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

1.1. Product identifier
Commercial Product Name: SODIUM HYDROGEN SULFATE
EC Index: 016-046-00-X
EC No: 231-665-7
CAS No.: 7681-38-1
REACH Registration Number: 01-2119552465-36-0003

1.2. Relevant identified uses of the substance or mixture and uses advised against
Main use category: Industrial use,
Specific use(s): Water treatment chemical, Chemical plating of metals, Food, See chapter Exposure scenario.

1.3. Details of the supplier of the safety data sheet
Company: PVS Chemicals Belgium n.v.
Pantserschipstraat 80
9000 -Gent, BELGIUM
Tel. +32 (0)9 257 77 00
Fax: +32 (0)9 257 77 25
E-mail address: reach@pvs.be

1.4. Emergency telephone number
Emergency telephone: +32 (0)9 257 77 00 (24/24 hrs)

UNITED KINGDOM
National Poisons Information Service
(Birmingham Centre) 0870 600 6266 (UK only)
City Hospital

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
2.1.1. Classification according to Regulation (EU) 1272/2008/EC
CLP-Classification: The product is classified as hazardous in accordance with Directive 1272/2008/EEC.
Eye Dam. 1 H318
Full text of H-phrases: see section 16.

2.1.2. Classification according to EU Directives 67/548/EC or 1999/45/EC
Classification: The product is classified as dangerous in accordance with Directive 67/548/EEC.
Xi; R41
Full text of R-phrases: see section 16.
2.2. Label elements

2.2.1. Labelling according to Regulation (EU) 1272/2008/EC

CLP pictograms

- GHS05

Signal word: Danger

Hazard statements (CLP): H318 - Causes serious eye damage.

Precautionary statements (CLP):

- P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection.
- 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.
- P501 - Dispose of contents/ container to an approved waste disposal plant.

2.2.2. Labelling according to Directives (67/548/EC - 1999/45/EC)

Not relevant

2.3. Other hazards

Other hazards which do not result in classification:

Results of PBT and vPvB assessment: Not required (inorganic)

SECTION 3: Composition/information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Product Identifier</th>
<th>%</th>
<th>Classification according to Directive 67/548/EEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hydrogensulphate</td>
<td>(CAS No.) 7681-38-1</td>
<td>&gt;= 92</td>
<td>Xi; R41</td>
</tr>
<tr>
<td></td>
<td>(EC No) 231-665-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(EC Index) 016-046-00-X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation: Move to fresh air. Call a physician immediately.

Skin contact: Take off all contaminated clothing immediately. Wash off with soap and water. If skin irritation persists, call a physician.

Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Call a physician immediately.
Ingestion: Do NOT induce vomiting. Drink plenty of water. Consult a physician.

Additional advice: First aider needs to protect himself. See also section 8. Never give anything by mouth to an unconscious person. Show this safety data sheet to the doctor in attendance. Treat symptomatically. When symptoms persist or in all cases of doubt seek medical advice.

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

Inhalation: May cause irritation of respiratory tract. Inhalation may provoke the following symptoms: Shortness of breath, cough, dry/sore throat.

Skin contact: May be irritating. Skin contact may provoke the following symptoms: Redness, pain, blisters.

Eye contact: Causes serious eye damage. Eye contact may provoke the following symptoms: Redness, pain.

Ingestion: Ingestion may cause irritation to mucous membranes. Ingestion may provoke the following symptoms: Abdominal pain, burning sensation.

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

No data available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Use dry chemical, CO2, water spray or alcohol resistant foam.

Extinguishing media which shall not be used for safety reasons: High volume water jet

5.2. Special hazards arising from the substance or mixture

Fire Hazard: Non flammable.

Specific hazards: Burning produces noxious and toxic fumes: SOx, NaOx. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. The pressure in sealed containers can increase under the influence of heat. Vapours may form explosive mixture with air. Vapours are heavier than air and may spread along floors.

5.3. Advice for firefighters

Advice for firefighters: Special protective equipment for firefighters In the event of fire, wear self-contained breathing apparatus. In the event of fire, cool tanks with water spray.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Wear personal protective equipment. See also section 8. Do not breathe vapours or spray mist. Avoid contact with skin and eyes.

Advice for emergency responders: Only qualified personnel equipped with suitable protective equipment may intervene.
6.2. Environmental precautions
Environmental precautions: Prevent product from entering drains.

6.3. Methods and material for containment and cleaning up
Methods for cleaning up: Prevent further leakage or spillage if safe to do so. Sweep up and shovel into suitable containers for disposal. Dispose of in accordance with local regulations. Local authorities should be advised if significant spillages cannot be contained.

6.4. Reference to other sections
See also section 8. See also section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Handling: Storage and handling must take place in conformity with national laws: GO70STORA025. Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Ensure that eye flushing systems and safety showers are located close to the working place.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs. Wash contaminated clothing before re-use. Keep working clothes separately.

