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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name and identification number: **Silicic acid, sodium salt; MR > 1,6 ≤ 2,6; lumps**
 CAS number: **1344-09-8**
 EC number: **215-687-4**
 The registration number: **01-2119448725-31-0007**
 Index Number: **none**
 EC name: **silicic acid; sodium salt**
 CAS name: **silicic acid; sodium salt**
 Other names: **glassy sodium silicate MR >1.6 ≤ 2,6;
 sodium silicate MR >1.6 ≤ 2,6.**
 Trade name: **VITROSIL S ***

Note: Sodium silicates are produced with a different molar ratio (MR), defined as the molar ratio of SiO₂ to Na₂O in the substance in solid (lump or powder) or liquid form. MR and physical state have a significant impact on classification and labelling.

* An appropriate numerical symbol corresponding to the type of product within the scope of the indicated module is added to the trade name.

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Formulation (e. g. detergents, adhesives, adhesives, surface technologies). Industrial applications (for example: production of silica; silica gel; zeolites; silicates; aluminium; ceramics; glass catalysts; production and application of liquid and solid detergents for washing fabrics, dishwashing; industrial detergents and disinfectants; production of corrosion inhibitors and anti-scaling agents; production of adhesives and binders in various industries - paper, ceramics, wood, building materials and permanent, casting, plastic insulation, anti-dusting agents; production of dispersion agents in various branches of industry – cosmetics, textiles; production of flame retardants, flotation agents, impregnators, stabilizers). Professional applications (e. g. : adhesives, adhesives, surface technologies).

A complete list of uses is given in the attached exposure scenarios.

Uses advised against not identified.

1.3. Details of the supplier of the safety data sheet

Producer: QEMETICA Silicates S.A.

Address: POLAND, PL 68-120 IŁOWA, 27 Żagańska Street

Telephone: tel. +48 68 360 07 47

E-mail address of the person responsible for the SDS

SDS@qemetica.com

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1.4. Emergency telephone number

112 (emergency call), 999 (emergency telephone number)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation 1272/2008/EC:

Skin Irrit. 2; H315 Causes skin irritation.

Eye Dam. 1; H318 Causes serious eye damage.

Section 16 provides the full names of the hazard classes.

2.2. Label elements

Label accordance with Regulation 1272/2008/EC (CLP)

Hazard pictograms, signal words:



Danger

Hazard statements:

H315 Causes skin irritation.

H318 Causes serious eye damage.

Precautionary statements:

P262 Do not get in eyes, on skin, or on clothing.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

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


P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3. Other hazards

Potential hazard exists at workstations: possible release of dust, which may exceed the NDS for non-toxic dust (see section 8. 1).

The substance does not meet the PBT and vPvB criteria. The criteria described in Annex XIII to Reg. REACH (PBT and vPvB properties) do not apply to inorganic substances.

The substance has not been included in the list established in accordance with Article

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59(1) of REACH as endocrine disrupting properties. The substance does not meet the criteria for endocrine disrupting properties set out in Commission Regulation (EU) 2017/2100 (OJ EU L 301 of 17.11.2017, as amended) and Commission Regulation (EU) 2018/605 (OJ EU L 101 of 20.04.2018, as amended).

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name:	Silicic acid, sodium salt with MR module > 1,6 ≤ 2,6
Content of pure substance:	≥99% ww (Na₂O+SiO₂)
Common proper name:	glassy sodium silicate MR > 1,6 ≤ 2,6
EC name:	silicic acid, sodium salt; No EC: 215-687-4
CAS name:	silicic acid, sodium salt; No CAS: 1344-09-8
IUPAC name:	sodium hydroxy(oxo)silanolate
Chemical formula:	Na₂O × nSiO₂

Description of substance: UVCB inorganic substance. Is a composition of oligomers of SiO₄ silicate anions combined with sodium cations.

The structural structure of the substance and its properties depend on the SiO₂ to Na₂O molar ratio (MR).

