SAFETY DATA SHEET

Sodium, Potassium silicate liquid

CAS No: 1344-09-8 ; 1312-76-1

UN No: Not available

EC/EINECS : -

Section 1: Chemical Product and Company Identification

- Product Name : Sodium, Potassium silicate liquid
- Chemical Name: Sodium, Potassium silicate liquid modul m (m : 2.65 - 3.0)
- Synonyms : Mixed alkali silicate solution, $nK_2O.Na_2O.\ mSiO_2$ (n,m : molar ratio)

Manufacturer's information:

Ducminh Company limited .

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Product use: General purpose industrial chemical for use in a wide range of applications : Detergents, Ceramic,...

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS No.	Molecular Formula	Wt (%)
Sodium, Potassium Silicate	1344-09-8, 1312-76-1	$nK_2O.Na_2O.\ mSiO_2$	37.5 - 39.5 %
Water	7732-18-5	H_2O	60.5 - 62.5 %

Chemicals Characterization: molar ratio $Na_2O + K_2O : SiO_2 = 1 : 2.5$ to $1 : 2.8$

Section 3: Hazards Identification

GHS Classification:

- Oral acute toxicity category 4 _ Harmful if swallowed.
- Skin irritation category 2 _ Causes skin irritation.
- Eye irritation category 1 _ Causes serious eye damage.

GHS Label:

GHS Signal Word: DANGER

GHS Precaution :

- H303 May be harmful if swallowed

Phrases:

- H315 Causes skin irritation
- H319 Causes serious eye irritation

GHS Response :

- P312 Call a doctor if you feel unwell.

Phrases:

- P302+P352 If on skin: Wash with plenty of soap and water.
- P332 + P313 If skin irritation occurs: Get medical advice/ attention.
- P362: Take off contaminated clothing and wash before reuse.
- P305 + P351 + P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337 + P313 If eye irritation persists: Get medical advice/ attention.

Emergency Overview:
- Color : Colorless to slight tint
- Physical state : Liquid
- Appearance : Clear to opaque
- Odor : Odorless to slight odor
- Physical hazards: Upon drying forms thin glass that can cut skin. Spilled material may cause a slipping hazard.
- Major health hazards : Corrosive. Causes serious eye damage. Causes skin irritation. Harmful if swallowed. Not listed by NTP, IARC or OSHA as a carcinogen.
- Acute Symptoms/Effects: Listed below.
Inhalation (Breathing): Respiratory System Effects: Inhalation exposure may cause irritation, redness of upper and lower airways, coughing, laryngeospasm and edema, shortness of breath, bronchoconstriction, and possible pulmonary edema. The pulmonary edema may develop several hours after a severe acute exposure.
Skin: Skin Irritation. Skin exposure may cause irritation, redness, itching, swelling, burning sensation.
Eye: Serious Eye Damage. Exposure to eyes may cause irritation and burns to the eye lids, conjunctivitis, corneal edema, and corneal burn. Significant and prolonged contact may cause damage to the internal contents of the eye. The full extent of the injury may not be immediately apparent.
Ingestion (Swallowing): Gastrointestinal System Effects: Exposure by ingestion may cause irritation, swelling, and perforation of upper and lower gastrointestinal tissues. Permanent scarring may occur.
- **Chronic Symptoms/Effects:** Repeated and prolonged skin contact may cause a dermatitis This material is not a crystalline silica, and it does not cause pulmonary silicosis.
- **Other hazards which do not result in classification:** Hydrogen gas when reacting with aluminum, zinc and tin

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
Skin Contact: If on skin, wash with plenty of water. If skin irritation occurs, get medical advice/attention SPECIFIC TREATMENT: Wash with lots of water. Take off contaminated clothing and wash before reuse.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Interaction with Other Chemicals Which Enhance Toxicity: None known.
Medical Conditions Aggravated by Exposure: May aggravate preexisting conditions such as:. Eye disorders that decrease tear production or have reduced integrity. Skin disorders that compromise the integrity of the skin such as: psoriasis, rashes, eczema, skin infections. Pulmonary disorders that compromise the integrity of the lungs such as asthma.
Protection of First-Aiders: Avoid contact with skin and eyes. Use personal protective equipment. Refer to Section 8 for specific personal protective equipment recommendations. At minimum, treating personnel should utilize PPE sufficient for prevention of bloodborne pathogen transmission.
Notes to Physician: Treat as a corrosive substance. Treat symptoms with supportive care. There is no specific antidote. The absence of visible signs or symptoms of burns does NOT reliably exclude the presence of actual tissue damage. It may take 48-72 hours to assess the extent of an ocular burn. Probable mucosal damage may contraindicate the use of gastric lavage

Section 5: Fire and Explosion Data

Fire Hazard: Negligible fire hazard.
Extinguishing Media: Use media appropriate for surrounding fire.
Fire Fighting: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.
Sensitivity to Mechanical Impact: Not sensitive.
Sensitivity to Static Discharge: Not sensitive.
Lower Flammability Level (air): Not flammable
Upper Flammability Level (air): Not flammable
Flash point: Not flammable
Auto-ignition Temperature: Not applicable

Section 6: Accidental Release Measures

1. Personal protection:
Do not get in eyes, on skin or on clothing. Avoid breathing mist, vapor, or spray. Dries to form glass film which can easily cut skin. Spilled material may cause a slipping hazard. Wear appropriate personal protective equipment recommended in Section 8.

