

## Safety Data Sheet

According to Regulation (EC) N° 1907/2006 (REACH) considering addition to  
Regulation EC N° 453/2010

### Sodium hydroxide

#### 1 IDENTIFICATION OF THE SUBSTANCE/EC REPRESENTATIVE/MANUFACTURER

##### 1.1 Product identifiers

IUPAC name:	Sodium hydroxide
Synonyms:	Caustic soda, sodium hydroxide, sodium hydrate
EC number:	215-185-5
EC name:	Sodium hydroxide
CAS number:	1310-73-2
CAS name:	Sodium hydroxide
RTECS:	WB4900000
Reference number:	01-2119457892-27-0023

##### 1.2 Identified uses

Within industry sodium hydroxide can be used for example to adjust the pH, to produce biodiesel from vegetableoils, to clean bottles (food industry), in pulp and paper industry, to dry air, to extract alumina, in textile industry, to peel leather, to manufacture chemicals (intermediate use), to regenerate resins or to soften water. Consumers also use it for paint stripping or to unblock sinks.

Additional information: Full text of PROC, ERC; PC and SU see in the ES as an Annex.

##### 1.3 Details of the manufacturer/EC representative:

Manufacturer:	JSC «Kaustik» Volgograd 400097, Volgograd, Russia
Only representative	<b>PROCHEMICAL GROUP s.r.o.</b> NabrezieSv. Cyrila 47 Prievidza 97101, Slovakia <b>Sales department:</b> tel.: +421 911 993183 web: www.prochemical.eu mail: sales@prochemical.eu

#### 2 HAZARDS IDENTIFICATION

##### 2.1 Classification and labelling according to CLP

Sodium hydroxide is listed on Annex VI of Regulation (EC) No 1272/2008 (CLP) (Index N° 011-002-00-6).  
Classification

Hazard class and category:

Skin corrosive; category 1A

Hazard statement: H314:

Causes severe skin burns and eye damage

H290:

May be corrosive to metals.

H318:

Causes serious eye damage.

Labelling

Signal word:

Danger

Hazard Pictogram Codes and Symbols:

GHS05: corrosion



Specific concentration limits

Skin Corr. 1A; H314 (Causes severe skin burns and eye damage):  $C \geq 5 \%$ Skin Corr. 1B; H314 (Causes severe skin burns and eye damage):  $2 \% \leq C < 5 \%$ Skin Irrit. 2; H315 (Causes skin irritation):  $0.5 \% \leq C < 2 \%$ Eye Irrit. 2; H319 (Causes serious eye irritation):  $0.5 \% \leq C < 2 \%$ 

## 2.2. Classification according to DSD / DPD

Sodium hydroxide is listed on Annex I of Directive 67/548/EEC (DSD) (Index N° 011-002-00-6).

Classification

Indication of danger: C - corrosive

R-phrase: R35 - causes severe burns

## 2.3 Other hazards

### 2.3.1. Summary and overall Conclusions on PBT or vPvB Properties Sodium

hydroxide is not considered to be a PBT or vPvB substance.

### 2.3.2. Precautionary statements

P260: Do not breathe dust/fume/gas/mist/vapors/spray.

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

P303 + P361 + P353: IF ON SKIN (or hair): Remove/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.

P310: Immediately call a POISON CENTER or doctor/physician.

The proposed Precautionary Statements mentioned above are applicable for industrial use. Other or additional Precautionary Statements may be more appropriate for professional and/or consumer use of NaOH.

## 3 COMPOSITION/ INFORMATION ON INGREDIENTS

Components:	CAS №	EC number (EINECS, EILINCS)	Mass fraction, %
Sodium hydroxide NaOH	1310-73-2	215-185-5	not less than 99.5
Sodium carbonate Na <sub>2</sub> CO <sub>3</sub>	497-19-8	207-838-8	not more than 1.0

## 4 FIRST AID MEASURES

### 4.1 Description of first aid measures

#### If inhaled

- Move to fresh air.

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- Oxygen or artificial respiration if needed.
- Victim to lie down in the recovery position, cover and keep him warm.
- Call a physician immediately.

**In case of eye contact**

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine).
- Call a physician or poison control centre immediately.
- Take victim immediately to hospital.

