SAFETY DATA SHEETS

According to the UN GHS revision 8

Version: 1.0
Creation Date: July 15, 2019
Revision Date: July 15, 2019

1. SECTION 1: Identification

1.1. GHS Product identifier

Product name Bronopol

1.2. Other means of identification

Product number -

Other names 2-Bromo-2-nitro-1,3-propanediol; 2-bromo-2-nitropropane-1,3-diol; BNPK

1.3. Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research uses.

Uses advised against no data available

1.4. Supplier's details

Company Shandong Sincere Chemical Co., Ltd.

Address No.21 Industrial North Road, Licheng District, Jinan City, Shandong Province, China

Telephone (+86) 188-6575-9396

1.5. Emergency phone number

Emergency phone number (+86) 188-6575-9396

Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

2. SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Acute toxicity - Category 4, Oral
Acute toxicity - Category 4, Dermal
Skin irritation, Category 2
Serious eye damage, Category 1
Specific target organ toxicity – single exposure, Category 3
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

2.2. GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s) H302 Harmful if swallowedH312 Harmful in contact with skinH315 Causes skin irritationH318 Causes

	serious eye damageH335 May cause respiratory irritationH400 Very toxic to aquatic life
Precautionary statement(s)	
Prevention	P264 Wash ... thoroughly after handling.P270 Do not eat, drink or smoke when using this product.P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...P261 Avoid breathing dust/fume/gas/mist/vapours/spray.P271 Use only outdoors or in a well-ventilated area.P273 Avoid release to the environment.
Response	P301+P317 IF SWALLOWED: Get medical help.P330 Rinse mouth.P302+P352 IF ON SKIN: Wash with plenty of water/...P317 Get medical help.P321 Specific treatment (see ... on this label).P362+P364 Take off contaminated clothing and wash it before reuse.P332+P317 If skin irritation occurs: Get medical help.P305+P354+P338 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.P319 Get medical help if you feel unwell.P391 Collect spillage.
Storage	P403+P233 Store in a well-ventilated place. Keep container tightly closed.P405 Store locked up.
Disposal	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3. Other hazards which do not result in classification

no data available

3. SECTION 3: Composition/information on ingredients

3.1. Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Bronopol	Bronopol	52-51-7	200-143-0	99.0%

4. SECTION 4: First-aid measures

4.1. Description of necessary first-aid measures

Medical attention is required. Consult a doctor. Show this safety data sheet (SDS) to the doctor in attendance.

If inhaled

Fresh air, rest.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower.

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!).

4.2. Most important symptoms/effects, acute and delayed

Excerpt from ERG Guide 133 [Flammable Solids]: Fire may produce irritating and/or toxic gases. Contact may cause burns to skin and eyes. Contact with molten substance may cause severe burns to skin and eyes. Runoff from fire control may cause pollution. (ERG, 2016)

4.3. Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Irritating materials

5. SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Wear self contained breathing apparatus for fire fighting if necessary.

5.2. Specific hazards arising from the chemical

Excerpt from ERG Guide 133 [Flammable Solids]: Flammable/combustible material. May be ignited by friction, heat, sparks or flames. Some may burn rapidly with flare-burning effect. Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence. Substance may be transported in a molten form at a temperature that may be above its flash point. May re-ignite after fire is extinguished. (ERG, 2016)

5.3. Special protective actions for fire-fighters

Use water spray, powder, alcohol-resistant foam, carbon dioxide.

6. SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

6.2. Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

6.3. Methods and materials for containment and cleaning up

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations ... Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations .

7. SECTION 7: Handling and storage

7.1. Precautions for safe handling

NO open flames. Prevent deposition of dust.
Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2. Conditions for safe storage, including any incompatibilities

Separated from food and feedstuffs and incompatible materials. See Chemical Dangers. Dry. Well closed. Keep in a well-ventilated room.Keep container tightly closed in a dry well-ventilated place.

8. SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure limit values
MAK skin absorption (H); MAK sensitization of skin (SH)
Biological limit values
no data available

8.2. Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3. Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection
Wear safety goggles or eye protection in combination with breathing protection.
Skin protection

Protective gloves.
Respiratory protection
Use local exhaust or breathing protection.
Thermal hazards
no data available

9. SECTION 9: Physical and chemical properties and safety characteristics

Physical state	2-bromo-2-nitropropane-1,3-diol is a white crystals. Ignite easily and burn readily. May detonate under strong shock. Decomposes when heated, evolving toxic gases. Toxic by skin absorption, inhalation or ingestion.
Colour	White crystalline powder
Odour	Odorless
Melting point/freezing point	-6°C(lit.)
Boiling point or initial boiling point and boiling range	182°C(lit.)
Flammability	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit	no data available
Flash point	97°C(lit.)
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	greater than or equal to 100 mg/mL at 63° F (NTP, 1992)
Partition coefficient n-octanol/water	log Kow = -0.64 (est)
Vapour pressure	1.2601e-05 mm Hg at 68° F (NTP, 1992)
Density and/or relative density	1.91 g/cm3
Relative vapour density	no data available
Particle characteristics	no data available

10. SECTION 10: Stability and reactivity

10.1. Reactivity

Decomposes on heating and on burning. This produces toxic and corrosive fumes including hydrogen bromide and nitrogen oxides. Reacts with some metals, amines and alkaline compounds.

