



Physical Chemistry_Chpt_One_Properties of Gases

P22

75/100 Serenity line

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1st Exam-paper A

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

(50 points)

1: If a gas has a non-polar particle then the difference between the volume of this gas is:

Answer: a) $V_{Real} > V_{Perfect}$ b) $V_{Real} \times V_{Perfect}$ c) $V_{Real} = V_{Perfect}$ d) $V_{Real} \neq V_{Perfect}$

2: A gas occupies 300000 mL at 130 °C and 760 mmHg pressure. What would be its volume at STP?

Answer: a) 203.22 mL b) 203.22 dm³ c) 204 L d) 204 dm³

3: Calculate the weight of CH₄ (16 g.mol⁻¹) in a 10 L cylinder at 15 x 10⁵ Pa and 307 K.

Answer: a) 95.33 g mol⁻¹ b) 95.33 g c) 95.33 mol d) 95.33 kg

4: Calculate the number of moles for CH₄ in a 10000 mL cylinder at 10⁶ Pa and 32 °C.

Answer: a) 4.5 mol b) 4.0 mol c) 4.0 mmol d) 4.5 mmol

5: According to Graham's law the heaviest gas is?

Answer: a) H₂O b) CH₄ c) NH₃ d) CO

6: A 20 L tank contains a certain amount of gas at 10⁵ Pa. The gas is transferred to another tank 40 dm³. What should be its pressure?

Answer: a) 0.50 atm b) 50 dm³ c) 50 atm d) 0.50 mmHg

7: According to the Avogadro's law the amount of a substance is directly proportional with?

Answer: a) p b) T c) R d) V e) n

8: The difference between real and ideal gas is one of the following?

Answer: a) law p & high T b) high p & law T c) high p & high T d) law p & law T

9: It can know the density of a gas by applying one of the following?

Answer: a) Van der Waal's law b) Graham's law c) Charles's law d) Gay-Lussac's law

10: If V_m is bigger than V_m^0 then this means the behaviour of a gas is?

Answer: a) Real b) Ideal c) Real & ideal d) $Z < 1$

Q2: A (28 mol) gas sample has a mass of 10000 mg. The volume of a container is 22 dm³ at a temperature of 76 °C and a pressure of 641 Torr. What is the density of the gas? (25 points)

Q3: An Ar gas is placed in a container at 30 °C at a pressure of 730 torr. What is the volume of the container in ml? (25 points)

Q-2- $w_t = \frac{10000}{1000}$
 $w_t = 10g$

$T = 76^\circ C + 273$
 $T = 349K$

التحويل

$n = \frac{w_t}{M.Wt} \Rightarrow M.Wt = \frac{10g}{28 \text{ mol}} \Rightarrow \therefore M.Wt = 0.358 \text{ mol}$

$d = \frac{PM}{RT}$

? \equiv units

حول الضغط من Torr الى atm

$\frac{641}{760} = 0.843 \text{ atm}$

$d = \frac{0.843 \cdot 0.358 \text{ mol}}{0.082 \cdot 349K}$

$d = \frac{0.295}{28.618} = 0.010$

Q2 $\frac{20}{25}$

Q-3-

$\frac{730}{760} = 0.96 \text{ atm}$ ← تحول ال P من Torr الى atm

$30^\circ C + 273 = 303K$ ← تحول درجة الحرارة الى K

$PV = nRT$

? \equiv units

$(0.96 \text{ atm})(V) = (1) \cdot (0.082) \cdot (303K)$

$(V) = \frac{24.846}{0.96 \text{ atm}} = 25.88125 \text{ L}$

Q3 $\frac{20}{25}$

How? \rightarrow حول ال V الى mL

$V = 25881.25 \text{ mL}$