Description of impurities: Occurring contaminants below 1% of the above do not affect the classification of the substance. These are metal oxides derived from raw materials (quartz sand) e.g., oxides of: calcium, magnesium, aluminium, titanium, iron, etc.

SECTION 4: First aid measures


4.1. Description of first aid measures

General instructions: Persons carrying first aid should wear personal protective equipment. In case of contact with the product, always bring a doctor and present him with the label and product safety data sheet.

Inhalation: Remove or remove the victim from the site of exposure, lay in a comfortable lying or sitting position, provide peace of mind, protect against heat loss. Place the unconscious person in a lateral, steady position. In case of apnea, use artificial respiration. Provide access to fresh air and tranquility. Call a doctor immediately.

Skin contact (or hair): Soiled, soaked cover should be removed immediately. Rinse skin and hair under a strong jet of water or shower. Immediately wash contaminated skin for 10-15 minutes with plenty of water or soapy water. In case of contamination of a large area of skin immediately go for a shower. Call a doctor if you experience worrying symptoms.

Eye contact: Remove contact lenses, if present and easy to do. Immediately flush contaminated eyes with plenty of water for 10-15 minutes. Keep eyelids wide open to rinse the entire surface of the eyes with water, including the eyelids. Call a physician

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immediately. During transportation to the doctor should continue flushing eyes.

Ingestion: Rinse mouth with water. Give plenty of water to drink to conscious person in small portions. Do not induce vomiting. Call a physician immediately.

Responders should use appropriate personal protective equipment (see section 8. 2. 2.), provide adequate general and local ventilation, avoid direct contact with the substance, avoid inhalation of dust, aerosols and vapors.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation: May cause respiratory irritation.

Prolonged exposure may cause cough, headache, nausea.

Eye contact: Causes serious damage to the eyes.

Skin contact: Causes serious skin irritation.

Ingestion: Causes damage to mucosa.

4.3. Indication of any immediate medical attention and special treatment needed

The decision on further emergency treatment should be made by a doctor after a thorough assessment of the victim's condition. Use symptomatic treatment.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Non-flammable and does not support smoking.

Extinguishing measures to suit nearby materials.

Unsuitable extinguishing media: No data on non-recommended funds.

5.2. Special hazards arising from the substance or mixture

Non-flammable, non-explosive substance. At temperatures above 60°C, it reacts dangerously with aluminum and its alloys, zinc and its alloys. As a result of the reaction, hydrogen can be formed, generating a danger of explosion. It reacts violently with solutions of mineral acids (e. g. nitric, sulfuric) and with concentrated hydrofluoric acid.


5.3. Advice for firefighters

Use full protective equipment and airway isolation devices with independent air circulation. Containers exposed to fire or heat should be cooled with a jet of dispersed water from a safe distance and, if possible, removed from the endangered area. Protect surface and ground water, soil and sewage from contamination. Fire water should be treated as a hazardous contamination and stored in separate containers.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment, and emergency procedures

For non-emergency personnel: Access of non-emergency personnel to the area of accident should be restricted until the completion of the disposal of the product. Wear

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appropriate personal protective equipment. Do not drink, eat, and smoke. Provide adequate local and general ventilation. Avoid direct contact with the substance. Protect eyes and skin. Avoid inhalation of dust, aerosols and vapours.

For emergency responders: Wear appropriate personal protective equipment. Do not drink, eat and smoke. Provide adequate local and general ventilation. Avoid direct contact with the substance. Protect eyes and skin. Avoid inhalation of dust, aerosols and vapours.

6.2. Environmental precautions

Do not allow the substance to enter drains, surface and ground waters, reservoirs and watercourses. In the event of contamination of the environment with a large amount of the preparation, notify the relevant authorities and chemical rescue services.

6.3. Methods and material for containment and cleaning up

Secure the drains. Secure damaged packages. Collect the product released into the environment mechanically and forward for utilization. Do not rinse with water, do not neutralize.

6.4. Reference to other sections

Personal protective equipment - see Section 8.2.2. Disposal - see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Do not allow the workplace environment to exceed the normative concentrations of hazardous components. Provide adequate general and local exhaust ventilation. Prevent from entering the sewage system, surface and ground water and soil. Prevent the use of mutually incompatible materials (see Section 10.5).

