Last revised date : 2022-05-16
MSDS No. : AA00566-2100000376

Safety Data Sheet(SDS)

1. Identification of the substance/mixture and of the company/undertaking

1) Product identifier : CAUSTIC SODA 50% (NAOH 50%)

2) Relevant identified uses of the substance or mixture and uses advised against

○ Relevant identified uses

18.6.pH-regulating agents

○ Uses advised against

3) Supplier information

○ Company name [Manufacture]

Company : LGChem CA1, CA2

Address : 1121, Yeosusandan-ro, Yeosu-si, Jeollanam-do, Republic of Korea / 535, Sandanjungang-ro, Yeosu-si, Jeollanam-do, Republic of Korea

Emergency number :

2. HAZARD IDENTIFICATION

1) Hazard classification

- Corrosive to metals Category 1
- Acute toxicity(Dermal) Category 4
- Skin corrosion/irritation Category 1
- Serious eye damage/eye irritation Category 1

2) Allocation label elements

Hazard pictograms

Signal word

- DANGER

Hazard statements

H290 May be corrosive to metals
H312 Harmful in contact with skin
H314 Causes severe skin burns and eye damage
H318 Causes serious eye damage

Precautionary statements

- Prevention

P234 Keep only in original packaging.
P260 Do not breathe mist/vapours/spray.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

- Response

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomition.
P302+P352 If you get on your skin: Wash with a large amount of water.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately receive medical institutions and doctors' consultation.
P312 If you feel uncomfortable, receive medical institutions and doctors' consultation.
P321 When contacting with substances, make a treatment such as rinsing the skin and eyes in the water flowing more than 20 minutes.
P362+P364 Take off contaminated clothing and wash it before reuse.
P363 Wash contaminated clothing before reuse.
P390 Absorb spillage to prevent materialdamage.

- Storage

P405 Store locked up.
P406 Since it is a metal corrosive substance, keep it in the manufacturer or the administrative government office in the corrosion resistant container.

- Disposal

P501 Dispose of contents and containers according to the legislation of the waste

3) Other hazardsNo data available

○ Product NFPA Level

Health	Flamm abliity	Reactivity
3	0	1

(※ 0 = Insufficient , 1 = Slightly , 2 = ordinary , 3 = Highness , 4 = Very high)

3. Composition/Information on ingredients

Components	Common name	CAS No.	PCT(wt%)
Sodium hydroxide	Sodium hydroxide	1310-73-2	49.5 ~ 50.5
Water	Water	7732-18-5	50

4. FIRST AID MEASURES

1) Following eye contact
- Seek immediate medial assistance.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

2) Following skin contact
- For minor skin contact, avoid spreading material on unaffected skin.
- Seek immediate medial assistance.
- For hot product, immediately immerse in or flush the affected area with large amounts of cold water to dissipate heat.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Remove and isolate contaminated clothing and shoes.

3) Following inhalation
- Seek immediate medial assistance.
- Keep victim warm and quiet.
- Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
- Move to fresh air.
- Administer oxygen if breathing is difficult.
- Give artificial respiration if victim is not breathing.

4) Following ingestion
- Seek immediate medial assistance.
- Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

5) Advice to physician
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Effects of contact or inhalation may be delayed.

5. FIRE FIGHTING MEASURES

1) Suitable (and unsuitable) extinguishing media

○ Suitable extinguishing media

- CO2.
- Dry chemical.
- Water spray.
- Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
- Use dry sand or earth to smother fire.

○ Unsuitable extinguishing media

- Direct water.

2) Special hazards arising from the substance or mixture

○ Pyrolytic product

- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

○ Risk of fire and explosion

- Containers may explode when heated.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Some are oxidizers and may ignite combustibles.
- Some may burn but none ignite readily.

○ Other

- TOXIC; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Some may produce flammable hydrogen gas upon contact with metals.
- Fire may produce irritating, corrosive and/or toxic gases.

3) Special protective equipment for firefighters

- Rescuers should put on appropriate protective gear.
- Dike fire-control water for later disposal; do not scatter the material.
- Substance may be transported in a molten form.
- Move containers from fire area if you can do it without risk.
- Evacuate area and fight fire from a safe distance.
- Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
- Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
- Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Fire involving Tanks: Do not get water inside containers.
- Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.

- Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.

6. ACCIDENTAL RELEASE MEASURES

1) Health considerations and protective equipment
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Clean up spills immediately, observing precautions in Protective Equipment section.
- Do not get water inside containers.
- Stop leak if you can do it without risk.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Cover with plastic sheet to prevent spreading.
- Please note that materials and conditions to be avoided.

2) Environmental precautions
- Runoff may be corrosive and/or toxic and cause pollution.
- Prevent entry into waterways, sewers, basements or confined areas.

3) For cleaning up
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Absorb the liquid and scrub the area with detergent and water.

7. HANDLING AND STORAGE

1) Precautions for safe handling
- Avoid breathing vapors from heated material.
- Loosen closure cautiously before opening.
- Handling refer to engineering control/personal protection section.
- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
- Avoid prolonged or repeated contact with skin.
- Do not enter storage area unless adequately ventilated.
- Use care in handling/storage.
- Please note that materials and conditions to be avoided.
- Use only in a well-ventilated area.

2) Conditions for safe storage (including any incompatibilities)
- Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Chemical exposure limits, Biological exposure standard

Components	Occupational exposure limits	ACGIH	Biological standard
Sodium hydroxide	TWA : Not applicable STEL : C 2㎎/㎥	TWA : Not applicable STEL : Not applicable	Not applicable
Water	TWA : Not applicable STEL : Not applicable	TWA : Not applicable STEL : Not applicable	Not applicable

2) Appropriate engineering controls

- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
- Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

3) Personal protection equipment

○ Respiratory protection

- Wear breathing protection, which needs a confirmation from the Korea Occupational Safety and Health Agency.

- If high frequency of use or exposure, wear air respirator.

○ Eye protection

- Wear suitable protective goggles and face shields.

○ Hand protection

- Wear suitable protective gloves.

○ Body protection

- Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Deliquescence Liquid
Physical state	Liquid
Colour	Colorless
Odour	Odorless
Odour threshold	No data availalbe
pH	No data available
Melting point/freezing point	13℃
Initial boiling point and boiling range	145℃
Flash point	No data available
Evaporation rate	No data availalbe
Flammability(solid, gas)	Nonflammability
Upper/lower flammability or explosive limits	Not available
Vapour pressure	13mmHg

Solubility(ies)	109g/100ml
Vapour density	No data available
Relative density	1.511 (40℃)
n-octanol/water partition coefficient	-3.88
Auto ignition temperature	Not available
Decomposition temperature	No data available
Viscosity	25㎟/s
Molecular weight(mass)	40

10. STABILITY AND REACTIVITY

1) Stability and hazardous reactivity

- Containers may explode when heated.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.

- TOXIC; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

- Contact with molten substance may cause severe burns to skin and eyes.
- Some may produce flammable hydrogen gas upon contact with metals.
- Some are oxidizers and may ignite combustibles.
- Some may burn but none ignite readily.
- Fire may produce irritating, corrosive and/or toxic gases.

2) Conditions to avoid

- Heat.

3) Incompatible materials

- Combustibles, reducing material.
- Metal.

4) Hazardous decomposition products

- Irritating, corrosive and/or toxic gas.
- Corrosive/toxic fume.

11. TOXICOLOGICAL INFORMATION

1) Exposure route information

○ Inhalation

- Not applicable

○ Skin Contact

- Causes severe skin burns and eye damage

- Harmful in contact with skin

○ Eye Contact

- Causes serious eye damage

○ Ingestion

- Not applicable

2) Health hazard information

○ Acute toxicity

● Acute toxicity(Oral) PRODUCT : Not classified(ATEmix = 199.778mg/kg)

- Sodium hydroxide : LD50 340 ㎎ / ㎏ ~ 140 ㎎ / ㎏ experimental species: Rat (reliability 4), Source: ECHA (Toxicity values are listed but are not reflected in the hazard classification due to low reliability)

- Water : LD50 90000 ㎎ / ㎏ experimental species: Rat (LD50> 90 ml / kg (Rat))

● Acute toxicity(Dermal) PRODUCT : Category 4(ATEmix = 1100mg/kg)

