

# Nitrilotriacetic acid trisodium salt

sc-253193

Material Safety Data Sheet



The Power is Question

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

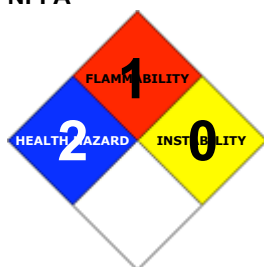
### PRODUCT NAME

Nitrilotriacetic acid trisodium salt

### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

### NFPA



### SUPPLIER

Santa Cruz Biotechnology, Inc.  
2145 Delaware Avenue  
Santa Cruz, California 95060  
800.457.3801 or 831.457.3800

### EMERGENCY:

ChemWatch  
Within the US & Canada: 877-715-9305  
Outside the US & Canada: +800 2436 2255  
(1-800-CHEMCALL) or call +613 9573 3112

### SYNONYMS

C6-H6-N-O6-Na3, "nitrilotriacetic acid trisodium salt", "sodium nitrilotriacetate", "N, N-bis(carboxymethyl)glycine trisodium salt", "trisodium nitrilotriacetate", "trisodium nitrilotriacetic acid", "nitrite triacetic acid, sodium salt", anhydrous, hydrate, monohydrate, "Cheelox NTA-14", "Hampshire NTA", NTA

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	1		
Toxicity:	2		
Body Contact:	2		
Reactivity:	1		
Chronic:	2		

Min/Nil=0  
Low=1  
Moderate=2  
High=3  
Extreme=4



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Harmful if swallowed.  
Limited evidence of a carcinogenic effect.  
Irritating to eyes and skin.

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

##### EYE

■ This material can cause eye irritation and damage in some persons.

##### SKIN

■ This material can cause inflammation of the skin on contact in some persons.  
■ The material may accentuate any pre-existing dermatitis condition.  
■ Open cuts, abraded or irritated skin should not be exposed to this material.  
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

##### INHALED

■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.  
■ The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.

#### CHRONIC HEALTH EFFECTS

■ There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.  
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

<p>.

High levels of sodium nitrilotriacetate can cause cancer of the kidney and liver. Prolonged exposure causes changes in the excretory system, including blood, crystals or sugar in the urine and high blood sugar.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
nitrilotriacetic acid, trisodium salt	5064-31-3	100

## Section 4 - FIRST AID MEASURES

##### SWALLOWED

· For advice, contact a Poisons Information Center or a doctor at once. · Urgent hospital treatment is likely to be needed.

##### EYE

■ If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

##### SKIN

■ If skin or hair contact occurs: · Immediately flush body and clothes with large amounts of water, using safety shower if available. · Quickly remove all contaminated clothing, including footwear.

##### INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

#### NOTES TO PHYSICIAN

■ for poisons (where specific treatment regime is absent):

##### BASIC TREATMENT

· Establish a patent airway with suction where necessary.  
· Watch for signs of respiratory insufficiency and assist ventilation as necessary.

## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not applicable
Upper Explosive Limit (%):	Not Available
Specific Gravity (water=1):	Not available
Lower Explosive Limit (%):	Not Available

### EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.

### FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible solid which burns but propagates flame with difficulty.
  - Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
- Combustion products include: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), metal oxides, other pyrolysis products typical of burning organic material.
- May emit poisonous fumes.
- May emit corrosive fumes.

### FIRE INCOMPATIBILITY

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

### PERSONAL PROTECTION

- Glasses:
- Full face- shield.
- Gloves:
- Respirator:
- Particulate

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up. NOTE: Vacuum cleaner must be fitted with an exhaust micro filter (HEPA type) (consider explosion-proof machines designed to be grounded during storage and use).
- Dampen with water to prevent dusting before sweeping.
- Place in suitable containers for disposal.

### MAJOR SPILLS

- Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
  - Wear protective clothing when risk of exposure occurs.
- Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
- Do NOT cut, drill, grind or weld such containers.
  - In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

### RECOMMENDED STORAGE METHODS

- Glass container.
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.

