

Mr Canning's Gas Law Madness!!!

Remember – Temperature should always be converted into Kelvin. The other units do not need to be changed unless we are using the Ideal Gas equation.

Easy

Medium

Hard

Question 1 - Sketch the graph of Boyle- Marriotte's Law and state any conditions required (constants).

Question 2 - A balloon contains 4 moles of an ideal gas with a volume of 5.0 L. If an additional 8 moles of the gas is added at constant pressure and temperature, what will be the final volume of the balloon? (*Hint: if there are twice as many then volume will be twice as much*)

Question 3 - What is the density (in g/L) of a gas with a molar mass of 60 g/mol at 0.75 atm and 27 °C? (*Hint: First, work out the number of moles if we had 1 litre, then work out the mass*)

Question 4 - State Charles's Law and write the equation.

Question 5 - 4 moles of nitrogen gas are confined to a 6.0 L vessel at 177 °C and 12.0 atm. If the vessel is allowed to expand isothermally to 36.0 L, what would be the final pressure? (*Hint: The number of moles and temperature are constant*)

Question 6 - A 9.0 L volume of chlorine gas is heated from 27 °C to 127 °C at constant pressure. What is the final volume?

Question 7 - The temperature of a sample of an ideal gas in a sealed 5.0 L container is raised from 27 °C to 77 °C. If the initial pressure of the gas was 3.0 atm, what is the final pressure?

Question 8 - A 0.614 mole sample of ideal gas at 12 °C occupies a volume of 4.3 L. What is the pressure of the gas?

Question 9 - A 60.0 L tank of chlorine gas at 27 °C and 125 atm springs a leak. When the leak was discovered, the pressure was reduced to 50 atm. How many moles of chlorine gas escaped?

Question 10 – What assumptions do we make when dealing with Ideal Gases and why do we make them? Explain when these assumptions are most valid (which conditions)?