

Topic : Gaseous State
Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.6

(3 marks, 3 min.)

M.M., Min.

[18, 18]

Subjective Questions ('-1' negative marking) Q.7 to Q.8

(4 marks, 5 min.)

[8, 10]

- The vapour pressure of water depends upon :
 (A) Surface area of water in container (B) Volume of container
 (C) Temperature (D) All of these
- Among the following substances, the maximum vapour pressure is exerted by :
 (A) Water (b.pt. = 100°C) (B) Acetone (b.pt. = 56°C)
 (C) Ethanol (b.pt. = 78°C) (D) Chloroform (b.pt. = 61°C)
- A sample of air is saturated with benzene (vapour pressure = 100 mm Hg at 298 K) at 298K, 750 mm Hg pressure. If it is isothermally compressed to one third of its initial volume, the final pressure of the system is:
 (A) 2250 torr (B) 2150 torr (C) 2050 torr (D) 1950 torr
- A vessel has nitrogen gas and water vapours in equilibrium with liquid water at a total pressure of 1 atm. The partial pressure of water vapours is 0.3 atm. The volume of this vessel is reduced to one third of the original volume, at the same temperature, then total pressure of the system is : (Neglect volume occupied by liquid water)
 (A) 3.0 atm (B) 1 atm (C) 3.33 atm (D) 2.4 atm
- 60 mL of pure dry O₂ is subjected to silent electric discharge. If only 20% of it is converted to O₃, volume of the mixture of gases (O₂ and O₃) after the reaction is V₁ mL and after passing through turpentine oil is V₂ mL. V₁ and V₂ are :
 (A) 56 mL and 52 mL respectively (B) 48 mL and 40 mL respectively
 (C) 48 mL and 44 mL respectively (D) 56 mL and 48 mL respectively
- 15 mL of a gaseous hydrocarbon was exploded with 72 mL of oxygen. The volume of gases on cooling was found to be 57 mL, 30 mL of which was absorbed by KOH and the rest was absorbed in a solution of alkaline pyrogallol. Then the formula of hydrocarbon is :
 (A) C₃H₄ (B) C₂H₄ (C) C₂H₆ (D) C₃H₆
- 1 litre of a mixture of CO and CO₂ is taken. This mixture is passed through a tube containing red hot charcoal, where the following reaction takes place :

$$\text{CO}_2 + \text{C} \longrightarrow 2\text{CO}$$
 The volume now becomes 1.6 litres. Find the volume of gas sample obtained by passing 1 litre of initial gas mixture through KOH solution.
- 1120 mL of ozonised oxygen (O₂ + O₃) at STP weighs 1.76 g. Calculate the reduction in volume on passing this through alkaline pyrogallol solution

Answer Key

DPP No. # 33

- | | | | | |
|--------|--------------|------------|--------|--------|
| 1. (C) | 2. (B) | 3. (C) | 4. (D) | 5. (D) |
| 6. (B) | 7. CO = 0.4L | 8. 896 mL. | | |

Hints & Solutions

DPP No. # 33

1. (a) V.P. depends on temperature.
3. Pressure of air = $750 - 100 = 650$ mm of Hg
 on compressing $P_f = \text{Hg } 650 \times 3$ mm of Hg
 $= 1950$ mm of Hg
 so $P_T = (1950 + 100) = 2050$ mm of Hg

4. $P_{N_2} + P_{H_2O(v)} = 1 \text{ atm}$, $\therefore P_{H_2O} = 0.3 \text{ atm}$

$$\therefore P_{N_2} = 0.7 \text{ atm}$$

Now new pressure of N_2 in another vessel of volume $V/3$ at same T is given by :

$$P_{N_2} \times \frac{V_1}{3} = 0.70 \times V_1$$

$$\therefore P_{N_2} = 2.1 \text{ atm}$$

Since aqueous tension remains constant, and thus total pressure in new vessel.

$$= P_{N_2} + P_{H_2O} = 2.1 + 0.3 = 2.4 \text{ atm.}$$

5. $3O_2 \rightleftharpoons 2O_3$
 $t = 0$ 60
 $t = t_1$ 48 8
 so $V_1 = 48 + 8 = 56$ and $V_2 = 48$ (on passing through turpentine oil, O_3 will be absorbed.)

7. $CO_2 + C \longrightarrow 2CO$
 At $t = 0$ $x \text{ L}$ $(1 - x) \text{ L}$
 At $t = t$ 0 $2x \text{ L}$
 $1 - x + 2x = 1.6$
 $1 + x = 1.6$
 $x = 0.6 \text{ L}$
 $1 - x = 0.4 \text{ L}$

8. 896 mL.