Physical Chemistry-Properties of Gases

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

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 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 ≠ V^om 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

Q/2/

NO ANSWER

Q2 0/25

Q/3

$$d = \frac{P\,m}{V\,R\,T}$$

$$= \frac{1(\text{atm}) \times 44(\text{g.mol}^{-1})}{22.4(\text{L}) \times 0.082(\text{L.atm/mol.K}) \times 298(\text{K})}$$

$$= \frac{44\ (\text{g})}{24.436\ (\text{L})} = 1.8006\ \text{g/L}$$

1.96 g/L

STP

V = 22.4 L

P = 1 atm

R = 0.082 L.atm/mol.K

T = 273 + 25 = 298 K

Q3 24/25