Thank You So much

88/100 Eighty Eight

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Abd Tusjakb

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Physical Chemistry-Properties of Gases

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Department of Chemistry — **1st Exam-paper B**

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

1: Helium represents a.

Answer: a) real gas b) ideal gas **c) noble gas** d) heavy gas 5/5

2: A 0.2 L container contains a certain amount of gas at 1.0 bar pressure. The gas is transferred to another vessel of volume 0.5 dm^3. What should be it is pressure?

Answer: a) 0.60 atm b) 0.40 dm^3 **c) 0.4 atm** d) 0.4 mmHg 5/5

3: A gas occupies 299 dm^3 at 127 °C and 760 mm pressure. What would be it is volume at STP?

Answer: **a) 199.8 L** b) 199 dm^3 c) 200 L d) 204 dm^3 0/5

4: Calculate the weight of CH_4 (16 $g.mol^{-1}$) in a 10 L cylinder at 15 atm and 34 °C.

Answer: a) 95.33 g mol^{-1} **b) 95.33 g** c) 85.80 mol d) 86.65 g 5/5

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5: Calculate the number of moles for CH_4 in a 12 L cylinder at 14 bar and 28 °C.

Answer: **a) 6.8 mol** b) 6.9 mol c) 6.5 mol d) 6.7 mol 5/5

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

Answer: a) H_2 b) O_2 c) N_2 **d) CO_2** 5/5

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** 5/5

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

Answer: a) p & V b) T & n c) **d) attraction forces & volume of a gas** 5/5

9: It can know the molecular mass of un known gas by applying one of the following?

Answer: a) Boyle's law **b) Graham's law** c) Charles's law d) Gay-Lussac's law 5/5

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

Answer: **a) Real** b) Ideal c) Real & ideal d) Z = 0 5/5

Q2: A gas sample has a mass of 9.98 g. Its volume is 21.6 L at a temperature of 75.46 °C and a pressure of 641 Torr. Calculate its molar mass.

Q3: A 1.3 mole of Ar gas is placed in a container at 27 °C at a pressure of 725 torr. What is the volume of the container in ml?

12/01/2021 **Best wishes** **Dr Abduljabbar I. R. Rushdi**

Q2/ wt = 9.98 g.

V = 21.6 L

T = 75.46°C + 273 = 348.46 K

P = 641 Torr $\Rightarrow$ (atm $\times \frac{641 \text{ Torr}}{760 \text{ Torr}}$

P = 0.84342 atm

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PV = nRT

0.84342 atm × 21.6 L = n × 0.082 (L.atm/mol.K) × 348.46 K

18.2178 = n 28.573

$n = \frac{18.2178}{28.573?}$? = units

$= 0.63758$ mol.

$n_{(mol)} = \frac{wt(g)}{M.wt\ g/mol} \Rightarrow M.wt_{g/mol} = \frac{9.98\ g}{0.63758\ mol} = 15.6529\ g/mol$

Q3/ n = 1.3 mol

T = 27 + 273 = 300 K.

P = 725 torr $\Rightarrow$ (atm $\times \frac{725 \text{ torr}}{760 \text{ torr}}$) = 0.95394 atm.

V = ? ml

PV = nRT

0.95394 atm × V = 1.3 mol × 0.082 (L.atm/mol.K) × 300 K

0.95394 × V = 31.98 L

$V = \frac{0.95394}{31.98} = 0.0298$ L

V = (ml × 0.0298 K × 1000 K)

V = 29.8 mL.

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