AP Chemistry

Thou Shalt Not Forget Questions

**General Equilibrium**

1. Write the equilibrium expression for the following reaction: 2N2(g) + 3H2(g) 🡪 2NH3(g)
2. Write the Kc/Kp for this reaction in #1
3. A large/small Keq means that there are more (products or reactants) at equilibrium?
4. Reversing a reaction? / Doubling a reaction? / Adding reactions? --- What happens to Keq ?
5. If Q is larger/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 reaction: **ENDO**: 2H2S(g) + 3O2(g) ® 2H2O(g) + 2SO2(g) **EXO**: 2H2(g) + O2(g) ® 2H2O(g)

1. 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 dec./inc.? (write an example on the white board)

**Acid-Base Equilibrium**

1. The pH of acids/bases are \_\_\_\_\_\_\_ than 7.
2. Acids/bases donate or accept [H+] (protons).
3. How do you make a hydronium ion?
4. Write the formula for the 6 strong acids.
5. Write the formula for the strong bases.
6. a) If [H+] = 1 x 10-x what is the pH?

b) If the pH = x, what is the [H+]?

1. The stronger the acid, the \_\_\_\_\_\_\_\_\_\_\_\_ its conjugate base.
2. If Keq is greater/less than 1, then which side of the reaction has the stronger acid and base?
3. a) Square Root of MaKa is equal to what variable?

b) You CANNOT use [H+] =Square Root of MaKa if what is true about the acid?

1. “x” in the ice box calculation is equal to what ion for a weak acid/base.
2. % Ionization of a weak acid = \_\_\_\_\_\_\_\_\_\_
3. a) % ionization increases/decreases as the acid concentration \_\_\_\_\_\_\_\_\_\_\_\_.

b) Adding more water to a weak acid will increase or decrease the % ionization.

1. a) Give an example of a salt that contains a CBOWA.

b) CBOWA ions have what charge?

1. a) Give an example of a salt that contains a CAOWB.

b) CAOWB ions have what charge?

1. a) If a salt contains conjugates of both a strong acid and strong base, the salt is \_\_\_\_\_\_\_\_.

b) Give an example of a salt that is neutral.

1. A larger/smaller Ka / Kb value means a stronger or weaker acid/base?
2. a) Smaller cations are more or less acidic?

b) More (+) charge on the cation makes it more or less acidic?

c) More oxygens/more electronegative atoms on an anion makes it more or less acidic?

d) List 2 things that make a cation more acidic.

**Additional Aspects of Aqueous Equilibrium: Titrations and Buffers**

1. Buffers have 2 general components. Name them.
2. a) MaKa/[salt] equals what variable?

b) When using the formula [H+] = MaKa/[salt], what units can you use instead of molarity for Ma and [salt]?

1. a) Adding a common ion to a weak acid/base decreases or increases the % ionization?

b) Adding a common ion to a weak acid/base has what effect on the pH?

1. MaVa=MbVb This is only true “when”/“where” in a titration?
2. a) M1V1 = M2V2 is used for what type of calculation?

b) What formula do we use for dilution calculations?

1. a) Titrations: Weak acid + Strong Base has a pH at the equivalence point that’s above or below or equal to 7?

b) Weak Base + Strong Acid has a pH at the equivalence point that’s above or below or equal to 7?

c) Strong Acid + Strong Base has a pH at the equivalence point that’s above or below or equal to 7?

1. a) pH = pKa “when”/“where” in a titration?

b) At the ½ equivalence point for a “weak + strong” titration, what 2 concentrations are equal?

c) At the ½ equivalence point for a “weak + strong” titration, what does the pKa/pH equal?

1. Buffer capacity depends on what factor(s)?
2. a) 2 ions....Ksp = ? ; 3 ions...Ksp = ?

b) For a Ksp ICE box, “x” refers to what value?

c) What are the units for molar solubility?

1. What does the magnitude of Ksp (or the magnitude of “x” of a Ksp ICE box) tell us about the salt?
2. When Q is less than or greater than Ksp, then a precipitate will form.
3. List the symbols of the most common spectator cations/the most common spectator anion in a chemical reaction.