

## Definitions: Acid & Base, Conjugate Acid & Conjugate Base

- An **acid** donates protons (i.e., Hydrogen ions) in a reaction
- A **base** accepts protons (i.e., Hydrogen ions) in a reaction
- A **conjugate base** results from removing a single  $H^+$  from an acid.



- A **conjugate acid** results from adding a single  $H^+$  to a base.



## Concentration, pH, pOH

### pH, pOH

- $pH = -\log[H^+]$
- $pOH = -\log[OH^-]$
- $pH + pOH = 14$

### $[H^+]$ , $[OH^-]$

- $[H^+] = 10^{-pH}$
- $[OH^-] = 10^{-pOH}$
- $[H^+][OH^-] = 10^{-14}$

### Neutral Solution

In a neutral solution:  $[H^+] = 10^{-7}$        $[OH^-] = 10^{-7}$        $pH = 7$        $pOH = 7$

### pH of Acids & Bases

- Acids:  $pH < 7$
- Bases:  $pH > 7$
- Neutral:  $pH = 7$

## Neutralization

- Moles  $H^+$  from acid = moles  $OH^-$  from base.

$$i_a M_a V_a = i_b M_b V_b$$

$i_a, i_b$  - Subscripts of H and OH in chemical formulae of acid and base;

$M_a, M_b$  - molarity of acid and base;  $V_a, V_b$  - volume of acid and base in any units