

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY/UNDERTAKING

### 1.1 Product Identifier

Chemical name: Sodium hydroxide  
 EC number: 215-185-5  
 CAS number (EC inventory): 1310-73-2  
 Index number: 011-002-00-6  
 Registration number: 01-2119457892-27-0066  
 Chemical characterization: Inorganic mono-constituent substance - in solution

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

In industry it can be used, for example, for adjusting pH, producing biodiesel from vegetable oils or cleaning bottles (food industry), for flotation deinking (pulp and paper industry), drying air, extracting alumina (aluminium industry) or mercerising cotton (textile industry), in leather tanning, for peeling vegetables, manufacturing chemical products (intermediate use), regenerating resins or softening water. Consumer uses include stripping paint or unblocking drains.

Relevant Identified Uses (see corresponding <i>Exposure Scenario</i> - ES, annexed to this SDS)	<ul style="list-style-type: none"> <li>• Manufacture of liquid NaOH - Exposure Scenario 1 – Annex 1</li> <li>• Manufacture of solid NaOH - Exposure Scenario 2 – Annex 2</li> <li>• Industrial and occupational use of NaOH - Exposure Scenario 3 – Annex 3</li> <li>• Consumer use of NaOH - Exposure Scenario 4 – Annex 4</li> </ul>
Uses advised against	There are no uses advised against.

### 1.3 Details of the supplier of the safety data sheet

See footnote.

### 1.4 Emergency telephone number

ELECTROQUÍMICA DEL NOROESTE, S.A.U Telf: 0034 986 866 569 (24 hours/day), Fax: 0034 986 866 822  
 Emergency National Number: 112

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

Regulation (EC) No 1272/2008

<u>Class of hazard</u>	<u>Hazard category</u>	<u>Hazard statements</u>
<i>Skin corrosion</i>	<i>Cat 1A</i>	H314: Causes severe skin burns and eye damage
<i>May be corrosive to metals</i>	<i>Cat 1</i>	H290: May be corrosive to metals

Additional information

Specific concentration limits CLP

Concentration (%)	Classification
C ≥ 5 %	Skin corrosion1A; H314 Causes severe skin burns and eye damage
2 % ≤ C < 5 %	Skin corrosion1B; H314 Causes severe skin burns and eye damage
0,5 % ≤ C < 2 %	Skin corrosion 2; H315 Causes skin irritation
0,5 % ≤ C < 2 %	Eye irritation 2; H319 Causes serious eye irritation


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## 2.2 Label Elements

Regulation (EC) No 1272/2008

Signal word		DANGER	
Symbol(s):	GHS05	CORROSION	
Hazard statements:	H314	Causes severe skin burns and eye damage	
Precautionary statements:	P260 P280 P310 P303 + P361 + P353 P305 + P351 + P338	Do not breathe dust/fume/gas/mist/vapours/spray. Wear protective gloves/protective clothing/eye protection/face protection. Immediately call a POISON CENTER or doctor/physician IF ON SKIN (OR HAIR): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	
Precautionary statements for end user:	P101 P102 P103	If medical advice is needed, have product container or label at hand. Keep out of reach of children. Read label before use.	

When the substance is sold to the general public at a concentration of 0.2% or greater, the following is obligatory:

- The packaging must be fitted with child-resistant fastenings.
- The label must carry a tactile hazard warning.

The packaging of the product should have:

- A single seal fastener for opening.
- EC No.
- Indication of "EC Labelling".

## 2.3 Other Hazard

- Not available.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

Hazardous substance

Chemical Name	CAS-No.	EC-No.	REACH No.	Concentration[%]
Sodium hydroxide	1310-73-2	215-185-5	01-2119457892-27-0066	>30%

### 3.2 Mixtures

Not applicable.

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## SECTION 4: FIRST AID MEASURES

### 4.1 Description of first aid measures

<b>If inhaled:</b>	<ul style="list-style-type: none"> <li>- Remove the victims(s) into the fresh air.</li> <li>- If necessary, administer oxygen or artificial respiration.</li> <li>- Lay the victim in the recovery position and keep warm.</li> <li>- Immediately call for medical attention.</li> </ul>
<b>In case of skin contact:</b>	<ul style="list-style-type: none"> <li>- Remove immediately contaminated clothing and shoes.</li> <li>- Rinse immediately with plenty of water</li> <li>- Keep victim warm and in a calm place.</li> <li>- Call a physician or contact SOS POISONS immediately.</li> <li>- Wash contaminated clothing before using it again.</li> </ul>
<b>In case of eye contact:</b>	<ul style="list-style-type: none"> <li>- Rinse immediately with plenty of water, including under the eyelids, for at least 15 minutes.</li> <li>- Call a physician or contact SOS POISONS immediately.</li> <li>- Take the victim to hospital immediately.</li> </ul>
<b>If swallowed:</b>	<ul style="list-style-type: none"> <li>- Call a physician or contact SOS POISONS immediately.</li> <li>- Take the victim to hospital immediately.</li> <li>- If swallowed, rinse mouth out with water (only if victim is conscious).</li> <li>- DO NOT induce vomiting.</li> <li>- Artificial respiration and/or oxygen may be required.</li> </ul>

### Self-protection of rescuers

<i>Respiratory protection:</i>	<ul style="list-style-type: none"> <li>- wear a mask with appropriate filter.</li> <li>- Recommended filter type: P2.</li> </ul>
<i>Hand protection:</i>	<ul style="list-style-type: none"> <li>- Wear waterproof gloves.</li> <li>- Suitable material:- PVC, neoprene, natural rubber and butyl rubber</li> </ul>
<i>Eye protection:</i>	<ul style="list-style-type: none"> <li>- Chemically resistant goggles must be worn.</li> </ul>

### 4.2 Most important symptoms and effects, both acute and delayed:

#### 4.2.1 Inhalation

- Corrosive to respiratory system.
- Symptoms: Difficulty in breathing, coughing, chemical pneumonia and pulmonary oedema.

#### 4.2.2 Skin contact

- Causes severe burns.
- Symptoms: Redness, tissue swelling and burning.

#### 4.2.3 Eye contact

- Causes severe burns.
- Small amounts splashed into eyes may cause irreversible damage and blindness.
- Symptoms: redness, lacrimation, tissue swelling and burning.

#### 4.2.4 Swallowing

- If swallowed, causes severe burns in the mouth and throat and risk of perforating the oesophagus and stomach.
- Symptoms: Nausea, abdominal pain, vomiting with blood, diarrhoea, suffocation, coughing and respiratory deficiency.

