-D- F7 A زينب علي دهام / كيمياء مساءي شعبة

Physical Chemistry_Chpt_One_Properties of Gases

30/100 Thirty only

24-11-2021 Wed Zalab Dr. Abdulljabbar I. R. Rushdi

Name of a student Zainab Ali Ibrahim Signature No. 3

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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 0/5

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 0/5

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} 5/5

20/50 Q1

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

Answer: a) low rate b) high rate c) middle rate (d) low density 0/5

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^{-1} (d) 15.04 dm^{-3} 0/5

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 20×10^3 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} 0/5

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 5/5

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 0/5

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 5/5

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

Answer: a) zero (b) one c) two d) three 5/5

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 = 1.00 2.00 3.00 (m)

V = 4.00 7.50 11.75

Where is the weight (m)

$pV = nRT$

$pV = \frac{w}{M}RT$

$M = \frac{wRT}{pV}$

$n = \frac{PV}{RT} = \frac{1\ atm \times 4\ L}{0.082 \frac{atm \times L}{mol \times K} \times 273\ K} = \frac{4\ atm\ L}{22.38 \frac{atm \times L}{mol}} = 0.178\ mol$

No (m)

Unit of molar mass is g. mol^{-1}

n and is not mol

$n = \frac{PV}{RT} = \frac{2\ atm \times 7.50\ (L)}{0.082 \frac{atm \times L}{mol \times K} \times 273} = \frac{15}{22.38} = 0.6702\ mol$

n

$n = \frac{PV}{RT} = \frac{3\ atm \times 11.75}{0.082 \frac{atm \times L}{mol \times K} \times 273} = \frac{35.25}{22.38} = 1.575\ mol$

n

Q2 5/25

Q3/

2 = vinlo

this is not V2 b

$P_1 V_1 = P_2 V_2$

$2 \times 10^2 \times 2.48 = P_2 \times 2.14 \longrightarrow P_2 = \frac{2 \times 10^2\ atm \times 2.48\ (L)}{2.14\ (L)} = 2.3177\ atm$

2.14 2.48

$bar = 2.3177 \times 0.333 = 0.77\ bar$

$torr = 2.3172 \times 0.323 = 0.748\ torr$

Q3 5/25