

More 2nd Semester Review

LE CHATELIER'S PRINCIPLE AND CHEMICAL EQUILIBRIUM

Consider the following reaction: $\text{PCl}_{5(g)} \rightleftharpoons \text{PCl}_{3(g)} + \text{Cl}_{2(g)} + \text{heat}$

1. In what direction will the equilibrium shift when $\text{Cl}_{2(g)}$ is added?
shifts left
2. In what direction will the equilibrium shift if $\text{PCl}_{3(g)}$ is removed?
shifts right
3. In what direction will the equilibrium shift if the temperature is increased? **The left.*
4. In what direction will the equilibrium shift if the volume is increased?
**Since pressure is then decreased it will shift to the side with more molecules, which is the right side.*
5. If there is more reactant than product at equilibrium, what can you conclude about K_{eq} ? Q ?
** K_{eq} is less than one since the reactants are favored.*
**You can't conclude anything about Q since Q is the reaction quotient. It can change depending on when you measure the concentration of the reactants and the products.*

Remember that K_{eq} and Q are found the same way. For the reaction above:

$$K_{eq} = \frac{[\text{PCl}_3][\text{Cl}_2]}{[\text{PCl}_5]}$$

Q = same quotient as K_{eq} But, K_{eq} is a constant for this particular reaction at a specific temperature.

TITRATION CURVES

- *The equivalence point is the midpoint on the vertical portion of the pH titration curve. See p. 615 in book. The equivalence point is the point where you will have water and salt as the products.

INTERMOLECULAR FORCES

- *The strongest i-m forces are hydrogen bonds. The weakest i-m forces are the dispersion forces. See p.240

SOLUTION FORMATION

- *Energy is required to break apart both the solute molecules and the solvent molecules.