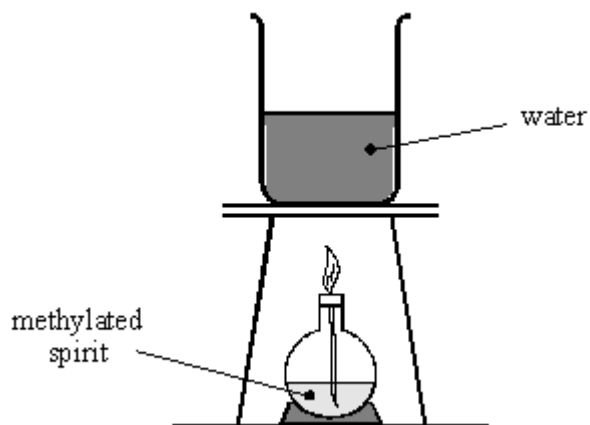


Energy Changes part 3

Q1.

A student is using a spirit burner to heat some water.



- (a) Complete these sentences.

Substances like methylated spirit which we burn to give out energy, are called _____ . The energy is given out as _____ energy.

(2)

- (b) Choose a word from this list to complete the sentence below.

gases liquids solids

The methylated spirit seems to disappear as it burns.

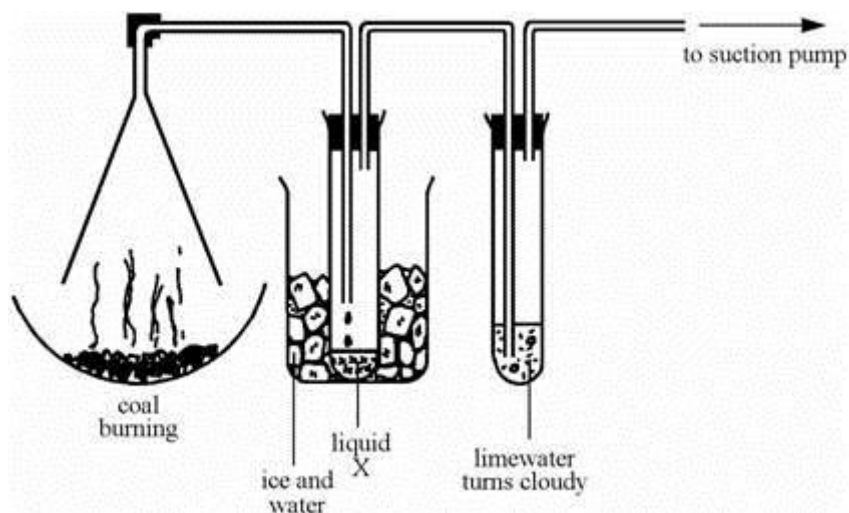
The new substances produced during burning are mainly _____

(1)

(Total 3 marks)

Q2.

The gases produced when coal burns are cooled by ice and then bubbled through limewater.



(a) Complete these sentences.

(i) The coal is reacting with _____ when it burns.

(ii) During burning, elements in the coal are converted to compounds called _____

(2)

(b) Choose words from this list to complete the sentences.

carbon carbon dioxide sulphur sulphur dioxide
sodium water

(i) Liquid X is a compound made from hydrogen and oxygen.

It is called _____

(ii) Sulphur dioxide is an acidic gas. It is given off when coal burns, because coal contains the element _____

(iii) Most fuels are compounds of hydrogen and _____

(3)

(c) Burning coal is an exothermic reaction.

Explain what "exothermic" means.

(1)

(d) (i) Which gas turns limewater cloudy?

(ii) Which element in the coal is oxidised to form this gas?

(2)

(Total 8 marks)

Q3.

Choose words from this list to complete the sentences,

ammonia carbon dioxide hydrogen nitrogen
electrical heat solar sound

(a) In air, the two most common gases are oxygen and _____ .

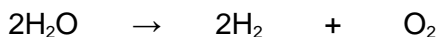
(b) When natural gas burns, energy is released mainly as _____ .

(c) When natural gas burns, a gas is produced which turns limewater milky.

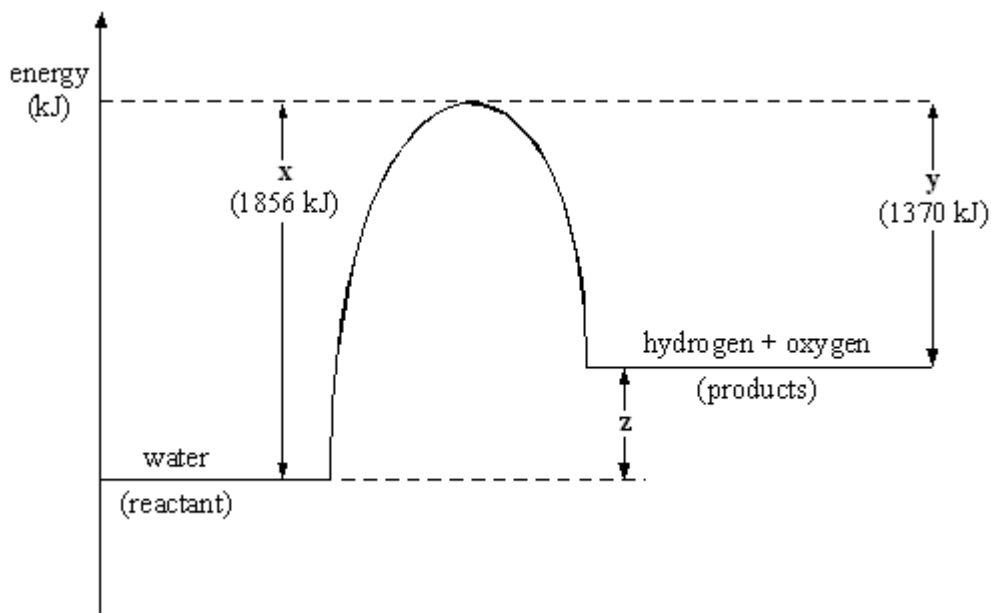
The gas is _____ .