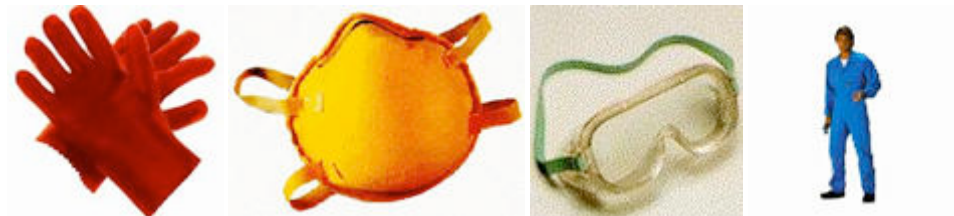
## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC	Notes
US - California Permissible Exposure Limits for Chemical Contaminants	nitrilotriacetic acid, trisodium salt (Particulates not otherwise regulated Respirable fraction)		5						(n)
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	nitrilotriacetic acid, trisodium salt (Particulates not otherwise regulated Respirable fraction)		5						
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	nitrilotriacetic acid, trisodium salt (Particulates not otherwise regulated (PNOR)(f)-Respirable fraction)		5						
US - Michigan Exposure Limits for Air Contaminants	nitrilotriacetic acid, trisodium salt (Particulates not otherwise regulated, Respirable dust)		5						
Canada - Prince Edward Island Occupational Exposure Limits	nitrilotriacetic acid, trisodium salt (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)		10						See Appendix B current TLV/BEI Book

ENDOELTABLE

### PERSONAL PROTECTION



#### RESPIRATOR

Particulate

Consult your EHS staff for recommendations

#### EYE

- Chemical goggles.
- Full face shield.

#### HANDS/FEET

■ Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.

· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to

EN 374) is recommended.

- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- polychloroprene
- nitrile rubber
- butyl rubber
- fluorocautchouc
- polyvinyl chloride

Gloves should be examined for wear and/ or degradation constantly.

#### OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

#### ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.

- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Solid.

Mixes with water.

State	Divided solid	Molecular Weight	257.10
Melting Range (°F)	>392	Viscosity	Not Applicable
Boiling Range (°F)	Not available	Solubility in water (g/L)	Miscible
Flash Point (°F)	Not Available	pH (1% solution)	10.5-11.5
Decomposition Temp (°F)	770 approx.	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Not applicable
Upper Explosive Limit (%)	Not Available	Specific Gravity (water=1)	Not available
Lower Explosive Limit (%)	Not Available	Relative Vapor Density (air=1)	Not applicable
Volatile Component (%vol)	8 max. (water)	Evaporation Rate	Not applicable

### APPEARANCE

White powder with no distinct odour; soluble in water, forming alkaline solution. Soluble in polar solvents. Product is hygroscopic.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

### STORAGE INCOMPATIBILITY

- Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

## Section 11 - TOXICOLOGICAL INFORMATION

NITRILOTRIACETIC ACID, TRISODIUM SALT

### TOXICITY AND IRRITATION

NITRILOTRIACETIC ACID, TRISODIUM SALT:

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (rat) LD50: 1100 mg/kg	Skin (rabbit): non-irritating *
Intraperitoneal (Mouse) LD50: 500 mg/kg	Eye (rabbit): Irritant *
* [BASF]	

#### ■ For nitrilotriacetic acid (NTA) and its salts:

Exposure to nitrilotriacetic acid, and presumably also to its water-soluble metal complexes, occurs as a result of its presence in household detergents and in drinking water. Little information on the toxicity of NTA in humans is available. The kidney is the primary target for NTA toxicity in animals. There is a clear evidence of carcinogenicity in rats and mice, causing kidney, bladder and urinary tract tumours in high doses and after long-term exposure. No human carcinogenic data are available. There is no evidence of teratogenicity and mutagenicity. The mechanism of the toxicity can be partly explained by chelation of essential divalent metal ions such as Ca, Mg and Zn.

