



FRI

Physical Chemistry\_Chpt\_One\_Properties of Gases

15/100 Fifteen only  
Dr. Abduljabbar I. R. Rushdi

Name of a student Amar alsade imad Signature \_\_\_\_\_ No. \_\_\_\_\_

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Department of Chemistry

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

1<sup>st</sup> Exam-Repeat\_1

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

(50 points)

1: Calculate the weight of C<sub>2</sub>H<sub>4</sub> gas (26 g mol<sup>-1</sup>) in a 10000 Cm<sup>3</sup> cylinder at 1520 mmHg and 90 °C.

Answer: a) 17.47 g<sup>-1</sup> mol<sup>-1</sup> b) 17.47 g<sup>-1</sup> c) 17.47 mol d) 17.47 g e) 17.47 mg

2: When V<sub>Real</sub> > V<sub>Perfect</sub>, this means that the gas is:

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

3: The difference between real and ideal gas equation, that the ideal gas equation is not interested in?

Answer: a) p<sub>gas</sub> & n<sub>gas</sub> b) V<sub>container</sub> & p<sub>attraction</sub> c) V<sub>gas</sub> & p<sub>attraction</sub> d) T<sub>gas</sub> & p<sub>gas</sub>

4: Calculate the density of C<sub>2</sub>H<sub>4</sub> is placed in a 50000 Cm<sup>3</sup> container at 760 torr and 273 K.

Answer: a) 1.16 g<sup>-1</sup> L<sup>-1</sup> b) 1.16 g<sup>-1</sup> L c) 1.16 g L<sup>-1</sup> d) 1.16 mg L<sup>-1</sup>

5: Graham's law studies the \_\_\_\_\_ of the gas.

Answer: a) flow b) collision c) diffusion d) effusion

6: The right formula of the Dalton's law is?

Answer: a) p<sub>i</sub> = χ<sub>i</sub> Σ p<sub>i</sub> b) p<sub>i</sub> = χ<sub>i</sub> Σ p<sub>T</sub> c) p<sub>T</sub> = χ<sub>i</sub> Σ p<sub>i</sub> d) p<sub>i</sub> = χ<sub>T</sub> p<sub>T</sub>

7: The law of Corresponding states is an evidence that the gas is?

Answer: a) real b) ideal c) expanded d) compressed e) heavy

8: The total mol fractions of atmospheric pressure of air is equal to?

Answer: a) zero b) one c) two d) three

9: A gas occupies 30 × 10<sup>-3</sup> m<sup>3</sup> at 75 °C and 76 CmHg pressure. What would be its volume at STP?

Answer: a) 23.5 dm<sup>3</sup> b) 23.5 m<sup>2</sup> c) 23.5 L<sup>-1</sup> d) 23.5 m<sup>-3</sup>

10: When the value of Z > 1 this means the dominated forces are:

Answer: a) attraction b) van der Waal c) repulsion d) compression

Q2: The following data have been observed for 5000 mg of unknown gas at 0 °C. Calculate the best value of the

molar mass of this gas, and what is it?

p/10 <sup>5</sup> Pa	0.75	0.60	0.25	(25 points)
V/dm <sup>3</sup>	9.33	11.60	27.50	

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by 1.80 dm<sup>3</sup>. The p<sub>f</sub> and V<sub>f</sub> of the gas are 197 atm and 2.14 dm<sup>3</sup>, respectively. Calculate the p<sub>original</sub> of the gas in (a) bar, (b) torr. (25 points)

Sun\_28/11/2021

With best my wishes

Dr Abduljabbar I. R. Rushdi

Q2

This is not the required Eq.

