

5.3.1 Chemical Reactions (Forming Compounds)

Chemistry deals with atoms and how and why atoms stick together to form everything from germs to galaxies, including you.

Chemistry is also about atoms getting unstuck and forming new combinations with other atoms.

A **Chemical Reaction** (chemical change) occurs when one or more substances are mixed together and **different** substances form. The new substance (or substances) has chemical properties which are **different** than the chemical properties of the old substance(s).

In all chemical reactions,

- the **reactants** are pure substances that are the ingredients for the chemical reaction (they get used up)
- the **products** are pure substances that have been created after the chemical reaction is done

A **chemical equation** is a shorthand way of describing a chemical reaction.

Chemical Word Equations are expressed in words.

Example:

hydrogen gas + oxygen gas → water

In the word equation above, identify:

a) the reactants (the substances that react together)

hydrogen *and* oxygen

b) the products (the substances produced by the reaction)

water

Chemical Formula Equations are expressed using chemical formulae.

Example:

$2 \text{H}_2 + \text{O}_2 \rightarrow 2 \text{H}_2\text{O}$

In the chemical formula equation above, identify:

a) the reactants (the substances that react together)

H_2 *and* O_2

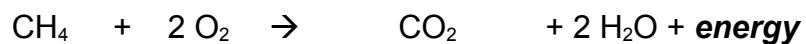
b) the products (the substances produced by the reaction)



Combustion is a special chemical reaction that occurs when a ***substance reacts rapidly with oxygen and releases energy.***

Example:

methane + oxygen → carbon dioxide + water + energy



Chemical Reactions always follow the ...

“Law of Conservation of Mass”

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