1. IDENTIFICATION

Product identifier

Product code: B2294
Product Name: 2-BROMO-2-NITRO-1,3-PROPANEDIOL

Other means of identification

Synonyms:
2-Bromo-2-nitropropan-1,3-diol
2-Bromo-2-nitropropane-1,3-diol
2-Bronopol
Bronidol
Bronopol

CAS #: 52-51-7
RTECS #: TY3385000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: No information available.
Uses advised against: No information available

Supplier:
Spectrum Chemical Mfg. Corp
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: https://www.spectrumchemical.com
Emergency telephone number: Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous according to the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - Oral</td>
<td>Category 3</td>
</tr>
<tr>
<td>Acute toxicity - Inhalation (Dusts/Mists)</td>
<td>Category 3</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 2</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 2A</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Category 3</td>
</tr>
<tr>
<td>Flammable solids</td>
<td>Category 2</td>
</tr>
</tbody>
</table>

Label elements
Hazard statements
Toxic if swallowed
Toxic if inhaled
Causes skin irritation
Causes serious eye irritation
May cause respiratory irritation
May cause an allergic skin reaction
Flammable solids

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Wear protective gloves
Wear protective clothing
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Contaminated work clothing must not be allowed out of the workplace
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/.../equipment

Precautionary Statements - Response
In case of fire: Use CO2, dry chemical, or foam to extinguish.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
IF ON SKIN: Wash with plenty of water
Take off contaminated clothing and wash it before reuse
If skin irritation or rash occurs: Get medical advice/attention
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth

Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal

Product code: B2294
Product name: 2-BROMO-2-NITRO-1,3-PROPANEDIOL
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Bromo-2-nitro-1,3-propanediol</td>
<td>52-51-7</td>
<td>100</td>
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</tbody>
</table>

4. FIRST AID MEASURES

First aid measures

General Advice: National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothing and shoes. Get medical attention.

Eye Contact: Flush eyes with water for 15 minutes. Get medical attention.

Inhalation: Toxic by inhalation. Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or Poison Control Centre immediately.

Ingestion: Toxic if swallowed. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

Symptoms
- Causes serious eye irritation
- Moderate eye irritation
- Causes skin irritation
- Moderate skin irritation
- May cause an allergic skin reaction
- Irritating to respiratory system
- May cause nausea and vomiting

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically.

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical. Carbon dioxide (CO2). Water spray mist or foam.

Unsuitable Extinguishing Media: Do not use a solid (straight) water stream as it may scatter
Specific hazards arising from the chemical


Specific hazards: Flammable solid.

Special Protective Actions for Firefighters

Specific Methods: For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.

Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Remove all sources of ignition.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment: Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading.

Methods for cleaning up: Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions: Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. Keep away from incompatible materials.

Safe Handling Advice: Wear personal protective equipment. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not breathe dust. Do not ingest. When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions: Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials. Store in a segregated and approved area.

Incompatible Materials:

Product code: B2294

Product name: 2-BROMO-2-NITRO-1,3-PROPANEDIOL
### Strong oxidizing agents
- Strong bases
- Strong reducing agents

---

#### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control parameters**

**National occupational exposure limits**

**United States**

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<tr>
<th>Components</th>
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<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WEEL</th>
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**Canada**

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**Australia and Mexico**

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<th>Mexico</th>
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<tbody>
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<td>52-51-7</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

**Appropriate engineering controls**

**Engineering measures to reduce exposure:**

Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Individual protection measures, such as personal protective equipment**

**Personal Protective Equipment**

**Eye protection:**
- Goggles or Safety glasses with side-shields.

**Skin and body protection:**
- Long sleeved clothing
- Chemical resistant apron
- Gloves

**Respiratory protection:**
- Effective dust mask. or. Wear respirator with dust filter. Use a dust respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentration of dust (dust clouds), inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent.

**Hygiene measures:**
- Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

---

#### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Product code:** B2294

**Product name:**

2-BROMO-2-NITRO-1,3-PROPANEDIOL

OL
10. STABILITY AND REACTIVITY

Reactivity
No information available

Chemical stability

Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur


Incompatible Materials: Strong oxidizing agents
Strong bases
Strong reducing agents


Physical state: Solid
Appearance: Crystalline.

Odor: Odorless.
Taste: No information available.

Molecular/Formula weight (g/mole): 199.99
Flammability: Flammable solid

Flash Point Tested according to: Not available
Autoignition Temperature (°C/°F): No information available

Upper Explosion Limit (%): No information available
Melting point/range(°C/°F): 130-133 °C/266-271 °F

Boiling point/range(°C/°F): No information available
Bulk density: No information available

Specific gravity: No information available
pH: No information available

Evaporation rate: No information available
Vapor density: No information available

Odor threshold (ppm): No information available
Partition coefficient (n-octanol/water): log Kow = -0.64

Miscibility: No information available
Solubility: Soluble in Water
Soluble in Alcohol
Soluble in ethyl acetate
Slightly soluble in chloroform
Slightly soluble in Acetone
Slightly soluble in Ether
Slightly soluble in Benzene

Product code: B2294
Product name: 2-BROMO-2-NITRO-1,3-PROPANEDIOL
Other Information
Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Ingestion. Inhalation. Skin.

