Right to Know

Hazardous Substance Fact Sheet

Common Name: **SODIUM HYPOCHLORITE**

Synonyms: Clorox; Liquid Bleach; Sodium Oxychloride

Chemical Name: Hypochlorous Acid, Sodium Salt

Date: April 2000 Revision: September 2008

CAS Number: 7681-52-9

RTK Substance Number: 1707

DOT Number: UN 1791

Description and Use

Sodium Hypochlorite is a clear, slightly yellow or green liquid with a strong *Chlorine* odor. It is usually mixed in water and used as a household cleaner, a disinfectant, and a bleaching agent. It is also used in water treatment and purification.

Reasons for Citation

- **Sodium Hypochlorite** is on the Right to Know Hazardous Substance List because it is cited by DOT, IARC and EPA.
- This chemical is on the Special Health Hazard Substance List.

SEE GLOSSARY ON PAGE 5.

FIRST AID

Eye Contact

- Immediately flush with large amounts of water for at least 30 minutes, lifting upper and lower lids. Remove contact lenses, if worn, while flushing. Seek medical attention immediately.

Skin Contact

- Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of water. Seek medical attention.

Inhalation

- Remove the person from exposure.
- Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- Transfer promptly to a medical facility.
- Medical observation is recommended for 24 to 48 hours after overexposure, as pulmonary edema may be delayed.

EMERGENCY NUMBERS

Poison Control: 1-800-222-1222

CHEMTREC: 1-800-424-9300

NJDEP Hotline: 1-877-927-6337

National Response Center: 1-800-424-8802

EMERGENCY RESPONDERS >>>> SEE BACK PAGE

Hazard Summary

Hazard Rating	NJDOH	NFPA
HEALTH	3	-
FLAMMABILITY	0	-
REACTIVITY	0	-

CORROSIVE
POISONOUS GASES ARE PRODUCED IN FIRE

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

- **Sodium Hypochlorite** can affect you when inhaled.
- Contact can severely irritate and burn the skin and eyes with possible eye damage.
- Inhaling **Sodium Hypochlorite** can irritate the nose and throat.
- Inhaling **Sodium Hypochlorite** can irritate the lungs. Higher exposures may cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency.
- Exposure to **Sodium Hypochlorite** can cause headache, dizziness, nausea and vomiting.
- **Sodium Hypochlorite** is not combustible but is a STRONG OXIDIZER which enhances the combustion of other substances.

Workplace Exposure Limits

NIOSH: The recommended airborne exposure limit (REL) is **0.5 ppm** (as *Chlorine*), which should not be exceeded during any 15-minute work period.

AIHA: The American Industrial Hygiene Association recommends a Workplace Environmental Exposure Level (WEEL) of **2 mg/m^3** for a 15-minute work period.

Determining Your Exposure

- Read the product manufacturer's Material Safety Data Sheet (MSDS) and the label to determine product ingredients and important safety and health information about the product mixture.
- For each individual hazardous ingredient, read the New Jersey Department of Health Hazardous Substance Fact Sheet, available on the RTK website (www.nj.gov/health/eoh/rtkweb) or in your facility's RTK Central File or Hazard Communication Standard file.
- You have a right to this information under the New Jersey Worker and Community Right to Know Act, the Public Employees Occupational Safety and Health (PEOSH) Act if you are a public worker in New Jersey, and under the federal Occupational Safety and Health Act (OSHA) if you are a private worker.
- The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and the PEOSH Hazard Communication Standard (N.J.A.C. 12:100-7) require employers to provide similar information and training to their employees.

This Fact Sheet is a summary of available information regarding the health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

Health Hazard Information

Acute Health Effects
The following acute (short-term) health effects may occur immediately or shortly after exposure to **Sodium Hypochlorite**:

- Contact can severely irritate and burn the skin causing a rash and blisters.
- **Sodium Hypochlorite** can irritate and burn the eyes with possible eye damage.
- Inhaling **Sodium Hypochlorite** can irritate the nose and throat.
- Inhaling **Sodium Hypochlorite** can irritate the lungs causing coughing and/or shortness of breath. Higher exposures may cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath.
- Exposure to **Sodium Hypochlorite** can cause headache, dizziness, nausea and vomiting.

Chronic Health Effects
The following chronic (long-term) health effects can occur at some time after exposure to **Sodium Hypochlorite** and can last for months or years:

Cancer Hazard
- While **Sodium Hypochlorite** has been tested, it is not classifiable as to its potential to cause cancer.

