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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

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

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

4: Calculate the weight of H_2 (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

5: Calculate the number of moles for CO_2 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

6: According to Graham's law the lightest gas is?
Answer: a) H_2 b) O_2 c) N_2 d) CO_2

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

8: If a gas has Vm ≠ Vºm then this means one of the following?
Answer: a) real   b) noble   c) ideal   d) heavy

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

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

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)**

Wed_20/01/2021   **Best wishes**   **Dr Abduljabbar I. R. Rushdi**

Q2/

$$\frac{t_1}{t_2} = \left(\frac{d_2}{d_1}\right)^{\frac{1}{2}}$$

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

Q3/ $\qquad$ $PM = dRT$ $\qquad$ $M = 44\,g \cdot mol^{-1}$

$$1\,atm \times 44\,g \cdot mol^{-1} = d \times 0.082\,L \cdot atm/mol \times K \times 273K$$

$$d = \frac{1\,atm \times 44\,g \cdot mol^{-1}}{0.082\,L \cdot atm/mol \cdot K \times 273\,K}$$

$$d = 1.96 \quad g/L$$

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