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#### 4.3 Indication of immediate medical attention and special treatment needed:

- Eye contact: Rinse immediately with water for 30 minutes. In case of difficulty opening eyelids, administer analgesic collyrium (oxybuprocaine).
- Skin contact: Remove clothing and rinse with plenty of water.
- Swallowing: Rinse mouth out with water. Do not induce vomiting, give milk. Artificial respiration and/or oxygen may be required.

### SECTION 5: FIREFIGHTING MEASURES

#### 5.1 Extinguishing media

Suitable extinguishing media:	<i>Use extinguishing media suited to the local circumstances and surroundings (for example): Dry chemical powder and CO<sub>2</sub>.</i>
Unsuitable extinguishing media:	Water may be ineffective.

#### 5.2 Special hazards arising from the substance or mixture

- The product is neither inflammable nor combustible.
- Reacts exothermically with water.
- Gives off hydrogen upon reaction with metals.

#### 5.3 Advice for firefighters

- In case of fire, use self-contained breathing apparatus.
- Use personal protective equipment.
- Wear chemically resistant suit.
- Cool the containers/tanks by spraying with water.

### SECTION 6: ACIDENTAL RELEASE MEASURES

#### 6.1 Personal precautions, protective equipment and emergency procedures

- Prevent additional spillage, if safe to do so.
- Keep away from incompatible products.
- Evacuate staff to safe areas.
- Keep staff away from the spill and upwind of it.
- Ventilate the area.
- Wear suitable protective clothing.

##### 6.1.1 For staff not involved in the emergency response

- Move people to a safe area.

##### 6.1.2 For staff responsible for emergency response

- Wear suitable personal protective equipment (e.g.: chemical protection suit; goggles, protective footwear, gloves and suitable respiratory protective equipment)
- Evacuate staff to safety areas.
- Keep people away.
- Ventilate the area.

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## 6.2 Environmental precautions

- Do not release into the environment.
- Do not flush into surface water or into sanitary sewer system.
- If the product contaminates rivers, lakes or sewers, inform the responsible authorities.

## 6.3 Methods and materials for containment and cleaning up

### 6.3.1 - Contain the spill with protective barriers.

- Cover the sewer exits.

### 6.3.2 - Use absorbent material.

- Gather the waste in suitable containers for this substance.
- Keep the waste in duly labelled containers.

### 6.3.3 - Never use water on spills of this product.

## 6.4 Reference to other sections

- See points 7 and 8 for protective measures.
- See point 13 on waste treatment.

## SECTION 7: HANDLING AND STORAGE

### 7.1 Precautions for safe handling

- To avoid thermal decomposition, do not overheat *the substance*.
- When diluting, add the product to water. Never add water to the product.
- Use the product in closed systems.
- Use only equipment and materials compatible with the product.
- Keep away from incompatible products, *as acids*.
- Preferably use a pump or gravity when transferring.

### 7.2 Conditions for safe storage, including any incompatibilities

- Store in the original container.
- Store in a well-ventilated place.
- Keep in a dry place.
- Keep in duly labelled containers.
- Keep the container closed.
- Prevent dust from gathering.
- Keep away from incompatible products (*acids*).
- Suitable material:- Stainless steel and polyethylene.

### 7.3 Specific end use(s)

NaOH is used during the production phase of several cleaning products, though in most cases the amounts used in end products are limited.

Professional cleaning products with free NaOH after formulation are: floor strippers, oven and floor degreasers, drain unblockers, dishwashing products and polish removers.

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## SECTION 8: EXPOSURE CONTROL/ PERSONAL PROTECTION

### 8.1 Control parameters

#### 8.1.1 Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Legal Basis
Sodium hydroxide	1310-73-2	2 mg/m <sup>3</sup>	MC	NP 1796: 2007

(\*) For Sodium Hydroxide in solid state.

#### 8.1.2 DNEL/PNEC value(s)

##### DNEL value(s)

DNEL for sodium hydroxide for long-term inhalation, workers = 1.0 mg/m<sup>3</sup>.

DNEL for sodium hydroxide for long-term inhalation, general population = 1.0 mg/m<sup>3</sup>

##### PNEC value(s)

No data.

### 8.2 Exposure controls

#### 8.2.1 Appropriate Engineering Controls

- Ensure adequate ventilation.
- Apply the technical measures to meet the occupational exposure limits.

#### 8.2.2 Individual Protection Measures, Such as Personal Protective Equipment

Respiratory protection:	- In case of dust or aerosol formation, wear a mask with appropriate filter. - Recommended filter type: P2.
Hand protection:	- Wear waterproof gloves. - Suitable material: PVC, neoprene, natural rubber and butyl rubber. - Unsuitable material: Leather.
Eye protection:	- Chemically resistant goggles must be worn.
Body and skin protection:	- In case of dust, chemically resistant PVC or neoprene boots and apron must be worn.
Hygiene measures:	- Eye-wash stations must be available in accordance with applicable standards. - Remove immediately contaminated clothing and shoes. - Handle in accordance with good industrial health and safety practices.

#### 8.2.3 Environmental Exposure Controls

Discard rinse water in compliance with applicable regulations:

- Portaria nº 209/2004, de 3 de Março – European Waste List (Commission Decision 2000/532/EC);
- Decreto – Lei n.º 178/2006 – Waste Management;
- Portaria nº 1408/2006 of 18 December – Regulations on operating the integrated electronic waste record system.
- Decreto – Lei n.º 73/2011, de 17 de Junho – Altera o regime geral da gestão de resíduos e transpõe a *Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives*

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## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

a) Appearance:	Viscous liquid
b) Odour:	Odourless
c) Odour threshold:	No data(*)
d) pH:	>13
e) Melting point/freezing point:	From 0 °C (30% (m/m)) to 12 °C (50% (m/m))
f) Initial boiling point and boiling range:	116 °C (30% (m/m)) to 143 °C (50% (m/m))
g) Flash point:	Product is not flammable
h) Evaporation rate:	No data(*)
l) Flammability (solid, gas):	Not applicable (**)
j) Upper/lower limits of flammability or explosivity:	The product is neither flammable nor explosive
k) Vapour pressure:	< 13.3 hPa, at 20 °C
l) Vapour density:	No data (*)
m) Relative density:	1.33 to 1.51
n) Solubility(ies):	Totally soluble at 20 °C
o) Partition coefficient n-octanol/water:	Not applicable (**)
p) Auto-ignition temperature:	No data (*)
q) Decomposition temperature:	No data
r) Viscosity:	12 to 120 mPa.s, at 20 °C
s) Explosive properties:	Not applicable (**)
t) Oxidising properties:	Not applicable (**)

(\*) No reliable data source for this data

(\*\*) According to EU Risk Assessment Report – Vol. 73

### 9.2 Other information

Dissociation constant:	Sodium hydroxide dissociates completely in water to Na <sup>+</sup> and OH <sup>-</sup> .
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- NaOH is a strong base that dissociates in water, in the sodium ion (Na<sup>+</sup>) and in the hydroxyl ion (OH<sup>-</sup>). Dissolution/disassociation in water is highly exothermal.