Reproductive Hazard
- According to the information presently available to the New Jersey Department of Health, **Sodium Hypochlorite** has not been tested for its ability to affect reproduction.

Other Effects
- **Sodium Hypochlorite** can irritate the lungs. Repeated exposure may cause bronchitis to develop with coughing, phlegm, and/or shortness of breath.

Medical

Medical Testing
If symptoms develop or overexposure is suspected, the following is recommended:

- Consider chest x-ray after acute overexposure

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under the OSHA Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020).

Mixed Exposures
- Smoking can cause heart disease, lung cancer, emphysema, and other respiratory problems. It may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

Workplace Controls and Practices

Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include: (1) enclosing chemical processes for severely irritating and corrosive chemicals, (2) using local exhaust ventilation for chemicals that may be harmful with a single exposure, and (3) using general ventilation to control exposures to skin and eye irritants. For further information on workplace controls, consult the NIOSH document on Control Banding at www.cdc.gov/niosh/topics/ctrlbanding/.

The following work practices are also recommended:

- Label process containers.
- Provide employees with hazard information and training.
- Monitor airborne chemical concentrations.
- Use engineering controls if concentrations exceed recommended exposure levels.
- Provide eye wash fountains and emergency showers.
- Wash or shower if skin comes in contact with a hazardous material.
- Always wash at the end of the workshift.
- Change into clean clothing if clothing becomes contaminated.
- Do not take contaminated clothing home.
- Get special training to wash contaminated clothing.
- Do not eat, smoke, or drink in areas where chemicals are being handled, processed or stored.
- Wash hands carefully before eating, smoking, drinking, applying cosmetics or using the toilet.

Personal Protective Equipment

The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Gloves and Clothing

- Avoid skin contact with **Sodium Hypochlorite**. Wear personal protective equipment made from material that can not be permeated or degraded by this substance. Safety equipment suppliers and manufacturers can provide recommendations on the most protective glove and clothing material for your operation.
- Safety equipment manufacturers recommend Butyl, Nitrile, Neoprene, Natural Rubber and Viton for gloves and DuPont Tychem® SL, CPF 3, and Responder®; Kappler® Zytron® 300; and Saint-Gobain ONESuit® TEC, or the equivalent, for **Sodium Hypochlorite** *solutions* (30 to 70%).
- All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- Wear non-vented, impact resistant goggles when working with fumes, gases, or vapors.
- Wear indirect-vent, impact and splash resistant goggles when working with liquids.
- Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.
- Do not wear contact lenses when working with this substance.

Respiratory Protection

Improper use of respirators is dangerous. Respirators should only be used if the employer has implemented a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

- Where the potential exists for exposure over **2 mg/m^3**, (or over **0.5 ppm** as *Chlorine*), use a NIOSH approved full facepiece respirator with an acid gas cartridge and N100 particulate prefilters. Increased protection is obtained from full facepiece powered-air purifying respirators.
- Leave the area immediately if (1) while wearing a filter or cartridge respirator you can smell, taste, or otherwise detect **Sodium Hypochlorite**, (2) while wearing particulate filters abnormal resistance to breathing is experienced, or (3) eye irritation occurs while wearing a full facepiece respirator. Check to make sure the respirator-to-face seal is still good. If it is, replace the filter or cartridge. If the seal is no longer good, you may need a new respirator.
- Consider all potential sources of exposure in your workplace. You may need a combination of filters, prefilters or cartridges to protect against different forms of a chemical (such as vapor and mist) or against a mixture of chemicals.
- Where the potential exists for exposure over **20 mg/m^3** (or over **5 ppm** as *Chlorine*), use a NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.
- Exposure to **30 ppm** (as *Chlorine*) is immediately dangerous to life and health. If the possibility of exposure above **30 ppm** exists, use a NIOSH approved self-contained breathing apparatus with a full facepiece operated in a pressure-demand or other positive-pressure mode equipped with an emergency escape air cylinder.

Fire Hazards

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

- **Sodium Hypochlorite** is not combustible but is a STRONG OXIDIZER which enhances the combustion of other substances.
- Use dry chemical, CO_2, water spray or foam as extinguishing agents.
- POISONOUS GASES ARE PRODUCED IN FIRE, including *Sodium Oxide* and *Chlorine*.
- Use water spray to keep fire-exposed containers cool.
- **Sodium Hypochlorite** may ignite combustibles (wood, paper and oil).

