

ACTIVITY # 15.1 HEAT & COOLING CURVE**Date due:** _____**165**

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

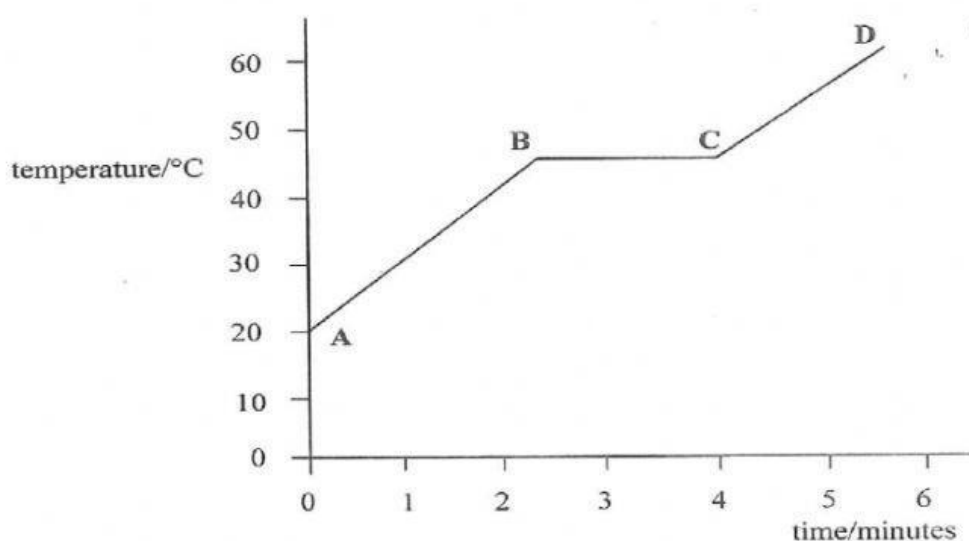
**Fig. 7.1**

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]

- 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.

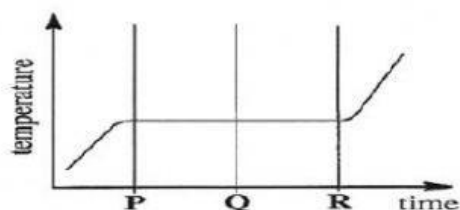


Fig. 2.2

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

P _____

Q _____

R _____

[3]

