

MATERIAL SAFETY DATA SHEET

1. Chemical Product And Company Information

Chemical Name: Sodium Hypochlorite Solution
Synonyms/Trade Names: Hypo, Bleach, Liquid bleach, Soda bleach
Chemical Family:
Formula: NaOCl
Molecular Weight: 74.44
CAS No.: 7681-52-9
Uses: Used as a disinfectant and sanitizer in swimming pools, bleach for textiles and wood pulp and in effluent treatment.

Manufacturer & Supplier:
ERCO Worldwide, a division of Superior Plus LP
Wanuskewin Rd. & 71st Street
Saskatoon, Saskatchewan S7K 3R3
(306) 931-7767

Transportation Emergency Telephone Numbers :
CANADA:
CANUTEC (613) 996-6666
USA:
CHEMTREC 1-800-424-9300

ERCO Worldwide (USA) Inc.
101 Highway 73 South
Nekoosa, Wisconsin 54457
(715) 887-4000

Canadian WHMIS Classification (s):

E - Corrosive



2. Composition / Information On Ingredients

Name:	Conc. % By Weight	CAS No.
Sodium Hypochlorite	4.5 - 15	7681-52-9
Sodium Hydroxide	1 - 5	1310-73-2

3. Hazard Identification

Emergency Overview:

Clear light yellow to greenish-yellow liquid with a chlorine-like (bleach) odour. Does not burn. Decomposes when heated, during a fire or upon contact with acids releasing corrosive chlorine gas. During a fire, corrosive hydrogen chloride gas may also be generated. Reacts with primary and aromatic amines, ammonia and ammonium salts to form explosively unstable compounds. CORROSIVE to the eyes and skin. May cause blindness and permanent scarring.

Routes of Entry:

Inhalation:

Sodium hypochlorite does not easily form a vapour, but solutions decompose slowly on contact with air releasing corrosive chlorine gas. Chlorine can cause severe irritation of the nose, throat and lungs, and even death, depending on the airborne concentration. Mists formed from solutions can probably cause mild to severe irritation of the nose and throat, depending mainly upon the airborne concentration and the strength of the solution.

Skin Contact:

Sodium hypochlorite solutions can cause corrosive injury depending on the duration of contact, the concentration and pH of the solution. Corrosive materials are capable of producing severe burns, blistering and permanent scarring.

Eye Contact:

Sodium hypochlorite solutions can cause corrosive injury, depending on the concentration and pH of the solution, and the duration of contact. Corrosive materials are capable of causing permanent eye damage, including blindness.

Ingestion:

Swallowing sodium hypochlorite solutions can cause irritation, pain and inflammation of the mouth, throat and stomach, as well as vomiting. In severe cases, serious effects including ulceration and perforation of the gastrointestinal tract and death can result.

Symptoms of Exposure:

See above.

4. First Aid Measures

Skin:

Avoid direct contact. Wear chemical protective clothing, if necessary. As quickly as possible, flush with lukewarm, gently flowing water for at least 20 minutes, or until the chemical is removed. If irritation persists, repeat flushing. Under running water, remove contaminated clothing, shoes and leather goods (e.g., watchbands, belts). Completely decontaminate clothing, shoes and leather goods before reuse, or discard. Obtain medical advice immediately.

Eyes:

Avoid direct contact. Wear chemical protective gloves, if necessary. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 20-30 minutes, by the clock, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. If irritation persists, repeat flushing. Neutral saline solution may be used as soon as it is available. **DO NOT INTERRUPT FLUSHING.** If necessary, keep emergency vehicle waiting. Quickly transport victim to an emergency care facility.

Inhalation:

Sodium Hypochlorite can release corrosive chlorine gas. Take proper precautions to ensure your own safety before attempting rescue. Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. **DO NOT** allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. Avoid mouth-to-mouth contact by using mouth guards or shields. Immediately transport victim to an emergency care facility.

Ingestion:

NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Have victim rinse mouth thoroughly with water. **DO NOT INDUCE VOMITING.** Have victim drink 240 to 300 mL (8 to 10 oz) of water to dilute material in stomach. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Rinse mouth and repeat administration of water. Quickly transport victim to an emergency care facility.

