Ch. 15 concept map (Principles of Chemical Reactivity: Equilibria)

1. Understand that chemical reactions proceed both in forward and reverse directions. Know what happens to forward and reverse rates and reactant and product concentrations at equilibrium.
2. Be able to write expressions for equilibrium constants K_c and K_P. Be able to convert from K_c to K_P and vice versa. Know that solid and liquid substances are not included in equilibrium constant expressions.
3. Relate the magnitude of the equilibrium constant to the position of equilibrium. Use the value of the equilibrium constant to describe a reaction as reactant-favored or product-favored.
4. Be able to write an expression for the reaction quotient Q and calculate its value from initial concentration or pressure data. Use the value of Q to predict the direction the reaction will take to reach equilibrium.
5. Perform calculations using ICE tables.
6. Calculate the new equilibrium constant after a chemical equation has been multiplied by a factor or reversed, or after multiple chemical equations have been added together.
7. Understand how changing concentrations of aqueous species, or pressures and volumes of gaseous species, affects the direction of a reaction. Use Le Chatelier's principle to predict the direction of a reaction after it undergoes such changes.
8. Understand the effect of temperature on the values of equilibrium constants of endothermic and exothermic reactions. Predict the direction of an endothermic or exothermic reaction after it undergoes a temperature change.