## SECTION 10: STABILITY AND REACTIVITY

### 10.1 Reactivity

- Potential exothermal hazard;
- May be corrosive to metals.

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## 10.2 Chemical stability

- Stable if stored in the recommended conditions.

## 10.3 Possibility of hazardous reactions

- Gives off hydrogen upon reaction with metals.
- Exothermic reaction with strong acids.
- Violent reaction risk.
- Explosion risk.
- Reacts violently with water.

## 10.4 Conditions to avoid

- Keep out of direct sunlight.
- To avoid thermal decomposition, do not overheat.
- Do not submit the product to low temperatures (risk of freezing).

## 10.5 Incompatible materials

- Acids, oxidising agents, aluminium and other light metals and their alloys

## 10.6 Hazardous decomposition products

- Hydrogen (through contact with metals).

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

The greatest hazard (and mode of action) that NaOH poses to human health is local irritation and/or corrosion. When human skin is exposed to low concentrations (non-irritant), absorption of NaOH should be relatively low due to low ion absorption. It is therefore likely that, in normal conditions of use and handling, assimilation of NaOH will be limited. In these conditions, the absorption of OH<sup>-</sup>, via exposure to NaOH, should not alter the pH of the blood. Furthermore, in these conditions, sodium absorption through exposure to NaOH is far less than the assimilation of sodium through food products. Consequently, it is unlikely that NaOH is systemically available in the body in normal conditions of use and handling (EU RAR, 2007).

Hazard class	Dose descriptor	Method/reference
Acute oral toxicity:	No Data	
Acute dermal toxicity:	No Data	
Acute inhalation toxicity:	No Data	
Skin irritation/ corrosion:	Irritating for 61% of human volunteers (0.5% NaOH; for exposure up to 1 hour)  In vitro study on skin tissue; Result: corrosive (500 µL of a water-based formulation containing sodium hydroxide; breakthrough time of 13.16 min ± 0.06)	Coverage: fragment – 25 mm Hill Top chamber containing a Webril pad (closed exposure); York et al. 1996). Griffiths et al.(1997).  Stobbe et al. (2003)
Eye irritation/corrosion:	In rabbits: Not irritating (1% solution of NaOH) Irritating (2% solution of NaOH)	OECD Directive 405 (Acute irritation/corrosion of the eyes) Jacobs (1992).
Respiratory irritation.	NOEL (humans) =1 mg/m <sup>3</sup> sodium Hydroxide Mist (respiratory irritation)	Fritschi et al. (2001)

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Skin Sensitisation:	No Data	
Germ cell mutagenicity:	No Data	
Carcinogenicity:	No Data	
Reproductive toxicity:	No Data	
STOT - SE	No Data	
STOT- RE	No Data	
Aspiration hazard	No Data	

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1 Toxicity

#### Information on environmental effects

Its high solubility in water 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 sodium ion (Na<sup>+</sup>) and hydroxyl ion (OH<sup>-</sup>). As a solid, NaOH dissolves rapidly and subsequently dissociates in water (EU RAR, 2007).

If released into the air as an aerosol in water, NaOH will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or other acids), in the following way: NaOH + CO<sub>2</sub> → HCO<sub>3</sub><sup>-</sup> + Na<sup>+</sup>. Subsequently, the salts (e.g. sodium (bi)carbonate) will be dissipated from the air (US EPA, 1989; OECD, 2002).

In this way, air releases of neutralised NaOH will mainly end up in the soil or water. If released into the soil, the absorption of soil particles will be insignificant (EU RAR, 2007). Depending on the buffering capacity of the soil the OH<sup>-</sup> will be neutralised in water in the porous soil, or the pH may increase.

Hazard class	Dose descriptor	Method/reference
Toxicity to fish:	No reliable information exists.	
Toxicity to daphnia and other aquatic invertebrates:	EC <sub>50</sub> (48 h): 40.4 mg/l (nominal) based on: Immobility (Ceriodaphnia sp.)	48-hour acute immobilisation test in accordance with the Environment Protection Authority; Warne et al. (1999).
Toxicity to algae/cyanobacteria	No data.	
Toxicity to freshwater plants	No data.	

### 12.2 Persistence and degradability

Biodegradability:	No data – study scientifically unjustified (inorganic substance).
Degradation (abiotic):	Data waiving – study scientifically unjustified (inorganic substance).

### 12.3 Bioaccumulative potential

- Since NaOH is highly soluble in water, it is unlikely to bioconcentrate in organisms.

### 12.4 Mobility in soil

No data.

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## 12.5 Results of PBT/vPvB assessment

- NaOH does not meet the criteria of persistence, bioaccumulation and toxicity. Therefore, NaOH is not considered to be a PBT or vPvB substance (EU RAR, 2007).

## 12.6 Other adverse effects

- Not applicable.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

#### Waste disposal procedures:

- It is not advisable to discharge caustic soda waste through the wastewater.
- Solutions with high pH must be neutralised with inorganic acids before being sent for disposal.
- EWC Code 06 02 04(\*) – Sodium Hydroxide

#### Packaging treatment:

- Recycling of packaging is preferable to elimination or incineration.
- Rinse containers with water e neutralise water used for washing
- EWC Code 15 01 10(\*) – Packaging containing / contaminated by waste from hazardous substances

#### Applicable regulations:

- Portaria nº 209/2004 of 3 March – European Waste List;
- Decreto-Lei nº 178/2006 of 5 September – Waste Management;
- Portaria nº 1408/2006 of 18 December – Regulations on operating the integrated electronic waste record system.
- Decreto – Lei nº 73/2011 of 17 June – Amends the general regime for waste management and transposes Directive 2008/98/EC, of the European Parliament and of the Council, of 19 November on waste

## SECTION 14: TRANSPORT INFORMATION

### ADR

UN number:	1824 (liquid)
UN proper shipping name:	SODIUM HYDROXIDE SOLUTION
Transport hazard class(es):	8
Packing group:	II
Classification Code:	C5
Hazard identification No:	80
Labels:	8
Tunnel restriction code:	(E)
Environmental hazards :	

