AQA A-LEVEL PHYSICS · 7408

PHYSICS



EXAM QUESTION PACK

3.6.2.3 MOLECULAR KINETIC THEORY MODEL

SCORE	PERCENTAGE
/12	%

STEMUP

These questions belong to AQA, not to us.

The examination questions, mark schemes and examiner reports in this pack were written and published by AQA. They are past assessment materials, reproduced here so that students can revise from them.

What we do not own

STEMUP is not affiliated with AQA and does not own, and makes no claim to own, any of the question, mark scheme or examiner report material in this pack. AQA has not endorsed, approved or been involved in the production of it. AQA and the qualification titles used here belong to their respective owners and appear for identification only.

Where to find the originals

AQA publishes its past papers, mark schemes and examiner reports free of charge. Always check the current specification at aqa.org.uk before you revise, because content and wording can change between series.

If you hold the rights to any material in this pack and would like it amended or removed, contact admin@stemup.co.uk and we will act on it.

Q1.

(a) A number of assumptions are made when explaining the behaviour of a gas using the molecular kinetic theory model.

State **one** assumption about the size of molecules.

_____

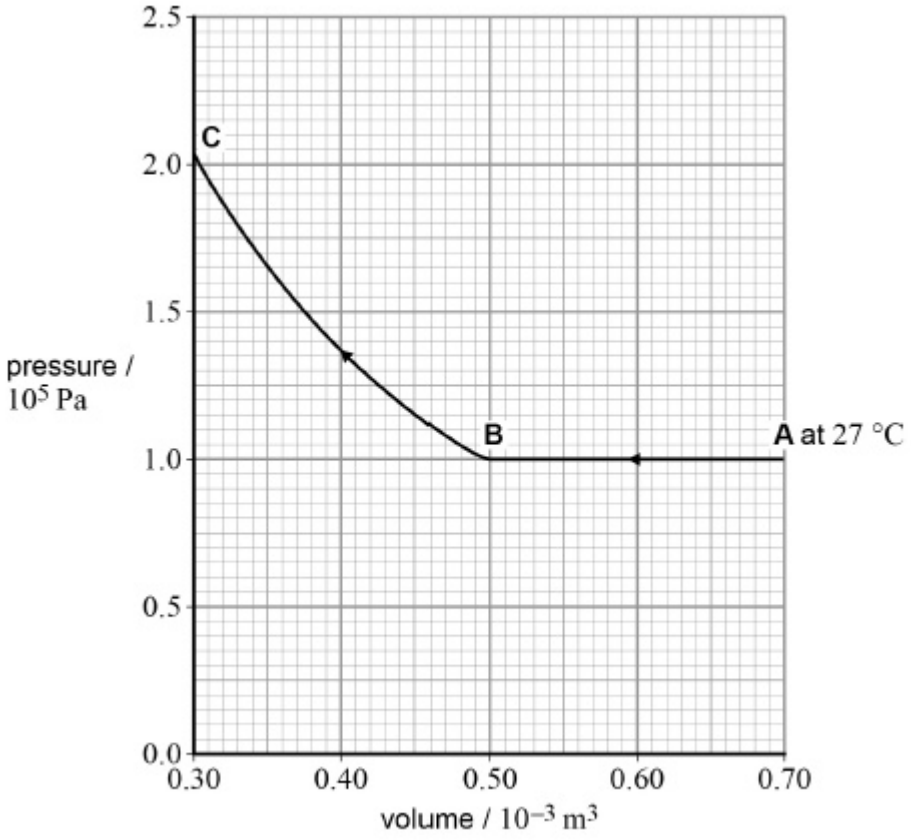
_____

_____

(1)

The graph shows how the pressure changes with volume for a fixed mass of an ideal gas.

At **A** the temperature of the gas is 27 °C. The gas then undergoes two changes, one from **A** to **B** and then one from **B** to **C**.



(b) Calculate the number of gas molecules trapped in the cylinder using information from the initial situation at **A**.

number of molecules = _____

(2)

STEMUP.CO.UK

(c) Calculate, in K, the change in temperature of the gas during the compression that occurs between **A** and **B**.

change in temperature = _____ K

(2)

(d) Deduce whether the temperature of the gas changes during the compression from **B** to **C**.

_____

_____

(2)

(e) Compare the work done on the gas during the change from **A** to **B** with that from **B** to **C** on the graph.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(3)

STEMUP.CO.UK

(Total 10 marks)

Q2.

The composition of a carbon dioxide (CO_2) molecule is one atom of $^{12}_{6}C$ and two atoms of $^{16}_{8}O$.

What is the number of molecules of CO_2 in 2.2 kg of the gas?

A 1.0×10^{22} ⬭

B 3.0×10^{22} ⬭

C 3.0×10^{25} ⬭

D 4.7×10^{25} ⬭

(Total 1 mark)

Q3.

What is the total internal energy of 2.4 mol of an ideal gas which has a temperature of 15 °C?

A 6.0×10^{-21} J ⬭

B 1.4×10^{-20} J ⬭

C 4.5×10^{2} J ⬭

D 8.6×10^{3} J ⬭

(Total 1 mark)

STEMUP.CO.UK