General labor hygiene regulations apply. When performing any activity with the substance, do not eat, drink, take medication or smoke. Avoid contact with eyes and skin. Avoid inhalation of dust, aerosols and vapours. Remove contaminated clothing and protective equipment before entering eating areas. Wash hands and face before break and after working with the product. Wash the body surface and personal protective equipment after use. Change and clean contaminated clothing before reuse.

Use the protective measures listed in section 8.2.2.

7.2. Conditions for safe storage, including any incompatibilities


Store in bulk or in containers in covered, hardened landfills. Do not store in containers/tanks made of or coated with zinc or aluminium. Store in a dry place.

Store away from non-compliant materials (referred to in section 10. 5).

7.3. Specific end use(s)

Specified in the exposure scenarios.

Follow the guidance given in this card and the exposure scenarios.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Substance name	TWA	STEL	BLV
Dusts	10 mg/m ³ (inhalable fraction)	-	-
	4 mg/m ³ (respirable dust)		

Legal basis: Ordinance on maximum permissible concentration and intensity of harmful factors in the work environment in accordance with national limit values. EH40/2005 Workplace exposure limits, fourth edition, published 2020, ISBN 978 0 7176 6733 8.

In the REACH registration dossier, DNEL (derived no-effect level) values have been set out in accordance with the following tables.

For employees: employed in manufacturing and processing in which the concentration of the substance in the product and mixture exceeds 25%.


DNEL:

Route of exposure	DNEL Employees			
	Acute, local effects	Acute, systemic effects	Chronic, local effects	Chronic, systemic effects
Inhalation	Medium risk (no specific threshold)	No threat has been identified	Medium risk (no specific threshold)	5,61 mg/m ³
Through the skin	Medium risk (no specific threshold)	No threat has been identified	Medium risk (no specific threshold)	1,59 mg/kg b.w./day
Oral	No threat has been identified	No threat has been identified	No threat has been identified	No threat has been identified
On the eyes	Medium risk (no specific threshold)	No threat has been identified	Medium risk (no specific threshold)	No threat has been identified

The product in the form of lumps is not present on the consumer market.

PNEC:

Goal of environmental protection	PNEC
Freshwater	7,5 mg/l
Freshwater sediments	No threat has been identified

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Seawater	1,0 mg/l
Marine sediments	No threat has been identified
Food chain	No threat has been identified
Microorganisms during wastewater treatment	348 mg/l
Soil (agricultural)	No threat has been identified
Air	No threat has been identified

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Do not allow the workplace environment to exceed the normative concentrations of hazardous components. Provide adequate general and local exhaust ventilation. Prevent from entering the sewage system, surface and ground water and soil.

Appropriate precautions for use and storage of the product are given in Section 7.

8.2.2. Individual protection measures, such as personal protective equipment

Eye/face protection: Wear suitable safety goggles according to EN 166 and a face shield.

Skin Protection: Wear protective clothing and gloves according to EN 374, material: NBR (nitrile rubber), thickness min 0.3 mm, penetration time > 480 min (level 6).

Respiratory protection: If the product is used in large quantities indoors, adequate respiratory protection is required. Appropriate breathing apparatus should be used in an environment where there is a risk of exposure to dust, aerosol or mist. At high concentrations, indoors, wear a half mask with ABEK class absorber with min. P2.


Thermal Hazards: Not required.

The individual protective equipment used should meet the requirements of Regulation (EU) 2016/425 of the European Parliament and of the Council of March 9, 2016, on personal protective equipment and repealing Council Directive 89/686/EEC (EU OJ L 81, 31. 03. 2016). The employer is obliged to provide individual protective equipment appropriate to the work performed and meeting all requirements, including their maintenance, and cleaning.

