BMB122: Biophysical Chemistry (15/03/2011)
Term Test-1
Time- 40 min Marks-20

1. A 5.00 L scuba tank contains 1.05 mole of O_2 and 0.418 mole He at 25°C. What is the partial pressure of each gas, and what is the total pressure in the tank?   3

2. A 10.0 L cylinder contains oxygen gas at 20.0°C and 735 mm Hg. How many grams of oxygen are in the cylinder?   3

3. Equal V ml of two gases has diffused in t_1 and t_2 minutes. M_1 and M_2 is the molecular mass and r_1 and r_2 are the diffusion rate respectively. Then prove that.
$$\frac{r_1^2}{r_2^2} = \frac{t_2^2}{t_1^2} = \frac{M_2}{M_1}$$ 3

4. At 30°C an aqueous solution of iodine containing 0.0516g litre^{-1} is in equilibrium with a CCl_4 solution containing 4.412 g litre^{-1}. The solubility of iodine in water at 30°C is 0.34 g litre^{-1}. Find the solubility of iodine in CCl_4.   3

5. Briefly describe the Nernst's distribution law.   2

6. The distribution coefficient of A for benzene and water is 10. Find the amount of A extracted if 1g of it dissolved in 100ml of water is equilibrated in a separatory funnel with 100ml of benzene.   3

7. What is R? Calculate the value of R in SI unit.   3

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