



Physical Chemistry_Chpt_One_Properties of Gases

R_3

55 Fifty five
28-11-21

Name of a student _____ Signature _____ No. _____

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) $17.47 \text{ g}^{-1} \text{ mol}^{-1}$ 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) $p_{\text{gas}} \ \& \ n_{\text{gas}}$ **b) $V_{\text{container}} \ \& \ p_{\text{attraction}}$** c) $V_{\text{gas}} \ \& \ p_{\text{attraction}}$ d) $T_{\text{gas}} \ \& \ p_{\text{gas}}$

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/

$$PV = nRT$$

$$T = 273$$

Q2/ 15/25

$$Q3/ \quad V_1 = 1.80 \text{ dm}^3, \quad V_2 = 2.14 \text{ dm}^3, \quad P_2 = 197 \text{ atm}, \quad P_1 = ?$$

$$P_1 V_1 = P_2 V_2$$

$$P_1 (1.80 \text{ dm}^3) = (197 \text{ atm})(2.14 \text{ dm}^3)$$

$$P_1 = \frac{197 \text{ atm} \times 2.14 \text{ dm}^3}{1.80 \text{ dm}^3}$$

$$P_1 = 234.2 \text{ atm}$$

$$d) \quad 1 \text{ atm} = 1 \text{ bar} \Rightarrow P_1 = 234.2 \text{ bar}$$

$$b) \quad 1 \text{ atm} = 760 \text{ torr}$$

$$P_1 = 234.2 \times 760$$

$$P_1 = 177992 \text{ torr}$$

Q3/ 15/25