

# Sodium tetrafluoroborate

sc-253597



The Power is Question

## Material Safety Data Sheet

Hazard Alert Code  
Key:

EXTREME

HIGH

MODERATE

LOW

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

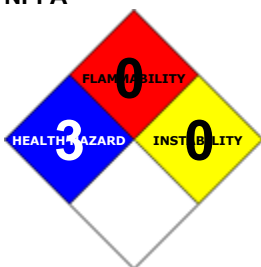
### PRODUCT NAME

Sodium tetrafluoroborate

### 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

NaBF<sub>4</sub>, "sodium fluoroborate", "sodium borofluoride", "sodium tetrafluoroborate", "borate (1-), tetrafluoro-, sodium", "sodium tetrafluoro borate"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

	Min	Max	
Flammability:	0	■	
Toxicity:	3	■	
Body Contact:	4	■	Min/Nil=0 Low=1 Moderate=2 High=3 Extreme=4
Reactivity:	0	■	
Chronic:	2	■	

### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Risk of serious damage to eyes.

Irritating to respiratory system and skin.

Skin contact may produce health damage\*.

Cumulative effects may result following exposure\*.

Inhalation and/or ingestion may produce serious health damage\*.

\* (limited evidence).

## POTENTIAL HEALTH EFFECTS

### ACUTE HEALTH EFFECTS

#### SWALLOWED

■ The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion.

■ Accidental ingestion of the material may be seriously damaging to the health of the individual; animal experiments indicate that ingestion of less than 40 gram may be fatal.

■ Fluoride causes severe loss of calcium in the blood, with symptoms appearing several hours later including painful and rigid muscle contractions of the limbs.

Cardiovascular collapse can occur and may cause death with increased heart rate and other heart rhythm irregularities.

#### EYE

■ The material can produce severe chemical burns to the eye following direct contact.

Vapours or mists may be extremely irritating.

■ If applied to the eyes, this material causes severe eye damage.

#### SKIN

■ The material can produce severe chemical burns following direct contact with the skin.

■ This material can cause inflammation of the skin on contact in some persons.

■ The material may accentuate any pre-existing dermatitis condition.

■ Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

■ 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

■ The material can cause respiratory irritation in some persons.

The body's response to such irritation can cause further lung damage.

■ Inhalation of dusts, generated by the material during the course of normal handling, may produce serious damage to the health of the individual.

■ 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.

If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.

■ Borates may act as simple airway irritants.

Dryness of the mouth, nose or throat, dry cough, nose bleeds, sore throat, productive cough, shortness of breath, chest tightness and difficulty breathing were related to higher dose long term exposures.

### CHRONIC HEALTH EFFECTS

■ Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis.

Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

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. Prime symptom is breathlessness; lung shadows show on X-ray.

Borate can accumulate in the testes and deplete germ cells and cause withering of the testicles, according to animal testing. Hair loss, skin inflammation, stomach ulcer and anaemia can all occur. Repeated swallowing or inhalation irritates the stomach, causes a loss of appetite, disturbed digestion, nausea and vomiting, red rash, dry skin and mucous membranes, reddening of the tongue, cracking of the lips, inflamed conjunctiva, swelling of the eyelids and kidney injury. Animal testing revealed prolonged ingestion causes effects to the reproductive system in both males and females.

Fluoroborates accumulate in the thyroid gland, preventing the uptake of iodine. Chronic exposure to boron trifluoride can increase levels of bone fluoride and cause dental fluorosis.

### Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
Sodium tetrafluoroborate	13755-29-8	> 99

### Section 4 - FIRST AID MEASURES

#### SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

#### 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.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.

#### SKIN

If there is evidence of severe skin irritation or skin burns:

- Avoid further contact. Immediately remove contaminated clothing, including footwear.
- Flush skin under running water for 15 minutes.
- Avoiding contamination of the hands, massage calcium gluconate gel into affected areas, pay particular attention to creases in skin.
- Contact the Poisons Information Centre.

#### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

For massive exposures:

- If dusts, vapours, aerosols, fumes or combustion products are inhaled, remove from contaminated area.
- Lay patient down.
- Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

#### NOTES TO PHYSICIAN

- Treat symptomatically.

