

ATTACHMENT 1 – *MSDS SODIUM CHLORATE CRYSTAL*

1. Chemical Product and Company Identification

Eka Chemicals Inc., Pulp and Paper North America

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US

(770) 578-0858

24 Hour Emergency Number

CHEMTREC (800) 424-9300 North
America

CHEMTREC 001-703-527-3887
International

Canada - CANUTEC (613) 996-6666

Canada - Magog, QC (819) 843-8771

U.S. Columbus, MS (800) 227-5301

Product Name

SODIUM CHLORATE CRYSTAL

Chemical Name

Inorganic salt, Oxidizer

CAS

7775-09-9

Synonym(s)

Sodium Chlorate Pulp Grade Crystal, Technical Grade Crystal

Chemical Type

Sodium chlorate crystal

Intended Use

Oxidizing agent, used primarily for producing chlorine dioxide used for paper pulp bleaching. Used as a defoliant, herbicide, and in uranium ore processing.

2 Hazards Identification

Emergency Overview

Sodium Chlorate is a white to slightly yellow crystalline material. The crystals are similar in appearance to table salt. Sodium Chlorate is odorless and very soluble in water. Harmful if swallowed. Oxidizer: accelerates combustion of organic materials (wood, paper, oil, clothing). High heat (265 C / 510 F) may cause violent decomposition. Mixing with acids may produce toxic and explosive chlorine dioxide and chlorine gas. Harmful if swallowed. Oxidizer: Accelerates combustion of organic materials (wood, paper, oil, clothing). Explosive: High heat (265 C / 510 F) may cause violent decomposition. Reactivity: Mixing with acids may produce toxic and explosive chlorine dioxide and chlorine gas.

Routes of Exposure

Skin and eye contact, ingestion and inhalation

Potential Health Effects

Ingestion

This product is harmful if swallowed. Large exposure may be fatal. Ingestion of this product may cause nausea, vomiting and diarrhea. May cause difficulty in breathing and unconsciousness. Alcohol consumed before or after exposure may increase adverse effects.

Skin

Prolonged exposure may cause skin irritation.

Eyes

This product is irritating to the eyes. May injure eye tissue if not removed promptly.

Inhalation

Dusts of this product may cause irritation of the nose, throat, and respiratory tract. High concentrations may be fatal.

Target organs

Overexposure may cause kidney damage, liver damage and breathing disorders. Overexposure may cause lung damage, blood damage and eye damage.

Chronic Effects

Not listed as a possible carcinogenic by OSHA, IARC or NTP. No studies were found on the possible carcinogenic effects of sodium chlorate. No mutagenic effects were seen on mice for sodium chlorate. Ames salmonella microsome assay were positive. No studies were found on the possible teratogenic effects of sodium chlorate in humans or experimental animals.

3. Composition / Information on Ingredients

Component

Eka SC

CAS

7775-09-9

% Wt/Wt

99.6 - 100 %

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4. First Aid Measures

First Aid

<i>Ingestion</i>	DO NOT induce vomiting. Examine lips and mouth to determine whether the tissues are damaged which may indicate ingestion. (Absence of such signs is not conclusive.) Loosen tight clothing. If victim is not breathing, give artificial respiration. Call a physician immediately.
<i>Skin</i>	Wash with soap and water. Immediately take off all contaminated clothing. Rinse again. Do not allow contaminated clothing to dry before washing clothing on site. Get prompt medical attention if irritation occurs.
<i>Eyes</i>	Immediately flush eyes thoroughly with water for at least 15 minutes. Obtain medical attention if irritation persists.
<i>Inhalation</i>	Remove victim to fresh air. If the affected person is not breathing, apply artificial respiration. If symptoms persist, get medical attention.
<i>Notes to Physician</i>	Risk of methemoglobinemia if taken internally. DO NOT treat with methylene blue.

