



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:

(50 degree)

1: Carbon dioxide is classified as a .

Answer: a) toxic gas b) ideal gas c) real gas d) heavy gas (0.15)

2: A 2 dm<sup>3</sup> container contains a certain amount of gas at 0.5 atm pressure. The gas is transferred to another vessel of volume and the pressure is 0.25 bar. What should be it is Volume?

Answer: a) 0.40 atm b) 0.40 dm<sup>3</sup> c) 0.4 bar d) 4 bar (0.15)

3: A gas occupies 400 dm<sup>3</sup> at 130 °C and 76 cmHg pressure. What would be it is volume at STP?

Answer: a) 270 L b) 207 dm<sup>3</sup> c) 207 m<sup>3</sup> d) 204 cm<sup>3</sup> (0.15)

4: Calculate the weight of H<sub>2</sub> (2.00 g.mol<sup>-1</sup>) in a 2 L cylinder at 2.5 atm and 27 °C.

Answer: a) 0.40 mol<sup>-1</sup> b) 0.40 g c) 0.40 mol g<sup>-1</sup> d) 0.4 g mol<sup>-1</sup> (0.15)

5: Calculate the number of moles for CO<sub>2</sub> in a 10 L cylinder at 8 bar and 27 °C.

Answer: a) 3.25 mmol b) 3.00 mol c) 3.00 L d) 2.99 mol (0.15)

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

Answer: a) H<sub>2</sub> b) O<sub>2</sub> c) N<sub>2</sub> d) CO<sub>2</sub> (0.15)

7: According to the Boyle's law the pressure of a gas is inversely proportional with?

Answer: a) mol b) T c) R d) V (0.15)

8: If a gas has Vm ≠ V<sup>0</sup>m then this means one of the following?

Answer: a) real b) noble c) ideal d) heavy (0.15)

9: If RT > pV this means the forces dominated are?

Answer: a) attraction b) repulsion c) Van der Waal's d) no one of these (0.15)

10: According to Gay-Lussac's law the volume of the gas is?

Answer: a) constant b) variable c) equal to zero d) equal to 22.4 L (0.15)

Q2: Under the same conditions of temperature and pressure, how many times faster will hydrogen effuse compare to carbon dioxide. (25 degree)

Q3: Calculate the density of carbon dioxide (44 g mol<sup>-1</sup>) at STP. (25 degree)

Q2/

$$\frac{r_1}{r_2} = \frac{t_2}{t_1}$$

Q2  $\frac{25}{25}$

Q3/

$$d = \frac{PM}{RT} = \frac{1 \text{ atm} \times 44 \text{ g mol}^{-1}}{0.082 \frac{\text{atm} \cdot \text{L}}{\text{mol} \cdot \text{K}} \times 273 \text{ K}} = 1.9 \text{ g/L}$$

Q3  $\frac{25}{25}$