For acute or repeated short term exposures to boron and its compounds:

- Nausea, vomiting, diarrhoea and epigastric pain, haematemesis and blue-green discolouration of both faeces and vomitus characterise adult boron intoxication.
- Assess and correct any abnormalities found in airway and circulation.
- A tidal volume of 10-15 mg/kg should be maintained.
- Emesis should be induced unless the patient is in coma, is experiencing seizures or has lost the gag reflex. If any of these are present, gastric lavage should be performed with a large-bore tube after endotracheal intubation or in the presence of continuous respiratory action.

for corrosives:

#### BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- Monitor and treat, where necessary, for pulmonary oedema .

For acute or short term repeated exposures to fluorides:

- Fluoride absorption from gastro-intestinal tract may be retarded by calcium salts, milk or antacids.
- Fluoride particulates or fume may be absorbed through the respiratory tract with 20-30% deposited at alveolar level.
- Peak serum levels are reached 30 mins. post-exposure; 50% appears in the urine within 24 hours.
- For acute poisoning (endotracheal intubation if inadequate tidal volume), monitor breathing and evaluate/monitor blood pressure and pulse frequently since shock may supervene with little warning. Monitor ECG immediately; watch for arrhythmias and evidence of

Q-T prolongation or T-wave changes. Maintain monitor. Treat shock vigorously with isotonic saline (in 5% glucose) to restore blood volume and enhance renal excretion.  
Ingestion - intravenous injection of 10% calcium gluconate repeated hourly is a routine treatment for systemic poisoning.  
Inhalation - continue observation for 48 hours due to danger of pulmonary oedema.

## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not applicable
Upper Explosive Limit (%):	Not applicable
Specific Gravity (water=1):	2.47 @ 20 C.
Lower Explosive Limit (%):	Not applicable

### EXTINGUISHING MEDIA

- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

### FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
- Not considered a significant fire risk, however containers may burn.

Decomposition may produce toxic fumes of: hydrogen fluoride, metal oxides.

May emit corrosive fumes.

### FIRE INCOMPATIBILITY

None known.

Avoid contact with oxidizing agents and acids.

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear full body protective clothing with breathing apparatus.

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.

### RECOMMENDED STORAGE METHODS

- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

<

### STORAGE REQUIREMENTS

- Material is hygroscopic, i.e. absorbs moisture from the air. Keep containers well sealed in storage.
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.

## 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 ACGIH Threshold Limit Values (TLV)	sodium fluoborate (Fluorides, as F)		2.5						TLV® Basis: Bone dam; fluorosis ; BEI

### PERSONAL PROTECTION



#### EYE

- Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure
- Chemical goggles whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted
- Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection.
- Alternatively a gas mask may replace splash goggles and face shields.

#### HANDS/FEET

- Elbow length PVC gloves

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

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

#### OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.

### ENGINEERING CONTROLS

■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

## PHYSICAL PROPERTIES

Mixes with water.  
Corrosive.  
Toxic or noxious vapours/gas.

State	DIVIDED SOLID	Molecular Weight	109.79
Melting Range (°F)	723- 763	Viscosity	Not Applicable
Boiling Range (°F)	662 decomposes	Solubility in water (g/L)	Miscible
Flash Point (°F)	Not applicable	pH (1% solution)	3-4 @ 40% soln
Decomposition Temp (°F)	723- 763	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not applicable	Vapour Pressure (mmHG)	Not applicable
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	2.47 @ 20 C.
Lower Explosive Limit (%)	Not applicable	Relative Vapour Density (air=1)	Not applicable
Volatile Component (%vol)	Not applicable	Evaporation Rate	Not applicable

## APPEARANCE

■ Material is hygroscopic, absorbs moisture from surrounding air. Crystals. No odour. Soluble in water. Bitter acid taste. Insoluble in alcohol, ether, alkalis. Decomposes above 350 C and releases toxic hydrogen fluoride, boron trifluoride and sodium fluoride. Solutions in water should not be handled in glass.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

### STORAGE INCOMPATIBILITY

- Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
- These trifluorides are hypergolic oxidisers. They ignites on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.
- The state of subdivision may affect the results.
- Dangerous goods of other classes.
- Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.
- Avoid reaction with oxidising agents

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

## Section 11 - TOXICOLOGICAL INFORMATION

sodium fluoborate

### TOXICITY AND IRRITATION

■ 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.

No significant acute toxicological data identified in literature search.

### CARCINOGEN

Boron and Compounds (Oral Route)*	US EPA Carcinogens Listing	Carcinogenicity	
Fluorides, as F	US ACGIH Threshold Limit Values (TLV) - Carcinogens	Carcinogen Category	A4

## Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

## Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
sodium fluoborate	LOW	No Data Available	LOW	HIGH

## Section 13 - DISPOSAL CONSIDERATIONS

### US EPA Waste Number & Descriptions

#### A. General Product Information

Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)

### Disposal Instructions

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

- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

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. In most instances the supplier of the material should be consulted.

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.

