Energy Changes

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Citric acid and sodium hydrogencarbonate are mixed. The temperature falls from 21.0 °C to 15.5 °C. Calculate the temperature change and state the type of reaction. (2 marks)

Step 1 · Change

15.5 – 21.0 = –5.5 °C (a fall of 5.5 °C)

Step 2 · Type

Energy was taken in from the surroundings: endothermic.

Answer: Fall of 5.5 °C; endothermic

Check: A temperature fall means the surroundings lost energy to the reaction.

2. Now try one with the steps

Describe how a reaction profile shows that a reaction is exothermic. (2 marks)

Step 1 · Levels

Step 2 · Meaning

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Define the term exothermic reaction. [1]

2. Define the term endothermic reaction. [1]

3. Give one example of an exothermic reaction. [1]

4. Give one example of an endothermic reaction. [1]

5. The temperature of a reaction mixture rises from 19.5 °C to 27.0 °C. Calculate the temperature change in °C. [1]

6. The temperature of a mixture falls by 4.5 °C from 22.0 °C. Calculate the final temperature in °C. [1]

7. Define the term activation energy. [1]

8. Give one everyday use of an exothermic reaction and one of an endothermic reaction. [2]

9. Describe how a reaction profile shows that a reaction is endothermic. [1]

10. State whether the overall energy change, ΔH, is positive or negative for an exothermic reaction. [1]

11. Explain why energy is conserved in a chemical reaction even though the temperature changes. [2]

12. Explain why a match must be struck to light a gas cooker, even though the combustion of methane is exothermic. [2]

13. Explain, in terms of bond breaking and bond making, why a reaction is endothermic. [2]

14. State whether bond breaking is exothermic or endothermic, and explain why. [2]

4. Before you hand it in

"An endothermic reaction gives out cold."
Endothermic reactions take IN energy from the surroundings, so the surroundings cool.

"Breaking bonds releases energy."
Breaking bonds needs energy (endothermic); making bonds releases energy (exothermic).

Measuring activation energy from the products

Ea = energy from the reactants' level to the top of the curve.