

# Sodium Perborate Monohydrate

## Sodium Perborate Monohydrate

### Material Safety Data Sheet

**Chemical:** Sodium Perborate  
Monohydrate (PBS)

NFPA: H=2 F=0 I= 1 S=OX  
HMIS: H=2 F=0 R=1 PPE= Supplied by user;  
dependent on conditions

**MSDS Number:** PBS-0405  
**Effective Date:** 18 April 2005  
**Issued by:** Solvay Chemicals, Inc. Regulatory Affairs Department

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## 1. Company and Product Identification

- 1.1 Product Name:** Sodium Perborate Monohydrate  
**Chemical Name:** Perboric acid, sodium salt, monohydrated  
**Synonyms:** PBS, Sodium Peroxyborate, Sodium Peroxoborate, PBS-1, PBSM  
**Chemical Formula:**  $\text{NaBO}_3 \cdot \text{H}_2\text{O}$   
**Molecular Weight:** 100  
**CAS Number:** 10332-33-9  
**EINECS Number:** 234-390-0
- 1.2 Recommended Uses:** Used as bleaching agents, cleaning/ washing agents, oxidizing agents.
- 1.3 Supplier:** Solvay Chemicals, Inc.  
PO BOX 27328 Houston, TX 77227-7328  
3333 Richmond Ave. Houston, Texas 77098
- 1.4 Emergency Telephone Numbers**  
**Emergencies (USA):** 1-800-424-9300 (CHEMTREC®)  
**Transportation Emergencies (INTERNATIONAL/MARITIME):** 1-703-527-3887 (CHEMTREC®)  
**Transportation Emergencies (CANADA):** 1-613-996-6666 (CANUTEC)  
**Transportation Emergencies (MEXICO-SETIQ):** 01-800-00-214-00 (MEX. REPUBLIC)  
525-559-1588 (Mexico City and metro area)



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## 2. Composition/Information on Ingredients

INGREDIENTS*	FORMULA	WT. PERCENT	CAS #
Sodium Perborate Monohydrate	$\text{NaBO}_3 \cdot \text{H}_2\text{O}$	>95	10332-33-9
Sodium Metaborate	$\text{NaBO}_2$	1-3	7775-19-1

## 3. Hazards Identification

### Emergency Overview:

- Toxicity effects principally related to its irritating properties.
- Limited hazard to the environment (sensitive plants).
- Supports combustion of other substances (oxidizing product).

**3.1 Route of Entry:** Inhalation: Yes Skin: Yes Ingestion: Yes

**3.2 Potential Effects of exposure:** Irritating to mucous membranes, eyes and skin.

### Inhalation:

- Nose and throat irritation.
- At high concentrations, cough.

### Eyes:

- Severe eye irritation, watering, redness.
- Risk of temporary eye lesions.

### Skin contact:

- May cause irritation.
- In case of repeated contact: risk of dermatitis.

**Skin contact:** Boric acid, a conversion product of sodium perborate in biological systems, is poorly absorbed through intact skin, but is absorbed through abraded, denuded or burned skin leading to systemic effects similar to ingestion.

### Ingestion:

- Severe irritation of the mouth, throat, esophagus and stomach.
- Bloating of stomach, belching.

**Target Organs:** Large doses of boric acid have been shown to be toxic to most organs including central nervous system, reproductive system (testes and developing fetus), liver and kidneys.

**Carcinogenicity:** See section 11.3.

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#### 4. First-Aid Measures

**General Recommendations:** Do not dry soiled clothing near an open flame or incandescent heat source.

##### 4.1 Inhalation:

- Remove the subject from dusty environment.
- Consult a physician in case of respiratory symptoms.

##### Eyes:

- Flush eyes as soon as possible with running water for 15 minutes, while keeping the eyelids open.
- Consult an ophthalmologist in all cases.

##### Skin:

- Remove contaminated shoes, socks and clothing; wash the affected skin with running water.
- Clean clothing.
- Consult a physician in case of persistent pain or redness.

**Ingestion:** Consult a physician immediately in all cases.

##### If the subject is completely conscious:

- Rinse and administer fresh water.
- Do not induce vomiting.

##### If the subject is unconscious:

- NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
- Loosen collar and tight clothing, lay the victim on his/her left side.
- Keep warm (blanket).

**4.2 Medical Treatment/Notes to Physician:** See Section 4.1 above.

#### 5. Fire-Fighting Measures

**5.1 Flash point:** Not applicable.

**5.2 Auto-ignition Temperature:** Not applicable.

**5.3 Flammability Limits:** Non-flammable.

##### 5.4 Unusual Fire and Explosion Hazards:

- Oxidizer.
- Contact with flammables may cause fire or explosion.

