

<b>CLASS - X</b>	<b>TOPIC- CHAP.2</b> <b>Some important salts</b>
<b>SUBJECT- CHEMISTRY</b>	<b>Prepared by –Rubina Sarkar/</b> <b>30/06/2021</b>

**Question**-Explain Chlor- alkali process?

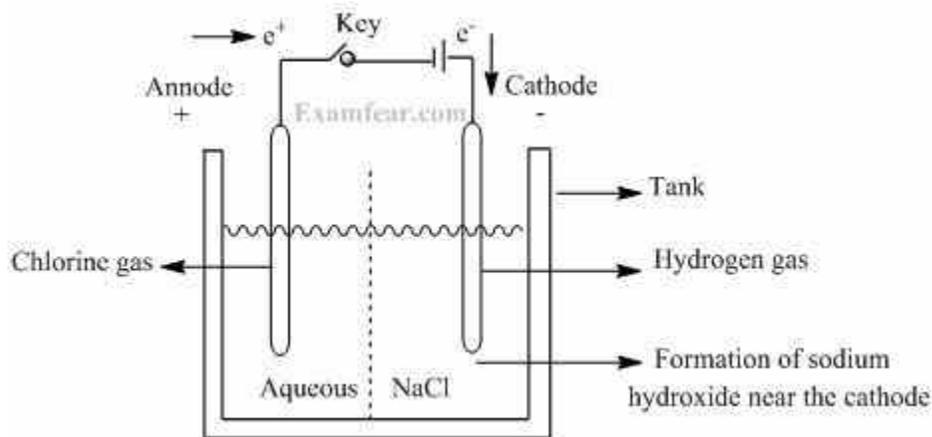
**Answer**- When a concentrated solution of sodium chloride is electrolyzed, it forms sodium hydroxide (NaOH), chlorine gas and hydrogen gas. Chlorine gas is formed at the anode (positive charge) and hydrogen gas at the cathode (negative charge). The reaction that takes place given as:



The above reaction is called chlor-alkali process.

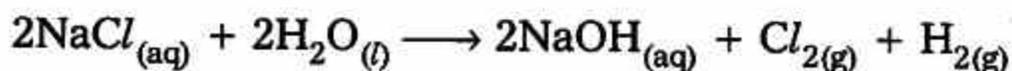
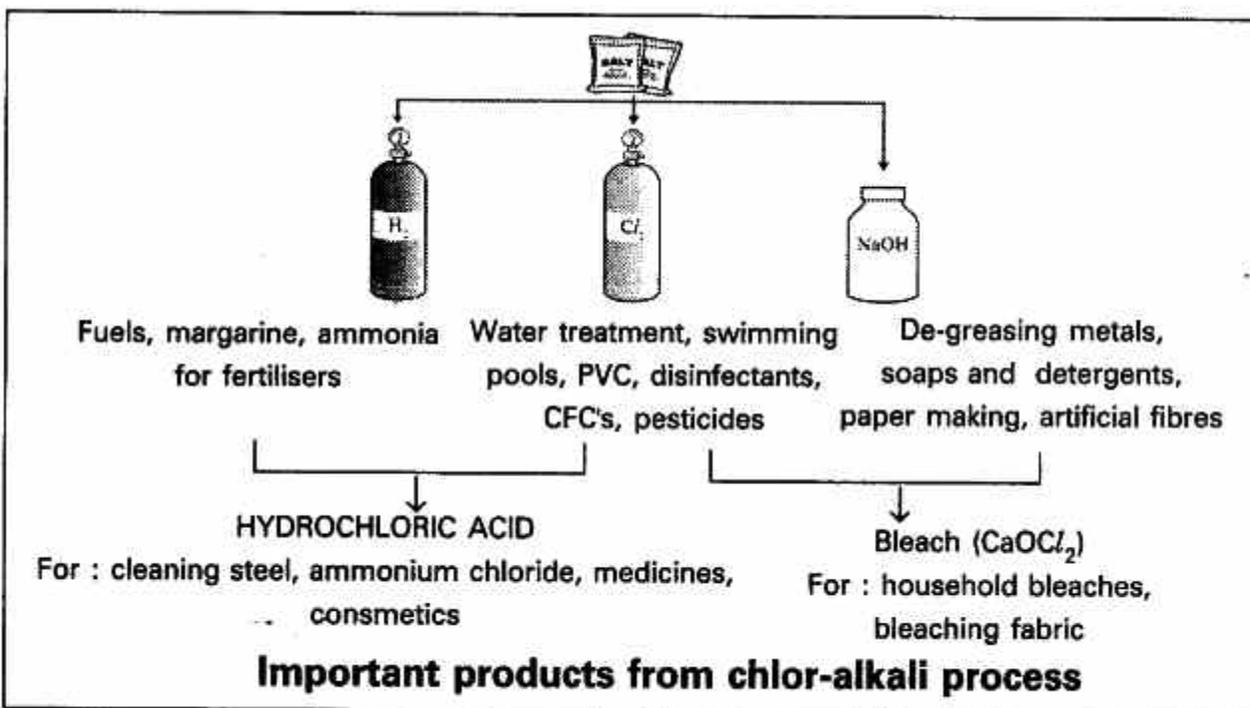
The electrolysis of a concentrated solution of sodium chloride known as chlor- alkali process because of the products formed:

