



F13

Physical Chemistry_Chpt_One_Properties of Gases

30
100
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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°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 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°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 .

$p/10^5 \text{ Pa}$	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_r and V_r 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

20
50

Q2/

$$PV = nRT$$

$$n = \frac{V}{P} = \frac{3,0}{0,750} \rightarrow = 4$$

$$n = \frac{V}{P} = \frac{4,5}{0,500} \rightarrow = 9$$

$$n = \frac{V}{P} = \frac{7,0}{0,200} \rightarrow = 35$$

$$n = \frac{0,750 \cdot 3,0}{0,082 \cdot 273} = \text{?}$$

$$n = \frac{0,500 \cdot 4,5}{0,082 \cdot 273} = 0,10$$

$$n = \frac{0,200 \cdot 7,0}{0,082 \cdot 273} = 0,10$$

~~h = \frac{m}{M}~~
 $n = \frac{m}{M}$ mass / molar mass
 $h = \frac{m}{M} \rightarrow \frac{4}{1} = \frac{m}{800}$ $M = 3200$

$$h = \frac{m}{M} \rightarrow \frac{9}{1} = \frac{m}{800}$$
 $M = 7200$

$$h = \frac{m}{M} \rightarrow 35 = \frac{m}{800}$$
 $M = 28000$

Q2 25

$$T = 273$$

$$m = 800 \text{ mg}$$

$$R = 0,082$$

Q3/

$$V = 1,80 \text{ dm}^3$$

$$P_f = 2 \times 10^2 \text{ kPa}$$

$$V_f = 2,14 \text{ dm}^3$$

Q3 25

NO ANSWER
why?