

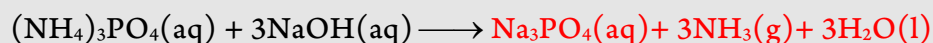
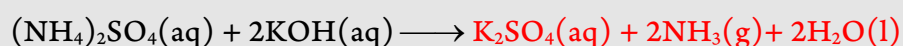
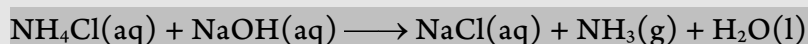
Section Four : Acids (酸) and Alkalis (鹼)

Unit Fifteenth: Alkalis, pH and Strength

II.. Properties of alkalis

(e) Action of alkalis on ammonium compounds:

e.g.



Ionic equation:



(h) Action of alkalis on non-metal oxides:

e.g.

Sodium hydroxide + carbon dioxide \longrightarrow Sodium carbonate + water



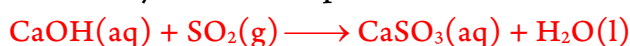
Calcium hydroxide + carbon dioxide \longrightarrow Calcium carbonate + water



Sodium hydroxide + sulphur dioxide \longrightarrow Sodium sulphite + water



Calcium hydroxide + sulphur dioxide \longrightarrow Calcium sulphite + water



VI. Strengths (強度) of Acids and Alkalis

B. Examples of strong and weak acids

	Acid	Formula	Important particles present in aqueous solution
Strong	Nitric	HNO_3	$\text{H}^+(\text{aq}), \text{NO}_3^-(\text{aq})$
	Sulphuric	H_2SO_4	$\text{H}^+(\text{aq}), \text{SO}_4^{2-}(\text{aq})$
	Hydrochloric	HCl	$\text{H}^+(\text{aq}), \text{Cl}^-(\text{aq})$
Weak	Carbonic	H_2CO_3	$\text{H}_2\text{CO}_3(\text{aq}), \text{HCO}_3^-(\text{aq}), \text{H}^+(\text{aq}), \text{CO}_3^{2-}(\text{aq})$
	Ethanoic (Acetic)	CH_3COOH	$\text{CH}_3\text{COOH}(\text{aq}), \text{CH}_3\text{COO}^-(\text{aq}), \text{H}^+(\text{aq})$
	Sulphurous	H_2SO_3	$\text{H}_2\text{SO}_3(\text{aq}), \text{HSO}_3^-(\text{aq}), \text{H}^+(\text{aq}), \text{SO}_3^{2-}(\text{aq})$

D. Strength and concentration of acids and alkalis (酸鹼的強度和濃度)

	Concentrated	Dilute	Strong	Weak
0.001M HCl		✓	✓	
5M HCl	✓		✓	
0.001M CH ₃ COOH		✓		✓
5M CH ₃ COOH	✓			✓

Supplementary Exercise

- A1. (1) a. Add blue litmus paper to identify the two acids.
(Indicator changes to red.)
- b. Add red litmus paper to the remaining solutions to identify the two alkalis.
- c. The solution not affecting litmus paper is sodium chloride.
- (2) Add either acid to the two alkaline solutions.
The one that gives a gas is sodium carbonate solution.
The other is ammonia solution.
- (3) Add pH paper to the acids.
The solution with the lower pH is dilute hydrochloric acid.