The concentration of hazardous substances in the working environment shall be monitored according to recognised test methods. The mode, methods, type and frequency of testing and measurement of factors harmful to health occurring in the working environment should meet the requirements of the Regulation of the Minister of Health of 2 February 2011 on testing and measurement of factors harmful to health in the working environment (Journal of Laws 2011 No. 33, item 166, as amended).

8.2.3. Environmental exposure controls


Do not allow the product to enter the groundwater, sewage system, wastewater, or soil. The substance does not pose significant risks to the environment, but due to its high alkaline reaction, it is recommended to neutralize it before discharge into water and wastewater.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid in the form of shapeless hard lumps,
Colour	Colourless or bluish, greenish or celery
Odour	Odourless
Melting point/freezing point	Due to the glass nature, solid sodium silicate has no pronounced melting point: softening temperature: 550-670°C Melting temperature: 730-870°C Aqueous solutions have a slightly lower melting point than water.
Boiling point or initial boiling point and boiling range	According to Annex VII (point 7.3) of the REACH Regulation, tests do not need to be carried out for solids that melt above 300°C. The determination of the boiling point is not practical for solid anhydrous silicates as they are glass with a high melting point. The boiling point of aqueous solutions is determined by the water content.
Flammability	The tests do not need to be carried out as the substance is inorganic. Pyrophoricity is not a feature related to its chemical structure and experience in handling and use. The substance does not self-ignite in contact with air. Non-flammable substance. The substance does not heat itself.
Lower and upper explosion limit	Non-explosive substance. There are no chemical groups associated with explosive properties in the molecule, so according to Annex VII (section 7.11) of REACH, the test does not need to be conducted.
Flash point	According to Annex VII (Section 7.9) of REACH, a flash point test is not necessary because the substance is inorganic.
Auto-ignition temperature	Preliminary results rule out self-heating of the substance up to 400°C. According to Annex VII (section 7.12) of REACH, the test does not need to be conducted.
Decomposition temperature	No data available - the substance does not decompose at temperatures below 1400°C
pH	11-13 at 20°C
Kinematic viscosity	Not applicable - solid Aqueous solutions (with different concentrations and molar ratios of Na ₂ O/SiO ₂) exhibit dynamic viscosities of 20 - 100,000 mPa*s at 20 °C.
Solubility	Product dissolves extremely slowly in water under ambient

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	<p>conditions.</p> <p>It is not possible to quantify the water solubility. Aqueous solutions are characterized by a dynamic equilibrium of polymerization/hydrolysis of monomeric SiO₂(aq.), oligomeric silicate ions and polysilicate ions, which is strongly pH dependent.</p> <p>The amorphous silica which precipitates after neutralization of alkaline silicate solutions has a water solubility of 115 mg/l at 25°C and an inert pH.</p>
Partition coefficient n-octanol/water (log value)	The substance is inorganic, so according to Annex VII (section 7.8) of REACH, testing is not necessary. In addition, sodium silicate is insoluble in alcohol, indicating that this also applies to n-octanol. Therefore, the octanol/water partition coefficient is not applicable.
Vapour pressure	0.0016 hPa in 1172 °C
Density and/or relative density	1,26-1,71g/cm ³ (solutions)
Relative vapour density	Does not apply to solids.
Particie characteristics	Granules: 200 -1250 µm Powder: 0,02 – 2000 µm Particle size distribution for powders: D10 = 30,178 µm D50 = 85,273 µm D90 = 187,823 µm

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Not applicable.

9.2.2. Other safety characteristics

In aqueous solutions, it has a strong corrosive effect on most metals.

SECTION 10: Stability and reactivity

10.1. Reactivity


Alkaline substance, easily dissolved in water.

10.2. Chemical stability

Alkaline substance, under normal conditions very slightly soluble in water. On the surface, it reacts with carbonic anhydride to form Na₂CO₃, it can react with acid vapors.

10.3. Possibility of hazardous reactions

Contact with strong acids and hydrofluoric acid causes heat generation. The reaction with

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hydrofluoric acid is accompanied by the release of dangerous gases (silicon tetrafluoride). Contact with aluminum or its alloys, zinc or its alloys, results in the release of hydrogen.

