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**Max Time : 1 hr** **Class = 12th Chemistry Test**  **Max Marks : 30**

**ELECTROCHEMISTRY**

**(Upto Nernst Equation)**

1. Multiple choice questions : [ 1 X 5 = 5]
2. The cell constant of a conductivity cell :
3. Changes with change in concentration of the electrolyte
4. Changes with the nature of the electrolyte
5. Changes with increase in temperature of the electrolyte
6. Remain constant for a cell
7. (NH4OH) is equal to :

|  |  |
| --- | --- |
| a) (NH4OH) + (NH4Cl) – (HCl) | b) (NH4Cl) + (NaOH) – (NaCl) |
| c) (NH4Cl) + (NaCl) – (NaOH) | d) (NaOH) + (NaCl) – (NH4Cl) |

1. The limiting molar conductivities o for NaCl , KBr and KCl are 126 , 152 and 150 S cm2 mol – 1 respectively. The o for NaBr is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 278 S cm2 mol – 1 | b) 176 S cm2 mol – 1 | c) 128 S cm2 mol – 1 | d) 302 S cm2 mol – 1 |

1. The molar conductivity of 0.5 mol/dm3 solution of AgNO3 with electrolytic conductivity of 5.76 x 10 – 3 S cm– 1 at 298 K is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2.88 S cm2 mol – 1 | b) 11.52 S cm2 mol – 1 | c) 0.086 S cm2 mol – 1 | d) 28.8 S cm2 mol – 1 |

1. Standard electrode potential for Sn4+/Sn2+ couple is + 0.15 V and that for the Cr3+/Cr couple is – 0.74 V. These two couples in their standard state are connected to make a cell. The cell potential will be :

|  |  |  |  |
| --- | --- | --- | --- |
| a) + 1.83 V | b) + 1.19 V | c) + 0.89 V | d) + 0.18 V |

1. Which of the following have maximum molar conductivity. [ 2 ]
2. 0.08 M solution and its specific conductivity is 2 x 10 – 2 – 1 cm – 1.
3. 0.1 M solution and its resistivity is 50 cm.
4. Define Limiting Molar conductivity. [ 2 ]
5. The resistance of 1 N solution of salt is 50 . Calculate the equivalent conductance of the solution, if the two platinum electrodes in solution are 2.1 cm apart and each having an area of 4.2 cm2. [ 2 ]
6. The EMF of the following cells are : Ag | Ag+ (1 M) || Cu2+ (1 M) | Cu : = 0.46 V

Zn | Zn2+ (1 M) || Cu2+ (1 M) | Cu : = + 1.1 V

Calculate the e. m. f. of the cell : Zn | Zn2+ (1 M) || Ag+ (1 M) | Ag [ 2 ]

1. Write 3 factors affecting Electrolytic conductance. [ 2 ]
2. Define Molar conductivity and Cell constant. [ 3 ]
3. The conductivity of 0.001028 M acetic acid is 4.95 x 10 – 5 S/cm. Calculate its dissociation constant if for acetic acid is 390.5 S cm2 mol – 1. [ 3 ]
4. Can we store : (a) Copper sulphate solution in zinc vessel? [ 3 ]

(b) Copper sulphate solution in silver vessel? (c) Copper sulphate solution in iron vessel?

= 0.34 V , = 0.76 V , = 0.80 V , = 0.44 V

1. At 291 K, saturated solution of BaSO4 was found to have a specific conductivity of 3.648 x 10– 6 S cm– 1, that of water used being 1.25 x 10– 6 S cm– 1. Ionic conductances of Ba2+ and ions are 110 and 136.6 S cm2/mol respectively. Calculate the solubility of BaSO4 at 291 K. (At mass of Ba = 137). [ 3 ]
2. Assume a cell with : Cu (s) + 2 Ag+ (1 x 10 – 3 M) Cu2+ (0.25 M) + 2 Ag (s) ; = 2.97

Calculate Ecell of the reaction. [ 3 ]