What is a Chemical Reaction?

A chemical reaction is the reaction between substances resulting in a *chemical change*.

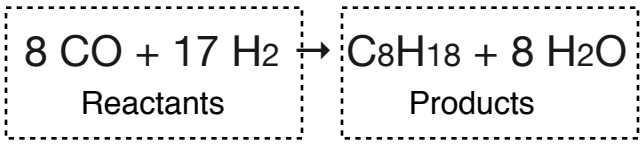
Chemical reactions are generally difficult to reverse. Some examples of chemical reactions are cooking an egg, burning paper or the rusting of iron.

Chemical reactions result in the production one or more new products with unique properties.

All chemical reactions take the form of Reactants → Products

The chemicals that react in a reaction are called the reactants. In the equation below CO and H_2 are the reactants.

The chemicals that are produced are called the products. In the equation below C_8H_{18} and H_2O are the products.



Word equations are a simple way to represent chemical reactions.

The reactants are written on the left hand side and the products on the right hand side.

The arrow(→) means 'gives' or 'produces'.

Examples of word equations are

Hydrogen + Oxygen → Water

Sodium + Chlorine → Sodium chloride

Zinc + Hydrochloric acid → Zinc chloride + hydrogen gas

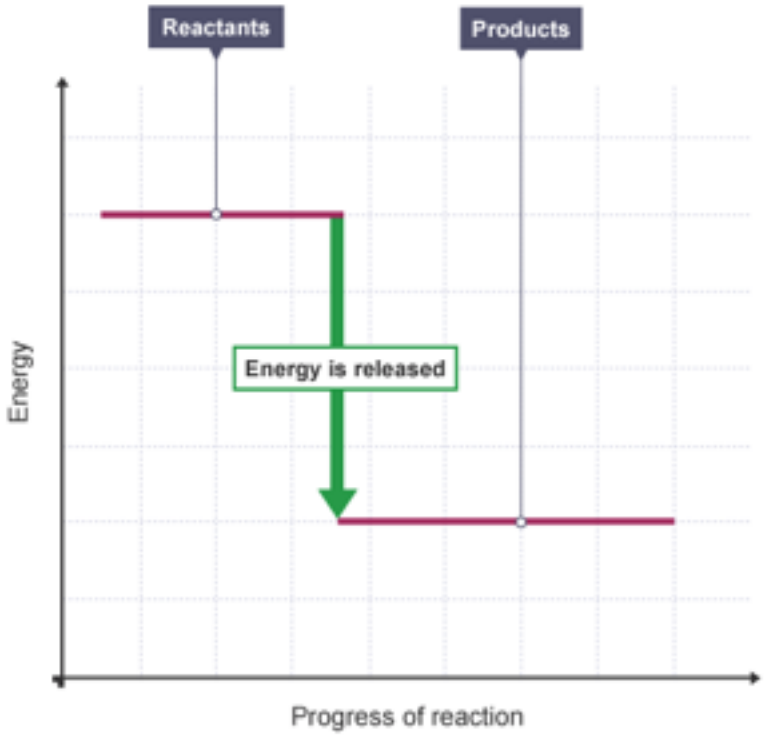
Bonds and chemical reactions

During a chemical reaction:

1. Bonds in the *reactants* are broken
2. New bonds are made in the *products*
3. Energy is *needed* to break bonds.
4. Energy is *released* when bonds are made.

Exothermic reactions

Exothermic reactions give out heat energy making the surroundings feel warmer. This is shown in the energy level diagram below.



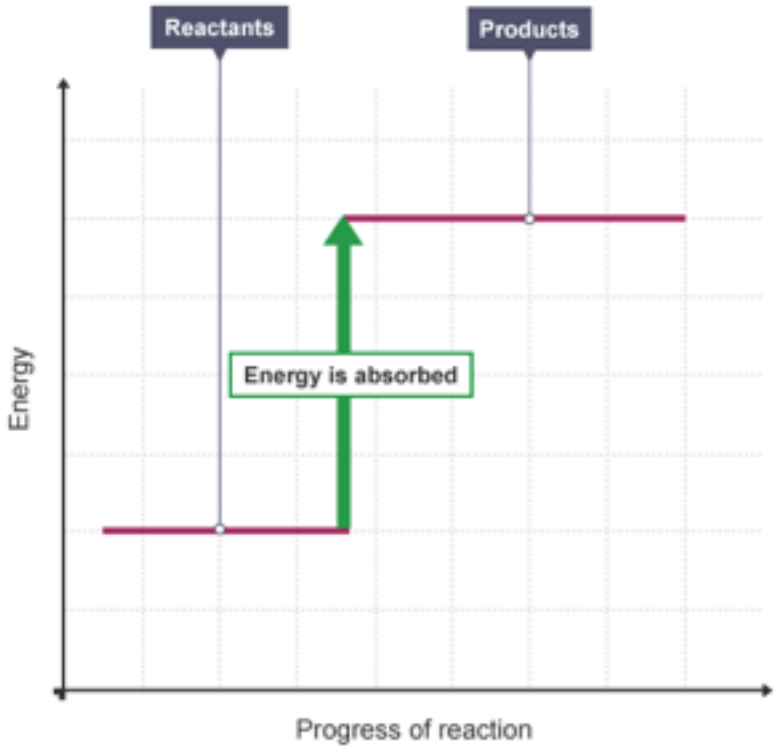
Energy is **LOST** in a exothermic reaction.

Some common ***exothermic*** reactions

- A burning candle flame
- Rusting metal
- Burning sugar

Endothermic reactions

Endothermic reactions absorb heat energy from the surroundings, making the temperature of the surroundings cooler. This is shown in the energy level diagram below.



Energy is **GAINED** in a exothermic reaction.

Some common ***endothermic*** reactions

- Baking bread
- Cooking an egg
- Photosynthesis

Adapted From:

http://www.chemistryforkids.net/help/what-is-a-chemical-reaction

http://www.bbc.co.uk/schools/gcsebitesize/science/triple_aqa/calculating_energy_changes/energy_from_reactions/revision/4/

http://antoine.frostburg.edu/chem/senese/101/thermo/faq/exothermic-endothermic-examples.shtml