



Physical Chemistry, Chpt_One_Properties of Gases

FRG

35 Thirty Five
100

28-11-21
Dr Abduljabbar I. R. Rushdi

Name of a student Abduljabbar I. R. Rushdi Signature _____

No. 15

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°C .

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

2: When $V_{\text{Real}} > V_{\text{Perfect}}$, 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) $V_{\text{container}}$ & $p_{\text{attraction}}$ c) V_{gas} & $p_{\text{attraction}}$ 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) $1.16 \text{ g}^{-1} \text{ L}^{-1}$ b) $1.16 \text{ g}^{-1} \text{ L}$ 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 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)

$p/10^5 \text{ Pa}$	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/

$P = 0.75$? $V = 9.33 \text{ dm}^3$

$P_M = dRT$ $T_K = 273$

$0.75 M = 9.33 \times 0.082 \times 273$?

$M = \frac{9.33 \times 0.082 \times 273}{0.75}$?

$M = 278.4$?

? = units

79

$P_M = dRT$

$0.60 M = 11.60 \times 0.082 \times 273$

$M = \frac{11.60 \times 0.082 \times 273}{0.60}$

$M = 432.7$

$P_M = dRT$

$0.25 M = 27.50 \times 0.082 \times 273$

$M = \frac{27.50 \times 0.082 \times 273}{0.25}$

$M = 246.4$

Q2/25

Q3/25 NO ANSWER why?

V/dm^3	8.33	11.60	27.50
$p/10^5 \text{ Pa}$	0.75	0.60	0.25