



Physical Chemistry-Properties of Gases

46
20-01-2021
Fouady
5/5
Wed
Dr. Abduljabbar I. R. Rushdi



Name of a student محمد عبد الجبار رشدي Signature Dr. Abduljabbar I. R. Rushdi No. 20

University of Mustansiriyah 1st Semester-2021
Department of Chemistry 1st Exam-paper B

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

1: Carbon dioxide is classified as a .
Answer: a) toxic gas b) ideal gas **c) real gas** d) heavy gas 0/5

2: A 2 dm³ container contains a certain amount of gas at 0.5 atm pressure. The gas is transferred to another vessel of volume and the pressure is 0.25 bar. What should be it is Volume?
Answer: a) 0.40 atm **b) 0.40 dm³** c) 0.4 bar d) 4 bar 5/5

3: A gas occupies 400 dm³ at 130 °C and 76 cmHg pressure. What would be it is volume at STP?
Answer: a) 270 L **b) 207 dm³** c) 207 m³ d) 204 cm³ 0/5

4: Calculate the weight of H₂ (2.00 g.mol⁻¹) in a 2 L cylinder at 2.5 atm and 27 °C.
Answer: a) 0.40 mol⁻¹ **b) 0.40 g** c) 0.40 mol g⁻¹ d) 0.4 g mol⁻¹ 0/5

5: Calculate the number of moles for CO₂ in a 10 L cylinder at 8 bar and 27 °C.
Answer: a) 3.25 mmol **b) 3.00 mol** c) 3.00 L d) 2.99 mol 5/5

6: According to Graham's law the lightest gas is?
Answer: a) H₂ **b) O₂** c) N₂ d) CO₂ 0/5

7: According to the Boyle's law the pressure of a gas is inversely proportional with?
Answer: a) mol b) T c) R **d) V** 5/5

8: If a gas has V_m ≠ V^om then this means one of the following?
Answer: a) real b) noble c) ideal **d) heavy** 0/5

9: If RT > pV this means the forces dominated are?
Answer: a) attraction **b) repulsion** c) Van der Waal's d) no one of these 0/5

10: According to Gay-Lussac's law the volume of the gas is?
Answer: **a) constant** b) variable c) equal to zero **d) equal to 22.4 L** 5/5

Q2: Under the same conditions of temperature and pressure, how many times faster will hydrogen effuse compare to carbon dioxide. (25 degree)

Q3: Calculate the density of carbon dioxide (44 g mol⁻¹) at STP. (25 degree)

Q2

$$\frac{V_1 \rho_1}{V_2 \rho_2} = \frac{M_1 \rho_1}{M_2 \rho_2}$$

H₂

$$\frac{V_1 \rho_1}{V_2 \rho_2} = \frac{t_1(\rho_1)}{t_2(\rho_2)}$$

$$Q_2 = \frac{1}{25}$$

Q3

$$P = 1 \text{ atm}$$

$$M = 44 \text{ g/mol}$$

$$R = 0.082 \text{ L-atm/mol}\cdot\text{K}$$

$$T = 273 \text{ K}$$

$$d = ?$$

$$d = \frac{PM}{RT}$$

$$d = \frac{1 \text{ (atm)} \cdot 44 \text{ (g/mol)}}{0.082 \text{ (L-atm/mol}\cdot\text{K)} \cdot 273 \text{ K}}$$

$$= 1.9655 \text{ g/L}$$

$$Q_3 = \frac{25}{25}$$