

Name _____

Date _____

End of Chapter 5 test

This test and its sample answers have been written by the authors. IB may award marks differently.

Avogadro constant $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$

- 1 Under which conditions do real gases deviate most from the ideal gas model?
 - A low temperature and low pressure
 - B low temperature and high pressure
 - C high temperature and low pressure
 - D high temperature and high pressure
- 2 At the same temperature and pressure, which of the following gases would deviate the most from ideal gas behaviour?
 - A $\text{NH}_3(\text{g})$
 - B $\text{N}_2(\text{g})$
 - C $\text{O}_2(\text{g})$
 - D $\text{CO}_2(\text{g})$
- 3 On graphs plotting the relationships between the pressure, volume and temperature of an ideal gas, which of the following is not true?
 - A A graph of P against $\frac{1}{V}$ will be a straight line.
 - B A graph of PV against V will be a straight line.
 - C A graph of P against T will be a straight line.
 - D A graph of P against V will be a straight line.
- 4 A sample of gas occupies a volume of 454 cm^3 at STP (standard temperature and pressure). How many gas molecules are there in the sample?
 - A 1.2×10^{22}
 - B 1.2×10^{25}
 - C 20
 - D 0.02

- 5 546 cm³ of oxygen gas at STP (standard temperature and pressure) will occupy which volume at the same pressure but heated to 100°C?
- A 2184 cm³
B 746 cm³
C 373 cm³
D 200 cm³
- 6 A gas at 50 kPa and 26.85°C has a volume of 200 cm³. What is its volume at 100 kPa and 326.85°C?
- A 100 cm³
B 200 cm³
C 400 cm³
D 800 cm³
- 7 A sample of 60 cm³ nitrogen gas is cooled from 26.85°C to -23.15°C at constant pressure. What is the final volume of the nitrogen gas?
- A 0 cm³
B 20 cm³
C 40 cm³
D 50 cm³
- 8 X mol of a gas occupies 4 m³ at 1 atm and 250 K. What is the volume for 5x mol of the same gas at 2 atm and 400 K?
- A 3.2 m³
B 4 m³
C 16 m³
D 20 m³
- 9 A party balloon will explode if the pressure of the gas inside the balloon goes over 844 mmHg. If the original gas inside the balloon was at 760 mmHg at 27°C, at what temperature will the balloon pop if the gas is heated up (assuming the volume of the gas does not change)?
- A 30°C
B 60°C
C 90°C
D 100°C

10 0.024 g of an unknown gas has a volume of 175 cm^3 at 8.3 kPa and 77°C .
What is the relative molecular mass of the gas?

- A** 16
- B** 24
- C** 32
- D** 48

11 An unknown gas has a density of 1.76 kg/m^3 at 27°C and 100 kPa.
What is the possible molecular formula of the gas?

- A** CO
- B** C_2H_4
- C** C_3H_8
- D** C_4H_{10}

END OF TEST