CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

SELF ASSESSMENT PAPER -6

Questions

1. Calculate the half-life of a first order reaction from their rate constants given below:

(i) $200s^{-1}$

(ii) 2min^{-1}

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2. The half-life for radioactive decay of 14C is 5730 years. An archaeological artifact containing wood had only 80% of the 14C found in a living tree. Estimate the age of the sample.

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3. A reaction is second order with respect to a reactant How is the rate of reaction affected if the concentration of the reactant is

(i) doubled

(ii) reduced to half ?

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4. The partial pressure of ethane over a solution containing $6.56x10^{-3}$ g of ethane is 1 bar. If the solution contains

$5.00 \times 10^{-2}g$ of ethane then what shall be the partial pressure of the gas ?

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5. Copper crystallizes into a foc lattice with edge length $3.61 \times 10^{-8}cm$. Show that the calculated density is in agreement with its measured value of $8.92 gcm^{-3}$.

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6. Heptane and octane form an ideal solution. At 373 K, the vapour pressures of the two liquid components are 105.2 kPa and 46.8 kPa respectively. What will be the vapour pressure of a mixture of 26.0 g of heptane and 35 g of octane ?

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7. Give reasons for the following:

(a) Aluminia is dissolved in cryolite for electrolysis instead electrolyzed directly. **(b) Zinc oxide can be reduced to metal by heating with carbon but Cr_2O_3 cannot be reduced by heating with carbon.**

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8. The molar conductivity of 0.025 mol L^{-1} methanoic acid is $46.1 \text{ S cm}^2 \text{ mol}^{-1}$. **Calculate its degree of mol. dissociation and dissociation constant. Given** $\lambda° (H^+) = 349.6 \text{ S cm}^2 \text{ mol}^{-1}$ and $\lambda° (H\mathbb{C}O^-) = 54.6 \text{ S cm}^2 \text{mol}$.

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9. Conductivity of 0.00241 M acetic acid is $7.896 \times 10^{-5}\, Scm^{-1}$.

Calculate its molar conductivity and if for acetic acid is $390.5\ S\ cm^2 mol^{-1}$, what is its dissociation constant?