5. Fire-Fighting Measures

Conditions Of Flammability:

Not combustible (will not burn)

Means To Extinguish:

Sodium hypochlorite solutions do not burn. Extinguish fire using extinguishing agents suitable for the surrounding fire and not contraindicated for use with sodium hypochlorite.

DO NOT use dry chemical fire extinguishing agents containing ammonium compounds (such as A:B:C agents) since an explosive compound can be formed. Use water spray, fog or foam. Fire fighting agent should be chosen to deal with other materials present. Do not get water inside the containers. Move containers from the area if this can be accomplished without risk. Cool containers with water from maximum distance until well after the fire is out.

Hazardous Combustion Products :

Chlorine gas, Hydrogen Chloride gas, Oxygen gas, Disodium Oxide

Flash Point & Method: Not combustible (does not burn)

Upper Flammability Limit: Not applicable

Lower Flammability Limit: Not applicable

Auto-Ignition Temperature: Not applicable

Mechanical Impact Sensitivity: Not sensitive

Static Discharge Sensitivity: Sodium hypochlorite solutions will not accumulate a static charge. Since these solutions do not burn, they will not be ignited by a static discharge.

6. Accidental Release Measures

Leak Or Spill Procedures :

Restrict access to area until completion of the clean-up. Ensure clean-up is conducted by trained personnel only. Wear adequate personnel protective equipment. Ventilate area. Do not touch spilled material. Prevent spilled material from entering sewers, waterways or confined spaces. Contain spill with sand, earth or absorbent material which does not react with spilled material. Never use combustibles such as sawdust to absorb.

SMALL SPILLS

Soak up spill with absorbent material which does not react with spilled chemical. Put material in suitable, covered, labelled containers. Flush area with water. Contaminated absorbent material may pose the same hazards as the spilled product.

Small spills of sodium hypochlorite solutions can be broken down by covering it with a reducing agent such as sodium thiosulfate, sodium metabisulfite, or a ferrous salt. With the sulfite or ferrous salt, add some dilute (2 M) sulfuric acid to speed up the reaction. Transfer the mixture into large containers of water and neutralize with soda ash (sodium carbonate).

LARGE SPILLS

For transportation incidents contact CANUTEC (Canada) or CHEMTREC (USA) emergency numbers in section 1. For onsite incidents contact fire and emergency services and ERCO Worldwide at phone numbers in section 1.

Waste Control Procedures :

Consult appropriate Federal, State/Provincial and local regulatory authorities to ascertain disposal procedures. Care should be taken not to mix waste with incompatible material.

7. Handling Storage

Handling Procedures And Equipment :

Handle in well ventilated areas. Have emergency equipment readily available to handle possible spill. Label containers and keep containers closed when not in use.

Storage:

Store in cool, dry location away from direct sunlight, heat sources and combustible materials. Vented containers must be used. Keep storage temperatures below 29°C (85°F). Long storage is impossible, because the shelf life of sodium hypochlorite is limited.

8. Exposures Controls / Personal Protection

Protective Equipment:

Use NIOSH approved respirators suitable for chlorine.

Use tight-fitting chemical safety goggles.

Gloves, boots and apron should be used depending on exposure. Safety showers and eye wash fountains should be installed in storage and handling areas.

Use only rubber (butyl, natural, neoprene, nitrile), polyethylene, polyvinyl chloride, Viton(TM), Silver Shield/4H(TM) (polyethylene/ethylene vinyl alcohol) or Tychem(TM) SL (Saranex(TM)) materials.

Engineering Controls:

Although good ventilation is suggested, no special ventilation is required unless sodium hypochlorite is exposed to decomposition condition such as spills, or acidic conditions.

9. Physical And Chemical Properties

State: Liquid (solution)

Odour: Strong chlorine odour

Odour Threshold: Not available

Boiling Point: Decomposes slowly above 40°C (104°F)

Melting Point: not applicable

Freezing Point: -25°C (-13°F) for 12% Solution and -6°C (21°F) for 5% solution

pH: 11 - 13

Coefficient Of Water/Oil Distribution: Log P (Oct) = -3.42 (estimated)

Appearance: Clear, greenish-yellow, aqueous solution

Specific Gravity: Approximately 1.15 - 1.2 @ 15°C

Vapour Pressure: Does not form a vapour but slowly decomposes giving off gases.
All containers should be vented.

