

In a reaction, if the oxidation number of an element increases, it is called **oxidation**.
If the oxidation number of an element decreases, it is called **reduction**.

Metals and acids react to form salt and hydrogen gas. For example:
 $\text{Ca} + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2$
Calcium is oxidised and hydrogen is reduced

Steps:

- Balance the change in oxidation number with electrons.
- Add water and H^+ ions to balance the oxidation.
- The final equation is checked by adding the charges on both the sides.

Redox reaction is a combination of oxidation and reduction

Oxidation is the loss of electrons.
Reduction is the gain of electrons.

Redox equations

Redox and electron transfer

Redox reactions of metal with acid

Element	Oxidation number
Group 1 elements	+1
Group 2 elements	+2
Aluminium	+3
Fluorine	-1
Chlorine	-1 except in compounds with oxygen and fluorine
Hydrogen	+1 except in metal hydrides
	-1 in metal hydrides (For example: NaH)
Oxygen	-2 except in peroxides and OF_2
	-1 in peroxides (For example: H_2O_2)
	+2 in OF_2

Redox

Writing formulae using oxidation numbers

Some elements have variable oxidation states such as iron, copper, nitrogen, etc.
In such cases, the oxidation number is given in Roman numerals in brackets.

Calculating oxidation numbers

Unknown oxidation numbers for elements in a compound or ion can be calculated by using known oxidation numbers.

A higher positive oxidation number denotes that the atom is more oxidised.

Oxidation numbers

The oxidation number of an uncombined element is always 0.
Oxidation number of a monoatomic ion is always the same as the charge.
The sum of oxidation numbers of all elements that form a compound is 0.
The sum of oxidation numbers of all elements that form a polyatomic ion is equal to the charge.
The more electronegative an element is, the higher the negative oxidation number in a compound or ion.