(FR₂)

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University of Mustansiriyah　　　　　　　　　1st Semester-2021

Department of Chemistry　　　　　　　　　　1st Exam-Repeat_1

Q1: Circle the right answer for all of the following:　　　　　　　　(50 points)

1: Calculate the weight of C_2H_4 gas (26 g mol^{-1}) in a 10000 Cm^3 cylinder at 1520 mmHg and 90 $^{\circ}$C.

Answer:　　a) 17.47 g^{-1} mol^{-1}　　　b) 17.47 g^{-1}　　c) 17.47 mol　　d) 17.47 g　　e) 17.47 mg

2: When $V_{Real} > V_{Perfect}$, this means that the gas is:

Answer:　　a) perfect　　　　b) noble　　　　c) real　　　　d) heavy

3: The difference between real and ideal gas equation, that the ideal gas equation is not interested in?

Answer:　　a) p_{gas} & n_{gas}　　b) $V_{container}$ & $p_{attraction}$　　c) V_{gas} & $p_{attraction}$　　d) T_{gas} & p_{gas}

4: Calculate the density of C_2H_4 is placed in a 50000 Cm^3 container at 760 torr and 273 K.

Answer:　　a) 1.16 g^{-1} L^{-1}　　b) 1.16 g^{-1} L　　c) 1.16 g L^{-1}　　d) 1.16 mg L^{-1}

5: Graham's law studies the ---------------- of the gas.

Answer:　　a) flow　　　b) collision　　　c) diffusion　　　d) effusion

6: The right formula of the Dalton's law is?

Answer:　　a) $p_i = \chi_i \sum p_i$　　b) $p_i = \chi_i \sum p_T$　　c) $p_T = \chi_i \sum p_i$　　d) $p_i = \chi_T p_T$

7: The law of Corresponding states is an evidence that the gas is?

Answer:　　a) real　　b) ideal　　c) expanded　　d) compressed　　e) heavy

8: The total mol fractions of atmospheric pressure of air is equal to?

Answer:　　a) zero　　　b) one　　　c) two　　　d) three

9: A gas occupies 30 × 10^{-3} m^3 at 75 $^{\circ}$C and 76 CmHg pressure. What would be its volume at STP?

Answer:　　a) 23.5 dm^3　　b) 23.5 m^2　　c) 23.5 L^{-1}　　d) 23.5 m^{-3}

10: When the value of Z > 1 this means the dominated forces are:

Answer:　　a) attraction　　　b) van der Waal　　c) repulsion　　d) compression

NO ANSWER, why?

Q2: The following data have been observed for 5000 mg of unknown gas at 0 $^{\circ}$C. Calculate the best value of the molar mass of this gas, and what is it?　　　　　(25 points)

p/10^5 Pa	0.75	0.60	0.25
V/dm^3	9.33	11.60	27.50

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by 1.80 dm^3. The p_f and V_f of the gas are 197 atm and 2.14 dm^3, respectively. Calculate the $p_{original}$ of the gas in (a) bar, (b) torr. (25 points)

Sun_28/11/2021　　　　　With best my wishes　　　　　Dr Abduljabbar I. R. Rushdi

Q2/ $P = 0.75$

$V = 9.33 \, dm^3 \rightarrow 9.33 \times 10^{-6} \, L$ ✗

$R = 0.082$

$m = 5000 \, mg \rightarrow \dfrac{5000}{1000} \rightarrow 50 \, g$ (crossed) 5

$T \quad 0 \, °C \rightarrow 273 \, K$

① $PV = n R T \quad n = \dfrac{m}{M} \quad \rightarrow \quad M = \dfrac{m}{PV} R T$

$PV = \dfrac{m}{M} R T$

$M = \dfrac{0.082 \times 273^?}{0.75^? \times 9.33 \times 10^{-6}}$ = units? $\dfrac{?}{?}$ = Result

4: Calculate the density ...

② $P = 0.6$

$V = 11.6 \times 10^{-6} \, L$

$M = \dfrac{0.082 \times 273^?}{0.6 \times 11.6 \times 10^{-6}}$ [Result]?

$\dfrac{10}{25}$ Q₂

③ $P = 0.25$

$V = 27.5 \times 10^{-6}$

$M = \dfrac{0.082 \times 273}{0.25 \times 27.5 \times 10^{-9}}$ [Result]?

Q3/ NO ANSWER Why?

$\dfrac{0}{25}$ Q₃

$\dfrac{0}{25}$ Q₃