Lesson 172: Le Chatelier's Principle/Keg Notes Chemistry with Lab

A reaction in which the _____ can react to form the _____ is called a _____ reaction.

A + B ☐ C + D

Chemical _____ occurs when the _____ in a _____ reaction form the _____ at the same _____ that _____ form _____.

At equilibrium:

- the _____ of the reactants and products does not _____
- the concentration of reactants can be _____ to, _____, or _____ the concentration of the products.

_____A + _____B ⇌ _____C + _____ D

$$K_{eq} = \frac{[\ ]^c[\ ]^d}{[\ ]^a[\ ]^b}$$

If K_{eq} is…	… reaction is favored
= 1	neither
<1	
>1	

Ex. #1: Calculate K_{eq} for the following reaction using the given equilibrium concentrations. Then determine whether the forward or reverse reaction is favored.

$N_2O_4 \rightleftharpoons 2NO_2$ $[N_2O_4] = 0.23M$ $[NO_2] = 0.037M$

Ex. #2: Calculate K_{eq} for the following reaction using the given equilibrium concentrations.

$N_2 + 3H_2 \rightleftharpoons 2NH_3$

$[N_2]$ = _____ $[H_2]$ = _____ $[NH_3]$ = _____

The _____ reaction is favored.

LeChatelier's Principle:

When a _____ is applied to a system in a state of equilibrium, the system reacts in a way to _____ the stress.

Stress	System Will Shift
addition of a chemical	
removal of a chemical	
increase in temperature	
decrease in temperature	
*increase in pressure	
*decrease in pressure	
addition of a catalyst	

*applies to reactions involving gases only

examples: $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g) + \text{heat}$

- When H_2 is added to the system, the reaction shifts to the _____ to use up the extra H_2. The amount of _____ produced will increase.
- What if _____ is removed? The reaction shifts to the _____ trying to replenish the N_2.
- When the temperature increases, the reaction shifts to the _____.
- When the pressure of the system increases, the reaction shifts to the _____, toward the side with _____ particles.
- When a catalyst is added, there will be _____ _____.

When a system in equilibrium…

shifts:	**[products]**	**[reactants]**
to the right		
to the left		

The Chemistry Quiz

CR1. _____ CR2. _____ 1. _____ 2. _____ 3. _____

4. _____ 5. _____