### IATA/ICAO

UN number:	1824 (liquid)
UN proper shipping name:	SODIUM HYDROXIDE SOLUTION
Transport hazard class(es):	8
Packing group:	II
Labels:	Corrosive (ICAO)
Packing instruction (cargo aircraft):	-
Packing instruction (passenger aircraft):	-
Packing instruction (LQ):	-

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IMDG	Environmental hazards :	-
	UN number:	1824 (liquid)
	UN proper shipping name:	SODIUM HYDROXIDE SOLUTION
	Transport hazard class(es):	8
	Packing group:	II
	Labels:	Corrosive
	EmS Number 1:	F-A, S-B
	Marine pollutant:	No
RID	UN number:	1824 (liquid)
	UN proper shipping name:	SODIUM HYDROXIDE SOLUTION
	Transport hazard class(es):	8
	Packing group:	II
	Classification Code:	C5
	Hazard identification No:	80
	Labels:	8
	Environmental hazards :	-

## SECTION 15: REGULATORY INFORMATION

### 15.1 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, concerning the registration, evaluation, authorisation and restriction of chemicals (REACH), and respective amendments;
- Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations, and respective amendments;
- 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, and respective amendments;
- 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 and respective amendments;
- Commission Directive 2000/39/EC of 8 June 2000 establishing a first list of 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, and respective amendments.
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste.
- Portaria n.º 209/2004, de 3 de Março – Lista Europeia de Resíduos;
- Decreto – Lei n.º 178/2006 de 5 de Setembro – Gestão dos Resíduos;
- Portaria n.º 1408/2006, de 18 de Dezembro – Regulamento de funcionamento do sistema integrado de registo electrónico de resíduos;
- Decreto – Lei n.º 73/2011, de 17 de Junho – Altera o regime geral da gestão de resíduos e transpõe a Directiva n.º 2008/98/CE, do Parlamento Europeu e do Conselho, de 19 de Novembro, relativa aos resíduos;
- Decreto-Lei n.º 24/2012 – Estabelece as prescrições mínimas em matéria de protecção dos trabalhadores contra os riscos para a segurança e saúde devido à exposição a agentes químicos no trabalho, transpondo para a ordem interna a Directiva n.º

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2009/161/EU, da Comissão, de 17 de Dezembro de 2009, que estabelece uma terceira lista de valores limite de exposição profissional indicativos para a aplicação da

- Directiva n.º 98/24/CE, do Conselho, de 7 de Abril de 1998, e altera a Directiva n.º 2000/39/CE, de 8 de Junho de 2000;
- NP 1796:2007 – Valores limite de exposição (VLEs) profissional a agentes químicos, e respectivas actualizações.
- DL 41-A/2010 de 29 de Abril com alterações introduzidas pelo Decreto-Lei n.º 246-A/2015, de 21 de Outubro.

## 15.2 Chemical safety assessment

A chemical safety study was made.

## SECTION 16: OTHER INFORMATION

### General:

This information is to our best present knowledge, correct and complete and is given in good faith. The user shall ensure that the information is complete and appropriate for the uses given in the text. Other specific uses of the product not mentioned in the text remain the user's own responsibility.

### Recommendations for occupational training:

Provide the operators with suitable information, instruction and training on the product.

### List of Changes:

DATE	REVISION	CHANGES MADE
24/01/2015	2	Point 1.1.and 1.4
		Points 2.1 to 2.3
		Points 4.1 to 4.3
		Points 5.1 to 5.3.
		Points 6.1 to 6.4
		Points 7.1 to 7.3
		Points 8.1 to 8.2
		Point 9.1
		Point 10.1 to 10.6
		Point 11.1
		Points 12.1 to 12.6
		Points 13.1 to 13.3.
		Point 14
		Point 15
Point 16		
20/07/2016	3	Change logo
26/01/2017	4	Word "SECTION" added to all section titles
		Section 1.1,1.2 and 1.4
		Section 2.1 and 2.2 - Classification and labeling eliminated regarding the Directive 67/548/ EEC or 1999/45/EC
		Section 4.1

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		Section 5.1
		Section 6.1.1 and 6.1.2
		Section 7.1 and 7.2
		Section 8.1 and 8.2
		Section 9.1
		Section 11.1
		Section 13.1
		Section 14
		Section 15.1
		Section 16

#### Abbreviations mentioned on the Sheet:

AC - Article Category  
 ADR: - The European Agreement concerning the International Carriage of Dangerous Goods by Road.  
 ES: - Exposure Scenario  
 MC: - Maximum concentration  
 DNEL: - Derived Non Effect Concentration  
 EC50 - Half of maximum effective concentration  
 PPE - Personal Protective Equipment  
 ERC - Environmental Release Category  
 WTP: - Water Treatment Plant  
 WWTP: - Wastewater Treatment Plant  
 SDS: - Safety Data Sheet  
 IATA: - International Air Transport Association  
 ICAO: - International Civil Aviation Organisation  
 IMDG: - International Maritime Dangerous Goods  
 LEV: - Low exposure level  
 EWC: - European Waste List  
 m/m: - Mass concentration  
 vPvB: - Very persistent and very bioaccumulative.  
 OEL: - Occupational exposure limit.  
 UNO: - United Nations Organisation  
 PBT: - Persistent, bioaccumulative and toxic.  
 PC - Product Category  
 PNEC: - Predicted No-Effect Concentration  
 PROC - Process Category  
 RID: - International Rule for Transport of Dangerous Substances by Railway  
 STOT - SE: - Specific Target Organ Toxicant - Single Exposure  
 STOT- RE: - Specific Target Organ Toxicant - Repeated Exposure  
 SU - Sector of Use  
 STEL: - Short-term exposure limit

#### References:

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#### Annexes:

- Annex 1: Exposure Scenario - Manufacturing of liquid NaOH
- Annex 2: Exposure Scenario - Manufacturing of solid NaOH
- Annex 3: Exposure Scenario - Industrial and professional use of NaOH
- Annex 4: Exposure Scenario - Consumer use of NaOH

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## Annex 1 Exposure Scenario - Manufacturing of liquid NaOH

### Exposure Scenario 1: Manufacture of liquid NaOH

#### List of all use descriptors

Sector of use (SU): - SU 3, 8 Manufacture of bulk, large scale chemicals.

Product category (PC): - Not applicable.

Process category (PROC):

PROC1 - Use in closed process, no likelihood of exposure.

PROC2 - Use in closed, continuous process with occasional controlled exposure.

