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WORKSHEET 10

School: **Ba Sangam College** Subject: **Chemistry**
Year: **12** Name:_____

Strand	**4 Materials**
Sub strand	**12.4.1 Inorganic Chemistry**
Content Learning Outcome	**12.4.1.2 Investigate the preparation, properties and uses of chlorine.**

Chlorine Notes Continued

Uses of chlorinating agent (sodium hypochlorite)

1. Bleaching

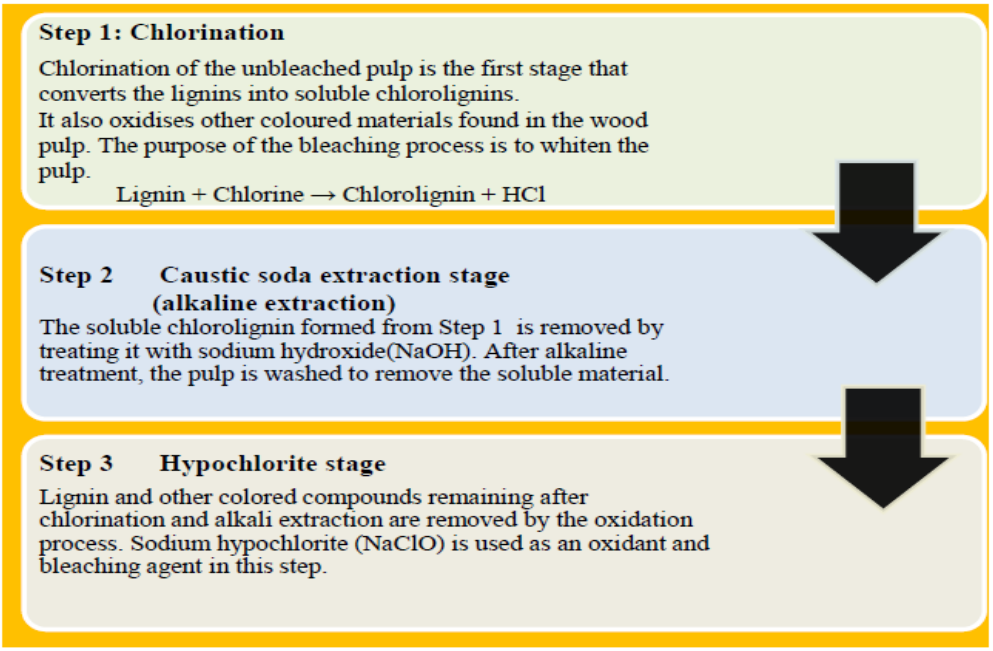
- Sodium hypochlorite (NaClO) is the main ingredient in laundry bleach.
- Used extensively as a bleaching agent in the textile, detergents, and paper and pulp industries

2. Anti-bacterial

- Large quantities of sodium hypochlorite are also used as a disinfectant in water and waste water treatment and sanitary equipment.
- In food processing, sodium hypochlorite is used to sanitize food preparation equipment. It is also used in fruits and vegetable processing, mushroom production, hog and poultry production, maple syrup production, and fish processing.

3. Oxidising Properties

- Sodium hypochlorite is also used as an oxidizing agent for organic products.
- **Example: Paper and Pulp Industry**
- The paper and pulp industry converts wood or recycled fibre into pulp and primary forms of paper.
- The uses of chlorine and NaClO in paper and pulp industry are as follows:



Other Uses of Chlorine (Cl_2)

- Chlorine is used to make consumer products such as paper, paints and other textiles and insecticides.
- About 20% of chlorine produced is used to make PVC.

- Another major use for chlorine is in organic chemistry. It is used as an oxidising agent.

Precipitation Reactions

- Precipitation reactions occur when cations and anions in aqueous solution combine to form an insoluble ionic solid called a precipitate (an insoluble solid that forms from mixing two solutions).
- A common example is the mixing of clear solutions of silver nitrate ($AgNO_3$) and sodium chloride NaCl.

The reaction is: $AgNO_3\,(aq) + NaCl\,(aq) \rightarrow AgCl\,(s) + NaNO_3\,(aq)$

white ppt

Solubility Rules

Substance	Soluble	Insoluble
Nitrates	All	None
Sulphates	Most	Lead sulphate, barium sulphate, calcium sulphate (slightly)
Chlorides	Most	Silver chloride and lead chloride
Carbonates	Sodium carbonate, potassium carbonate and ammonium carbonate	Most other carbonates
Hydroxides	Sodium hydroxide, potassium hydroxide and ammonium carbonate	Most other hydroxides

Activity

1. Chlorine and chlorinating agents play an important role in the paper and pulp industry.

i. Write a balanced equation for the reaction of chlorine and sodium hydroxide to produce sodium hypochlorite.

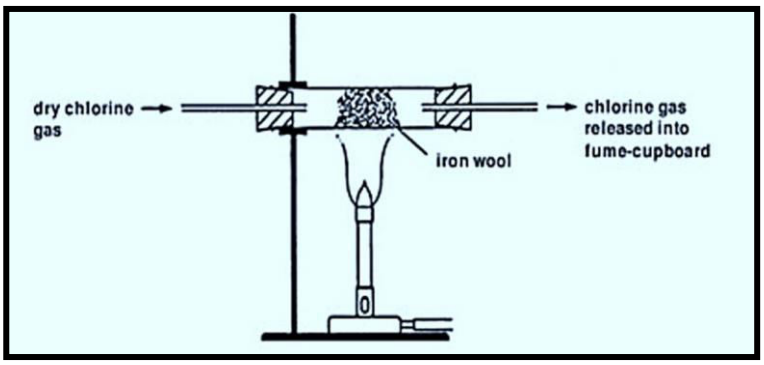
_____(2 marks)

ii. What purpose does chlorine and sodium hypochlorite serve in the paper and pulp industry?

_____

_____(1 mark)

2. Study the diagram given below and answer the question that follows.



Write the balanced chemical equation showing iron wool reacting with chlorine gas.

_____(2 marks)

3. Classify the following compounds into two groups: **soluble and insoluble.**

Lead chloride, silver nitrate, calcium carbonate, calcium hydroxide, sodium hydroxide, barium sulphate, silver iodide, ammonium nitrate, potassium chloride and lead sulphate,

_____

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_____

_____ (5 marks)