SECONDARY 3 CHEMISTRY WA3 CRASH COURSE

ACIDS, BASES, SALTS CHEATSHEET

SOLUBILITY

	SOLUBLE	INSOLUBLE
Group 1 & SPAN	ALL	-
Group 17	most	AgX PbX_2
SO_4^{2-}	most	Ca, Ba, Pb
CO_3^{2-}	1 & SPA	most
O^{2-}/OH^-	1 & SPA Ba	most

$Ca(OH)_2$, $Mg(OH)_2$: Sparingly soluble

ACID — BASE

Dissolve in water to release

H^+ — OH^-

STRONG Ionise FULLY (Fast)

WEAK Ionise PARTIALLY (Slow)

Ethanoic acid CH_3COOH — Ammonia NH_3

pH

Acidic $[H^+] > [OH^-]$ — **Basic** $[OH^-] > [H^+]$

0 SA — WA — 7 — WB — SB 14

Neutral

Water, salt

$[H^+] = [OH^-]$

*Always relate to rel. $[H^+]$ or $[OH^-]$

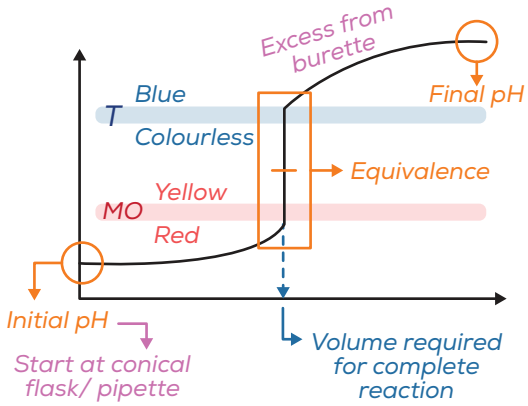
(Same for conductivity)

SALT

Metal/ NH_4^+ + ——

H_2SO_4	Sulfate	HNO_3	Nitrate
HCl	Chloride	CH_3COOH	Ethanoate
CH_3COONa		$(CH_3COO)_2Mg$	