7.2. Conditions for safe storage, including any incompatibilities
Storage: Store in dry, cool, well-ventilated area. Keep containers dry and tightly closed to avoid moisture absorption and contamination. Keep container tightly closed and dry. Keep away from open flames, hot surfaces and sources of ignition.

7.3 Specific end use(s)
No data available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
Exposure limit(s): No data available
PNEC (water): 11,09 mg/l
PNEC aqua (freshwater): 1,11 mg/l
PNEC aqua (marine water): 17,66 mg/l
PNEC sediment: 40,2 mg/kg dwt
PNEC sediment (zoetwater): 4,02 mg/kg dwt
PNEC soil: 1,54 mg/kg dwt
PNEC (STP):
8.2. Exposure controls

Personal protective equipment: The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection: In case of insufficient ventilation wear suitable respiratory equipment. Respirator with a full face mask (EN136). Recommended Filter type: ABEK/P2 (EN141). Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe (EN138/269 - EN137 - EN139).

Hand protection: Rubber gloves (EN 374): PVC. The selection of specific gloves for a specific application and time of use in a working area, should also take into account other factors on the working space, such as (but not limited to): other chemicals that are possibly used, physical requirements (protection against cutting/drilling, skill, thermal protection), and the instructions/specification of the supplier of gloves.

Eye protection: Tightly fitting safety goggles (EN 166).

Skin and body protection: Chemical-resistant overalls.

Thermal hazard protection: Not required under normal use. Use dedicated equipment.

Engineering measures: Ensure adequate ventilation. Use only in area provided with appropriate exhaust ventilation. Ensure that eyewash stations and safety showers are close to the workstation location. Eye wash bottle with pure water. Organisational measures to prevent /limit releases, dispersion and exposure. See also section 7.

Environmental exposure controls: Do not flush into surface water or sanitary sewer system. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- **Appearance**: crystals, granular
- **Colour**: white, light yellow
- **Odour**: none
- **pH**: 1,3
- **Melting point/range**: 315 °C
- **Boiling point/boiling range**: not applicable
- **Flash point**: not applicable
- **Evaporation rate**: not applicable
- **Flammability (solid, gas)**: not applicable
- **Explosion limits**: not applicable
- **Vapour pressure**: not applicable
- **Vapour density**: not applicable
- **Relative density**: 1.4 - 1.5 kg/l
- **Water solubility**: ca. 1080 g/l @ 25°C
- **Solubility in other solvents**: not applicable
- **Partition coefficient: n-octanol/water**: -2.2 (KOWWIN)
- **Autoignition temperature**: not applicable
- ** Decomposition temperature**: 460 °C
Viscosity : not applicable
Explosive properties : not applicable
Oxidizing properties : not applicable

9.2. Other information
No data available

SECTION 10: Stability and reactivity

10.1. Reactivity
Reactivity : See also section 10.5

10.2. Chemical stability
Stability : Hygroscopic

10.3. Possibility of hazardous reactions

10.4. Conditions to avoid
Conditions to avoid : Avoid dust formation. Avoid moisture, heat. See also section 7: Handling and storage.

10.5. Incompatible materials
Incompatible materials : Hydrolyses in presence of: Water, acidic aqueous solution. Gives off hydrogen by reaction with metals. See also section 7: Handling and storage.

10.6. Hazardous decomposition products
Hazardous decomposition products : Possible decomposition products are: Acidic aqueous solution. Gives off hydrogen by reaction with metals. Vapours may form explosive mixture with air.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity : Not classified (Not classified due to data which are conclusive although insufficient for classification.)

Sodium hydrosulphate (7681-38-1)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50/oral/rat</td>
<td>2140 mg/kg sulfuric acid</td>
</tr>
<tr>
<td>LC50/inhalation/4h/rat</td>
<td>&gt; 2400 mg/m³ sodium sulphate</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation : Not classified (Not classified due to data which are conclusive although insufficient for classification.)
pH: 1,3

Serious eye damage/irritation : Causes serious eye damage.
pH: 1,3
Respiratory or skin sensitisation: Not classified (Not classified due to data which are conclusive although insufficient for classification.)

Germ cell mutagenicity: Not classified (Not classified due to data which are conclusive although insufficient for classification.)

Carcinogenicity: Not classified (Not classified due to data which are conclusive although insufficient for classification.)

Reproductive toxicity: Not classified (Not classified due to data which are conclusive although insufficient for classification.)

Specific target organ toxicity (single exposure): Not classified (Not classified due to data which are conclusive although insufficient for classification.)

Specific target organ toxicity (repeated exposure): Not classified (Not classified due to data which are conclusive although insufficient for classification.)

Aspiration hazard: Not classified (Not classified due to data which are conclusive although insufficient for classification.)

Further information
Watery solution: same properties as H2SO4. Fine granules, crystals or powder. Fine substance that can cause the irritation of the airways, with coughing and the contraction of the airways. In contact with water the product forms sulphuric acid that can cause burns.