5. Fire Fighting Measures

<i>Flammable Properties</i>	This product is not combustible, but is an oxidizer. Mixtures with combustible or flammable materials may ignite easily, burn fiercely, or may explode. NOTICE: Leather and cloth impregnated with Sodium Chlorate are highly flammable and easily ignited with minor friction.
Extinguishing Media	
<i>Suitable Extinguishing Media</i>	Small and Large Fires: USE WATER ONLY. FOR LARGE FIRES: Wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH approved and full protective gear. DO NOT move cargo or vehicle if cargo has been exposed to heat. Move containers from fire area if you can without risk. ALWAYS STAY AWAY from the ends of tanks. Flood fire area with water from a distance. Cool containers with flooding quantities of water until well after the fire is out. For massive fires, fight fire from maximum distance or use unmanned hose holders or monitor nozzles. If this is not possible, withdraw from the area and let burn.
<i>Unsuitable Extinguishing Media</i>	Do not use dry chemicals, CO2, Halon, foam or fire blanket.
Protection of Fire Fighters	
<i>Protective Equipment for Fire Fighters</i>	Self-contained breathing apparatus/full protective clothes should be worn in fire conditions.
<i>Specific Hazards Arising From the Chemical</i>	Oxidizer - Keep away from flammable and combustible materials. Arsenic trioxide and sodium chlorate form spontaneously flammable mixtures. Wood, paper, cloth and leather goods contaminated with chlorates are easily ignited and burn rapidly. Mixtures with combustible materials ignite easily and burn fiercely, or may explode. Closed containers of Sodium Chlorate may explode if heated above 265 C (510 F). Mixing with acids may produce toxic and explosive chlorine dioxide and chlorine gas. Runoff may create a fire or explosive hazard. May cause environmental damage. Sodium Chlorate decomposes on heating to produce oxygen gas, salt and heat. Traces of chlorine dioxide and chlorine gas may also be generated.

6. Accidental Release Measures

<i>Personal Precautions</i>	In case of large spills, follow all facility emergency response procedures.
<i>Methods for Containment</i>	LARGE SPILL: Contain spill using noncombustible material such as vermiculite, sand or earth. DO NOT use combustible absorbents. Avoid contact with combustible materials such as wood, paper, oil or clothing. Dike far ahead of solution for later disposal. Notify the proper authorities.
<i>Methods for Clean-up</i>	SMALL SPILL: Use a clean dry shovel and place the material in a clean dry plastic or metal container for disposal. LARGE SPILL: Specialized equipment may be required to recover large quantities of material. Contact Eka Chemicals for recommendations. Following product recovery, flush area with water.

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7. Handling and Storage

Handling Procedures

Use only inert lubricants and packings for pumps, valves and other equipment. Exchange lubricants at regular intervals. Chlorates should be handled so as to avoid scattering of dust. Any operation that may cause dust should be well ventilated. Dust should be gathered and disposed of carefully. See Section 13 of MSDS if treating dust as waste. Electrical supply and distribution points are to be cleaned periodically of dust. Avoid contact with incompatibles. Keep container closed when not in use. Avoid contact with skin and eyes. Keep away from sources of heat and ignition. Packaging Materials: Use either metal drums or plastic lined bags.

Storage Procedures

Store in a cool, dry, and fireproof area away from heat sources including friction and impact. Big Bags: Store no more than two high. Store on gravel or crushed stone. Avoid storing on an asphalt-paved area. The minimum separation between sacks should be 8 meters or approximately 25 feet. Maintain a safe distance from buildings for fire and explosion safety. Bulk: Store in permanent bins of noncombustible construction. Store separate from all other materials. Organic substances, strong acids, phosphorous, sulfur, sulfides, powdered metals, ammonium salts, arsenic, copper, zinc, aluminum (possibly other metals), manganese dioxide, potassium cyanide, thiocyanates, expanded plastics such as polystyrene and polyurethane and other material that will either react with sodium chlorate or burn upon contact with it. Do not reuse big bags.

