(22) **Today**

Chap 6 Acid-Base and Donor-Acceptor Chemistry

Next Class (23)

Chap 6 Acid-Base and Donor-Acceptor Chemistry

(24) **Second Class from Today**

Test 2
Chap 4 Symmetry
Chap 5 Molecular Orbital Theory

Third Class from Today (25)

Chap 6 Acid-Base and Donor-Acceptor Chemistry

Tartaric acid, acetic acid - vinegar, citric acid

sour flavor

Bases - bitter flavor

Aqueous chemistry

Arrhenius acids increase the $H^+_{(aq)} = H_3O^+_{(aq)}$ concentration in H_2O

$H_5O_2^+$

Arrhenius bases decrease the concentration of H_3O^+ in H_2O

because $2\,H_2O \rightleftharpoons H_3O^+_{(aq)} + OH^-_{(aq)}$ autodissociation

Arrhenius bases increase OH^- concentration

$2\,H_2O \rightleftharpoons H_3O^+ + OH^- \qquad K_w = 10^{-14} \text{ @ } 25^\circ C$

is at 25°C a solution that has $[H_3O^+] = [OH^-]$ is

10^{-7} M in $H_3O^+ + OH^-$ which in the pH scale would have a $pH = -\log[10^{-7}] = 7$

an aqueous soln is neutral when this is true

When temp goes down so does K_w. That means at less 25°C neutral pH will be < 7

Bases from Gen Chem

$NH_4OH_{(aq)} \rightarrow NH_4^{\oplus}{}_{(aq)} + OH^{\ominus}{}_{(aq)}$ weak base

$NaOH_{(s)} \xrightarrow{H_2O} Na^+_{(aq)} + OH^{\ominus}$ strong base

$NH_3 + H_2O \rightleftharpoons NH_4^{\oplus} + OH^{\ominus}$ weak base

be careful not to confuse strong acid weak acid with strongly acid solution and weakly acidic solution

Acids from Gen Chem

$NH_4Cl_{(aq)} \rightarrow NH_4^{\oplus} + Cl^{\ominus}$ weak acid

$\downarrow\uparrow$

$H^+ + NH_3$

reaction goes to completion

$HCl_{(g)} + H_2O \rightarrow H_3O^{\oplus} + Cl^{\ominus}$ strong acid

reaction doesn't go to completion

$CH_3C(=O)(O-H) + H_2O \rightleftharpoons CH_3C(=O)(O^{\ominus}) + H_3O^+$ weak acid

a mixture of reactants and products exists when the rxn is "done"

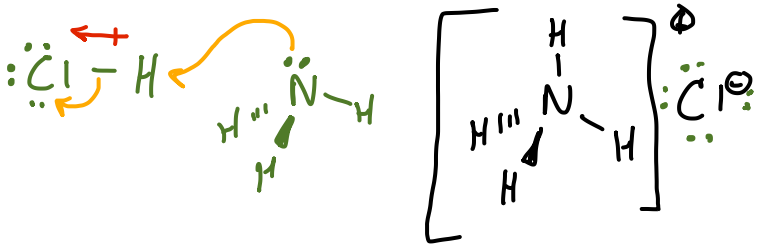
An Acid is a H^+ donor

acid base

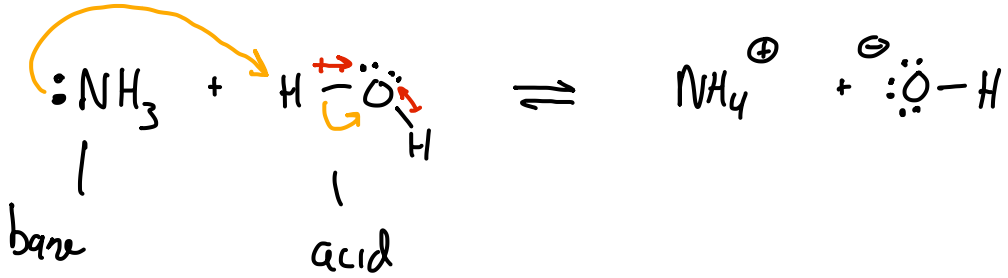
$HCl_{(aq)} + H_2O_{(l)} \rightarrow H_3O^+_{(aq)} + Cl^-_{(aq)}$

proton donor proton acceptor

$HCl_{(g)} + NH_{3(g)} \rightarrow NH_4Cl_{(s)}$



A base is a H^+ acceptor



	$^1H = {}^1_1p^+ + e^-$
	$^1H^+ = {}^1_1p^+$
deuterium	$^2H = {}^1_1p^+ + {}^1_0n + 1e^-$
deuteron	$^2H^+ = {}^1_1p^+ + {}^1_0n$
tritium	$^3H = {}^1_1p^+ + 2{}^1_0n + 1e^-$
	$^3H^+ = {}^1_1p^+ + 2{}^1_0n$

Lewis Acids are lone-pair acceptors

H^+ I am an acid ... I can donate myself to something else

I can only accept e^-'s because I don't have any

Lewis Bases are lone-pair donors