SECTION 12: Ecological information

12.1. Toxicity
Ecotoxicity effects: Toxic to aquatic organisms.

Component: Sodium hydrogensulphate (7681-38-1)
LC50/96h/fish: 7960 mg/l
EC50/48h/daphnia: 1766 mg/l
IC50/72h/algae: 1900 mg/l

12.2. Persistence and degradability
Persistence and degradability: Hydrolysis in water

12.3. Bioaccumulative potential
Bioaccumulation: Low potential
Partition coefficient: n-octanol/water: -2.2 (KOWWIN)

12.4. Mobility in soil
Mobility: Highly mobile in soils

12.5. Results of PBT and vPvB assessment
PBT/vPvB: Results of PBT and vPvB assessment: Not required (inorganic)

12.6. Other adverse effects
Further information: no data available
SECTION 13: Disposal considerations

13.1. Waste treatment methods
Waste from residues / unused products: Prevent product from entering drains. Handle with care. See also section 7. Collect and dispose of waste product at an authorised disposal facility. Dispose of in accordance with local regulations.

Contaminated packaging: Dispose of in accordance with local regulations.

Codes of waste (2001/573/EC, 75/442/EEC, 91/689/EEC): Classified as hazardous waste according to European Union regulations (06 03 03). Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information

Not classified as dangerous in the meaning of transport regulations.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

Authorisations/Restrictions on use: Not applicable.

This product contains an ingredient according to the candidate list of Annex XIV of the REACH Regulation1907/2006/EC. : None.

15.1.2. National regulations
WGK: 1

15.2. Chemical safety assessment
Chemical Safety Assessment: A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of R-, H- and EUH-phrases:
Eye Dam. 1: Serious eye damage/eye irritation Category 1
H318: Causes serious eye damage.
R41: Risk of serious damage to eyes.

Sources of key data used to compile the datasheet: http://ecb.jrc.it

Safety datasheet sections which have been updated: 1,2,3,4,5,6,7,8,9,10,11,12,13,15,16

Abbreviations and acronyms:
WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)
vPvB = very persistent and very bioaccumulating persistent, bioaccumulating and toxic (PBT).
ADNR = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
SAFETY DATA SHEET

SODIUM HYDROGEN SULFATE

ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC
IATA = International Air Transport Association
IMDG = International Maritime Dangerous Goods Code
LEL = Lower Explosive Limit/Lower Explosion Limit
UEL = Upper Explosion Limit/Upper Explosive Limit
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals


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<table>
<thead>
<tr>
<th>Number</th>
<th>Short description of exposure scenario</th>
<th>Life cycle stage covered by the ES</th>
<th>Product category</th>
<th>End Use</th>
<th>Sector of use</th>
<th>Process category</th>
<th>Article category</th>
<th>Service life for articles.</th>
<th>Environmental release category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manufacture and use of the substance as such or in preparation in industrial settings</td>
<td>14, 15, 19, 20, 21, 25, 35, 36, 37</td>
<td>X X X X</td>
<td>-</td>
<td>2a, 2b, 3, 4, 5, 6b, 7, 8, 9, 10, 11, 13, 15, 16, 17, 19, 20, 23</td>
<td>1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 12, 13, 14, 15, 17, 19, 21, 24</td>
<td>-</td>
<td>-</td>
<td>1, 2, 3, 4, 5, 6, 7, 12</td>
</tr>
<tr>
<td>2</td>
<td>Use of the substance as such or in preparation in professional settings</td>
<td>14, 15, 20, 35, 37</td>
<td>- X X X</td>
<td>-</td>
<td>22</td>
<td>2, 3, 4, 5, 6a, 8b, 9, 10, 11, 12, 13, 14, 15, 17, 19, 21, 24</td>
<td>-</td>
<td>-</td>
<td>8, 9, 10, 11</td>
</tr>
<tr>
<td>3</td>
<td>Consumer use of cleaning products</td>
<td>35</td>
<td>- - - X</td>
<td>21</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Consumer use of the substance as pH-regulator for swimming pools</td>
<td>20, 37</td>
<td>- - - X</td>
<td>21</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8</td>
</tr>
</tbody>
</table>
### Exposure scenario 1

