

Material Safety Data Sheet
Version No.: 2 (Rev. date : 2020-12-09)

BST Solution

1. Product and company identification

Product Name : BST Solution

Recommended Use : For Research Use Only

Supply Information

○ Company : Bioneer

○ Address : 8-11 Munpyeongseo-ro, Daedeok-gu, Daejeon 34302, Republic of Korea

○ Emergency telephone number : 82-42-930-8777

2. Hazards identification

A. Classification of the hazardous chemical

Flammable liquids: Category 2

Metallic corrosive substances : Category 1

Acute toxicity (oral): Category 4

Acute toxicity (skin): Category 4

Eye irritation: Category 2A

B. Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statements

H225 Highly flammable liquid and vapor

H290 May corrode metal

H302 Hazardous if swallowed

H315 Causes skin irritation

H319 Causes serious eye irritation

H312 Harmful in contact with skin

H350 May cause cancer

Precautionary statements

– Prevention :

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understand.

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P233 Keep container tightly closed.

P234 Store only in original container

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ventilating/lighting/equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P264 Wash hands thoroughly after handling

P270 Do not eat, drink or smoke when using this product

P280 Wear protective glove/protective clothing/eye protection/face protection

– Response :

P310 Immediately call a POISON CENTER or doctor/physician.

P321 Specific treatment (see ... on this label).

P301+P312 Seek medical attention if swallowed and feeling uncomfortable

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P302+P352 IF ON SKIN: Gently wash with plenty of soap and water.

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 advice/ attention.

P312 Call a POISON CENTER or doctor/physician you feel unwell.

P330 Rinse mouth.

P332+P313 If skin irritation occurs: Get medical advice/ attention.

P362 + 364 Immediately remove all contaminated clothing and wash before reuse.

P370+P378 In case of fire: Use alcohol-resistant form, Dry powder extinguishing agent, Carbon Dioxide for extinction.

P390 Absorb leaking water to prevent material damage

– Storage :

P402 + P404 Store in a dry place. Store in a closed container.

P405 Store locked up.

P406 Please store it in a corrosive container (as defined by the manufacturer or administrative office) as it is corrosive to metals.

– Disposal :

P501 Dispose of contents/container to information seted forth in the relevant laws and regulations.

C. Other Risks-Hazards Not Included in Risk-Hazard Classification

No information

3. Composition/information on ingredients

Chemical name	Synonyms	CAS No.	Weight (%)
Sodium hydroxide		1310-73-2	< 10%
Ethanol		64-17-5	< 70%

4. First aid measures

A. Eye contact

Rinse skin and eyes with water for at least 20 minutes immediately upon contact with substance.

Take immediate medical attention.

B. Skin Contact

Take immediate medical attention.

Remove contaminated clothing and shoes and isolate contaminated areas.

Flush skin and eyes with water for at least 20 minutes immediately upon contact with substance.

Wash clothes and shoes thoroughly before reuse.

C. Inhalation : Take urgent medical attention. Move to Fresh air. If you do not breathe, perform artificial respiration. If breathing is difficult, supply oxygen.

D. Ingestion: Do not feed anything by mouth to an unconscious person. Take immediate medical attention.

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- E. Notes to Physician : Have a medical personnel know about the substance and take protective measures.
Do not administer adrenergic preparations.
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5. Fire-fighting measures

A. Proper (improper) extinguishing Media

Use of alcohol, carbon dioxide or water spray in the digestion of this substance

Use dry sand or dirt during choking digestion

B. Special hazards from chemicals

May corrode metal

The container may explode when heated.

Some may generate flammable hydrogen gas in contact with metals

Non-flammable, the substance itself is not burned, but can be decomposed during heating to cause corrosive/toxic fume

May cause irritation, corrosive, toxic gas in the event of fire

C. Firefighting Protection and Precautions

Some may be transported at high temperatures

Leaking water can cause contamination

May cause skin and eye burns during contact

Let the ditch be dug up for the disposal of the extinguishing water and keep the material from scattering.

If you are not dangerous, move the container in the fire area

After the extinguishing of the tank fire, the container is cooled with plenty of water

If there is a high tone in the tank fire or if the tank is discolored, pull back immediately

When the tank fires, pull back from the tank in flames

6. Accidental release measures

A. Personal Precautions

Immediately wipe off any spills and follow preventive measures in the protective section.

Remove all ignition sources

If you are not at risk, stop the leak.

Do not touch the damaged container or leaking water without wearing adequate protection.

Cover with plastic sheet and spread

Be aware of the materials and conditions that should be avoided

B. Environmental precautions :

Avoid ingress into water, sewers, basements and confined spaces

C. Methods and material for containment and cleaning up

Absorb the spills into an inert material (e.g. dry sand or soil) and put it in a chemical waste container.

Absorb the liquid and flush contaminated area with detergent and water.

Absorb leaking water to prevent material damage.

7. Handling and storage

A. Handling precautions

Wash the treated area thoroughly after handling.

Do not eat, drink or smoke when using this product.

After the container has been emptied, the product residue may still remain, so follow all the MDS/label precautions

Please use the handling/storage carefully.

Carefully open the forehead before opening.

