



F8

Physical Chemistry Chpt_One_Properties of Gases

30 Thirty only
100

Handwritten notes and signatures in red ink.

Name of a student (A) ... Signature

No. 17

University of Mustansiriyah

1st Semester-2021

Department of Chemistry

1st Exam-paper D

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 x 10⁴ mL cylinder at 20 x 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 x 10³ mL) cylinder at 20 x 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 dm³

6: A vessel contains a certain amount of gas at 80 x 10⁵ Pa. The gas is transferred to another tank 20 dm³ with pressure of 20 x 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
V/L	4.00	7.50	11.75

(25 points)

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 x 10² kPa and 2.14 dm³, respectively. Calculate the p_f of the gas in (i) bar, (ii) torr. (25 points)

$$Q1 \quad PV = nRT \rightarrow n = \frac{RT}{PV} \rightarrow \frac{(0.082)(273)}{(1)(4)} \rightarrow 5.59$$

$$n_1 = \frac{m}{M} \rightarrow M = \frac{m}{n} \rightarrow \frac{10}{5.59} \rightarrow 1.79?$$

$$m = \frac{10000}{1000} \rightarrow 10?$$

? = units

$$n_2 = \frac{RT}{PV} \rightarrow \frac{(0.082)(273)}{(2)(7.5)} \rightarrow \frac{(22.386)}{15} \rightarrow 1.49$$

$$M = \frac{m}{n} \rightarrow \frac{10}{1.49} \rightarrow 6.71?$$

$$n_3 = \frac{m}{M} \rightarrow \frac{22.386}{10}$$

$$\frac{10}{22.2}$$

$$Q3 \quad \frac{0}{25}$$

NO ANSWER why?