**In case of skin contact**

- Take off contaminated clothing and shoes immediately.
- Wash off immediately with plenty of water.
- Keep warm and in a quiet place.
- Call a physician or poison control centre immediately.
- Wash contaminated clothing before re-use.

**In case of ingestion:**

- Call a physician or poison control centre immediately.
- Take victim immediately to hospital.
- If swallowed, rinse mouth with water (only if the person is conscious).
- Do NOT induce vomiting.
- Artificial respiration and/or oxygen may be necessary.

**Information to physician:** Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer for medical attention.

**4.2 Most important symptoms and effects, both acute and delayed****In case of skin contact:**

Burn injury with necrosis phenomena, spreading deep into tissues, nonhealing wounds lead to cicatrization;

**In case of eye contact:**

Smarting in eyes, burning sensation, lacrimation, strong edema and conjunctivitis of eyes, corneal opacity, and damage of iris. Eye contact with solutions or solid alkali causes chemical burn, possibly blindness;

**In case of inhalation:**

Cough, constriction, rhinitis, lacrimation;

**In case of per-oral intoxication (by ingestion):**

Burning of lips, mucous membranes of oral cavity, gullet, stomach, salivation, sickness and vomiting, often with blood, pains in the mouth, in tract of breast-bone and in abdominal zone, painful swallowing, effect of collapse.

**4.3 Indication of any immediate medical attention needed:**

In case of intoxication, eye and skin contact with sodium hydroxide immediate medical attention is required. Absence of visible signs or symptoms of burns doesn't exclude actual tissue damage. Rest and medical observation are therefore essential.

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## 5 FIREFIGHTING MEASURES

### 5.1. Extinguishing media

**Suitable extinguishing media:**

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable extinguishing media:**

- Water may be ineffective.

### 5.2. Specific hazards arising from the chemical

- The product is not flammable.
- Not combustible.
- Reacts violently with water.
- Gives off hydrogen by reaction with metals.

### 5.3. Special protective actions for fire-fighters

- In the event of fire, wear self-contained breathing apparatus.
- Use personal protective equipment.
- Wear chemical resistant oversuit
- Cool containers / tanks with water spray.

Specificity of firefighting:

No applicable.

## 6 ACCIDENTAL RELEASE MEASURES

### 6.1. Personal precautions, protective equipment and emergency procedure

**Advice for non-emergency personnel:**

- Prevent further leakage or spillage if safe to do so.
- Keep away from Incompatible products.

**Advice for emergency responders:**

- Evacuate personnel to safe areas.
- Keep people away from and upwind of spill/leak.
- Ventilate the area.
- Wear suitable protective clothing.

### 6.2. Environmental precautions

- Should not be released into the environment.
- Do not flush into surface water or sanitary sewer system.

### 6.3. Methods and materials for containment and cleaning up -

- Sweep up and shovel into suitable containers for disposal.
- Avoid dust formation.
- Keep in properly labelled containers.

- Keep in suitable, closed containers for disposal.

#### **6.4 Reference to other sections**

Treat recovered material as described in the sections 7,8,13.

### **7 HANDLING AND STORAGE**

#### **7.1. Precautions for safe handling**

- Used in closed system
- When diluting, always add the product to water. Never add water to the product.
- Use only equipment and materials which are compatible with the product.
- Keep away from Incompatible products.
- Preferably transfer by pump or gravity.
- All the works connected with the product should be performed using protective clothes and IPM.

#### **7.2. Conditions for safe storage, including incompatibilities**

Storage:

- Store in original container.
- Keep in a well-ventilated place.
- Keep in a dry place.
- Keep in properly labelled containers.
- Keep container closed.
- Avoid dust formation.
- Keep away from incompatible products.

#### **Packaging material Suitable**

**material:**

- Stainless steel, hermetic polyethylene, polypropylene, polypropylene laminated bags, as well as soft containers made of polypropylene material.

**Unsuitable material:**

- metals such as aluminum, magnesium, tin, zinc, copper, bronze, brass, chromium; - water-permeable materials.

#### **7.3. Specific end use(s)**

- Technical function of substance (what it does): intermediates, pH-regulating agents, laboratory chemicals.
- For further information, please contact: Supplier.
- Exposure scenarios for the identified uses are set out in the annex.

