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| **The [H+] of a solution with pH = 2 is how many times different than the [H+] of a solution with pH =3?** | 10 times greater. Remember that the [H+] of pH =2 is greater than pH=3. Also recall that pH is a log scale; every change in pH of 1x represents a change in [H+] of 10x. |
| **Give the Arrhenius definition of acids and bases** | Acids release H+ in a solution. Bases release OH- in solution. |
| **Distinguish between dissociation and ionization. Give an example of each** | Dissociation refers to the separation of ions(ex. NaCl is an ionic solid. When dissolved in water its ions come apart). Ionization refers to the creation of ions where none existed before (ex. HCL is not an ionic compound, yet it reacts with water to form ions: HCl + H2O → H3O+ + Cl-). |
| **Give the Brønsted definitions of acids and bases** | Acids are H+ donors. Bases are H+ acceptors. |
| **Brønsted definitions lead to what idea in acid-base equilibria?** | The idea of conjugate acid-base pairs (since H+ is transferred in a reaction, it must be transferred back in the reverse reaction.) |
| **Identify conjugate acid and base pairs in the reaction”**  **HCN + H2O → H3O+ + CN-** | On the left HCN donates H+ to H2O, thus HCN is a Brønsted acid and H2O is a base. On the right, H3O+ donates H+ to CN-, Thus H3O+ is a Brønsted acid (the conjugate of H2O) and CN- is a Brønsted base (the conjugate of HCN.) |
| **Give the Lewis definitions of acids and bases.** | Acids are electron pair acceptors. Bases are electron pair donors. |
| **What does diprotic and triprotic mean?** | Di- means two, -protic means proton (H+). A diprotic acid (such as H2SO4) is capable of giving off 2H+. H3PO4 is triprotic. (in Ka or Kb problems we will consider only the first H+ released). |
| **Write the chemical equation for a weak acid in its most general form.** | HA(aq) ⮀ H+(aq) + A-(aq), where A represents the anion part of the acid (this is simplified from HA(aq) + H2O ⮀ H3O+(aq) + A-(aq) |
| **What is meant by Ka? Give the equilibrium law for Ka.** | Ka is the acid ionization constant |
| **How are Ka problems solved?** | Same as other equilibrium problems (using RICE table) |
| **Distinguish between strength and concentration (use 0.0001 M HCl as an example)** | Strength refers to the degree of ionization. HCl is a strong acid because all HCl molecules dissociate (into H+ & Cl-). Concentration refers to moles/volume (described as concentrated or dilute). Thus , 0.0001 M HCl is a dilute solution of a strong acid. |
| **Write the chemical equation for a weak base in its most general form.** | B +H2O⮀ BH+ + OH-, where B represents the base. (note: B often has a very negative charge. Thus, BH+ would have a net charge of 0) |
| **What is meant by Kb? Give the equilibrium law for Kb** | Kb is the base ionization constant |
| **How are Kb problems solved?** | Same as other equilibrium problems (RICE Table) |
| **How are Kb problems often different than other equilibrium problems** | They involve OH-, thus they often require conversions between H+, pH, OH-, and pOH |