Vapour Density: Not available

Evaporation Rate: Not available

Solubility In Water: Product is water solution and can be diluted at any proportion.

Bulk Density: Not applicable

10. Stability And Reactivity

Chemical Stability:

Sodium hypochlorite solutions decompose slowly at normal temperatures releasing low concentrations of corrosive chlorine gas. Decomposition is influenced by temperature, concentration, pH, ionic strength, exposure to light and the presence of metals, such as copper, nickel or cobalt, metal oxides, e.g. rust and other impurities, such as acids and amines.

Reactivity Conditions:

At ambient conditions, reacts vigorously with acids to liberate chlorine gas.

Heat, sunlight, acidic conditions, the presence of metals and other impurities accelerates decomposition.

Incompatible Substances:

ACIDS (especially hydrochloric acid) - contact releases corrosive chlorine gas.

PRIMARY AMINES (e.g. ethylamine) and AROMATIC AMINES (e.g. aniline) - react to form explosively unstable N-mono- or di-chloramines.

AMMONIUM SALTS (e.g. ammonium sulfate and ammonium nitrate), AMMONIA, UREA, or

PHENYLACETONITRILE - form explosive nitrogen trichloride, if acid is present.

ETHANEDIOL (ETHYLENE GLYCOL) - erupts violently after an induction period of about 4 to 8 minutes.

ETHYLENEIMINE (AZIRIDINE) - form the explosive N - chloroethyleneimine.

FORMIC ACID - becomes explosive at 55 deg C (131 deg F).

FURFURALDEHYDE - dropwise addition of the aldehyde to a 10% excess of sodium hypochlorite solution at 20-25 deg C (70-80 deg F) can lead to a violent explosion.

METALS (especially copper, nickel and cobalt) - accelerate decomposition.

METHANOL - can form explosive methyl hypochlorite, especially in the presence of acids or other etherification catalysts.

REDUCING AGENTS (e.g. hydrides, such as lithium aluminum hydride) - cause a violent reaction.

SODIUM ETHYLENEDIAMINETETRACETATE (EDTA) SOLUTION and SODIUM HYDROXIDE

SOLUTION - mixing the three solutions leads to vigorous foaming decomposition.

Corrosivity to Metals:

Sodium hypochlorite solutions (20%) are corrosive to brass (aluminum, naval and silicon) bronze, carbon steel, cast iron, Hastelloy, Inconel, nickel, stainless steels (types 304/347, 316 and 400 series) and silicon copper. Concentrated sodium hypochlorite is corrosive to most metals, including aluminum, copper, brass, bronze, carbon steel, Hastelloy, Inconel, lead, Monel, nickel and stainless steel type 400 series. Sodium hypochlorite solutions are not corrosive to tantalum, titanium and zirconium. Dilute solutions are not corrosive to Hastelloy C/C-276 (10%), Incolloy (5%) and high silicon iron.

Corrosivity to Non-Metals:

Sodium hypochlorite solutions attack some plastics (such as nylon, Bisphenol A-fumarate and isophthalic polyesters), elastomers (such as soft rubber, neoprene and nitrile Buna-N) and coatings (such as coal tar epoxy, epoxy and vinyls).

Sodium hypochlorite solutions do not attack acrylonitrile-butadiene-styrene (ABS), Butyl rubber, isoprene, hard rubber, natural rubber, polyvinyl chloride (PVC), chlorinated polyvinyl chloride (CPVC), polyethylene, polypropylene, polystyrene, Teflon and Viton.

Hazardous Decomposition Products:

Chlorine (by reaction with acids), oxygen (accelerated by nickel, copper, cobalt, tin, manganese, iron), sodium chlorate (with increased temperature).

11. Toxicological Information

Skin Contact: Causes severe skin irritation with blistering and ulceration.