- The products formed in this reaction are NaOH (a strong base/alkali), chlorine and hydrogen gas.
- “Chlor” means chlorine and “alkali” means NaOH.



**Question** – What are the uses of the products of Chlor- alkali process?

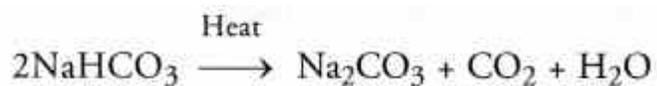
**Answer**- The uses of the products of Chlor-alkali process are-



**Question 2.** A baker found that the cake prepared by him is hard and small in size. Which ingredient has he forgotten to add that would have made the cake fluffy? Give reason.

**Answer:**

The baker has forgotten to add baking powder while making the dough for the cake. Actually, sodium hydrogen carbonate present in baking powder releases carbon dioxide on baking. The bubbles of the gas evolved leave behind pores which make the cake soft and fluffy.



**Question 4.** Dry pellets of base 'X' when kept in open absorb moisture and turn sticky. The compound is also formed by chlor-alkali process. Write chemical name and formula of X. Describe chlor-alkali process with balanced chemical equation. Name the type of reaction that occurs when X is treated with dilute hydrochloric acid.

**Answer:** The base is sodium hydroxide and chemical formula is NaOH. Chlor alkali process is basically formation of Caustic soda or sodium hydroxide. chlor stands for chlorine gas and alkali stands for NaOH.

equation:

$2\text{NaCl}(\text{sodium chloride}) + 2\text{H}_2\text{O}(\text{water}) \rightarrow 2\text{NaOH}(\text{sodium hydroxide}) + \text{Cl}_2(\text{chlorine}) + \text{H}_2(\text{hydrogen})$ .

$\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$

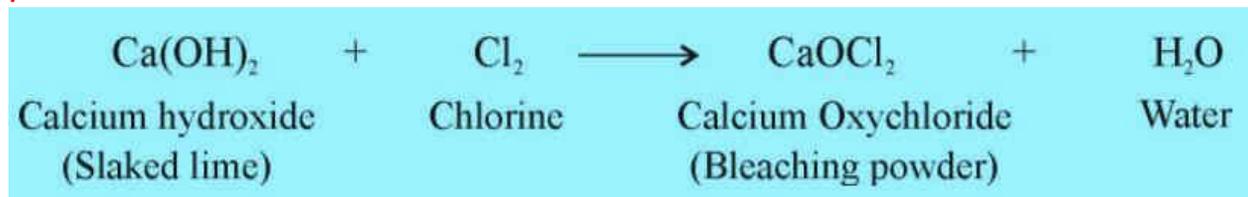
The base 'X' is NaOH. It is of deliquescent nature and absorbs moisture from air and becomes wet. It is manufactured by chlor-alkali process. The reaction of NaOH with dilute HCl is known as neutralization reaction.

**Question.** A yellow powder X gives a pungent smell if left open in air. It is prepared by the reaction of dry compound Y with chlorine gas. It is used for disinfecting drinking water. Identify X and Y. and write the reaction involved.

**Answer-** X is bleaching powder. Y is calcium hydroxide.

Explanation: X must be bleaching powder with chemical formula as it is used for disinfecting drinking water and also a yellow powder.

It can be prepared by the reaction of with hence Y (dry compound) must be that calcium hydroxide. When calcium hydroxide reacts with chlorine gas it forms bleaching powder and water. The reaction can be written as:





**Question 11.** A compound `A` on heating at 370 K gives `B` used as plaster for supporting fractured bones in the right position. `B` on mixing with water changes to `A`. Identify `A` and `B` and write the chemical reaction.

**Answer-** Gypsum on heating at 370K gives plaster of paris

Thus

A - gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ )

B - plaster of paris ( $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ )

$\text{CaSO}_4 \cdot 2\text{H}_2\text{O} \text{ -----} \rightarrow \text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O} + 1 \frac{1}{2} \text{H}_2\text{O}$



**Question14.** A substance `X` used in the kitchen for making tasty crispy pakoras. and is also an ingredient of antacid. Name the substance `X`.

