



(P1)

Physical Chemistry_Chpt_One_Properties of Gases

50 Fifty only
100



Name of a student Saja Abass Alwan Signature [Signature]

24-11-21
Wed Jabbar
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University of Mustansiriyah

1st Semester-2021

Department of Chemistry

1st Exam-paper C

Q1: Circle the right answer for all of the following:

(50 points)

1: If a gas has polar particles then the difference between the volume of this gas is:

- Answer: a) $V_{Real} > V_{Perfect}$ b) $V_{Real} < V_{Perfect}$ c) $V_{Real} = V_{Perfect}$ d) $V_{Real} \neq V_{Perfect}$

2: A gas occupies 60×10^3 mL at 150°C and 760 mmHg pressure. What would be its volume at STP?

- Answer: a) 38.7 mL b) 38.7 dm³ c) 38.7 L⁻¹ d) 38.7 dm³

3: Calculate the weight of H₂O gas (18 g.mol⁻¹) in a 5 L cylinder at 10×10^2 kPa and 373 K.

- Answer: a) 29.40 g mol⁻¹ b) 29.40 g c) 29.40 mol d) 29.40 kg

4: Calculate the density of H₂O placed in a 22400 mL cylinder at 10^5 Pa and 0°C .

- Answer: a) 0.804 kg L⁻¹ b) 0.804 g L⁻¹ c) 0.804 g d) 0.804 L⁻¹

5: According to Graham's law the heaviest gas is?

- Answer: a) H₂O b) CH₄ c) NH₃ d) Cl₂

6: A tank contains a certain amount of gas at 10^5 Pa. The gas is transferred to another tank 40 dm³ with pressure of 200×10^3 Pa. What should be its volume?

- Answer: a) 80 L b) 80 Pa L c) 80 Pa dm³ d) 80 L⁻¹

7: According to Boyle's law the pressure of a gas is inversely proportional with?

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

8: The difference between real and ideal gas, that the real gas interested in?

- Answer: a) V & p b) V & T c) p & n d) T & p

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

- Answer: a) Van der Waal b) Graham c) Charles d) Gay-Lussac

10: The behaviour of real gas is ideal when the value of Z is equal to

- Answer: a) $V_m < V_m^0$ b) $V_m > V_m^0$ c) $V_m = V_m^0$ d) $V_m \neq V_m^0$

Q2: The following data have been observed for 800 mg of nitrogen gas at 273 K. Calculate the best value of the

molar mass of N₂.

$p/10^5$ Pa	0.750	0.500	0.200
V/dm^3	3.0	4.5	7.0

(25 points)

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by 1.80 dm³. The p_i and V_i of the gas are 2×10^2 kPa and 2.14 dm³, respectively. Calculate the p_{original} of the gas in (i) bar, (ii) torr. (25 points)

Wed_10/11/2021

Best wishes

Dr Abduljabbar I. R. Rushdi

25
Q1
50

$\frac{m}{M}$

فصل في الغازات

فصل في الغازات
 $n = \frac{m}{M}$

$n =$

Q2 / $PV = nRT$

(19)

$0.750 \text{ Pa} \times 3.0 \text{ dm}^3 = n \times 0.082 \text{ atm} \cdot \text{L} / \text{mole} \cdot \text{K} \times 273 \text{ K}$

→ should be converted to atm because of R

$n = \frac{0.750 \text{ Pa} \times 3.0 \text{ dm}^3}{0.082 \text{ atm} \cdot \text{L} / \text{mole} \cdot \text{K} \times 273 \text{ K}}$

No Results $n = \frac{m}{M}$

$PV = nRT$

Q2 $\frac{10}{25}$

$0.500 \text{ Pa} \times 4.5 \text{ dm}^3 = n \times 0.082 \text{ atm} \cdot \text{L} / \text{mol} \cdot \text{K} \times 273 \text{ K}$

$n = \frac{0.500 \text{ Pa} \times 4.5 \text{ dm}^3}{0.082 \text{ atm} \cdot \text{L} / \text{mol} \cdot \text{K} \times 273 \text{ K}}$

$n = \frac{m}{M}$

$PV = nRT$

$n = \frac{PV}{RT} \rightarrow \frac{0.200 \times 7.0 \text{ dm}^3}{0.082 \text{ atm} \cdot \text{L} / \text{mol} \cdot \text{K} \times 273 \text{ K}}$

$n = \frac{m}{M}$

$2 \times 10^2 \times 10^3 = 2 \times 10^5$

Q3 / $P_1 V_1 = P_2 V_2$

$P_1 \times 1.80 \text{ dm}^3 = 2 \times 10^5 \text{ Pa} \times 2.14 \text{ dm}^3$

$P_1 = \frac{2 \times 10^5 \text{ Pa} \times 2.14 \text{ dm}^3}{1.80 \text{ dm}^3}$

$P = \frac{2 \times 10^5 \text{ Pa} \times 2.14 \text{ dm}^3}{1.80 \text{ dm}^3}$

Q3 $\frac{15}{25}$