

Sodium Hypochlorite Solution (5-10% w/w)

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<p>Manufacturer's name and address: Olin Corporation – Chlor Alkali Products Division CLEVELAND, TN OFFICE 490 Stuart Road NE Cleveland, TN 37312-4918 U.S. • (423) 336-4850</p>	<p>Supplier's name and address: PCI Chemicals Canada Company d/b/a Olin Chlor Alkali Products MONTREAL, QC OFFICE 2020 University, Suite 2190 Montreal, Quebec H3A 2A5 Canada • (514) 397-6100</p>
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Product Name:	Sodium Hypochlorite Solution (5-10% w/w)		
CAS#:	7681-52-9	Preparation date (M/D/Y):	10/03/08
MSDS Code:	NaOCl (5-10 wt%)-e	Revision date (M/D/Y):	05/11/2010
Synonyms:	Sodium Hypochlorite Solution, Bleach, Javel Water, Clorox		
Product Use:	Bleach, disinfectant		

Emergency Contacts (24 hr.)

FOR INFORMATION REGARDING ON SITE CHEMICAL EMERGENCIES INVOLVING A SPILL OR LEAK, CALL

U.S.: 1-800-424-9300 – CHEMTREC

Canada: 1-800- 567-7455

SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient(s)	% (w/w)	AIHA WEEL	Exposure Limits		CAS NO.
			OSHA / ACGIH TLV-TWA		
Sodium Hypochlorite	5 – 10	2 mg/m ³	Not Available		7681-52-9

SECTION 3 – HAZARD IDENTIFICATION

Emergency Overview: CORROSIVE! Contact with acid liberates toxic chlorine gas. Causes burns to skin, eyes, respiratory tract and mucous membranes. Harmful or fatal if swallowed. May cause sensitization by skin contact. Read the entire MSDS for a more thorough evaluation of the hazards.

Potential Health Effects:

Routes of exposure: inhalation, skin contact, eye contact and ingestion.

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Inhalation: Mist can irritate the nose and throat. If mixed with acids, hypochlorite solutions release large amounts of chlorine gas. This gas can cause severe irritation of the nose and throat. Exposure to high levels of chlorine gas may result in severe lung damage.

Skin Contact: Sodium hypochlorite mist and solutions can cause skin irritation. In severe cases, chemical burns may result.

Eye Contact: Can cause severe eye irritation and permanent eye injury.

Ingestion: May cause irritation, pain and inflammation of the mouth and stomach, vomiting, shock, confusion, delirium, coma and, in severe cases, death. Perforation of the esophagus or stomach may occur.

Chronic Effects: SKIN: Prolonged or repeated skin contact may cause allergic reaction (dermatitis). Symptoms include chronic, itchy eczema.

Existing Medical Conditions Possibly Aggravated by Exposure: Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of vapors or mists may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

Carcinogenicity: Sodium hypochlorite is not classified as a carcinogen by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as a carcinogen by OSHA (Occupational Safety and Health Administration), and not listed as a carcinogen by NTP (National Toxicology Program).

Δ **Other important hazards:** Refer to TOXICOLOGICAL INFORMATION (Section 11) for additional information.

SECTION 4 – FIRST AID MEASURES

General: If you feel unwell seek medical advice (show the label where possible).

Inhalation: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance: induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Give Cardiopulmonary Resuscitation (CPR) only if there is no pulse AND no breathing. Obtain medical attention IMMEDIATELY.

Skin Contact: Immediately flush skin with running water for at least 20 minutes. Under running water remove contaminated clothing, jewelry and shoes. If irritation persists, repeat flushing. For burns, obtain medical attention. Discard heavily contaminated clothing and shoes in a manner which limits further exposure. Otherwise, wash clothing separately before reuse.

Eye Contact: Immediately flush eyes with running water for a **minimum** of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Ingestion: DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give water to dilute material, 240 – 300 mL (8 to 10 oz.). If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.

