



Physical Chemistry_Chpt_One_Properties of Gases

FR14

45/100 Forty Five

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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 C₂H₄ gas (26 g mol⁻¹) in a 10000 Cm³ 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 C₂H₄ is placed in a 50000 Cm³ container at 760 torr and 273 K.

Answer: a) 1.16 g L⁻¹ b) 1.16 g 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 $30 \times 10^{-3} \text{ m}^3$ at 75 °C and 76 CmHg pressure. What would be its volume at STP?

Answer: a) 23.5 dm³ b) 23.5 m² c) 23.5 L⁻¹ d) 23.5 m³

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?

$p/10^5 \text{ Pa}$	0.75	0.60	0.25	(25 points)
V/dm^3	9.33	11.60	27.50	

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by 1.80 dm³. The p_f and V_f of the gas are 197 atm and 2.14 dm³, respectively. Calculate the $p_{original}$ of the gas in (a) bar, (b) torr. (25 points)

Q2

$P = 0.7 \quad v = 9.33 \quad T = 0^\circ + 273 = 273$? = units

$M = \frac{mRT}{Pv}$

your Eq. is not right

$M = \frac{0.082 \text{ L} \cdot \text{atm} / \text{mol} \cdot \text{K} \cdot \text{mol} \cdot 273}{0.75 \cdot 9.33} = 278.4$?

$M = 278.4 \times 5000 = 1.392$

$M = 432.7 \times 5000 =$

Q2 $\frac{5}{25}$

M =

Q3

$v_c = \frac{v}{v_t}$

$P = \frac{197 \times 3.852}{1.80}$

$v = 1.8 \times 2.14 = 3.852$

$P = 421.8$

$P_1 v_1 = P_2 v_2$

$197 \times 3.852 = P_2 \times 1.8$

Q3 $\frac{5}{25}$

$P_2 = \frac{197 \times 3.852}{1.8}$

Dr. Abdulrahman I. K. Rusydi

With best my wishes

Sun_28/11/2021