

WJEC (Eduqas) Chemistry GCSE

8 - Energy Changes in Chemistry

Flashcards

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What is activation energy?



What is activation energy?

The minimum amount of energy that particles must possess so that when they collide they react



What is an endothermic reaction?



What is an endothermic reaction?

- A reaction that takes in energy from the surroundings so the temperature of the surroundings decreases.
- The energy needed to break existing bonds is greater than the energy released from forming new bonds.



What is an exothermic reaction?



What is an exothermic reaction?

- A reaction that transfers energy to the surroundings so the temperature of the surroundings increases.
- The energy released from forming new bonds is greater than the energy needed to break existing bonds.



Give 3 examples of an endothermic reaction.



Give 3 examples of an endothermic reaction.

- Thermal decomposition
- Reaction of citric acid and sodium hydrogencarbonate.
- Everyday examples: sports injury packs



Give 3 examples of an exothermic reaction.



Give 3 examples of an exothermic reaction.

- Combustion
- Many oxidation reactions
- Neutralisation
- Everyday examples: self-heating cans and hand warmers



Define a reaction profile.



Define a reaction profile.

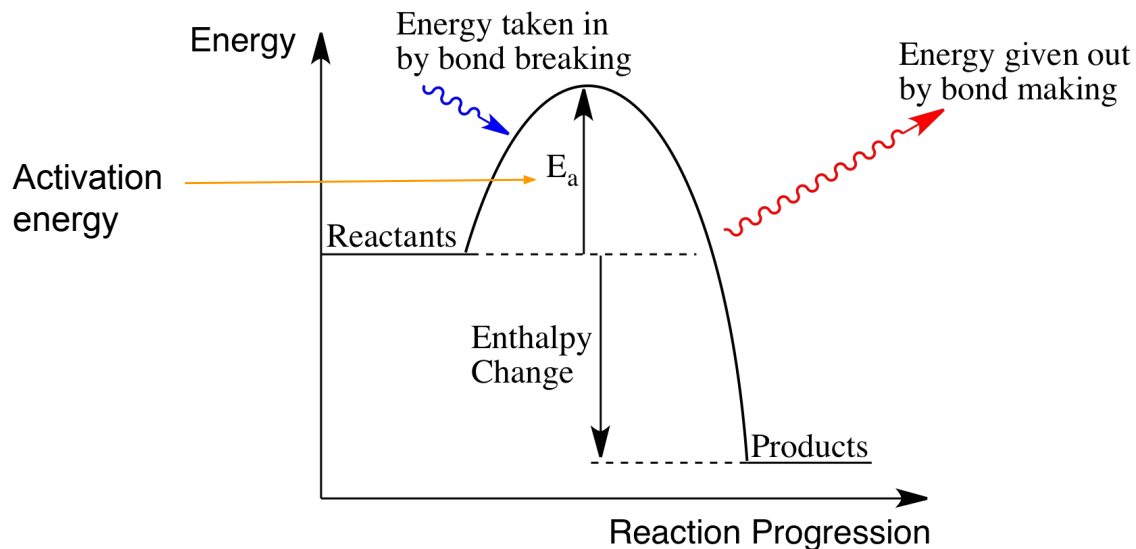
A graph used to show the relative energies of reactants and products, the activation energy and the overall energy change of a reaction.



Draw and label a reaction profile for an exothermic reaction, indicating the activation energy.