2. Environmental Hazards:
Sinks and mixes with water. High pH of this material is harmful to aquatic life. See Section 12.

3. Handling measures:
1) Small Spill:
- Absorb for use sand or other non-combustible material.
- Rinse residue with plenty of water and neutralize.
- Collect spilled material in appropriate container for disposal.

2) Large Spill:
- Contain spill with sand, earth.
- Dike for later disposal. Isolate hazard area and deny entry.
- Prevent runoff into waterways, sewers, basements or confined spaces.
- Neutralise/decontaminate residue.
- Wash spill area with water.

Section 7: Handling and Storage

1. Handling: Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Avoid breathing vapor, mist, or spray. Product shipped/handled hot can cause thermal burns. Use care when handling hot material. Do not eat, drink or smoke in areas where this material is used. Use appropriate personal protective equipment (PPE). See Section 8, Exposure Controls and Personal Protection, for additional information.

2. Storage: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Keep separated from incompatible substances, see Section 10.

3. Incompatibilities/ Materials to Avoid: Can generate heat when mixed with acids, Avoid prolonged contact with alkali sensitive metals such as: aluminum, brass, bronze, copper, lead, tin, zinc because flammable hydrogen gas can be generated.

Section 8: Exposure Controls/Personal Protection

Regulatory Exposure Limit(s): None. This product does not contain any components that have regulatory occupational exposure limits (OEL's) established.

OEL: Occupational Exposure Limit; OSHA: *United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit*

NON-REGULATORY EXPOSURE LIMIT(S): *Listed below for the product components that have advisory (non-regulatory) occupational exposure limits (OEL's) established.*

- The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

- The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

Engineering Controls: Use with adequate ventilation. Keep tanks closed. Safety shower and eyewash fountain should be within direct access.

Personal Protective equipment:
Eye Protection: Wear safety glasses with side-shields. If eye contact is likely, wear chemical resistant safety goggles. Wear chemical safety goggles with a face-shield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
Skin and Body Protection: Wear protective clothing to minimize skin contact. When skin contact is likely, wear a similar protective suit. Wear appropriate heat resistant clothing when potential exists for contact with hot materials.
Hand Protection: Wear appropriate chemical resistant gloves. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove. Use gloves that are cut resistant if handling dry glass material.
Respiratory Protection: A NIOSH approved respirator with N95 (dust, fume, mist) cartridges may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

Section 9: Physical and Chemical Properties

Appearnce	Liquid, Clear to opaque	Flash point	Not flammable
Ordor	Odorless to slight odor	Critical Temperature	Not available
Color	Colorless to slight tint	Oxidizing Properties	None oxidizer
pH	11 - 14	Photodegradation	No photodegradation
Boiling Point	101 - 102 ºC	Biodegradtion	Not applicable (inorganic substances)
Melting Point	Not applicable to liquid	Water Solublity	100%
Decomposition temperature	No data available	Freezing Point	- 1 ºC

Section 10: Stability and Reactivity Data

Stability: This material is stable under all conditions of use and storage

Possibility of Hazardous Reactions: Contact with acids will cause gelling and evolution of heat. contact with incompatible metals may produce flammable hydrogen gas.

Materials to avoid: Avoid prolonged contact with alkali sensitive metals such as: aluminum, brass, bronze, copper, lead, tin, zinc because flammable hydrogen gas can be generated.

Hazard decomposition product: None. Contact with incompatible metals may produce flammable hydrogen gas

Chemical Stability: Stable at normal temperatures and pressure.