(i) How does `X` help to make cakes and bread soft and spongy.

(ii) Is the pH value of solution of `X` is lesser than or greater than 7.0?

**Answer-** X is baking soda

The chemical formula is  $\text{NaHCO}_3$  (sodium bicarbonate).

It is also used in bakery to make fluffy cakes as when it is heated it releases the carbon dioxide gas and that gas makes the cake fluffy. It is a basic salt as it is composed of NaOH and  $\text{H}_2\text{CO}_3$  and here NaOH is a base of strong type.

ii) its pH scale is greater than 7.0

**Question 15.** Bleaching powder is also known as chloride of lime. It is a solid and yellowish white in colour. Bleaching powder can be easily identified by the strong smell of chlorine. When calcium hydroxide (slaked lime) reacts with chlorine, it gives calcium oxychloride (bleaching powder) and water is formed. Aqueous solution of bleaching powder is basic in nature. The material to be bleached is first passed through solution of NaOH to remove greasy matter. Then it is passed through aqueous solution of bleaching powder and very dil. HCl solution. HCl reacts with bleaching powder to liberate nascent oxygen which bleaches material.

(i) Bleaching powder is used as

- (a) bleaching agent in textile, paper and jute industry
- (b) disinfectant for water to make water free of germs
- (c) Oxidizing agent in many industries
- (d) all of these

(ii) Bleaching powder is also known as

- (a) Calcium oxychloride      (b) calcium hypochlorite
- (c) Chloride of lime      (d) all of these.

(iii) Bleaching powder gives smell of chlorine because it

- (a) is unstable      (b) gives chlorine on exposure to atmosphere
- (c) is a mixture of chlorine and slaked lime      (d) contains excess of chlorine

(iv) Select the correct statement(s) regarding bleaching powder.

- (a) It is pale yellow powder having smell of chlorine

- (b) It is sparingly soluble in water and gives milky suspension when dissolved in water
- (c) As bleaching powder gives nascent oxygen, it shows bleaching property
- (d) All of these

(v) Identify the product 'X' in the given reaction  $\text{Ca(OH)}_2 + \text{Cl}_2 \rightarrow \text{X} + \text{H}_2\text{O}$

- (a)  $\text{CaOCl}_2$  (b)  $\text{CaCl}_2$  (c)  $\text{Ca(ClO}_3)_2$  (d)  $\text{CaCO}_3$

**Question 16.** The preparation of washing soda is carried out through following steps:

**Step-I: Manufacture of sodium hydrogen**



**Sodium hydrogen carbonate**

**Step-II: Thermal decomposition of sodium hydrogen carbonate:** When dry crystals of sodium hydrogen carbonate are heated strongly, they decompose to form anhydrous sodium carbonate (soda ash).



**Step-III: Recrystallization of sodium carbonate:** Sodium carbonate thus obtained is recrystallized to form crystals of washing soda.



**Anhydrous**

**Washing soda**

**sodium carbonate**

1. Some of the uses of washing soda are given below:

- (I) It is used for removing permanent hardness of water
- (II) It is used in glass industry
- (III) It is used in paper industry
- (IV) It is used in the manufacture of sodium compounds such as borax

Select the correct option regarding uses of washing soda

- (a) (I) and (II) only (b) (II) and (III) only
- (c) (II) and (IV) only (d) (I), (II), (III) and (IV)

(ii) What products will be formed along with water when sodium carbonate reacts with dilute hydrochloric acid?

- (a)  $\text{CO}$  and  $\text{NaCl}$  (b)  $\text{Na}$  and  $\text{CO}_2$
- (c)  $\text{NaCl}$  and  $\text{CO}_2$  (d)  $\text{Na}$  and  $\text{CO}$

(iii) Chief raw materials for the manufacture of washing soda are

- (a) sodium chloride, ammonia and limestone

(b) ammonia, sodium hydrogen carbonate and copper sulphate

(c) sodium hydroxide, calcium chloride and ammonia

(d) calcium chloride, sodium chloride and copper sulphate.

(iv) What is the action of sodium carbonate on litmus paper?

(a) Turns red litmus blue

(b) Turns blue litmus red

(c) No change on litmus

(d) Both (a) and (b)

(v) What products will be obtained when solution of sodium carbonate and slaked lime is heated?

(a) NaOH and CaCl<sub>2</sub>

(b) CaCO<sub>3</sub> and NaOH

(c) NaHCO<sub>3</sub> and NaOH

(d) NaCl and CaCO<sub>3</sub>