3.9 Kinetic Theory of Gases and the Gas Laws: 10-minute Pack

Total Marks

EDEXCEL 4PH1 · Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 State one assumption of the kinetic theory model for an ideal gas in a sealed container.

(Total for Question 1 is 1 mark)

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2 Convert a temperature of -40°C to kelvin and state whether this temperature is above absolute zero.

(Total for Question 2 is 3 marks)

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3 Convert an absolute temperature of 100 K to degrees Celsius and state whether this temperature is above or below typical laboratory room temperature (about 20°C).

(Total for Question 3 is 2 marks)

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4 A trapped gas at 80 kPa occupies 600 cm^3 at constant temperature. The external pressure is increased to 160 kPa so the gas is compressed further. Calculate the new volume using Boyle's law. Show equation, substitution and unit.

(Total for Question 4 is 3 marks)

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Mark scheme · 3.9 Kinetic Theory of Gases and the Gas Laws: 10-minute Pack

Question 1

particles are in constant random motion	**B1**

Answer: Particles are in constant random motion

Question 2

states the conversion T(K) = T(°C) + 273 and substitutes -40 + 273	**M1**
233 K cao	**A1**
states that 233 K is above absolute zero (0 K)	**B1**

Answer: 233 K, which is above absolute zero

Question 3

uses conversion °C = K - 273	**M1**
100 K = -173°C and this is below room temperature	**A1**

Answer: -173°C, which is well below room temperature

Question 4

states p1V1 = p2V2	**M1**
rearranges and substitutes V2 = p1V1 / p2 = 80 kPa x 600 cm^3 / 160 kPa	**M1**
final answer V2 = 300 cm^3 cao	**A1**

Answer: 300 cm^3

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