**Manufacture and use of the substance as such or in preparation in industrial settings**

<table>
<thead>
<tr>
<th>1. Exposure scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
</tr>
</tbody>
</table>
| **Sector of use** | SU2a - Mining, (without offshore industries)  
SU2b - Offshore industries  
SU 3 - Industrial uses: Uses of substances as such or in preparations at industrial sites  
SU4 - Manufacture of food products  
SU5 - Manufacture of textiles, leather, fur  
SU6b - Manufacture of pulp, paper and paper products  
SU7 - Printing and reproduction of recorded media  
SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)  
SU9 - Manufacture of fine chemicals  
SU 10 - Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)  
SU11 - Manufacture of rubber products  
SU13 - Manufacture of other non-metallic mineral products, e.g. plasters, cement  
SU15 - Manufacture of fabricated metal products, except machinery and equipment  
SU16 - Manufacture of computer, electronic and optical products, electrical equipment  
SU17 - General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment  
SU19 - Building and construction work  
SU20 - Health services  
SU23 - Electricity, steam, gas water supply and sewage treatment |
| **Process category** | 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)  
PROC7 - Industrial spraying  
PROC8a - Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities  
PROC8b - Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities  
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
PROC10 - Roller application or brushing  
PROC12 - Use of blowing agents in manufacture of foam  
PROC13 - Treatment of articles by dipping and pouring  
PROC14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation  
PROC15 - Use as laboratory reagent  
PROC16 - Using material as fuel sources, limited exposure to unburned product to be expected  
PROC17 - Lubrication at high energy conditions and in partly open process  
PROC18 - Greasing at high energy conditions  
PROC19 - Hand-mixing with intimate contact and only PPE available |
| **Product category** | PC1 - Adhesives, sealants  
PC14 - Metal surface treatment products, including galvanic and electroplating products  
PC15 - Non-metal-surface treatment products  
PC19 - Intermediate  
PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents  
PC21 - Laboratory chemicals  
PC25 - Metal working fluids  
PC35 - Washing and cleaning products (including solvent based products)  
PC36 - Water softeners  
PC37 - Water treatment chemicals |
| **Article category** |  |
| **Environmental release category** | ERC1 - Manufacture of substances  
ERC2 - Formulation of preparations |
ERC3 - Formulation in materials
ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
ERC5 - Industrial use resulting in inclusion into or onto a matrix
ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b - Industrial use of reactive processing aids
ERC6c - Industrial use of monomers for manufacture of thermoplastics
ERC6d - Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7 - Industrial use of substances in closed systems
ERC12a - Industrial processing of articles with abrasive techniques (low release)
ERC12b - Industrial processing of articles with abrasive techniques (high release)

Processes, tasks, activities covered

Manufacture and use of the substance as such or in preparation in industrial settings

### 2. Operational conditions and risk management measures

#### 2.1. Control of worker exposure

<table>
<thead>
<tr>
<th>Frequency and duration of use</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Use amount per worker per day</strong></td>
<td>The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation (industrial vs. professional) and level of containment/automation (as reflected in the PROC) is the main determinant of the process intrinsic emission potential.</td>
</tr>
<tr>
<td><strong>Exposure duration per day</strong></td>
<td>60 min (Due to high level of automation and measures at the process level (please see below), inhalation exposure is negligible and the exposure duration is consequently short.) : PROC 7</td>
</tr>
<tr>
<td><strong>Frequency of exposure</strong></td>
<td>Not restricted: All applicable PROCs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product characteristics</th>
<th></th>
</tr>
</thead>
</table>
| **Emission potential** | PROC 7: medium  
PROC 21, 24: low - high  
All other applicable PROCs: very low - low |
| **Physical Form (at time of use)** | PROC 7: powder  
PROC 21,24: Dust  
All other applicable PROCs: granular |
| **Vapour pressure** | Not relevant |
| **Dustiness** | 1% as obtained in rotating drum testing |
| **Concentration of the Substance in Mixture/Article** | Not restricted (All applicable PROCs) |
| **Amount used** | The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation (industrial vs. professional) and level of containment/automation (as reflected in the PROC) is the main determinant of the process intrinsic emission potential. |

<table>
<thead>
<tr>
<th>Human factors not influenced by risk management</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breathing volume</strong></td>
<td>10 m³/day</td>
</tr>
<tr>
<td><strong>Dermal exposure</strong></td>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Other operational conditions affecting workers exposure</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Outdoor use / Indoor use</strong></td>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Process conditions: Pressure</strong></td>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Process temperature</strong></td>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Room size</strong></td>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Ventilation rate per hour</strong></td>
<td>Not relevant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technical conditions and measures at process level to prevent release</th>
<th></th>
</tr>
</thead>
</table>
| **Containment** | PROC 1, 2, 3, 7: closed process  
All other applicable PROCs: not required |
| **Segregation** | PROC 1, 2, 3: not required  
PROC 7: Spraying of sodium hydrogen sulfate in a segregated spray tower where direct exposure of the worker is excluded.  
All other applicable PROCs: not required |

<table>
<thead>
<tr>
<th>Technical conditions and measures to control dispersion from the source towards the worker</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local exhaust</strong></td>
<td>All other applicable PROCs: Effectiveness : 78 %</td>
</tr>
</tbody>
</table>
2.2. Control of environmental exposure

Product characteristics
Not relevant

Frequency and duration of use
Annual operating days Continuous use/release
Amount used Not relevant

Environmental factors not influenced by risk management
Flow rate of receiving surface water: 18.000 m³/day

Other given operational conditions affecting environmental exposure
During the industrial use of the substance, it is assumed that a substantial fraction of the substance reacts/oxidizes during the process (e.g., bleaching, use in paper/textile/photographic industry). A minimum fraction of 93% (receiving water: freshwater) and 84% (receiving water: marine environment) is taken forward in the ES when on-site OR municipal treatment is available. When treated in on-site AND consequently in municipal treatment, there is no need to take oxidation during the industrial use into account.

