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University of Mustansiriyah

Department of Chemistry

1st Semester-2021

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 °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 °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

Q2: The following data have been observed for 5000 mg of unknown gas at 0 °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/ m = 5000 mg
T = 0 —> 273

$$M = \frac{dRT}{P} = \frac{0.22 \times 0.082 \times 273K}{0.75} ?$$

? = units

$$M = \frac{0.22 \times 0.082 \frac{atm \cdot L}{mol \cdot K} \times 273K}{0.60 ?}$$

$$M = \frac{0.22 \times 0.082 \frac{atm \cdot L}{mol \times K} \times 273K}{0.25 ?}$$

$\left(Q_2 \frac{5}{25} \right)$

$P_1 V_1 = P_2 V_2 \longrightarrow P_1 \times 1.80L = 197 atm \times 2.14L$

This is not V_1

$$P_1 = \frac{197 atm \times 2.14L}{1.80L} = \frac{421.58}{1.80} = 234.211 \ atm$$

① $234.211 \times 101.33 \ bar$

$\left(Q_3 \frac{10}{25} \right)$

② 234.211×760

$17800036 ?$