



Physical Chemistry\_Chpt\_One\_Properties of Gases

FR8

40/100 Fourly only

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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> = x<sub>i</sub> Σ p<sub>i</sub> b) p<sub>i</sub> = x<sub>i</sub> Σ p<sub>T</sub> c) p<sub>T</sub> = x<sub>i</sub> Σ p<sub>i</sub> d) p<sub>i</sub> = x<sub>i</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? (25 points)

p/10 <sup>5</sup> Pa	0.75	0.60	0.25
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>r</sub> and V<sub>r</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)

Q2

$W = 5000 \text{ mg} \div 1000 = 5 \text{ g} = 0.005 \text{ kg} = 0.005 \text{ mol}$

$C = 0^\circ \rightarrow 0 + 273 = 273 \text{ K}$

$P = 10^5 \text{ Pa} \rightarrow \frac{10^5}{100000} = 1 \text{ atm}$

$V = 9.33 \text{ dm}^3 = \frac{9.33}{1000} = 0.00933 \text{ m}^3$

$PV = nRT$

$1 \text{ atm} \times 0.00933 \text{ L} = \frac{0.005 \text{ mol}}{M.Wt} \times 0.082 \frac{\text{atm} \cdot \text{L}}{\text{mol} \cdot \text{K}} \times 273 \text{ K}$

$M.Wt = ?$

Q2 25

Q3

$V = 1.8 \text{ L}$

$P = 197 \text{ atm}$

$PV = nRT$

Q3 25

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?

$V/\text{dm}^3$	$P/10^5 \text{ Pa}$
27.50	0.75
11.80	0.60
0.25	0.25

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by 1.80 dm³. The p and V of the gas are 197 atm and 2.14 dm³, respectively. Calculate the pressure of the gas in (a) bar, (b) torr. (25 points)