### **8 EXPOSURE CONTROLS / PERSONAL PROTECTION**

#### **8.1 Control parameters**

##### **8.1.1 Derived No Effect Level (DNEL)**

Workers

Acute / short-term (dermal, inhalation – local and systemic effects)

Long term (dermal – local and systemic effects, inhalation – systemic effects)

The focus is the occurrence of local effects after acute and repeated exposure at those places where NaOH is produced and/or used. This is because NaOH is not expected to become systemically available in the body under normal handling and use conditions.

DNEL long-term inhalation = 1.0 mg/m<sup>3</sup> (local effects)

#### General population

Acute / short-term (dermal, inhalation, oral – systemic effects; dermal, inhalation - local)

Long term (dermal, inhalation, oral – systemic effects; dermal - local effects)

As sodium hydroxide is not expected to become systemically available in the body under normal handling and use conditions, the focus is on possible risks from acute exposure (local effects). DNEL long-term inhalation = 1.0 mg/m<sup>3</sup> (local effects)

### 8.1.2 Predicted No Effect Concentration (PNEC)

PNEC aqua (freshwater, marine water, intermittent releases, STP): The toxicity of NaOH can be ascribed to the pH increase due to the addition of OH<sup>-</sup>, as the sodium concentrations are too low to explain the effects observed in acute toxicity studies. A generic PNEC cannot be derived from single-species toxicity data for NaOH, as the pH of natural waters as well as the buffer capacity of natural waters show considerable differences and aquatic organisms/ecosystems are adapted to these specific natural conditions, resulting in different pH optima and pH ranges that are tolerated.

PNEC (sediment (freshwater/marine water), soil): The high water solubility and very low vapour pressure indicate that NaOH will be found predominantly in water. In water (including soil or sediment pore water), NaOH is present as the sodium ion (Na<sup>+</sup>) and hydroxyl ion (OH<sup>-</sup>), as solid NaOH rapidly dissolves and subsequently dissociates in water.

PNEC oral: According to the EU RAR (2007) bioaccumulation in organisms is not relevant for NaOH.

### 8.1.3 National Occupational Exposure Limits OEL

OEL = 0.5 mg/m<sup>3</sup>

Occupational Exposure Limits (OELs) in the EU and Norway (ACGIH, 2006)

EU Member State	Unit	TW	ST	Ceiling	Reference
Austria	mg/m <sup>3</sup>	2	4		
Belgium	mg/m <sup>3</sup>			2	ACGIH (2006)
Czech Republic	mg/m <sup>3</sup>	1	2		ACGIH (2006)
Denmark	mg/m <sup>3</sup>	2			
Finland	mg/m <sup>3</sup>	2			ACGIH (2006)
France	mg/m <sup>3</sup>	2			
Hungary	mg/m <sup>3</sup>	2			
Ireland	mg/m <sup>3</sup>		2		ACGIH (2006)
Norway	mg/m <sup>3</sup>			2	ACGIH (2006)
Poland	mg/m <sup>3</sup>	0.5	1		ACGIH (2006)
Portugal	mg/m <sup>3</sup>		2		
Spain	mg/m <sup>3</sup>		2		ACGIH (2006)
Sweden	mg/m <sup>3</sup>	1		2	ACGIH (2006)
United Kingdom	mg/m <sup>3</sup>		2		ACGIH (2006)

## 8.2. Exposure controls

**8.2.1. Appropriate engineering controls -**

Ensure adequate ventilation.

- Apply technical measures to comply with the occupational exposure limits.

**8.2.2. Individual protection measures Eye protection:**

- Chemical resistant goggles must be worn. **Skin and body protection:**

- Chemical resistant apron

- Apron/boots of PVC, neoprene in case of dusts. **Hand protection:**

- Impervious gloves

- Suitable material: PVC, Neoprene, Natural Rubber, butyl-rubber - Unsuitable material: Leather

**Respiratory protection:**

- In the case of dust or aerosol formation use respirator with an approved filter. - Recommended Filter type: P2 **Hygiene measures:**

- Eye wash bottles or eye wash stations in compliance with applicable standards.

- Take off contaminated clothing and shoes immediately.

