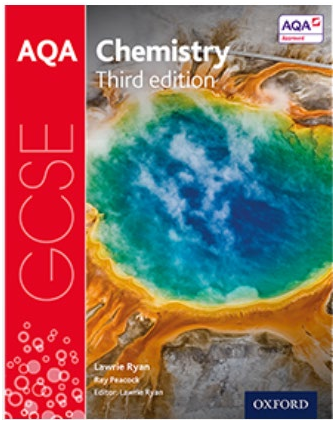
Extended Homework Task

Chemistry C7 Energy changes

Aiming for Grade 6

Name ……

Please hand in a completed printed version at the end of the topic



The online text book access to support this homework can be accessed through your Kerboodle account at www.kerboodle.com.

The username is your first initial and sir name (no gap).

If you have not accessed the book before the password will be the same as your username. If you have logged on before you will have changed the password to your own choice.

Click onto the science 9-1 tile and then onto the digital book.

Resources to support this homework can be found in the online student book

- **Energy changes pages 112 to 125**

Task 1

In your science lesson you will have completed a required practical experiment on endothermic and exothermic reactions.

The results of a similar experiment are shown below.

1. Calculate the rise or fall in temperature in stations 1 and 2. Write the answer as either a + or a – number on the table.

Station	Observations
Station 1: adding ammonium chloride to water	Temperature before:20^{oC} Temperature after: 13^{oC} **The temperature went up/down by**:
Station 2: adding acid to alkali	Temperature before: 20^{oC} Temperature after: 31^{oC} **The temperature went up/down by:**
Station 3: using an ice pack	I felt the temperature …
Station 4: using a hand-warmer	I felt the temperature …

Read the following statements.

Endothermic reactions take energy from the surroundings, which get colder.

Exothermic reactions release energy into the surroundings, which get hotter.

2. Now decide whether the reactions you carried out were endothermic or exothermic. Write down how you know.

Station 1 was endothermic/exothermic. I know this because:

.....

..... *(2 marks)*

Station 2 was endothermic/exothermic. I know this because:

.....

..... *(2 marks)*

Station 3 was endothermic/exothermic. I know this because:

.....

..... *(2 marks)*

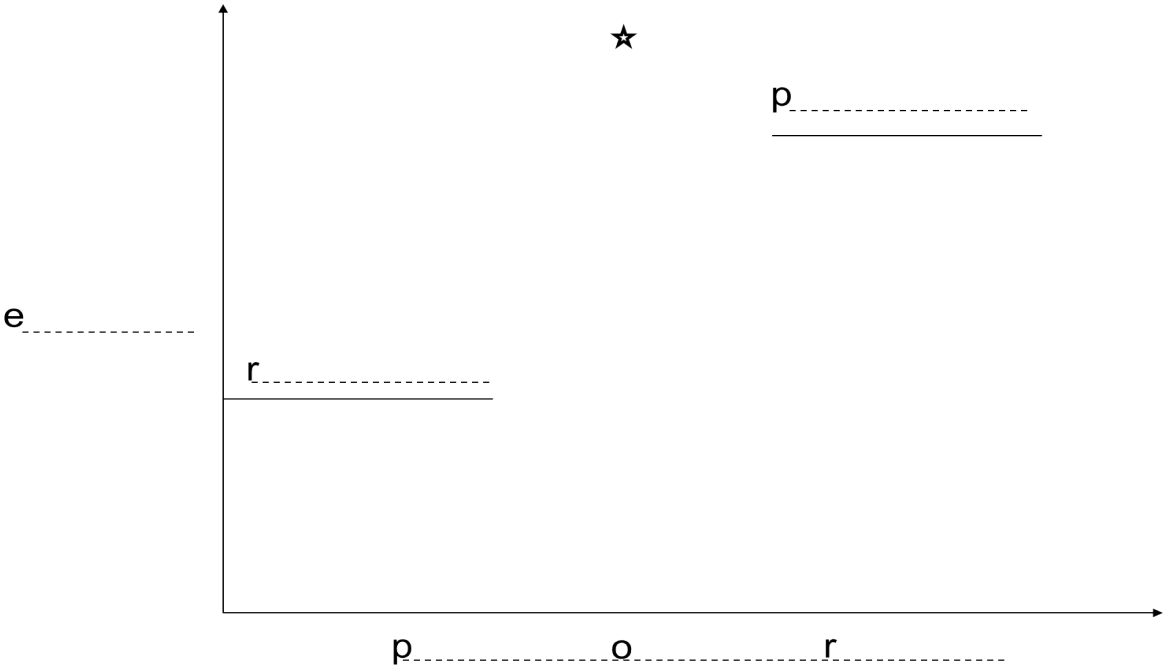
Station 4 was endothermic/exothermic. I know this because:

.....

