

Knowledge organiser

Big idea: Reactions



Y8 topic: Chemical Energy

I have already learned:

In KS2: Properties and change of materials

In Y7: Acids and alkalis and metals

This topic links to:

Types of reaction (Y8)

Unit C3 – Quantitative chemistry (Y9)

Unit C4 – Chemical changes (Y9)

Unit C5 – Energy changes (Y10)

Unit C6 – Rate of chemical change (Y10)

It is important to study about chemical energy because...

Chemical reactions often go faster at higher temperatures so can be dangerous if we don't control them. Some chemical reactions need to be heated or they won't work at all.

Possible careers involving chemical energy are...

Chef

Fuel scientist

Chemical engineer

Environmental scientist

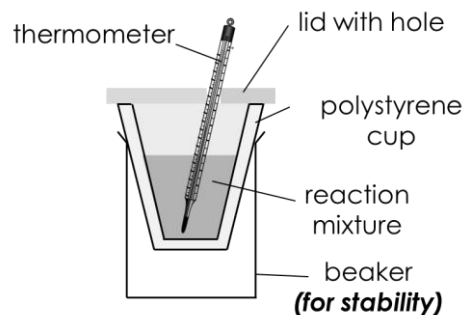
KNOWLEDGE ORGANISER

BIG IDEA: REACTIONS

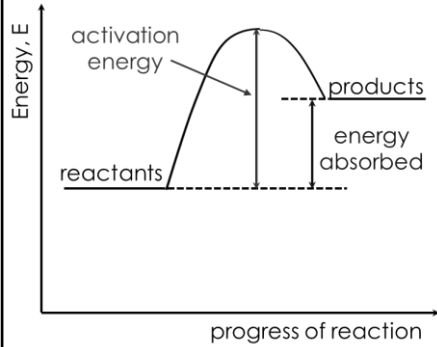
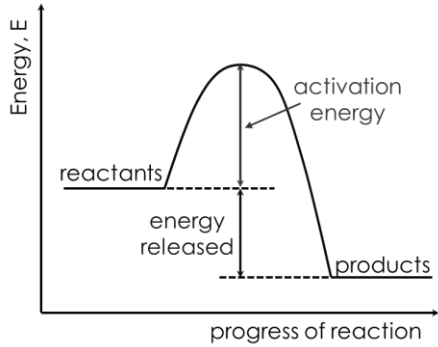
TOPIC: CHEMICAL ENERGY

Key Word	Definition
reactant(s)	Substances that react together.
product(s)	Substances formed in a reaction.
catalyst	A substance that increases the rate of a chemical reaction but is unchanged at the end
chemical reaction	Where the atoms in the reactant(s) rearrange to form new chemical(s).
exothermic reaction	A chemical reaction that gives out energy, usually as heat or light
endothermic reaction	A chemical reaction that takes in energy, usually as heat or light
chemical bond	A force that holds atoms together in molecules
activation energy	The minimum (lowest) amount of energy needed for a reaction to take place

Investigating energy changes: We use this apparatus to determine whether a reaction is endothermic or exothermic. The polystyrene cup is used because it is a thermal insulator (doesn't let heat pass through easily).



Endothermic and exothermic reactions: All chemical reactions involve a change in the energy of the chemicals. This is because, when a chemical reaction takes place, energy can either be taken in from, or transferred to the surroundings (the air, water, beaker etc.). Energy profile diagrams are used to show this change in the energy of the chemicals. Here are some features of endothermic and exothermic reactions:

type of reaction	endothermic	exothermic
energy of chemicals	increases	decreases
energy of surroundings	decreases	increases
observations	temperature decreases	temperature increases and/or light given off
examples	photosynthesis, ice packs	respiration, neutralisation, combustion (burning)
energy profile diagram		

Catalysts: These increase the rate of a chemical reaction but are unchanged at the end. Examples include:

- Platinum and palladium – used in car exhausts to make gases less harmful
- Nickel – used to make margarine
- Enzymes – biological catalysts made of proteins that ensure the chemical reactions in our body can take place (keeping us alive!)