Note to Physicians: Symptomatic. Treatment and supportive therapy as indicated.

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SECTION 5 – FIRE FIGHTING MEASURES

Δ	Flash Point and Method	Not applicable.
	Flammable Limits (Lower)	Not applicable
	Flammable Limits (Upper)	Not applicable
	Auto Ignition Temperature	Not applicable
	Combustion and Thermal Decomposition Products	Chlorine, sodium oxide, oxygen
	Rate of Burning	Not applicable
	Explosive Power	Not applicable
	Sensitivity to Mechanical Impact	Not applicable
	Sensitivity to Static Discharge	Not sensitive. Stable material.
	Fire and Explosion Hazards	Non-combustible (does not burn). This material is non-flammable but is decomposed, causing a pressure build-up, which could result in an explosion. When heated, it may release chlorine gas. See Section 10.
Δ	Extinguishing Media	Use media appropriate for the surrounding fire. DO NOT use dry chemical fire extinguishers containing ammonium compounds since an explosive compound can be formed.

Special Information: Water may be used to cool containers of Hypochlorite solution exposed to heat from a fire. This should be done from a safe distance since containers may rupture.

Move containers from fire area if you can do it without risk. Dike fire control water for later disposal; do not scatter the material.

Fire involving tanks or trailer loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Do not get water inside containers. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from the ends of tanks.

Evacuation: If tank or tank truck involved in a fire, ISOLATE and consider evacuation of 800 meters (1/2 mile) radius.

Fire Fighting Protective Equipment: Firefighters should wear protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode in a fire involving this material. Toxic gas and vapors are produced upon decomposition.

NOTE: Also see "Section 10 - Stability and Reactivity"

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Spills, Leaks, or Releases:

- Restrict access to area until completion of clean up. Ensure trained personnel conduct clean up.
- Remove all ignition sources (no smoking, flares, sparks or flames). All equipment should be grounded and non-sparking. Ventilate area.

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- Wear adequate personal protective equipment. Do not touch spilled material.
- Stop leak if possible without personal risk.
- Small spills: Cover with DRY earth, sand or other non-combustible material. Use clean non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal. Rinse area with water.
- Large spills: Prevent entry into sewers and confined areas. Dike with inert material (sand, earth, etc.). Contact fire and emergency services and supplier for advice. Collect product for recovery or disposal by pumping it into polyethylene containers. Consider in-situ neutralization and disposal. Ensure adequate decontamination of tools and equipment following clean up. Collect contaminated soil and water, and absorbent for proper disposal. Comply with Federal, Provincial/State and local regulations on reporting releases.

Deactivation for Small Spills: Hypochlorite can be broken down by covering it with a reducing agent such as sodium sulfite or sodium thiosulfate.

Deactivating Chemicals: Use sodium sulfite or diluted hydrogen peroxide to reduce the material. Ensure there is no chlorine residue before neutralizing with a weak solution of hydrochloric or sulfuric acid.

Waste Disposal Methods: Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste with normal garbage or to sewer systems.

Note: - Clean-up material may be a RCRA Hazardous Waste on disposal.
- Spills are subject to CERCLA reporting requirements: RQ = 100 lbs. (45.4 kg)

SECTION 7 – HANDLING AND STORAGE

Precautions: Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Wear appropriate Personal Protection Equipment. People working with this chemical should be properly trained regarding its hazards and its safe use.

Handling Procedures and Equipment: Avoid generating mist. Use smallest possible amounts in designated areas with adequate ventilation. Keep containers closed when not in use. Empty containers may contain hazardous residues. Use corrosion-resistant transfer equipment when dispensing.

Storage Requirements: Store in a cool, dry, well-ventilated area, out of direct sunlight. Store containers at 15 – 29°C (59 – 84°F). Keep containers tightly closed when not in use and when empty. Protect from damage. Vent caps should be checked with full personal protection. Store away from incompatible materials such as reducing materials, strong acids, nitrogen compounds, copper, nickel and cobalt. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. This product has a shelf life of up to six months at 60°F or lower.