Acute toxicity: The acute toxicity of NTA and its salts in animals is relatively low

NTA trisodium salt (Na<sub>3</sub>NTA) is poorly absorbed from the gastrointestinal tract in humans. When absorbed the compound is rapidly excreted in the urine. About 87% of the absorbed dose were excreted within the first 24 h post dosing. NTA is not biotransformed and is excreted almost entirely unchanged in urine. The absorption through skin is minimal. Less than 0.1% of dermal doses are absorbed

NTA has a preference for bone where it forms complexes with divalent cations such as calcium. In addition to the skeleton, a high concentration is seen in the kidney and the urinary bladder up to 8 hours after injection

NTA was readily absorbed from the gastrointestinal tract of the mice (in contrast to humans) and is rapidly distributed into all tissues with highest concentrations in the bladder, kidney and bone. Elimination of NTA from the skeletal tissue was also rapid - after 8 hours no detectable material was left. This indicates no serious accumulation in the bone.

Orally administered nitrilotriacetic acid and its trisodium salt were nephrotoxic to rats and mice of each sex. Toxicity occurs at high doses and appears to be due to Zn ion accumulation secondary to the chelating properties of nitrilotriacetic acid; administration of Zn ion accentuated the nephrotoxicity of the acid. Urothelial cytotoxicity and regenerative hyperplasia were seen in male and female rats but not in mice, and only at doses

higher than those that produced nephrotoxicity. The mechanism is unclear but appears to involve cellular Ca ion depletion secondary to the chelating effect of nitrilotriacetic acid. Urinary microcrystals were also produced.

NTA is a skin irritant. The degree of irritation depends on the degree of neutralisation by counter-ions.. A 20% solution of Na<sub>3</sub>NTA was not skin irritating in a patch test on 66 persons . NTA is a mild eye irritant

Dermal exposure to NTA does not cause sensitisation . A 20% solution of Na<sub>3</sub>NTA was not allergenic in a patch test on 66 persons .

Subchronic toxicity: Rats fed for 90 days with diets containing 2,000 ppm (0.2 g/kg bw/day) Na<sub>3</sub>NTA and no effects were observed. Rats fed a diet containing 20,000 ppm (2 g/kg bw/day) had abnormal kidneys and a significant decrease in weight gain with a corresponding increase in organ/body weight ratios (liver and kidney)

Mutagenicity and Carcinogenicity: NTA induces tumours only after prolonged exposure to higher doses than those producing kidney toxicity. The reported induction of tumours in rodents is considered to be due to cytotoxicity resulting from the chelation of divalent cationics such as zinc and calcium in the urinary tract. Dosages of NTA that do not alter Zn or Ca distribution do not produce any urinary tract toxicity even after chronic exposure. When toxic doses are supplied chronically some of the severely damaged tissues may develop tumours . Rats were given 0.1% NTA trisodium salt in drinking water for 2 years. The exposed animals showed an increase in hyperplasia and tumourigenesis in the kidney. NTA and Na<sub>3</sub>NTA were tested for carcinogenicity in mice and rats by oral administration and induced tumours of the urinary system (kidney, ureter and bladder). The monohydrate administered in the diet induced malignant tumours of the urinary system. When administered in drinking water to rats, it induced renal adenomas and adenocarcinomas.

The International Agency for Research on Cancer (IARC) has evaluated that there is sufficient evidence for the carcinogenicity of NTA and its salts in experimental animals and the overall evaluation is that NTA and its salts are possibly carcinogenic to humans.

The potential of NTA to cause chromosome abnormalities was investigated in cell cultures (human lymphocytes and Chinese hamster ovary cells) and in vivo in mice (micronucleus test). NTA was not found mutagenic in any of the three test assays.