10.4. Conditions to avoid

Avoid contact with non-compliant materials (see section 10. 5). Protect from moisture.

10.5. Incompatible materials

Keep away from oxidizing agents, strong alkalis, strong acids and also alkali metals, alkaline earth metals, zinc, aluminum, tin, lead and their alloys.

10.6. Hazardous decomposition products

Under normal conditions of use and storage, the substance does not degrade.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity:

Based on available data, the classification criteria are not met.
 The substance has no acute toxic effects by any route of exposure.

Oral: LD₅₀ (rat, *Wistar*) > 3400 mg/kg b.w. (method equivalent or similar to OECD 401) (Spanjers, M. Th. i Til, H. P. 1981)

Inhalation: LC₅₀ (rat, *Sprague-Dawley*) > 2,06 g/m³ (EPA OPPTS 870.1300) (Durando, J. 2004)

Skin: LD₅₀ (rat, *Sprague-Dawley*) > 5000 mg/kg b.w. (EPA OPPTS 870.1200) (Durando, J. 2004)

Skin corrosion/irritation:


Causes skin irritation (H315).
 Based on available data, the classification criteria are not met.
 The substance can exhibit an irritant to corrosive effect depending on the molar modulus of MR. As MR increases, the corrosive/irritant effect decreases. For MR =2.0 to 2.4, an irritant effect occurred at concentrations of 38-41% (Cuthbert and Carr 1985).

Serious eye damage/irritation:

Causes serious eye damage (H318).
 Based on available data, the classification criteria are not met.
 For the sake of animals, in vivo tests were not conducted because the substance is a skin irritant/ corrosive. A series of non-validated in vitro studies indicate the same inverse correlation between molar ratio and irritation as was observed for skin irritation. Powders with molar ratios of MR 2.0, 2.4 and 2.6 showed acutely irritating effects on the removed eyeballs of rabbits.

Respiratory or skin sensitisation:

Based on available data, the classification criteria are not met.
 Skin sensitization

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Based on a cross-sectional approach based on clustering of substances, no sensitizing effect of sodium silicate was found on the basis of available negative results of local lymph nodes of mice after administration of sodium metasilicate to their skin (Karrow N. A. et al. 2002).

In a case report in humans, contact urticaria caused by sodium silicate was observed in one individual (Tanaka T. et al. 1982).

Respiratory sensitization

The study is not required. No data available.

Germ cell mutagenicity:

Based on available data, the classification criteria are not met.

The in vitro genetic toxicity of disodium methosilicate nonahydrate was tested by the Ames test (BASF SE, 2012). The test substance did not induce reversion in any of the *S. typhimurium* strains or in *E. coli* WP2 uvrA with or without metabolic activation.

All other in vitro mutagenicity tests with bacteria were negative. Sodium silicate (MR= 3.3) also did not induce chromosomal aberrations and HPRT mutations in mammalian V79 cells in vitro, both in the presence and absence of metabolic activation. In vivo, sodium metasilicate did not induce chromosomal aberrations in the bone marrow of mice

Carcinogenicity:

Based on available data, the classification criteria are not met.

No data indicating carcinogenicity of soluble sodium silicates. In addition, sodium silicate does not contain structures indicative of carcinogenicity.

Reproductive toxicity:

Based on available data, the classification criteria are not met.

No data available for sodium silicate. Based on a cross-sectional approach based on clustering of substances, no adverse reproductive effects of sodium silicate were found based on the available negative results of disodium metasilicate studies on mice (Saiwai K. et al., 1980).

NOAEL (mice) > 200 mg/kg b. w./day

STOT-single exposure:

Based on available data, the classification criteria are not met.

STOT-repeated exposure:

Based on available data, the classification criteria are not met.

Sodium silicate was tested in toxicity studies after multiple oral doses over an exposure range of 28 days to 180 days in rats and dogs. No adverse effects were observed in male and female rats administered the test substance through drinking water for 180 days (Smith G. S. et al., 1973).


