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University of Mustansiriyah abadalKarem

Department of Chemistry

1st Semester-2021

1st Exam-paper B G

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) Σχ

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

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

$$\frac{1.135\,?}{625\,?} = \frac{3.5\,?}{V_2}$$

V = 3.5 L
P = 115 kPa
Torr الى تحويل
P = 115 ÷ 101.325
$P_1 = 1.135$ ~~Torr~~ at
$P_2 = 625$ torr
$V_2 = ?$

$$\frac{1.816 \times 10^{-3}}{} = \frac{3.5}{V_2}$$

torr is not equal to atm

$$V_2 = \frac{3.5}{1.816 \times 10^{-3}}$$

Q2 10/25

$$V_2 = 1.927 \times 10^{+3}\ L$$

Q3

$$PV = nRT \quad \checkmark$$

$$P = \frac{nRT}{V} \quad \checkmark$$

0.5 mol not 1 mol

V = 3 dm³
n = 0.5 × 2
n = 1 mol
This is not true
This is no. of moles and not molar mass

T = 42 ? + 273
T = 315 K
P = ?

$$P = \frac{1\,mol \times 0.082 \times \times \times \times 315\,K}{3\,K}$$

$$P = \frac{0.082 \times 315}{3}$$ atm

$$P = \frac{25.83}{3}$$

15/25 Q3

$$P = 8.61\ atm$$

≤4.305 at