Reproductive toxicity: The effect on reproduction and development of Na<sub>3</sub>NTA in the diet was studied in rats for two generations and in rabbits during a single pregnancy. Na<sub>3</sub>NTA caused no effects on reproduction or embryonic development in either rats or rabbits. The only effects of Na<sub>3</sub>NTA on the rats were some growth depression in both adults and weanling animals fed 0.5% . Pregnant mice were given 0.2% NTA in the drinking water from day 6 to 18 of pregnancy. The fetuses were examined for malformations. Skeletal or visceral examination did not reveal any teratogenic effects, although NTA also accumulated in the foetal skeleton.

WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

#### CARCINOGEN

NITRILOTRIACETIC ACID, TRISODIUM SALT MONOHYDRATE	US Environmental Defense Scorecard Recognized Carcinogens	Reference(s)	P65
NITRILOTRIACETIC ACID, TRISODIUM SALT MONOHYDRATE	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	P65

## Section 12 - ECOLOGICAL INFORMATION

No data

#### GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles

Name / EHS TRN A1a A1b A1 A2 B1 B2 C1 C2 C3 D1 D2 D3 E1 E2 E3 Cas No / RTECS No \_\_\_\_\_  
Nitrilotr 103 500 0 NI 0 R 1 0 1 (0) 0 1 1 CMR D 3 icetic 0 acid, trisodium salt / CAS:5064- 31- 3 / MB8400000

Legend: EHS=EHS Number (EHS=GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships)

NRT=Net Register Tonnage, A1a=Bioaccumulation log Pow, A1b=Bioaccumulation BCF, A1=Bioaccumulation, A2=Biodegradation, B1=Acute aquatic toxicity LC/EC1C50 (mg/l), B2=Chronic aquatic toxicity NOEC (mg/l), C1=Acute mammalian oral toxicity LD50 (mg/kg), C2=Acute mammalian dermal toxicity LD50 (mg/kg), C3=Acute mammalian inhalation toxicity LC50 (mg/kg), D1=Skin irritation & corrosion, D2=Eye irritation & corrosion, D3=Long-term health effects, E1=Tainting, E2=Physical effects on wildlife & benthic habitats, E3=Interference with coastal amenities, For column A2: R=Readily biodegradable, NR=Not readily biodegradable. For column D3: C=Carcinogen, M=Mutagenic, R=Reprotoxic, S=Sensitising, A=Aspiration hazard, T=Target organ systemic toxicity, L=Lung injury, N=Neurotoxic, I=Immunotoxic. For column E1: NT=Not tainting (tested), T=Tainting test positive. For column E2: Fp=Persistent floater, F=Floater, S=Sinking substances. The numerical scales start from 0 (no hazard), while higher numbers reflect increasing hazard. (GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships)

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

! Puncture containers to prevent re-use and bury at an authorized landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

## Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

## Section 15 - REGULATORY INFORMATION

**nitrilotriacetic acid, trisodium salt (CAS: 5064-31-3, 18662-53-8) is found on the following regulatory lists;**

"Canada Domestic Substances List (DSL)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "OECD Representative List of High Production Volume (HPV) Chemicals", "US EPA High Production Volume Program Chemical List", "US Food Additive Database", "US Toxic Substances Control Act (TSCA) - Inventory"

## Section 16 - OTHER INFORMATION

### LIMITED EVIDENCE

- Cumulative effects may result following exposure\*.
  - May produce discomfort of the respiratory system\*.
- \* (limited evidence).

### ND

Substance CAS Suggested codes nitrilotriacetic acid, trisodium salt 5064- 31- 3 nitrilotriacetic acid, trisodium salt 18662- 53- 8

### Ingredients with multiple CAS Nos

Ingredient Name CAS nitrilotriacetic acid, trisodium salt 5064-31-3, 18662-53-8

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- Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:  
[www.chemwatch.net/references](http://www.chemwatch.net/references).

- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the

reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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