**EMERALD ROYAL INTERNATIONAL SCHOOL, MPAPE ABUJA**

**LESSON PLAN AND NOTE FOR WEEK 7 ENDING 16TH JUNE, 2023**

**TERM: THIRD**

**WEEK : 7**

**DATE: 12TH - 16TH JUNE, 2023**

**SUBJECT : CHEMISTRY**

**TOPIC : ELECTROLYSIS**

**SUB- TOPIC : 1. faradays first law of electrolysis and its calculation.**

1. **Faradays second law of electrolysis and its calculation.**

**3. uses of electrolysis.**

**PERIOD: 1ST**

**TIME : 8: 10 - 8 :50**

**DURATION:**  **40 minutes**

**CLASS: SS2**

**NUMBER IN CLASS:**  **3**

**AVERAGE AGE: 14 years**

**SEX: mixed**

**LEARNING OBJECTIVES: By the end of the lesson, the students should be able to;**

1. State faradays first law of electrolysis.

2.state faradays second law of electrolysis.

3.state the uses of electrolysis.

**RATIONALE:** The students should understand the faradays laws of electrolysis and uses of electrolysis.

**PREVIOUS KNOWLEGDE:** The student have been taught terms use in electrolysis.

**INSTRUCTIONAL MATERIALS:** A chart showing faradays laws of electrolysis.

**REFERENCE MATERIALS:** New school Chemistry for Senior Secondary Schools by Osei Yaw Ababio .

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| **STEPS** | **TEACHER’S ACTIVITIES** | **STUDENTS’ ACTIVITIES** | **LEARNING POINTS** |
| **INTRODUCTION** | The teacher introduces the lesson by reviewing the previous lesson. | The students were active. | To arouse the students interest. |
| **PRESENTATION**  **STEP 1** | The teacher states the laws of electrolysis and solve calculation on it. | The students pay attention. | To keep them focus for better understanding. |
| **STEP 2** | The teacher states the faradays second law and asks the students to repeat after her. | The students repeat after the teacher. | To encourage retention ability. |
| **STEP 3** | The teacher states the uses of electrolysis. | The students pay attention. | To keep them focus for better understanding. |
| **BOARD SUMMARY** | **FARADAY’S FIRST LAW OF ELECTROLYSIS**  Faraday's First Law of Electrolysis: The law states that the mass of an element discharged during electrolysis is  directly proportional to the quantity of electricity that passes through the electrolyte The more the quantity of  electricity passed through the electrolyte, the more the mass of the element deposited. Mathematically, the mass of a  substance deposited is directly proportional to the quantity of electricity that passes through the electrolyte as  shown: m ∞ Q  m = mass of the substance deposited  Q = quantity of electricity used (expressed in the unit *Coulomb,* C),  The quantity of electricity used cannot be measured directly but can be  obtained from the quantity of electric current used in ampere (A) and the  period of time (in seconds) in which the electric current is passed. This  expressed mathematically as shown:  Q = It  Q =quantity of electricity, 1= current, t = time of flow of current in seconds(s)  m It  m = Elt where E is the electrochemical equivalent  m/E = It  If m/E = It and Q= It then m/E = Q  Thus Q = It  The teacher does calculations involving Faraday's First law of Electrolysis and gives the students class  work to do based on the Calculations:  Example 1  Calculate the mass of silver deposited when a current of 2.6A is passed  through a solution of a silver salt for 70minutes.(Ag = 108; 1F = 96500C)  SOLUTION  Quantity of electricity used, Q = It  Q = 2.6 x ( 70 x 600 )  Ag+ (aq) + e - → Ag  1F  108g  96,500C liberate 108g of Ag  109,200C will liberate 108 x 109,200  96,500  = 12.22g  The mass of silver deposited is 12.22g  Example 2  0.222 g of a divalent metal is deposited when a current of 0.45 ampere is passed through a solution of its salt for 25  minutes using appropriate electrodes. Calculate the relative atomic mass of the metal.  (F = 96,500 C)  **Solution**  Q = It = 0.45 x 60 x 25 coulombs.  M2+ x 2e- M (or 2F produce 1 mole of M)  0.45 x 60 x 25 discharges 0.222 x 2 x 96500 = 63.5g.   1. 45 x 60 x 25Relative atomic mass of M = 63.5 g.   **Faraday’s Second Law –** It states that when the same quantity of electricity is passed through different electrolytes,  the relative number of moles of the elements deposited is inversely proportional to the charges carried by the ions of  the elements respectively.  **Note -** One Faraday deposit one mole of electrons. (1 Faraday = 96500coulombs)  **Example**  What quantity of copper will be deposited by the same quantity of electricity that deposited 9.0g of aluminium? (Al  = 27, Cu = 64)  SOLUTION  Al3+ + 3e- Al  3F deposited 27g of Al (but 1F = 96500C)  Q deposited 9g of Al  Q = 3 x 96500 x 9  27  Q = 96500 C  Cu2+ + 2e- Cu  2F gives 64g  2 x 96500C gives 64g  96500 C gives y  Y = 96500 x 64  2 x 96500  Y = 32g    **Use of Electrolysis**  (a) Extraction of element. Many metals and non-metals (e.g. Na, K, Mg, Ca, AI, Zu, F, Cl) are obtained either through  electrolysis of their own (or fused) aqueous solutions.  (b) Purification of metals (e.g. Cu, Hg, Ag, Au).  (c) Electroplating of one metal by another  (d) Preparation of some important compounds. (e.g. sodium hydroxide, sodium chloride) | The students ask question for clarification. | To create room for slow learners. |
| **EVALUATION** | The teacher evaluates the students with the following questions;   1. State the first and second law of electrolysis.   2. A current of 0.36A was passed through dilute tetraoxosulphate (vi) acid for  1hour 40mins. Calculate the quantity of electricity that was passed.  3.state at least 4 uses of electrolysis. | The students attempt the questions. | To ascertain their level of understanding. |
| **CONCLUSION** | The teacher concludes by copying note on the board. She checks and marks the notes. | The students copy the note into their note books. | For future use. |
| **HOME WORK** | 1.A current of 4.0A was passed through copper (ii) tetraoxosulphate vi  solution for one hour using copper electrodes. What was the mass of copper  deposited? (Cu = 64, IF = 96500C).  2.Calculate the amount of gold deposited when a current of 5 A is passed through a solution of gold salt for two  hours 15minutes. If the same current  is used, find the time taken for 6.0g of gold to be deposited. | The students did their assignment and submit for marking and correction. | To encourage the students to study at home. |



10/5/2023

Principal Head Instuctor