

**AP Chemistry**  
**2018 AP Chemistry Summer Assignments**  
**Mr. Marmora**

**Directions:** Answer each of the following questions and post all responses to Google Classroom. Be sure to show ALL work where necessary and to submit all assignments before the due date and time. **ASSIGNMENTS THAT ARE SUBMITTED AFTER THE DUE DATE AND TIME WILL NOT BE SCORED AND YOU WILL EARN A GRADE OF “ZERO” FOR THAT ASSIGNMENT. NO EXCEPTIONS. PERIOD. THE END.**

-----

**1. In an AP Chemistry experiment, 1250 g of ammonium phosphate and 225 g of barium chloride react in a 2500 mL beaker.**

*» Due Date: Friday, July 20<sup>th</sup>, 2018 before 8:00 PM*

- (a) Write and balance the chemical reaction (with states) that is taking place in the beaker.
  - (b) Calculate the theoretical yield of precipitate formed at the end of the reaction.
  - (c) What is the limiting reagent?
  - (d) Identify the excess reagent. How much excess reagent is leftover when the precipitate has fully formed?
  - (e) Determine the concentrations of each of the reactants at the start of the reaction.
  - (f) Write the net-ionic equation for the reaction that took place in the beaker. Identify:
    - i) which substance was oxidized and reduced;
    - ii) the oxidizing and reducing agents;
    - iii) the color of the precipitate formed.
  - (g) Calculate the oxidation number of nitrogen in the aqueous product.
  - (h) For a separate experiment, what mass of ammonium phosphate is needed to react with 250. mL of 1.25 M barium chloride?
- 

**2. Use the Ideal-Gas Law to answer each of the following problems:**

*» Due Date: Friday, July 27<sup>th</sup>, 2018 before 8:00 PM*

- (a) A sample of chlorine gas at 543 torr has a volume of 21.6 L. If the temperature of the chlorine is 0°C, what mass of chlorine (in mg) is present?
- (b) If 55.0 L of butane (C<sub>4</sub>H<sub>10</sub>) undergoes complete combustion at 730 mmHg and 20°C, what mass of each product are formed?
- (c) A 1.25 g sample of solid calcium carbide reacts with water to produce acetylene gas (C<sub>2</sub>H<sub>2</sub>) and aqueous calcium hydroxide. If the acetylene was collected over water at 25°C and 740.0 mmHg, what volume (mL) of acetylene was produced?

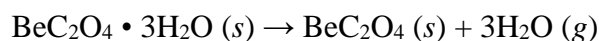
**3. Answer the following questions about  $\text{BeC}_2\text{O}_4 (s)$  and its hydrate.**

» *Due Date: Friday, August 3<sup>rd</sup> before 8:00 PM*

(a) Calculate the mass percent of carbon in the hydrated form of the solid that has the formula  $\text{BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O}$ .

(b) What is the name given to the hydrate in Part (a)?

(c) When heated to  $220.^\circ\text{C}$ ,  $\text{BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O} (s)$  dehydrates completely as represented below:



(d) If 3.21 g of  $\text{BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O} (s)$  is heated to  $220.^\circ\text{C}$ , calculate

(i) the mass of  $\text{BeC}_2\text{O}_4 (s)$  formed.

(ii) the volume of the  $\text{H}_2\text{O} (g)$  released, measured at  $220.^\circ\text{C}$  and 735 mmHg.

---

**4. Write the molecular, total-ionic, and net-ionic equations for the following laboratory reactions. Please refer to the reading on *The Activity Series of Metals* in your textbook (pages 163-166) and use it where necessary when writing the reactions. If a reaction does not occur using the Activity Series, please write "NR."**

» *Due Date: Friday, August 10<sup>th</sup>, 2018 before 8:00 PM*

1. Aluminum metal is added to a solution of copper (II) chloride.
2. Hexane ( $\text{C}_6\text{H}_{14}$ ) is burned in oxygen.
3. A solution of sodium hydroxide is added to a solution of magnesium bromide.
4. Hydrogen gas is passed over hot copper (II) oxide.
5. Small pieces of strontium are added to water.
6. Calcium is added to a dilute solution of hydrochloric acid.
7. Calcium is added to a dilute solution of phosphoric acid.
8. Liquid bromine is added to a graduated cylinder of potassium iodide.
9. Magnesium is added to a solution of ferric chloride.
10. Aqueous solutions of potassium chromate and silver nitrate are mixed.



**KEEP  
CALM  
AND  
TAKE  
AP CHEMISTRY**

