



F1

Physical Chemistry\_Chpt\_One\_Properties of Gases

25-11-21 5/100 Fire only  
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1<sup>st</sup> Exam-paper E

(50 points)

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

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  $60 \times 10^3$  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<sup>3</sup> c)  $38.7$  L<sup>-1</sup> d)  $38.7$  dm<sup>3</sup>

3: Calculate the weight of H<sub>2</sub>O gas ( $18 \text{ g.mol}^{-1}$ ) in a  $5$  L cylinder at  $10 \times 10^2$  kPa and  $373$  K.  
Answer: a)  $29.40 \text{ g mol}^{-1}$  b)  $29.40$  g c)  $29.40 \text{ mol}$  d)  $29.40$  kg

4: Calculate the density of H<sub>2</sub>O placed in a  $22400$  mL cylinder at  $10^5$  Pa and  $0^\circ C$ .  
Answer: a)  $0.804 \text{ kg L}^{-1}$  b)  $0.804 \text{ g L}^{-1}$  c)  $0.804 \text{ g L}^{-1}$  d)  $0.804 \text{ L}^{-1}$

5: According to Graham's law the heaviest gas is?  
Answer: a) H<sub>2</sub>O b) CH<sub>4</sub> c) NH<sub>3</sub> d) Cl<sub>2</sub>

6: A tank contains a certain amount of gas at  $10^5$  Pa. The gas is transferred to another tank  $40 \text{ dm}^3$  with pressure of  $200 \times 10^3$  Pa. What should be its volume?  
Answer: a)  $80 \text{ L}$  b)  $80 \text{ Pa L}$  c)  $80 \text{ Pa dm}^3$  d)  $80 \text{ L}^{-1}$

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 <sub>2</sub>	p/10 <sup>5</sup> Pa	0.750	0.500	0.200
V/dm <sup>3</sup>		3.0	4.5	7.0

(25 points) NO ANSWER why? Q2 25

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by  $1.80 \text{ dm}^3$ . The p<sub>r</sub> and V<sub>r</sub> of the gas are  $2 \times 10^2 \text{ kPa}$  and  $2.14 \text{ dm}^3$ , respectively. Calculate the p<sub>original</sub> of the gas in (i) bar, (ii) torr. (25 points)

Thur\_11/11/2021

Best wishes

Dr Abduljabbar I. R. Rushdi

Q3 25 NO ANSWER why?