Physical Chemistry_Chpt_One_Properties of Gases

Name of a student ---- A2 نبأ هيثم كريم ---- Signature ------------------ No. ----

University of Mustansiriyah   1st Semester-2021

Department of Chemistry   1st Exam-paper D

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

1: According to van der Waal's corrections if $V_{Real} < V_{Perfect}$ of any gas that means the gas has:

Answer: a) non-polar particles   b) polar particles   c) small particles   d) big particles

2: Calculate the weight of CO_2 gas (44 g.mol^{-1}) in a 0.5×10^4 mL cylinder at 20×10^2 kPa and 25 °C.

Answer: a) 180 g mol^{-1} b) 180 g   c) 180 mol   d) 180 kg

3: Calculate the density of CO_2 placed in a 22.4×10^3 mL cylinder at 20×10^2 kPa and 298 K.

Answer: a) 36.06 kg L^{-1} b) 36.06 g L^{-1} c) 36.06 g   d) 36.06 L^{-1}

4: According to Graham's law the heaviest gas has?

Answer: a) low rate   b) high rate   c) middle rate   d) low density   NO ANSWER

5: A gas occupies 20 dm^3 at 90 °C and 760 torr pressure. What would be its volume at STP?

Answer: a) 15.04 mL   b) 15.04 dm^3 c) 15.04 L   d) 15.04 dm^{-3}

6: A vessel contains a certain amount of gas at 80×10^5 Pa. The gas is transferred to another tank 20 dm^3 with pressure of 20×10^5 Pa. What should be its volume?

Answer: a) 0.5 L   b) 0.5 Pa L   c) 0.5 Pa dm^3 d) 0.5 L^{-1}

7: According to Avogadro's law n is directly proportional with volume at constant?

Answer: a) p & V   b) T & p   c) T & V   d) p & n   e) R & P

8: Attractive and repulsive forces between particles are present in a?

Answer: a) perfect gas   b) non-ideal gas   c) ideal gas   d) noble gas

9: It can follow the direct proportional between temperature and volume through the law of

Answer: a) Van der Waal   b) Graham   c) Charles   d) Gay-Lussac   NO ANSWER

10: The mol fraction of atmospheric pressure is equal to?

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

Q2: The following data have been observed for 10000 mg of CO_2 gas at 273 K. Calculate the best value of the molar mass of CO_2.   (25 points)

p/10^2 kPa	1.00	2.00	3.00
V/L	4.00	7.50	11.75

Q3: A perfect gas undergoes isothermal expansion, which increases its volume by 2.48 dm^3. The p_i and V_i of the gas are 2×10^2 kPa and 2.14 dm^3, respectively. Calculate the p_f of the gas in (i) bar, (ii) torr. (25 points)

Wed_10/11/2021   Best wishes   Dr Abduljabbar I. R. Rushdi

Q2/

$P_V = nR^{\cdot}T$

~~100×4~~ $= n \times 0.082 \times 273$

$400 = n \times 22.3$

$$n = \frac{400}{22.3}$$

Q3 $V_1 P_1 = V_2 P_2$

~~2.14~~ $2.48 \times 2 \times 10^2 = 2.14 \times P_2$

$$P_2 = \frac{2.48 \times 2 \times 10^2}{2.14} = 23$$

$$P_2 = \frac{23.17}{560} = 0.041 \text{ bar}$$

$$P = \frac{23.17}{101 \, 325} = 2.27$$