

5 Liquid helium boils at 4.2 K.

(a) Convert 4.2 K to a temperature in °C.

(1)

temperature = °C

(b) Liquid helium boils to form helium gas.

(i) State two ways in which the arrangement and motion of the molecules change as the helium becomes a gas.

(2)

1

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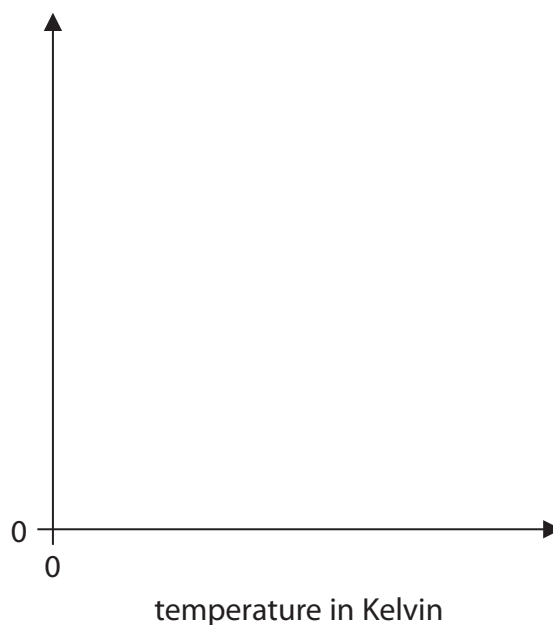
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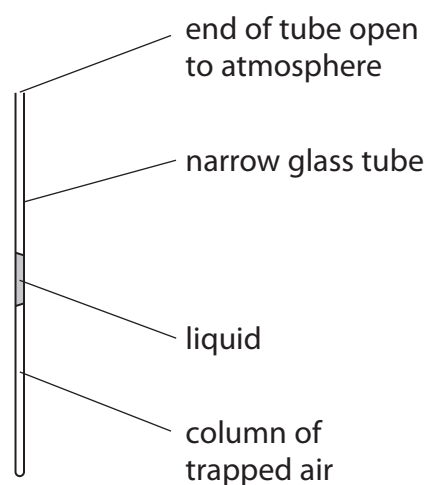
(ii) The average kinetic energy of the molecules in helium gas depends on its Kelvin temperature.

Sketch a graph on the axes below to show this relationship.

(2)

average
kinetic energy

(c) Some air is trapped in a narrow glass tube so that its pressure remains constant.



Describe how this apparatus can be used to investigate the relationship between the temperature and the volume of air at constant pressure.

You may add to the diagram to help your answer.

(4)

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(Total for Question 5 = 9 marks)