PROC3 - Use in closed batch process (synthesis or formulation).

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises.

PROC8a/b – Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at (non-) dedicated facilities.

PROC9 – Transfer of substance or preparation into small containers (dedicated filling line, including weighing).

Article category (AC): Not applicable.

Environmental Release:

Category (ERC): - ERC1 Manufacture of substances.

#### EU Risk Assessment

A risk assessment was undertaken by the EU based on Regulation of Existing Substances (*Council Regulation 793/93*). In 2007 a global risk assessment report was finalised and is available on the internet:

[http://ecb.jrc.ec.europa.eu/DOCUMENTS/ExistingChemicals/RISK\\_ASSESSMENT/REPORT/sodiumhydroxidereport416.pdf](http://ecb.jrc.ec.europa.eu/DOCUMENTS/ExistingChemicals/RISK_ASSESSMENT/REPORT/sodiumhydroxidereport416.pdf)

### Contributing scenario of environmental exposure control

#### Product characteristics

Liquid NaOH, all concentrations.

#### Frequency and duration of use

Continuous.

#### Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

The purpose of the risk management measures related to the environment is to avoid discharge of NaOH solutions into municipal wastewaters or surface waters, since they could significantly alter the pH.

The pH values must be monitored regularly during release into surface waters. Generally discharges must be made so that changes in the pH of surface water are kept to a minimum.

Generically most aquatic organisms can tolerate pH values of 6-9. This is also mentioned in the OECD standard tests with aquatic organisms.

#### Conditions and measures related to external treatment of waste for disposal

Liquid NaOH waste must be reused or discharged into industrial wastewater and then neutralised, if necessary.

### Contributing scenario controlling worker exposure

#### Product characteristics

Liquid NaOH, all concentrations.

#### Frequency and duration of use/exposure

8 hours/day, 200 days/year

#### Technical conditions and measures at process level (source) to prevent release

Where possible, substitute manual processes with automated and/or closed processes. Irritating mists, sprays and potential splashes will therefore be avoided:

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- Use closed systems or cover the open containers (for example with canvas);
- Transport in pipelines, technical filling/emptying of drums with automatic systems (suction pumps, etc.);
- Use long-handled tongs for manual use "to avoid direct contact and exposure to splashes".

#### Technical conditions and measures to control dispersion from sources towards the worker

Local and/or general ventilation is a good practice.

#### Organisational measures to prevent/limit releases, dispersion and exposure

Workers who act in risk processes/areas must be trained to:

- Avoid working without respiratory protection.
  - Understand the corrosive properties and particularly the effects of inhaling sodium hydroxide.
  - Follow the safest procedures indicated by the employer.
- The employer must also certify that the necessary PPE is in good condition and is used according to instructions.

#### Conditions and measures related to personal protection, hygiene and health evaluation

- **Respiratory protection:** - In case of dust or aerosol formation (e.g. spraying): use respiratory protection with approved filter (P2)
- **Hand protection:** - Waterproof and chemically resistant protective gloves
  - o Material: butyl rubber, PVC, polychloroprene with natural latex lining, thickness of the material: 0.5 mm, rupture time: > 480 min
  - o Material: nitrile rubber, fluorine rubber, thickness of the material: 0.35-0.4 mm, rupture time: > 480 min
- **Eye protection:** - Chemically resistant protective goggles must be worn. If splashes are likely, wear wellfitting safety goggles with facial protection.
- **Body protection:** Wear suitable protective clothing, aprons, shield and suits, if splashes are likely.
- **Leg protection:** Wear rubber or plastic boots.

#### Exposure estimate and reference to source

##### Worker exposure:

NaOH is a corrosive substance.

When handling substances and formulations, immediate skin contact may only occasionally occur and it is assumed that daily repeated exposure will be negligible. Skin exposure to NaOH was therefore not quantified.

NaOH is unlikely to be present systemically in the organism in normal conditions of handling and use, which is why systemic effects of NaOH after inhalation or thermal exposure should not occur.

Based on NaOH measurements and in accordance with the proposed risk management measures for controlling worker exposure, the worst reasonable scenario for inhalation exposure of 0.33 mg/m<sup>3</sup> (the typical value is 0.14 mg/m<sup>3</sup>) is below the DNEL of 1 mg/m.

##### Environmental exposure:

The aquatic effect and risk assessment only deal with the effects in organisms/ecosystems due to possible alterations in the pH related to OH<sup>-</sup> discharges, since the toxicity of the ion Na<sup>+</sup> should be insignificant compared to the (potential) effect of the pH. Its high solubility in water and the very low pressure indicate that NaOH will be found mainly in water.

When risk management measures related to the environment are implemented, there is no exposure to the sludge activated from a sewage treatment plant and no exposure to the water that receives it on the surface.

Sediment partitioning is not considered since it is not relevant for NaOH. If released to the aquatic compartment, the absorption of sediment particles will be negligible.

No significant release to the air should occur due to the very low vapour pressure of NaOH. If released to the air in the form of aerosol in water, NaOH will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or other acids).

Significant releases to land environment are not expected. The sludge application route is not relevant to releases into farming soil since particles will not be absorbed into the WTPs and WWTPs. If released to soil the absorption to the particles from the soil will be negligible.

Depending on the buffering capacity of the soil the OH<sup>-</sup> will be neutralised in the water of the soil pores or the pH may increase.

No bioaccumulation will occur.

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## Annex 2 Exposure Scenario - Manufacturing of solid NaOH

### Exposure Scenario 2: Manufacture of solid NaOH

*List of all use descriptors*

Sector of use (SU): - SU 3, 8 - Manufacture of bulk, large scale chemicals.

Product category (PC): - Not applicable.

Process category (PROC):

PROC1 - Use in closed process, no likelihood of exposure.

PROC2 - Use in closed, continuous process with occasional controlled exposure.

PROC3 - Use in closed batch process (synthesis or formulation).

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises.

PROC8a/b – Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at (non-) dedicated facilities.

PROC9 – Transfer of substance or preparation into small containers (dedicated filling line, including weighing).

Article category (AC): - Not applicable.

Environmental Release

Category (ERC): - ERC1 Manufacture of substances

*EU Risk Assessment*

A risk assessment was undertaken by the EU based on Regulation of Existing Substances (*Council Regulation 793/93*). In 2007 a global risk assessment report was finalised and is available on the internet:

[http://ecb.jrc.ec.europa.eu/DOCUMENTS/ExistingChemicals/RISK\\_ASSESSMENT/REPORT/sodiumhydroxidereport416.pdf](http://ecb.jrc.ec.europa.eu/DOCUMENTS/ExistingChemicals/RISK_ASSESSMENT/REPORT/sodiumhydroxidereport416.pdf)

### Contributing scenario of environmental exposure control

**Product characteristics**

Solid NaOH.