Section 11: Toxicological Information

Acute toxicity – Oral: LD50, rat: Not determined. The acute oral toxicity of this product has not been tested. When chemically similar Sodium Silicates were tested on a 100% solid basis, their single dose acute oral LD50 in rats ranged from 1280 mg/kg to 3200 mg/kg. The acute oral lethality resulted from nonspecific causes. These products contain 30-60% Potassium Silicate thus each product is estimated to have an Acute Oral Toxicity LD50, rat: >2000 mg/kg.
Acute toxicity – Dermal: No data available.
Acute toxicity – Inhalation: No data available.
Acute toxicity – Respiratory: No data available.
Skin sensitization: No data available.
Germ cell mutagenicity: The mutagenic potential of this material has not been tested. Chemically similar Sodium Silicate was not mutagenic to the bacterium E. Coli when tested in a mutagenicity bioassay.
Carcinogenicity: There are no known reports of carcinogenicity of alkali silicates. Alkali silicates are not listed by IARC, NTP or OSHA as a carcinogen.
Reproductive toxicity STOT-single: No data available.
STOT repeated exposure: Frequent ingestion over extended periods of time of gram quantities of silicates is associated with the formation of kidney stones and other siliceous urinary calculi in humans.
Aspiration hazard: No data available.
Serious eye damage: SevereIrritant. This material has not been tested for primary eye irritation. However, on the basis of it's similarity to Sodium Silicate solutions in composition and alkalinity it is regarded as a severe eye irritant.
Skin corrosion/irritation: When tested for primary skin irritation potential, similar potassium silicate solutions produced no irritation to intact skin but well defined irritation to abraded skin. Human experience confirms that irritation occurs when this material gets on clothes at the collar, cuffs or other areas when abrasion may occur.
Subchronic/chronic toxicity: The subchronic toxicity of this material has not been tested. In a study of rats fed chemically similar Sodium Silicate in drinking water for three months, at 200, 600 and 1800 ppm, changes were reported in the blood chemistry of some animals but no specific changes to the organs of the animals due to Sodium Silicate administration were observed in any of the dosage groups. Another study reported adverse effects to the kidneys of dogs fed Sodium Silicate in their diet at 2.4 g/kg/day for 4 weeks, whereas rats fed the same dosage did not develop any treatment-related effects. Decreased numbers of births and survival to weaning was reported for rats fed Sodium Silicate in their drinking water at 600 and 1200 ppm.

Section 12: Ecological Information Ecotoxicity

Ecotoxicity: Avoid contaminating waterways. Soluble in water. Sinks and mixes with water. Only water will evaporate from this material. The ecotoxicity of Potassium Silicate has not been tested. The following data is reported for chemically similar Sodium Silicates on a 100% solids basis: A 96 hour median tolerance for fish (Gambusia affnis) of 2320 ppm; a 96 hour median tolerance for water fleas (Daphnia magna) of 247 ppm; 1 96 hour median tolerance for snail eggs (Lymnea) of 632 ppm; and a 96 hour median tolerance for Amphipoda of 160 ppm. These products contain 30-60% Potassium Silicate.

Persistance and degradation: This material is not persistent in aquatic systems but it's high pH when undiluted or unneutralised is acutely harmful to aquatic life. Diluted material rapidly depolymerises to yield dissolved silica in a form that is indistinguishable from natural dissolved silica. It does not contribute to BOD. This material does not bioaccumulate except in species that use silica as a structural material such as diatoms and siliceous sponges. Neither silica nor potassium will appreciable bioconcentrate up the food chain.

Mobility: Expected to be mobile in soil. Diluted material rapidly depolymerises to yield dissolved silica in a form that is indistinguishable from natural dissolved silica.

Bioaccumulative potential: No data available.

Section 13: Disposal Considerations

Classification: Disposed material is not a Hazardous waste.

Disposal Method: Dispose in accordance with federal, state and local regulations and permits.

Section 14: Transport Information

Special Provisions for Transport: 42/2020/NĐ-CP Regulations on transporting dangerous goods in Vietnam

Identification: Not applicable.

DOT UN Status: This material is not regulated hazardous material for transportation.

Land transport (DOT): Non-Hazardous for Land Transport.

Sea transport (IMDG): Non-Hazardous for Sea Transport.

Air transport (ICAO-TI / IATA-DGR): Non-Hazardous for Air Transport.

Section 15: Other Regulatory Information

HMIS (U.S.A.):	Health Hazard: 1	Reactivity: 0
	Fire Hazard: 0	Personal Protection:
National Fire Protection Association (USA):	Health: 0	Reactivity: 0
	Flammability: 0	Specific hazard:
Protective Equipment:	Chemical goggles, Body-covering protective clothing and gloves.	

Section 16: Other Information References

Prepared by: Ducminh Company Limited Rev.03. 28 August 2019

OECD SIDS: Soluble Silicate, International Programme on Chemical Safety (IPCS): Chemical Safety Information from Intergovernmental Organization (INCHEM), France 20-23 April 2004

IUCLID Dataset Substance ID:1344-09-8, European Commission – European Chemicals Bureau, 18 Feb 2000. Soluble Silicate: Chemical, toxicological, ecological and legal aspects of production, transport, handling and application, European Chemical Industry Council, Belgium. Feb 2013

ESIS : European chemical Substances Information System, http://esis.jrc.ec.europa.eu/, 29 May 2014

International Chemical Safety Cards: Sodium Silicate (solution 25-50%), The National Institute for **Occupational Safety and Health (NIOSH)**, http://www.cdc.gov/niosh/ipcsneng/neng1137.html, 20 June 2014

Alphabetical index of substances and articles, United Nations Recommendations on the Transport of Dangerous Goods (UNRTDG) http://www.unece.org/fileadmin/DAM/trans/danger/publi/unrec/rev14 /English/05E_Index.pdf, 30 June 2014