Technical conditions and measures at process level to prevent release
Not specified

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
Risk management measures related to the environment aim to avoid discharging NaHSO₄ solutions into municipal wastewater or to surface water, in case such discharges are expected to cause significant pH changes regular control of the pH value during introduction into open waters is required. In general discharges should be carried out such that pH changes in receiving surface waters are minimised (e.g. through neutralisation). In general most aquatic organisms can tolerate pH values in the range of 6-9. This is also reflected in the description of standard OECD tests with aquatic organisms. Neutralisation of waste waters and effluent should be widespread (often it is also required by national legislation).

Organizational measures to prevent/limit release from the site
Not relevant

Conditions and measures related to waste
Solid industrial waste of NaHSO₄ should be reused or discharged to the industrial wastewater and further neutralized if needed.

3. Exposure estimation and reference to its source

3.1. Health
Inhalation exposure The exposure estimation tool MEASE was used for the assessment of inhalation exposure.
Dermal exposure Not relevant

3.2. Environment
The release to water is calculated based upon the default ERC release factors from the ECHA guidance.

The exposure estimation tool EUSES was used for the assessment of the local environmental concentrations.

4. Guidance to check compliance with the Exposure Scenario

4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

<table>
<thead>
<tr>
<th>DNEL</th>
<th>Inhalation: 10 mg/m³</th>
</tr>
</thead>
</table>

Due to the negligible dermal absorption of sodium hydrogen sulfate, the dermal route is not a relevant exposure path for sodium hydrogen sulfate and a dermal DNEL has not been derived. Thus, dermal exposure is not assessed in this exposure scenario.

4.2. Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
## Exposure scenario 2

**Use of the substance as such or in preparation in professional settings**

<table>
<thead>
<tr>
<th>Exposure scenario</th>
<th>Title</th>
<th>Sector of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exposure scenario</td>
<td>Use of the substance as such or in preparation in professional settings</td>
<td>SU 22 - Professional uses: Public domain (administration, education, entertainment, services, craftsmen)</td>
</tr>
</tbody>
</table>

### Process category

| Process category | 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 - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities | PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at 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 | PROC12 - Use of blowing agents in manufacture of foam | PROC13 - Treatment of articles by dipping and pouring | PROC14 - Production of preparations or articles by tableting, compression, extrusion, pelletisation | PROC15 - Use as laboratory reagent | PROC17 - Lubrication at high energy conditions and in partly open process | PROC19 - Hand-mixing with intimate contact and only PPE available | PROC21 - Low energy manipulation of substances bound in materials and/or articles | PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles |

### Product category

| Product category | PC14 - Metal surface treatment products, including galvanic and electroplating products | PC15 - Non-metal-surface treatment products | PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents | PC35 - Washing and cleaning products (including solvent based products) | PC37 - Water treatment chemicals |

### Article category

| Environmental release category | ERC8a - Wide dispersive indoor use of processing aids in open systems | ERC8b - Wide dispersive indoor use of reactive substances in open systems | ERC8c - Wide dispersive indoor use resulting in inclusion into or onto a matrix | ERC8d - Wide dispersive outdoor use of processing aids in open systems | ERC8e - Wide dispersive outdoor use of reactive substances in open systems | ERC8f - Wide dispersive outdoor use resulting in inclusion into or onto a matrix | ERC9a - Wide dispersive indoor use of substances in closed systems | ERC9b - Wide dispersive outdoor use of substances in closed systems | ERC10a - Wide dispersive outdoor use of long-life articles and materials with low release | ERC10b - Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing) | ERC11a - Wide dispersive indoor use of long-life articles and materials with low release | ERC11b - Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing) |

### Processes, tasks, activities covered

| Processes, tasks, activities covered | Use of the substance as such or in preparation in professional settings |

## 2. Operational conditions and risk management measures

### 2.1. Control of worker exposure

| Frequency and duration of use | Use amount per worker per day | The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation (industrial vs. professional) and level of containment/automation (as reflected in the PROC) is the main determinant of the process intrinsic emission potential. |
Exposure duration per day | 60 min (Due to high level of automatisation and measures at the process level (please see below), inhalation exposure is negligible and the exposure duration is consequently short.) : PROC 7
---|---
Frequency of exposure | Not specified

**Product characteristics**

| Emission potential | PROC 7: medium  
PROC 21, 24: low - high  
All other applicable PROCs: very low - low  
| Physical Form (at time of use) | PROC 7: powder  
PROC 21, 24: Dust  
All other applicable PROCs: granules  
| Vapour pressure | Not relevant  
| Dustiness | 1% as obtained in rotating drum testing  
| Concentration of the Substance in Mixture/Article | Not restricted (All applicable PROCs)  

**Amount used**
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation (industrial vs. professional) and level of containment/automation (as reflected in the PROC) is the main determinant of the process intrinsic emission potential.

