ACTIVITY # 15.1 HEAT & COOLING CURVE Date due:_____

This question is about density, the kinetic theory and changes of state.

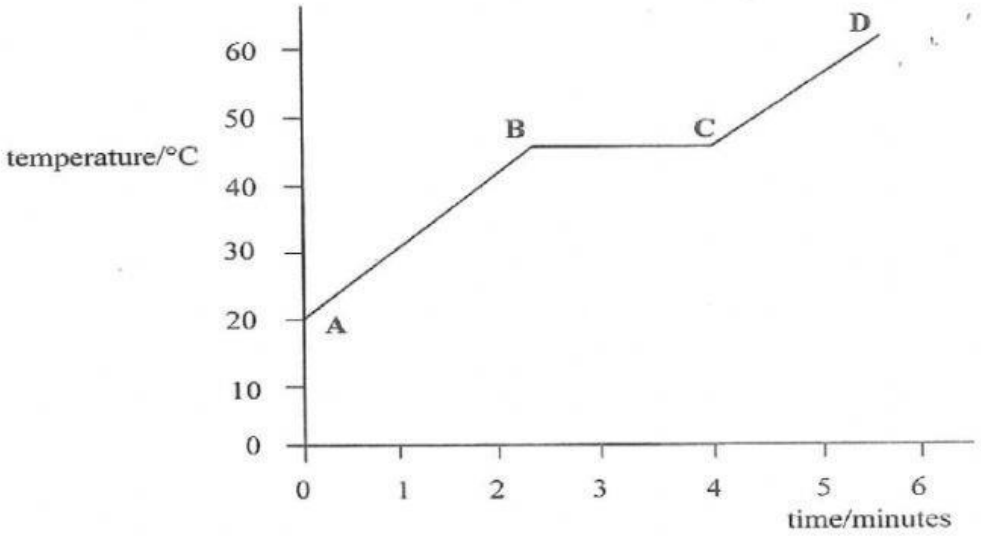


Fig. 7.1

Fig. 7.1 shows the heating curve of solid beeswax as it is gently heated from room temperature (20 °C).

(a) As the beeswax is being gently heated. Explain briefly, in terms of its particles

(i) why the temperature of the beeswax increases from **A** to **B**?

_____

(ii) why the temperature of the beeswax remains constant from **B** to **C**?

_____ [2]

(b) (i) Name the process taking place between points **B** and **C**.

_____ [1]

(ii) What is the state of the beeswax between points **C** and **D**?

_____ [1]

(iii) How many minutes did it take for the beeswax to melt?

_____ [1]

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c. **Fig. 2.2** shows a **temperature** versus **time** graph for a beaker full of crushed ice as it is gently heated whilst being stirred.

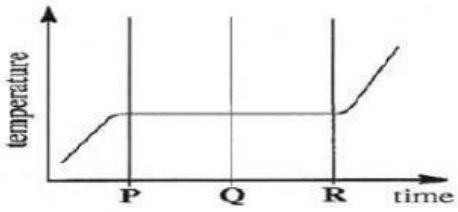


Fig. 2.2

(i) Briefly describe what you would see if you looked into the beaker at times.

P _____

_____

Q _____

_____

R _____

_____ [3]

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d. Fig. 4.2 shows the cooling curve of the wax.

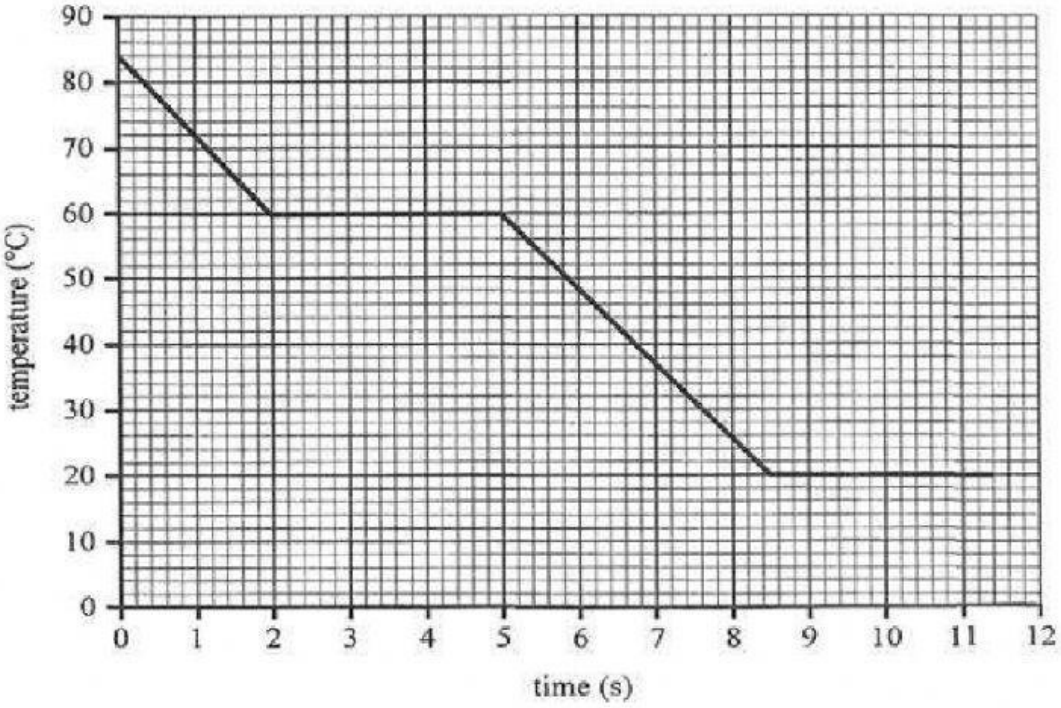


Fig. 4.2

(i) Briefly explain how cooling affects the kinetic energy of the wax molecules.

