



Physical Chemistry\_Chpt\_One\_Properties of Gases

Name of a student Amna Jabbar Rashad

Signature [Signature]

No. 12

65/100 Sixty five  
23-11-2021  
Tus. 10/6  
Abd  
Dr. Abduljabbar I. R. Rushdi

University of Mustansiriyah

1<sup>st</sup> Semester-2021

Department of Chemistry

1<sup>st</sup> Exam-paper B

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

(50 points)

1: A vessel of 5000 mL capacity contains a certain amount of gas at 313 K and 2 bar pressure. The gas is transferred to another vessel of volume 10000 mL at 40 °C. What should be its pressure?

Answer: a) 1.0 atm b) 1.0 mmHg c) 75 cmHg d) 1.5 bar

2: If the particles of a gas are polar that means the difference between  $p_{ideal}$  and  $p_{real}$  is

Answer: a) low b) equal c) high

3: Calculate the temperature of 5000 mmol of a gas occupying 5.0 dm<sup>3</sup> at  $3.3 \times 10^5$  Pa?

Answer: a) 40.2 °C b) 40.2 K c) 44.2 °C d) 44.2 K

4: Calculate the weight of NH<sub>3</sub> (17 g.mol<sup>-1</sup>) in a 4 L cylinder at 8 atm and 300 K.

Answer: a) 22.11 kg b) 22.11 g c) 23 K d) 23 °C

5: Calculate the  $p_c$  of a gas, if the  $p_r$  is 0.44 and  $p$  is 1 bar.

Answer: a) 2.27 K b) 2.27 atm c) 2.27 L d) 2.27 mol

6: If the attraction forces are calculated, that means the gas is?

Answer: a) real b) noble c) perfect d) compressed

7: According to the Dalton's law total mole fraction is equal to?

Answer: a)  $\sum n$  b)  $\sum p_i$  c)  $\sum p_T$  d)  $\sum x$

8: What is the partial pressure of a gas in a mixture, if the  $X_i$  is 1, and the conditions are at STP?

Answer: a) 0.99 torr b) 0.89 bar c) 0.900 atm d) 1.01 bar

9: At high pressure the  $Z > 1$  which means the dominated forces are?

Answer: a) Van der Waal's b) equal c) repulsions d) attractions

10: According to Avogadro's law the amount of a gas at STP is?

Answer: a) 1.00 mol b) 2.00 mol c) 1.00 mmol d) 2.00 mmol

Q2: The air inside a flexible 3.5 L container has a pressure of 115 kPa. What should the volume of the container be increased to in order to decrease the pressure to 625 torr? (25 points)

Q3: A 3 dm<sup>3</sup> container holds 0.5 moles of N<sub>2</sub> gas at 42 °C. What is the pressure inside the container? (25 points)

Q2//  $V_1 = 3.5 \text{ L}$

$P_1 = 115 \text{ kPa} \rightarrow 115 \times 1000 = 115000 \text{ Pa}$

$V_2 = ?$

$P_2 = 625 \text{ torr}$

$P_1 V_1 = P_2 V_2$   
 $115000 \times 3.5 = 625 \times V_2$

$V_2 = \frac{115000}{625}$

$V_2 = 18.5 \text{ L}$

no matching in units

Q2  $\frac{10}{25}$

Q3//

$V = 3 \text{ dm}^3 \rightarrow V = \frac{3}{1000} \text{ cm}^3 \rightarrow V = 0.003 \text{ cm}^3$

$n = 0.5 \text{ moles}$

$t = 42^\circ\text{C}$

$T(\text{K}) = ^\circ\text{C} + 273$   
 $= 42 + 273$   
 $= 315 \text{ K}$

$P = ?$

$PV = nRT$   
 $P \times 0.003 = 0.5 \times 0.082 \times 315$

$P = \frac{0.5 \times 0.082 \times 315}{0.003}$

$= \frac{12.915}{0.003}$

$= 4305 \text{ atm}$

? = units

Q3  $\frac{15}{25}$