mass of 42.0 g. What is the density in  $\text{g/cm}^3$ ? Will ruthenium metal float on water? (Density of water is  $1 \text{ g/cm}^3$ )

4. The density of bismuth metal is  $9.8 \text{ g/cm}^3$ . What is the mass of a sample of bismuth that displaces 65.8 mL of water?

### Conversions (round answers correctly and show work with units)

5. Make the following conversions:

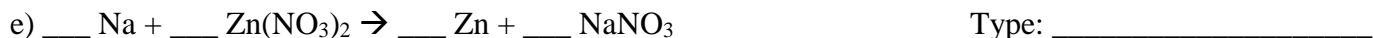
a) 16.2 m to km

b) 5.44 nL to mL

c) 45.7 mL/s to kL/hr

## Chemical Reactions

6. Balance the following and equations and tell what type of reaction it is (synthesis, decomposition, single replacement, double replacement, or combustion)



7. What are diatomic molecules? List the 7.

## Moles

8. Calculate the number of moles of the following: (SHOW WORK)

a) 42.8 g of  $\text{KNO}_3$

b) 155.7 L of  $\text{CO}_2$  at STP

c)  $9.25 \times 10^{26}$  molecules of  $\text{CaCl}_2$

## Stoichiometry

9. Using the following equation:  $2 \text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow 2 \text{H}_2\text{O} + \text{Na}_2\text{SO}_4$

How many grams of sodium sulfate will be formed if you start with 200 grams of sodium hydroxide and you have an excess of sulfuric acid?

10. Using the following equation:  $\text{Pb}(\text{SO}_4)_2 + 4 \text{LiNO}_3 \rightarrow \text{Pb}(\text{NO}_3)_4 + 2 \text{Li}_2\text{SO}_4$

How many grams of lithium nitrate will be needed to make 250 grams of lithium sulfate, assuming that you have an adequate amount of lead (IV) sulfate to do the reaction?

11. Using the following equation:  $\text{Fe}_2\text{O}_3 + 3 \text{H}_2 \rightarrow 2 \text{Fe} + 3 \text{H}_2\text{O}$  Calculate how many grams of iron can be made from 16.5 grams of  $\text{Fe}_2\text{O}_3$ .

## Nomenclature

12. Complete the empty boxes within the table below.

Identify the type of chemical (Choose the best choice) <b>Ionic Compound, Covalent Compound, or Element</b>	Name of the chemical	Formula for the chemical
	Magnesium hydroxide	
		H <sub>2</sub>
	Lead (IV) bromide	
		H <sub>2</sub> CO <sub>3</sub>
		CBr <sub>4</sub>
		NCl <sub>3</sub>
		AlCl <sub>3</sub>
	Sulfur hexafluoride	
	Manganese (IV) chloride	
		Ba <sub>3</sub> N <sub>2</sub>
		N <sub>2</sub> O <sub>3</sub>
	Helium	
	Ammonia	
		Sn(ClO <sub>3</sub> ) <sub>4</sub>

**Part 2:** Memorize all the ions on the common ion sheet. You may know some of these already. Year round you will have to recall a majority of these ions by rote memory. We will start this year with the assumption you know all listed on the ion sheet.