Model Question paper

Gaseous state - I 1

11th Standard

Chemistry

Reg.No. : | | | | | | |

I. Answer all the questions.

II. Use blue pen only.

Time : 00:45:00 Hrs

Total Marks : 35

Part - A

2 x 1 = 2

1) A curve drawn at constant temperature is called an isotherm.This shows relationship between

(a) P and 1/V (b) PV and V (c) P and V (d) V and 1/P

2) The critical temperature of a gas is that temperature

(a) Above which it can no longer remain in the gaseous state. (b) Above which it can not be liquified by pressure (c) At which it solidifies

(d) At which volume of gas becomes zero

Part - B

3 x 2 = 6

3) Write the mathematical expression for Boyle's law

4) Compare the partial pressures of gases A and B when 3 moles of A and 5 moles of B mixed in a constant volume, and 25^{o} C and 1 atm pressure.

5) Give the correction factors for the volume and pressure deviation for a Vanderwaal's gas.

Part - C

4 x 3 = 12

6) What is the molar volume of nitrogen at 500K and 600 atm according to the ideal gas law?

7) Define Graham's law of diffusion.

8) Give the values of an R-gas constant in calories and Joules.

9) What are the units of Vanderwaal's constants 'a' and 'b'?

Part - D

3 x 5 = 15

10) At 27^{o}C, H_2 is leaked through a tiny hole in a vessel for 20 minutes.Another unknown gas at the same T and P as that of H_2 is leaked through the same hole for 20 minutes. After effusion of the gas, the mixture exerts a pressure of 6 atm. The H_2 content of the mixture is 0.7 moles. If the volume of the container is 3 liters what is the molecular weight of unknown gas?

11) Calculate the total pressure in a 10L cylinder which contains 0.4g of helium, 1.6g of oxygen, and 1.4g of nitrogen at 27^{o} C. Also calculate the partial pressure of He gas in the cylinder. Assume ideal behavior for gases. R=0.082 lit atm $K^{-1}mol^{-1}$

12) Vanderwaal's constant in liter atmosphere per mole for carbon dioxide are a=3.6 and b=4.28×10^{-2} . Calculate the critical temperature and critical volume of the gas. R=0.0820 lit atm K^{-1} mol^{-1}

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