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University of Mustansiriyah

Department of Chemistry

1st Semester-2021

1st Exam-paper P

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 g.mol^{-1}) in a 0.5×10^4 mL cylinder at 20×10^2 kPa and 25 °C.

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

3: Calculate the density of CO_2 placed in a 22.4×10^3 mL cylinder at 20×10^2 kPa and 298 K.

Answer: a) 36.06 kg L^{-1} b) 36.06 g L^{-1} c) 36.06 g   d) 36.06 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 dm^3 at 90 °C and 760 torr pressure. What would be its volume at STP?

Answer: a) 15.04 mL   b) 15.04 dm^3 c) 15.04 L^{-1} d) 15.04 dm^{-3}

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

Answer: a) 0.5 L   b) 0.5 Pa L   c) 0.5 Pa dm^3 d) 0.5 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 K. Calculate the best value of the molar mass of CO_2. (25 points)

p/10² kPa	1.00	2.00	3.00
V/L	4.00	7.50	11.75

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

Date 10/11/2021   Best wishes   Dr Abduljabbar I. R. Rushdi

Q2/

Q3/

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$P_i = 2 \times 10^2 \, KPa$

$V_i = 2.14 \, dm^3$

bar

$P_e =$

Torr

$V_e = 2.48 \, dm^3$

$$P_i V_i = P_e V_e$$

$$2 \times 10^2 * 2.14 = P_e \, 2.48$$

$$4.28 \times 10^2 = P_e \, 2.48$$

$$P_e = \frac{4.28 \times 10^2}{2.48}$$

$$P_e = 10^2 \, KPa$$

$Q_3 \dfrac{10}{25}$