Outdoor storage tanks should be suitably diked or otherwise provided with an adequate means of secondary containment. Appropriate secondary containment measures should be taken to prevent spills or leaks from indoor storage tanks and tank-truck unloading stations from entering sewers or other channels that discharge directly to a water body or a municipal sewage system.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

PREVENTIVE MEASURES

Recommendations listed in this section indicate the type of equipment, which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls: Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact. Smoking should be prohibited in areas in which sodium hypochlorite solution is stored or handled.

PERSONAL PROTECTIVE EQUIPMENT

Eye Protection: Wear splash resistant chemical goggles and full-face shield. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron, rain jacket, pants or coveralls, as appropriate, to prevent skin contact.

RECOMMENDED (resistance to breakthrough longer than 8 hours): butyl rubber, natural rubber, neoprene, nitrile rubber, polyethylene, Viton™, Saranex™, Responder™.

Respiratory Protection: A NIOSH/MSHA approved air-purifying respirator equipped with acid mist cartridges for concentrations up to 10 times the TLV. Use a supplied air respirator if concentrations are higher or unknown.

EXPOSURE GUIDELINES

PRODUCT: Sodium Hypochlorite

Workplace environmental exposure level guides (WEELS) / American Industrial Hygiene Association (AIHA) / 2001 short-term time weighted average; 2 mg/m³: 15 minute

	Sodium Hypochlorite	Chlorine*
ACGIH TWA	Not established	0.5 ppm
OSHA PEL	Not established	0.5 ppm
NIOSH IDLH	Not established	10 ppm
ACGIH STEL	Not established	1 ppm
OSHA STEL	Not established	1 ppm as Cl ₂
NIOSH (15 min. ceiling)	Not established	0.5 ppm
ACGIH Ceiling	Not established	Not established

* Chlorine may be present as a decomposition product.

Refer to Section 2.

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SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Alternate Name(s)	Hypochlorous acid, Clorox, Javel water, bleach
Chemical Name	Sodium hypochlorite
Chemical Family	Hypochlorous acid salt
Molecular Formula	NaOCl
Molecular Weight	74.4
Physical State and Appearance	Green to yellow, watery liquid
Odor	Pungent chlorine-like odor
PH	11-13
Vapor Pressure (mm Hg at 21°C(69.8°F))	12 mmHg
Vapor Density (Air = 1)	No data
Boiling Point	Decomposes above 40°C (104°F)
Freezing Point (Melting)	7.5°F (-13.6°C)
Solubility (Water)	Completely
Specific Gravity	About 1.1 (6% w/w solution) @ 20°C (68°F)
Evaporation Rate	Not available
% Volatile by Volume	Not available
Coefficient of Oil/Water distribution	Not available

SECTION 10 – STABILITY AND REACTIVITY

Chemical Stability: Stable at room temperature.

Hazardous Decomposition Products: Decomposes slowly at normal temperatures to form toxic chlorine gas.

Thermal decomposition: Chlorine, sodium oxide, oxygen, oxides of chlorine, sodium chlorate and hydrogen.

Conditions to Avoid: Keep away from high heat, and sunlight or ultra-violet light. Do not store above 30°C (86°F). Do not allow solutions to evaporate dry. Keep away from incompatibles.

Incompatibility with other Substances: May react violently with strong acids producing chlorine gas, which is toxic. Other incompatibles include organic material, cellulose, oxidizable materials, ammonia, urea, ammonium salts, ethyleneimine, cyanides, nitrogen compounds, alcohols, metals, and metal oxides. Reacts with metals to produce flammable hydrogen gas. Metal and metal oxide catalysts decompose hypochlorites, evolving oxygen and often causing explosions. May react explosively with nitrogen containing compounds or form chloroamines, which are explosive. Alkaline hypochlorite solutions may react explosively with some chloroorganic compounds.