_____ [1]

(ii) Name the state of matter of the wax when the temperature is **58° C**.

_____ [1]

(iii) State the freezing point of the wax.

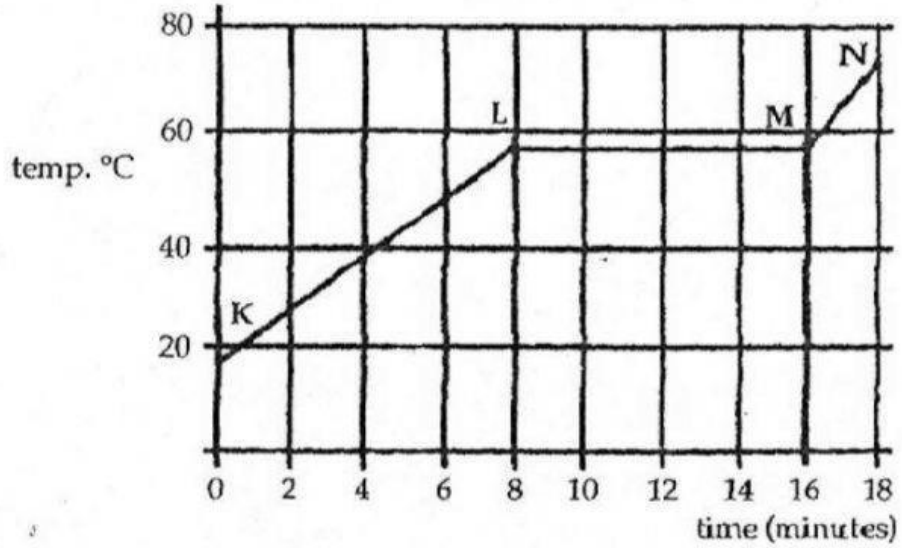
_____ [1]

(iv) State what would happen to the freezing point of wax if impurities were added to it.

_____ [1]

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2. The graph shows the temperature and time for 400 g of solid wax which was heated from room temperature in an insulated container.



(a) State the melting point of the wax.

_____ [1]

(b) Write down the principal molecular energy change in the wax, in each of the three stages **KL**, **LM** and **MN**.

_____

_____

_____ [2]

(c) (i) Show that the time taken from point **K** of the graph to point **L** of the graph is 8.0 minutes.

_____

_____ [2]

(ii) Show that the temperature rise between point **K** of the graph and point L of the graph is 36 K (°C).

_____

_____ [2]

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3. This question is about changes in state.

Figure 4.1 shows a graph of temperature against time for 400 g of solid wax heated from room temperature in an insulated container by a 20 W heater.

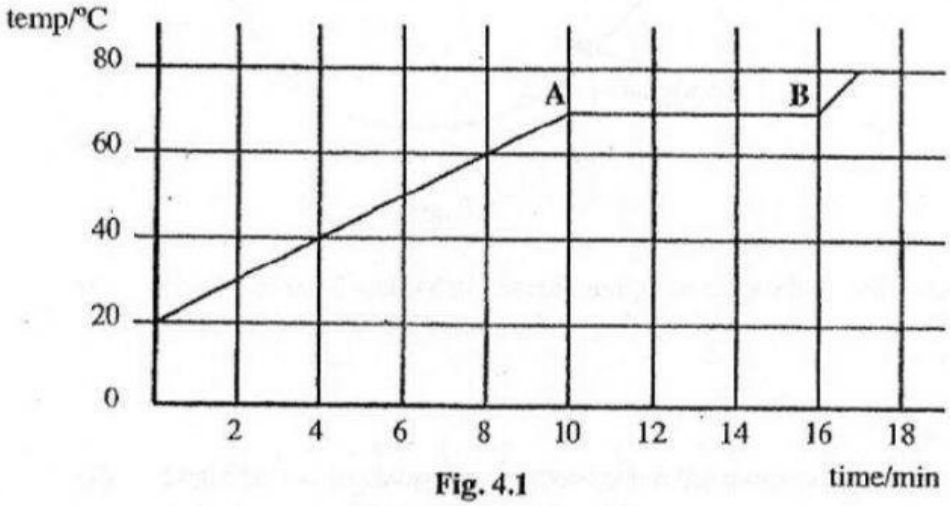


Fig. 4.1

(a) State the value of the temperature of the room.

_____ [1]

(b) State the value of the melting point of the wax.

_____ [1]

(c) Explain why the temperature of the wax remains constant from points **A** to **B**, even though the heater is still on.

_____

_____ [2]

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