50/100  Fifty only

**Physical Chemistry_Chpt_One_Properties of Gases**

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No. 5

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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 °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**  0/5

**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**  5/5  25/50

**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**  0/5

**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  5/5

**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  5/5

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

Answer: a) real  b) noble  c) perfect  **d) compressed**  0/5

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

Answer: a) Σn  **b) Σp$_i$**  c) Σp$_T$  d) Σχ  0/5

**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  0/5

**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  5/5

**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  5/5

**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)

$V_1$  $P_1$  $P_2$

**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)

V  n  T  $P_?$

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

$$Q2) \quad P_1V_1 = P_2V_2$$

$$\frac{115 \, kPa}{760} = 0.15 \, torr$$

$$0.15 \, torr * 3.5 L = \cancel{625 \, torr} * V_2$$

$$V_2 = \frac{0.15 \, torr * 3.5 L}{625 \, torr} = \boxed{8.4 \times 10^{-4} \, L}$$

this decreased in volume not increased

$$\boxed{Q_2 \frac{10}{25}}$$

$$Q_3) \quad pV = nRT$$

$$P * 3 \times 10^3 \, mol = 0.5 \, mol * 0.082 \, atm \cdot L/mol \cdot k * 315 \, K$$

$$P = \frac{0.5 \, mol * 0.082 \, atm \cdot L/mol \cdot k * 315 \, K}{3 \times 10^3 \, L}$$

$$P = 4.305 \times 10^{-3} \, atm \qquad \boxed{Q_3 \frac{10}{25}}$$