Do not breathe vapors from the heated material.

Do not enter the storage area without proper ventilation.

Be aware of the materials and conditions that should be avoided.

Work with reference to engineering management and personal protective equipment

B. Storage precautions

Store only in the original container.

Store in a lock storage area.

Store in a corrosive container (as defined by the manufacturer or administrative office), as it is corrosive to metals.

Drain the empty drum completely and prevent it from being properly put back on the drum regulator or place it properly.

Keep away from food and drinks.

8. Exposure controls / personal protection

A. Chemical Exposure Standards, Biological Exposure Standards Etc. :

Domestic Regulation : Sodium hydroxide C2mg/m³, Ethyl alcohol TWA : 1000ppm

ACHIH Regulation : Sodium hydroxide TWA STEL C 2 mg/m³, Ethyl alcohol TWA : STEL 1000 ppm mg/m³

Biological Exposure Standards : No data available

B. Proper physical management : Use process separation, local ventilation, minimizing air contamination below exposure thresholds etc. for physical management. Install face and emergency showers where this material is stored or used.

C. Personal protection

Respiratory protection

If the exposure threshold is below 10000ppm, use a half-face gas mask with an appropriate (purification) filter with a protection level of above 10, considering the physical and chemical properties of the exposed gas/liquid If the exposure threshold is below 25000ppm, use a loose-fitting hood/helmet-type electric breathing aid or continuous flow helmet-type gas mask with a protection level above 25, considering the physical and chemical properties of the exposed gas/liquid If the exposure threshold is below 50000ppm, use a full/half-faced electric breathing mask or full/hood-type air-line mask with a protection level above 50, considering the physical and chemical properties of the exposed gas/liquid If the exposure threshold is below 1000000ppm, use a (purification) filter type electric full-face gas mask or full/hood type air-line mask with a protection level above 1000, considering the physical and chemical properties of the exposed gas/liquid If the exposure threshold is below 10000000ppm, use a pressure-demand full/helmet/hood-type air-line mask with a protection level above 10,000

Eyes protection : No data available.

Hands protection : No data available.

Body protection : No data available

9. Physical and chemical properties

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- A. Appearance : Achromatic
 - B. Odor : No information
 - C. Odor threshold : No information
 - D. pH : No information
 - E. Freezing/Melting point : No information
 - F. Boiling point and Range : No information
 - G. Flash point : No information
 - H. Evaporation speed : No information
 - I. Flammability (Solid, Gas) : No information
 - J. Ignition or explosion range : No information
 - K. Vapor pressure : No information
 - L. Solubility : No information
 - M. Vapor density : No information
 - N. Specific weight : No information
 - O. n-Octanol/Water solubility coefficient : No information
 - P. Self-Flammability : No information
 - Q. Decomposition temperature : No information
 - R. Viscosity : No information
 - S. Molecular weight : No information
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10. Stability and Reactivity

- A. Chemical stability and toxic reaction potential
 - Toxic gases may form by decomposition under high heat.
 - Container may explode upon heating.
 - Highly flammable liquid and vapor
 - May violently polymerize and cause fire and explosions
 - May form explosive mixture near and above ignition point.
 - Highly flammable: Easily ignited with heat, sparks or flames.
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Leaks may lead to fire/explosions

Vapor explosion hazard indoors, outdoors and in sewers.

May form explosive mixture when vapor is mixed with air.

B. Conditions to avoid

Heat, sparks, flames, etc. Ignition source

C. Conditions to avoid

Flammable materials, reducing material, metal

D. Hazardous decomposition products

corrosive/toxic fumes.

11. Toxicological information

A. Probable exposure paths

May cause irritation, respiratory distress, headache, dizziness, sleepiness, loss of motor function.

May cause hypothermia or heating, change in blood pressure, vomiting, respiratory distress, irregular heartbeats, sleepiness, loss of direction, vocal impairment, emotional change, loss of motor function, visual impairment, pupil dilation, seizures, loss of consciousness

B. Health hazard information

Acute toxicity

– Oral

Sodium hydroxide : LD50 140 ~ 340 mg/kg Rat

Ethyl alcohol : LD50 7060 mg/kg Rat (OECD Guideline 401)

– Skin

Sodium hydroxide : LD50 140 ~ 340 mg/kg Rat

Ethyl alcohol : No information

– Inhalation

Sodium hydroxide : No information

Ethyl alcohol : LC50 30300 mg/m³ 4 hr Mouse (OECD Guideline 403)

Skin corrosion/irritation

Sodium hydroxide : Severe irritation from skin irritation tests on rabbits

Ethyl alcohol : No irritation

Serious eye damage/eye irritation

Sodium hydroxide : Severe irritation from eye irritation tests on rabbits

Ethyl alcohol : Medium irritation

Respiratory or skin sensitization : No information

Carcinogenicity

Industrial Safety Regulation : No information

Department of Labor Notice : Ethyl alcohol 1A

IARC : 1 (Ethanol in alcoholic beverages)

OSHA : No information

ACGIH : Ethyl alcohol A3

NTP : No information

EU CLP : No information

Germ cell mutagenicity

Sodium hydroxide : Microbe reverse mutation test: Negative, Chromosomal aberration test: Negative

Ethyl alcohol : White rat and mouse dominant lethal dose testing – Positive Reports of aneuploidy in mouse reproductive cells.

