



FS

Physical Chemistry_Chpt_One_Properties of Gases

20/100 Twenty only
25-11-21
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Name of a student _____ Signature _____ No. 13

University of Mustansiriyah

1st Semester-2021

Department of Chemistry

1st 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 CO₂ gas (44 g mol⁻¹) in a 0.5 × 10⁴ mL cylinder at 20 × 10² kPa and 25 °C.

Answer: a) 180 g mol⁻¹ b) 180 g **c) 180 mol** d) 180 kg

3: Calculate the density of CO₂ placed in a 22.4 × 10³ mL cylinder at 20 × 10² 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 dm³ at 90 °C and 760 torr pressure. What would be its volume at STP?

Answer: a) 15.04 mL **b) 15.04 dm³** c) 15.04 L⁻¹ d) 15.04 dm⁻³

6: A vessel contains a certain amount of gas at 80 × 10⁵ Pa. The gas is transferred to another tank 20 dm³ with pressure of 20 × 10⁵ Pa. What should be its volume?

Answer: a) 0.5 L **b) 0.5 Pa L** c) 0.5 Pa dm³ 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 CO₂ gas at 273 K. Calculate the best value of the molar mass of CO₂.

p/10 ² kPa	1.00	2.00	3.00	(25 points)
V/L	4.00	7.50	11.75	

Q3: A perfect gas undergoes isothermal expansion, which increases its volume by 2.48 dm³. The p_i and V_i of the gas are 2 × 10² kPa and 2.14 dm³, 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

$$M = \frac{mAT}{PV}$$

$$M = \frac{10 \times 0.082 \times 273}{1.500 \times 4.00}$$

$$= \frac{22.386}{6.000} = 3.731$$

$$M = \frac{22.386}{3.000} = 7.462 \text{ g/mol}$$

Q3

$$P_1 \times V_1 = P_2 \times V_2$$

$$2 \times 10^2 \times 1.80 = P_2 \times 2.14$$

$$P_2 = \frac{200 \times 1.80}{2.14} = 168.2 \text{ kPa}$$

هذا التغير في الضغط

Q3 25