Corrosivity to Metals: Solutions can be corrosive to many metals.

Hazardous Polymerization: Will not occur.

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SECTION 11 – TOXICOLOGICAL INFORMATION

Δ For additional toxicological information, refer to Section 3.

TOXICOLOGICAL DATA

Sodium Hypochlorite:

Δ Toxicity Data: TD_{Lo} (Lowest published toxic dose) oral-woman- 1 gm/kg
TD_{Lo} 45 mg/kg intravenous-man
LD₅₀ oral rat- 8910 mg/kg
LD₅₀ oral mouse- 5800 mg/kg
LD₅₀ dermal rabbit - >10,000 mg/kg
LC₅₀ rat- >5250 mg/m³ (4 hr)

Irritation Data: Eyes: One drop of 15% solution (pH 11.2) caused immediate severe pain. If not quickly washed off with water, it caused bleeding and swelling of the tender tissue surrounding the eye (conjunctiva) and damage with swelling to the front part of the eye (cornea). The eyes sometimes healed in two to three weeks with slight or no scar damage to the cornea.

Skin: A solution of 3.5% NaOCl applied to rabbit skin for 15 or 30 minutes caused severe skin damage.

Mutagenicity: No data available.

Reproductive Effects: No data available.

Teratogenicity and Fetotoxicity: No data available

Synergistic Materials: None known

Δ **Sensitization to material:** Not expected to cause respiratory or skin sensitization reactions.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicological Information: Harmful to aquatic life in low concentrations.

Fish Toxicity: LC₅₀ (48 hr) rainbow trout 0.07 mg/ l.
LC₅₀ (96 hr) fathead minnow 5.9 mg/l.

Invertebrate and Microbial Toxicity: LOEC Oncorhynchus kisutch 0.02 mg/l.

Persistence and Degradation: No data available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Review federal, state and local government requirements prior to disposal.

Do not dispose of waste with normal garbage, or to sewer systems.

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Whatever cannot be saved for recovery or recycling, including containers should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options.

RCRA: Test waste material for corrosivity, D002, prior to disposal.

SECTION 14 – TRANSPORT INFORMATION

	TDG CLR *	DOT
Shipping Name	Hypochlorite Solution	Hypochlorite Solution
Hazard Class / Division	8	8
Identification No.	UN1791	UN1791
Packing group	II	II
ERAP/RQ	N/AP	RQ = 100 lbs. (45.4 kg)

Note: * TDG CLR (Clear Language Regulations) became effective August 15, 2002

- Δ **IATA/ICAO Shipping Description:** UN1791, Hypochlorite solution, Class 8, PG II is accepted for air transport.
- Δ **For Chemical Emergencies in Transportation Requiring Activation of Olin 24 Hour Emergency Response Plan Call:**

U.S.	1-800-424-9300 – Chemtrec
Canada	1-800-567-7455

SECTION 15 – REGULATORY INFORMATION

- Δ **USA INFORMATION:**
 - OSHA Classification:** Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)
 - SARA Regulations sections 313 and 40 CFR 372:** N
 - SARA Hazard Categories, SARA SECTIONS 311/312 (40 CFR 370.21):**
 - ACUTE: Y
 - CHRONIC: N
 - FIRE: N
 - REACTIVE: N
 - SUDDEN RELEASE: N
 - OSHA PROCESS SAFETY (29CFR1910.119): N
 - CERCLA SECTION 103 (40 CFR 302.4):** Y
 - Reportable Quantity (RQ) under CERCLA:** RQ = 100 lbs. (45.4 kg)
 - TSCA Inventory Status:** Y

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Other Regulations/Legislation which apply to this product:

Right-to-Know/Disclosure Lists: Illinois, Massachusetts, New Jersey, Pennsylvania,

This product does not contain nor is it manufactured with ozone depleting substances.