- Handle in accordance with good industrial hygiene and safety practice.

**8.2.3. Environmental exposure controls**

- Dispose of rinse water in accordance with local and national regulations.

**9 PHYSICAL AND CHEMICAL PROPERTIES****9.1 Information on basic physical and chemical properties****Characteristics**

Molecular formula:	NaOH
Molecular weight range:	40.0
Physical state at 20 °C and 101.3 kPa	White granules of spherical or semispherical form, slighttints are admitted.
Odour	Odourless
pH	> 13
Melting point/freezing point, °C	320-324
Boiling point, °C	1378
Relative density g/sm <sup>3</sup> (at 20 °C)	2.02-2.13
Bulk density g/sm <sup>3</sup> (at 20 °C)	1.14
Water solubility mg/l (at 20 °C)	522000
Solvent solubility	Insoluble in fats, acetone and ether. Soluble in ethanoland glycerol.
Vapour pressure	Not applicable. According to the REACH Regulation, thestudy does not need to be conducted if the melting point isabove 300°C (Annex VII, column 2 adaptation).

Partition coefficient: n-octanol/water	Not applicable. According to the REACH Regulation, the study does not need to be conducted if the substance is inorganic (Annex VII, Column 2 adaptation)
Autoignition temperature	No data
Decomposition temperature	No data
Viscosity	not applicable
Granulometry, mm	0.8-2.7
Flammability	The substance is not flammable
Explosive properties -	Fire- and explosion-proof
Oxidizing properties	Non oxidizer

## 9.2 Other information

Avoid storage and transportation in open condition, because absorption of water and carbon dioxide of air with heat emission takes place.

Accidental contact of the product with nitric acid and other strong acids should be avoided, as soon as reaction with them is accompanied by release of heat.

NaOH is a strong alkaline substance that dissociates completely in water into the sodium ion (Na<sup>+</sup>) and hydroxyl ion (OH<sup>-</sup>). The dissolution/dissociation in water is strongly exothermic, so a vigorous reaction occurs when NaOH is added to water.

## 10 STABILITY AND REACTIVITY

### 10.1 Reactivity:

- Potential for exothermic hazard -
- May be corrosive to metals.

### 10.2. Chemical stability

- Stable under recommended storage conditions.

### 10.3. Possibility of hazardous reactions -

- Gives off hydrogen by reaction with metals.
- Exothermic reaction with strong acids.
- Risk of reaction violent up to explosion.
- Reacts violently with water.

### 10.4. Conditions to avoid -

- Exposure to moisture.
- Freezing

### 10.5. Incompatible materials

- Acids, including organic;
- Metals, such as aluminum, magnesium, tin, zinc, other light metals and their alloys;

### 10.6. Hazardous decomposition products

- Hydrogen (as a result of reaction with light metals)



**11 TOXICOLOGICAL INFORMATION**

Acute oral toxicity:	LD50 = 40 mg/kg, i.p., mice. LDmin = 500 mg/kg, i.g., rabbits. Lethal dose by ingestion for man is 4.95 mg/kg.
In case of skin contact:	Causes strong irritation and chemical burns of skin.
In case of eye contact:	Causes strong irritation and chemical burns of eyes.
In case of inhalation:	The vapors of the product (aerosol) irritate strongly upper respiratory tract.
Sensitizing effect:	Not considered to be a skin sensitizer.
Carcinogenicity	no data available
Mutagenicity:	Animal testing did not show any mutagenic effects., In vitro tests did not show mutagenic effects
Toxicity for reproduction	Effect on fertility, foetotoxic effect, no observed effect
Specific target organ toxicity – single exposure	Inhalation: Corrosive Oral: Corrosive Dermal: Corrosive
Specific target organ toxicity – repeated exposure	not applicable
Extent of hazardous effect on human organism:	Sodium hydroxide is a highly hazardous substance for human organism. When getting on cutaneous covering it causes chemical burn dissolving albumins into albumites. While long term exposure upon cutaneous covering may cause ulcers and eczemas. Has strong effect on mucous membranes, may cause damage of upper respiratory system and lungs. Even the most minor amount of caustic soda is hazardous for eyes.

