LESSON PLAN
CLASS : XII
SUBJECT : CHEMISTRY
TOPIC : ELECTROCHEMISTRY

Weightage in board exams-9 marks/70

UNSGD

My topic is fulfilling goals of sustainable development like : Goal 4 – Quality education and Goal 7 – Affordable and clean energy.

(**KPI -1 To improve the performance of students in calculation and observation skills while doing log calculation applying nernst equation (Problem solving and critical thinking skills)**

KPI-2 To strengthen in depth understanding of the concept , analyse and apply it in daily life.

Objectives :

Specific objectives : To enable to :

- Describe an electrochemical cells and differentiate between galvanic and electrolytic cells, (Understanding,Analyse)
- Apply nerst equation for calculating the emf of galvanic cell and define standard potential of cell (Application)
- Differentiate between ionic and electronic conductivity. (Analyse)
- Enunciate Kohlrausch law and learn its application.(Interpretation and application)
- Understand quantitative aspects of electrolysis.(knowledge)
- Describe the construction of some primary and secondary batteries and fuel cells.(knowledge)
- Analyse and evaluate corrosion examples seen in daily life.
- To apply the concept of cell and corrosion in daily life.

Behavioural objective:

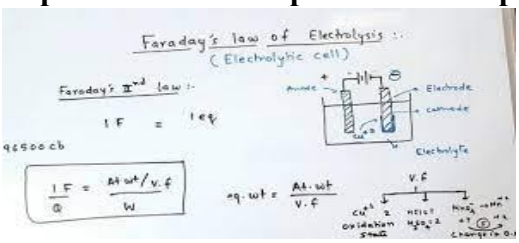
- To enable the students to inculcate the habits of stepwise solution of every problem.
- To enable the students to develop the observational and listening skills.
- To enhance the calculation skills of problem.

Processes/activities :

Previous knowledge :

- What is a battery or cell?
- Where do you use cells in daily life?
- What are two basic types of cell?
  OR
  What is basic principle behind working of cells?
  - **Demonstrate the various types of cells as shown below-**

- Lecture method
- **Explanation of the topic with the help of diagram on board-**



- **Solving numericals of Nernst equation, kohlrausch law , faraday law on board for eg-**