10.2. Chemical stability

Slightly hygroscopic. Stable under normal storage conditions, but unstable in aluminum containers.

10.3. Possibility of hazardous reactions

Combustible.Incompatible with strong oxidizing agents, strong bases, strong reducing agents, acid chlorides and acid anhydrides. It is also incompatible with sulfhydryl compounds or with aluminum or iron containers (it is stable in contact with tin or stainless steel). (NTP, 1992)

10.4. Conditions to avoid

no data available

10.5. Incompatible materials

An aqueous solution of bronopol degrades in the presence of cupric and ferric ions as well as aluminum and tin metals.

10.6. Hazardous decomposition products

The substance decomposes on heating or on burning producing toxic and corrosive fumes, including hydrogen bromide and nitrogen oxides.

11. SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Mouse oral 350 mg/kg
- Inhalation: LC50 Rat inhalation >5 mg/L air/6 hr
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Cancer Classification: Group E Evidence of Non-carcinogenicity for Humans

Reproductive toxicity

no data available

STOT-single exposure

The substance is corrosive to the eyes. The substance is irritating to the skin and respiratory tract.

STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization.

Aspiration hazard

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

12. SECTION 12: Ecological information

12.1. Toxicity

- Toxicity to fish: LC50; Species: Oncorhynchus mykiss (Rainbow trout); Conditions: flow through; Concentration: 41.6 ppm for 96 hr (95% confidence interval: 36-45 ppm) /100% a.i./ /from table
- Toxicity to daphnia and other aquatic invertebrates: EC50; Species: Daphnia magna /(Water flea)/; Conditions: static; Concentration: 1.4 mg/L for 48 hr; Effect: intoxication, immobilization /99.4% a.i./ /from table
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2. Persistence and degradability

AEROBIC: Bronopol was not biodegraded using a mixed culture sewage sludge test(1). Bronopol, present at 100 mg/L, reached 0% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(2).

12.3. Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for bronopol(SRC), using an estimated log Kow of -0.64(1) and a regression-derived equation(1). According to a classification scheme(2), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4. Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of bronopol can be estimated to be 1(SRC). According to a classification scheme(2), this estimated Koc value suggests that bronopol is expected to have very high mobility in soil.

12.5. Other adverse effects

no data available

13. SECTION 13: Disposal considerations

13.1. Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. SECTION 14: Transport information

14.1. UN Number

ADR/RID: UN3241 (For reference only, please check.) IMDG: UN3241 (For reference only, please check.) IATA: UN3241 (For reference only, please check.)

14.2. UN Proper Shipping Name

ADR/RID: 2-BROMO-2-NITROPROPANE- 1,3-DIOL (For reference only, please check.) IMDG: 2-BROMO-2-NITROPROPANE- 1,3-DIOL (For reference only, please check.) IATA: 2-BROMO-2-NITROPROPANE- 1,3-DIOL (For reference only, please check.)

14.3. Transport hazard class(es)

ADR/RID: 4.1 (For reference only, please check.) IMDG: 4.1 (For reference only, please check.) IATA: 4.1 (For reference only, please check.)

14.4. Packing group, if applicable

ADR/RID: III (For reference only, please check.) IMDG: III (For reference only, please check.) IATA: III (For reference only, please check.)

14.5. Environmental hazards

ADR/RID: Yes IMDG: Yes IATA: Yes

14.6. Special precautions for user

no data available

14.7. Transport in bulk according to IMO instruments

no data available

15. SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Bronopol	Bronopol	52-51-7	200-143-0
European Inventory of Existing Commercial Chemical Substances (EINECS)	Listed.		
EC Inventory	Listed.		
United States Toxic Substances Control Act (TSCA) Inventory	Listed.		
China Catalog of Hazardous chemicals 2015	Not Listed.		
New Zealand Inventory of Chemicals (NZIoC)	Listed.		
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.		
Vietnam National Chemical Inventory	Listed.		
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.		

Korea Existing Chemicals List (KECL)	Listed.

16. SECTION 16: Other information

Information on revision

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Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/

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