**Human factors not influenced by risk management**

| Breathing volume | 10 m³/d  
Dermal exposure | Not relevant  

**Other operational conditions affecting workers exposure**

| Outdoor use / Indoor use | Not relevant  
Process conditions: Pressure | Not relevant  
Process temperature | Not relevant  
Room size | Not relevant  
Ventilation rate per hour | Not relevant  

**Technical conditions and measures at process level to prevent release**

| Containment | PROC 2, 3, 11: closed process  
All other applicable PROCs: not required  
| Segregation | PROC 2, 3: not required  
PROC 11: Spraying in non-industrial settings has to be performed in segregated areas where direct exposure of the worker is excluded.  
All other applicable PROCs: not required  

**Technical conditions and measures to control dispersion from the source towards the worker**

| Local exhaust |  
| Level of separation | PROC 11: Any potentially required separation of workers from the emission source is indicated above under "Frequency and duration of exposure". A reduction of exposure duration can be achieved, for example, by the installation of ventilated (positive pressure) control rooms or by removing the worker from workplaces involved with relevant exposure.  
All other applicable PROCs: Separation of workers from the emission source is generally not required in the conducted processes.  

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

| Good work practice | Avoid inhalation, ingestion and contact with skin and eyes. Advice on general occupational hygiene: Handle in accordance with good industrial hygiene and safety practice. Workers wear protective clothing. Change working clothes after each work shift. Shower or bathe at the end of working. Do not smoke. When using do not eat or drink. Do not blow dust off with compressed air.  

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

| All applicable PROCs: |  
| Respiratory protection | In case of insufficient ventilation, wear suitable respiratory equipment.  
Effective dust mask: EN 143, EN 149, FFP2  
Effectiveness : APF : 10  
| Gloves | Wear as appropriate: Protective gloves (EN 374)  
Protective gloves against thermal risks  
Protective gloves against mechanical risks  
| Eye/face protection | Yes  
Goggles (EN 166) |
### Sodium hydrogensulfate

#### PVS Chemicals Belgium N.V.

**Safety shoes**
- Wear as appropriate

**Skin and body protection**
- Wear as appropriate

#### Control of environmental exposure

**Product characteristics**
- Not relevant

**Frequency and duration of use**

<table>
<thead>
<tr>
<th>Annual operating days</th>
<th>Continuous use/release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount used</td>
<td>Not relevant</td>
</tr>
</tbody>
</table>

**Environmental factors not influenced by risk management**

Flow rate of receiving surface water: 18,000 m³/day

**Other given operational conditions affecting environmental exposure**

Effluent (of the waste water treatment plant) discharge rate: 2000 m³/d

**Technical conditions and measures at process level to prevent release**
- Not specified

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

Discharge to an on-site wastewater treatment plant or to a municipal sewage treatment plant is assumed.

**Organizational measures to prevent/limit release from the site**
- Not relevant

**Conditions and measures related to waste**
- Not relevant

#### Exposure estimation and reference to its source

**3. Health**

**Inhalation exposure**
- The exposure estimation tool MEASE was used for the assessment of inhalation exposure.

**Dermal exposure**
- Not relevant

**3. Environment**

The release to water is calculated based upon the default ERC release factors from the ECHA guidance.

**The exposure estimation tool EUSES was used for the assessment of the local environmental concentrations.**

#### Guidance to check compliance with the Exposure Scenario

**4. Health**

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**DNEL**
- Inhalation: 10 mg/m³

Due to the negligible dermal absorption of sodium hydrogen sulfate, the dermal route is not a relevant exposure path for sodium hydrogen sulfate and a dermal DNEL has not been derived. Thus, dermal exposure is not assessed in this exposure scenario.

**4. Environment**

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.
### Exposure scenario 3  Consumer use of cleaning products

