

# SAFETY DATA SHEET

## 1. SUBSTANCE AND SOURCE IDENTIFICATION

### Product Identifier

**SRM Number:** 187f  
**SRM Name:** Sodium Tetraborate Decahydrate (Borax) pH Standard  
**Other Means of Identification:** Not applicable.

### Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended for use in preparing solutions for calibrating electrodes for pH measuring systems. SRM 187f Sodium Tetraborate Decahydrate ( $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10 \text{H}_2\text{O}$ ) was prepared to ensure high purity and uniformity. However, this SRM is certified ONLY as a pH standard, pH(S), not as a pure substance. A unit of SRM 187f consists of 30 g of sodium tetraborate decahydrate.

### Company Information

National Institute of Standards and Technology  
Standard Reference Materials Program  
100 Bureau Drive, Stop 2300  
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200  
FAX: 301-948-3730  
E-mail: SRMMSDS@nist.gov  
Website: <http://www.nist.gov/srm>

Emergency Telephone ChemTrec:  
1-800-424-9300 (North America)  
+1-703-527-3887 (International)

## 2. HAZARDS IDENTIFICATION

### Classification

**Physical Hazard:** Not classified.  
**Health Hazard:** Serious Eye Damage/Eye Irritation – Category 2A  
Reproductive Toxicity – Category 1B

### Label Elements

#### Symbol:



**Signal Word:** DANGER

### Hazard Statement(s):

H319 Causes serious eye irritation  
H360 May damage fertility or the unborn child.

### Precautionary Statement(s):

P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P264 Wash hands thoroughly after handling.  
P280 Wear protective gloves, protective clothing and eye protection.  
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P308 + P313 If exposed or concerned: Get medical attention.  
P337 + P313 If eye irritation persists: get medical attention.  
P405 Store locked up.  
P501 Dispose of contents and container according to local regulations.

**Hazards Not Otherwise Classified:** Not applicable.

**Ingredients(s) with Unknown Acute Toxicity:** Not applicable.

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### 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

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**Substance:** Sodium Tetraborate Decahydrate

**Other Designations:** Borax, sodium pyroborate decahydrate, sodium biborate decahydrate, boricin.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Sodium Tetraborate Decahydrate	1303-96-4	215-540-4	100

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### 4. FIRST AID MEASURES

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**Description of First Aid Measures:**

**Inhalation:** If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

**Skin Contact:** Wash skin with soap and water for at least 15 minutes. If necessary, seek medical attention.

**Eye Contact:** Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

**Ingestion:** If a large amount is swallowed, seek medical attention.

**Most Important Symptoms/Effects, Acute and Delayed:** Gastrointestinal disorders and reproductive effects.

**Indication of any immediate medical attention and special treatment needed, if necessary:** If any of the above symptoms are present, seek medical attention if needed.

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### 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

**Extinguishing Media:**

Suitable: Use extinguishing media appropriate for the surrounding area.

Unsuitable: None listed.

**Specific Hazards Arising from the Chemical:** None listed.

**Special Protective Equipment and Precautions for Fire-Fighters:** Avoid inhalation of material or combustion byproducts. Move container from fire area if it can be done without risk. Stay upwind and keep out of low areas. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

**NFPA Ratings** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1

Fire = 0

Reactivity = 0

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### 6. ACCIDENTAL RELEASE MEASURES

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**Personal Precautions, Protective Equipment and Emergency Procedures:** Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

**Methods and Materials for Containment and Clean up:** Notify safety personnel of spills. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry. Keep out of water supplies and sewers.

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### 7. HANDLING AND STORAGE

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**Safe Handling Precautions:** Use methods to minimize dust. See Section 8, "Exposure Controls and Personal Protection".

**Storage:** Store and handling in accordance with all current regulations and standards.

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### 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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**Exposure Limits:**

OSHA (PEL): Not established.

