

Acid-Base Reactions & Salt

Acid-Base Reactions & Salt

Salts

What is the pH of the products of a neutralization reaction?

Acid-Base Reactions & Salt

Salts

Re-examining conjugate acids-bases...

Example #1



HCl is a strong acid. What can be said about the properties of its conjugate base, Cl⁻?

Acid-Base Reactions & Salt

Salts

Example #2



NH_3 is a weak base. What can be said about the properties of its conjugate acid, NH_4^+ ?

Acid-Base Reactions & Salt

Salts

If a reaction produces an ionic salt with acidic or basic properties, the pH of the final solution will be affected.

Acid-Base Reactions & Salt

Salts

Effects of ions:

1. Conjugate acids of *weak* bases tend to be acidic.
2. Conjugate bases of *weak* acids tend to be basic.
3. Metal ions of Group 1A and IIA do not affect the pH (except for Be^{2+})
4. Metal ions with +3 charges or greater tend to form acidic solutions.

Acid-Base Reactions & Salt

1. Conjugate Acids

What are the ions of NH_4Cl ?



How will this affect pH?

Acid-Base Reactions & Salt

2. Conjugate Bases

What are the ions of LiCl?

What are the ions of $\text{KC}_2\text{H}_3\text{O}_2$?

Which salt(s) will cause a change in pH? Why?

Acid-Base Reactions & Salt

3. Group IA & IIA Metals

These metals will not **hydrolyze** with water.

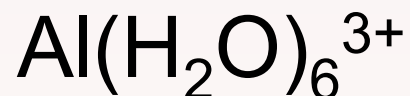
do not cause H_2O to become H_3O^+ or OH^-

One exception, Be^{2+} , will cause a solution to become acidic.

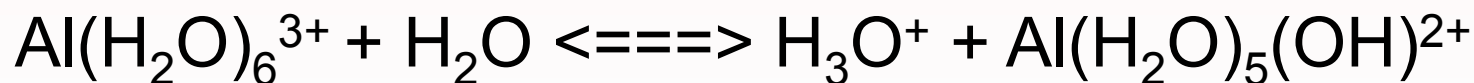
Acid-Base Reactions & Salt

4. Other Metals

Some metals often are complexed with water molecules.



These hydrated complexes will react with water to form acids.



Acid-Base Reactions & Salt

Salts

Some salts will release both a cation and anion that can affect pH.

Need to look at the K_a and K_b values of the ions.

If $K_a > K_b$, the solution will be

If $K_a < K_b$, the solution will be

Acid-Base Reactions & Salt

Example #1

Salt: NH_4CN

$$\text{NH}_4^+ K_a = 5.8 \times 10^{-10}$$

$$\text{CN}^- K_b = 1.6 \times 10^{-5}$$