# Worksheet #5

# Name:

Seat#:

<u>Required Sections:</u> (Refer to R-5 for guidelines and requirements. Make note of any specific changes given by your teacher in class) **Prelab:** All written in your lab notebook – Answer Pre-Lab Questions, Hypothesis (If, Then, Because!), Materials,
Reagent Table, Procedures, Data Table pre-written in your lab notebook on a separate page from the rest of prelab
(but do not rip out carbon copy pages of data table when turning in prelab). **Post-lab:** - Post Lab Two Pager, Discussion Questions

# Purpose:

How do the properties of magnesium and calcium compare and contrast as they react with water and hydrochloric acid?

# Pre-Lab Questions:

- 1) What is the definition of a group?
- 2) Name the different groups of the periodic table (not 1A, 2A, etc..., say the actual names of the groups):
- 3) What is the definition of reactivity?

#### Hypothesis:

Answer the purpose – how do you think the reactions will be different/same? It should be in an "If, Then, Because" format. You need to think about the "Because" part! Talk with your classmates, think about what we already know, etc.

#### Materials:

2 pieces of Mg ribbon (2-3 cm) Phenolphthalein indicator 1.0*M* HCl 2 small chunks of Ca Distilled or Deionized H<sub>2</sub>O 4 - 50mL beakers Forceps 50mL graduated cylinder

# Procedure:

- **1)** Put on your safety goggles
- 2) Place 15 mL of distilled water in a 50mL beaker
- 3) Put 1-2 drops of phenolphthalein indicator into the 50mL beaker. (Phenolphthalein turns pink in the presences of a base)
   CAUTION: Phenolphthalein solution is poisonous and flammable. Do not get it in your mouth; do not swallow any. Be sure there are no flames in the lab when you are using it.
- 4) Obtain a piece of magnesium ribbon from your teacher.
- 5) Add the magnesium to the 50mL beaker.
- 6) Carefully observe the reaction look for the signs of a reaction (color change, temperature change, gas being formed, solid being formed, light being emitted). Record any observations and any signs of a reaction you observe, be sure to include observations about the magnitude and the speed of the reaction.
- 7) Place 15 mL of water in a 50ml beaker
- 8) Put 1-2 drops of phenolphthalein indicator into the 50mL beaker.
- 9) Using forceps obtain a small chunk of Ca and put it into your 50 mL beaker. CAUTION: Do not touch the Ca with your hands. Gloves are available if you like.
- 10) Carefully observe the reaction look for the signs of a reaction (color change, temperature change, gas being formed, solid being formed, light being emitted). Record any observations and any signs of a reaction you observe, be sure to include observations about the magnitude and the speed of the reaction.
- 11) Place 15mL of 1.0 *M* HCl in a 50mL beaker, and 50 mL of 1.0 *M* HCl in a 50 ml beaker.
- 12) Obtain a piece of Mg ribbon and obtain a small chunk of Ca, as described in steps 4 and 9.
- 13) Place the Mg in a 50mL beaker and the Ca chunk in the other 50mL beaker.
- 14) Carefully observe the reaction look for the signs of a reaction (color change, temperature change, gas being formed, solid being formed, light being emitted). Record any observations and any signs of a reaction you observe, be sure to include observations about the magnitude and the speed of the reaction.

# Data Table: [create your own data table to be used during the lab]

Qualitative Observations			
	Reaction with H <sub>2</sub> O	Reactions with HCI	
Mg	Sample	Table	
Са	סוקווואס		

Quantitative Observations			
	Reaction with H <sub>2</sub> O	Reactions with HCI	
Mg	Sample Table		
Ca	eampre		

# Discussion Set:

- 1) Which metal reacted faster with water? With Acid?
- 2) Consult your text or other references and find out if beryllium reacts the same way as Mg and Ca with water and acid. JUSTIFY.
- 3) Make a statement about the trends in reactivity as you move down the column of alkaline earth metals.
- 4) Predict the reactivity of strontium and barium, based on your activity in this lab.
- 5) How, do you think, are barium and radium metals are stored in the stock room based on the reactivity? Should they be stored in normal containers? Use the internet to help you research this question. Explain your answer.
- 6) If sufficient radium could be gathered for a test, predict its reactivity with water and hydrochloric acid. Explain.
- 7) Why would it be dangerous to handle even a small amount of radium? Your answer should NOT be about radioactivity...think about the chapter we are on right now and the point of the lab!
- 8) Group VIIA (The halogens nonmetallic elements) reactivity decreases as the atomic number increases. Why do you think this group of elements is opposite Group IA? Explain.
- 9) What should you have learned from this experiment regarding trends of the periodic table?