ORIENT PAPER MILLS - CAUSTIC SODA UNIT, AMLAI, ANUPPUR (M.P.)

PRODUCT STEWARDSHIP SUMMARY

[Refer to the material Safety Data Sheet (MSDS) for additional Information and before handling this material.]

Sodium Hypochlorite

Summary

Sodium hypochlorite is a greenish yellow liquid with a faint chlorine-like odor. The term "hypochlorite" refers to the salts of hypochlorous acid (HOCl). Since the acid is extremely unstable, most users handle the more stable hypochlorite solutions instead. These salts are prepared in solution by reacting chlorine with a strong alkali, such as caustic soda, or an alkaline earth hydroxide. Sodium hypochlorite (NaOCl) solution is commonly known as household bleach. At stronger concentrations, it is used for bleaching paper, pulp, and textiles. Other applications include use as a chemical intermediate for the manufacture of organic chemicals, in water purification, in medicine, in fungicides, in swimming pool disinfectants and as a germicide.

1. Chemical Identity

Name: Sodium hypochlorite
Synonyms: Chlorine bleach, Soda bleach, Household Bleach Chemical Abstracts Service (CAS) number: 7681-52-9 Chemical Formula: Cl-O.Na
Molecular Weight: 74.44

2. Production

The common method for making sodium hypochlorite is to react chlorine with a solution of caustic soda. The final concentration of the sodium hypochlorite solution depends on the initial concentration of the starting caustic soda solution. The following equation gives the chemical reaction involved, regardless of concentration:

$$Cl_2 + 2\ NaOH = NaOCl + NaCl + H_2O$$

3. Uses

Sodium hypochlorite is used as a disinfectant; a water treatment agent in swimming pool water, drinking water, wastewater and sewage, and pulp and paper mill process water; and as a bleaching agent for textiles.

4. Physical and Chemical Properties

Sodium hypochlorite is generally sold in aqueous solutions containing 5 to 15% sodium hypochlorite, with 0.25 to 0.35% free alkali (usually NaOH) and 0.5 to 1.5% NaCl. Solutions of up to 40% sodium hypochlorite are available, but solid sodium hypochlorite is not commercially used. Sodium hypochlorite

solutions are a clear, greenish yellow liquid with an odor of chlorine. **Odor may not provide an adequate warning of hazardous concentrations**. Sodium hypochlorite solutions can liberate dangerous amounts of chlorine or chloramine if mixed with acids or

ammonia. Anhydrous sodium hypochlorite is very explosive. Hypochlorite solutions should be stored at a temperature not exceeding 20ºC (68 ºF) away from acids in well-fitted air-tight bottles away from sunlight.

Hazardous Decomposition Products: Chlorine and hydrogen chloride

Conditions to Avoid: Avoid heat, flames, sparks, and other sources of ignition. Avoid exposure to direct sunlight. Avoid contact with metals.

5. Health Effects

- May cause eye irritation (possibly severe), chemical burns, eye damage, and blindness.
- Skin contact may be irritating and corrosive.
- Inhalation may cause coughing, choking, irritation and pulmonary edema.
- Ingestion may cause irritation, corrosion of gastrointestinal tract, pain and vomiting.
- Carefully controlled sensitization studies on animals have not resulted in any reproducible positive findings. Standard sensitization patch tests in healthy human volunteers show no potential to induce contact sensitization.
- In tests using rats and mice, there was no evidence of carcinogenicity.

6. Environmental Effects

Sodium hypochlorite may adversely affect aquatic life. This material is inorganic and not subject to biodegradation. This material is believed not to bioconcentrate in aquatic systems.

Before disposing of any significant volumes of aqueous solutions of sodium hypochlorite to any sanitary discharge system or receiving body of water, contact the local environmental regulating agency and/or plant management first. Proper neutralization is critical because sodium hypochlorite can seriously disrupt sewage or other treatment plant operations resulting in failure of the biological or chemical treatment processes. In addition, waste streams containing sodium hypochlorite may come into contact with acidic conditions and chlorine gas may be released.

7. Exposure

Sodium hypochlorite is corrosive and causes severe skin burns, serious eye damage, and damage to the respiratory system if inhaled. The most likely ways exposures could occur are:

- Worker exposure – Exposure could occur in the manufacturing facility or in industrial facilities that use sodium hypochlorite. When exposures occur, they are typically by inhalation of vapors. Exposure to skin or eyes, causing severe irritation or chemical burns, could also occur. Good industrial hygiene practices and the use of personal protective equipment minimize the risk of exposure.
- Consumer exposure – OxyChem does not sell sodium hypochlorite directly into the retail market.
- Releases – If a spill occurs, emergency personnel should wear protective equipment to minimize exposures.

