

N38 – Acid Base

Salts

Important!

**You HAVE to have your
strong acids and bases
memorized!**

Important!



Then...

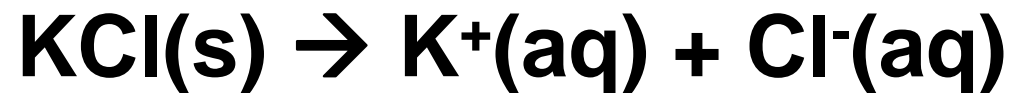
the salt can “hydrolyze” into an acid or a base!

$\text{H}_2\text{O} + \text{SALT} \rightarrow$ Maybe makes an acidic solution
Maybe makes a basic solution
Maybe makes a neutral solution
You have to determine that!

Acid-Base Properties of Salts

Type of Salt	Examples	Comment	pH of solution
Cation is from a strong base, anion from a strong acid	KCl, KNO ₃ NaCl NaNO ₃	Both ions are neutral	Neutral

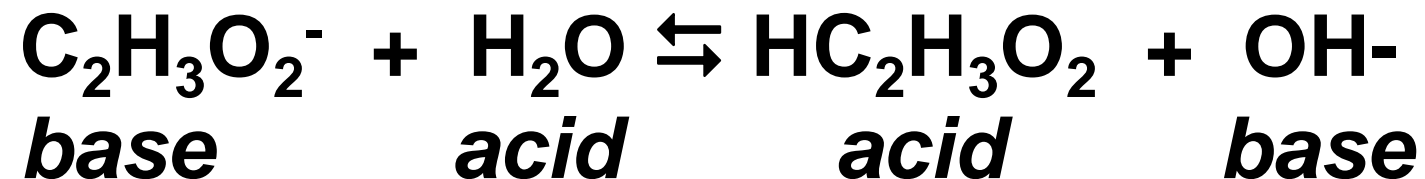
These salts simply dissociate in water:



Acid-Base Properties of Salts

Type of Salt	Examples	Comment	pH of solution
Cation is from a strong base, anion from a weak acid	$\text{NaC}_2\text{H}_3\text{O}_2$ KCN, NaF	Cation is neutral, Anion is basic	Basic

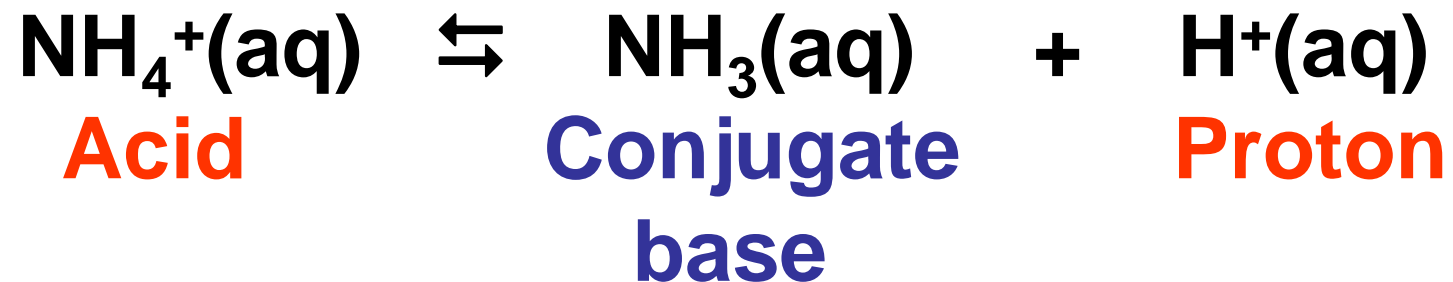
The basic anion can accept a proton from water:



Acid-Base Properties of Salts

Type of Salt	Examples	Comment	pH of solution
Cation is the conjugate acid of a weak base, anion is from a strong acid	NH_4Cl , NH_4NO_3	Cation is acidic, Anion is neutral	Acidic

The acidic cation can act as a proton donor:



Acid-Base Properties of Salts

Type of Salt	Examples	Comment	pH of solution
Cation is the conjugate acid of a weak base, anion is conjugate base of a weak acid	$\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ NH_4CN	Cation is acidic, Anion is basic	See below

- **IF K_a for the acidic ion is greater than K_b for the basic ion, the solution is acidic**
- **IF K_b for the basic ion is greater than K_a for the acidic ion, the solution is basic**
- **IF K_b for the basic ion is equal to K_a for the acidic ion, the solution is neutral**

Acid-Base Properties of Salts

Type of Salt	Examples	Comment	pH of solution
Cation is a highly charged metal ion; Anion is from strong acid	$\text{Al}(\text{NO}_3)_3$ FeCl_3	Hydrated cation acts as an acid; Anion is neutral	Acidic

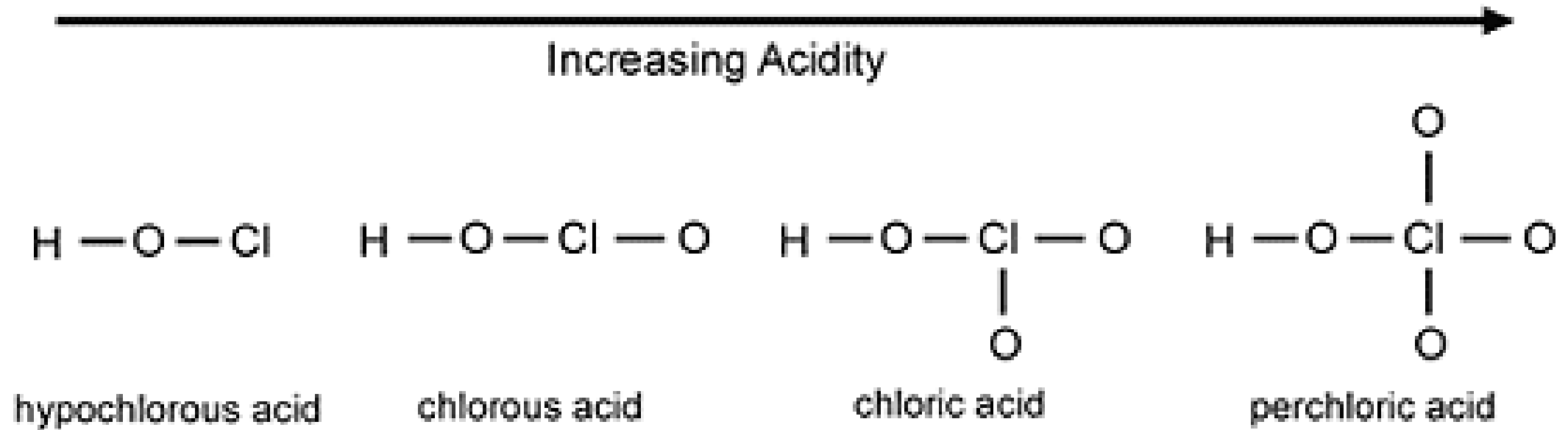
Step #1:



Step #2:



Effect of Structure on Acid-Base Properties



**High electronegativity pulling on the e- in the Hydrogen.
Bond is therefore weakened so it breaks more easily,
therefore more acidic.**