Physical Chemistry_Chpt_One_Properties of Gases

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

University of Mustansiriyah — 1st Semester-2021

Department of Chemistry — 1st Exam-paper

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)

Thurs 09/11/2021

Best wishes

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Q2

$V_1 = 3.5\ L$

$V_2 = ?$

$P_1 = 155\ kPa$

$P_2 = 625\ torr$

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

Q2 5/25

Q3

$PV = nRT$

$P = \frac{nRT}{V} \Rightarrow P = \frac{0,5 \times 0,08 \times 42}{3} = 0,56$

? = units

? ? ? → TO K

Q3 10/25