75/100 Seventy Five

Physical Chemistry_Chpt_One_Properties of Gases

Name of a student ———— زهراء نجم حيدر ————Signature ———— No. ————

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University of Mustansiriyah   1st Semester-2021

Department of Chemistry   1st Exam-Repeat_1

Q1: Circle the right answer for all of the following: 35 (50 points)

غاز M حجم درجة الحرارة ضغط

1: Calculate the weight of C_2H_4 gas (26 g mol⁻¹) in a 10000 Cm³ cylinder at 1520 mmHg and 90 °C.

Answer: الوزن a) 17.47 g⁻¹ mol⁻¹   b) 17.47 g⁻¹   c) 17.47 mol   **d) 17.47 g**   e) 17.47 mg

عندما يكون الحجم الغاز الحقيقي اكبر من المثالي

2: When $V_{Real} > V_{Perfect}$, this means that the gas is:

Answer: a) perfect   b) noble   **c) real**   d) heavy

الفرق الحقيقي و الغاز الحقيقي بين الغاز المثالي

3: The difference between real and ideal gas equation, that the ideal gas equation is not interested in?

Answer: a) p_{gas} & n_{gas} b) $V_{container}$ & $p_{attraction}$ **c) V_{gas} & $p_{attraction}$**   d) T_{gas} & p_{gas}

احسب كثافة حجم

4: Calculate the density of C_2H_4 is placed in a 50000 Cm³ container at 760 torr and 273 K.

Answer: a) 1.16 g⁻¹ L⁻¹   b) 1.16 g⁻¹ L   **c) 1.16 g L⁻¹**   d) 1.16 mg L⁻¹

Q1 45/50

5: Graham's law studies the ---------------- of the gas.

Answer: a) flow   b) collision   c) diffusion   **d) effusion**

قانون الصيغة الصحيحة

6: The right formula of the Dalton's law is?

Answer: **a) $p_i = \chi_i \sum p_i$**   b) $p_i = \chi_i \sum p_T$ c) $p_T = \chi_i \sum p_i$ d) $p_i = \chi_T p_T$

يكون الحالات المنطابقة مثال لغازات

7: The law of Corresponding states is an evidence that the gas is?

Answer: **a) real**   b) ideal   c) expanded   d) compressed   e) heavy

مجموع الكسور المولية

8: The total mol fractions of atmospheric pressure of air is equal to?

Answer: a) zero   **b) one**   c) two   d) three

غاز سؤال   ماهو الحجم لظروف المثالية

9: A gas occupies 30 × 10⁻³ m³ at 75 °C and 76 CmHg pressure. What would be its volume at STP?

Answer: a) 23.5 dm³   b) 23.5 m²   **c) 23.5 L⁻¹**   d) 23.5 m⁻³

10: When the value of Z > 1 this means the dominated forces are:

Answer: a) attraction   b) van der Waal   **c) repulsion**   d) compression

الوزن القيم السالبة الوزن احسب افضل

Q2: The following data have been observed for 5000 mg of unknown gas at 0 °C. Calculate the best value of the molar mass of this gas, and what is it?   (25 points)

p/10⁵ Pa	0.75	0.60	0.25
V/dm³	9.33	11.60	27.50

غاز سؤال وضوحة

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by 1.80 dm³. The p_f and V_f of the gas are 197 atm and 2.14 dm³, respectively. Calculate the $p_{original}$ of the gas in (a) bar, (b) torr. (25 points)

P_1

$V_r = \dfrac{U}{C}$

Sun_28/11/2021   With best my wishes   Dr Abduljabbar I. R. Rushdi

$PM = dRT$

Q2∘ -

①

② $M = \dfrac{PMV}{RT}$

atm كانت إذا Pabقيمة نحول

$1 atm = 101,325 Pa$

$10^5 Pa = 1 atm$

$P_{(atm)} = \dfrac{0.75}{101,325} = 0.007 atm$

$M = \dfrac{(0.006 atm)(5000)(11.60L)}{(0.082)(0)}$

$M = 348 g$

L إلى V نحول ثم L إلى mcm نحول

$1L = 1 cm^3 = 9.33L$

③ $M = \dfrac{PMV}{RT}$

? M الذري الوزن نخبر

$PM = \dfrac{m}{PV} RT$

$M = \dfrac{PMV}{RT}$ $M = \dfrac{mRT}{\rho}$

$M = \dfrac{(0.002 atm)(5000 mg)(27.5L)}{(0.082)(0)}$

$M = 275 g$

$m = \dfrac{(0.007)(5000)(9.33)}{(0.082 \, mol)(0)} = 326.5 g$

The equation have asked about molar mass

قيمة كانت فقط 275g هي صحيحة القيمة

Q③ :- $V_r = \dfrac{V}{V_c}$

$1L = 1 cm$

$1L = 1.80 L$

$1L = 2.14 L$

$1.80 = \dfrac{U}{2.14}$

$V = 3.9L$ الحجم

$P_1 V_1 = P_2 V_2$

$P_1(3.9) = (197)(2.14)$

$\dfrac{3.9 P_1}{3.9} = 42.158$ 421.58

$\dfrac{2.14 +}{520}{}$
$\dfrac{}{394}$
$Q3\ 25$

$P_1 = 108.09 atm$