- Sodium hydroxide : No data available

- Water : No data available

● Acute toxicity(Inhalation:Gases) PRODUCT : Not classified

- Sodium hydroxide : No data available

- Water : No data available

● Acute toxicity(Inhalation:Vapours) PRODUCT : Not classified

- Sodium hydroxide : No data available

- Water : No data available

● Acute toxicity(Inhalation:Dust/mist) PRODUCT : Not classified

- Sodium hydroxide : No data available

- Water : No data available

○ Skin corrosion/irritation PRODUCT : Category 1

- Sodium hydroxide : Search using rabbit skin corrosion / irritation test results irritation Causes severe corrosion observed in the OECD Guideline 404 people. It causes severe skin necrosis in rabbits. Strong alkaline corrosive substances, Source: ECHA

- Water : Not applicable

○ Serious eye damage/eye irritation PRODUCT : Category 1

- Sodium hydroxide : Serious eye damage / irritation test results severe conjunctival irritation was observed with a rabbit OECD Guideline 405 search, Source: ECHA

- Water : Not applicable

○ Respiratory sensitization PRODUCT : Not classified

- Sodium hydroxide : No data available

- Water : Not applicable

○ Skin sensitization PRODUCT : Not classified

- Sodium hydroxide : This did not show skin sensitization in skin sensitization tests on humans negative, Source: SIDS

- Water : Not applicable

○ Carcinogenicity PRODUCT : Not classified

- Sodium hydroxide : No data available

- Water : No data available

○ Germ cell mutagenicity PRODUCT : Not classified

- Sodium hydroxide : Return using in vitro bacterial mutation tests, using the Ames regardless voice, in vitro S. typhimurium in the presence or absence of metabolic activation system test results, regardless of the presence or absence of metabolic activation system audio, test or more chromosomes using CHO cells in vitro results, If that metabolic activation system positive / no metabolic activation system visible due to induced or more of the audio S9 product chromosome formation, minute cell test results using in vivo mouse bone marrow cells, negative, Source: ECHA

- Water : Not applicable

○ Reproductive toxicity PRODUCT : Not classified

- Sodium hydroxide : No data available

- Water : Not applicable

○ Specific target organ toxicity single exposure PRODUCT : Not classified

- Sodium hydroxide : Rooms at stimulating the respiratory, airway in humans and does not sufficiently ventilated place causing a pulmonary edema during the working day, and although the rain was observed irreversible obstructive damage in a 25-year-old women who inhaled aerosol form into the lungs of 5 % NaOH insufficient evidence, Source: NLM, SIDS

- Water : Not applicable

○ Specific target organ toxicity repeated exposure PRODUCT : Not classified

- Sodium hydroxide : Not available in reliability due to corrosive substances

- Water : Not applicable

○ Aspiration hazard PRODUCT : Not classified

- Sodium hydroxide : No data available

- Water : Not applicable

12. ECOLOGICAL INFORMATION

1) Aquatic toxicity

- Fish>PRODUCT : Not classified

  - Sodium hydroxide : LC50 125 ㎎ / ℓ 96 hr Other (Gambusia affinis)
  - Water : No data available

- Crustacea>PRODUCT : Not classified

  - Sodium hydroxide : EC50 40.4 ㎎ / ℓ 48 hr Other (Ceriodaphnia dubia), Source: ECHA

- Water : No data available

- Aquatic algae>PRODUCT : Not classified

  - Sodium hydroxide : No data available
  - Water : No data available

2) Persistence and degradation

- n-octanol water partition coefficient>PRODUCT : Not classified

  - Sodium hydroxide : -3.88 log Kow (estimated), Source: SRC
  - Water : -1.38 log Kow ()

- Degradation>PRODUCT : Not classified

  - Sodium hydroxide : No data available
  - Water : No data available

- Biodegradation>PRODUCT : Not classified

  - Sodium hydroxide : (Not applicable (Source: Not applicable)), Source: OECD SIDS
  - Water : No data available

3) Bioaccumulative potential>PRODUCT : Not classified

  - Sodium hydroxide : (I expect that this will not bioaccumulate in high water solubility (Source: Considering its high water solubility, NaOH is not expected to bioconcentrate in organisms)), Source: OECD SIDS

