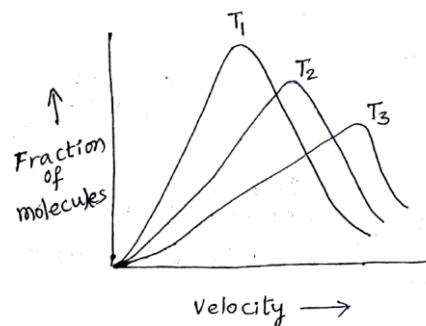


Single Correct Answer Type:

- A gaseous mixture contains 17.6 g CO₂ and 100 g of Neon. If the pressure of gaseous mixture is 10 bar. What is the partial pressure of CO₂ in the mixture? (in bars)
(A) 0.74 (B) 0.925 (C) 0.831 (D) 0.99
- A 2 litre flask contains 1.6 g of methane & 0.5 g H₂ at 27° C . Calculate the total pressure of the mixture?
(A) 3.87 atm (B) 4.31 atm (C) 2.45 atm (D) 5.4 atm
- x moles of carbon monoxide gas at 0.8 atm takes 38 seconds to diffuse through a pinhole, while 'x' moles of an unknown gas XeF_n at 1.6 atm takes 57 seconds to diffuse through same hole. What is the nearest value of 'n'?
(A) 2 (B) 4 (C) 6 (D) 8
- 100 litres of H₂ take 10 min to diffuse out of a vessel. How long will 50 litres of SO₂ take to diffuse out from the same vessel under same conditions?
(A) 56.56 min (B) 35.67 min (C) 47.82 min (D) 25.44 min
- Calculate the molecular weight of gas 'x' which diffuses 4 times faster than gas 'y', which intern diffuses twice as fast as another gas 'Z'. Molecular weight of Z is 128
(D) 2 (B) 4 (C) 8 (D) 16
- Calculate kinetic energy of 8 grams methane gas at 127° C (in K.Joules)
(A) 2.494 (B) 2494.2 (C) 49.88 (D) 4.988
- The temperature at which the rms velocity of a gas becomes thrice of its value at 27° C ?
(A) 887° C (B) 1214° C (C) 2427° C (D) 1160° C
- Calculate the temperature at which the RMS velocity of SO₂ equals that of Helium gas at -253° C
(A) 320° C (B) 47° C (C) 160° C (D) 94° C
- The Average kinetic energy of phosgene gas at 227° C is?
(A) 2.035×10^{-28} ergs (B) 1.035×10^{-13} ergs (C) 2.435×10^{-23} ergs (D) 2.785×10^{-20} ergs
- What is the value of vander waals constant (b), if the diameter of a molecule is 4 Å ?
(A) 80.67 mL.mol⁻¹ (B) 19.6 mL.mol⁻¹ (C) 1.96 mL.mol⁻¹ (D) 9.89 mL.mol⁻¹
- The Vanderwaals equation for CO₂ at low pressure
(A) $PV = RT - Pb$ (B) $PV = RT - \frac{a}{V}$ (C) $PV = RT + \frac{a}{V}$ (D) $PV = RT + Pb$
- Which of the following has more value for a given gas Critical temp (T_C), Invertion temp (Ti), boyle's temp (T_b)
(A) T_b (B) Ti (C) T_C (D) Can't be predicted
- What is the value of $\frac{Pb}{RT}$ of 1 mole of a real gas at a High pressure? (interms of Z); (b = Vanderwaals constant)
(A) Z (B) 1 (C) Z+1 (D) Z-1

14. The Vanderwaals constants for a substance are $a = 150 \text{ K.Pa.dm}^6.\text{mol}^{-2}$ and $b = 20 \text{ cm}^3.\text{mol}^{-1}$. Find critical temperature of the substance
 (A) 276 K (B) 286 K (C) 267 K (D) 293 K
15. 1 mol of CS_2 gas at 97°C occupies a volume of 40 litres. If Vanderwaals constant $a = 20 \text{ L}^2.\text{atm.mol}^{-2}$. Calculate compressibility factor Z , under low pressure
 (A) 0.983 (B) 0.829 (C) 0.952 (D) 0.921

16. In the following graph of Maxwell distribution of molecular velocities Which of the following order of temperatures is correct?



- (A) $T_1 < T_2 < T_3$ (B) $T_1 > T_2 > T_3$
 (C) $T_2 < T_1 < T_3$ (D) $T_1 > T_3 > T_2$

17. The critical temperature & critical pressure of a gas obeying vander waals equation are 30°C and 73 atm respectively. Its vanderwaals constant 'b' in Lit.mol^{-1} is
 (A) 0.500 (B) 0.060 (C) 0.265 (D) 0.042
18. 2 moles of Ammonia occupied a volume of 5 litres at 27°C . Calculate the pressure if the gas obeyed vander waals equation
 ($a = 4.17 \text{ atm.Lit}^2.\text{mol}^{-2}$; $b = 0.0371 \text{ lit.mol}^{-1}$)
 (A) 9.33 atm (B) 18.66 atm (C) 4.66 atm (D) 12.32 atm
19. A gas can be liquefied most suitably at:
 (A) $T = T_C$ and $P < P_C$ (B) $T < T_C$ and $P = P_C$ (C) $T < T_C$ and $P > P_C$ (D) $T > T_C$ and $P > P_C$
20. Attractive forces present in a real gas in the vander waals equation given by
 (A) nb (B) $\frac{n}{V}$ (C) $\frac{an^2}{V^2}$ (D) $-nb$

Numerical Based:

21. The ratio between critical constants is represented as $8P_C V_C = xRT_C$. What is the value of 'x'?
22. The ratio between inversion temperature of a gas & its boyle temperature is _____
23. The ratio between the rms velocity of H_2 at 50 K and that of O_2 at 800 K is _____
24. The rate of diffusion of Helium is how many times greater than that of sulphur dioxide
25. The pressure exerted by one mole of methane gas at 273 K; (in atmospheres)
 [$a = 3.592 \text{ dm}^6.\text{atm.mol}^{-2}$, $b = 0$]

KEY

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|-------|-------|-------|-------|-------|
| 1. A | 2. B | 3. C | 4. A | 5. A |
| 6. A | 7. C | 8. B | 9. B | 10. A |
| 11. B | 12. B | 13. D | 14. C | 15. A |
| 16. A | 17. D | 18. A | 19. C | 20. C |
| 21. 3 | 22. 1 | 23. 1 | 24. 4 | 25. 1 |