Date Planned : __ / __ / __	Daily Tutorial Sheet-6	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-2	Exact Duration :_____

76. At 27°C, hydrogen is leaked through tiny hole into a vessel for 20 minutes. Another unknown gas at the same temperature and pressure as that of H_2 is leaked through the same hole for 20 min. After the effusion of the gases the mixture exerts a pressure of 6 atm. The H_2 content of the mixture is 0.7 moles. If the volume of the container is 3 L, what is the molecular weight of the unknown gas ? ▶

(A)   1088   (B)   10.88   (C)   108.8   (D)   None of these

77. 10 ml of a gaseous organic compound containing C, H and O only was mixed with 100 ml of O_2 and exploded under conditions which allowed the water formed to condense. The volume of the gas after explosion was 90ml. On treatment with NaOH solution, a further contraction in volume of 20 ml was observed. Given the vapour density of the compound as 23, deduce the molecular formula of the compound. All volume measurements were carried out under the same conditions. ▶

(A) C_2H_4O (B) C_2H_6O (C) C_3H_6O (D)   None of these

78. 5 ml of a gas containing only carbon and hydrogen were mixed with an excess of oxygen (30 ml) and the mixture exploded by means of an electric spark. After the explosion, the volume of the mixed gases remaining was 25 ml. On adding a concentrated solution of potassium hydroxide, the volume further diminished to 15 ml of the residual gas being pure oxygen. All volumes have been reduced to N.T.P. Calculate the molecular formula of the hydrocarbon gas. ▶

(A) C_2H_6 (B) C_3H_6 (C) C_2H_4 (D)   None of these

79. Consider the following statements :

The mean free path of gas molecules

I.   decreases with increase in concentration

II.   increases with decrease in pressure at constant temperature

III.   decreases with increase in molecular size

Which of the above statements are correct?

(A)   I , II   (B)   I, III   (C)   II, III   (D)   I, II, III

80. One mole of nitrogen gas at 0.8 atm takes 38 s to diffuse through a pinhole, whereas one mole of an unknown compound of xenon with fluorine at 1.6 atm takes 57s to diffuse through the same hole. Calculate the molecular formula of the compound. ▶

(A) XeF_6 (B) XeF_2

(C) XeF_4 (D)   None of these

81. The average velocity of gas molecules is 400 m/sec. Calculate its rms velocity at the same temperature.

(A) 434.1 ms^{-1} (B) 368.5 ms^{-1}

(C) 489.9 ms^{-1} (D)   None of these

82. A graph is plotted between PV_m along Y-axis and P along X-axis, where V_m is the molar volume of a real gas. Find the intercept along Y-axis. ▶

(A) $(RT)^{-1}$ (B)   RT   (C)   1   (D)   None of these

83. 1.0 litre of N_2 and 7/8 litre of O_2 at the same temperature and pressure were mixed together. What is the relation between the masses of the two gases in the mixture ? ▶

(A)   1   (B)   0.5   (C)   2   (D)   4

84. The volumes of two vessels at same temperature are in the ratio of 2 : 3. One vessel contains H_2 and other N_2 at 600 mm and 900 mm respectively. The final pressure when they are connected together is : (Assume that N_2 and H_2 react to form NH_3)

(A) 620 mm (B) 760 mm (C) 780 mm (D) 800 mm

85. The rate of effusion of two gases 'A' and 'B' under identical conditions of temperature and pressure are in the ratio of 2 : 1. What is the ratio of rms velocity of their molecules if T_A and T_B are in the ratio of 2 : 1 ?

(A) $2 : 1$ (B) $\sqrt{2} : 1$ (C) $2\sqrt{2} : 1$ (D) $1 : \sqrt{2}$