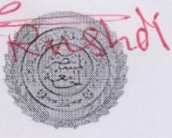




Physical Chemistry-Properties of Gases

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

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

1: Helium represents a.

Answer: a) real gas ~~b) ideal gas~~ c) noble gas d) heavy gas 015

2: A 0.2 L container contains a certain amount of gas at 1.0 bar pressure. The gas is transferred to another vessel of volume 0.5 dm<sup>3</sup>. What should be it is pressure?

Answer: a) 0.60 atm ~~b) 0.40 dm<sup>3</sup>~~ c) 0.4 atm d) 0.4 mmHg 015

3: A gas occupies 299 dm<sup>3</sup> at 127 °C and 760 mm pressure. What would be it is volume at STP?

Answer: ~~a) 199.8 L~~ b) 199 dm<sup>3</sup> c) 200 L d) 204 dm<sup>3</sup> 015

4: Calculate the weight of CH<sub>4</sub> (16 g.mol<sup>-1</sup>) in a 10 L cylinder at 15 atm and 34 °C.

Answer: a) 95.33 g mol<sup>-1</sup> ~~b) 95.33 g~~ c) 85.80 mol d) 86.65 g 515

5: Calculate the number of moles for CH<sub>4</sub> in a 12 L cylinder at 14 bar and 28 °C.

Answer: ~~a) 6.8 mol~~ b) 6.9 mol c) 6.5 mol d) 6.7 mol 515

6: According to Graham's law the heaviest gas is?

Answer: a) H<sub>2</sub> b) O<sub>2</sub> ~~c) N<sub>2</sub>~~ d) CO<sub>2</sub> 515

7: According to the Avogadro's law the amount of a substance is directly proportional with?

Answer: a) p b) T c) R d) V 515

8: The difference between real and ideal gas is one of the following?

Answer: a) p & V b) T & n c) ~~d) attraction forces & volume of a gas~~ 515

9: It can know the molecular mass of un known gas by applying one of the following?

Answer: a) Boyle's law b) Graham's law c) Charles's law d) Gay-Lussac's law 515

10: If V<sub>m</sub> is bigger than V<sup>o</sup><sub>m</sub> then this means the behaviour of a gas is?

Answer: ~~(a) Real~~ b) Ideal c) Real & ideal d) Z = 0 515

Q2: A gas sample has a mass of 9.98 g. Its volume is 21.6 L at a temperature of 75.46 °C and a pressure of 641 Torr. Calculate its molar mass.

Q3: A 1.3 mole of Ar gas is placed in a container at 27 °C at a pressure of 725 torr. What is the volume of the container in ml?

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Best wishes

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$$T(^{\circ}C) = T_c + T(373K)$$
$$T(^{\circ}C) (27^{\circ}C + 273K) = 300K$$
$$P = 725 \times 10^{-3} \text{ atm}$$
$$V = \frac{1.3 \times 0.082 \times 300 \text{ mol} \cdot \text{L}}{725 \times 10^{-3} \text{ atm}} = 0.4 \text{ L} \rightarrow 0.4 \times 10^{-3}$$

$$Q_3 = PV = nRT$$

$$(T_c^\circ = T_c^\circ + 273 \text{ K})$$

$$T_c^\circ = 27^\circ + 273 \text{ K}$$



$$Q_2 = PV = nRT$$

$$PV = \frac{wt}{M \cdot wt} RT$$

$$641 \times 10^{-3} \text{ atm} \times 21.6 \text{ L} = \frac{9.989}{M \cdot wt} \times 0.082 \text{ atm} \cdot \text{L} \cdot \text{mol}^{-1} \cdot \text{K} \times 348.46 \text{ K}$$

$$M \cdot wt = \frac{9.989 \times 0.082 \text{ mol} \times 348.46}{641 \times 10^{-3} \text{ atm} \times 21.6 \text{ L}}$$

$$= 9.60 \text{ g/mol}$$

~~Ar 40~~