8. Exposure Controls / Personal Protection

Exposure Guidelines

OSHA PEL: Total Dust: 15 mg/m³ TWA; Respirable Fraction: 5 mg/m³ TWA. ACGIH TLV: Total Dust: 10 mg/m³ TWA; Respirable Fraction: 3 mg/m³ TWA.

Engineering Controls

Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Personal Protective Equipment

Eyes/Face

Wear safety glasses with side shields, or chemical goggles plus a face shield when splashing is a hazard.

Skin

Wear protective gloves, plastic or rubber. Wear plastic or rubber safety toed boots. Wash exposed skin with soap and water. Leather and cloth impregnated with Sodium Chlorate are highly flammable and easily ignited with minor friction. When contact is likely, wear PVC or rubber rainsuit and wash down rainsuit after each use. For general use, clothing of poly/cotton blend may be worn. Change clothing when contaminated and wash on-site. Do not allow contaminated clothing to dry before washing clothing on-site.

Respiratory

In the case of insufficient ventilation wear suitable respirator (NIOSH/MSHA approved).

9. Physical & Chemical Properties

Appearance

Form	Crystalline solid
Color	White to pale yellow
Odor	None
Odour Threshold	Not Available.
Physical State	solid
pH	7 (Neutral)
Melting Point	478.4 °F (248 °C) (478 F)
Freezing Point	478.4 °F (248 °C) (478 F)
Boiling Point	Decomposes above 265 C / 510 F, liberating oxygen gas
Flash Point	Not flammable
Evaporation Rate	Not Available.
Flammability	Not Available
Upper/Lower Flammability	Not flammable

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Vapor Pressure	Negligible
Vapor Density	Not applicable
Specific Gravity	2.49 (Water = 1), 1.5 - 1.8 (bulk crystal, approximate)
Solubility (H2O)	50 % @ 20 C
Coefficient of Water/Oil Distribution	Not Available.
Octanol/H2O Coeff	Not applicable
Auto Ignition Temperature	Not flammable, but decomposes at 265 C (510 F) approx.
Decomposition Temperature	Not Available.
Viscosity	Not applicable

10. Chemical Stability & Reactivity Information

<i>Incompatible Materials</i>	Organic substances, strong acids, phosphorous, sulfur, sulfides, powdered metals, ammonium salts, arsenic, copper, zinc, aluminum (possibly other metals), manganese dioxide, potassium cyanide, thiocyanates, expanded plastics such as polystyrene and polyurethane and other material that will either react with sodium chlorate or burn upon contact with it.
<i>Hazardous Decomposition Products</i>	Sodium Chlorate decomposes on heating to produce oxygen gas, salt and heat. Traces of chlorine dioxide and chlorine gas may also be generated.
<i>Possibility of Hazardous Reactions</i>	Stable under normal conditions. Decomposes above 265 C / 510 F, liberating oxygen gas. Will not occur.

11. Toxicological Information

<i>Toxicological Information</i>	Harmful if swallowed. Large exposure may be fatal. LD (Lo) for sodium chlorate is 214 mg/kg (Human).
<i>Acute Effects</i>	LD50 (oral,rat) > 5000 mg/kg.
<i>Component Analysis - LD50</i>	Chromium compounds and perchlorate are created as byproducts in the process for the electrolytic production of chlorates. Hexavalent chromium is a carcinogen present at an average level of < 10 ppm and perchlorate, which can affect the thyroid gland, is present at an average of < 300 ppm.
<i>Inhalation Effects</i>	Dust is irritating to nose, throat and respiratory tract. High concentrations may be fatal. LC50 (Dust): 112000 mg/m3, 4 hours [rat].
<i>Irritation to skin</i>	Frequent or prolonged contact may cause irritation.
<i>Irritation to eyes</i>	Causes eye irritation and may injure eye tissue if not removed promptly.
<i>Carcinogenicity/mutagenicity & long term effects</i>	Persons spraying herbicides containing sodium chlorate developed dermatitis, sweating, skin lesions, nausea, and sore throat.

