> 1. **Hydrolysis**

Hydrolysis

In previous Chemistry courses, you have learned about neutralization reactions where:
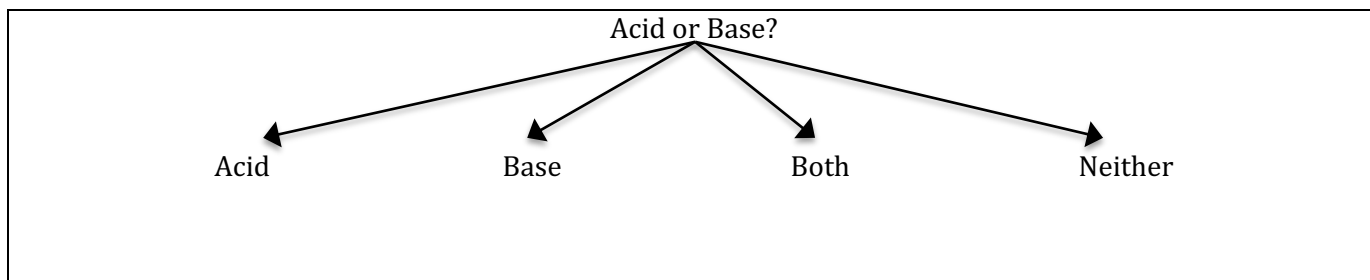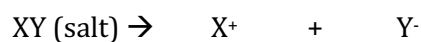**Acid + Base → Salt + Water**

HY + XOH → XY + H₂O

HCl + NaOH → NaCl + H₂O
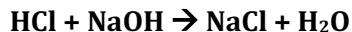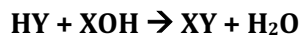
The "salt" produced in neutralization reactions are actually acidic or basic. The ions that make up the salt behave as weak acids or bases.

XY (salt) →   X⁺   +   Y⁻

Acid or Base?

Acid   Base   Both   Neither

Consider the following...

HCl + NaOH → _____ + H₂O

HNO₂ + NaOH → _____ + H₂O

$$C_6H_5OH + NH_4OH \rightarrow \underline{\hspace{2cm}} + H_2O$$

$$C_6H_5COOH + Mg(OH)_2 \rightarrow \underline{\hspace{2cm}} + H_2O$$
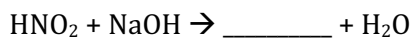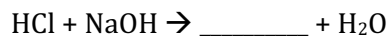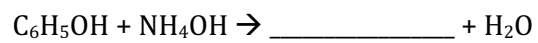
Circle the following salts whose ions **will** hydrolyze (react with water!) when dissociated in water.
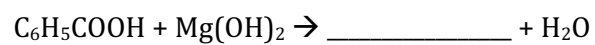
NH_4Cl Na_2CO_3 $RbClO_4$ Li_2SO_3 BaI_2 NH_4HCOO KIO_3 CsF $CaBr_2$

Acid or Base?

Acid   Base   Both   Neither (salt)