NIOSH (REL): 5 mg/m<sup>3</sup> (TWA)

ACGIH (REL): 2 mg/m<sup>3</sup> (TWA inhalable fraction)

**Engineering Controls:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Personal Protection:** In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

**Respiratory Protection:** If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

**Eye/Face Protection:** Wear splash resistant safety goggles with a face shield. An eyewash station should be readily available near areas of use.

**Skin and Body Protection:** Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### Descriptive Properties:

#### Appearance

(physical state, color, etc.):

#### Molecular Formula:

#### Molar Mass (g/mol):

#### Odor:

#### Odor threshold:

#### pH:

#### Evaporation rate:

#### Melting point/freezing point (°C):

#### Relative Density (g/L):

#### Vapor Pressure (mmHg):

#### Vapor Density (air = 1):

#### Viscosity (cP):

#### Solubility(ies):

#### Partition coefficient (n-octanol/water):

#### Particle Size:

### Sodium Tetraborate Decahydrate

efflorescent white solid

Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub>·10(H<sub>2</sub>O)

381.37

odorless

not available

9.5 at 20 °C (3% aqueous)

not available

62.2-75 (144-167 °F)

1.73 (relative to water)

negligible at 20 °C

not applicable

not applicable

5.8-6.25 % water, glycerol; insoluble in acids

not available

not available

### Thermal Stability Properties:

#### Autoignition Temperature (°C):

not available

#### Thermal Decomposition (°C):

not available

#### Initial boiling point and boiling range (°C):

320 (608 °F)

#### Explosive Limits, LEL (Volume %):

not available

#### Explosive Limits, UEL (Volume %):

not available

#### Flash Point (°C):

not available

#### Flammability (solid, gas):

not available

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** Stable at normal temperatures and pressure.

**Stability:**   X   Stable        Unstable

**Possible Hazardous Reactions:** No data available.

**Conditions to Avoid:** Generating dust.

**Incompatible Materials:** metals, oxidizing materials.

**Fire/Explosion Information:** See Section 5, "Fire Fighting Measures".

**Hazardous Decomposition:** Oxides of boron, oxides of sodium.

**Hazardous Polymerization:** \_\_\_\_\_ Will Occur       X  Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Exposure:** \_\_\_\_\_ Inhalation      \_\_\_\_\_ Skin       X  Ingestion

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** Fatigue, weakness, anorexia, anemia, jaundice, encephalopathy.

**Potential Health Effects (Acute, Chronic and Delayed):**

**Inhalation:** May cause irritation of the mucous membranes with coughing, dryness and sore throat and may be absorbed causing systemic effects as detailed in acute ingestion. Repeated or prolonged absorption of borates may cause bronchitis, laryngitis, and other effects as detailed in chronic ingestion.

**Skin Contact:** May cause irritation. Skin absorption may occur through intact or damaged skin causing as detailed in acute ingestion.

**Eye Contact:** May cause irritation with redness, pain, blurred vision and possible corneal injury. Borax (CAS No. 1303-96-4) was evaluated for the potential to induce eye irritation in New Zealand White rabbits. Six young adult rabbits were administered 0.1 g of the test article into 1 eye by gently pulling the lower lid away from the eyeball to form a cup into which the material was instilled. The lids were then held together for one second. The untreated eye in each animal served as control. The eyes were examined at 1, 24, 48, and 72 hours post-treatment and scored against the Draize Scale for Ocular Lesions. Mean irritation scores ranged from 34.5 at the 24 hours examination to 20.7 at the 72 hours examination. One animal exhibited slow and incomplete recovery by 21 days post-treatment. Based on this, the test material was considered severely irritating.

