

# Edexcel Chemistry IGCSE

## 3.8 - Energetics

Investigate temperature changes accompanying some of the following types of change: salts dissolving in water, neutralisation reactions, displacement reactions and combustion reactions

### Flashcards

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# What is an exothermic reaction?



# What is an exothermic reaction?

A reaction which gives out heat energy



# What is an endothermic reaction?



# What is an endothermic reaction?

A reaction which takes in heat energy



What 2 values are needed to calculate the change in temperature? How is this calculated?



What 2 values are needed to calculate the change in temperature? How is this calculated?

Initial temperature and final temperature

Temperature change = final temp - initial temp



Describe an experiment to measure the temperature change of a combustion reaction





# Describe an experiment to measure the temperature change of a combustion reaction

- Put  $100\text{cm}^3$  of water in a copper can and record its temperature
- Measure the mass of a spirit burner filled with the substance being tested then place it below the copper can and light the wick
- Continue heating until the spirit burner is extinguished
- Measure the final mass of the spirit burner and the maximum temperature of the water



Different substances in spirit burners are burned to heat water in a copper can and the temperature change is measured.

What are possible errors in this experiment?



Different substances in spirit burners are burnt to heat water in a copper can and the temperature change is measured. What are possible errors in this experiment?

Heat lost to surroundings

Not all flames are the same height from different spirit burners

Incomplete combustion

Evaporation of substance while weighing



The temperature change of a neutralisation reaction is measured. State 2 ways this experiment would be different to measuring the temperature change of a combustion reaction.



The temperature change of a neutralisation reaction is measured. State 2 ways this experiment would be different to measuring the temperature change of a combustion reaction.

- Solutions are placed in a polystyrene cup not a copper can
- A second reactant is needed
- No spirit burner required



In a neutralisation reaction, what steps can be taken to ensure minimal heat loss in the reaction?



In a neutralisation reaction, what steps can be taken to ensure minimal heat loss in the reaction?

- Use a polystyrene cup
- Place an insulated lid on the cup
- Place polystyrene cup in a beaker filled with cotton wool



Are combustion reactions exothermic or endothermic? Why?





Are combustion reactions exothermic or endothermic? Why?

Exothermic:

Heat energy is given out



How can you calculate  $Q$  (heat energy released by a reaction)?



How can you calculate  $Q$  (heat energy released by a reaction)?

$$Q = mc\Delta T$$

$m$  - mass of substance being heated (g)

$c$  - specific heat capacity of water ( $\text{J}/\text{kg}^\circ\text{C}$ )

$\Delta T$  - temperature change ( $^\circ\text{C}$ )



Are neutralisation reactions exothermic or endothermic? Why?



Are neutralisation reactions exothermic or endothermic?

Exothermic:

Heat energy is given out



A salt is dissolved in water. Is this exothermic or endothermic?



Salts dissolve in water. Is this exothermic or endothermic?

Can be either endothermic or exothermic, depends on the salt used



Are displacement reactions exothermic  
or endothermic?





Are displacement reactions exothermic or endothermic?

It depends on the reaction - they can be either endothermic or exothermic



A salt is dissolved in water and the temperature of the solution decreases. Is this an exothermic or endothermic reaction?



A salt is dissolved in water and the temperature of the solution decreases. Is this an exothermic or endothermic reaction?

Endothermic

