



Physical Chemistry-Properties of Gases

Handwritten notes: 20-01-2021, 100, Wed, 15, Dr. Abduljabbar I. R. Rushdi, Forty only



Name of a student _____ Signature _____ No. 15

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 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

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

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

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

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

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 ≠ V^0m 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)

Q2)

~~NO ANSWER~~

Q2⁰/₂₅

Q3) ~~$d = ?$, $M = 44 \text{ g.mol}^{-1}$, $P = 1 \text{ atm}$~~
 ~~$T = 0^\circ\text{C} + 273\text{K} = 273\text{K}$~~

~~$PV = nRT$
 $PV = \frac{m}{M} RT$~~

~~$P \cdot M = \frac{m}{V} RT$~~

~~$\therefore P \cdot M = dRT$~~

~~$d = \frac{P \cdot M}{RT} \Rightarrow d = \frac{1 \text{ atm} \times 44 \text{ g.mol}^{-1}}{0.082 \text{ atm.L/mol.K} \times 273 \text{ K}}$~~

~~$d = \frac{44 \text{ g}}{0.082 \text{ L} \times 273} \Rightarrow d = \frac{44 \text{ g}}{22.386 \text{ L}}$~~

~~$\therefore d = 1.9655 \text{ g/L}$~~

Q3¹/₂₅