$$\frac{P_1}{P_2} = \frac{V_2}{V_1}$$

$$\frac{0.75}{P_2} = \frac{5000}{9.33}$$

$$P_2 = \frac{6.9975}{5000} \Rightarrow P_2 = 0.0013995 \text{ Pa}$$

Q2 5/25

افضل قيمة

$$\frac{P_1}{P_2} = \frac{V_1}{V_2}$$

شجون درجة الحرارة

$$\frac{0.60}{P_2} = \frac{5000}{11.60}$$

$$P_2 = \frac{6.96}{5000} \Rightarrow P_2 = 0.001392 \text{ Pa}$$

$$\frac{P_1}{P_2} = \frac{V_1}{V_2}$$

$$\frac{0.25}{P_2} = \frac{5000}{27.50}$$

$$P_2 = \frac{6.875}{5000} \Rightarrow P_2 = 0.001375 \text{ Pa}$$

Q3

$$\frac{P_1}{P_2} = \frac{V_2}{V_1}$$

$$\frac{P_1}{197} = \frac{1.80}{1.14}$$

$$P_1 = \frac{354.6}{1.14} = 311.0526316 \text{ Pa}$$

Q3 5/25



Name of a student: \_\_\_\_\_  
University of Mustansiriyah  
Department of Chemistry

Q1: Circle the right answer for all of the following:  
1: Calculate the weight of CH<sub>4</sub> gas (2 g mol<sup>-1</sup>) in a 5000 cm<sup>3</sup> cylinder at 1250 mmHg and 90 °C.  
Answer: a) 17.87 g mol<sup>-1</sup> b) 17.47 g mol<sup>-1</sup> c) 17.47 mol d) 17.47 mg

2: When V<sub>eff</sub> > V<sub>real</sub>, this means that the gas is...  
Answer: a) perfect b) non-ideal c) real d) ideal

3: The difference between real and ideal gas equation is not interested in...  
Answer: a) P and T b) V and P c) V and T d) V and P and T

4: Calculate the density of CH<sub>4</sub> is placed in a 5000 cm<sup>3</sup> container at 760 torr and 273 K.  
Answer: a) 1.16 g l<sup>-1</sup> b) 1.16 g l<sup>-1</sup> c) 1.16 g l<sup>-1</sup> d) 1.16 mg l<sup>-1</sup>

5: Graham's law studies the... of the gas.  
Answer: a) flow b) collision c) diffusion d) effusion

6: The right formula of the Dalton's law is?  
Answer: a) P<sub>1</sub> = X<sub>1</sub>P b) P<sub>1</sub> = X<sub>1</sub>P<sub>2</sub> c) P<sub>1</sub> = X<sub>1</sub>P<sub>1</sub> d) P<sub>1</sub> = X<sub>1</sub>P<sub>2</sub>

7: The law of Corresponding states is an evidence that the gas is?  
Answer: a) real b) ideal c) expanded d) compressed

8: The total mol fractions of atmospheric pressure of air is equal for...  
Answer: a) zero b) one c) two d) three

9: A gas occupies 30 x 10<sup>-3</sup> m<sup>3</sup> at 75 °C and 76 cmHg pressure. What is its volume at 0 °C and 76 cmHg pressure?  
Answer: a) 23.5 dm<sup>3</sup> b) 23.5 m<sup>3</sup> c) 23.5 dm<sup>3</sup> d) 23.5 m<sup>3</sup>

10: When the value of Z > 1 this means the dominant force is...  
Answer: a) attraction b) van der Waal c) repulsion d) compression

Q2: The following data have been observed for 5000 mg of unknown gas at 0 °C. Calculate the best value of its molar mass of this gas, and what is it?  
Answer: a) 11.7 g b) 11.7 g c) 11.7 g d) 11.7 g

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by 1.80 dm<sup>3</sup> and its pressure by 1.14 atm. Calculate the original volume of the gas in dm<sup>3</sup>.  
Answer: a) 1.14 dm<sup>3</sup> b) 1.14 dm<sup>3</sup> c) 1.14 dm<sup>3</sup> d) 1.14 dm<sup>3</sup>

Q4: Calculate the pressure of the gas in [atm] if the volume of the gas is 1.80 dm<sup>3</sup> and its pressure is 1.14 atm.  
Answer: a) 1.14 atm b) 1.14 atm c) 1.14 atm d) 1.14 atm

With best my wishes  
Sun 28/11/2021