..... *(2 marks)*

3. You have been provided with two blank reaction profiles. These show how the amount of energy changes through the course of a reaction. Carry out the steps described below to complete each reaction profile.

a Endothermic reactions



i. Complete the boxes for each label. Choose from the following words: *(4 marks)*

reactants	energy	progress of reaction	products

ii. Find the line that shows the energy level of the reactants. *(1 mark)*

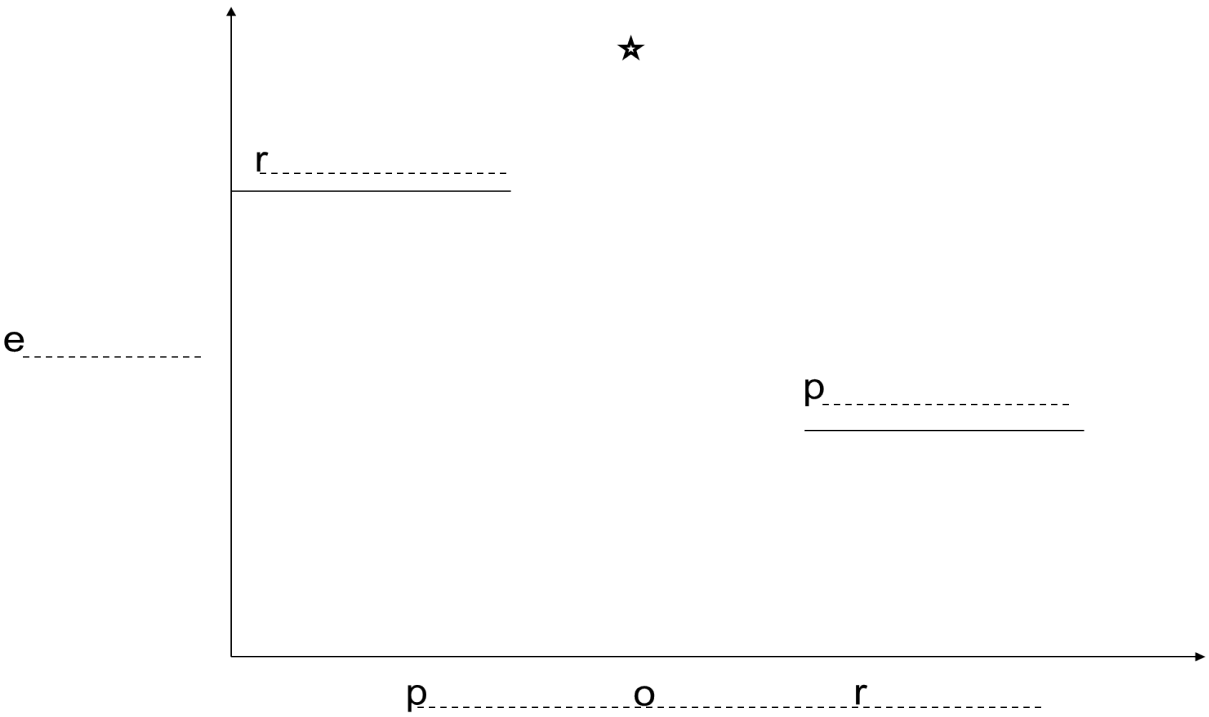
iii. Draw a dotted curved line from this line, up to the star (this is only there to help you, it is not usually found on a reaction profile) and then back down to the line that shows the energy level of the products.

iv. Use these words to complete the following paragraph to describe your endothermic reaction profile: *(7 marks)*

colder	products	energy	start	endothermic	temperature	activation

On a reaction profile for an _____ reaction, the energy level of the reactants is lower than the energy level of the _____. Because the reactants need to gain _____ to get to the higher energy level, they take it from the surroundings. This means the surroundings lose energy and get _____. The _____ of endothermic reactions decreases. The dotted line on the profile shows that the energy has to get past a certain level before the reaction can _____. This is called the _____ energy.