NOAEL (rats) > 159 mg per kg b.w./day

The health effects of topical exposure are given in section 4. 2

11.2. Information on other hazards

11.2.1 Endocrine disrupting properties

The substance is not included in the list established in accordance with Article 59 (1) of REACH as having endocrine disrupting properties. The substance does not meet the criteria for endocrine disruptors as defined by Commission Regulation (EU) 2017/2100 (EU OJ L 301, 17.11.2017) and Commission Regulation (EU) 2018/605 (EU OJ L 101, 20.04.2018).

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SECTION 12: Ecological information

12.1. Toxicity

The substance does not meet the criteria for classification as hazardous to the environment. Soluble silicates are indistinguishable from the natural forms of silicates, which make up 59% of the Earth's crust, and enter waterways through natural geochemical processes. Soluble silicates entering waters as a result of production and processing processes are not of anthropogenic significance.

Acute toxicity to fish:

LC₅₀ (96h) (Brachydanio rerio) 1108 mg/l (Adema, D.M.M. 1988)

LC₅₀ (96h) (Onchorhynchus mykiss) 260-310mg/l (Maruyama, T. et al. 1989)

NOEC (96 h) (Brachydanio rerio) 348 mg/l (Adema, D.M.M. 1988)

For risk assessment purposes, the PNEC is derived from the ubiquitous background concentration of SiO₂ in fresh water in Europe, which is 7.5 mg/L.

Acute toxicity to invertebrates:

EC₅₀ (48 h): 1700 mg/L (Daphnia magna) (Kirch, A. 1997)

For the PNEC risk assessment, it is derived from the ubiquitous background concentration of SiO₂ in fresh water in Europe, which is 7.5 mg/L.

Chronic toxicity to fish and invertebrates:

According to section 9.1, Annex IX of REACH, there is no need for long-term toxicity testing for aquatic invertebrates and fish.

Soluble silicates have been shown not to be acutely toxic to aquatic organisms. Short-term toxicity tests with fish, aquatic invertebrates and algae resulted in concentrations (EC₅₀ and LC₅₀) above 100 mg/L. In addition, dissolved silica is indistinguishable from naturally dissolved silica, which is ubiquitous in the environment. Depending on the pH value, the reaction with naturally occurring dissolved multivalent metals such as Ca, Mg, Fe and Al will result in the formation of insoluble silicates or amorphous silica. These products are abundant in natural soils and rocks. In fact, silica is the second most abundant element on earth. Silicon is also an essential component of diatoms and is captured by diatoms from the surrounding water and incorporated into their skeleton. Due to the natural adaptation of organisms to silicon, it can be assumed that the additional contribution of anthropogenic soluble silicates will not cause increased risk to aquatic organisms. Therefore, chronic aquatic toxicity is not expected.

Algae and other aquatic plants:


EC₅₀ (72h, biomass) (Scenedesmus subspicatus): 207 mg/l (Rieche, H. W. 1995)

EC₅₀ (72h, growth rate) (Scenedesmus subspicatus) > 345,4mg/l (Rieche, H. W. 1995)

Toxicity to sedimentary organisms

According to Section 1, Annex XI of REACH, Section 1, a long-term study of toxicity to sedimentary organisms does not appear to be scientifically necessary and has been omitted due to the combined evidence based on existing information:

a) a small amount of dissolved soluble silicates under environmentally relevant conditions,

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- b) the fact that dissolved soluble silicates are molecular individuals that cannot be distinguished from natural dissolved silica, and
- c) the absence of any adverse effects on aquatic organisms below 100 mg/L.

Toxicity to: soil macroorganisms, terrestrial plants, soil microorganisms

According to Section 1 of Annex XI to REACH, toxicity tests for terrestrial organisms do not appear to be scientifically necessary and are omitted due to the combined evidence based on existing information:

- a) a small amount of dissolved soluble silicates under environmentally relevant conditions,
- b) the fact that silicates are natural components of soil minerals and ubiquitous in soils,
- c) presumably, low emissions of anthropogenic soluble silicates into the terrestrial environment, and
- d) no adverse effects in the water compartment.