**Frequency and duration of use**

Continuous.

**Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil**

The purpose of the risk management measures related to the environment is to avoid discharge of NaOH solutions into municipal wastewaters or surface waters, since they could significantly alter the pH.

The pH values must be monitored regularly during release into surface waters.

Generally discharges must be made so that changes in the pH of surface water are kept to a minimum.

Generically most aquatic organisms can tolerate pH values of 6-9. This is also mentioned in the OECD standard tests with aquatic organisms.

**Conditions and measures related to external treatment of waste for disposal**

There is no solid NaOH waste. Liquid NaOH waste must be reused or discharged into industrial wastewater and then neutralised, if necessary.

### Contributing scenario controlling worker exposure

**Product characteristics**

Solid NaOH, all concentrations.

**Frequency and duration of use/exposure**

8 hours/day, 200 days/year.

**Technical conditions and measures at process level (source) to prevent release**

Where possible, substitute manual processes with automated and/or closed processes. Irritating mists, sprays and potential splashes will

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therefore be avoided:

- Use closed systems or cover the open containers (for example with canvas).
- Transport in pipelines, technical filling/emptying of drums with automatic systems (suction pumps, etc.).
- Use long-handled tongs for manual use "to avoid direct contact and exposure to splashes".

#### Technical conditions and measures to control dispersion from sources towards the worker

Local and/or general ventilation is a good practice.

#### Organisational measures to prevent/limit releases, dispersion and exposure

- Workers who act in risk processes/areas must be trained to:
  - o Avoid working without respiratory protection.
  - o Understand the corrosive properties and particularly the effects of inhaling sodium hydroxide.
  - o Follow the safest procedures indicated by the employer.
- The employer must also certify that the necessary PPE is in good condition and is used according to instructions.

#### Conditions and measures related to personal protection, hygiene and health evaluation

- Respiratory protection: In case of dust or aerosol formation (e.g. spraying): use respiratory protection with approved filter (P2)
- Hand protection: Waterproof and chemically resistant protective gloves
  - o Material: butyl rubber, PVC, polychloroprene with natural latex lining, thickness of the material: 0.5 mm, rupture time: > 480 min.
  - o Material: nitrile rubber, fluorine rubber, thickness of the material: 0.35-0.4 mm, rupture time: > 480 min.
- Eye protection: chemically resistant protective goggles must be worn. If splashes are likely, wear well-fitting safety goggles with facial protection.
- Body protection: Wear suitable protective clothing, aprons, shield and suits, if splashes are likely, *wear: rubber or plastic boots.*

#### Exposure estimate and reference to source

##### Worker exposure:

NaOH is a corrosive substance.

When handling substances and formulations, immediate skin contact may only occasionally occur and it is assumed that daily repeated exposure will be negligible. Skin exposure to NaOH was therefore not quantified.

NaOH is unlikely to be present systemically in the organism in normal conditions of handling and use, which is why systemic effects of NaOH after inhalation or thermal exposure should not occur.

Based on NaOH measurements and in accordance with the proposed risk management measures for controlling worker exposure, the worst reasonable scenario for inhalation exposure of 0.33 mg/m<sup>3</sup> (the typical value is 0.14mg/m<sup>3</sup>) is below the DNEL of 1 mg/m.

##### Environmental exposure:

The aquatic effect and risk assessment only deal with the effects in organisms/ecosystems due to possible alterations in the pH related to OH<sup>-</sup> discharges, since the toxicity of the ion Na<sup>+</sup> should be insignificant compared to the (potential) effect of the pH.

Its high solubility in water and the very low pressure indicate that NaOH will be found mainly in water.

When risk management measures related to the environment are implemented, there is no exposure to the sludge activated from a sewage treatment plant and no exposure to the water that receives it on the surface.

Sediment partitioning is not considered since it is not relevant for NaOH. If released to the aquatic compartment, the absorption of sediment particles will be negligible.

No significant release to the air should occur due to the very low vapour pressure of NaOH. If released to the air in the form of aerosol in water, NaOH will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or other acids).

Significant releases to land environment are not expected. The sludge application route is not relevant to releases into farming soil since particles will not be absorbed into the WTPs and WWTPs.

If released to soil the absorption to the particles from the soil will be negligible.

Depending on the buffering capacity of the soil the OH<sup>-</sup> will be neutralised in the water of the soil pores or the pH may increase.

No bioaccumulation will occur.

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## Annex 3 Exposure Scenario - Industrial and professional use of NaOH

### Exposure Scenario 3 – Industrial and occupational use of NaOH

#### List of all use descriptors

Sector of use (SU): - SU 1-24

Since Sodium Hydroxide is so widely used and for so many different purposes, it can potentially be used in all sectors of use (SU) described by the use descriptor system (SU 1-24). NaOH is used for different purposes in a variety of industrial sectors.

Product category (PC): - PC 0-40

Sodium Hydroxide can be used in many different categories of chemical products (PC). It may be used, for example, as an absorbent (PC2), metal surface treatment product (PC14), non-metal surface treatment product (PC15), intermediate (PC19), pH-regulator (PC20), laboratory chemical (PC21), cleaning product (PC35), water softener (PC36), water treatment chemical (PC37) or extraction agent. However, it may also potentially be used in the other chemical product categories (PC 0 – 40).

Process category (PROC):

PROC1 - Use in closed process, no likelihood of exposure.

PROC2 - Use in closed, continuous process with occasional controlled exposure.

PROC3 - Use in closed batch process (synthesis or formulation).

PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises.

**PROC5** - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).

PROC8a/b – Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at (non-) dedicated facilities.

PROC9 – Transfer of substance or preparation into small containers (dedicated filling line, including weighing).

PROC10 – Roller application or brushing.

PROC11 - Non industrial spraying.

PROC13 – Treatment of articles by dipping and pouring.

PROC15 – Use as laboratory reagent in small scale laboratories.

The aforementioned process categories are considered the most important, but other categories may be possible (PROC 1 – 27).

Article category (AC): - Not applicable.

Although Sodium Hydroxide may be used in the manufacturing process of articles, the substance is not expected to be present in the article. The article categories (AC) do not seem to be applicable to Sodium Hydroxide.

Environmental Release Category (ERC):

ERC1 – Manufacture of substances.

ERC2 – Formulation of preparations.

