60/100 Sixty only

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Physical Chemistry-Properties of Gases

Name of a student ---------- Signature ---------- No. 3

University of Mustansiriyah — **1st Semester-2021**

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

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

Q1 40/50

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

Answer: a) H_2 b) O_2 c) N_2 d) CO_2 0/5

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

I cannot follow your answer

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.

$75.46 + 273 = 348.46$ K

$PV = nRT$

$0.84 \times 21.6 = n \times 0.082 \times 348.46$

$18.144 = n \times 28.57$

$n = \frac{18.144}{28.57} = 0.63$ mol

$P = \frac{1 \times 641}{760} = 0.84$ atm

$n = \frac{m}{M} \Rightarrow 0.63 = \frac{9.98}{M}$

$M = 15.84$

Q2 5/25

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?

$n = 1.3$ mol

$T = 273 + 27 = 300$ K

$\frac{1 \times 725}{760} = \frac{725}{760} = 0.95$ atm

$PV = nRT$

$0.95 \times V = 1.3 \times 0.082 \times 300$

$V = \frac{1.3 \times 0.082 \times 300}{0.95} = \frac{31.98}{0.95} = 33.66$ L

$V(mL) = \frac{V(L)}{1000} = \frac{33.66}{1000} = 0.033$ mL

Q3 15/25

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