Acute Toxicity

The following values are calculated based on chapter 3.1 of the GHS document

Component Information

<table>
<thead>
<tr>
<th>Component Information</th>
<th>Value</th>
</tr>
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<td>2-Bromo-2-nitro-1,3-propanediol</td>
<td>[52-51-7](L)</td>
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<tr>
<td>LD50/oral/rat =</td>
<td>180 mg/kg Oral LD50 Rat</td>
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<tr>
<td>LD50/oral/mouse =</td>
<td>No information available</td>
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<tr>
<td>LD50/dermal/rabbit =</td>
<td>&gt;2000 mg/kg</td>
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<tr>
<td>LD50/dermal/rat =</td>
<td>1600 mg/kg LD50 dermal Rat</td>
</tr>
<tr>
<td>LC50/inhalation/rat =</td>
<td>&gt; 5 g/m³ Inhalation LC50 Rat 6 hr; 800 mg/m³ Inhalation LC50 Rat 4 hr</td>
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<tr>
<td>LC50/inhalation/mouse =</td>
<td>No information available</td>
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<tr>
<td>Other LD50 or LC50 information =</td>
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</table>

Product Information

<table>
<thead>
<tr>
<th>Product Information</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50/oral/rat =</td>
<td>VALUE - Acute Tox Oral = 180 mg/kg</td>
</tr>
<tr>
<td>LD50/oral/mouse =</td>
<td>Value - Acute Tox Oral = No information available</td>
</tr>
<tr>
<td>LD50/dermal/rabbit</td>
<td>VALUE - Acute Tox Dermal = &gt; 2000 mg/kg</td>
</tr>
<tr>
<td>LD50/dermal/rat</td>
<td>VALUE - Acute Tox Dermal = 1600 mg/kg</td>
</tr>
<tr>
<td>LC50/inhalation/rat</td>
<td>VALUE-Vapor = No information available</td>
</tr>
<tr>
<td>VALUE-Gas =</td>
<td>No information available</td>
</tr>
<tr>
<td>VALUE-Dust/Mist =</td>
<td>0.8 mg/l (4-hr.)</td>
</tr>
<tr>
<td>LC50/Inhalation/mouse</td>
<td>VALUE-Vapor = No information available</td>
</tr>
<tr>
<td>VALUE - Gas =</td>
<td>No information available</td>
</tr>
<tr>
<td>VALUE - Dust/Mist =</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Symptoms

Skin Contact: Causes skin irritation. Moderately irritating to the skin. May be harmful in contact with skin.

Product code: B2294
Product name: 2-BROMO-2-NITRO-1,3-PROPANEDIOL
Eye Contact: Causes serious eye irritation. Moderately irritating to the eyes.

Inhalation Toxic by inhalation. Irritating to respiratory system.

Ingestion Toxic if swallowed. Ingestion may cause nausea, vomiting. May affect respiration (dyspnea - difficulty breathing and shortness of breath). May affect urinary system (kidneys). May affect respiration (dyspnea, respiratory depression).

Aspiration hazard No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity Skin: Sensitizer. May cause allergic skin reaction (allergic contact dermatitis).

Sensitization: May cause sensitization by skin contact.

Mutagenic Effects: No information available

Carcinogenic effects: Not considered carcinogenic.

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>IARC</th>
<th>ACGIH - Carcinogens</th>
<th>NTP</th>
<th>OSHA HCS - Carcinogens</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Bromo-2-nitro-1,3-propanediol</td>
<td>52-51-7</td>
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<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

ACGIH (American Conference of Governmental Industrial Hygienists)
IARC (International Agency for Research on Cancer)
NTP (National Toxicology Program)
OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity No data is available

Reproductive Effects: No information available
Developmental Effects: No information available
Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure Respiratory system.
STOT - repeated exposure No information available.
Target Organs: No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: Potential for bioconcentration in aquatic organisms is low.

Product code: B2294
Product name: 2-BROMO-2-NITRO-1,3-PROPANEDIOL
Mobility: It is expected to have very high mobility based on estimated Koc.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Bromo-2-nitro-1,3-propane-1,3-diol</td>
<td>52-51-7</td>
<td>None</td>
<td>None</td>
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</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT

UN-No: UN3241
Proper Shipping Name: 2-Bromo-2-nitropropane-1,3-diol
Hazard Class: 4.1
Subsidiary Class: No information available
Packing group: III
Emergency Response Guide Number: 133
Marine Pollutant: No data available
DOT RQ (lbs): No information available
Special Provisions: 46, IB8, IP3
Symbol(s): No information available
Description: UN3241, 2-Bromo-2-nitropropane-1,3-diol, 4.1, III

TDG (Canada)