  - Water : No data available

4) Mobility in soil>PRODUCT : Not classified

  - Sodium hydroxide : (Im very flexible (Originally in water and soil: Very mobile in soil and very soluble in water).), Source: OECD SIDS
  - Water : No data available

5) Other adverse effects>PRODUCT : Not classified

  - Sodium hydroxide : No data available
  - Water : No data available

13. DISPOSAL CONSIDERATIONS

1) Disposal methods

- Every commercial waste producer shall either treat wastes generated from his/her place of business by him/herself or commission the treatment of such wastes to a person who has license for a waste treatment business under Article 26(3), a person who recycles of such wastes under Article 44(2), a person who has installed and operates a waste disposal facility under Article 4 or 5, a person who has completed the registration of a business of discharging wastes into the sea under Article 18 of the Marine Environment Management Act.

2) Precautions (including disposal of contaminated container of package)

- Do not allow spill material to enter sewers, storn water drains, soil, etc.

14. TRANSPORT INFORMATION

1) UN No. : 1824

2) Proper shipping name : SODIUM HYDROXIDE SOLUTION

3) Class or division : 8

4) Packing group : II

5) Marine pollutant : Not applicable

6) Special safety response for transportation or transportation measure :

Emergency measures in case of fire : F-A

Emergency measures in the effluent : S-B

- ADR

· Tunnel restriction code : E

- IMDG

· Marine pollutant : Not applicable

- Air transport(IATA)

· UN No. : 1824

· Proper shipping name : SODIUM HYDROXIDE SOLUTION

· Class or division : 8

· Packing group : II

15. REGULATORY INFORMATION

1) Occupational Safety and Health Act in Korea
PRODUCT : Environment measure substance, Hazardous SubstancesRequiring Management, Substance exposure limits

- Sodium hydroxide : Environment measure substance(more than 1%), Hazardous SubstancesRequiring Management(more than 1%), Substance exposure limits

2) Toxic Chemical Control Act in Korea
PRODUCT : Pollutant release and transfer register substances, Toxic substances

- Sodium hydroxide : Pollutant release and transfer register substances, Toxic substances(more than 5%)

3) Safety Control of Dangerous Substances Act in Korea
PRODUCT : Not applicable

4) Wastes Control Act in Korea
PRODUCT : Designated waste (Corrosive waste - Waste alkali)

-In case of disposal, it must be disposed of in accordance with Article 13 of the Waste Management Act.

5) Other regulations in KOREA and Abroad regulations

- ETC regulation

- Sodium hydroxide : EU. GHS Classification. CLP Reg. No 1272/2008 of 16 Dec 2008, Annex VI, Table 3.1, List of harmonized classification & labelling
- Sodium hydroxide : CERCLA Hazardous Substances [other than radionuclides] (40 CFR 302.4) (as amended by 75 FR 78918, Dec. 17, 2010), OSHA Hazard Communication Standard: On One of the Floor Lists of the OSHA HCS (29 CFR 1910.1200)

- PERSISTENT ORGANIC POLLUTANTS CONTROL ACT
- Act on the registration and evaluation of chemicals PRODUCT : As well as manufacturing`s report shall be excluded from existing chemicals, Existing Commercial Chemical Substances, Existing chemicals subject to registration

- Sodium hydroxide : Existing Commercial Chemical Substances, Existing chemicals subject to registration
- Water : As well as manufacturing`s report shall be excluded from existing chemicals, Existing Commercial Chemical Substances

16. OTHER INFORMATION

1) Reference

- ECHA
- Ministry of Employment and Labor
- Ministry of Environment
- NLM, SIDS
- OECD SIDS
- SIDS
- SRC

2) Print date : 2018-12-20

3) Revision date

○ Revised date count : 5

○ Last revised date : 2022-05-16

○ Last revised history : 2. Hazard Identification : Delete Acute toxicity(Oral), Add Acute toxicity(Dermal)
9. Physical and Chemical Properties: Add "Non-flammable" / Add temp in Relative Density
11. Toxicological Inforamtion: Add comment in Acute toxicity(Oral)

4) Other