

Chemistry - 11th Class Chemistry Short Questions Chapter 3 Preparation

Q1. The product of pressure and volume at constant. Temperature and number of moles is a constant quantity. Why?

Ans 1: When the temperature and number of moles of a gas are constant, then the increase of pressure decreases the volume in such a way that PV remains constant ($PV = K$), by doubling the pressure the volume becomes half. We can say that, $P_1V_1 = P_2V_2 = P_3V_3$, at constant temperature and number of moles.

Q2. What are isotherms? What happens to the positions of isotherms when they are plotted at high temperature for a particular gas?

Ans 1: Isotherms are the graphs between pressure and volume at constant temperature and number of moles. This condition is fulfilled by Boyle's law. The word isotherm means "same temperature".

Q3. What are various scales of thermometry?

Ans 1:

Q4. The amount of pressure which is decreased due to the forces of attraction is given by a/V_2 where 'a' is the van der Waal's constant and V is the volume of the vessel.

Ans 1: The pressure p is proportional to the number of molecules which are hitting on the walls of the vessel/area/sec. The number of molecules/area/sec. Is proportional to the density of the gas. P' (lessened pressure) depends upon the number of molecules which are attracting each other.

Q5. Justify that 1 cm^3 of H_2 1 cm^3 of CH_4 at STP will have same number of molecules. When one molecule of CH_4 is 8 times heavier that of hydrogen.

Ans 1: According to Avogadro's law, equal volumes of the ideal gases at same temperature and pressure have equal number of molecules. So 1 cm^3 of H_2 and 1 cm^3 of CH_4 at STP will have an equal number of molecules. No doubt, the molecule of methane is eight times heavier than H_2 , but the sizes of the gas molecules and their masses don't disturb the volumes. The reason is that at STP, one molecule of the gas is at a distance of three hundred times than its diameter.

Q6. Why do we get a straight line when pressures are plotted against inverse of volumes? This straight line changes its positions in the graph by varying the temperature. Justify it.

Ans 1: When the pressure of a gas is plotted against $1/V$, we get a straight line at constant temperature. The reason is that P and $1/V$ are directly proportional to each other, with power unity on both variables. When the temperature changes then value of p changes for same $1/V$ value.

Q7. Charles's law is not obeyed when the temperature is measured on Celsius scale. Justify it.

Ans 1:

Q8. How the value of the general gas constant 'R' can be derived with the help of Avogadro's law?

Ans 1:

Q9. The amount of pressure which is decreased due to the forces of attraction is given by a/V_2 where 'a' is the van der Waal's constant and V is the volume of the vessel.

Ans 1: The pressure p is proportional to the number of molecules which are hitting on the walls of the vessel/area/sec. The number of molecules/area/sec. Is proportional to the density of the gas. P' (lessened pressure) depends upon the number of molecules which are attracting each other.

Q10. How the behavior of real gases is given by van der waal's equation?

Ans 1: The constant 'a' and 'b' called van der Waal's constants give the quantitative measurements of attractive forces and sizes of the gas molecules. These parameters are very important for the real gases.