UN-No: UN3241
Proper Shipping Name: 2-Bromo-2-nitropropane-1,3-diol
Hazard Class: 4.1
Subsidiary Risk: No information available
Packing Group: III
Marine Pollutant: No Information available
Description: UN3241, 2-Bromo-2-nitropropane-1,3-diol, 4.1, III

ADR

UN-No: UN3241
Proper Shipping Name: 2-Bromo-2-nitropropane-1,3-diol
Hazard Class: 4.1
Packing Group: III
Subsidiary Risk: No information available
Special Provisions: 638
Description: UN3241, 2-Bromo-2-nitropropane-1,3-diol, 4.1, III, ENVIRONMENTALLY HAZARDOUS

IMO / IMDG

UN-No: UN3241
Proper Shipping Name: 2-Bromo-2-nitropropane-1,3-diol
Hazard Class: 4.1

Product code: B2294

Product name:
2-BROMO-2-NITRO-1,3-PROPANEDIOL
Subsidiary Risk: No information available
Packing Group: III
Marine Pollutant: No information available
EMS: F-J
Description: UN3241, 2-Bromo-2-nitropropane-1,3-diol, 4.1, III, Marine pollutant

RID
UN-No: UN3241
Proper Shipping Name: 2-Bromo-2-nitropropane-1,3-diol
Hazard Class: 4.1
Subsidiary Risk: No information available
Packing Group: III
Special Provisions: 638
Description: UN3241, 2-Bromo-2-nitropropane-1,3-diol, 4.1, III, ENVIRONMENTALLY HAZARDOUS

ICAO
UN-No: UN3241
Proper Shipping Name: 2-Bromo-2-nitropropane-1,3-diol
Hazard Class: 4.1
Subsidiary Risk: No information available
Packing Group: III
Special Provisions: A20
Description: UN3241, 2-Bromo-2-nitropropane-1,3-diol, 4.1, III

IATA
UN-No: UN3241
Proper Shipping Name: 2-Bromo-2-nitropropane-1,3-diol
Hazard Class: 4.1
Subsidiary Risk: No information available
ERG Code: 3L
Special Provisions: No information available
Description: UN3241, 2-Bromo-2-nitropropane-1,3-diol, 4.1, III

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>U.S. TSCA</th>
<th>KOREA KECL</th>
<th>Philippines (PICCS)</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
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<tbody>
<tr>
<td>2-Bromo-2-nitro-1,3-propanediol</td>
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<td>PresentACTIV E</td>
<td>Present KE-03691</td>
<td>Present (2)-325</td>
<td>Present</td>
<td>Present</td>
<td>Present 200-143-0</td>
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</table>

U.S. Regulations


Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
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Product code: B2294
Product name: 2-BROMO-2-NITRO-1,3-PROPANEDIOL
CERCLA/SARA

<table>
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<th>Components</th>
<th>CAS-No.</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
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U.S. TSCA

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<th>TSCA 8(d) - Health and Safety Reporting</th>
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Canada

WHIMIS 2015 - GHS Classifications

WHIMIS 2015 Hazard Classification Information: The WHMIS 2015 classification of this product has not been validated or reviewed yet.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

Inventory

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<th>Canada (NDSL)</th>
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EU Classification

EU GHS - SV - CLP 1272/2008

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<td>2-Bromo-2-nitro-1,3-propanediol</td>
<td>52-51-7</td>
<td>Acute toxicity - Oral - Acute Tox. 4: H302 Harmful if swallowed. (Minimum classification); Acute toxicity - Dermal - Acute Tox. 4: H312 Harmful in contact with skin. (Minimum classification); Skin corrosion/irritation - Skin Irrit. 2: H315 Causes skin irritation.; Serious Eye Damage/Eye Irritation - Eye Dam. 1: H318 Causes serious eye damage.; Specific target organ toxicity - Single exposure - STOT SE 3: H335 May cause respiratory irritation.; Hazardous to aquatic environment - acute hazard - Aquatic Acute 1: H400 Very toxic to</td>
</tr>
</tbody>
</table>
aquatic life. (M Factor: 10)

EU - CLP (1272/2008)

R-phrase(s)
R50 - Very toxic to aquatic organisms.
R41 - Risk of serious damage to eyes.
R21/22 - Harmful in contact with skin and if swallowed.
R37/38 - Irritating to respiratory system and skin.

S-phrase(s)
none

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Bromo-2-nitro-1,3-propandiol</td>
<td>52-51-7</td>
<td>Xn; R21/22 Xi; R37/38-41 N; R50</td>
<td>2.5%&lt;=C N; R50</td>
<td>S: (2)-26-36/37/39-61</td>
</tr>
</tbody>
</table>

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
Xn - Harmful.
Xi - Irritant.
N - Dangerous for the environment.

16. OTHER INFORMATION

Preparation Date: 11/13/2018
Revision Date: 11/13/2018
Prepared by: Sonia Owen

Disclaimer:
All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.
End of Safety Data Sheet