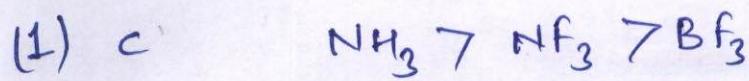


Level 1



(2) d b depends upon Molecular Size.

(3) d

(4) c

$$\frac{P_{\text{CO}_2}}{P_{\text{H}_2}} = \sqrt{\frac{44}{4}} = \sqrt{11} = \frac{3.31}{1}$$

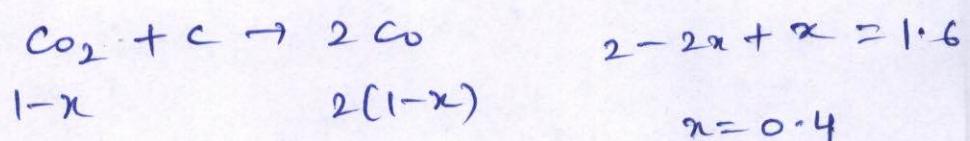
(5) d 'a' is a measure of intermolecular force of attraction.

(6) a Same as ques. 4.

(7) b

$$\text{let } \text{CO}_2 = x \text{ L}$$

(8) d



$$\text{CO}_2 = 0.6 \text{ L} \text{ or } 60\%$$

(9) b balloon will have enlarged

(10) a a will be neglected.

(11) c greater the value of a more easily the gas can be liquified.

(12) c

(13) c $P = \frac{2P_1}{T_1 + T_2}$

(14) a $P_1 > P_2$

(15) b $\frac{T}{P} = \frac{300}{330} \Rightarrow P = 4.4 \text{ atm.}$

(16) b $n_1 \times 300 = n_2 \times 600$

$$n_2 = \frac{n_1}{2}$$

(17) b it will expand.

(18) d K.E is temperature dependent.

~~(19) d~~

(19) ~~d~~ Gases do not have definite shape and volume.

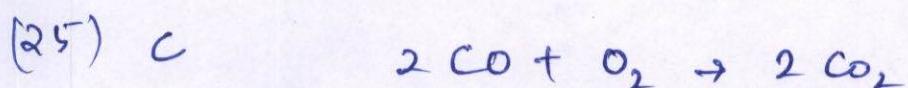
(20) d because Dalton's law of partial pressure is valid for non-reacting gases.

(21) a $P \propto d \times T$

(22) b Charles Law

(23) c

(24) c due to ~~low mass of H₂~~ Graham's law of diffusion.



2 ml 1 ml 2 ml Remaining volume = 10 ml
20 ml 50 ml 20 ml of O₂.
 40 ml

(26) a Z > 1 H₂ & He shows positive deviation.

(27) c $\frac{r_A}{r_B} = \frac{P_A}{P_B} \sqrt{\frac{M_B}{M_A}}$

(28) c $1.25 = \sqrt{\frac{64}{28}} \times \frac{T}{32.3}$

(29) a Average K.E. = $\frac{3}{2} kT = \frac{3}{2} \times 1.38 \times 10^{-23} \times 298$
= $6.17 \times 10^{-21} \text{ kJ}$

(30) c.

$$U \propto \sqrt{\frac{I}{M}} \quad T = \sqrt{\frac{T_{H_2} \times 2.8}{T_{N_2} \times 2}}$$

$$T = \frac{T_{H_2} \times 14}{T_{N_2}}$$

$$T_{N_2} = 2 T_{H_2}$$

(31) a Same as ques. 30

(32) d

~~Urms~~ ~~same as ques~~ $U_{rms} = \sqrt{\frac{3RT}{M}}$

(33) b.

$$\frac{U_1}{U_2} = \sqrt{\frac{1200}{300}} \Rightarrow U_2 = \frac{U_1}{2}$$

(34) c Real gas behave as ideal gas at high temperature and low pressure.