Toxicity to birds

According to section 9.6.1, Annex X of REACH, the test does not need to be conducted because direct emissions from soluble silicates into the terrestrial compartment are considered negligible. Since silicates are, moreover, natural components of soil minerals, such tests would be of limited value. SiO₂ accounts for 59% and similar percentages are present in many sediments and soils. The contribution of anthropogenic factors to the occurrence in different compartments will be negligible compared to the concentrations caused by the natural silica flux.

12.2. Persistence and degradability

Due to its chemical structure and inorganic nature, photodegradation of soluble silicates is not expected.

With regard to hydrolysis stability, it is highly dependent on the pH regime. The basic assumption is that silica dissolves according to: SiO₂ + H₂O = Si(OH)₄. At low concentrations it occurs as monomers, at higher concentrations polymerization will occur. Most soluble silicates are in the form: M₂O x mSiO₂ x nH₂O where M = alkali metal, mainly Na, but also K. The m index (molar ratio) varies between 0.5 - 4. Above pH 10.6, the solutions are chemically stable. The increase in ionic strength accelerates nucleation and deposition and reduces the solubility of SiO₂. Coating the surface with organic matter can hinder dissolution, but at the same time Si(OH)₄ can form complexes with organic matter, which promotes dissolution (Falcone 1997).

As inorganic substances, soluble silicates are not biodegradable due to their chemical structure.


Elimination of sodium silicate in the model wastewater treatment plant was only marginal: 90-100% was detected in the wastewater. The study was conducted in accordance with GLP and EU guidelines 82/242/EEC and 82/243/EEC (Richterich 1994).

What is more, silica is constantly being removed from water through biochemical processes: diatoms, radiolarians, silicic flagellates, and some sponges serve as a silicon sink, incorporating it into their shells and skeletons as amorphous biogenic silica, often referred to as opal (SiO₂-nH₂O). During blooms, they can deplete dissolved silica in surface waters to less than 1 mg/L (Edwards 1973).

12.3. Bioaccumulative potential

Low bioaccumulation potential.

Toxicokinetic data in vertebrates showed low bioaccumulation potential. Ingested soluble silicates are excreted in the urine and to a lesser extent in the feces. Significantly increased and rapid urinary excretion of silica was observed when soluble sodium silicates were

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administered to rats (Benke and Osborn 1979), dogs (King et al. 1933), cats (King and McGeorge 1938) and guinea pigs (Sauer et al. 1959). The half-life in urinary silicon excretion after administration of sodium silicate to rats by gastric tube was 24 hours (Benke and Osborn 1979).

12.4. Mobility in soil

According to Annex VIII of REACH, adsorption/desorption screening does not need to be performed if the substance can be expected to have a low adsorption potential based on its physicochemical properties.

Based on the physicochemical properties of silicic acid, the sodium salt can be expected to have a relatively low adsorption potential to sediment and soil. Crystalline silicates, such as silicic acid, sodium salt are easily soluble in water and insoluble in alcohol. The expected relatively low adsorption potential is confirmed by measurements of soluble silicate removal at several wastewater treatment plants, where marginal removal by sedimentation and adsorption was determined to be 10% of the total amount (van Dokkum et al., 2004). Accurately predicting the distribution of soluble silicates in different environmental compartments is not possible, because there is a dynamic equilibrium between various mono-, oligo- and poly-bonded anions, depending on pH conditions and substance concentration. Sediments and soil particles are believed to act as a mechanism to buffer the concentration of dissolved silica in natural waters through sorption and desorption of dissolved silica (Schleyer and Blumberg, 1982). In this process, the anthropogenic contribution to various environmental compartments will be negligible compared to concentrations from the natural silica flux. Moreover, dissolved silica from commercially available soluble silicates is indistinguishable from natural dissolved silica (Schleyer and Blumberg, 1982).

12.5. Results of PBT and vPvB assessment

The criteria described in Annex XIII (PBT and vPvB properties) do not apply to inorganic substances.

