

CHEMISTRY

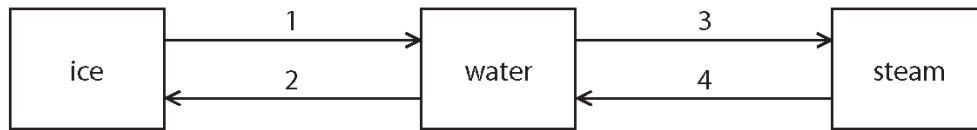
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1- (4CH0-S 2014-Paper 1CR-Q1)-KINETIC THEORY AND DIFFUSION

The compound with the formula H_2O can exist in three states of matter. The names of these three states are shown in the boxes.

The numbers 1, 2, 3 and 4 represent changes of state.



(a) The particles of H_2O are arranged differently in each state.

(i) In which state are the particles furthest apart?

(1)

(ii) In which state do the particles have the least energy?

(1)

(iii) In which state are the particles arranged in a regular pattern?

(1)

(b) (i) Change of state 1 is called

(1)

- A boiling
- B condensing
- C freezing
- D melting

(ii) Change of state 4 is called

(1)

- A boiling
- B condensing
- C freezing
- D melting

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(c) The term sublimation is also used for a change of state.

Sublimation is the change of state from

(1)

- A** solid to liquid
- B** liquid to gas
- C** gas to liquid
- D** solid to gas

(d) Heat energy is released when steam changes to water.

(i) What term is used to describe this type of energy change?

(1)

(ii) Write an equation, including state symbols, for the change of state from steam to water.

(1)

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1- (4CH0-S 2014-Paper 1CR-Q9)-STRUCTURE, OXYGEN AND OXIDES

Molybdenum (Mo) is a metal. It is often used to make an alloy with iron.

Like iron, it is extracted from its oxide. Unlike iron, it occurs mainly as its sulfide.

- (a) Molybdenum sulfide is converted into molybdenum oxide by heating in air.
The equation for this reaction is



- (i) Why is molybdenum said to be oxidised in this reaction?

(1)

- (ii) The sulfur dioxide formed in the reaction could form acid rain if it escaped into the atmosphere.

Write a chemical equation for the formation of an acid from sulfur dioxide.

(1)

- (b) The table shows the melting points of molybdenum oxide and sulfur dioxide.

	Melting point in °C
molybdenum oxide	800
sulfur dioxide	-75

The melting point indicates the type of bonding and structure in a compound.

- (i) What is the type of bonding in a molecule of sulfur dioxide?

(1)

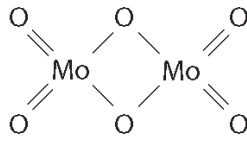
- (ii) Explain why the melting point of sulfur dioxide is low.

(2)

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- (iii) The melting point of molybdenum oxide suggests that it has ionic bonding. However, it is often represented as a molecular structure.

Deduce the molecular formula of molybdenum oxide as shown in this structure.



(1)

- (c) The metallic structure of molybdenum gives it some typical properties.

- (i) Describe the metallic structure of molybdenum.

(2)

- (ii) Explain why molybdenum is a good conductor of electricity.

(2)

- (iii) Explain why molybdenum is malleable.

(2)