# EASTERN UNIVERSITY, SRI LANKA
# THIRD EXAMINATION IN SCIENCE
# FIRST SEMESTER 2003/2004 (Repeat)
# CH 303 ELECTROCHEMISTRY

**Answer all questions.**                                              **Time:01 Hour**

1. (i) Define the following terms:
     (a) Molar conductivity
     (b) Mobility
     (c) Flux

   Show that $\lambda/\lambda^\infty = \alpha$ for a weak electrolyte.
   ($\lambda$- Molar conductivity, $\lambda^\infty$ molar conductivity at infinite dilution and $\alpha$- dissociation constant of the weak acid)

   (ii) Conductivity of a saturated aqueous solution of silver chloride is $1.980 \times 10^{-4}$ $Sm^{-1}$. If the conductivity of the water used to prepare the solution is $1.78 \times 10^{-5}$ $Sm^{-1}$, calculate
     (a) the solubility
     (b) the solubility product of silver chloride .
   $\lambda^\infty$ for $Ag^+$ and $Cl^-$ are $6.35 \times 10^{-3}$ $Sm^2mol^{-1}$ and $7.55 \times 10^{-3}$ $Sm^2mol^{-1}$ respectively. All data are at $25^0C$.

2. (a) Calculate the molar conductivity of sodium sulphate solution at infinite dilution.
     ($\Lambda^\alpha_{Na^+} = 0.502 \times 10^{-2}$ $\Omega^{-1}m^2mol^{-1}$, $\Lambda^\alpha_{1/2\,SO_4^{2-}} = 0.800 \times 10^{-2}$ $\Omega^{-1}m^2mol^{-1}$)

   (b) Calculate the potential difference between hydrogen electrodes in the following cell at 298 K. The activity coefficients of 0.01 M and 0.1 M HCl solutions in the cell are 0.95 and 0.85 respectively.

   $Pt$ / $H_2(g)$, $HCl$ / $AgCl(s)$,$Ag$ // $Ag$, $AgCl(s)$/ $HCl$, $H_2(g)$/$Pt$
   (1 atm)   ($c_1$= 0.01)                        ($c_2$ =0.1)  (1 atm)

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