**Plotting of Graphs using EXCEL or LIBREOFFICE CALC Part 1**

**Problem 1:** Plot the graph of conductance vs volume of NaOH for the following data using spread sheet.

Vol. of NaOH: 0 1 2 3 4 5 6 7 8 9

Conductance: 2.0 1.8 1.6 1.4 1.2 1.3 1.4 1.5 1.6 1.7

**Problem 2**: The molar conductivity of a strong electrolyte at different concentrations is as follows:

conc/M 17.68 10.8 2.67 1.28 0.83 0.19

Molar conductivity 42.45 45.91 51.81 54.09 55.78 57.42

Using spreadsheet plot the graph of vs . Find the value of limiting molar conductivity.

**Problem 3**: Using spreadsheet plot the pH vs volume of base for the data given. Also plot the first derivative graph ( ∆pH vs Vmean)

Vol of NaOH: 0 1 2 3 4.0 4.2 4.4 4.5 4.7 5.0

pH 1.0 1.4 1.7 2.0 2.3 2.6 3.0 3.5 4.0 5.0

Vol of NaOH: 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 7.0 7.5

pH 6.0 7.0 8.0 10.0 10.5 11.0 11.5 12.0 12.2 12.4

**Problem 4**: Determine the normality and strength of given acetic acid solution by titrating it potentiometrically against sodium hydroxide solution***.***

Normality of NaOH solution =NNaOH =0.67N

Volume of acetic acid taken = 30mL

Drop value = 1/20 = 0.05mL

|  |  |
| --- | --- |
| **No. of drops of NaOH** | **EMF(mV)** |
| 0 | 191 |
| 10 | 165 |
| 20 | 147 |
| 30 | 136 |
| 40 | 128 |
| 50 | 120 |
| 60 | 113 |
| 70 | 105 |
| 80 | 99 |
| 90 | 89 |
| 100 | 80 |
| 110 | 68 |
| 115 | 60 |
| 120 | 48 |
| 125 | 34 |
| 130 | -7 |
| 132 | -125 |
| 134 | -202 |
| 138 | -230 |
| 140 | -248 |
| 142 | -256 |
| 144 | -261 |
| 146 | -262 |
| 148 | -259 |
| 150 | -261 |
| 155 | -263 |
| 160 | -272 |
| 165 | -275 |
| 170 | -278 |
| 180 | -284 |
| 190 | -288 |

**Problem 5: Plot the calibration curve for K2Cr2O7 in the acidic medium using the following data. Calculate the molar extinction coefficient of K2Cr2O7 if the diameter of the cuvette is 1 cm.**

|  |  |
| --- | --- |
| Concentration of K2Cr2O7 acidic solution  (mol L-1)x103 | Absorbance |
| 0.5 | 0.10 |
| 1.0 | 0.15 |
| 1.5 | 0.25 |
| 2.0 | 0.30 |
| 2.5 | 0.35 |
| 3.0 | 0.45 |
| 3.5 | 0.57 |
| 4.0 | 0.64 |
| 4.5 | 0.70 |
| 5.0 | 0.85 |
| Given solution | **0.40** |