



F38

Physical Chemistry\_Chpt\_One\_Properties of Gases

40 Priority Only  
25/11/21  
Dr Abduljabbar I. R. Rushdi



Name of a student Ali mazin Saeed Signature \_\_\_\_\_ No. 2

University of Mustansiriyah

1<sup>st</sup> Semester-2021

Department of Chemistry

1<sup>st</sup> Exam-paper F

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

(50 points)

1: According to van der Waal's corrections if  $V_{Real} < V_{Perfect}$  of any gas that means the gas has:

Answer: a) non-polar particles b) polar particles c) small particles d) big particles

2: Calculate the weight of  $CO_2$  gas ( $44 \text{ g mol}^{-1}$ ) in a  $0.5 \times 10^4 \text{ mL}$  cylinder at  $20 \times 10^2 \text{ kPa}$  and  $25^\circ C$ .

Answer: a)  $180 \text{ g mol}^{-1}$  b) 180 g c) 180 mol d) 180 kg

3: Calculate the density of  $CO_2$  placed in a  $22.4 \times 10^3 \text{ mL}$  cylinder at  $20 \times 10^2 \text{ kPa}$  and  $298 \text{ K}$ .

Answer: a)  $36.06 \text{ kg L}^{-1}$  b)  $36.06 \text{ g L}^{-1}$  c) 36.06 g d)  $36.06 \text{ L}^{-1}$

4: According to Graham's law the heaviest gas has?

Answer: a) low rate b) high rate c) middle rate d) low density

5: A gas occupies  $20 \text{ dm}^3$  at  $90^\circ C$  and  $760 \text{ torr}$  pressure. What would be its volume at STP?

Answer: a) 15.04 ml b)  $15.04 \text{ dm}^3$  c)  $15.04 \text{ L}^{-1}$  d)  $15.04 \text{ dm}^3$

6: A vessel contains a certain amount of gas at  $80 \times 10^5 \text{ Pa}$ . The gas is transferred to another tank  $20 \text{ dm}^3$  with pressure of  $20 \times 10^5 \text{ Pa}$ . What should be its volume?

Answer: a) 0.5 L b) 0.5 Pa L c)  $0.5 \text{ Pa dm}^3$  d)  $0.5 \text{ L}^{-1}$

7: According to Avogadro's law n is directly proportional with volume at constant?

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

8: Attractive and repulsive forces between particles are present in a?

Answer: a) perfect gas b) non-ideal gas c) ideal gas d) noble gas

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

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

10: The mol fraction of atmospheric pressure is equal to?

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

Q2: The following data have been observed for 10000 mg of  $CO_2$  gas at  $273 \text{ K}$ . Calculate the best value of the molar mass of  $CO_2$ .

p/ $10^2 \text{ kPa}$	1.00	2.00	3.00
V/L	4.00	7.50	11.75

(25 points)

Q3: A perfect gas undergoes isothermal expansion, which increases its volume by  $2.48 \text{ dm}^3$ . The  $p_i$  and  $V_i$  of the gas are  $2 \times 10^2 \text{ kPa}$  and  $2.14 \text{ dm}^3$ , respectively. Calculate the  $p_f$  of the gas in (i) bar, (ii) torr. (25 points)

Thur\_11/11/2021

Best wishes

Dr Abduljabbar I. R. Rushdi

Q2 //  $PV = nRT$

$mg \rightarrow g (\div 1000) \Rightarrow 10000 mg \rightarrow 10g$

①  $PV = \frac{m}{M} RT$

$KPa \rightarrow Pa (\times 1000) \Rightarrow 1 \times 10^2 KPa \rightarrow 100000 Pa$

$100000 \times 4 = \frac{10}{M} \times 0.082 \times 273$

$400000 = \frac{10}{M} \times 22.386$

$400000 = \frac{223.86}{M}$

$223.86 = 400000 M$

$M = 5.59 \times 10^{-4} \text{ mol}$

②

$2 \times 10^2 KPa \rightarrow 200000 Pa$

$200000 \times 7.5 = \frac{10}{M} \times 0.082 \times 273$

$1500000 = \frac{10}{M} \times 22.386$

$1500000 = \frac{223.86}{M}$

$M = 1.49 \times 10^{-4} \text{ mol}$

③

$3 \times 10^2 KPa \rightarrow 300000 Pa$

$300000 \times 11.75 = \frac{223.86}{M}$

$3525000 = \frac{223.86}{M}$

$M = 6.35 \times 10^{-5} \text{ mol}$

What is the purpose?

Q3 //

Q3 25

NO ANSWER  
Why?

use 10 to represent the no. of moles

Q2 25