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

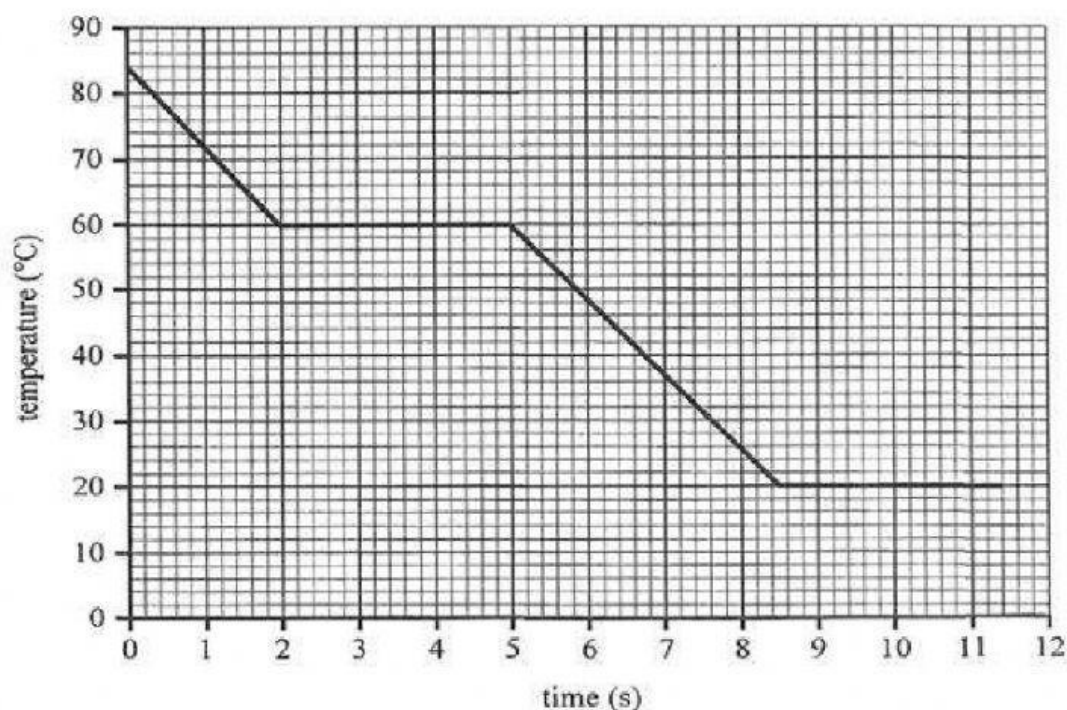
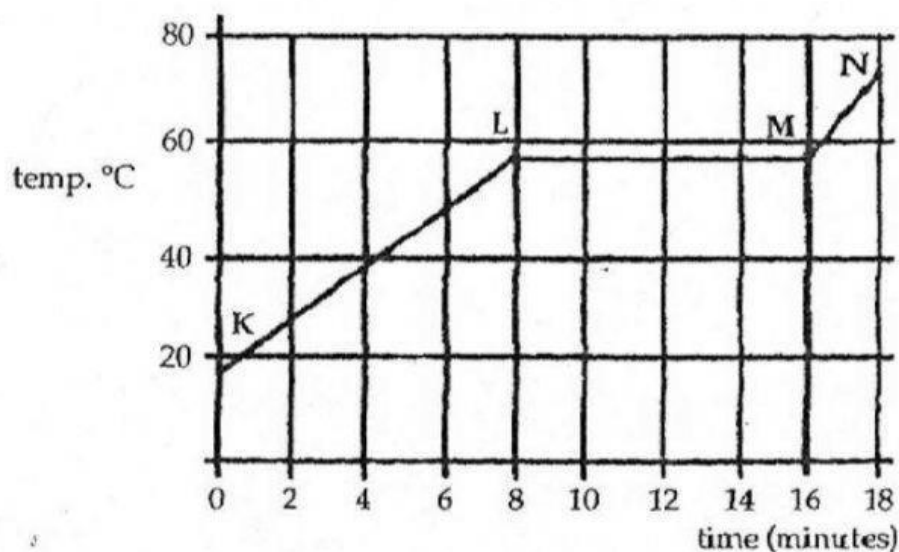


Fig. 4.2

- (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]

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]

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.

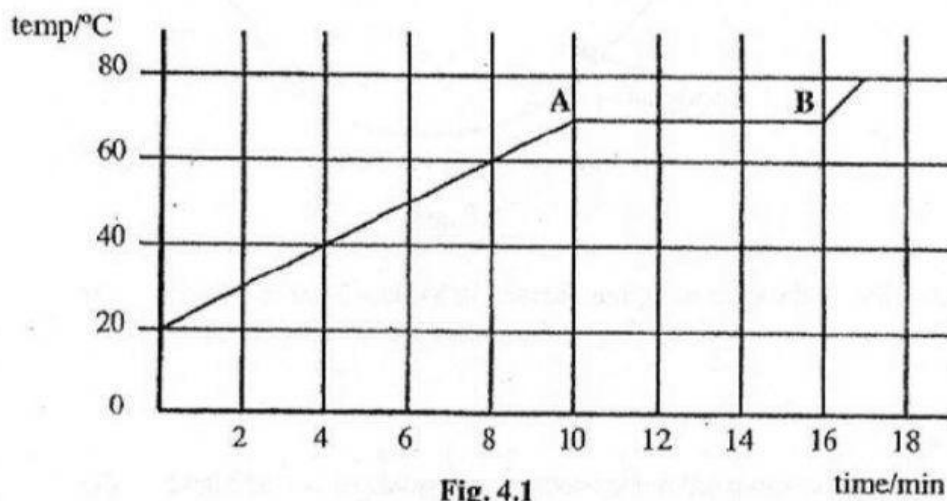


Fig. 4.1

- (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]