

AQA, OCR, Edexcel

GCSE Science

GCSE Chemistry

Energy Changes

Answers

M M E

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Total Marks: /32

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Energy transfer during exothermic and endothermic reactions

Q1: Throughout the course of a chemical reaction, explain what happens to the *energy*.

A= The amount of energy in the universe at the end of a chemical reaction is the same as before the reaction takes place (1 mark).

(1 mark)

Q2: During a chemical reaction, if the energy is transferred to the surroundings, how much energy will the products have and why?

A= The product molecules must have less energy (1 mark) than the reactants, by the amount transferred (1 mark).

(2 marks)

Q3: What is an exothermic reaction?

A= Transfers energy to the surroundings (1 mark). The temperature of the surroundings increases/ products have less energy than the reactants (1 mark).

(2 marks)

Q4: Give two examples of an exothermic reaction.

1. Combustion
2. Oxidation reactions
3. Neutralisation

(2 marks)

Q5: Give an example of an everyday use of an exothermic reaction.

A= Self-heating cans/hand warmers/ heat packs

(1 mark)

Q6: What is an endothermic reaction?

A=Takes in energy from the surroundings (1 mark) so the temperature of the surroundings decreases/ products have more energy than the reactants (1 mark).

(2 marks)

Q7: Give two examples of endothermic reactions.

1. Thermal decompositions
2. Reaction of citric acid and sodium hydrogen carbonate

(2 marks)

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Q8: Give an example of an everyday use of an endothermic reaction.

A= Sports injury pack/ cooler pack

(1 mark)

Reaction Profiles

Q9: Using concepts from the collision theory, explain what is needed for a chemical reaction to occur between particles.

A= Reacting particles need to collide with each other (1 mark) and with sufficient energy (1 mark)
Increasing the **frequency** of successful collisions (1 mark)

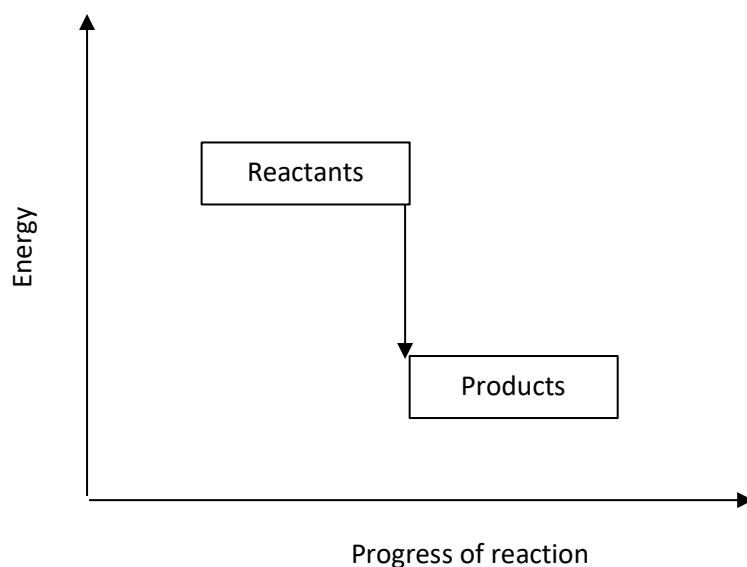
(3 marks)

Q10: Define activation energy.

A= The minimum amount of energy (1 mark) the particles must have to react (1 mark)

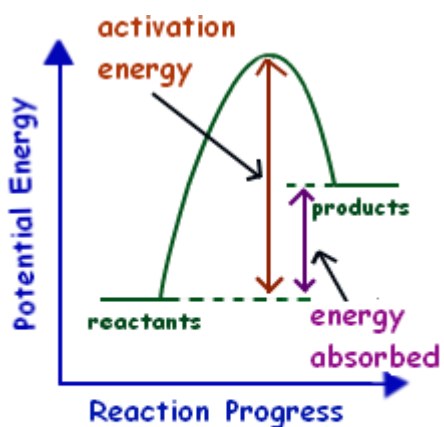
(2 marks)

Q11: Complete a diagram to display an exothermic reaction. Draw an arrow to show the energy change and label on the products and reactants.



(2 marks)

Q12: Complete an energy level diagram for an endothermic reaction. Label on the activation energy and energy absorbed.



**Endothermic
reaction**

(3 marks)

The energy change of reactions

Q13: Complete the following sentences.

Energy must be to bonds in the
Energy is when bonds in the are formed.

(5 marks)

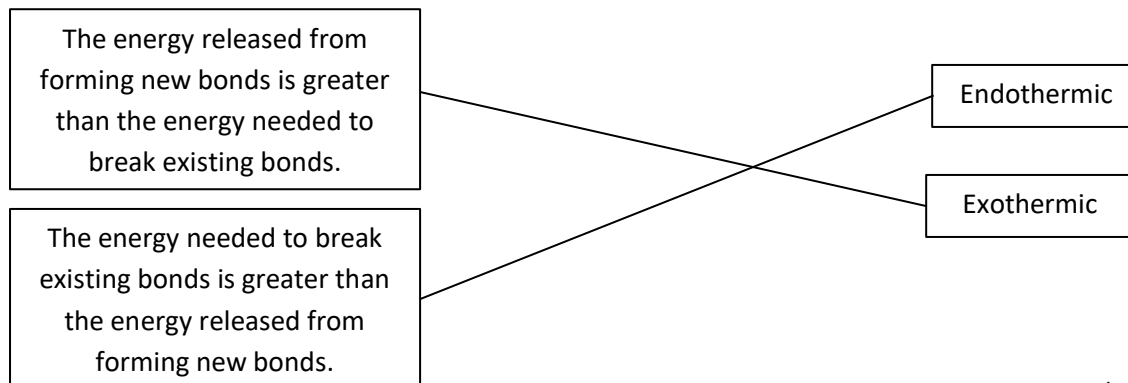
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Q14: How is the overall energy change of a reaction calculated?

A= The difference between the sum of the energy needed to break bonds in the reactants (1 mark) and the sum of the energy released when bonds in the products are formed (1 mark).

(2 marks)

Q15: Match the boxes.



(2 marks)