12. Ecological Information

Ecotoxicity

<i>Aquatic toxicity</i>	Harmful to aquatic organisms especially to algae. Toxic to Fucus vesiculosus (bladder wrack). Chlorate can disturb microorganisms in sediment; for example those involved with the nitrogen cycle. 48 hour LD50 Oncorhynchus mykiss (rainbow trout) = 2750 mg/l. 24 hour LC50 Daphnia magna (water flea) = 880 mg/l (KClO3). Clear inhibitory effect for Scenedesmus (a planktonic green algae) @ 7 mg/l. EC50 for Fucus vesiculosus (bladder wrack) is 0.08 mg/l (long term study).
<i>Ecological Information</i>	Chlorate is converted to chlorite in plants. Chlorate is accumulated in the plant cells until toxic concentrations are reached and the plant dies. There is no evidence of accumulation in animals. Stays dissolved in water. Can be leached out of soil.
<i>Persistence/Degradability</i>	Slow degradation in soil in aerobic conditions. More rapid degradation to NaCl and O2 in anaerobic conditions (microbial degradation). BOD5 and COD: Not applicable.

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13. Disposal Considerations

Disposal Instructions

Sodium Chlorate is a characteristic hazardous waste as defined by RCRA: 40CFR261. EPA Hazardous Waste Number: D001 (ignitable waste) State/Provincial and local regulations are complex and may differ from Federal regulations. Contact a waste disposal firm for disposal advice. Empty containers may contain residues and should be washed with water prior to disposal. May create a fire or explosion hazard. Mixing with acids may produce toxic and explosive chlorine dioxide and chlorine gas. May cause environmental damage. Recycling of containers may be permitted, provided the container is "empty", as described in 40 CFR 261.7(b)(1)", when the container is used within the United States. When the container is used within Canada, the following regulations apply: "A container that has been completely emptied using common practices, and that contains less than 2.5 cm of residue, is typically considered to be an "empty container" and not subject to regulation as a hazardous material or hazardous waste" (see also Ontario - O. Reg. 347, Quebec - O.C. 1091-2004, B.C. - B.C. Reg. 63/88, Alberta - Reg. 192/96, and/or Saskatchewan - E.10.2, Reg. 3, as appropriate).

14. Transport information

Goods Description

Sodium Chlorate Crystal (Oxidizing Substance)

15. Regulatory Information

US Federal Regulations

This product is listed on the U.S. EPA TSCA Inventory. OSHA HCS: Subject to OSHA Hazard Communication Standard. CAA RMP: Not subject to CAA RMP.

OSHA Regulated

Regulated under 29 CFR 1910.1200. Not subject to OSHA PSM. Consult Federal, State/Provincial, and local regulations for changes and applicability to your materials.

SARA 302

Not subject to SARA Section 302.

SARA 311/312

TQ for reporting: 10,000 pounds

SARA 313

Not subject to SARA Section 313.

Canada DSL

Listed

WHMIS Classification

C, DB2 - Poisonous and infectious material - Other effects - Toxic

General

Not a CERCLA Hazardous Substance. (An unlisted characteristic D001 waste is reportable under CERCLA. The RQ is 100 pounds for a D001 waste.)
This product contains a chemical known to the State of California to cause cancer or reproductive harm: chromium byproduct (<4ppm). Cr(VI) 0.05 mg/m³ ACGIH TLV TWA NTP: Cr(VI) compounds: known human carcinogen IARC: Cr(VI) Group 1 carcinogen

16. Other Information

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HMIS RATINGS

Health 1
Flammability Classification 0
Reactivity 2
Pers. Prot X

NFPA RATINGS

Health 1
Flammability Classification 0
Reactivity 2
Special Hazards OXY

Other Information

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