INDICATORS & TITRATION

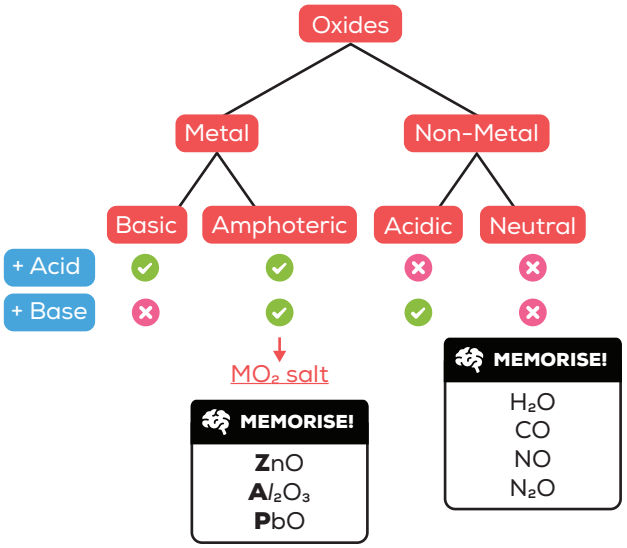


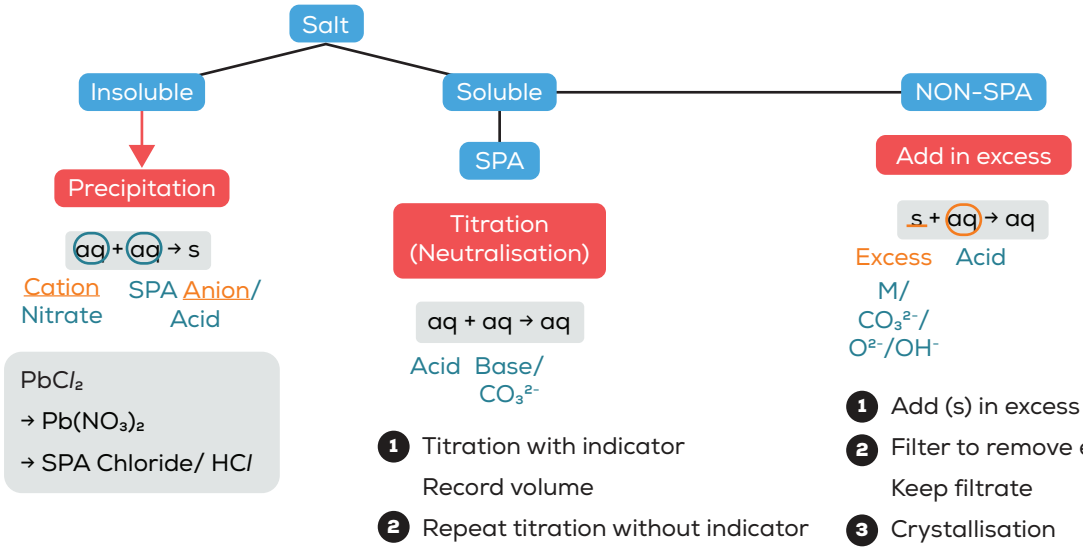
1. Initial pH
2. Final pH
3. Equivalence point
   → Suitable indicator range
   → Volume required for neutralisation

1. Acid + Metal → Salt + H_2 → Lighted splint extinguish with 'pop' sound
   → Unreactive: Cu, Ag, Au
   → Too reactive: Group 1, Group 2 below Ca
   } do not use!
2. Acid + CO_3^{2-} → Salt + H_2O + CO_2 → White ppt when bubbled through limewater
   ↓ $CaCO_3$ ↓ $Ca(OH)_2$
3. Acid + Base → Salt + H_2O
   (Neutralisation)
4. Alkali + NH_4^+ → Salt + H_2O + NH_3 → Moist red LP turns blue

THE piQue LAB

ACIDS, BASES, SALTS CHEATSHEET



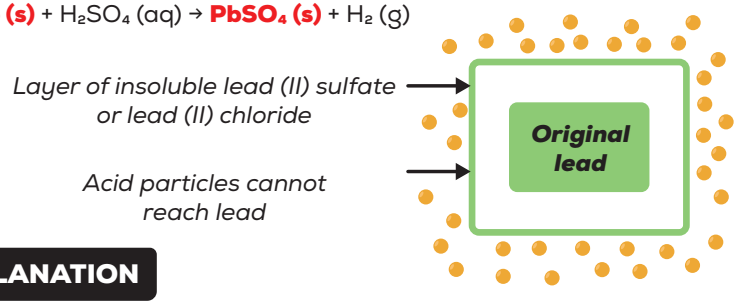


COMMON SITUATIONS

PREMATURE TERMINATION OF REACTION

CAUSE (s) + (aq) → (s)

e.g. **Pb (s)** + H_2SO_4 (aq) → **$PbSO_4$ (s)** + H_2 (g)



EXPLANATION

Insoluble layer of $PbSO_4$ formed around lead, preventing further reaction from happening. Reaction terminates prematurely, and the yield decreases.

DECREASE IN MASS OVER TIME

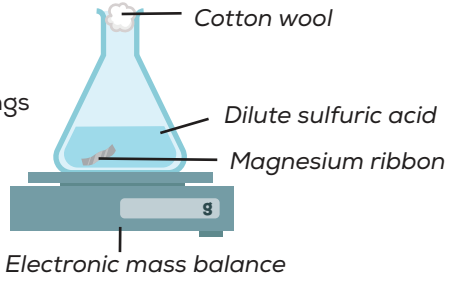
CAUSE Gas formed released into surroundings

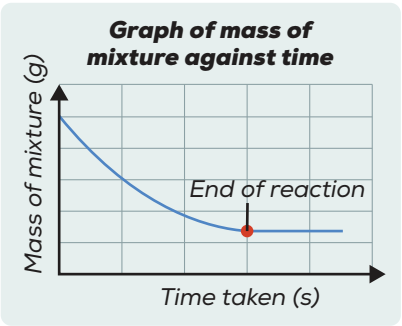
- Acid + Metal
- Acid + Carbonate
- Alkali + Ammonium salt

⚠ TAKE NOTE

If there is no gas released, mass **should not change** due to principal of conservation of mass, example:

- Acid + Base → Salt + Water
- Formation of precipitation without formation of gas





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