ERC4 – Industrial use of processing aids in processes and products, not becoming part of articles.

ERC6A – Industrial use resulting in manufacture of another substance (use of intermediates).

ERC6B – Industrial use of reactive processing aids

ERC7 – Industrial use of substances in closed systems.

ERC8A – Wide dispersive indoor use of processing aids in open systems.

ERC8B – Wide dispersive indoor use of reactive substances in open systems.

ERC8D - Wide dispersive outdoor use of processing aids in open systems.

ERC9A - Wide dispersive indoor use of substances in closed systems.

The aforementioned environmental release categories are considered the most important but other industrial environmental release categories may also be possible (ERC 1 – 12).

*Other explanations:* Typical uses include: manufacture of organic and inorganic chemical products, formulation of chemical products, pulp manufacture and bleaching, manufacture of aluminium and other metals, food industry, water treatment, textile production, occupational end use of formulated products and other industrial uses.

#### EU Risk Assessment

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A risk assessment was undertaken by the EU based on Regulation of Existing Substances (*Council Regulation 793/93*). In 2007 a global risk assessment report was finalised and is available on the internet:

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### Contributing scenario of environmental exposure control

#### Product characteristics

Solid or liquid NaOH, all concentrations (0-100%), if solid: low dust formation class.

#### Frequency and duration of use

Continuous.

#### Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

The purpose of the risk management measures related to the environment is to avoid discharge of NaOH solutions into municipal wastewaters or surface waters, since they could significantly alter the pH.

The pH values must be monitored regularly during release into surface waters.

Generally discharges must be made so that changes in the pH of surface water are kept to a minimum.

Generically most aquatic organisms can tolerate pH values of 6-9. This is also mentioned in the OECD standard tests with aquatic organisms.

#### Conditions and measures related to external treatment of waste for disposal

There is no solid NaOH waste. Liquid NaOH waste must be reused or discharged into industrial wastewater and then neutralised, if necessary.

### Contributing scenario controlling worker exposure

#### Product characteristics

Solid or liquid NaOH, all concentrations (0-100%), if solid: low dust formation class

#### Frequency and duration of use/exposure

8 hours/day, 200 days/year.

#### Technical conditions and measures at process level (source) to prevent release

For the worker, both solid and liquid NaOH which contain products at a concentration of > 2%:

Where possible, substitute manual processes with automated and/or closed processes. Irritating mists, sprays and potential splashes will therefore be avoided:

- Use closed systems or cover the open containers (for example with canvas).
- Transport in pipelines, technical filling/emptying of drums with automatic systems (suction pumps, etc.).
- Use long-handled tongs for manual use "to avoid direct contact and exposure to splashes".

#### Technical conditions and measures to control dispersion from sources towards the worker

For the worker, both solid and liquid NaOH which contain products at a concentration of > 2%:

- Local and/or general ventilation is a good practice.

#### Organisational measures to prevent/limit releases, dispersion and exposure

For the worker, both solid and liquid NaOH which contain products at a concentration of > 2%:

- Workers who act in risk processes/areas must be trained to:
  - o Avoid working without respiratory protection.
  - o Understand the corrosive properties and particularly the effects of inhaling sodium hydroxide.
  - o Follow the safest procedures indicated by the employer.
- The employer must also certify that the necessary PPE is in good condition and is used according to instructions. Where possible and for occupational use, specific distributors and specially designed pumps should be used to prevent splashes/spills/exposure.

#### Conditions and measures related to personal protection, hygiene and health evaluation

For the worker and professional, both solid and liquid NaOH which contain products at a concentration of > 2%:

- Respiratory protection: In case of dust or aerosol formation (e.g. spraying): use respiratory protection with

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approved filter (P2).

• Hand protection: waterproof and chemically resistant gloves:

o Material: butyl rubber, PVC, polychloroprene with natural latex lining, thickness of the material: 0.5 mm, rupture time: > 480 min.

o Material: nitrile rubber, fluorine rubber, thickness of the material: 0.35-0.4 mm, rupture time: >480 min.

• Eye protection: chemically resistant protective goggles must be worn. If splashes are likely, wear well-fitting safety goggles with facial protection.

• Body protection: Wear suitable protective clothing, aprons, shield and suits, if splashes are likely, wear: rubber or plastic boots.

### Exposure estimate and reference to source

Worker exposure:

NaOH is a corrosive substance. When handling substances and formulations, immediate skin contact may only occasionally occur and it is assumed that daily repeated exposure will be negligible. Skin exposure to NaOH was therefore not quantified.

NaOH is unlikely to accumulate systemically in the body in normal conditions of use and handling and therefore no systemic effects of NaOH are expected after inhalation or skin exposure.

Based on NaOH measurements in the pulp, paper and bleached recycled paper industries, aluminium and chemical industries and in accordance with the proposed risk management measures for controlling occupational and worker exposure, inhalation exposure is below the DNEL of 1 mg/m<sup>3</sup>.

In addition to the exposure data measured, the ECETOC TRA tool was used to measure inhalation exposure (see table below). It was assumed that there was no local air extraction or respiratory protection, unless otherwise specified. The duration of exposure was assumed to be 4 hours a day in the worst case scenario, and an occupational use was indicated when this was relevant for indicating the worst case scenario. In solid format, the low dust formation class was selected because NaOH is highly hygroscopic. Only the most relevant PROC were considered in the analysis.

PROC	PROC description	Liquid (mg/m <sup>3</sup> )	Solid (mg/m <sup>3</sup> )
PROC 1	Use in closed process, no likelihood of exposure	0,17	0,01
PROC 2	Use in closed, continuous process with occasional controlled exposure (e.g. sampling)	0,17	0,01
PROC 3	Use in closed batch process (synthesis or formulation)	0,17	0,1
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises	0,17	0.2 (with LEV)
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	0,17	0.2 (with LEV)
PROC 7	Industrial spraying	0,17	Not applicable
PROC 8a/b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at (non-) dedicated facilities.	0,17	0,5
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	0,17	0,5
PROC 10	Roller application or brushing	0,17	0,5
PROC 11	Non industrial spraying	0,17	0.2 (with LEV)
PROC 13	Treatment of articles by dipping and pouring	0,17	0,5
PROC 14	Production of preparations or articles by tableting, compression, extrusion, pelletisation	0,17	0.2 (with LEV)
PROC 15	Use as laboratory reagent	0,17	0,1
PROC 19	Hand-mixing with intimate contact and only PPE available	0,17	0,5
PROC 23	Open processing and transfer operations with minerals/metals at elevated temperature	0,17	0.4 (with LEV)

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			and RPE (90%)
PROC 24	High (mechanical) energy work-up of substances bound in materials and/or articles	0,17	0.5 (with LEV and RPE (90%))

**Environmental exposure:**

The aquatic effect and risk assessment only deal with the effects in organisms/ecosystems due to possible alterations in the pH related to OH<sup>-</sup> discharges, since the toxicity of the ion Na<sup>+</sup> should be insignificant compared to the (potential) effect of the pH. Its high solubility in water and the very low pressure indicate that NaOH will be found mainly in water. When risk management measures related to the environment are implemented, there is no exposure to the sludge activated from a sewage treatment plant and no exposure to the water that receives it on the surface.

