

Reactions

4. Types of Reaction

CONCEPT 1

LESSON GUIDE

COMBUSTION

PRECISE LEARNING POINTS

KNOW

I know what combustion is.

APPLY

I can apply my knowledge to write word equations for different combustion reactions.

EXTEND

I can extend my knowledge to evaluate the advantages and disadvantages of different fuels.

NOTES

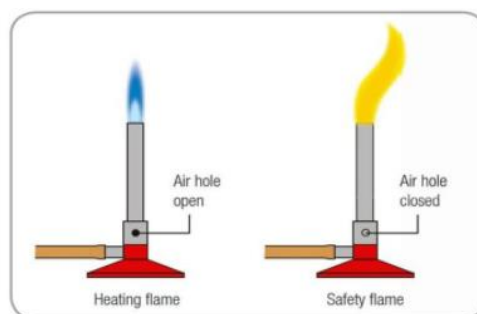
When you burn wood or any other fuel, new products are made. This type of chemical reaction irreversible as we can't get the reactants back i.e. the wood or fuel. This means burning is a chemical reaction.

Combustion is the scientific word for burning. In a combustion reaction a substance reacts with **oxygen** from the air and transfers energy to the surroundings as light and heat, this is why you see flames when things burn. Combustion reactions happen at high temperatures. The products of a combustion reaction are called **oxides**.

One example of a combustion reaction is the burning of methane in air. When it reacts with the oxygen in the air it produces either a hot blue flame or an orange flame. The energy that the reaction produces can be used to heat water, cook food, and generate electricity or even power vehicles.

The products of combustion reactions are compounds of oxygen, called oxides. Since methane is made up of atoms of carbon and hydrogen (these are called hydrocarbons), the products of its combustion reaction are oxides of carbon and hydrogen. The names of these oxides are **carbon dioxide and water**. This is an example of an oxidation reaction because the fuel reacts with oxygen. So, when a hydrocarbon is burnt with oxygen, carbon dioxide is always made. Carbon dioxide is a greenhouse gas, and contributes to global warming.

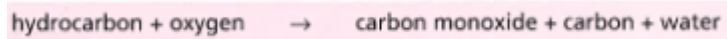
Sometimes there is not enough oxygen available to react with all of the fuel (hydrocarbon), this is known as incomplete combustion. When this happens water is still produced, but carbon monoxide and carbon are produced instead of the carbon dioxide.



Complete Combustion:



Incomplete Combustion:



Carbon Monoxide is a poisonous gas, and the carbon produced is simply soot. Both of these products are a danger to our health. Also it must be noted both reactions release light and heat energy, but incomplete combustion releases far less.