P17

65/100 Sixty Five

23-11-2021 Tue. Dr. Abdulljabbar I. R. Rushdi

Physical Chemistry_Chpt_One_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 points)**

1: A vessel of 5000 mL capacity contains a certain amount of gas at 313 K 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) $\Sigma \chi$

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**

Q2// $V = 3.5\ L$

$P_1 = 115\ kPa$

$V_2 = ?$

$P_2 = 625\ torr$

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$$P_2 = \frac{1\ atm * 625}{760} = 0.822\ atm$$

? = units

$$P_1 \times V_1 = P_2 \times V_2$$

$$115 \times 3.5 = 0.822 \times V_2$$

$$V_2 = \frac{115 \times 3.5}{0.822} = \frac{402.5}{0.822} = 489.6\ L$$

Q3// $V = 3 dm^3$

$n = 0.5\ mole$

$T = 42 ^\circ C$

$P = ?$

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$T = 42 + 273 = 315\ K$

$$PV = nRT$$

$$P = \frac{nRT}{V} = \frac{0.5\ mole * 0.082\ L.atm/mol.K \times 315\ K}{3\ L = 3000\ K}$$

$$= 4.305\ atm$$