##### 5.5 Extinguishing Methods

###### Common:

- Large quantities of water, water spray.
- In case of fire in close proximity, all means of extinguishing are acceptable (subject to sections below).

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**Inappropriate extinguishing means:** No restriction.

#### 5.6 Fire Fighting Procedures

**Specific hazards:**

- Oxygen released on exothermic decomposition may support combustion in case of surrounding fire.
- Pressure burst may occur due to decomposition in confined spaces/containers.

**Protective measures in case of intervention:**

- Personnel should wear full bunker gear and positive-pressure self-contained breathing apparatus.
- When intervention in close proximity, wear acid-resistant over-suit.
- Apply cooling water to sides of transport or storage vessels that are exposed to flames until fire is out.
- Do not approach hot vessels containing product.

**Other precautions:** If safe to do so, remove the exposed containers.

## 6. Accidental Release Measures

#### 6.1 Precautions:

- Observe protective measures given in sections 5 and 8.
- Avoid materials and products which are incompatible with the product (see section 10).
- Avoid direct contact of the product with water.

#### 6.2 Cleanup methods:

- Collect the product with suitable means (shovel or sweep) avoiding dust formation.
- All receiving equipment should be clean, dry, vented, labeled and made of materials compatible with the product.
- Do not return spilled or contaminated material to inventory.
- In order to avoid the risk of contamination, the recovered product must not be returned to the original container.
- Clean area with large quantities of water.
- For disposal methods, refer to section 13.

**6.3 Precautions for protection of the environment:** Immediately notify the appropriate authorities in case of reportable spill.

## 7. Handling and Storage

#### 7.1 Handling:

- Clean and dry process and other piping and equipment before using this product.
- Never return unused product to storage container.
- Keep away from incompatible products.
- Containers and equipment used to handle the product should be used exclusively for that product.
- Avoid contact with water or humidity.

For more information consult the supplier.

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#### 7.2 Storage:

- Store in a dry area.
- Protect from direct sunlight.
- Store away from heat sources.
- Keep away from incompatible products (see section 10).
- Store in vented containers.
- Store in temperatures less than 40°C (104°F).
- Keep in container fitted with safety valve or vent.
- Container must be used exclusively for the product.

#### 7.3 Specific Uses: See Section 1.2.

#### 7.4 Other precautions:

- Warn personnel of the dangers of the product.
- Follow the protective measures given in section 8.

#### 7.5 Packaging:

- Stainless Steel.
- PE.
- Paper and PE.
- Glass.
- Passivated aluminum.

## 8. Exposure Controls/Personal Protection

### 8.1 Exposure Limit Values:

Authorized limit Values	TLV® ACGIH®-USA (2002)	OSHA PEL	SAEL (Solvay Acceptable Exposure Limit)
Particulates not otherwise classified (PNOC)	Inhalable 10 mg/m <sup>3</sup> TWA	Inhalable 15 mg/m <sup>3</sup> TWA	5 mg/m <sup>3</sup> TWA
	Respirable 3 mg/m <sup>3</sup> TWA	Respirable 5 mg/m <sup>3</sup> TWA	
Sodium Perborate Monohydrate			

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SAEL is Solvay Acceptable Exposure Limit, Time Weighted Average for 8-hour workdays.

No Specific TLV-STEL (Short Term Exposure Level) has been set. Excursions in exposure level may exceed 3 times the TLV-TWA for no more than a total of 30 minutes during a workday and under no circumstances should they exceed 5 times the TLV-TWA.

### 8.2 Exposure Controls:

#### 8.2.1 Occupational Exposure Controls:

**8.2.1.1 Ventilation:** Provide ventilation in work areas to keep exposure below applicable limits. See Section 8.1.

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**8.2.1.2 Respiratory protection:** For many conditions, no respiratory protection may be needed; however in dusty or unknown atmospheres or when exposures exceed limit values use NIOSH-approved dust respirator.

**8.2.1.3 Hand protection:** Protective gloves made of PVC, neoprene or rubber.

**8.2.1.4 Eye protection:** Wear dustproof goggles.

**8.2.1.5 Skin protection:** When prolonged or frequently repeated contact could occur, use protective full-body-clothing such as PVC or rubber, impervious to this material.

