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Physical Chemistry_Chpt_One_Properties of Gases

15/100 Fifteen only
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Also 7ab6
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University of Mustansiriyah

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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 dm³ 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 NH₃ (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) $\sum n$ b) $\sum p_i$ c) $\sum p_T$ d) $\sum \chi$

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 dm³ container holds 0.5 moles of N₂ gas at 42 °C. What is the pressure inside the container? (25 points)

$$Q2 / \frac{P1}{P2} = \frac{V1}{V2} \rightarrow \frac{115}{625 \text{ kPa}} = \frac{3.5 \text{ L}}{V2}$$

$$V2 = \frac{625 \times 3.5}{115} = 2 \text{ L}$$

? = units

سواء قانون بيرنولي العلاقة بين سرعة التدفق ويزداد الحجم يقل

$$Q2 = \frac{5}{2}$$

$$Q3 / \frac{V1}{n1} = \frac{V2}{n2} \rightarrow \frac{3}{0.5} = \frac{42}{n2}$$

Pressure is required not the no. of mols

$$Q4 / Vb \frac{an2}{V2} = (V - nb)$$

$$42b \frac{3 \times 0.5}{42} = (42 - 0.5b)$$

$$P_m = nRT$$

$$P \times 28.00 = 0.5 \times 0.082 \times 42$$

$$P = \frac{0.5 \times 0.082 \times 42}{28}$$