



# MATERIAL SAFETY DATA SHEET

## 1. Product and Company Identification

**Material name** TRONOX® Sodium Chlorate Solution  
**Version #** 01  
**Revision date** 09-29-2009  
**Product Code** Sodium chlorate solution  
**MSDS Number** B-5011  
**Product use** Non-selective herbicide and defoliant.  
**Manufacturer information** Tronox LLC  
3301 NW 150th Street  
Oklahoma City, OK 73134 US  
ChemProdSteward@tronox.com  
1-405-775-5000 (24-hours)  
**Emergency** CHEMTREC 1-800-424-9300

## 2. Hazards Identification

**Physical state** Liquid.  
**Appearance** Liquid.  
**Emergency overview** DANGER

Oxidizer - contact with other material may cause fire. May produce shock-sensitive mixtures. Thermally unstable at elevated temperature. Not itself combustible but assists fire in burning materials.  
May be harmful if swallowed. May irritate the respiratory tract (nose, throat, and lungs) , eyes and skin.

**OSHA regulatory status** This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

### Potential health effects

#### Routes of exposure

Inhalation. Ingestion. Skin contact. Eye contact.

#### Eyes

May cause eye irritation.

#### Skin

May cause skin irritation. Prolonged skin contact may cause dermatitis.

#### Inhalation

May cause irritation to the respiratory system.

#### Ingestion

Harmful if swallowed. This material may produce methemoglobin which, in sufficient concentration, causes cyanosis, a blue-gray discoloration of the skin and lips caused by a reduced ability of the blood to carry oxygen. Ingesting large quantities can cause abdominal pain, nausea, and diarrhea, possibly with dark blood, cyanosis, possibly progressing to headache, difficulty in breathing, dizziness, seizures, or coma. Overexposure causes kidney and liver damage.

### Target organs

Blood and/or blood-forming organs. Respiratory system. Eyes. Skin.

### Chronic effects

May cause thyroid damage based on animal data.

### Signs and symptoms

Ingesting large quantities can cause abdominal pain, nausea, and diarrhea, possibly with dark blood, cyanosis, possibly progressing to headache, difficulty in breathing, dizziness, seizures, or coma. Symptoms may include redness, edema, drying, defatting and cracking of the skin.

**Potential environmental effects** Toxic to aquatic organisms. May cause long-term adverse effects in the environment.

## 3. Composition / Information on Ingredients

Components	CAS #	Percent
Water	7732-18-5	56.3
Sodium chlorate	7775-09-9	43.7

**Composition comments** All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## 4. First Aid Measures

### First aid procedures

<b>Eye contact</b>	Remove contact lenses, if present and easy to do. Flush eyes immediately with large amounts of water. Get medical attention if irritation develops and persists.
<b>Skin contact</b>	Wash skin thoroughly with soap and water. Get medical attention if irritation develops or persists.
<b>Inhalation</b>	Remove victim to fresh air. If not breathing, clear airway and start mouth-to-mouth artificial respiration or use a bag-mask respirator. Get immediate medical attention. If the victim is having trouble breathing, transport to medical care and if available, give supplemental oxygen.
<b>Ingestion</b>	Immediately give 3-4 glasses of water, and induce vomiting. Give fluids until vomitus is clear. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person. Get immediate medical attention.

**Notes to physician** Chemical of exposure is sodium chlorate, a strong oxidizer and methemoglobin former. Cyanosis may be noted within several hours following inhalation or ingestion.

**General advice** Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

## 5. Fire Fighting Measures

**Flammable properties** The product is not flammable. Strong oxidizer - contact with other material may cause fire.

### Extinguishing media

<b>Suitable extinguishing media</b>	Water. Water spray or fog.
<b>Unsuitable extinguishing media</b>	Do not use CO2 or dry chemical. Do not use a fire blanket.

### Protection of firefighters

**Protective equipment and precautions for firefighters** For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Firefighters should wear full protective clothing including self contained breathing apparatus. Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.

**Special protective equipment for fire-fighters** No specific recommendations.

**Specific methods** Use water spray to cool unopened containers. Move container from fire area if it can be done without risk.

