Acids and Bases
Chem1B, General Chemistry II
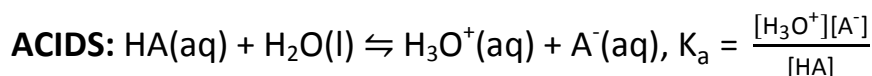
RELATIONSHIPS

K_a and K_b of a conjugate pair are <u>inversely</u> related.

pK_a/pK_b and K_a/K_b are <u>inversely</u> related.

$[H_3O^+]$/pH and $[OH^-]$/pOH of a solution are <u>inversely</u> related.

K_a/K_b of an acid/base and percent ionization are <u>directly</u> related.

ACIDS: $HA(aq) + H_2O(l) \rightleftharpoons H_3O^+(aq) + A^-(aq)$, $K_a = \dfrac{[H_3O^+][A^-]}{[HA]}$

Acids donate H^+

The **STRONGER** the acid:

- The **larger** (less negative exponent) the K_a (strong acids have $K_a > 1$)
- The **smaller** the pK_a
- The **higher** the percent ionization (in terms of $[H_3O^+]$)
- The **higher** the $[H_3O^+]$ and the **lower** $[OH^-]$
- The **lower** the pH and the **higher** the pOH
- The **more stable** the conjugate base
- The **weaker** the conjugate base and the **lower** (more negative exponent) its K_b

BASES: $B(aq) + H_2O(l) \rightleftharpoons OH^-(aq) + BH^+(aq)$, $K_b = \dfrac{[OH^-][BH^+]}{[B]}$
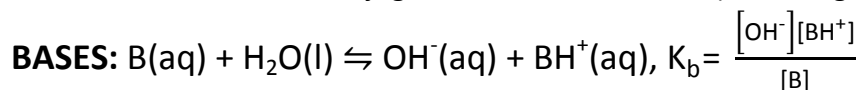
Bases accept H^+

The **STRONGER** the base:

- The **larger** (less negative exponent) the K_b (strong bases have $K_b > 1$)
- The **smaller** the pK_b
- The **higher** the percent ionization (in terms of $[OH^-]$)
- The **higher** the $[OH^-]$ and the **lower** the $[H_3O^+]$
- The **lower** the pOH and the **higher** the pH
- The **more stable** the conjugate acid
- The **weaker** the conjugate acid and the **lower** (more negative exponent) its K_a