8. Recommended Risk Management Measures

- Prior to using sodium hypochlorite, carefully read and comprehend the Material Safety Data Sheet. The Refer to technical references and handbooks to ensure proper selection of materials used to process, store, and/or transfer sodium hypochlorite. Few materials of construction will withstand the highly reactive

nature of sodium hypochlorite. Improper selection of those materials may result in damage to the handling system and contamination of the product. As a general rule, no metals should be allowed to come in contact with this chemical.

- Store sodium hypochlorite solutions in the original, labeled container.
- Industrial users of sodium hypochlorite should store it in vented containers, or in containers equipped with adequate relief devices. If venting rate is exceeded by the decomposition rate, swelling or damage to the container may occur.
- Use closed systems when possible to prevent worker exposure. Provide local exhaust ventilation where vapors, mist or aerosols may be generated.
- Work areas where sodium hypochlorite is used should be well ventilated to maintain concentrations below exposure limits. If exposures exceed accepted limits or if respiratory discomfort is experienced, use a NIOSH approved full-face air purifying respirator with high efficiency particle air (HEPA) cartridges. Acid gas cartridges may be required if decomposition products are present. If concentrations are unknown or at or above 10 mg/m^3, an approved self- contained breathing apparatus operated in the pressure demand mode is required.
- Wear chemical safety goggles with a face shield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
- Wear chemical resistant gloves made of natural rubber, neoprene, nitrile, or polyvinyl chloride (PVC) to prevent skin contact.
- Wear chemical resistant clothing to prevent contact with the body.

Regulatory Compliance Information

Risk Phrases	**R23/24/25:** Toxic by inhalation, in contact with skin and if swallowed. **R34:** Causes burns **R36:** Irritating to eyes **R50/53:** Very toxic to aquatic organisms, may cause long term adverse effects **R37:** Irritating to respiratory system **R38:** Irritating to skin
Safety Phrases	**S2:** Keep locked up and out of the reach of children. **S24/25:** Avoid contact with skin and eyes. **S23:** Do not breathe gas/flumes/vapours/spray. **S26:** In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. **S36/37/39:** Wear suitable protective clothing, gloves, and eye/face protection. **S45:** In case of accident or if you feel unwell, seek medical advice immediately and show the label where possible) **S61:** Avoid release to the environment.

"CLEAN AIR ACT": This product does not contain nor is it manufactured with ozone depleting substances. It is not defined as a Hazardous Air Pollutant per 40 CFR 112. EPA Pesticide: The 10.5% and 12.5% sodium hypochlorite products are registered with the U.S. EPA as a pesticide, as required under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). It is a violation of Federal law to use this product for pesticidal applications in a manner inconsistent with the FIFRA labelling.

9. PACKAGING AND TRANSPORATION

Sodium hypo chlorite is packed in 200 LTR PVC drum and transported only through trucks for Paper Plant.

10. Product Stewardship

OPM-CSU is committed to managing sodium hypo chlorite so that it can be safely used by its employees and customers. OPM-CSU's relationships with its customers encourage communication about safety and environmental stewardship.

11.AdditionalInformation

For more information regarding OPM-CSU' sodium hypo chlorite, contact our customer service department by calling 18-00-111735 Or, in Orient Paper Mills - Caustic Soda Unit, Distt. Anuppur, Madhya Pradesh – 484 117 India.

12.Notice

Prior to its use, the user is responsible for determining the suitability of the product or products covered by this Product Stewardship Summary and for complying with state, local laws, and regulations in connection with its use. Neither OPM-CSU nor any of its affiliates shall be responsible for any damages of any kind whatsoever resulting from the use of or reliance on this Product Stewardship Summary or product or products to which it refers. This Product Stewardship Summary is intended only to provide a general summary of the potential hazards associated with the product or products described herein. It is not intended to provide detailed information about potential health effects and safe use and handling information and, although OPM-CSU believes this information is correct, OPM-CSU makes no warranties as to its completeness or accuracy.

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the OPM-CSU product(s) mentioned in this document. Before working with any of these products, users must read and become familiar with the available information on product hazards, proper use, and handling. Information is available in several forms, such as Material safety data sheets (MSDS) and product labels. A copy of OPM-CSU's MSDS for HCl can be obtained by the company. This information is subject to change without notice.

Date: Initial Issue – September' 2020