(b) $Mg(s) | Mg^{2+}(0.1\ M) || Cu^{2+}(1.0 \times 10^{-3}\ M) | Cu(s)$

Given: $E^0_{Cell} = 2.71\ V$

Applying Nernst equation

$$Mg + Cu^{2+} \longrightarrow Mg^{2+} + Cu$$

$$E_{Cell} = E^0_{Cell} - \frac{0.0591}{n} \log \frac{[Mg^{2+}]}{[Cu^{2+}]}$$

$$= 2.71 - \frac{0.0591}{2} \log \frac{0.1}{1 \times 10^{-3}}$$

$$= 2.71 - \frac{0.0591}{2} \log \frac{0.1}{0.001}$$

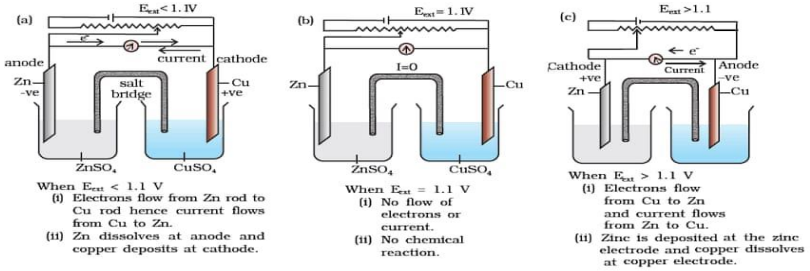
$$= 2.71 - 0.02955 \log 100$$

$$= 2.71 - 0.02955 \times 2$$

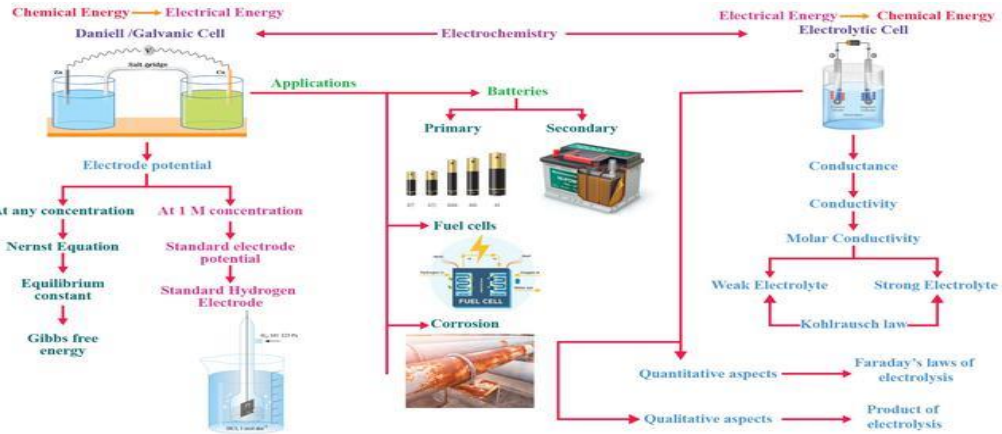
$$= 2.71 - 0.0591$$

$$\therefore \quad E_{Cell} = 2.65\ V$$

- **Discussion of various problems and case studies.for example**
  Effect of external voltage on direction of current in a electrochemical cell as shown below-



- Laboratory demonstration of working of galvanic cell
- Giving individual board practice to slow learners.
- Discussing the various tricks to simplify the products of electrolysis.
- **Providing summary of chapter in the form of concept map.**



Assessment :

- **Worksheets (Application based questions) For example-**

CHOITRAM SCHOOL NORTH CAMPUS
WORKSHEET
CLASS:XII
SUBJECT: CHEMISTRY
ELECTROCHEMISTRY

Answer the following questions:

1. Can you store copper sulphate solutions in a zinc pot?
2. The molar conductivity of 0.025mol/L methanoic acid is 46.1Scm^{2}mol^{-1}. Calculate its degree of dissociation and dissociation constant. Given $\lambda^0(H^+)$= 349.6Scm^{2}mol^{-1} and $\lambda^0(HCOO^-)$= 54.6Scm^{2}mol^{-1}
3. What is the effect of temperature on ionic conductance?
4. Write the mathematical expresssion for -
   (i) Kohlrausch's Law
   (ii) Debye Huckel Onsager Equation
5. Write the Nernst equation and calculate the e.m.f of the following cells:
   (i) $Mg/Mg^{2+}(0.001M\ //\ Cu^{2+}(0.0001M)\ /\ Cu_{(s)}$
   Given $E^0_{Mg2+/Mg} = -2.37$ V; 1F=96500 C/mol Given $E^0_{Cu2+/Cu} = +0.337V$
   Also determine the value of standard free energy change (ΔG^0) for the cell.

- Exercise discussion of NCERT and Exemplar.
- MCQ sheets for practice
- Class test after completing the chapter
- Informal assessment in the class by recapitulation.
- Lab practice of making a cell and finding its emf.

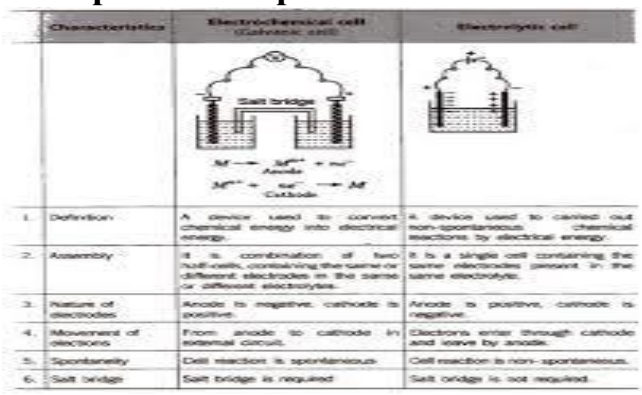
Digital content to be used :

https://youtu.be/paRg8Q9Y1t8

Expected Learning outcome :

Students will be able to :

- **Differentiate between galvanic and electrolytic cells in the tabular form explaining the concept for example-**



- Apply Nernst equation and Kohlrausch law in various problems
- Understand working of various primary and secondary cells
- Understand corrosion and its principles.
- Relate the concept of corrosion and cells in daily life.

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