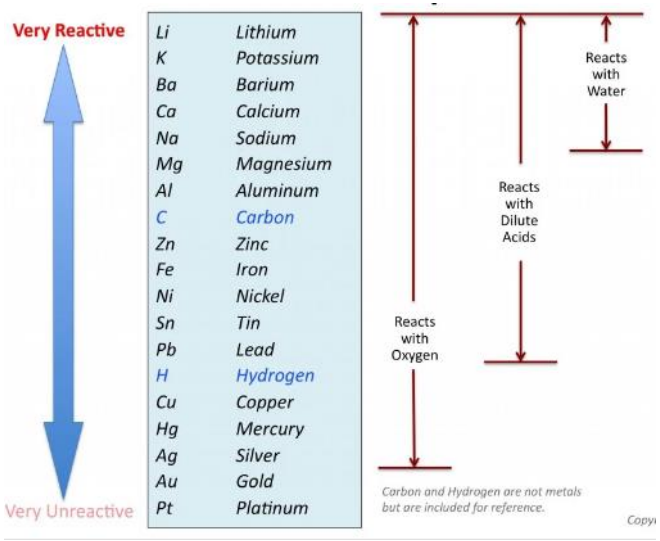
C2 – Chemical reactions and energy changes

Keyword	Definition
Soluble	Dissolves in water
Insoluble	Does not dissolve in water
Base	A substance that neutralises an acid. All metal oxides and hydroxides are bases.
Salt	A compound formed when an acid reacts with a metal or metal compound
Crystallisation	When a solution is heated, water evaporates and leaves the salt behind.
Displacement	When a more reactive metal takes the place of a less reactive metal in a compound
Oxidation	The gain of oxygen
Thermal decomposition	The breakdown of a substance using heat
Ore	A rock that contains enough metal or metal compound that is worth extracting
Atmosphere	The layer of gases surrounding the Earth
Exothermic	A reaction in which heat is given out to the surroundings
Endothermic	A reaction in which taken in from the surroundings
Combustion	Burning a substance in oxygen



The reactivity series shows metals in order of how easily they react with other substances.

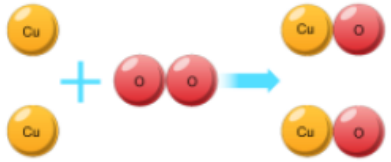
Very reactive take part in chemical reactions easily to form new substances.

Unreactive metals don't take part in chemical reactions easily. Some don't react at all, like platinum.

In an oxidation reaction, a substance gains oxygen.

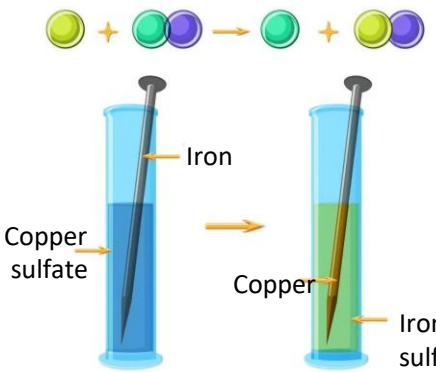
Metals react with oxygen in the air to produce metal oxides. For example, when copper is heated, it reacts with oxygen in the air to produce copper oxide:

Copper + Oxygen → Copper Oxide



A displacement reaction: iron is more reactive than copper, so it displaces (pushes out) the copper from copper sulfate:

Copper sulfate + iron → copper + iron sulfate



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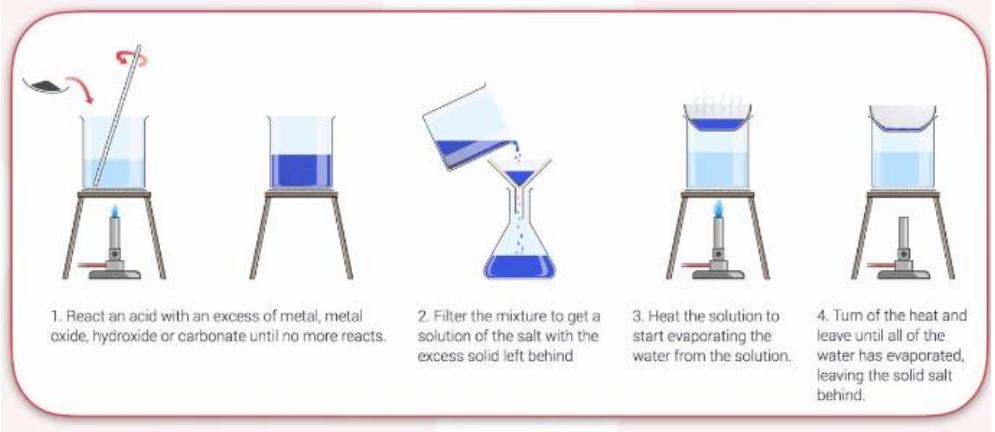
Making salts:

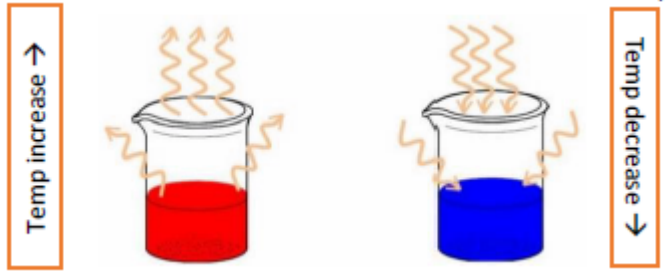


Endothermic Reactions

In an endothermic reaction, thermal energy is taken in from the surroundings, therefore there is a temperature decrease. Thermal decomposition is an example.

Exothermic Reactions

In an exothermic reaction, thermal energy is given out to the surroundings, therefore there is a temperature increase. Combustion, oxidation and neutralisation reactions are all examples.

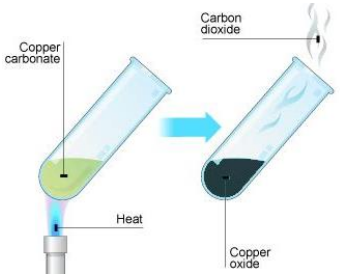


Thermal Decomposition

Some compounds break down when heated, forming two or more products from one reactants.

Many metal carbonates can break down easily when it is heated:

Copper Carbonate →Copper Oxide + Carbon Dioxide



Activities that are increasing the level of carbon dioxide in the atmosphere:

- Burning fossil fuels
- Deforestation

Making salts: general equations

Acid + alkali → salt + water

Acid + base → salt + water

Acid + metal → salt + hydrogen

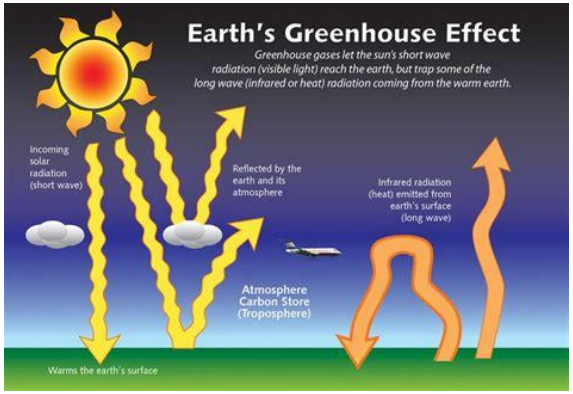
Metal + oxygen → metal oxide

Complete combustion:

Fuel + oxygen → carbon dioxide + water

Thermal decomposition:

Metal carbonate → metal oxide + carbon dioxide



Composition of the Earth's atmosphere: