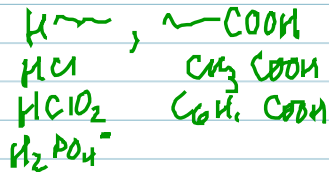
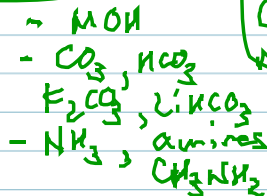


FORMULA CLUES

Acid

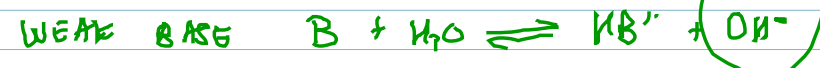
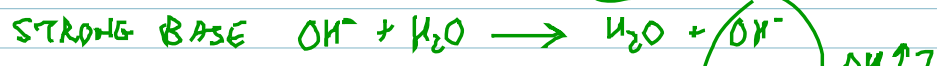
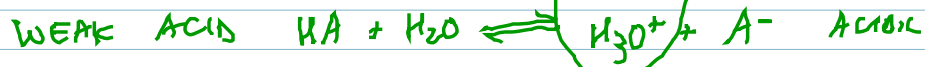
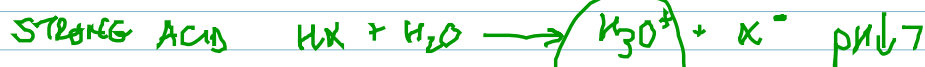


Bases



(alcohol  $\text{CH}_3\text{OH}$  not a base)

HYDROLYSIS  $\rightarrow$  reaction w/  $\text{H}_2\text{O}$



ACID/BASE      CONJUGATE (IN  $\text{H}_2\text{O}$ )  
STRONG ACID      neutral ion

WEAK ACID      BASE

STRONG BASE      neutral ( $\text{H}_2\text{O}$ )

WEAK BASE      ACID

SALT HYDROLYSIS acids + bases in disguise

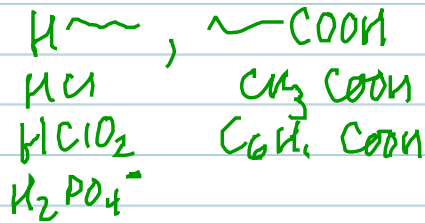
Salt = ionic compound

the chemical reaction of one or both of the ions from a salt with  $\text{H}_2\text{O}$

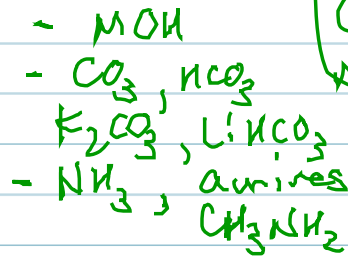
$\rightarrow$  produces acidic or basic aqueous soln's

## FORMULA CLUES

### Acid

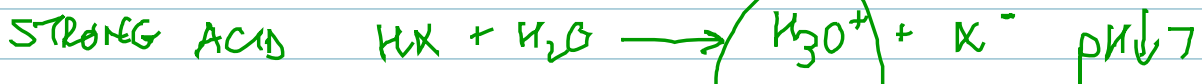


### Bases



alcohol  
 $\text{CH}_3\text{OH}$   
 not a base

## HYDROLYSIS $\rightarrow$ reaction w/ $\text{H}_2\text{O}$



ACID / BASE	CONJUGATE (IN $\text{H}_2\text{O}$ )
STRONG ACID	neutral ion
WEAK ACID	BASE
STRONG BASE	neutral ( $\text{H}_2\text{O}$ )
WEAK BASE	ACID

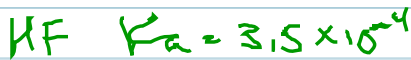
## SALT HYDROLYSIS acids + bases in disguise

