PHYSICAL SCIENCE

Name: _____

Date: _____

Chapter 5: Chemical Rxns – A Review

What you should be able to do on the test:

- Given an observation, recognize whether something is a chemical reaction or not. Also give an explanation as to why (ΔEnergy, gas produced, precipitate, color change, etc).
- Identify whether something is an exothermic or endothermic reaction
- Be able to correctly write a chemical reaction
- Identify how many reactants and products a chemical rxn has
- Explain significance of the conservation of mass
- Balance chemical rxns
- Classify Chemical rxns – synthesis, decomposition, or replacement
- Draw energy diagrams of exothermic and endothermic rxns with correct labels
- Identify the possible ways to speed up a reaction

Review Questions:

1. Is the following a chemical reaction? (Write **yes** or **no**) If it is a chemical reaction, give a reason WHY it is a chemical rxn.
   a. A metal is added to a solution and bubbles start to form
      Chem rxn? YES If yes, why is it? New Substance : Gas
   b. A liquid turns into a solid.
      Chem rxn? NO If yes, why is it? Same substance (H_2O)
   c. Two solutions are mixed and it is observed that the solution is colder
      Chem rxn? YES If yes, why is it? Energy change (endothermic)
   d. When two solutions are mixed, it turns cloudy and after putting it in a centrifuge, there is a white solid in the bottom of the test tube.
      Chem rxn? YES If yes, why is it? New substance : precipitate
   e. A piece of metal falls apart into many pieces
      Chem rxn? NO If yes, why is it? same substance (physical change)

2. Identify the following as an exothermic or endothermic rxn:
   a. Two solutions are mixed and the test tube feels warm. exo
   b. Water evaporates from a beaker & cools the liquid. endo
   c. A combustion reaction of methane occurs exo
   d. A metal is with water and the temperature drops endo
   e. Two gases react in a balloon and raise the temperature exo

3. Write the chemical equation for the following reactions (correctly balance too!)
   Use pg. 115 to refresh your memory of the ions:
   a. Hydrochloric acid reacts with Sodium hydroxide(NaOH) to yield water and sodium chloride

$$HCl + NaOH \longrightarrow H_2O + NaCl$$

   b. Ammonium Nitrate decomposes to yield nitrogen gas (N_2), oxygen gas (O_2), and water.

$$2\,NH_4NO_3 \longrightarrow 2N_2 + \_O_2 + 4H_2O$$

4. Balance the chemical rxns; label # of reactants & products; identify rxn type

   a. ____ Fe + 2 HCl ----→ ____ $FeCl_2$ + ____ H_2
   # reactants: 2 # products 2 Type of rxn Replacement

★★ b. 2 N_2 + 5 O_2 ----→ 2 N_2O_5
   # reactants: 2 # products 1 Type of rxn synthesis

   c. ____ H_2CO_3 ----→ ____ H_2O + ____ CO_2
   # reactants: 1 # products 2 Type of rxn decomposition

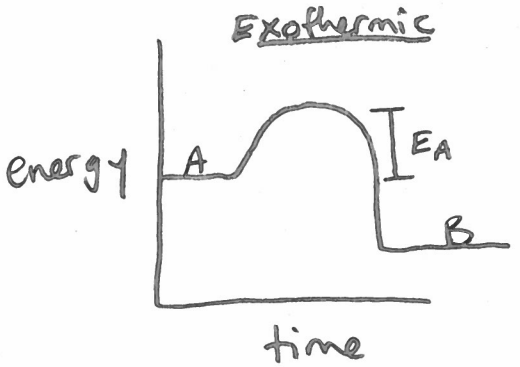
   d. ____ CuO + ____ H_2SO_4 ----→ ____ $CuSO_4$ + ____ H_2O
   # reactants: 2 # products 2 Type of rxn replacement

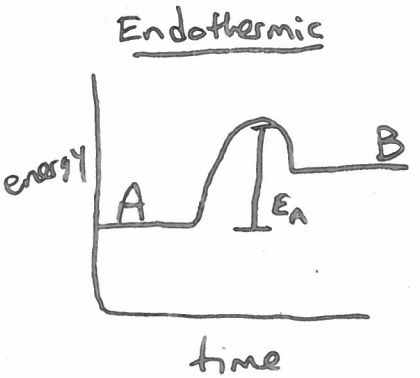
   e. 3 Mg + ____ N_2 --> ____ Mg_3N_2
   # reactants: 2 # products 1 Type of rxn synthesis

   f. ____ K_2O + ____ H_2O --> 2 KOH
   # reactants: 2 # products 1 Type of rxn synthesis

★★ g. 4 $KClO_3$ --> 3 $KClO_4$ + ____ KCl
   # reactants: 1 # products 2 Type of rxn decomposition

5. Draw and label the energy diagrams of exothermic and endothermic reactions.





A = reactants
B = products
E_A = Activation Energy