**Hazardous combustion products** Sodium oxides. Chlorine. Chlorine dioxide.

## 6. Accidental Release Measures

**Personal precautions** Avoid contact with skin and eyes. Use personal protection recommended in Section 8 of the MSDS. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

**Environmental precautions** Do not contaminate water. Prevent further leakage or spillage if safe to do so.

**Methods for containment** Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material.

**Methods for cleaning up** Keep combustibles away from spilled material.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

Large Spills: Dike far ahead of spill for later disposal. Remove with vacuum trucks or pump to storage/salvage vessels.

Following product recovery, flush area with water. For waste disposal, see Section 13 of the MSDS.

**Other information** Clean up in accordance with all applicable regulations.

## 7. Handling and Storage

**Handling** Do not ingest. Avoid inhalation of mist and contact with skin and eyes. Wash hands thoroughly after handling. Wear suitable protective clothing. Clean up spilled material immediately. Do not allow liquid to dry.

**Storage** Keep only in the original container in a cool, well-ventilated place. Keep away from combustible material. Keep product away from organic solvents and other products containing easily oxidized functional groups. Keep out of reach of children. Keep away from food, drink and animal feeding stuffs.

## 8. Exposure Controls / Personal Protection

**Occupational exposure limits** No exposure limits noted for ingredient(s).

**Engineering controls** Provide adequate general and local exhaust ventilation. Provide easy access to water supply or an emergency shower. Do not allow liquid to dry.

**Personal protective equipment**

**Eye / face protection** Wear safety glasses with side shields (or goggles).

**Skin protection** Wear protective gloves. Wear easily washable chemical resistant clothing. Chemical resistant boots. Do not wear leather shoes, gloves or belts.

**Respiratory protection** If ventilation is not sufficient to effectively prevent buildup of aerosols or mists, appropriate NIOSH/MSHA respiratory protection must be provided. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use.

**General hygiene considerations** Wash clothing after use. Handle in accordance with good industrial hygiene and safety practice. If clothing becomes contaminated, keep wet until washed.

## 9. Physical & Chemical Properties

**Appearance** Liquid.

**Color** Colorless to green or yellow.

**Odor** Odorless.

**Odor threshold** Not available.

**Physical state** Liquid.

**Form** Liquid.

**pH** 5 - 9

**Melting point** Not available.

**Freezing point** Not available.

**Boiling point** 230 °F (110 °C) (50 %)

**Flash point** Not available.

**Evaporation rate** Not available.

**Flammability** Not available.

**Flammability limits in air, upper, % by volume** Not available.

**Flammability limits in air, lower, % by volume** Not available.

**Vapor pressure** Not available.

**Vapor density** Not available.

**Specific gravity** 1.4 (50 %)

**Solubility (water)** Miscible

**Partition coefficient (n-octanol/water)** Not available.

**Auto-ignition temperature** Not available.

**Decomposition temperature** Not available.

## 10. Chemical Stability & Reactivity Information

**Chemical stability** Stable under normal temperature conditions and recommended use.

**Conditions to avoid** Avoid incompatible materials and intense heat.

**Incompatible materials** Reacts violently with combustibles, sulfuric acid, and reducing materials. Explosions may be caused by contact with ammonia salts, ammonium thiosulfate, antimony sulfide, arsenic, carbon, charcoal, organic matter, organic acids, thiocyanates, chemically active metals, oils, metal sulfides, nitrobenzene, powdered metals, sugar. Reacts with many organic materials to form shock-sensitive mixtures, causing explosion hazard.

**Hazardous decomposition products** Chlorine. Chlorine dioxide. Sodium oxides.

**Possibility of hazardous reactions**

Hazardous polymerization does not occur.

## 11. Toxicological Information

### Toxicological data

#### Components

#### Test Results

Sodium chlorate (7775-09-9)

Acute Oral LD50 Rat: 1200 mg/kg

#### Acute effects

May be harmful if swallowed. This material may produce methemoglobin which, in sufficient concentration, causes cyanosis, a blue-gray discoloration of the skin and lips caused by a reduced ability of the blood to carry oxygen. Ingesting large quantities can cause abdominal pain, nausea, and diarrhea, possibly with dark blood, cyanosis, possibly progressing to headache, difficulty in breathing, dizziness, seizures, or coma. Overexposure causes kidney and liver damage.

