7. ACIDIC & BASIC SALTS

UNIT 4 – ACIDS & BASES CH40S MR. WIEBE

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ALL SALTS ARE NOT CREATED EQUALLY

- Soluble salts are ionic compounds that readily dissolve in water.
- Soluble salts can create acidic, basic, or neutral solutions when they dissolve, depending on their make-up.
  - Acidic salts increase the $[H_3O^+]$ in solution when they dissolve.
  - Basic salts increase the $[OH^-]$ in solution when they dissolve.
  - Neutral salts do not alter either $[H_3O^+]$ or $[OH^-]$ when they dissolve.

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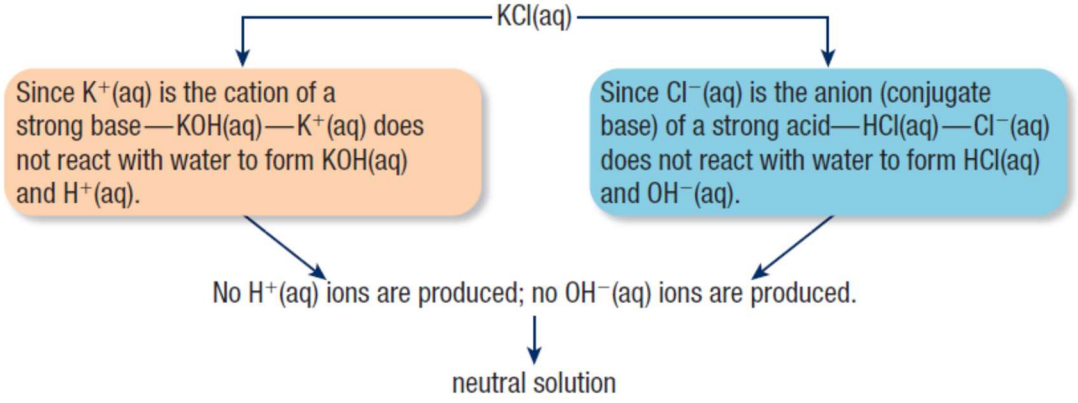
NEUTRAL SALTS



When the **acid** and **base** parents are both **strong** the salt is always **neutral**.

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NEUTRAL 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:

$KCl(s) \rightarrow$

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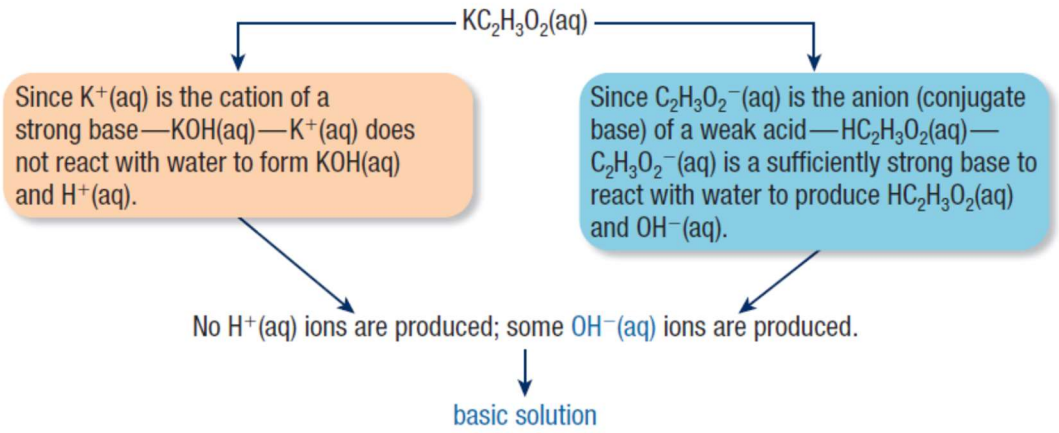
BASIC SALTS



When the **acid** parent is **weak** and the **base** parent is **strong** the salt is always **basic**.

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BASIC SALTS

Type of Salt	Examples	Comment	pH of solution
Cation is from a strong base, anion from a weak acid	$NaC_2H_3O_2$ KCN, NaF	Cation is neutral, Anion is basic	Basic

The basic anion can accept a proton from water:

$C_2H_3O_2^-$ + H_2O ⇆

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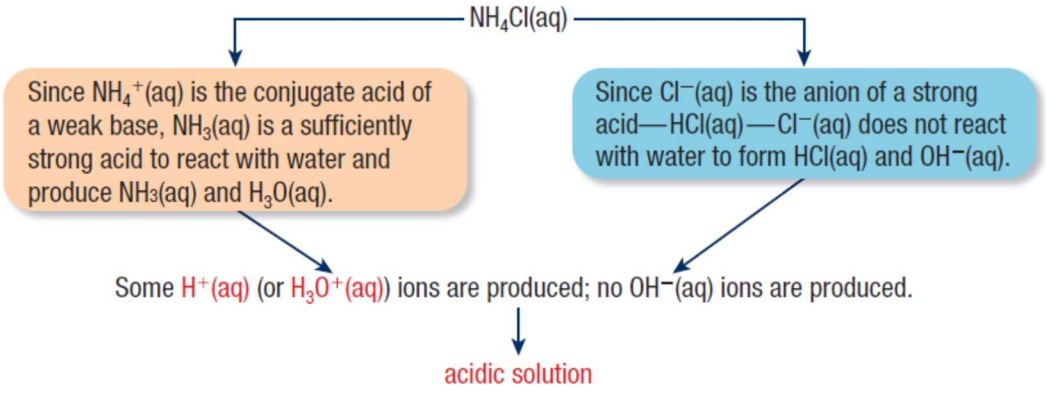
ACIDIC SALTS



When the **acid** parent is **strong** and the **base** parent is **weak** the salt is always **acidic**.

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ACIDIC 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:

$NH_4^+(aq) + H_2O \leftrightarrows$

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APPLICATIONS OF HYDROLYSIS

Tums

$CaCO_3$

Basic Salt neutralizes stomach acid

$CaCO_3 \rightleftarrows Ca^{2+} + CO_3^{2-}$

$CO_3^{2-} + HCl \rightarrow HCO_3^- + Cl^-$

$HCO_3^- + HCl \rightarrow H_2CO_3 + Cl^-$

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EXAMPLE #1

A chemist dissolves a mass of sodium nitrite in distilled water. Will the resulting aqueous solution be acidic, basic, or neutral? Support your claim.

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EXAMPLE #2

A chemist dissolves a mass of ammonium nitrate in distilled water. Will the resulting aqueous solution be acidic, basic, or neutral? Support your claim.

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