Skin Absorption: Not available

Eye Contact: Causes severe irritation of the mucous membranes of the eyes. May cause severe eye damage.

Inhalation: Irritation of the nose and throat causing coughing, difficulty with breathing and pulmonary edema.

Ingestion: Burning in the mouth and throat, abdominal cramps, nausea, vomiting, diarrhea, shock. May lead to convulsions, coma, and death.

LD₅₀: 8910 mg/kg (undiluted) (Rat, oral)

5800 mg/kg (Mouse, oral)

LC₅₀: Greater than 10,000 mg/m³ for 1 hour exposure (Inhalation, rat)

Exposure Limits: The Time-Weighted Average Limits have not been established. American Industrial Hygiene Association (2010) established short term limits of 2 mg/m³ (15 minutes)

Irritancy: Very dilute solutions (<1%) cause negligible irritancy, while more concentrated solutions (>10%) cause corrosive injury.

Sensitization: Not available.

Carcinogenicity: Not listed by IARC or ACGIH

Teratogenicity & Mutagenicity: Insufficient information to draw conclusions.

Reproductive Toxicology: Insufficient information to draw conclusions.

Toxicological Synergism: Not available

12. Ecological Information

Ecological Information:

Hypochlorite solutions will slowly decompose releasing chlorine which is a strong oxidizer and with the potential formation of chlorate. These decomposition products are harmful to plant life.

Biodegradability:

This material is inorganic and not subject to biodegradation. This material is believed not to persist in the environment but undergo reduction to sodium chloride.

Aquatic Toxicity:

Harmful to aquatic life.

Ecotoxicity Values (for pure sodium hypochlorite):

LC50: 0.07 mg/L (48 hr; rainbow trout) - Extreme Toxicity.

LC50: 5.9 mg/L (96 hr; fathead minnow) - High Toxicity.

13. Disposal Considerations

Disposal Considerations:

Consult appropriate Federal, State/Provincial and local regulatory authorities to ascertain disposal procedures. Care should be taken not to mix waste with incompatible material.

14. Transportation Information

Shipping Name (TDGR)	UN Number	Hazard Class	Packing Group
Hypochlorite Solution, more than 7 per cent available chlorine	UN 1791	8	II

15. Regulatory Information

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR .

Safety:

CANADIAN FEDERAL REGULATIONS : (not a comprehensive list)

WHMIS CLASSIFICATION:

E - Corrosive material

UNITED STATES FEDERAL REGULATIONS : For Sodium Hypochlorite (not a comprehensive list)

OSHA: Not a Hazardous Substance under 29 CFR Section 1910, Subpart Z.

CERCLA: Hazardous Substance under 40 CFR Part 302, RQ = 100 lbs.

SARA 313: Not subject to the reporting requirements of 40 CFR Part 372

SARA 311/312 EPA HAZARD CATEGORIES: Immediate (Acute) Health, Reactive Hazard

SARA 302: Not subject to 40 CFR Part 355

Environmental:

All components of this product are either on the Canadian Domestic Substances List (DSL) or the Non-Domestic Substances List (NDSL) or exempt.

All components of this product are either on the U.S. Toxic Substances Control Act (TSCA) Inventory List or exempt.

European Union Concentration Limits:

CONCENTRATION GREATER THAN OR EQUAL TO 25%: Corrosive; Dangerous for the Environment. Contact with acids liberates toxic gas. Causes burns. Very toxic to aquatic organisms. [C;N;R:31-34-50]

Transportation:

Transportation in Canada is governed by Transport Canada. Refer to the Transportation of Dangerous Goods (TDG) Regulations for special shipping requirements.

Transport in the U.S. is governed by the Department of Transportation (DOT). Refer to DOT regulations (49CFR) for special shipping requirements. (UN 1791)

ERG Number 154

16. Other Information

Prepared By:

ERCO Worldwide, A division of Superior Plus LP
Toronto, ON
416-239-7111

Summary of Changes Made in this Revision :

Sections " 5. Fire-Fighting Measures", "10. Stability And Reactivity", "11. Toxicological Information" and "12 Ecological Information" were updated.

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