Physical Chemistry-Properties of Gases

Name of a student ------------------------ Signature ----------------------- No. 22

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 dm^3 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 dm^3 c) 0.4 bar   d) 4 bar   5/5

3: A gas occupies 400 dm^3 at 130 °C and 76 cmHg pressure. What would be it is volume at STP?
Answer: a) 270 L   b) 207 dm^3 c) 207 m^3 d) 204 cm^3 5/5

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} 0/5

$\frac{20}{50}$

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   0/5

6: According to Graham's law the lightest gas is?
Answer: a) H_2 b) O_2 c) N_2 d) CO_2 5/5

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 Vm ≠ V°m 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   0/5

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)

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

Q 2: //

$$\frac{r_1}{r_2} = \frac{t_1}{t_2} = \left(\frac{m_2}{m_1}\right)^{\frac{1}{2}}$$

$$\frac{t_1}{t_2} = \left(\frac{m_2}{m_1}\right)^{\frac{1}{2}} \rightarrow \text{mol} (M)$$
$$\rightarrow \text{mol} (M)$$

(circled in red) $Q_2 \frac{15}{25}$

$$\frac{t_{H_2}}{t_2} = \left(\frac{44\,?}{2\,?}\right)^{\frac{1}{2}}$$

$$\frac{5}{t_2} = \left(\frac{44}{2}\right)^{\frac{1}{2}}$$

(red) From where you bring this No?

$$\frac{5}{t_2} = 4.6 \checkmark$$ (circled 5)

$$t_2 = 5 \times 4.6$$
$$= 23 \text{ mint}$$

(red) No need

Q 3: //

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

(red) $? \equiv$ Units

$$d = \frac{44 \times 1\,?}{0.082 \times 273\,?}$$

$$PV = nRT$$
$$PV = \frac{m}{M} RT$$
$$PM = \left(\frac{m}{V}\right) RT \rightarrow d$$

$$T = 0\,C° + 273$$
$$= 273$$
$$P = 1\,atm$$

$$d = 1.966 \quad \boxed{Kg \cdot m^3}$$ (red)

(red) g/L

(red circled) $Q_3 \frac{15}{25}$