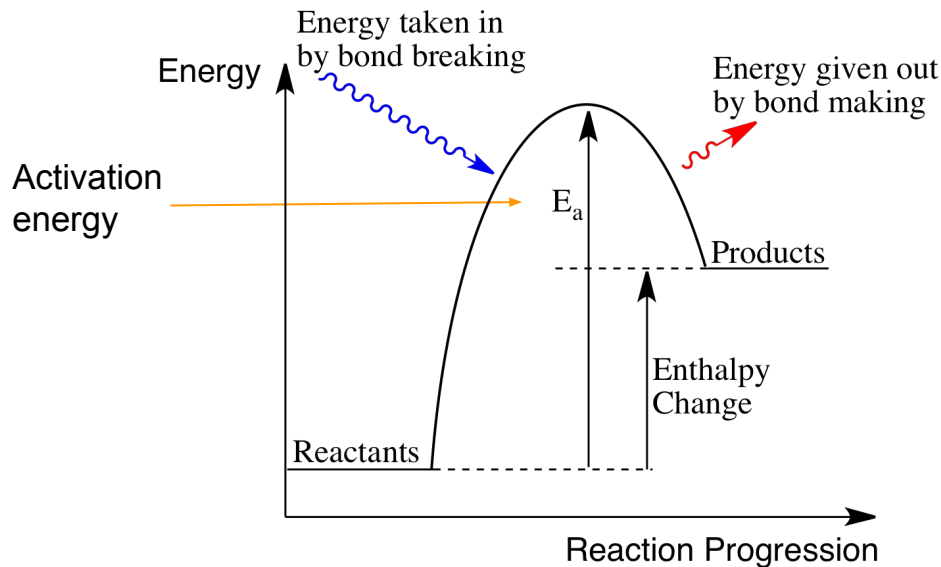
Draw and label a reaction profile for an exothermic reaction, indicating the activation energy.



Draw and label a reaction profile for an endothermic reaction, indicating the activation energy.



Draw and label a reaction profile for an endothermic reaction, indicating the activation energy.



How do you calculate energy change in a chemical reaction?



How do you calculate energy change in a chemical reaction?

- Can be calculated from bond energies
- Overall energy change = sum of energy to break bonds – sum of energy released when bonds form



What happens to energy when a bond is formed in a product?



What happens to energy when a bond is formed in a product?

Energy is released, increasing temperature of its surroundings



What happens to energy when a bond is broken in a reactant?



What happens to energy when a bond is broken in a reactant?

Energy is absorbed. Hence, an energy supply is needed to break bonds in reactants.



What is the name of a reaction where the energy needed to break bonds is greater than the energy released?



What is the name of a reaction where the energy needed to break bonds is greater than the energy released?

Endothermic



What is the name of a reaction where the energy needed to break bonds is less than the energy released?



What is the name of a reaction where the energy needed to break bonds is less than the energy released?

Exothermic



What happens to the surrounding temperature during an exothermic reaction?



What happens to the surrounding temperature during an exothermic reaction?

The temperature increases



What happens to the surrounding temperature during an endothermic reaction?



What happens to the surrounding temperature during an endothermic reaction?

The temperature decreases



What is a chemical cell?



What is a chemical cell?

- A cell which converts chemical energy to electrical energy.
- They are made up of two metal electrodes connected by an electrolyte.
- The cell produces a voltage until one of the reactants is used up.



What is a fuel cell?



What is a fuel cell?

- An electrochemical cell which continuously produces a voltage when supplied with a fuel and oxygen.
- The fuel donates electrons at one electrode and oxygen gains electrons at the other electrode.



Define a hydrogen-oxygen fuel cell.



Define a hydrogen-oxygen fuel cell.

- A fuel cell in which hydrogen and oxygen are the reactants that are used to produce a voltage.



What is the only product formed in a hydrogen-oxygen fuel cell?



What is the only product formed in a hydrogen-oxygen fuel cell?

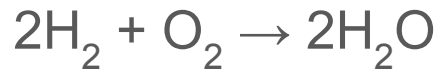
Water



State the chemical equation indicating the overall reaction for a hydrogen-oxygen fuel cell.



State the chemical equation indicating the overall reaction for a hydrogen-oxygen fuel cell.



Give 2 advantages of fuel cells.



Give 2 advantages of fuel cells.

- Greater efficiency
- Better for environment - produces only water



Give 3 disadvantages of fuel cells.



Give 3 disadvantages of fuel cells.

- Difficulties surrounding the transport of hydrogen
- Difficulties surrounding the production of hydrogen
- The explosiveness of hydrogen make it dangerous

