Thank you

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90/100 Ninty Only

Physical Chemistry-Properties of Gases

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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 5/5

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 X 0/5

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} X Sorry 5/5

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 5/5

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 $Vm \neq V^{o}m$ then this means one of the following?

Answer: (a) real 5/5 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 X 5/5

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

40/50 Q1

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.

$$\frac{\text{rate of effusion of } H_2}{\text{rate of effusion of } CO_2} = \sqrt{\frac{M_{CO_2}}{M_{H_2}}} = \frac{t_{(sec)}\, H_2}{t_{(sec)}\, CO_2}$$

$$\frac{r_{H_2}}{r CO_2} = \sqrt{\frac{44\ g/mol}{2\ g/mol}} = \frac{t_{(sec)}\, H_2}{t_{(sec)}\, CO_2} = 4.69$$

Q2 25/25

$\therefore H_2$ is 4.69 times faster than CO_2

Q3.

$$PV = nRT$$

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

$$d \rightarrow \frac{mRT}{RV} = M$$

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

Q3 25/25

$$d = \frac{44\ g/mol \times 1\ atm}{0.082\ \frac{atm \cdot L}{mol \cdot K} \times 273\ K} = 1.965\ g/L$$

1.965 g/L