12.6. Endocrine disrupting properties

The substance is not included in the list established in accordance with Article 59 (1) of REACH as having endocrine disrupting properties. The substance does not meet the criteria for endocrine disruptors as defined by Commission Regulation (EU) 2017/2100 (EU OJ L 301, 17.11.2017) and Commission Regulation (EU) 2018/605 (EU OJ L 101, 20.04.2018).

12.7. Other adverse effects

Alkaline substance. Unintentional release of a significant amount of the substance into the aquatic environment may cause a localized pH change that is harmful to organisms.


SECTION 13: Disposal considerations

13.1. Waste treatment methods

When disposing of waste, comply with Community Legislation:

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (EU OJ L 312/3 of 22.11.2008 as amended)

European Parliament and Council Directive 94/62/EC of 20 December 1994 on

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packaging and packaging waste (EU OJ L 365/10 of 31.12.1994 as amended)

How to dispose of the product: Do not introduce into the environment. If recovery and return for use is not possible, dispose of the waste product in properly labeled containers to an authorized company.

How to dispose of packaging: Do not introduce into the environment. Dispose of contaminated packaging as you would a product; transfer in properly labeled containers to an authorized company.

SECTION 14: Transport information

14.1. UN number or ID number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

It is not a hazardous material according to RID and ADR regulations.

14.5. Environmental hazards

The substance is not hazardous to the environment according to the criteria of the UN Model Regulations.

14.6. Special precautions for user

Alkaline substance. In case of unintentional release, collect mechanically using the individual protective equipment described in Section 8.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable


14.8. Shipping name according to IMSBC code

Shapeless nodules of vitreous sodium silicate.

SECTION 15: Regulatory information

Safety, health, and environmental regulations/legislation specific for the substance or mixture

- **Regulation (EC) No 1907/2006** of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation

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(EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, as amended.

- **Regulation (EC) No 1272/2008** of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 as amended.
- **Commission Regulation (EU) 2020/878** of June 18, 2020, amending Annex II to Regulation (EC) No. 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).
- **Directive 2008/68/EC** of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods as amended.

15.1. Chemical safety assessment

The chemical safety of the product has been evaluated.

SECTION 16: Other information

Full text of hazard statements:


H315 Causes skin irritation.
 H318 Causes serious eye damage.

Key to abbreviations and acronyms:

DNEL - Derived no-effect level.
 DSB - concentration in biological material.
 EC₅₀ - Half maximal effective concentration.
 Eye Dam. 1 - Serious eye damage/eye irritation, category 1.
 IMO - International Maritime Organization.
 IMSBC - International Maritime Solid Bulk Cargoes.
 LC₅₀ - the concentration at which death is observed in 50% of the test organisms.
 LD₅₀ - the dose at which death is observed in 50% of the test organisms.
 b.w. - body weight.
 NOAEL - no observable adverse effect level.
 CAS No. - the number assigned to a chemical substance by the Chemical Abstracts Service.
 Index number - the number assigned to the chemical substance in Annex VI of the CLP Regulation.
 EC No. - the number assigned to the chemical in the European Inventory of Existing Commercial Chemical Substances (EINECS), the European List of Notified Chemical Substances (ELINCS), or the list of chemicals listed in the European Commission publication "No-longer polymers" (NLP).
 PBT - persistent, bioaccumulative and toxic substance.
 PNEC - predicted no-effect concentration in the environment.
 vPvB - very persistent and very bioaccumulative substance.
 TWA - 8 hours' time-weighted average.
 BLV - Biological limit values.

Key Data Sources:

REACH registration dossier of the substance silicic acid, sodium salt.

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Training advice: Before use read the SDS.

The information contained in this document is based on the current state of our knowledge and is intended to describe the product from the perspective of safety requirements. They cannot be interpreted as a guarantee of product properties. The consignee and user are responsible for ensuring a safe workplace and conditions for the safe use of the product, and for complying with all applicable laws.

The safety data sheet cancels and replaces all its previous editions.
 Changes made to the previous edition – section 1.

An appropriate exposure scenario is set out in the Annex to this sheet.