CHEMISTRY

81. (1)

82. (1)

$T_1 = 273^\circ C = 273 + 273^\circ K = 546^\circ K$

$T_2 = 0^\circ C = 273 + 0^\circ C = 273^\circ K$

$P_1 = 1\ ;\ P_2 = ?$

According to Gay-Lussac's law

$\frac{P_1}{T_1} = \frac{P_2}{T_2} \therefore P_2 = \frac{P_1 T_2}{T_1} = \frac{1 \times 273^\circ K}{546^\circ K}$ atm;

$\frac{1}{2}$ atm.

83. (4)

Because both NO and C_2H_6 have same molecular weights $\left[M_{NO} = M_{C_2H_6} = 30\right]$ and rate of diffusion $\propto$ molecular weight

84. (2)

$d \propto \frac{P}{T}$ the value of $\frac{P}{T}$ is maximum for (2)

85. (1)

$V_{rms} = \sqrt{\frac{3RT}{M}}, V_{av} = \sqrt{\frac{8RT}{\pi M}}$;

$\frac{V_{rms}}{V_{av}} = \sqrt{\frac{3\pi}{8}} = \sqrt{\frac{66}{56}} \Rightarrow \frac{1.086}{1}$

86. (4)

Among these Cl_2 has the highest molecular weight so it will posses lowest root mean square velocity

87. (3)

$V_{rms} = \sqrt{\frac{3RT}{\text{Molecular weight}}}$

i.e., $V_{rms} \propto \frac{1}{\sqrt{M}} \propto (M)^{-\frac{1}{2}}$

88. (1)

$K.E. = \frac{3}{2}.RT = \frac{3}{2}.2.T \because R \approx 2 cal\ K^{-1} mol^{-1}$

$K.E. = 3T$

89. (1)

When pressure is low

$\left[p + \frac{a}{V^2}\right](V - b) = RT$

or $pV = RT + pb - \frac{a}{V} + \frac{ab}{V^2}$

or $\frac{pV}{RT} = 1 - \frac{a}{VRT}$

$Z = -\frac{a}{VRT}\left(\because \frac{pV}{RT} = Z\right)$

90. (2)

At high temperature and low pressure, Vander Waal's equation is reduced to ideal gas equation.

pV = nRT

pV = RT (For 1 mole of gas)

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