Salt = ionic compounds

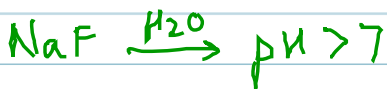
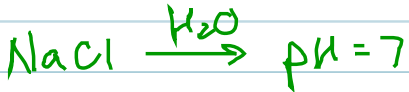
the chemical reaction of one or both of the ions from a salt with  $\text{H}_2\text{O}$

$\rightarrow$  produces acidic or basic aqueous soln's

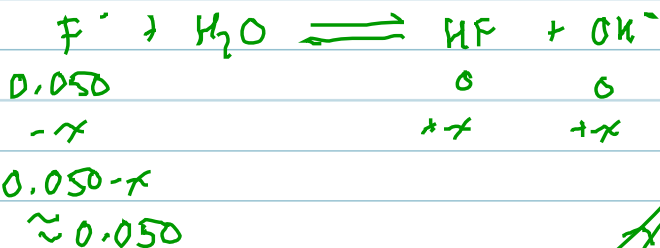
## ANIONS



$F^- K_b = \frac{10^{-14}}{K_a} = 2.9 \times 10^{-11}$



What is pH of a 0.050M NaF solution?



$K_b = 2.9 \times 10^{-11} = \frac{x^2}{0.050}$

$x = [OH^-] = 1.2 \times 10^{-6} M$

pOH =  $-\log x = 5.92$

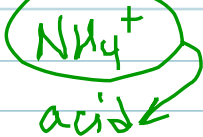
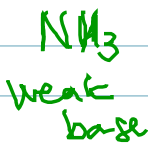
pH = 8.08

BASIC

\* ANIONS that are CONJUGATES of WEAK ACIDS produce BASIC soln's in H<sub>2</sub>O

## CATIONS

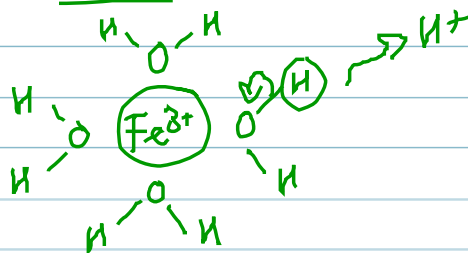
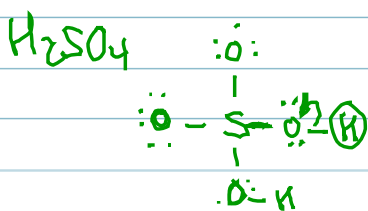
① Conjugates of weak bases are acids



NH<sub>4</sub><sup>+</sup> salts  
may be acidic

② +1, +2 metal ions typically do NOT hydrolyze

+3 ↑ metal ions produce ACIDIC soln's



\* CATION  $\Rightarrow$  ACIDIC  $\rightarrow$  ~~NOT~~  $\text{NH}_4^+$   
SOL'N  $\text{M}^{3+}$

\* ANION  $\Rightarrow$  BASIC  $\rightarrow$  Conjugates of  
SOL'N weak acids

---

$\text{KBr (aq)}$   $\text{K}^+ \rightarrow$  neutral  $\text{Br}^- \rightarrow$  neutral  $\rangle \text{pH} = 7$

$\text{NH}_4\text{Br (aq)}$   $\text{NH}_4^+ \rightarrow$  acidic  $\text{Br}^- \rightarrow$  neutral  $\rangle \text{pH} < 7$

$\text{FeBr}_3 \text{ (aq)}$   $\text{Fe}^{3+} \rightarrow$  acidic  $\text{Br}^- \rightarrow$  neutral  $\Rightarrow \text{pH} \downarrow ?$

$\text{NaNO}_2 \text{ (aq)}$   $\text{Na}^+$  neutral  $\text{NO}_2^-$  base  $\rangle \text{pH} \uparrow ?$

$\text{FeF}_3 \text{ (aq)}$   $\text{Fe}^{3+}$  acidic  $\text{F}^-$  basic  $\rangle ??$