



Physical Chemistry_Chpt_One_Properties of Gases

P19

70/100 Senenly only
2021
Abd
Abduljabbar I. R. Rushdi
19



Name of a student Ayeda Sad mahamed Signature Byeda No. 19

University of Mustansiriyah 1st Semester-2021

Department of Chemistry 1st Exam-paper A

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

1: If a gas has a non-polar particle 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 300000 mL at 130 °C and 760 mmHg pressure. What would be its volume at STP?

Answer: a) 203.22 mL b) 203.22 dm³ c) 204 L d) 204 dm³

3: Calculate the weight of CH₄ (16 g.mol⁻¹) in a 10 L cylinder at 15 x 10⁵ Pa and 307 K.

Answer: a) 95.33 g mol⁻¹ b) 95.33 g c) 95.33 mol d) 95.33 kg

4: Calculate the number of moles for CH₄ in a 10000 mL cylinder at 10⁶ Pa and 32 °C.

Answer: a) 4.5 mol b) 4.0 mol c) 4.0 mmol d) 4.5 mmol

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

Answer: a) H₂O b) CH₄ c) NH₃ d) CO

6: A 20 L tank contains a certain amount of gas at 10⁵ Pa. The gas is transferred to another tank 40 dm³. What should be its pressure?

Answer: a) 0.50 atm b) 50 dm³ c) 50 atm d) 0.50 mmHg

7: According to the Avogadro's law the amount of a substance is directly proportional with?

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

8: The difference between real and ideal gas is one of the following?

Answer: a) law p & high T b) high p & law T c) high p & high T d) law p & law T

9: It can know the density of a gas by applying one of the following?

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

10: If V_m is bigger than V_o then this means the behaviour of a gas is?

Answer: a) Real b) Ideal c) Real & ideal d) Z < 1

Q2: A (28 mol) gas sample has a mass of 10000 mg. The volume of a container is 22 dm³ at a temperature of 76 °C and a pressure of 641 Torr. What is the density of the gas? (25 points)

Q3: An Ar gas is placed in a container at 30 °C at a pressure of 730 torr. What is the volume of the container in ml? (25 points)

Q 2

$n = 28 \text{ mol}, m = 10000 \text{ g}, V = 22 \text{ dm}^3, T = 76^\circ\text{C}, P = 641 \text{ Torr}$

~~$V = \frac{22}{1000} = 0.022 \text{ L}, T = 76 + 273 = 349 \text{ K}, P = \frac{641}{760} = 0.843 \text{ atm}$~~

$M = \frac{m}{n} = \frac{10000}{28} = 357.14 \text{ g/mol}$

~~$d = \frac{PM}{RT} = \frac{0.843 \text{ atm} \times 357.14 \text{ g/mol}}{0.082 \text{ L} \cdot \text{atm} / \text{K} \cdot \text{mol} \times 349 \text{ K}}$~~

~~$d = 128 \text{ g/L}$~~

Q2 20/25

Q 3

$T = 30^\circ\text{C}, P = 730 \text{ Torr}$

~~$T = 30 + 273 = 303 \text{ K}$~~

~~$P = \frac{730}{760} = 0.96 \text{ atm}$~~

~~$PV = nRT$~~

~~$V = \frac{nRT}{P}$~~

~~$V = \frac{1 \text{ mol} \times 0.082 \text{ L} \cdot \text{atm} / \text{K} \cdot \text{mol} \times 303 \text{ K}}{0.96 \text{ atm}}$~~

~~$V = 25.8 \text{ L}$~~

~~$V = 25.8 \times 1000$~~

~~$V = 25800 \text{ mL}$~~

Q2 25/25