**8.3 Other precautions:**

- An eyewash and safety shower should be nearby and ready for use.
- Consult your industrial hygienist or safety manager for the selection of personal protective equipment suitable for the working conditions.

## 9. Physical and Chemical Properties

**9.1 Appearance:** crystalline powder.

**Color:** white.

**Odor:** odorless.

**9.2 Important Health, Safety and Environmental information:**

**pH:** approx. 10 (1.5% solution).

**Change of state:**

Melting point: Not applicable - decomposes.

Boiling point: Not applicable.

Decomposition Temperature:  $\geq 55^{\circ}\text{C}$  (133°F) (50 kg) Self-accelerated decomposition temperature (SADT) with oxygen release starting at  $50^{\circ}\text{C}$  (122°F).

**Flash Point:** Non-flammable.

**Flammability (solid, gas):** Non-flammable.

**Explosive Properties:** See section 4.

**Oxidizing Properties:** Weak oxidizer, See section 4.

**Vapor Pressure:** Not applicable.

**Relative Density:**

Specific gravity: No data.

( $\text{H}_2\text{O}=1$ ).

**Bulk Density:** 0.5-0.65g/cm<sup>3</sup>.

**Solubility:**

Water: 15 g/l @  $20^{\circ}\text{C}$  (68°F).

Fat: Not applicable.

**Partition coefficient:** Not applicable.

P (n-octanol/water).

**Viscosity:** Not applicable.

**Vapor Density (air=1):** No data.

**Evaporation Rate:** No data.

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#### 9.3 Other Information:

**Granulometry:** 95% > 0.15 mm.  
**(Particle size)** 95% < 1 mm.

### 10. Stability and Reactivity

**Stability:** Stable under certain conditions of use with slow gas release.

#### 10.1 Conditions to avoid:

- Heat/Sources of heat.
- Moisture.

#### 10.2 Materials and substances to avoid:

- Water.
- Acids.
- Bases.
- Salts of metals.
- Reducing agents.
- Organic materials.
- Flammable substances.

**10.3 Hazardous decomposition products:** Oxygen; Decomposition releases steam and heat.

**10.4 Hazardous Polymerization:** Will not occur.

**10.5 Other information:** None.

### 11. Toxicological Information

#### 11.1 Acute toxicity:

**Inhalation:** no data.

**Oral:** LD<sub>50</sub>, rat, 770-2100 mg/kg.

**Dermal:** LD<sub>50</sub>, rabbit, >2000 mg/kg.

#### **Irritation:**

- Rabbit, Irritant (eyes).
- Rabbit, Slight irritant (skin).
- Rabbit, Slight irritant (eyes), after direct rinsing.

**Sensitization:** Guinea Pig, Non-sensitizing (skin).

#### **Comments:**

- Toxic effect linked with irritating properties.
- Irritating effect for skin and eyes.

#### 11.2 Chronic toxicity:

- Oral route, Target organ: gastrointestinal system, > 1000 mg/kg, irritating effect.
- Humans, Target organ: respiratory system, > 21 mg/m<sup>3</sup>, irritating effect.
- In vitro mutagenic effect.
- No teratogenic effect.

**11.3 Carcinogenic Designation:** None.

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## 12. Ecological Information

### 12.1 Acute ecotoxicity:

- Fish, Bracydanio rerio, LC<sub>50</sub>, 96 hours, 51 mg/L.
- Fish, Bracydanio rerio; NOEC, 25 mg/L.
- Crustaceans, Daphnia magna; 48 hours, EC<sub>50</sub>, 11 mg/L.
- Crustaceans, Daphnia magna; NOEC, 8 mg/L.
- Algae, Scenedesmus subspicatus, 96 hours, EC<sub>50</sub>, 12 mg/L.

**12.2 Chronic ecotoxicity:** Data in boron content. Sodium perborate monohydrate contains 10.83% boron.

#### Terrestrial plants

- Sensitive plants - LOEC: 0.3 - 1 mg/l.
- Intermediate plants - LOEC: 1 - 2 mg/l.
- Tolerant plants - LOEC: 2 - 4 mg/l.

Sensitive plants: citrus, stone fruit, nut trees.

### 12.3 Mobility:

- Air - Not applicable.
- Water - Considerable solubility and mobility.
- Soil/sediments - Non-significant adsorption.

### 12.4 Degradation

#### Abiotic:

- Air- Not applicable.
- Water- significant hydrolysis.  
Degradation products: boric acid, borate, hydrogen peroxide (biodegradable).
- Soil- hydrolysis.