(35) b

$$d \propto \frac{P}{T}$$

(36) b

$$P \times 20 = \frac{120}{40} \times 0.0821 \times 400$$

$$P = 4.92 \text{ atm.}$$

(37) b

$$T_C = \frac{8a}{27Rb} \quad T_B = \frac{a}{Rb}$$

(38) c

Pv against P

(39) c

$$P \times 125.3 = 4 \times 0.0821 \times 398$$

$$P = 1.056 \text{ bar.}$$

(40) d

(41) b

$$P = \frac{202 \times 3 + 101 \times 4}{7} \approx 144 \text{ kPa}$$

(42) b

$$n \propto \frac{PV}{T}$$

(43) d

$$\frac{n_1}{n_2} = \frac{\frac{3 \times 1.65}{493}}{\frac{0.7 \times 1}{383}} \Rightarrow \frac{n_2}{n_1} = \frac{1}{5.49} \Rightarrow \frac{n_1 - n_2}{n_1} = 81.8\%$$

(44) c

at high Pressure $PV = RT + Pb$

(45) b

$$PV = \frac{n}{M} RT \Rightarrow PV = \frac{w}{M} \times RT$$

$$w = 4.22 \text{ g}$$

$$\% \text{ purity} = \frac{4.228}{5} \times 100 \approx 84.6$$

(46) b

(47) d

20 m above sea level.

(48) a

$$PV = 3\left(RT - \frac{99}{V}\right)$$

(49) c

$$\frac{V_{H_2}}{V_{O_2}} = \sqrt{\frac{56 \times 32}{80 \times 2}} = 1$$

(50) a

$$\text{intercept} = \frac{RT}{M}$$

Level-2

(1) b 22.4 L

(2) c $\frac{10}{x} = \frac{1000}{2000} \sqrt{\frac{2}{4}} \Rightarrow x = 20\sqrt{2} \text{ torr min}^{-1}$

(3) a high pressure and low temperature

(4) d Kinetic energy will be same.

(5) b $\frac{t_{\text{gas}}}{t_{\text{H}_2}} = \sqrt{\frac{32}{2}} \Rightarrow \frac{t_{\text{gas}}}{25} = 4 \Rightarrow t_{\text{gas}} = 20 \text{ sec.}$
if gas is oxygen.

(6) b

(7) b high pressure and low temperature

(8) d $a = \text{atm L}^2 \text{ mol}^{-2}$

(9) a $v_{\text{rms}} : v_{\text{av}} : v_{\text{mp}} = \sqrt{\frac{3RT}{M}} : \sqrt{\frac{8RT}{KM}} : \sqrt{\frac{2RT}{M}}$
 $= \sqrt{3} : \sqrt{\frac{56}{22}} : \sqrt{2}$

(10) c $\frac{P'}{P} - 1 = \frac{100}{95} - 1 = \frac{5}{95} \times 100 = 5.26\%$

(11) b $V_f = V_0 \left(1 + \frac{t_c}{273}\right)$

(12) c * same as Ques. 4

(13) c $T_1 > T_2 > T_3 \therefore V \propto T$

(14) a balloon filled with hydrogen due to low molar mass

(15) a $P_{O_2} = P_T \times \chi_{O_2}$

$$= P_T \times \frac{n_{O_2}}{n_{O_2} + n_{CH_4}} = P_T \times \frac{\frac{w}{32}}{\frac{w}{32} + \frac{w}{16}} = P_T \times \frac{1}{3}$$

(16) b $n_1 \times 300 = n_2 \times 400$

$$\frac{n_1}{n_2} = \frac{3}{4} \quad n_2 = \frac{3}{4} n_1$$

(17) d $\frac{n_1}{n_2} = \frac{17}{57} = 0.3$

(18) c

(19) c

(20) d by Graham's Law of Diffusion

(21) (a) ~~boyle~~

(22) c

(23) b same as Ques 12

(24) c

(25) b $22.4 \text{ g} - 22.4 \text{ L}$
 $11.2 - 11.2 \text{ L}$

(26) d $PV = nRT$

$$1 \times V = \left(\frac{16}{32} + \frac{3}{2} \right) \times 0.0821 \times 273$$