#### Local effects

May irritate eyes and skin.

#### Sensitization

Not a skin sensitizer.

#### Chronic effects

May cause thyroid damage based on animal data.

#### Carcinogenicity

This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

#### Epidemiology

Based on epidemiological studies, pre-existing respiratory system, digestive tract, blood and kidney disorders may be aggravated by prolonged exposure to high concentrations of sodium chlorates.

#### Mutagenicity

Knowledge about mutagenicity is incomplete.

#### Neurological effects

No data available for this product.

#### Reproductive effects

Knowledge about reproductive effects is incomplete.

#### Teratogenicity

Not available.

#### Further information

No other specific acute or chronic health impact noted.

## 12. Ecological Information

#### Ecotoxicity

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Sodium chlorate is a non-specific herbicide, which will destroy the vegetation.

#### Environmental effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

#### Persistence and degradability

The product is degraded completely by abiotic reduction.

#### Bioaccumulation / Accumulation

The product is not expected to bioaccumulate.

#### Mobility in environmental media

The product is water soluble and may spread in water systems.

## 13. Disposal Considerations

#### Waste codes

D001

#### Disposal instructions

Dispose of this material and its container to hazardous or special waste collection point. Do not allow this material to drain into sewers/water supplies.

#### Contaminated packaging

Since emptied containers may retain product residue, follow label warnings even after container is emptied.

## 14. Transport Information

### DOT

#### Basic shipping requirements:

**UN number** UN2428  
**Proper shipping name** Sodium chlorate, aqueous solution  
**Hazard class** 5.1  
**Packing group** II

#### Additional information:

**ERG number** 140

### IATA

#### Basic shipping requirements:

**UN number** 2428  
**Proper shipping name** Sodium chlorate, aqueous solution  
**Hazard class** 5.1

Packing group II  
Labels required 5.1

**IMDG**

**Basic shipping requirements:**

UN number 2428  
Proper shipping name SODIUM CHLORATE, AQUEOUS SOLUTION  
Hazard class 5.1  
Packing group II  
Environmental hazards  
Marine pollutant No  
Labels required 5.1

**TDG**

**Basic shipping requirements:**

Proper shipping name SODIUM CHLORATE, AQUEOUS SOLUTION  
Hazard class 5.1  
UN number UN2428  
Packing group II



DOT



IATA



IMDG



TDG

**15. Regulatory Information**

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.  
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

**CERCLA (Superfund) reportable quantity (lbs)**

None

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories** Immediate Hazard - Yes  
Delayed Hazard - No  
Fire Hazard - Yes  
Pressure Hazard - No  
Reactivity Hazard - Yes

**Section 302 extremely hazardous substance** No

**Section 311 hazardous chemical** Yes

**Drug Enforcement Agency (DEA)** Not controlled

**WHMIS status** Controlled  
**WHMIS classification** C - Oxidizing  
D2B - Other Toxic Effects-TOXIC

**WHMIS labeling**



**Inventory status**

<b>Country(s) or region</b>	<b>Inventory name</b>	<b>On inventory (yes/no)*</b>
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

**State regulations** This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

**US - Massachusetts RTK - Substance: Listed substance**

Sodium chlorate (CAS 7775-09-9) Listed.

**US - New Jersey RTK - Substances: Listed substance**

Sodium chlorate (CAS 7775-09-9) Listed.

**US - Pennsylvania RTK - Hazardous Substances: Listed substance**

Sodium chlorate (CAS 7775-09-9) Listed.

**16. Other Information**

**Further information** HMIS® is a registered trade and service mark of the NPCA.

**HMIS® ratings**  
Health: 2  
Flammability: 0  
Physical hazard: 2  
Personal protection: X

**NFPA ratings**  
Health: 2  
Flammability: 0  
Instability: 1  
Special hazards: OX

**Disclaimer** The information in the sheet was written based on the best knowledge and experience currently available.

**Issue date** 09-29-2009