**12 ECOLOGICAL INFORMATION****12.1 Ecotoxicity**

Acute toxicity for fish:	LC50 = 45,4 mg/l, <i>Oncorhynchus mykiss</i> (Rainbow trout) 96h . LC50 = 160 mg/l, <i>Carassius auratus</i> (Goldfish) 24h.
	LC50 = 189 mg/l, <i>Leuciscus idus melanotus</i> (Golden orfe) 48h. LC50 = 125 mg/l, <i>Gambusia affinis</i> (Mosquitofish) 24, 48, 96h.
Acute toxicity for invertebrates:	EC 40 – 240 mg/l <i>Daphnia magna</i> ( <i>Daphnia Magna</i> ). LC50 = 40 mg/l <i>Ophryotrocha diadema</i> ( <i>Marine polychaete</i> ) 48h.
Acute toxicity for microorganisms:	EC50 = 22 mg/l <i>Photobacterium phosphoreum</i> (luminescent bacterium) 15min.
Additional information:	LC50 30 – 100 mg/l, Crangon ( <i>Crustaceans</i> ) и Asteroidne (Starfish), 48h.

**12.2 Persistence and degradability**

Transforms in the environment. Product of transformation is sodium carbonate.

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**12.3 Bioaccumulative potential**

Not relevant

**12.4 Mobility in soil**

Very mobile in soil and soluble in water where its ionization/neutralization takes place. Is not dispersed in the air.

**12.5 Results of PBT and vPvB assessment**

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

**12.6 Other adverse effects**

No data available

**13 DISPOSAL CONSIDERATIONS****13.1. Waste treatment methods -**

Dilute with plenty of water.

- Solutions with high pH-value must be neutralized before discharge.
- Neutralize with acid.
- In accordance with local and national regulations.

**13.2. Contaminated packaging**

- Where possible recycling is preferred to disposal or incineration.
- Clean container with water.
- Dispose of as unused product.
- In accordance with local and national regulations.

**14 TRANSPORT INFORMATION****- IATA-DGR**

UN number	UN 1823
Class	8
Packing group	II
ICAO-Labels	8 - Corrosive
Proper shipping name	SODIUM HYDROXIDE, SOLID

**-IMDG**

UN number	UN 1823
Class	8
Packing group IMDG	II
Labels	8 - Corrosive
HI/UN No.	1823

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EmS      F-A S-B

Environmental hazards      Marine pollutant: no  
Proper shipping name      SODIUM HYDROXIDE, SOLID

**-ADR**

UN number      UN 1823  
Class      8  
Packing group      II  
ADR/RID-Labels      8 - Corrosive  
HI/UN No.      80/1823  
Proper shipping name      SODIUM HYDROXIDE, SOLID

**-RID**

UN number      UN 1823  
Class      8  
Packing group      II  
ADR/RID-Labels      8 - Corrosive  
HI/UN No.      80/1823  
Proper shipping name      SODIUM HYDROXIDE, SOLID

**- ADN**

UN number      UN 1823  
Class      8  
Packing group      II  
ADR/RID-Labels      8 - Corrosive  
Proper shipping name      SODIUM HYDROXIDE, SOLID

**15 REGULATORY INFORMATION****15.1. Applicable Laws or Regulations**

- 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), as amended
- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances, 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, as amended
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work, as amended
- Commission Directive 2000/39/EC of 8 June 2000 establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work, as amended
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste

**15.2. Chemical safety assessment**

A chemical safety assessment has been carried out for this substance.

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Read the safety data sheet before using the product.

**16.2 Recommended restrictions on use:**

No restrictions at intended application.

**16.3. Advice on using information stated in the safety data sheet**

This SDS is only intended for the indicated country to which it is applicable. The European SDS format compliant with the applicable European legislation is not intended for use nor distribution in countries outside the European Union with the exception of Norway and Switzerland. Safety data sheets applicable in other countries/regions are available upon request.

The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product which conforms to the specification, unless otherwise stated. In this case of combinations and mixtures one must make sure that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and the environment.

Responsible executives, who receive this data sheet, must guarantee that every person, potential to use, treat, dispose or contact with the product in some other way, have read and understood the information described here properly. Note that appearance and content of safety data sheets for the same product may vary in different countries to comply with requirements of different regulations.