

Acids & Bases

Arrhenius Acids & Bases

- Arrhenius acid: produces H^+
- Arrhenius base: produces OH^-
- Only applies to aqueous solutions & not all bases have OH^-

Bronsted Lowry

- Acids = proton donor
- Bases = proton acceptor
- Works in non aqueous

Protons

- proton= H^+ = H_3O^+

Conjugate Acids & Bases

- H^+ transferred to OH^-

K_a and K_b

- Acid dissociation constant
- Base dissociation constant
- $K_a = \frac{[H_3O^+][A^-]}{[HA]}$
- $K_b = \frac{[BH][OH^-]}{[B]}$

Acid Strengths

- Strong acid $\rightarrow K_a > 1$
 - Assume 100% dissociation
 - Yields weak conjugate base
 - $HCl, HBr, H_2SO_4, HClO_4, HI, HNO_3$
- Weak acid $\rightarrow K_a < 1$
 - Yields strong conjugate base
- When calculating
 - Strong & strong \rightarrow add concentrations & use
 - Strong & weak \rightarrow use strong
 - Weak & weak \rightarrow compare K_a & use the stronger one
- Polyprotic acid
 - Multiple protons

Water

- Acid & base
- Amphoteric \rightarrow behave as either
- Autoionization
 - $2 H_2O \rightleftharpoons H_3O^+ + OH^-$
- $K_w = 1.0 \times 10^{-14}$ at 25 degrees celsius
 - Neutral water $[H_3O^+] = [OH^-] = 1.0 \times 10^{-7}$

pH & pOH

- $pH = -\log[H_3O^+]$
- $pOH = -\log[OH^-]$
- $pOH + pH = 14$
- $[H_3O^+] = 10^{-pH}$

Chapter 15 Review Acids Bases

Daniel F McAuley



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