Q4.

The symbol equation shows the decomposition of water.



An energy level diagram for this reaction is shown below.

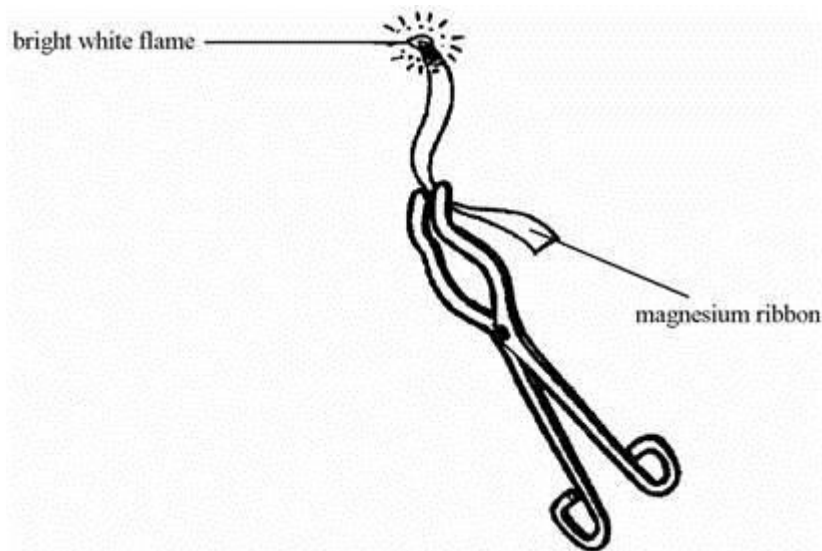


Explain the significance of **x**, **y** and **z** on the energy level diagram in terms of energy transfers that occur in the reaction. You should make specific reference to the bonds broken and formed and to the nett energy transfer (energy transferred to or from the surroundings).

(Total 6 marks)

Q5.

The diagram shows some magnesium ribbon burning.



(a) Choose words from the list to complete the sentences below.

electrical heat light kinetic
an endothermic an exothermic a neutralisation a reduction

When magnesium burns, it transfers _____
 and _____ energy to the surroundings.
 We say that it is _____ reaction.

(3)

(b) Complete the word equation for the reaction.

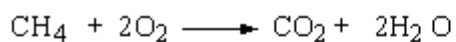
magnesium + _____ \longrightarrow magnesium oxide

(1)

(Total 4 marks)

Q6.

Methane and oxygen react together to produce carbon dioxide and water.



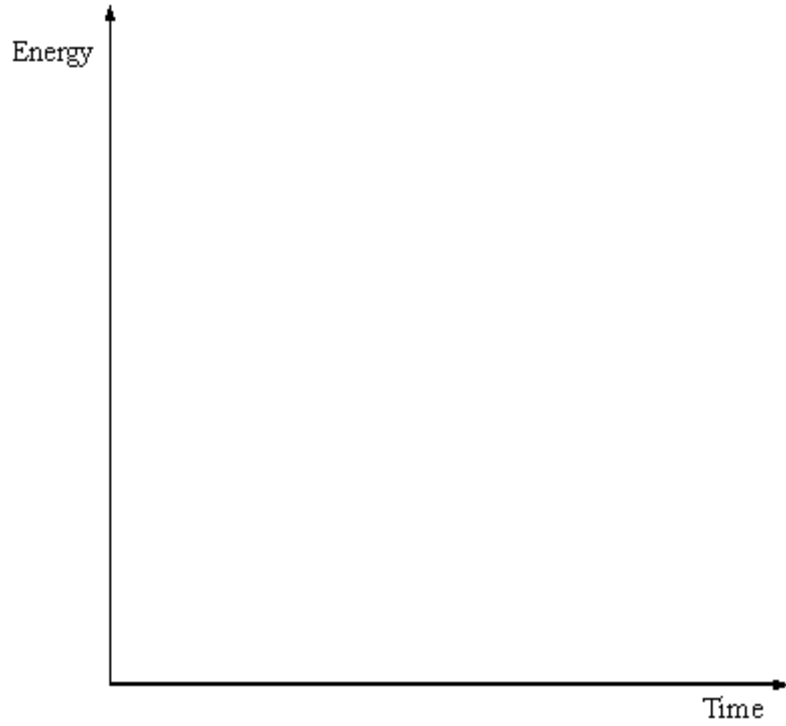
818 kJ of energy is given out to the surroundings for each formula mass (mole) of methane that reacts.

The methane gas will not burn in oxygen until a flame is applied, but once lit it continues to burn.

(a) Explain why energy must be supplied to start the reaction but it continues by itself once started.

(4)

- (b) Sketch an energy level diagram for the reaction and indicate on the diagram the nett energy released.



(3)

(Total 7 marks)