$$V = 44.8 \text{ L}$$

(27) a Translational Kinetic energy

(28) d NH_3

(29) a $d \propto \frac{P}{T}$

(30) d

$$V_0 = \sqrt{\frac{2R(1+273)}{M}}$$

$$V_{rms} = \sqrt{\frac{3R \times 2 \times (1+273)}{M/2}} = \sqrt{6} V_0$$

(31) a $d \propto \frac{P}{T}$

(32) a same as Ques. 16

(33) b $P \times 0.44 = \frac{0.2}{X} RT$

$$P \times 0.32 = \frac{0.1}{44} \times RT$$

$$X = 64 \\ \text{SO}_2$$

(34) a $V \propto \sqrt{T}$

(35) a $PV = \frac{0.54}{X} \times R \times 300 ; PV = 0.14 \times R \times 290$

$$X = 79.8$$

Assertion - Reason

- (1) d Real gas behave as ideal gas at low pressure and high temperature.
- (2) d
- (3) c $P \propto T$
- (4) c Intermolecular hydrogen bonding
- (5) d Kinetic energy is Temperature dependent.
- (6) a Nacl is good conductor in aqueous or molten state.
- (7) d
- (8) a same as ques. 2.
- (9) b Hydrogen and Helium shows positive deviation.
- (10) b Ideal gas equation $PV = nRT$

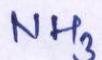
Previous year's Questions

(1) a

$$\text{Ans. } V_{H_2} : V_{O_2} : V_{CH_4} = \frac{1}{2} : \frac{1}{32} : \frac{1}{16}$$

$$16 : 1 : 2.$$

(2) a



(3) b Same as ques 2. Level 2.

(4) d 'd' is the measure of intermolecular force of attraction.

(5) c same as ques 5 Level 2

(6) e Same as ques 5

(7) a $v \propto \sqrt{T}$

(8) b

$$P_{N_2} = \frac{n}{n+n} \times P_T = \frac{1}{2} P_T$$

(9) c

$$P_{CH_4} = \frac{\frac{w}{16}}{\frac{w}{16} + \frac{w}{2}} P_T = \frac{1}{9} P_T$$

(10) d

(11) d it will form homogeneous mixture.

(12) b

(13) a

$$n_1 T_1 = n_2 T_2$$

$$\frac{w_1}{M_1} T_1 = \frac{w_2}{M_2} T_2$$

(14) a Atmalysis

(15) c

$$PV = nRT$$

(16) d

$$d = \frac{PM}{RT}$$

(17) a

$$P 2.46 \times 10 = \frac{28}{28} \times 0.0821 \times T$$

$$T = 299.6 K$$

(18) a

$$K.E. \propto T$$

(19) a $PV = nRT$
 ~~$P \propto V$~~

(20) d same as ques 6

(21) d $\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$

(22) c b is cordume.

(23) a for ideal gas $z=1$

(24) c ~~$P \propto d^2$~~

 $P \propto \frac{d}{M}$

$$\frac{P_A}{P_B} = \frac{d_A}{d_B} \times \frac{M_B}{M_A} = 4$$

(25) d same as ques 7.

(26) c same as ques 25

(27) d greater value of a means more easily the gas can be liquified.

(28) c same as ques. 25.

(29) a ~~same as ques. 29 level I~~. $3\sqrt{3} = \sqrt{\frac{M}{2}} \Rightarrow M = 54$
 $12n + 2n - 2 = 54$
 $n = 4$

(30) b same as ques. 29 Level I

(31) c at high temperature and low pressure

(32) a K.E. remains constant.

(33) b $P \times 3 = 0.6 \times 0.0821 \times 298$

(34) b same as ques. 27.

(35) c below critical temperature gas can be liquify.

(36) c same as ques. 32

(37) c ~~same as~~ by using $P = \frac{d}{M} RT$

(38) a

(39) d $v_{m.p.} = \sqrt{\frac{2RT}{M}}$ $v_{rms} = \sqrt{\frac{3RT}{M}}$

$$v_{rms} = \frac{\sqrt{3}}{\sqrt{2}} \times v_{m.p.} = \frac{\sqrt{3}}{\sqrt{2}} \times 300 = 367 \text{ m/s}$$

(40) a

(41) a b $v_{avg} = \sqrt{\frac{8RT}{\pi M}}$

(42) a $\frac{dp}{P} = -\frac{dw}{V}$

(43) d

(44) a same as ques. 5

(45) a at high pressure $z = 1 + \frac{pb}{RT}$

(46) d

(47) b $z > 1$

(48) c due to attraction between its molecules

(49) d $r \propto \frac{1}{\sqrt{M}}$

(50) a

(51) d

(52) a $\frac{K.E_1}{K.E_2} = \frac{3/2}{4/32} = 12/1$