Spills and Emergencies

If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

If **Sodium Hypochlorite** is spilled or leaked, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- Eliminate all ignition sources.
- Neutralize with *Sodium Bisulfite,* cover with *Soda Ash* and place into covered containers for disposal or wash with plenty of water.
- Ventilate area of spill or leak.
- DO NOT wash into sewer.
- It may be necessary to contain and dispose of **Sodium Hypochlorite** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

Handling and Storage

Prior to working with **Sodium Hypochlorite** you should be trained on its proper handling and storage.

- **Sodium Hypochlorite** may react violently or explosively with STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); ACID COMPOUNDS (such as ALUMINUM CHLORIDE, FERRIC CHLORIDE and ALUM); ACID-BASED CLEANING COMPOUNDS (such as BRICK and CONCRETE CLEANERS); and AMMONIA COMPOUNDS (such as AMMONIUM HYDROXIDE, AMMONIUM CHLORIDE and QUATERNARY AMMONIUM SALTS) to release *Chlorine* and other toxic gases.
- **Sodium Hypochlorite** may react violently with ORGANIC MATERIALS (such as SOLVENTS, FUELS, ALCOHOLS, GLYCOLS and INSECTICIDES); AMINES; and ORGANIC POLYMERS to form *Chlorinated Organic compounds*, explosive compounds and *Chlorine gas*.
- **Sodium Hypochlorite** is not compatible with HYDROGEN PEROXIDE and METALS (such as COPPER, NICKEL, COBALT and IRON), and should not be handled in equipment or piping containing STAINLESS STEEL, ALUMINUM, CARBON STEEL or OTHER COMMON METALS. The reaction may release *Oxygen gas* and can cause container rupture.
- The reaction of **Sodium Hypochlorite** and REDUCING AGENTS (such as SODIUM BISULFITE and SODIUM THIOSULFATE) gives off heat.
- Store in tightly closed containers in a cool, well-ventilated area away from LIGHT as **Sodium Hypochlorite** will decompose.

Occupational Health Information Resources

The New Jersey Department of Health offers multiple services in occupational health. These services include providing informational resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations.

For more information, please contact:

New Jersey Department of Health
Right to Know
PO Box 368
Trenton, NJ 08625-0368
Phone: 609-984-2202
Fax: 609-984-7407
E-mail: rtk@doh.state.nj.us
Web address: http://www.nj.gov/health/eoh/rtkweb

The Right to Know Hazardous Substance Fact Sheets are not intended to be copied and sold for commercial purposes.

GLOSSARY

ACGIH is the American Conference of Governmental Industrial Hygienists. They publish guidelines called Threshold Limit Values (TLVs) for exposure to workplace chemicals.

Acute Exposure Guideline Levels (AEGLs) are established by the EPA. They describe the risk to humans resulting from once-in-a lifetime, or rare, exposure to airborne chemicals.

Boiling point is the temperature at which a substance can change its physical state from a liquid to a gas.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is unique, identifying number, assigned by the Chemical Abstracts Service, to a specific chemical.

CFR is the Code of Federal Regulations, which are the regulations of the United States government.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes destruction of human skin or severe corrosion of containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

ERG is the Emergency Response Guidebook. It is a guide for emergency responders for transportation emergencies involving hazardous substances.

Emergency Response Planning Guideline (ERPG) values provide estimates of concentration ranges where one reasonably might anticipate observing adverse effects.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

IARC is the International Agency for Research on Cancer, a scientific group.

Ionization Potential is the amount of energy needed to remove an electron from an atom or molecule. It is measured in electron volts.

IRIS is the Integrated Risk Information System database on human health effects that may result from exposure to various chemicals, maintained by federal EPA.

LEL or **Lower Explosive Limit**, is the lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the federal Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the New Jersey Public Employees Occupational Safety and Health Act, which adopts and enforces health and safety standards in public workplaces.

Permeated is the movement of chemicals through protective materials.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

Protective Action Criteria (PAC) are values established by the Department of Energy and are based on AEGLs and ERPGs. They are used for emergency planning of chemical release events.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

STEL is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

UEL or **Upper Explosive Limit** is the highest concentration in air above which there is too much fuel (gas or vapor) to begin a reaction or explosion.

Vapor Density is the ratio of the weight of a given volume of one gas to the weight of another (usually *Hydrogen*), at the same temperature and pressure.

The **vapor pressure** is a force exerted by the vapor in equilibrium with the solid or liquid phase of the same substance. The higher the vapor pressure the higher concentration of the substance in air.