Sediment partitioning is not considered since it is not relevant for NaOH. If released to the aquatic compartment, the absorption of sediment particles will be negligible.

No significant release to the air should occur due to the very low vapour pressure of NaOH. If released to the air in the form of aerosol in water, NaOH will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or other acids).

Significant releases to land environment are not expected. The sludge application route is not relevant to releases into farming soil since particles will not be absorbed into the WTPs and WWTPs. If released to soil the absorption to the particles from the soil will be negligible. Depending on the buffering capacity of the soil the OH<sup>-</sup> will be neutralised in the water of the soil pores or the pH may increase.

No bioaccumulation will occur.

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## Annex 4 Exposure Scenario - Consumer use of NaOH

### Exposure Scenario 4 – Consumer use of NaOH

*List of all use descriptors*

Sector of use (SU): - SU 21 – Private households

Product category (PC): - PC 0-40

Sodium Hydroxide can be used in many different chemical products categories (PC): PC 20, 35, 39 (neutralisation agents, cleaning products, cosmetics, personal care products). Other PCs are not explicitly considered in this Exposure Scenario. However, NaOH can also be used in other low concentration PCs, e.g.

PC3 (up to 0.01%), PC8 (up to 0.1%), PC28 and PC31 (up to 0.002%) and can also be used in the other product categories (PC 0-40).

Process category (PROC): - Not applicable.

Article category (AC): Not applicable.

Environmental Release Category - Category (ERC):

ERC8A – Wide dispersive indoor use of processing aids in open systems.

ERC8B – Wide dispersive indoor use of reactive substances in open systems.

ERC8D – Wide dispersive outdoor use of processing aids in open systems.

ERC9A – Wide dispersive indoor use of substances in closed systems.

The aforementioned environmental release categories are considered the most important but other wide dispersive environmental categories may also be possible (ERC 8 – 11b).

*Other explanations*

NaOH (up to 100%) is also used by consumers. It is used for unblocking and cleaning plumbing, treating wood and is also used to make soap at home.

NaOH is also used in batteries and for cleaning ovens

*EU Risk Assessment*

A risk assessment was undertaken by the EU based on Regulation of Existing Substances (*Council Regulation 793/93*). In 2007 a global risk assessment report was finalised and is available on the internet: [http://ecb.jrc.ec.europa.eu/DOCUMENTS/ExistingChemicals/RISK\\_ASSESSMENT/REPORT/sodiumhydroxidereport416.pdf](http://ecb.jrc.ec.europa.eu/DOCUMENTS/ExistingChemicals/RISK_ASSESSMENT/REPORT/sodiumhydroxidereport416.pdf)

### Contributing scenario of environmental exposure control

**Product characteristics**

Solid or liquid NaOH, all concentrations (0-100%), if solid: low dust formation class.

**Conditions and measures related to external treatment of waste for disposal**

This product and its packaging must be discarded safely (e.g. by taking to a public recycling facility). If the container is empty, treat as normal municipal waste.

Batteries must be recycled as far as possible (e.g. by taking them to a public recycling facility). The recovery of NaOH from alkaline batteries included electrolyte creep, collection and neutralisation with sulphuric acid and carbon dioxide.

### Contributing scenario controlling worker exposure

**Product characteristics**

Solid or liquid NaOH, all concentrations (0-100%), if solid: low dust formation class.

Typical concentrations: floor strippers (<10%), hair straighteners (<2%), oven cleaners (<5%), unblockers (liquid: 30%, solid: <100%), cleaning products (<1.1%).

**Technical conditions and measures related to product presentation**

- Resistant labelling and packaging must be used to prevent damage during normal use and storage of the product. Poor quality packaging implies physical loss of hazard information and instructions for use.

- All household products containing Sodium Hydroxide at over 2% which can be accessed by children must be fitted with a resistant fastener, which they are unable to open (already in use) and a tactile hazard warning (Adaptation to the Technical Progress of Directive (1999/45/EC, Annex IV, Part A and Article 15(2) of Directive 67/548 in the case of, respectively, hazardous preparations and substances

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for household use).

This will prevent accidents with children and other sensitive groups of society.

- It is recommended that only very viscous preparations should be delivered.
- It is recommended that only small amounts should be delivered.
- For battery use, only completely sealed articles must be used and with long-term maintenance service

#### Conditions and measures related to the information and recommendations for consumer behaviour

The consumer should also be provided with the best possible instructions for use and product information. This procedure can clearly reduce the risks of improper use.

In order to reduce the number of accidents involving children and the elderly it is recommended that the product should only be used in the absence of these two more sensitive groups.

To avoid improper use of Sodium Hydroxide, the instructions for use must contain a warning about hazardous mixtures.

Instructions aimed at consumers:

- Keep out of reach of children.
- Do not use the product in ventilation openings or slots.

#### Conditions and measures related to personal protection and health

For the consumer, both solid and liquid NaOH that contain products at a concentration of > 2%:

- Respiratory protection: In case of dust or aerosol formation (e.g. spraying): use respiratory protection with approved filter (P2).
- Hand protection: Waterproof and chemically resistant protective gloves.
- Eye protection: If splashes are likely, wear well-fitting safety goggles with facial protection.

#### Exposure estimate and reference to source

Consumer exposure:

- Short-term/acute exposure was assessed only in its most critical use: use of spray NaOH for oven cleaning. • The calculated short-term exposure of 0.3 – 1.6 mg/m<sup>3</sup> is slightly higher than the long-term DNEL for an inhalation of 1 mg/m<sup>3</sup> but less than the short-term occupational exposure limit of 2 mg/m<sup>3</sup>. In addition to this, NaOH will be rapidly neutralised as a result of its reaction with CO<sub>2</sub> (or other acids).

Environmental Exposure:

Consumer use refers to already diluted products which will continue to be rapidly neutralised in the sewers, long before reaching the WWTP or surface waters.

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