b. Exothermic reactions



Complete the boxes for each label. Try and recall the labels without looking back at your endothermic reaction profile. *(4 marks)*

i. Find the line that shows the energy level of the reactants.
Draw a dotted line from this line, up to the star (this is only there to help you, it is not usually found on a reaction profile) and then back down to the line that shows the energy level of the products. *(1 mark)*

ii. Finish the sentences below to describe the reaction profile. Try and complete each one without looking back at your paragraph about the endothermic reaction profile.

On a reaction profile for an exothermic reaction, the energy level of the products is:

Greater then / less than the reactants. *(1 mark)*

Energy is given out to the surroundings. This means that:

.....

..... *(1 mark)*

The dotted line on the profile shows:

.....

..... *(1 mark)*

Task 2

Produce a leaflet about endothermic and exothermic reactions.

Set your leaflet out in the following sections:

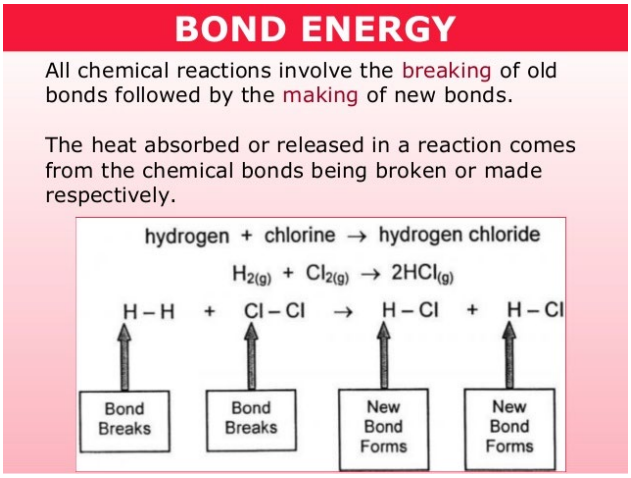
Section 1: Why does the energy change during reactions?

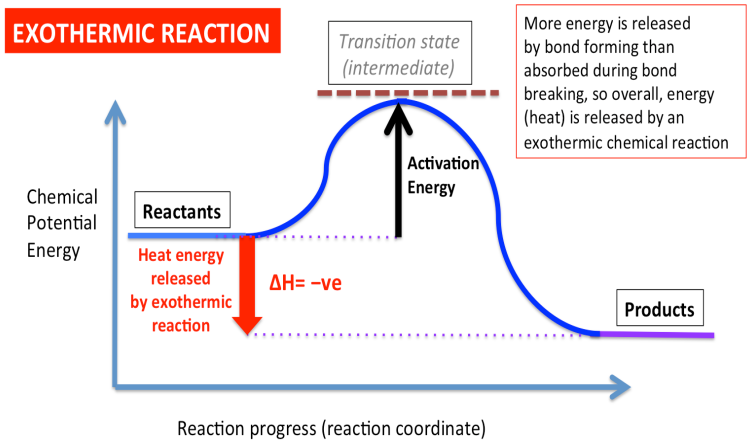
How do the different bonds in substances affect energy changes?

Section 2: What is an endothermic reaction?

What is an exothermic reaction?

Explain why energy is taken from the surroundings or released into the surroundings.





Section 3: What is a reaction profile?

Include fully labelled examples of reaction profiles for an endothermic and an exothermic reaction. Explain what they show, including an explanation of what activation energy is and how this is represented on a reaction profile.

Section 4: How are endothermic and exothermic reactions useful?

Include everyday examples of endothermic and exothermic reactions being used. Include diagrams of equipment or devices that utilise them if necessary.

Building key skills

There are skills that you will need to build up to help you access the information in these units.
To help you with these skills you can access myMaths programs or other maths resources.

C7 MyMaths: Energy changes

If your school has MyMaths, try looking at these activities that will support you in understanding the maths that is relevant to this chapter:

Using standard form with very small numbers

Using standard form with very large numbers

Dividing by 10 and 100

Decimal place value

Introduction to ratios