**Ingestion:** Borates may cause delayed symptoms including malaise, nausea, severe epigastric pain, hemorrhagic gastroenteritis with bloody vomitus and diarrhea, weakness, lethargy, fever and headache. Erythroderma may occur, followed by desquamation, excoriation, blistering and bullae, typically located on the palms, soles, buttocks and scrotum and later becoming generalized over the body. Repeated ingestion may result in anorexia, weight loss, mild gastrointestinal irritation with disturbed digestion, nausea, vomiting, mild diarrhea and gastroenteritis. Erythematous skin rashes, dry skin and mucous membranes with cracked lips, red tongue, conjunctivitis, anemia, irritability, patchy alopecia, periorbital edema, kidney injury and convulsions may also occur. Repeated doses may have a cumulative effect. One percent borax in the diet of dogs and rats in a 2-year feeding study caused growth suppression, decreased food utilization efficiency, degeneration of gonads, and skin desquamation on paws and tails. Testicular atrophy also occurred at this level in both dogs and rats. Other reproductive effects have been reported in animals.

**Numerical Measures of Toxicity:**

**Acute Toxicity:** Not classified.

Rat Oral LD50: 2660 mg/kg

**Skin Corrosion/Irritation:** Not classified; no data available.

**Serious Eye damage/ Eye irritation:** Category 2.

**Respiratory Sensitization:** Not classified; no data available.

**Skin Sensitization:** Not classified; no data available.

**Germ Cell Mutagenicity:** Not classified; no data available.

**Carcinogenicity:** Not classified

**Listed as a Carcinogen/Potential Carcinogen**      \_\_\_\_\_ Yes       X  No

Borax is not listed by NTP, IARC or OSHA.

**Reproductive Toxicity:** Category 1B; animal studies show changes in testes.

**Specific Target Organ Toxicity, Single Exposure:** Not classified; no data available.

**Specific Target Organ Toxicity, Repeated Exposure:** Not classified; no data available.

**Aspiration Hazard:** Not applicable.

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## 12. ECOLOGICAL INFORMATION

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**Ecotoxicity Data:** Data related to disodium tetraborate.

Fish: Common dab (*Limanda limanda*) LC50: 340 mg/L (96 h).

Algae: *Pseudokirchneriella subcapitata* EC50: 2.6-21.8 mg/L (96 h, static).

Invertebrate: Water flea (*Daphnia magna*) LC50: 1085-1402 mg/L (48 h).

**Persistence and Degradability:** No data available.

**Bioaccumulative Potential:** No evidence of bioaccumulation (related to disodium tetraborate).

**Mobility in Soil:** No data available.

**Other Adverse effects:** No data available.

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## 13. DISPOSAL CONSIDERATIONS

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**Waste Disposal:** Dispose of waste in accordance with all applicable federal, state, and local regulations.

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## 14. TRANSPORTATION INFORMATION

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**U.S. DOT and IATA:** Not regulated by DOT or IATA.

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## 15. REGULATORY INFORMATION

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### U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH: Yes.

CHRONIC HEALTH: Yes.

FIRE: No.

REACTIVE: No.

PRESSURE: No.

### State Regulations:

California Proposition 65: Not listed.

**U.S. TSCA Inventory:** Listed.

**TSCA 12(b), Export Notification:** Not listed.

### Canadian Regulations:

WHMIS Information: Not provided for this material.

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## 16. OTHER INFORMATION

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**Issue Date:** 27 June 2017

**Sources:** ChemAdvisor, Inc., SDS *Sodium Tetraborate Decahydrate*, 22 December 2016.

CDC; NIOSH; *NIOSH Pocket Guide to Chemical Hazards*; Department of Health and Human Services (DHHS), Centers for Disease Control and Prevention (CDC), National Institute for Safety and Health; *RTECS CAS #:* 1303-96-4, May 2009; available at <http://www.cdc.gov/niosh-rtecs/VZ22B6B8.html> (accessed June 2017).

U.S. National Library of Medicine; Hazardous Substances Data Bank (HSDB); Borax; available at <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm> (accessed June 2017).

Vendor SDS, *Sodium Tetraborate, Decahydrate Reagent (ACS)*, 20 March 2017.

### Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
ECHA	European Chemicals Agency	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transport Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

**Disclaimer:** Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail [srminfo@nist.gov](mailto:srminfo@nist.gov); or via the Internet at <http://www.nist.gov/srm>.