Decide if each of the following salts will produce an acidic, basic or neutral solution when combined with water.
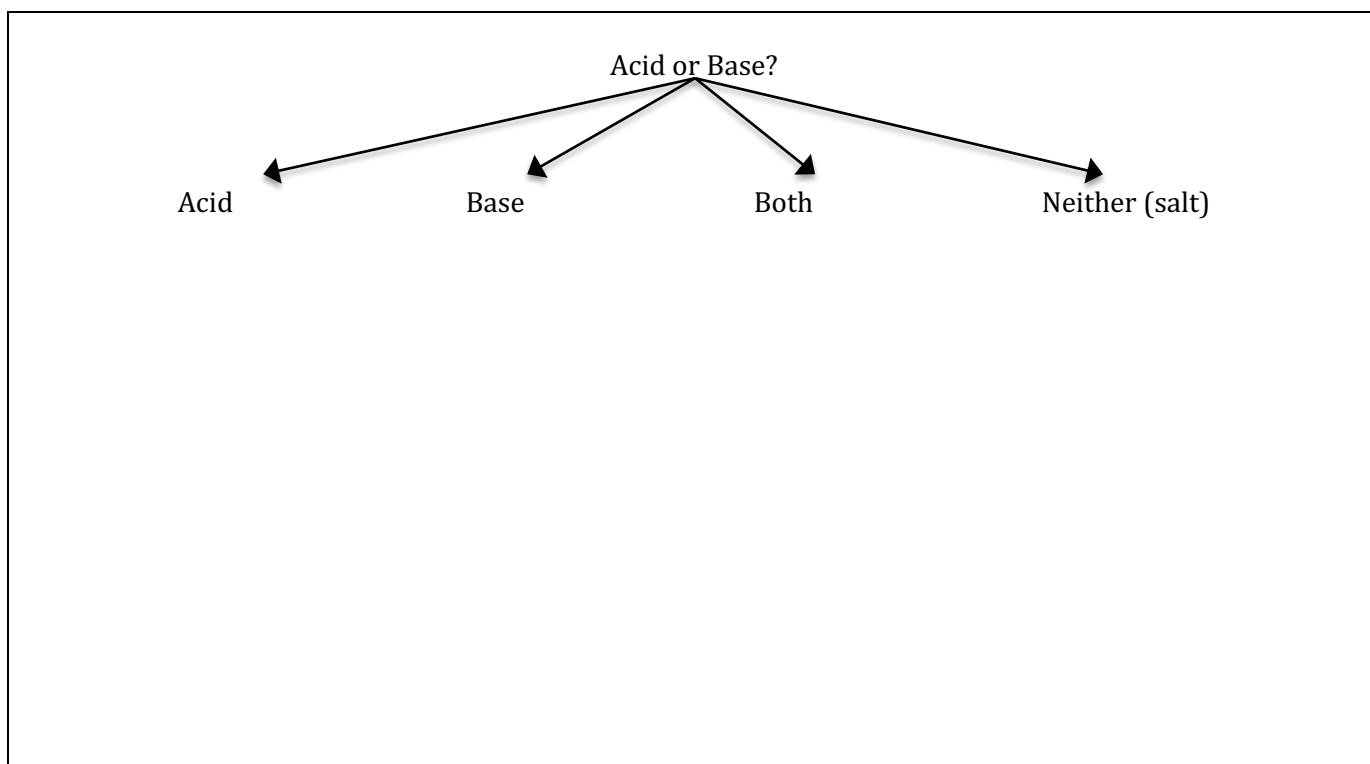
		K_a	K_b	pH (A, B, or N)
1.	Na_3PO_4	_____	_____	_____
2.	KH_2PO_4	_____	_____	_____
3.	Na_2CO_3	_____	_____	_____
4.	$KHSO_4$	_____	_____	_____
5.	$CaCO_3$	_____	_____	_____
6.	$NaNO_3$	_____	_____	_____
7.	$(NH_4)_2C_2O_4$	_____	_____	_____
8.	NH_4Cl	_____	_____	_____
9.	Na_2SO_3	_____	_____	_____
10.	$FeCl_3$	_____	_____	_____
11.	KCH_3COO	_____	_____	_____

Order the above substances from most acidic to most basic.

Most Acidic   Most Basic

____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

Example:

A 9.54g sample of $Mg(HCO_3)_2$ is dissolved in enough water to make 500.0 mL of solution. Calculate the pH of this solution.

- What is the concentration of $Mg(HCO_3)_2$?

- What is initial concentration of each ion? (*Hint – dissociation equation required)

- Which ion produced will hydrolyze?

- What is the equation when it reacts with water? Make an ICE table.

- Calculate pOH and pH.

A 200.0 mL aqueous solution of 0.50 M Na_2CO_3 is diluted to 500.0 mL. Calculate the pH of the resulting solution.

The K_b for pyridine, C_5H_5N, a weak base, is 4.7×10^{-9}. Calculate the pH of a 0.10 M solution of $C_5H_5NHNO_3$.

Complete: Hebden Pg. 148 #69, 70, 73