TENDER HEART HIGH SCHOOL, SEC-33B, (H.I.)

22.4.24

CLASS- X SUBJECT- CHEMISTRY

CHAPTER- 6 TEACHER- MOHINISHA THAKUR

Good morning to all the students!

Students this lesson is for class - X for the subject of chemistry, Topic :- 'Electrolytes' which is covered in chapter - 6 'Electrolysis' starting on page no - 101 of your text book titled - 'Concise chemistry by 'Selina Publication' and is being submitted to you on 22, April, 2024

All students may now please open page no - 101 of your notebook in front of you.

If all students are ready then let us start with this chapter. All students may now please listen carefully.

Most of the metals and alloys allow electricity to pass through them in solid as well as in molten states. Therefore they are called conductors. They conduct electricity due to the flow of electrons. Non-metals are non-conductors.

In the same way some chemical compounds conduct electric current in molten or aqueous state and get decomposed by the passage of electric current. These compounds are called

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electrolytes. Electrolytes are generally the salts in molten state or solutions of salts, soludion of acids or alkalies. The chemical compounds which do not allow electric current to pass through them in molten or aqueous state are called non-electrolytes. Non-electrolytes are the compounds which do not have ions and contain only molecules.

Electrolytes

Strong electrolyte

* They get dissociated almost completely and produce large number of free ions. e.g., NaCl

$NaCl \rightleftharpoons Na^+ + Cl^-$

$H_2SO_4 \rightleftharpoons 2H^+ + SO_4^{2-}$

* Here mostly ions are present so they are good conductors of electricity.

Weak electrolyte

* These are only partially dissciated in molten or aqueous state. e.g., CH_3COOH

$CH_3COOH \rightleftharpoons CH_3COO^- + H^+$

* Here some molecules of CH_3COOH break to produce ions while some do not break. So they produce less number of ions. They are poor conductors of electri-city.

Electrolysis:- When direct electric current is passed through a chemical compound, it decomposes (in aqueous solution or molten state). This process is called as electrolysis. This chemical compound is called electrolyte. For electrolysis

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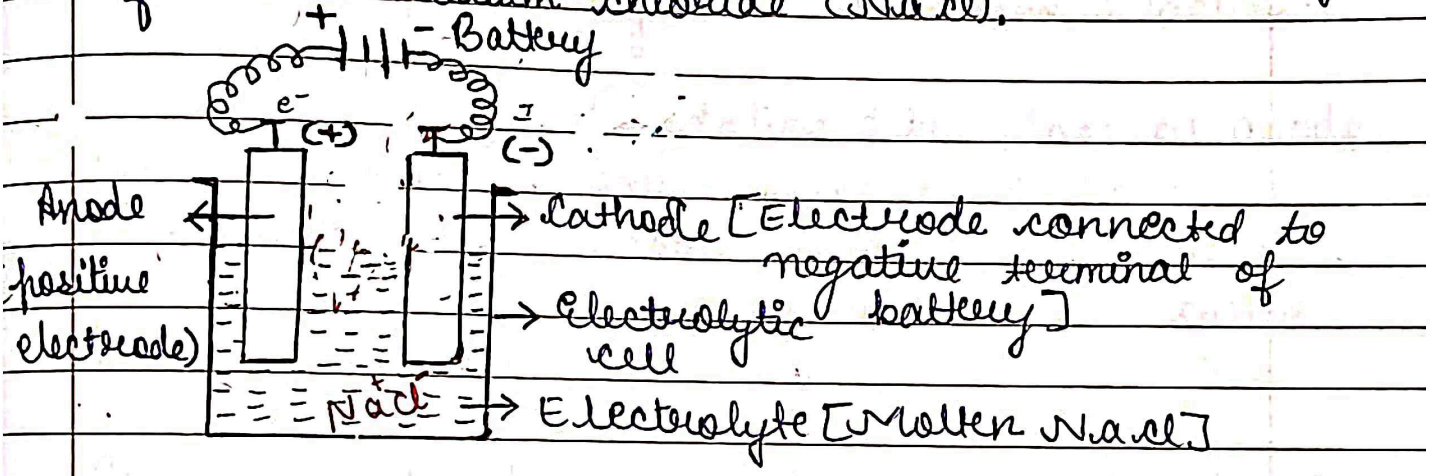
we require a non-conducting vessel in which we take the electrolyte. Two metal plates or wires that act as electrodes. An outside source of electricity (Battery).

Let us try to understand this by the electrolysis of molten sodium chloride (NaCl).



Molten NaCl dissociates into anions (Negative ions) and cations (Positive ions)

$NaCl \rightleftharpoons Na^+ + Cl^-$

When current is turned on the cations move towards cathode and anions move towards anode.

The cations get reduced at cathode where as the anions get oxidised at anode.

At cathode:- $Na^+ + e^- \rightarrow Na$ (reduction)

The cations gain electrons at cathode to become neutral atoms.

At Anode:- $Cl^- - e^- \rightarrow Cl$ (oxidation)

$Cl + Cl \rightarrow Cl_2$

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The anions lose electrons at anode to become neutral atoms. Slowly all the Na^+ get reduced to sodium and get deposited at cathode. Where as all the Cl^- get oxidised to chlorine (gas). This gas is released at the anode

The process of electrolysis is a redox reaction.

During electrolysis, oxidation takes place at anode whereas reduction takes place at cathode. We know that when oxidation and reduction take place simultaneously the phenomena is called as redox process.

Electrolytes produce ions by electrolytic dissocia-tion or ionisation.

Dissociation	Ionisation
The ions present in ionic compounds get separated in aqueous and molten state. This is called dissociation.	Polar covalent compounds contain molecules. but when they are dissolved in water (aqueous state) they produce positively or negatively charged ions. This process is called ionis-ation.
All ionic compounds show dissociation.	$HCl \xrightarrow{H_2O} H^+ + Cl^-$
$NaCl \rightarrow Na^+ + Cl^-$	

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Now, I will give you three a very short questions. You will get a three minutes break to write the answers in your chemistry notebook.

The Questions are:-

Que1:- Give two example of conductors?

Que2:- In electrolysis molten NaCl dissociates into _____ and _____.

Que3:- Give an example of Ionisation.

I hope you all have written the answers by now. Let us check the answers now.

Ans1:- Copper, aqueous solution of NaCl

Ans2:- anions, cations

Ans3:- $HCl \xrightarrow{H_2O} H^+ + Cl^-$

With this I am ending the totays lesson

Instructions And Homework

Students please read the chapter 6 the given material thoroughly. Read all the definitions and difference tables very carefully. Do the Intext Questions given on page -107 of your book.