<table>
<thead>
<tr>
<th><strong>1. Exposure scenario</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
</tr>
<tr>
<td><strong>Sector of use</strong></td>
</tr>
<tr>
<td><strong>Process category</strong></td>
</tr>
<tr>
<td><strong>Product category</strong></td>
</tr>
<tr>
<td><strong>Article category</strong></td>
</tr>
<tr>
<td><strong>Environmental release category</strong></td>
</tr>
<tr>
<td><strong>Processes, tasks, activities covered</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>2. Operational conditions and risk management measures</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.1. Control of consumer exposure</strong></td>
</tr>
<tr>
<td><strong>Frequency and duration of use</strong></td>
</tr>
<tr>
<td>Exposure duration per day</td>
</tr>
<tr>
<td>Acid surface cleaner (l) : 20 min (max)</td>
</tr>
<tr>
<td>Acid surface cleaner (s) : 20 min (max)</td>
</tr>
<tr>
<td>Toilet cleaner (s) : &lt; 1 min</td>
</tr>
<tr>
<td>Frequency of exposure</td>
</tr>
<tr>
<td>Acid surface cleaner (l) : 7 /week (max)</td>
</tr>
<tr>
<td>Acid surface cleaner (s) : 7 /week (max)</td>
</tr>
<tr>
<td>Toilet cleaner (s) : 2 /week (max)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Product characteristics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emission potential</strong></td>
</tr>
<tr>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Physical Form (at time of use)</strong></td>
</tr>
<tr>
<td>Acid surface cleaner (l) : Liquid</td>
</tr>
<tr>
<td>Acid surface cleaner (s) : Solid</td>
</tr>
<tr>
<td>Toilet cleaner (s) : Solid</td>
</tr>
<tr>
<td><strong>Vapour pressure</strong></td>
</tr>
<tr>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Dustiness</strong></td>
</tr>
<tr>
<td>Acid surface cleaner (l) : Not relevant</td>
</tr>
<tr>
<td>Acid surface cleaner (s) : very low</td>
</tr>
<tr>
<td>Toilet cleaner (s) : very low</td>
</tr>
<tr>
<td><strong>Concentration of the Substance in Mixture/Article</strong></td>
</tr>
<tr>
<td>Acid surface cleaner (l) : 6%</td>
</tr>
<tr>
<td>Acid surface cleaner (s) : 10%</td>
</tr>
<tr>
<td>Toilet cleaner (s) : 80%</td>
</tr>
<tr>
<td><strong>Amount used</strong></td>
</tr>
<tr>
<td>Acid surface cleaner (l) : (Typ) 12g/l; (max) 22g/l</td>
</tr>
<tr>
<td>Acid surface cleaner (s) : (max) 8g/l</td>
</tr>
<tr>
<td>Toilet cleaner (s) : (Typ) 20g; (max) 30g</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Human factors not influenced by risk management</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population potentially exposed</strong></td>
</tr>
<tr>
<td>Adult (BW: 60 kg)</td>
</tr>
<tr>
<td><strong>Breathing volume</strong></td>
</tr>
<tr>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Dermal exposure</strong></td>
</tr>
<tr>
<td>Acid surface cleaner (l) : Both hands (857,5 cm²)</td>
</tr>
<tr>
<td>Acid surface cleaner (s) : Both hands (857,5 cm²)</td>
</tr>
<tr>
<td>Toilet cleaner (s) : Only splashes (-)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Other given operational conditions affecting consumers exposure</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indoor/Outdoor</strong></td>
</tr>
<tr>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Room size</strong></td>
</tr>
<tr>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Ventilation rate per hour</strong></td>
</tr>
<tr>
<td>Not relevant</td>
</tr>
</tbody>
</table>

**Conditions and measures related to information and behavioural advice to consumers**

- Avoid contact with eyes.
- Keep out of reach of children.
- In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- Wash hands before breaks and immediately after handling the product.

**Conditions and measures related to personal protection, hygiene and health evaluation**
Wear suitable protective equipment. Safety goggles

### 2.2. Control of environmental exposure

**Product characteristics**
Not relevant

<table>
<thead>
<tr>
<th>Frequency and duration of use</th>
<th>Not relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount used</td>
<td>Not relevant</td>
</tr>
</tbody>
</table>

**Environmental factors not influenced by risk management**

<table>
<thead>
<tr>
<th>Dilution factor (river)</th>
<th>Default</th>
</tr>
</thead>
</table>

**Other given operational conditions affecting environmental exposure**

<table>
<thead>
<tr>
<th>Indoor/Outdoor</th>
<th></th>
</tr>
</thead>
</table>

#### Conditions and measures related to waste

<table>
<thead>
<tr>
<th>Conditions and measures related to municipal sewage treatment plant</th>
<th>Municipal sewage treatment plant (Default size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions and measures related to external treatment of waste for disposal</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Conditions and measures related to external recovery of waste</td>
<td>Not relevant</td>
</tr>
</tbody>
</table>

### 3. Exposure estimation and reference to its source

#### 3.1. Health

<table>
<thead>
<tr>
<th>Inhalation exposure</th>
<th>Qualitative assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal exposure</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Oral exposure</td>
<td>Qualitative assessment</td>
</tr>
<tr>
<td>Inhalation exposure</td>
<td>Not relevant (solid)</td>
</tr>
</tbody>
</table>

#### 3.2. Environment

The pH impact due to use of sodium hydrogen sulfate in household cleaning products is expected to be negligible. The influent of a municipal wastewater treatment plant is often neutralized anyway and sodium hydrogen sulfate may even be used beneficially for pH control of basic wastewater streams that are treated in biological WWTPs. Since the pH of the influent of municipal treatment plant is circum neutral, the pH impact is negligible on the receiving environmental compartments, such as surface water, sediment and terrestrial compartment.

### 4. Guidance to check compliance with the Exposure Scenario

#### 4.1. Health

The DU works inside the boundaries set by the exposure scenario if the substance is either marked as a liquid preparation or in case of a solid preparation is used as manufactured and not further processed to get smaller particles.