Δ **CANADIAN INFORMATION:**

This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS (Material Safety Data Sheet) contains all the information required by the CPR.

Controlled Products Regulations (WHMIS) Classification:

E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): Y

WHMIS Ingredient Disclosure List: Meets criteria for disclosure at 1% or greater.

Δ **EUROPEAN ECONOMIC COMMUNITY (EEC) INFORMATION:**

EINECS Number: 231-668-3

CALIFORNIA PROP 65 COMPONENTS:

This product is not listed, but it may contain elements known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act. For additional information, contact Olin Technical Services (800-299-6546)

SECTION 16 – OTHER INFORMATION

- Δ The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Olin will not be liable for any damages, losses, injuries or consequential damages that may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years.

Revision Indicators:

- Δ In the left margin indicates a revision or addition of information since the previous issue.

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**National Fire Protection Association (NFPA) Rating
Hazardous Materials Identification System (HMIS) Rating**

Δ

	NFPA	HMIS
HEALTH	3	3
FIRE	0	0
REACTIVITY / INSTABILITY	1	1
SPECIAL HAZARDS	N/Ap	N/Ap

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum
W = Water Reactive
OX = Oxidizer
* = Chronic health hazard

Δ **REFERENCE**

1. American Water Works Association, ANSI/AWWA B300-04, AWWA Standard for Hypochlorites, Colorado, Dec. 2004
2. Bretherick's Handbook of Reactive Chemical Hazards, 4th Ed, Butterworth & Co. Ltd., 1990
3. Chemlist, STN Database, Chemical Abstract Service, 2005
4. "CHEMINFO", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada, (2008).
5. Chemical Hazards Response Information System (CHRIS), CCOHS, Feb 2002.
6. HSDB- Hazardous Substances Data Bank, CCOHS, 2005
7. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database National Institute for Occupational Safety and Health, U.S. Dept. of Health and Human Services, Cincinnati, Entry Update/2008.
8. "2008 Threshold Limit Values and Biological Exposure Indices", American Conference of Government Industrial Hygienists, 2008.
9. Merck, 11th Edition, 1989

Δ **LEGEND**

ACGIH - American Conference of Governmental Industrial Hygienists
 AFFF - Aqueous Film Forming Foam
 AIHA - American Industrial Hygiene Association
 CAS # - Chemical Abstracts Service Registry Number
 CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
 CFR - Code of Federal Regulations
 DOT - Department of Transportation
 EINECS - European Inventory of Existing Chemical Substances
 EPA - Environmental Protection Agency
 ERAP - Emergency Response Assistance Plan
 IATA - International Air Transportation Association
 ICAO - International Civil Aviation Organization
 FRP - Fiberglass Reinforced Plastic
 HMIS - Hazardous Materials Identification System
 IARC - International Agency for Research on Cancer

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- IDLH - Immediately Dangerous to Life and Health
- LC₅₀ - The concentration of material in air expected to kill 50% of a group of test animals
- LD₅₀ - Lethal Dose expected to kill 50% of a group of test animals
- MSHA - Mine Safety and Health Administration
- N/Ap - Not Applicable
- N/Av - Not Available
- NFPA - National Fire Protection Association
- NIOSH - National Institute for Occupational Safety and Health
- NTP - National Toxicology Program
- OSHA - Occupational Safety & Health Administration
- PEL - Permissible Exposure Limit
- PVC - Polyvinyl chloride
- RCRA - Resource Conservation and Recovery Act
- SARA - Superfund Amendments and Reauthorization Act of the U.S. EPA
- STEL - Short Term Exposure Limit
- TDG - Transportation of Dangerous Goods Act/Regulations
- TLV - Threshold Limit Value
- TSCA - Toxic Substances Control Act
- TWA - Time Weighted Average
- WEEL - Workplace Environmental Exposure Level
- WHMIS - Workplace Hazardous Materials Identification System

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