**S-28**

**Unit 4 – Equilibrium**

1. Keq = [products]x/[reactants]y … x and y represent the coefficients in the balanced chemical equation.
2. Only (aq) and (g) appear in an equilibrium expression. Use [ ] for Molarity and (Pgas) for atm.
3. A large Keq means that there are more products at equilibrium. A small Keq means there are more reactants at equilibrium.
4. Reversing a reaction? 1/KeqDoubling a reaction? (Keq)2Adding reactions? Multiply the K’s together
5. Le Chatelier's Principle: It’s all about determining Q!!   
   If Q >Keq , then the reaction shifts to the left, towards the reactants.
6. Catalysts and inert gases DO NOT shift an equilibrium.
7. Changes in pressure (caused by changing the volume of a container) can shift an equilibrium ONLY IF the # of gas particles are different on each side...An increase in the pressure favors a shift in the equilibrium towards the side with LESS moles of gas. (Reminder: As V↓ , P↑)

**Unit 4 – Equilibrium**

1. Write the equilibrium expression for the following reaction: 2N2(g) + 3H2(g) 🡪 2NH3(g)
2. Write the Kc for this reaction in #1. Write the Kp for this reaction in #1
3. Does a large Keq means that there are more products or reactants at equilibrium?   
   Does a large Keq means that there are more products or reactants at equilibrium?
4. What happens to Keq  when:  
   Reversing a reaction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
   Doubling a reaction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   Adding reactions? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. If Q is larger than Keq, then the reaction shifts which direction?  
   If Q is smaller than Keq, then the reaction shifts which direction?
6. a) Name 2 things that DO NOT shift a reaction’s equilibrium position.  
   b) Name 3 ways to increase the amount of products present at equilibrium in the following endo/exo reactions:   
    **ENDO**: 2H2S(g) + 3O2(g)  2H2O(g) + 2SO2(g) **EXO**: 2H2(g) + O2(g)  2H2O(g)
7. a) When will a change in pressure (by changing the volume) NOT shift an equilibrium?  
   b) Which direction will the equilibrium shift if the volume is decreased? 2H2(g) + O2(g)  2H2O(g)   
    Which direction will the equilibrium shift if the volume is increased? 2H2(g) + O2(g)  2H2O(g)