**Biotic:** Aerobic, Ready biodegradability / closed bottle (48 hours): 85%, rapid biodegradation.

**12.5 Potential for bioaccumulation:** Result: non-bioaccumulable.

**12.6 Other adverse effects /Comments:** Toxic for aquatic organisms. Nevertheless, hazard for the environment is limited due to product properties:

No bioaccumulation.

Abiotic and biotic degradability into boron derivatives.

Weak persistence.

Boron is toxic for plants from 0.3 mg/l (sensitive plants).

## 13. Disposal Considerations

**13.1 Waste treatment:** Dispose of in approved waste facility operated by authorized contractor in compliance with federal, state and local regulations.

### 13.2 Packaging treatment:

- Consult current federal, state and local regulations regarding the proper disposal of emptied containers.
- To avoid waste generation, as far as possible, use dedicated containers.
- Empty containers are a source of hazard until they have been effectively cleaned. They must be handled and stored accordingly.
- Reuse containers in conformity with regulations.
- Containers that cannot be cleaned must be treated as waste.

**13.3 RCRA Hazardous Waste:** Listed as D001 (Ignitable).

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#### 14. Transport Information

Mode	DOT	IMDG	IATA
UN Number	UN 1479	UN 1479	UN 1479
Class (Subsidiary)	5.1	5.1	5.1
Proper Shipping Name	Oxidizing solid, n.o.s., (sodium perborate monohydrate)	Oxidizing solid, n.o.s., (sodium perborate monohydrate)	Oxidizing solid, n.o.s., (sodium perborate monohydrate)
Hazard label (Subsidiary)	Oxidizer	Oxidizing Agent	Oxidizer
Marine Pollutant	No	No	No
Placard (Subsidiary)	Oxidizer (5.1)	1479	
Packing Group	III	III	III
Reportable Quantity	100 lbs.		
MFGAG			
Emergency Info	ERG 140	EmS 5.1-11	ERG Code 5L

**Other:** Effective 1/1/05, this material was given its own unique ID number of UN 3377: Proper Shipping Name: Sodium Perborate Monohydrate. Labels, Marking, Packing group(s) remain the same. Use of previous ID - UN1479, Oxidizing Solid, N.O.S., (Sodium Perborate Monohydrate) is permitted during transition periods as follows: US DOT until 1/1/06, IMDG until 1/1/06, ADR/RID until 7/1/06, IATA - no transition, effective 1/1/05.

#### 15. Regulatory Information

##### National Regulations (US)

**TSCA Inventory 8(b):** Yes; CASRN 7632-04-4.

**SARA Title III Sec. 302/303 Extremely Hazardous Substances (40 CFR 355):** No.

##### SARA Title III Sec. 311/312 (40 CFR 370):

Hazard Category Yes, Fire Hazard, Immediate Health hazard.  
Threshold planning quantity - 10,000 lbs.

**SARA Title III Sec. 313 Toxic Chemical Emissions Reporting (40 CFR 372):** No.

##### CERCLA Hazardous Substance (40 CFR Part 302)

Listed: No.  
Unlisted Substance: Yes, Reportable Quantity 100 lbs.  
Characteristic: Ignitability (D001).

**Other:** None.

##### State Component Listing:

State Comment: None identified.

##### National Regulations (Canada)

**Canadian DSL Registration:** DSL CAS#7632-04-4.

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**WHMIS Classification:** C Oxidizing material.  
D2B Poisonous and infectious material - other toxic effects.

This product has been classified in accordance with the hazard criteria of the **Controlled Products Regulations**, and the MSDS contains all the information required by the **Controlled Products Regulations**.

**Labeling according to Directive 1999/45/EC.**

Symbols	O	Oxidizing.
	Xi	Irritant.
Phrases R	8	Contact with combustible material may cause fire.
	22	Harmful if swallowed.
	36/38	Irritating to eyes and skin.
Phrases S	15	Keep away from heat.
	8	Keep container dry.
	24/25	Avoid contact with skin and eyes.
	26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

## 16. Other Information

### 16.1 Ratings:

**NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)**

Health = 2 Flammability = 0 Instability = 1 Special = OX

**HMIS (HAZARDOUS MATERIAL INFORMATION SYSTEM)**

Health = 2 Fire = 0 Reactivity = 1 PPE = Supplied by User; dependent on local conditions

### 16.2 Other Information:

The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

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### 16.3 Reason for revision:

Supersedes edition: Solvay Chemicals MSDS PBS-0105 dated 20 January 2005.

Purpose of revision: Correct typo in new ID Number information in 14.