Chemistry - 11th Class Chemistry Short Questions Chapter 3 Preparation

Q1. **Lighter gases diffuse more rapidly than heavier gases. Give reason.**

Ans 1: At a given temperature the average. K.E. of different gas molecules are same. Since their masses are different, so their velocities will also be different. The lighter molecules will have greater velocities and so they WI diffuse rapidly.

Q2. **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.

Q3. **Justify that the volume of given mass of a gas becomes theoretically zero at -273°C.**

Ans 1:

Q4. **How the density of an ideal gas doubles by doubling the pressure or decreasing the temperature on Kelvin scale by 1/2?**

Ans 1:

Q5. **What is absolute zero? What happens to real gases while approaching it?**

Ans 1: It is the lowest possible temperature which would have been achieved if the substance remains in the gaseous state. All the real gases are converted to liquids above this temperature. This -273.16°C is called zero absolute or zero Kelvin.

Q6. **In Joule-Thomson effect sudden expansion of the gas molecules needs energy. Why?**

Ans 1: In the compressed state, there are sufficient attractive forces among. The molecules of the gas. During sudden expansion, the energy is required to overcome the intermolecular attractions. Moreover, the molecules need extra energy to run away in vacuum.

Q7. **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.

Q8. **Dalton's law of partial pressures is only applicable to those mixtures of gases which are Ideal and they do not react with each other**

under the given conditions. Why?

Ans 1: Dalton's low is applicable to the mixture of gases. All the gases in the mixture could have no forces of attractions or repulsions, so that they may be able to exert their own pressures independently. This is only possible when the gases are non-polar.

Q9. **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 1cm^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 H2, 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.

Q10. **Why the gases deviate from ideal behavior at high pressure and low temperature?**

Ans 1: When the temperature of the gases are low, the attractive forces become dominant, so gases don't obey the gas laws. When the pressure of the gases are high, collisions become more frequent and force of attraction are created. Moreover, the actual volume of the gas molecules are no more negligible as compared to the volume of the vessel.
