



INDIAN SCHOOL MUSCAT  
CLASS XI

CHEMISTRY WORKSHEET –9  
STATES OF MATTER

1	At a certain temperature, a certain mass of gas occupies a volume of $5\text{dm}^3$ when the pressure is 540mm of Hg. Calculate the pressure in atmosphere when the volume is reduces to $1.5\text{ dm}^3$ at the same temperature.
2	At a constant temperature, a certain mass of gas occupies 7.5 lt when the pressure is 800mm of Hg. Calculate the pressure at which the volume of the gas would be decreases by 35% of its initial volume.
3	The temperature of a given mass of air was reduced from $15^{\circ}\text{C}$ to $-15^{\circ}\text{C}$ . If the initial volume of air was 100ml, what would be its new volume if pressure is maintained a constant?
4	Calculate the volume occupied by 0.5 moles of $\text{CO}_2$ at $-25^{\circ}\text{C}$ and 760mm pressure. [At STP volume is 22.7 lt/mole]
5	The density of a gaseous oxide at 2 bar is the same as that of nitrogen gas measured at 5 bar at a given temperature. Find the molar mass of the oxide.
6	What will be the pressure of a gaseous mixture containing 4.2 g of nitrogen and 1.6 g of methane in a 5 lt flask at $27^{\circ}\text{C}$ ?
7	The mass of 500cc hydrogen at 760mm of Hg and 300K was found to be 0.0409g. Calculate the molecular mass of hydrogen.
8	The density of a gas was found to be 1.56g/lt at 745mm of Hg and $65^{\circ}\text{C}$ . Calculate its molecular mass.
9	38ml of moist nitrogen gas were collected at $27^{\circ}\text{C}$ and 746.5mm of Hg. Calculate the volume in ml of the gas at 273K and 101.3kPa pressure. (aq. tension at $27^{\circ}\text{C}$ = 26.5mm of Hg )
10	A gas occupies $0.15\text{dm}^3$ when collected over water at $15^{\circ}\text{C}$ and 75cm of Hg. In the dry condition the same gas occupies $0.138\text{dm}^3$ at NTP. Calculate aqueous tension.



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11	A 200cc capacity flask contained oxygen at 200mm and another flask of 300cc capacity contained nitrogen at 100mm pressure. The two flasks were connected so that both gases filled the combined volume. What is the partial pressure of each gas in the final mixture and what is the total pressure?
12	Express the following in the units given in brackets. a) 300cm of Hg [atmosphere]    b) 1bar [ kPa]    c) 500000 Pa [ bar] d) 450mm of Hg [ Pa]
13	Critical temperature for carbon dioxide and methane are 31.1oC and -81.9oC respectively. Which of theses has stronger intermolecular forces and why?
14	In terms of Charles laws explain why -273°C is lowest possible temperature?
15	Using the equation of state $PV=nRT$ show that at a given temperature, the density of a gas is proportional to pressure.
16	Derive i. The relation between partial pressure of a gas and its mole fraction. ii. The ideal gas equation iii. Relation between density of a gas and its molar mass
17	What do you mean by ideal and real gases? Why do real gases deviate from ideal behaviour? Write Vander Waals equation for real gases.
20	What type of intermolecular forces are existing between the following i. HCl and H <sub>2</sub> O    ii F <sub>2</sub> molecule    iii Br- and H <sub>2</sub> O    iv CO <sub>2</sub> and ammonia
21	Explain each of the following i. Tyres of automobiles are inflated to lesser pressure in summer than in winter ii. Glycerin is more viscous than water
22	Calculate the root mean square, average and most probable speeds of chlorine molecule at 27°C.



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