

Chemical Processes 7: Salts

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Acid-Base Neutralizations (D.R) and the production of Salts

Key terms

- Metal oxide
- Neutralization reaction
- Non-metal oxide
- Oxide
- Salts
- Aqueous
- Liquid
- Solid
- Gas

- See BC Science 10
Connections p 172

Neutralization

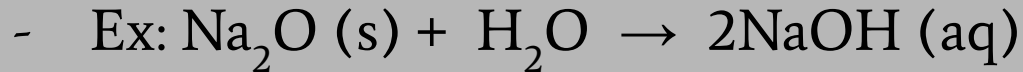
- The process by which an acid and a base neutralize one another
- Type of a **double replacement** reaction
- Acids and bases will react to form water and salt
 - Example: $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
Hydrochloric acid + sodium hydroxide \rightarrow table salt and water
 - Example: $2\text{CH}_3\text{COOH} + \text{Mg}(\text{OH})_2 \rightarrow \text{Mg}(\text{CH}_3\text{COO})_2 + 2\text{H}_2\text{O}$
Acetic acid + magnesium hydroxide \rightarrow magnesium acetate + water

Metal oxides and Non-metal oxides

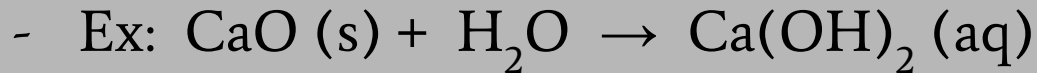
- An oxide is a chemical containing at least one oxygen atom/ion along with other elements

METAL OXIDE: Metal + oxygen

-When a metal oxide dissolves in water the solution becomes **basic**



Sodium oxide + water \rightarrow sodium hydroxide



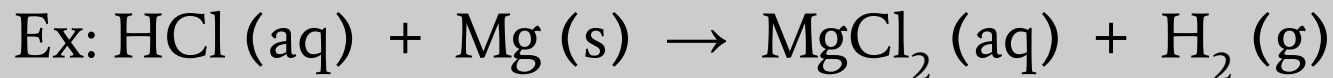
Calcium oxide + water \rightarrow calcium hydroxide

NON-METAL OXIDE: Non-metal + oxygen

- React with oxygen to form compounds like CO_2 and SO_2
- Fuels (coal/gas) when burned are combined with oxygen. The products are non-metal oxides which are released into the atmosphere.
 - Example: $\text{SO}_2 (\text{g}) + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_3$
Sulfur dioxide + water \rightarrow sulfurous acid

Acids and Metals

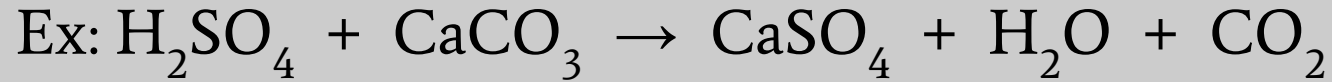
When metals react with acids they usually release hydrogen gas



Acid + metal \rightarrow salt + hydrogen gas

Acids and Carbonates

- Much of the Earth's carbon dioxide is trapped in rocks in the form of calcite and limestone
- These minerals contain calcium ions
- When carbonate and acids react, the carbonates help neutralize the acid- helpful in acid rain neutralization.



Sulphuric acid + calcium carbonate \rightarrow calcium sulphate + water + carbon dioxide

Assignment:

- handout p 92
- BC Science 10 Connections P 176