Physical Chemistry_Chpt_One_Properties of Gases

Name of a student --- Zena Mohammed Fadi --- 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 points)**

1: A vessel of 5000 mL capacity contains a certain amount of gas at 313 °C and 2 bar pressure. The gas is transferred to another vessel of volume 10000 mL at 40 °C. What should be its pressure?

Answer: **a) 1.0 atm** b) 1.0 mmHg c) 75 cmHg d) 1.5 bar

2: If the particles of a gas are polar that means the difference between p_{ideal} and p_{real} is

Answer: a) low b) equal **c) high**

3: Calculate the temperature of 5000 mmol of a gas occupying 5.0 dm^3 at 3.3×10^5 Pa?

Answer: a) 40.2 °C b) 40.2 K c) 44.2 °C **d) 44.2 K**

4: Calculate the weight of NH_3 (17 $g.mol^{-1}$) in a 4 L cylinder at 8 atm and 300 K.

Answer: a) 22.11 kg **b) 22.11 g** c) 23 K d) 23 °C

5: Calculate the p_C of a gas, if the p_r is 0.44 and p is 1 bar.

Answer: a) 2.27 K **b) 2.27 atm** c) 2.27 L d) 2.27 mol

6: If the attraction forces are calculated, that means the gas is?

Answer: a) real b) noble c) perfect **d) compressed**

7: According to the Dalton's law total mole fraction is equal to?

Answer: a) Σn **b) Σp_i** c) Σp_T d) Σx

8: What is the partial pressure of a gas in a mixture, if the X_i is 1, and the conditions are at STP?

Answer: a) 0.99 torr b) 0.89 bar **c) 0.900 atm** d) 1.01 bar

9: At high pressure the $Z > 1$ which means the dominated forces are?

Answer: a) Van der Waal's b) equal **c) repulsions** d) attractions

10: According to Avogadro's law the amount of a gas at STP is?

Answer: **a) 1.00 mol** b) 2.00 mol c) 1.00 mmol d) 2.00 mmol

Q2: The air inside a flexible 3.5 L container has a pressure of 115 kPa. What should the volume of the container be increased to in order to decrease the pressure to 625 torr? (25 points)

Q3: A 3 dm^3 container holds 0.5 moles of N_2 gas at 42 °C. What is the pressure inside the container? (25 points)

09/11/2021 **Best wishes** **Dr Abduljabbar I. R. Rushdi**

$V\ 3.5L$? $P_1 = 115\ KPa$ $P_2 = 625\ torr$ $V_2 = ?$

P

تحول الضغط الى وحدة atm

$\frac{5}{5}|.0$

0.1325×115

$$\frac{P_1}{P_2} = \frac{V_1}{V_2}$$

$$\frac{\quad}{\quad} = \frac{3.5L}{V_2}$$

$Q_2\ \frac{0}{25}$

Q3

$V = 3\,dm^3$, $n = 0.5\ mol$ - $T = 42C^\circ$

$T = C + 273$

$42 + 273 \longrightarrow 315K$

تحول الوحدات إعطم

$\frac{3}{1000} = 0.003L$

$0.3L$

$PV = NRT$

$$0.003L \times P = 0.5mol \times 0.082 \frac{atm.L}{mol.K} \times 315K$$

$$P = \frac{0.5mol \times 0.082 \frac{atm.L}{mol.K} \times 315K}{0.003L}$$

$P = \boxed{4.305}$ atm

$Q_3\ \frac{20}{25}$