Reproductive toxicity : No information

Specific target organ toxicity (single exposure) : No information

Specific target organ toxicity (repeated exposure) : No information

Aspiration hazard: No information

12. Ecological information

A. Biological toxicity

– Fish

Sodium hydroxide : LC50 125 mg/l 96 hr (*Gambusia affinis*)Ethyl alcohol : LC50 MIN 100 mg/l 96 hr *Pimephales promelas*

– Crustacean

Sodium hydroxide : EC50 40.4 mg/l 48 hr (*Ceriodaphnia dubia*)Ethyl alcohol : LC50 5012 mg/l 48 hr *Ceriodaphnia dubia* (other guideline: ASTM E729–80)

– Algae

Ethyl alcohol : ErC50 275 mg/l 72 hr *Chlorella vulgaris* (OECD Guideline 201)**B. Persistency and Degradability**

– Persistency

Sodium hydroxide : log Kow –3.88

Ethyl alcohol : log Kow –0.32

– Degradability : No information

C. Bioconcentration : No information**D. Soil mobility : No information****E. Other toxic effects : No information**

13. Disposal considerations

A. Disposal method : Dispose of contents and containers in accordance with the regulations, as specified in the Waste Control Act.

B. Disposal considerations : Please take into account the precautions set forth in the Waste Control Act.

14. Transport information**A. Land transport (ARD/RID)**

– UN No : UN 2924

– UN proper shipping name : FLAMMABLE LIQUID, CORROSIVE, N.O.S. (ETHANOL, SODIUM HYDROXIDE)

– Transport hazard class : 3(8)

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- Packaging group : II
 - Environmental hazards : No classification information
 - Special Safety Measures for Users Regarding Shipping or Shipping Measures :
Tunnel restriction code : D/E

B. Inland transport (AND) : No relevant

C. Air transport (IATA)

- UN No : UN 2924
- UN proper shipping name : FLAMMABLE LIQUID, CORROSIVE, N.O.S. (ETHANOL, SODIUM HYDROXIDE)
- Transport hazard class : 3(8)
- Packaging group : II
- Environmental hazards : No classification information
- Special Safety Measures for Users Regarding Shipping or Shipping Measures :
No

D. Sea transport (IMDG)

- UN No : UN 2924
- UN proper shipping name : FLAMMABLE LIQUID, CORROSIVE, N.O.S. (ETHANOL, SODIUM HYDROXIDE)
- Transport hazard class : 3(8)
- Packaging group : II
- Environmental hazards : No classification information
- Special Safety Measures for Users Regarding Shipping or Shipping Measures :
EmS Fire : F-E
EmS Spill : S-C

15. Regulatory information

A. Industrial safety and health regulation

Sodium hydroxide : Managed chemical, Work environment measurement chemical (Period : 6 mo.)

Ethyl alcohol : Exposure limited chemical

B. Hazardous chemical management regulation : Toxic material

C. Dangerous material management regulation : Type 4 Alcohols

D. Waste management regulation : Designated waste

E. Other domestic and international regulations

Domestic Regulation : Not Applicable

International Regulations

– OSHA Regulation : Not Applicable

– CERCLA Regulation : Sodium hydroxide 453.599kg (1000lb)

– EPCRA 302 Regulation : Not Applicable

– EPCRA 304 Regulation : Not Applicable

– EPCRA 313 Regulation : Not Applicable

– Rotterdam Convention Substance : Not Applicable

– Stockholm Convention Substance : Not Applicable

– Montreal Protocol Substance : Not Applicable

– EU Classification (Confirmed Classification Result)

Sodium hydroxide : Skin Corr. 1A, Ethyl alcohol : Flam. Liq. 2

– EU Classification (Risk Phrases) : Sodium hydroxide H314, Ethyl alcohol H225

– EU Classification (Safety Phrases) : Not Applicable

16. Other information

A. Source of Information

Sodium hydroxide

ECHA(Crustacean) ECHA(Oral) ECHA(Germ cell mutagenicity) ECHA(Severe Eye Damage or Irritation) ECHA(Skin Corrosion or Irritation) HSDB(Skin) OECD SIDS(Concentration) OECD SIDS(Biodegradability)) SIDS(Skin Hypersensitivity) SRC(Persistence)

Ethyl alcohol

ECHA(Crustacean) ECHA(Oral) ECHA(Concentration) ECHA(Reproductive Toxicity) ECHA(Germ cell mutagenicity)
ECHA(Severe Eye Damage or Irritation) ECHA(Algae) ECHA(Target Organ Toxicity (Repeat Exposure)) ECHA(Skin
Hypersensitivity) ECHA(Skin Corrosion or Irritation) ECHA(Inhalation) HSDB(Target Organ Toxicity (Single Exposure))
ICSC(Persistency) SIDS 2005(Fish)

B. Initial Issue Date : 2019-12-18

C. Revision Count and Latest Revision Date : 2, 2020-12-09

D. Others

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