For small quantities:

- Cautiously dissolve in water
- Neutralise with sodium carbonate or if product does not dissolve completely add a small quantity of hydrochloric acid followed by sodium carbonate
- Add excess calcium chloride to precipitate the fluoride and/ or carbonate
- Remove solids to site approved for hazardous waste
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurring in water; Neutralisation followed by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

## Section 14 - TRANSPORTATION INFORMATION

### DOT:

Symbols:	None	Hazard class or Division:	8
Identification Numbers:	UN2923	PG:	II
Label Codes:	8, 6.1	Special provisions:	IB8, IP2, IP4, T3, TP33
Packaging: Exceptions:	154	Packaging: Non-bulk:	212
Packaging: Exceptions:	154	Quantity limitations: Passenger aircraft/rail:	15 kg
Quantity Limitations: Cargo aircraft only:	50 kg	Vessel stowage: Location:	B
Vessel stowage: Other:	40		

Hazardous materials descriptions and proper shipping names:  
Corrosive solids, toxic, n.o.s.

**Air Transport IATA:**

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	6.1
UN/ID Number:	2923	Packing Group:	II
Special provisions:	A3		
Cargo Only			
Packing Instructions:	863	Maximum Qty/Pack:	50 kg
Passenger and Cargo		Passenger and Cargo	
Packing Instructions:	859	Maximum Qty/Pack:	15 kg
Passenger and Cargo Limited Quantity		Passenger and Cargo Limited Quantity	
Packing Instructions:	Y844	Maximum Qty/Pack:	5 kg

Shipping name:CORROSIVE SOLID, TOXIC, N.O.S.(contains sodium fluoborate)

**Maritime Transport IMDG:**

IMDG Class:	8	IMDG Subrisk:	6.1
UN Number:	2923	Packing Group:	II
EMS Number:	F-A,S-B	Special provisions:	274
Limited Quantities:	1 kg		

Shipping name:CORROSIVE SOLID, TOXIC, N.O.S.(contains sodium fluoborate)

**Section 15 - REGULATORY INFORMATION**



**sodium fluoborate (CAS: 13755-29-8) is found on the following regulatory lists;**

"Canada - Alberta Ambient Air Quality Guidelines", "Canada - Alberta Ambient Air Quality Objectives", "Canada - Northwest Territories Occupational Exposure Limits (English)", "Canada - Nova Scotia Occupational Exposure Limits", "Canada - Prince Edward Island Occupational Exposure Limits", "Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits", "Canada Domestic Substances List (DSL)", "Canada List of Prohibited and Restricted Cosmetic Ingredients (The Cosmetic Ingredient ""Hotlist"")", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "International Maritime Dangerous Goods Requirements (IMDG Code) - Substance Index", "US - Alaska Limits for Air Contaminants", "US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for Which Emissions Must Be Quantified", "US - California Environmental Health Standards for the Management of Hazardous Waste - List of Inorganic Persistent and Bioaccumulative Toxic Substances and Their STLC & TTLC Values", "US - Georgia Primary Maximum Contaminant Levels for Drinking Water - Inorganics", "US - Hawaii Air Contaminant Limits", "US - Massachusetts Drinking Water - Inorganic Maximum Contaminant Levels (MCLs)", "US - Massachusetts Drinking Water - Secondary Contaminants Maximum Contaminant Levels (MCLs)", "US - Michigan Exposure Limits for Air Contaminants", "US - North Dakota Air Pollutants - Guideline Concentrations", "US - Pennsylvania - Hazardous Substance List", "US - South Dakota Drinking Water Standards - Inorganic Chemicals", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Utah Primary Drinking Water Standards - Inorganic Contaminants", "US - Utah Secondary Drinking Water Standards - Inorganic Contaminants", "US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values", "US ACGIH Threshold Limit Values (TLV)", "US ACGIH Threshold Limit Values (TLV) - Carcinogens", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA Carcinogens Listing", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water"

**Section 16 - OTHER INFORMATION**

**LIMITED EVIDENCE**

- Skin contact may produce health damage\*.
- Inhalation and/or ingestion may produce serious health damage\*.
- Cumulative effects may result following exposure\*.

\* (limited evidence).



■ 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.

■ For detailed advice on Personal Protective Equipment, refer to the following U.S. Regulations and Standards:

OSHA Standards - 29 CFR:

1910.132 - Personal Protective Equipment - General requirements

1910.133 - Eye and face protection

1910.134 - Respiratory Protection

1910.136 - Occupational foot protection

1910.138 - Hand Protection

Eye and face protection - ANSI Z87.1

Foot protection - ANSI Z41

Respirators must be NIOSH approved.

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Issue Date: Sep-2-2009

Print Date: Mar-31-2012