NJ Health New Jersey Department of Health

Right to Know Hazardous Substance Fact Sheet

Emergency Responders Quick Reference

Common Name: **SODIUM HYPOCHLORITE**

Synonyms: Clorox; Liquid Bleach; Sodium Oxychloride
CAS No: 7681-52-9
Molecular Formula: NaOCl
RTK Substance No: 1707
Description: Clear, slightly yellow or green liquid with a strong *Chlorine* odor

HAZARD DATA

Hazard Rating

3 - Health

0 - Fire

0 - Reactivity

DOT#: UN 1791

ERG Guide #: 154

Hazard Class: 8 (Corrosive)

Firefighting

Sodium Hypochlorite is not combustible but is a STRONG OXIDIZER which enhances the combustion of other substances.

Use dry chemical, CO_2, water spray or foam as extinguishing agents.

POISONOUS GASES ARE PRODUCED IN FIRE, including *Sodium Oxide* and *Chlorine*.

Use water spray to keep fire-exposed containers cool.

Sodium Hypochlorite may ignite combustibles (wood, paper and oil).

Reactivity

Sodium Hypochlorite may react violently or explosively with STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); ACID COMPOUNDS (such as ALUMINUM CHLORIDE, FERRIC CHLORIDE and ALUM); ACID-BASED CLEANING COMPOUNDS (such as BRICK and CONCRETE CLEANERS); and AMMONIA COMPOUNDS (such as AMMONIUM HYDROXIDE, AMMONIUM CHLORIDE and QUATERNARY AMMONIUM SALTS) to release *Chlorine* and other toxic gases.

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Sodium Hypochlorite is not compatible with HYDROGEN PEROXIDE and METALS (such as COPPER, NICKEL, COBALT and IRON), and should not be handled in equipment or piping containing STAINLESS STEEL, ALUMINUM, CARBON STEEL or OTHER COMMON METALS. The reaction may release *Oxygen gas* and can cause container rupture.

The reaction of **Sodium Hypochlorite** and REDUCING AGENTS (such as SODIUM BISULFITE and SODIUM THIOSULFATE) gives off heat.

SPILL/LEAKS

Isolation Distance:

Small Spill: 30 meters (100 feet)

Large Spill: 100 meters (300 feet)

Fire: 800 meters (1/2 mile)

Neutralize with *Sodium Bisulfite,* cover with *Soda Ash* and place into covered containers for disposal or wash with plenty of water.

DO NOT wash into sewer.

Sodium Hypochlorite is toxic to aquatic organisms.

PHYSICAL PROPERTIES

Odor Threshold:	*Chlorine*-like
Flash Point:	Noncombustible
Specific Gravity:	1.1, 5% solution (water = 1)
Water Solubility:	Soluble
Boiling Point:	Decomposes
Molecular Weight:	74.4
pH:	10.8 to 11.4 (5.25% solution in water)

EXPOSURE LIMITS

NIOSH:	0.5 ppm, 15-min Ceiling (as *Chlorine*)
AIHA:	2 mg/m^3, 15-min WEEL
IDLH:	30 ppm (as *Chlorine*)

PROTECTIVE EQUIPMENT

Gloves:	Butyl, Nitrile, Neoprene, Natural Rubber and Viton (>8-hr breakthrough for 30 to 70% solutions)
Coveralls:	Tychem® SL, CPF 3, Responder®; Zytron® 300; and ONESuit® TEC (>8-hr breakthrough for 30 to 70% solutions)
Respirator:	>2 mg/m^3 - full facepiece APR with Acid gas cartridge and N100 prefilters >20 mg/m^3 or >5 ppm *Chlorine* - Supplied air

HEALTH EFFECTS

Eyes:	Irritation, burns and possible eye damage
Skin:	Severe irritation, burns, rash and blisters
Inhalation:	Nose, throat and lung irritation, with coughing and severe shortness of breath (Pulmonary edema)
	Headache, dizziness, nausea and vomiting

FIRST AID AND DECONTAMINATION

Remove the person from exposure.

Flush eyes with large amounts of water for at least 30 minutes. Remove contact lenses if worn. Seek medical attention immediately.

Quickly remove contaminated clothing and wash contaminated skin with large amounts of water. Seek medical attention.

Begin artificial respiration if breathing has stopped and CPR if necessary.

Transfer promptly to a medical facility.

Medical observation is recommended as symptoms may be delayed.