



Physical Chemistry-Properties of Gases

55
100
12-01-2021
Abd Jabbar
Dr. Abduljabbar Rushdi



Name of a student Rasha Hasan Moony Signature stage 2 No. 14

University of Mustansiriyah

1st Semester-2021

Department of Chemistry

1st Exam-paper A

Q1: Circle the right answer for all of the following:

1: A vessel of 50 mL capacity contains a certain amount of gas at 40 °C and 2 bar pressure. The gas is transferred to another vessel of volume 100 mL at 40 °C. What should be its pressure?

Answer: a) 1.0 atm b) 0.85 mmHg c) 0.9 cmHg d) 1 bar (S/S)

2: What is the right formula of the Van der Waals equation?

Answer: a) $p = [nRT/(V-nb)] - a(n^2/V^2)$ b) $P = [nRT/(V-nb)] - V(n^2/a^2)$ c) $p = [nRT/(b-nV)] - a(n^2/V^2)$ d) $P = [nRT/(V-nb)] - a(n^2/V^2)$ (S/S)

3: Calculate the temperature of 4.0 mol of a gas occupying 5.0 dm³ at 3.3 bar?

Answer: a) 50.3 °C b) 48 K c) 51 °C d) 50.3 K (0/5)

4: Calculate the weight of O₂ (32 g.mol⁻¹) in a 4 L cylinder at 9 atm and 281 K.

Answer: a) 50 kg b) 50 g c) 50 K d) 50 °C (S/S)

5: Calculate the p_c of He gas, if the p_r and p is 0.44 and 1 atm respectively

Answer: a) 2.26 K b) 2.26 atm c) 2.26 L d) 2.26 mol (S/S)

6: If the repulsion forces are negligible, that means the gas is?

Answer: a) real b) noble c) perfect d) compressed (S/S)

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

Answer: a) 0.10 mol b) 1.0 mol c) 0.10 d) 1.0 (0/5)

8: What is the partial pressure of a gas in a mixture if the X_i is 0.5, and the conditions are at STP?

Answer: a) 1.5 Pa b) 0.49 bar c) 0.5 atm d) 0.5 bar (S/S)

9: If the value of is 0.082 then the unit of temperature is?

Answer: a) Kelvin b) Celsius c) Fahrenheit d) no one of these (S/S)

10: According to the Avogadro's law the amount of a gas at STP is?

Answer: a) 1.00 mol b) 2.00 mol c) 1.00 L d) 2.00 mol (S/S)

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?

Q3: A 3 dm³ container holds 0.5 moles of N₂ gas at 42 °C. What is the pressure inside the container?

$$P_1 = 115 \text{ kPa}$$

$$V_1 = 3.5$$

$$P_2 = 6.25$$

$$V_2 = ?$$

$$\frac{115}{6.25} \cdot \frac{3.5}{V_2}$$

$$P_1 V_1 = P_2 V_2$$

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

$$= \frac{115 \text{ N}\cdot\text{m}^{-2} \cdot 3.5 \text{ L}}{6.25}$$

$$0.213 \text{ Pa} ?$$

$$= \frac{402.5}{0.213}$$

$$= 1.889 \text{ L}\cdot\text{N}\cdot\text{m}^{-2}$$

$$Q_2 \frac{5}{25}$$

$$PV = nRT$$

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

$$= \frac{0.5 \cdot 0.082 \cdot 315}{3}$$

$$= \frac{12.915}{3}$$

$$= 4.305 \text{ atm}$$

How do you know the unit is atm?

$$\frac{115}{6.25} \cdot \frac{3.5}{V_2}$$

$$Q_3 \frac{5}{25}$$