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# Redox Reactions

Redox Reactions are *electron-transferring* reactions. Redox is an abbreviation of reduction-oxidisations reactions. There are two types of reactions:

- ➖ Reduction reactions, where electrons are gained (and the charge decreases)
- ➕ Oxidisation Reactions, where electrons are lost (and the charge increases)

> ✎ Mnemonic for Redox Reactions
>
> We can use the Mnemonic O.I.L. R.I.G. to remember redox reactions affects
> **O** – Oxidisation **I** – is **L** – Loss
>
> **R** – Reduction **I** – is **G** – Gain

These are categories of reactions that can occur, depending on what happens to the amount of free electrons. We measure this using *Oxidisation Numbers*, which are a measure of the *free electrons* in a reaction

## Oxidisation Number

Oxidisation Number is a measure of free electrons in a reaction. These are electrons that are greater or less than the amount of protons in the nucleus of the atom.

- When a particle does not have a positive or negative charge, we call it a *Neutral Atom*
- When a particle does have a positive or negative charge, that number is the *Oxidisation Number*.

We can represent the change of oxidisation number with half-reactions, and we can summarize the full change of electrons in a reaction using a Net-ionic Reactions

### Half-Reactions

Half reactions are another way of showing the steps that redox reactions go through. You show the changes in charges separately, and then summarize it all into a net-ionic reaction

### Example

| | |
|---|---|
| Example Equation: | $2Al + 3Cu^{+2}S0_4 \rightarrow Al_2^{+3}(SO_4)_3 + 3Cu$ |
| Spectator ion: | $SO_4$ |
| Oxidisation Reaction: | $2Al \rightarrow 2Al^{+3} + 6e^-$ |
| Reduction Reaction: | $3Cu + 6e^- \rightarrow 3Cu^{2-}$ |
| Net-ionic Reaction: | $2Al + 3Cu \rightarrow 2Al^{3+} + 3Cu^{2-}$ |