

# Sodium metasilicate pentahydrate

sc-236909



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 metasilicate pentahydrate

### 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

Na<sub>2</sub>SiO<sub>3</sub>·5H<sub>2</sub>O, "sodium metasilicate pentahydrate", "disodium monosilicate", "disodium metasilicate", silicate, Metso, "sodium silicon oxide", "alkaline degreaser", detergent

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	0	■
Toxicity:	2	■
Body Contact:	3	■
Reactivity:	0	■
Chronic:	2	■

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



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Harmful if swallowed.  
Causes burns.  
Risk of serious damage to eyes.

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

#### EYE

- The material can produce chemical burns to the eye following direct contact.
- Vapors or mists may be extremely irritating.
- If applied to the eyes, this material causes severe eye damage.
  - Alkaline salts may be intensely irritating to the eyes and precautions should be taken to ensure direct eye contact is avoided.

#### SKIN

- The material can produce chemical burns following direct contact with the skin.
- 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.
- The material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering.

#### 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

- 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. 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.
- Repeated exposure to synthetic amorphous silicas may produce skin dryness and cracking.
- Available data confirm the absence of significant toxicity by oral and dermal routes of exposure.
- Numerous repeated-dose, subchronic and chronic inhalation toxicity studies have been conducted in a number of species, at airborne concentrations ranging from 0.5 mg/m<sup>3</sup> to 150 mg/m<sup>3</sup>. Lowest-observed adverse effect levels (LOAELs) were typically in the range of 1 to 50 mg/m<sup>3</sup>. When available, the no-observed adverse effect levels (NOAELs) were between 0.5 and 10 mg/m<sup>3</sup>. Differences in values may be due to particle size, and therefore the number of particles administered per unit dose. Generally, as particle size diminishes so does the NOAEL/LOAEL. Exposure produced transient increases in lung inflammation, markers of cell injury and lung collagen content. There was no evidence of interstitial pulmonary fibrosis.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
sodium metasilicate, pentahydrate	10213-79-3	>98

## 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. Inhalation of vapors or aerosols (mists, fumes) may cause lung edema. Corrosive substances may cause lung damage (e.g.

#### NOTES TO PHYSICIAN

- For acute or short-term repeated exposures to highly alkaline materials:

- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
- Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.

## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not applicable.
Upper Explosive Limit (%):	Not applicable
Specific Gravity (water=1):	1.75
Lower Explosive Limit (%):	Not applicable

### EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.

### FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.

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 to be a significant fire risk, however containers may burn.
- Decomposition may produce toxic fumes of: silicon dioxide (SiO<sub>2</sub>), metal oxides.  
May emit corrosive fumes.

### FIRE INCOMPATIBILITY

- None known.

### PERSONAL PROTECTION

Glasses:

Safety Glasses.

Full face- shield.

Gloves:

Respirator:

Particulate

## 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.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable, labelled container for waste disposal.
- 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 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.

### RECOMMENDED STORAGE METHODS

- Lined metal can, Lined metal pail/drum
- Plastic pail.

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

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

DO NOT store near acids, or oxidizing agents.

- No smoking, naked lights, heat or ignition sources.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

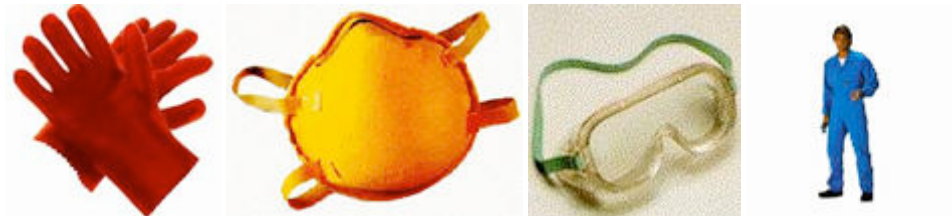
### EXPOSURE CONTROLS

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 OSHA Permissible Exposure Levels (PELs) - Table Z1	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica) - Tremolite, asbestiform; see 1910.1001)		0.1						(STEL (Excursion limit)(as averaged over a sampling period of 30 minutes))
US OSHA Permissible Exposure Levels (PELs) - Table Z1	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica) - Talc (containing asbestos); use asbestos limit; see 29 CFR 1910.1001)		0.1						See Table Z-3; (STEL (Excursion limit)(as averaged over a sampling period of 30 minutes))
US - Idaho - Limits for Air Contaminants	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silic))		[3]						
US OSHA Permissible Exposure Levels (PELs) - Table Z3	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica): Tremolite, asbestiforms (see 29 CFR 1910.1001))							0.1	
US - Hawaii Air Contaminant Limits	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica) - Soapstone, respirable dust)		3						
US - Michigan Exposure Limits for Air Contaminants	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica) Mica, respirable dust)		3						
US - Hawaii Air Contaminant Limits	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica) - Soapstone, total dust)		6						

US - Washington Permissible exposure limits of air contaminants	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica) Mica - Respirable fraction)	3	6	
US - Michigan Exposure Limits for Air Contaminants	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica) Tremolite)			0.1 R 325.51311 et seq, Asbestos for General Industry
US - Michigan Exposure Limits for Air Contaminants	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica) Talc (containing no asbestos), respirable dust)	2		
US - Michigan Exposure Limits for Air Contaminants	sodium metasilicate, pentahydrate (Silicates (less than 1% crystalline silica) Soapstone, total dust)	6		

ENDOELTABLE

## PERSONAL PROTECTION



## RESPIRATOR

Particulate

Consult your EHS staff for recommendations

## EYE

- Chemical goggles.
- Full face shield.

## HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

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.

## OTHER

- Overalls.
- PVC Apron.

## 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.

· If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Solid.  
Mixes with water.  
Corrosive.  
Alkaline.

State	Divided solid	Molecular Weight	212.14
Melting Range (°F)	Not available.	Viscosity	Not Applicable
Boiling Range (°F)	Not available.	Solubility in water (g/L)	Miscible
Flash Point (°F)	Not Applicable	pH (1% solution)	12.4
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not applicable	Vapour Pressure (mmHG)	Not applicable.
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	1.75
Lower Explosive Limit (%)	Not applicable	Relative Vapor Density (air=1)	Not applicable.
Volatile Component (%vol)	Nil @ 38 C.	Evaporation Rate	Not Applicable

### APPEARANCE

■ Soluble alkali silicates are complex non-stoichiometric chemical substances better described as glasses or aqueous solutions of glasses resulting from combinations of alkali metal oxides and silica. They possess the general formula  $M_2O \cdot xSiO_2$  where M is Na, K or Li and x is the molar ratio (MR), defining the number of moles silica ( $SiO_2$ ) per mole of alkali metal oxide ( $M_2O$ ). In industry it is common practice to indicate the weight ratio (W)  $SiO_2:M_2O$  which is derived from the MR by the following relationships: sodium silicates,  $MR=1.032 WR$ ; potassium silicate,  $MR=1.566 WR$ ; lithium silicates,  $MR=0.5 WR$ . All these silicates are soluble and alkaline with pH values ranging between 10 to 13. The alkalinity of the product increases as the MR or WR is reduced. With respect to EC Directives 67/458 (Dangerous Substances) and 91/155 (Dangerous Preparations) including relevant amendments (respectively 2001/59 and 2001/60), soluble silicates are classified as follows.

Molar Ratio $SiO_2:M_2O$	Powders	Liquids
	Corrosive R34, 37 S22, 26, 36/37/39, 45	Corrosive R34 S26, 36/37/39, 45
>1.6,	Irritant R37/38, 41 S22, 26, 36/37/39	Irritant R38, 41 S26, 36/37/39
>2.6	Irritant R36/37/38 S22, 26	Irritant R36/38 S26

Solutions of molar ratio >3.2 and concentrations <40% are not classified as dangerous or hazardous. The classification of the different groups of soluble silicates is not related to pH value but is based on skin and eye irritation tests. Soluble silicates classified as corrosive (molar ratio

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

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

### 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.  
· In presence of moisture, the material is corrosive to aluminium, zinc and tin producing highly flammable hydrogen gas.  
· For storage, no aluminium, light alloy, galvanised steel and glass receptacles or pipes should be used. On contact with aluminium or light alloys hydrogen gas may be evolved.  
· Steel, stainless steel and alkali stable plastic materials are generally appropriate.  
· Avoid oxidizing agents, acids, acid chlorides, acid anhydrides.  
· Avoid contact with copper, aluminium and their alloys.

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

## Section 11 - TOXICOLOGICAL INFORMATION

sodium metasilicate, pentahydrate

### TOXICITY AND IRRITATION

SODIUM METASILICATE, PENTAHYDRATE:

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

TOXICITY	IRRITATION
Oral (rat) LD50: 1153 mg/kg	Skin (human): 250 mg/24h SEVERE
	Skin (rabbit): 250 mg/24h SEVERE

■ The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

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.

The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

**sodium metasilicate anhydrous:**

## Section 12 - ECOLOGICAL INFORMATION

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

## 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.

! 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

DOT:

Symbols: None Hazard class or Division: 8

Identification Numbers: UN3253 PG: III

Label Codes: 8 Special provisions: IB8, IP3,

T1, TP33

Packaging: Exceptions: 154 Packaging: Non- bulk: 213

Packaging: Exceptions: 154 Quantity limitations: 25 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 100 kg Vessel stowage: Location: A aircraft only:

Vessel stowage: Other: 52.

Hazardous materials descriptions and proper shipping names:

Disodium trioxosilicate

### Air Transport IATA:

ICAO/IATA Class: 8 ICAO/IATA Subrisk: None

UN/ID Number: 3253 Packing Group: III

Special provisions: None

Cargo Only

Packing Instructions: 823 Maximum Qty/Pack: 100 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: 822 Maximum Qty/Pack: 25 kg  
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity  
Packing Instructions: Y822 Maximum Qty/Pack: 5 kg  
Shipping Name: DISODIUM TRIOXOSILICATE

**Maritime Transport IMDG:**

IMDG Class: 8 IMDG Subrisk: None  
UN Number: 3253 Packing Group: III  
EMS Number: F-A , S-B Special provisions: None  
Limited Quantities: 5 kg  
Shipping Name: DISODIUM TRIOXOSILICATE

## Section 15 - REGULATORY INFORMATION

**sodium metasilicate, pentahydrate (CAS: 10213-79-3) is found on the following regulatory lists;**

"International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US EPA High Production Volume Chemicals Additional List"

## Section 16 - OTHER INFORMATION

*Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.*

■ 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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