#### 4.2. Environment

The DU works inside the boundaries set by the exposure scenario if the substance is either marked as a liquid preparation or in case of a solid preparation is used as manufactured and not further processed to get smaller particles.
## 1. Exposure scenario

<table>
<thead>
<tr>
<th>Title</th>
<th>Consumer use of the substance as pH-regulator for swimming pools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU 21 - Consumer uses: Private households (= general public = consumers)</td>
</tr>
<tr>
<td>Process category</td>
<td></td>
</tr>
<tr>
<td>Product category</td>
<td>PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents</td>
</tr>
<tr>
<td></td>
<td>PC37 - Water treatment chemicals</td>
</tr>
<tr>
<td>Article category</td>
<td></td>
</tr>
<tr>
<td>Environmental release category</td>
<td>ERC8a - Wide dispersive indoor use of processing aids in open systems</td>
</tr>
<tr>
<td></td>
<td>ERC8b - Wide dispersive indoor use of reactive substances in open systems</td>
</tr>
<tr>
<td>Processes, tasks, activities covered</td>
<td>Consumer use of the substance as pH-regulator for swimming pools</td>
</tr>
</tbody>
</table>

## 2. Operational conditions and risk management measures

### 2.1. Control of consumer exposure

#### Frequency and duration of use

<table>
<thead>
<tr>
<th>Exposure duration per day</th>
<th>Pouring of granules: 1.33 min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drop wise application of solution: &gt;1 min-h</td>
</tr>
<tr>
<td></td>
<td>Post-application ingestion: 5 - 6h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency of exposure</th>
<th>Pouring of granules: 1/week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drop wise application of solution (s): 1/month</td>
</tr>
<tr>
<td></td>
<td>Post-application ingestion: Every day</td>
</tr>
</tbody>
</table>

#### Product characteristics

<table>
<thead>
<tr>
<th>Emission potential</th>
<th>Not relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Form (at time of use)</td>
<td>pH-regulating agents (l): Liquid</td>
</tr>
<tr>
<td></td>
<td>pH-regulating agents (s): granular</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Dustiness</td>
<td>pH-regulating agents (l): Not relevant</td>
</tr>
<tr>
<td></td>
<td>pH-regulating agents (s): very low</td>
</tr>
<tr>
<td>Concentration of the Substance in Mixture/Article</td>
<td>pH-regulating agents (l): ≤ 50%</td>
</tr>
<tr>
<td></td>
<td>pH-regulating agents (s): 100%</td>
</tr>
<tr>
<td>Amount used</td>
<td>pH-regulating agents (l): 10%</td>
</tr>
<tr>
<td></td>
<td>pH-regulating agents (s): 10g/m³ -&gt; pH = -0.1</td>
</tr>
<tr>
<td></td>
<td>Post-application ingestion: 0.05 l/h</td>
</tr>
</tbody>
</table>

#### Human factors not influenced by risk management

<table>
<thead>
<tr>
<th>Population potentially exposed</th>
<th>Pouring of granules: adult (60 kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drop wise application of solution: adult (60 kg)</td>
</tr>
<tr>
<td></td>
<td>Post-application ingestion: adult (60 kg) - Child (22 kg)</td>
</tr>
<tr>
<td>Breathing volume</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Dermal exposure</td>
<td>Pouring of granules: Palms of both hands (430 cm²)</td>
</tr>
<tr>
<td></td>
<td>Drop wise application of solution: Both hands (860 cm²)</td>
</tr>
<tr>
<td></td>
<td>Post-application ingestion: (-)</td>
</tr>
</tbody>
</table>

#### Other given operational conditions affecting consumers exposure

<table>
<thead>
<tr>
<th>Indoor/Outdoor</th>
<th>Not relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room size</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Ventilation rate per hour</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Skin Layer thickness</td>
<td>0.01 cm</td>
</tr>
</tbody>
</table>

#### Conditions and measures related to information and behavioural advice to consumers

Avoid contact with eyes.

Keep out of reach of children.

In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Wash hands before breaks and immediately after handling the product.
Assure an equal distribution of the salt by running the circulation pump for 4-6h and measure the pH to be in the desired range between 7.0-7.4 before swimming pool use.

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

Wear suitable protective equipment. Safety goggles

#### 2.2. Control of environmental exposure

### Product characteristics

Not relevant

### Frequency and duration of use

Not relevant

### Amount used

Not relevant

### Environmental factors not influenced by risk management

Dilution factor (river) Default

### Other given operational conditions affecting environmental exposure

Indoor/Outdoor

### Conditions and measures related to waste

Conditions and measures related to municipal sewage treatment plant Municipal sewage treatment plant Default

Conditions and measures related to external treatment of waste for disposal Not relevant

Conditions and measures related to external recovery of waste Not relevant

### 3. Exposure estimation and reference to its source

#### 3.1. Health

Inhalation exposure Qualitative assessment

Dermal exposure Not relevant

Oral exposure Qualitative assessment

Inhalation exposure Not relevant (OC1 - Solid, low dustiness)

#### 3.2. Environment

The pH impact due to use of sodium hydrogen sulfate in household cleaning products is expected to be negligible. The influent of a municipal wastewater treatment plant is often neutralized anyway and sodium hydrogen sulfate may even be used beneficially for pH control of basic wastewater streams that are treated in biological WWTPs. Since the pH of the influent of municipal treatment plant is circum neutral, the pH impact is negligible on the receiving environmental compartments, such as surface water, sediment and terrestrial compartment.

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#### 4.2. Environment

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