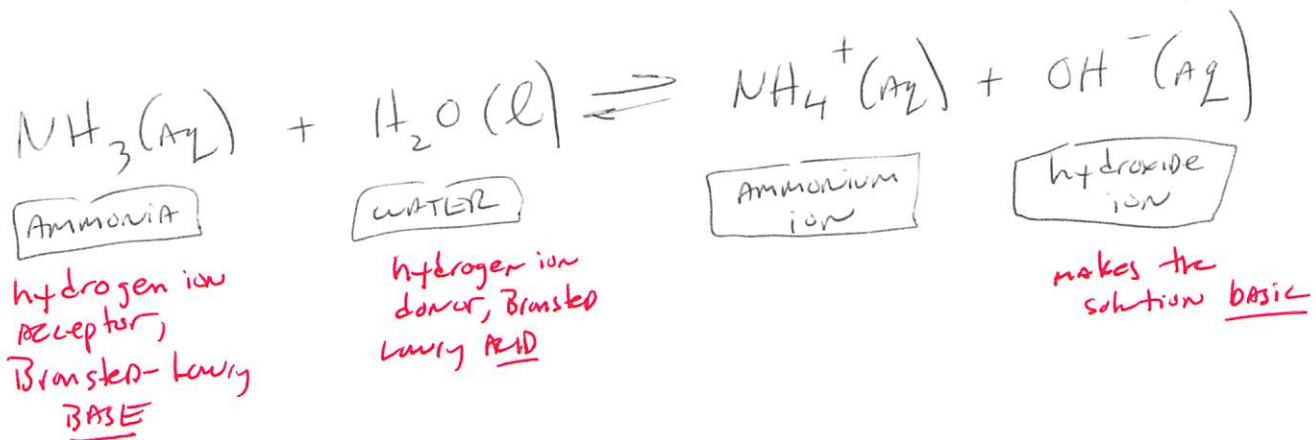
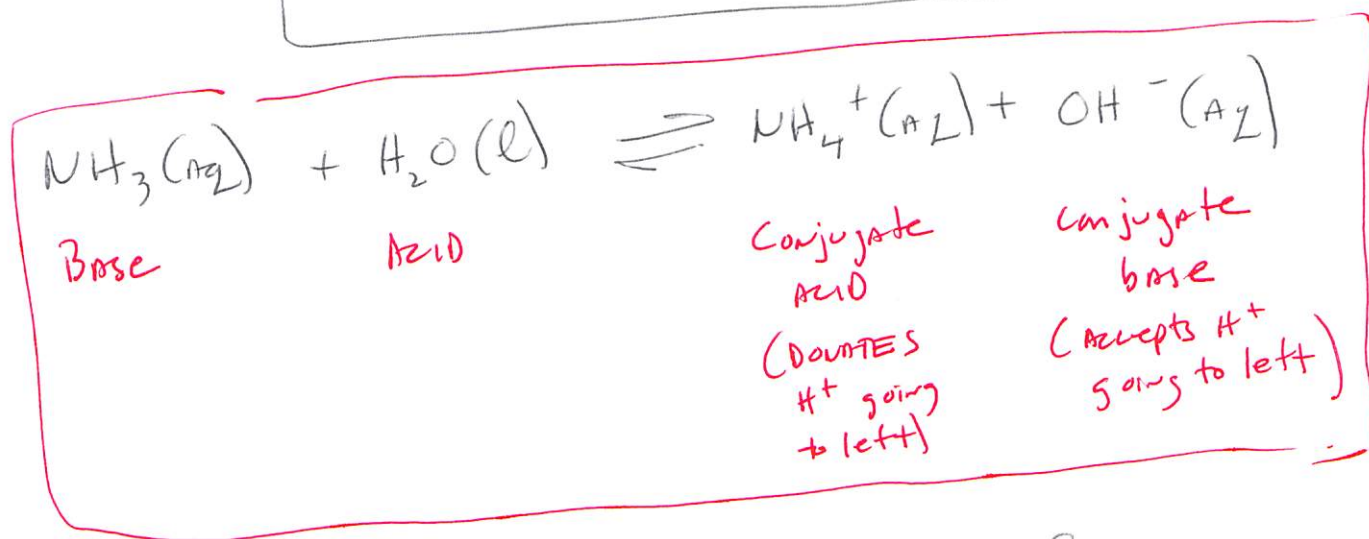




These types of reactions go in both directions

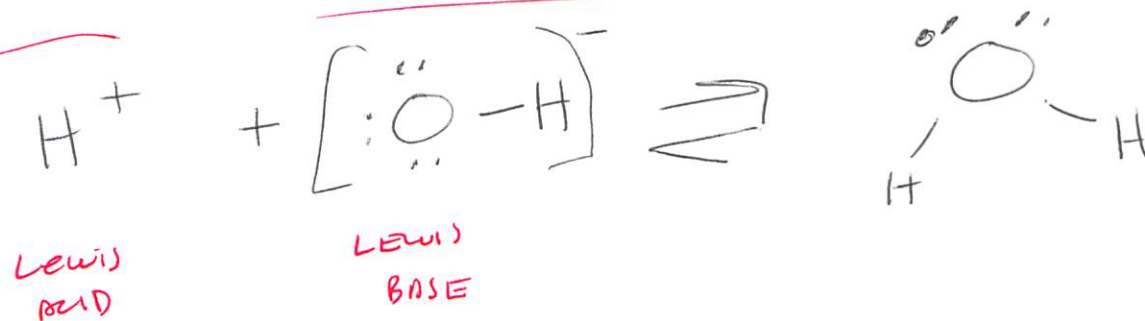


★ A conjugate acid is the particle formed when a base gains a hydrogen ion

★ A conjugate base is the particle that remains when an acid has donated a hydrogen ion

⇒ conjugate acid-base pairs are 2 substances related by the loss or gain of a hydrogen ion.

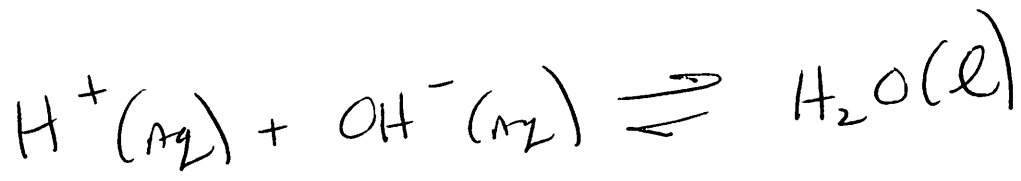
LEWIS ACID AND BASES



Lewis acid - can accept a pair of electrons to form a covalent bond.

Lewis base - can donate a pair of electrons to form a covalent bond.

Ion Product Constant for Water (K_w)



$$[H^+] \times [OH^-] = 1.0 \times 10^{-14}$$

★ applies for all dilute aqueous solutions at $25^\circ C$

$$K_w = [H^+] \times [OH^-] = 1.0 \times 10^{-14}$$

Problem: If the $[H^+]$ in a solution is $1.0 \times 10^{-5} M$ is it acidic, basic, or neutral? What is the $[OH^-]$ of this solution?

$$K_w = [H^+] \times [OH^-] \quad \text{so...}$$

$$[OH^-] = \frac{K_w}{[H^+]} = \frac{1.0 \times 10^{-14}}{1.0 \times 10^{-5}} = 10^{(-14 - (-5))} = 10^{-9}$$

$$= 1.0 \times 10^{-9} M$$

Calculating pOH

$$pOH = -\log[OH^-]$$

$$pH + pOH = 14$$

★ if you know the value of one, you know the value of the other.

!!