<u>Honors Chemistry Third Marking Period Review Sheet</u>

Spring, Mr. Wicks

<u>Chapter 7: Chemical Formulas and Chemical Compounds</u>

- I can use the periodic table to determine charges for ions of given elements.
- I can use the Stock system to name metal elements that can have multiple charges.
- I know the names, chemical formulas, and charges for common polyatomic ions:

OH^-	Hydroxide Ion	CO_3^{2-}	Carbonate Ion
NO_3^-	Nitrate Ion	SO_4^{2-}	Sulfate Ion
$C_2H_3O_2^-$	Acetate Ion	PO_4^{3-}	Phosphate Ion
HCO_3^-	Hydrogen Carbonate Ion	NH_4^+	Ammonium Ion
	(Bicarbonate Ion)	H_3O^+	Hydronium Ion

- I can combine cations and anions to write formulas for ionic compounds.
- I can write cations and anions from formulas for ionic compounds.
- I can rapidly distinguish ionic compounds (metal and nonmetal elements) from molecular compounds (nonmetal elements only) for chemical nomenclature purposes.
- I can use the following prefixes to write the names for molecular compounds.

Mono- (1), di- (2), tri- (3), tetra- (4), penta- (5), hexa- (6), hepta- (7), octa- (8), nona- (9), deca- (10)

- I can write chemical names given chemical formulas and vice versa for ionic compounds, molecular compounds, and selected acids.
- I can calculate the molar mass for a chemical formula from the atomic masses on a periodic table of the elements.
- I can use molar masses as conversion factors to solve problems.
- I can calculate the percent composition (percent by weight) of each element in a compound based on the compound's formula.

$$\%\ Composition\ of\ an\ Element\ in\ a\ Compound = \left(\frac{Mass\ of\ Element}{Mass\ of\ Compound}\right)(100)$$

- I can solve empirical formula problems using the strategy outlined in Table 1.
- I can use percent composition to determine the empirical formula of a compound. Remember it is helpful to assume you have 100 g of a given compound during problem solving.

Table 1: Problem Solving Strategy for Empirical Formula Calculations
1. Get mass of each element
2. Get moles
3. Get mole ratio
4. Use whole number multiplier if needed
5. Write the empirical formula

- I can obtain a molecular formula from an empirical formula using the molar masses of both. Recall $\left(\frac{MM_{Molecular\ Formula}}{MM_{Empirical\ Formula}}\right) = Whole\ Number\ Multiplier$ needed to obtain the molecular formula.

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Chapter 8: Chemical Equations and Reactions

- Chemical equations use symbols to represent chemical reactions that take place in a laboratory. I can write chemical equations including the states of matter, yield symbol, and symbol for heat.
- I can balance simple chemical equations by inspection and complicated chemical equations by the fraction method.
- I remember that balanced chemical equations have both material balance and charge balance. In addition, the lowest whole-number ratio is used for the set of chemical coefficients.
- I can explain why balanced chemical equations obey the law of conservation of mass.
- I can convert the symbols for a chemical equation into an English sentence and vice versa.
- I can compare and contrast the following types of reactions:
    1. Combination (synthesis) reactions—one product is formed.
    2. Decomposition reactions—one reactant is present.
    3. Single replacement reactions—one metal replaces a less active metal or hydrogen; one halogen replaces a less active halogen. Use an activity series to determine whether or not the reaction will take place.
    4. Double replacement (metathesis) reactions—pairs of ions exchange partners to form new products. Examples include precipitation reactions and acid-base neutralizations.
    5. Combustion—a fuel and oxygen react to form carbon dioxide and water.

Chapter 9: Stoichiometry

- Reaction stoichiometry refers to the set of coefficients relating amounts of reactants and products in a chemical equation. I can write mole ratios from the coefficients to use as conversion factors for stoichiometric calculations.
- I can use stoichiometry to interpret a chemical equation on a microscopic (molecular) level and a macroscopic (molar) level.
- I recall that both mass and number of atoms of each element are conserved in every chemical reaction and equation.
- I can calculate the mass (or moles) of one reactant or product from the mass (or moles) of another reactant or product in a balanced chemical equation.
- I can determine which reactant is the limiting reactant in a balanced chemical equation. I can also determine the amounts of products formed and the amount of excess reactant leftover.
- I can distinguish between actual yield, theoretical yield, and percent yield.
- I can calculate theoretical yield and percent yield. $Percent\ Yield = \left(\frac{Actual\ Yield}{Theoretical\ Yield}\right)(100)$