



F9

Physical Chemistry_Chpt_One_Properties of Gases

25-11-21
25/100
Abduljabbar I. R. Rushdi



Name of a student Saja Ahmad Hussain Signature

No. 23

University of Mustansiriyah

1st Semester-2021

Department of Chemistry

1st Exam-paper E

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

(50 points)

1: If a gas has polar particles then the difference between the volume of this gas is:

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

2: A gas occupies 60×10^3 mL at $150^\circ C$ and 760 mmHg pressure. What would be its volume at STP?

Answer: a) 38.7 mL b) 38.7 dm^3 c) 38.7 L^{-1} d) 38.7 dm^{-3}

3: Calculate the weight of H_2O gas (18 g.mol^{-1}) in a 5 L cylinder at 10×10^2 kPa and 373 K.

Answer: a) 29.40 g mol^{-1} b) 29.40 g c) 29.40 mol d) 29.40 kg

4: Calculate the density of H_2O placed in a 22400 mL cylinder at 10^5 Pa and $0^\circ C$.

Answer: a) 0.804 kg L^{-1} b) 0.804 g L^{-1} c) 0.804 g d) 0.804 L^{-1}

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

Answer: a) H_2O b) CH_4 c) NH_3 d) Cl_2

6: A tank contains a certain amount of gas at 10^5 Pa. The gas is transferred to another tank 40 dm^3 with pressure of 200×10^3 Pa. What should be its volume?

Answer: a) 80 L b) 80 Pa L c) 80 Pa dm^3 d) 80 L^{-1}

7: According to Boyle's law the pressure of a gas is inversely proportional with?

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

8: The difference between real and ideal gas, that the real gas interested in?

Answer: a) V & p b) V & T c) p & n d) T & p

9: It can follow the direct proportional between temperature and pressure through the law of

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

10: The behaviour of real gas is ideal when the value of Z is equal to

Answer: a) $V_m < V_m^0$ b) $V_m > V_m^0$ c) $V_m = V_m^0$ d) $V_m \neq V_m^0$

Q2: The following data have been observed for 800 mg of nitrogen gas at 273 K. Calculate the best value of the

molar mass of N_2 .

p/ 10^5 Pa	0.750	0.500	0.200
V/ dm^3	3.0	4.5	7.0

(25 points)

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by 1.80 dm^3 . The p_f and V_f of the gas are 2×10^2 kPa and 2.14 dm^3 , respectively. Calculate the $p_{original}$ of the gas in (i) bar, (ii) torr. (25 points)

Thur_11/11/2021

Best wishes

Dr Abduljabbar I. R. Rushdi

Q15
150

5/5

5/5

5/5

Q2//

77

Sol 1- $PV = nRT$

~~$n = \frac{m}{M} = \frac{800}{32}$~~

~~$0.750 \times 3.0 = 25 \times 0.082 \times 273$~~
 ~~$= 2.25 = 2.05 \times 273 = 2.25 = 559$~~
 ~~$= \frac{2.25}{559} = 0.004$~~

2- $PV = nRT$

? = units

Q2 10/25

~~$0.500 \times 4.5 = 25 \times 0.082 \times 273$~~
 ~~$= 2.25 = 2.05 \times 273 = 2.25 = 559 = \frac{2.25}{559}$~~

3- $PV = nRT \Rightarrow 0.200 \times 7.0 = 25 \times 0.082 \times 273$
 $\Rightarrow 1.4 = 2.05 \times 273 = \frac{1.4}{559} = 0.002$

Q3//

Sol

$P_r = \frac{P}{P_c} = \frac{2 \times 10^2}{2.14} = 9.34$

Q3 2/5