1. Identification of the substance/mixture and of the company

1.1 Product identifier:
   Substance name: potassium hydroxide
   EC No.: 215-181-3
   REACH Registration No.: 01-2119487136-33-0012
   CAS No.: 1310-58-3

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

1.2.1 Relevant identified uses
   KOH has mainly industrial uses. production of potassium carbonate (26 %), chemical manufacturing (16 %), production of potassium chemicals (12 %), production of fertilizers (11 %), production of phosphates (9 %), production of detergents (8 %), production of agricultural chemicals (7 %), production of alkaline batteries (6 %), all other (5 %) (OECD SIAR, 2002)

1.2.2 Uses advised against
   There are no uses advised against identified.

1.3. Details of the supplier of the SDS
   Supplier(Manufacturer)
   Unid Co., Ltd. Incheon Factory
   587-84 Hagik 1-Dong, Nam-gu, Incheon, South Korea
   Tel : + 82-32-830-7777, Fax :+82-32-832-4491
   E-mail : kjhyun@unid.co.kr
   National contact : K.J Hyun

1.4. Emergency telephone number
   Opening hours: 09:00 ~ 17:00
   Manufacturer's European Contact :
   OCI UNID Europe B.V
   Rivium Quadrant 81. 2090 LC Capelle a/d Ijssel. Netherlands
   Tel : +31 10 300 1012 Fax : +31 10 202 5466
   E-mail : sujlee@unid.co.kr
   Contact : S.J Lee

2. Hazards identification

2.1 Classification of the substance

2.1.1 Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]
   Acute Tox; category 4
   Skin corrosive; category 1A
   Corrosive to metals: category 1
   H302, H314, H290

2.1.2 Classification according to Directive 67/548/EEC
   Xn – harmful, C – corrosive
   R22, R35
   S1/2, S26, S36/37/39, S45

2.1.3 Additional information
   - For full text of R-phrases and Hazard- and EU Hazard-statements: see section 16
2.2. Label elements
Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard pictograms

GHS05  GHS07

Signal word:
Danger

Hazard statements:
H290 May be corrosive to metals
H302 Harmful if swallowed
H314 Causes severe skin burns and eye damage

Precautionary statements:
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.

Supplemental Hazard information (EU): N/A

2.3 Other hazards
KOH is not considered a PBT or a vPvB substance.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substances</th>
<th>Identifier number</th>
<th>Identification name</th>
<th>Weight(%) Content (or range)</th>
<th>EC Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium hydroxide</td>
<td>1310-58-3</td>
<td>potassium hydroxide</td>
<td>&gt;= 99.6 %</td>
<td>215-181-3</td>
</tr>
<tr>
<td>Sodium hydroxide</td>
<td>1310-73-2</td>
<td>sodium hydroxide</td>
<td>&lt;= 0.2 %</td>
<td>215-185-5</td>
</tr>
<tr>
<td>Dipotassium carbonate</td>
<td>584-08-7</td>
<td>dipotassium carbonate</td>
<td>&lt;= 0.2 %</td>
<td>209-529-3</td>
</tr>
</tbody>
</table>

4. First aid measures

4.1. Description of first aid measures
- general note
  N/A
- following inhalation
  Consult a doctor/medical service if breathing problems develop
Remove the victim into fresh air.
Unconscious: maintain adequate airway and respiration
- following skin contact
  Consult a doctor/medical service
  Wash immediately with lots of water and soap for 15 minutes
  Remove clothing while washing
- following eye contact
  Consult a doctor/medical service
  Rinse immediately with plenty of water for 15 minutes
  Do not apply neutralizing agents
- following ingestion
  Consult a doctor/medical service if you feel unwell
  Immediately give lots of water to drink
  Never give water to an unconscious person
  Do not induce vomiting
- notes for the doctor
  N/A

4.2. Most important symptoms and effects, both acute and delayed
  N/A

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

5. Fire-fighting measures

5.1 Extinguishing media:
  Suitable extinguishing media:
  - The product is non-combustible
  - Use fire-extinguishing media appropriate for surrounding materials.
  Unsuitable extinguishing media:
  - Water may be ineffective

5.2 Special hazards arising from the substance or mixture
  - Corrosive liquid.
  - Not combustible.
  - Reacts violently with water.
  - Gives off hydrogen by reaction with metals.

5.3 Advice for fire-fighters
  - Wear self contained breathing apparatus in case of fire.
  - Wear corrosion proof suit

5.4 Additional information:
  Instructions
  - Use fire fighting water moderately and contain it.
  - Use water spray to cool tanks/containers exposed to heat / remove them into safety.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
  - Wear chemical resistant personal protective equipment
  - Keep away from incompatible products
  - Isolate the area
  - Evacuate personnel to safe areas
  - Approach from upwind.
  - Ventilate the area.
  - Abundant running water should be available for emergency use.
  - Refer to protective measures listed in sections handling and storage
  and exposure controls/personal protection.
- Prevent further leakage or spillage if safe to do so.

6.2 Environmental precautions:
- Should not be released into the environment.
- Do not flush into surface water or sanitary sewer system.
- Dam up the liquid spill.
- Contain leaking substance, pump over in suitable containers
- Notify environmental personnel

6.3 Methods and material for containment and cleaning up
For cleaning up
- Carefully collect spill / leftovers.
- Equipment must be corrosion resistant.
- Scoop absorbed substance into closing containers.
- Take up liquid spill with inert absorbent material.
- Flush contaminated areas with large amounts of water and direct rinsings to chemical sewer or collect for treatment

6.4 Reference to other sections
N/A

7. Handling and storage

7.1 Precautions for safe handling
- When diluting, always add the product to water. Never add water to the product.
- Avoid splashing of material.
- Safety showers should be readily available in handling and storage areas.
- Keep away from incompatible products.
- Observe strict hygiene - avoid eye and skin contact.
- Remove contaminated clothing immediately.
- Eye wash fountains should be located in the work areas and should be immediately accessible for emergency use.

7.2 Conditions for safe storage, including any incompatibilities
- KOH in contact with water or moisture may result in enough heat to ignite combustibles.
- Keep away from : heat sources, highly flammable materials, incompatible products.
- Keep container tightly closed.
- Store in a well-ventilated area.
- Store at ambient temperature.

Packaging materials:
- Suitable: stainless steel, synthetic material / polyethylene, glass
- To avoid: lead, aluminium, copper, tin, zinc, bronze

7.3 Specific end use(s):
Exposure scenario for the mixture is attached.

8. Exposure controls/personal protection

8.1 Control parameters
Occupational Exposure limit values(OEL)

<table>
<thead>
<tr>
<th>Substance : Potassium hydroxide</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS No. : 1310-58-3</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Limit value-Eight hours</td>
</tr>
<tr>
<td>Country</td>
</tr>
<tr>
<td>Austria</td>
</tr>
<tr>
<td>Belgium</td>
</tr>
<tr>
<td>Canada-Québec</td>
</tr>
<tr>
<td>Denmark</td>
</tr>
</tbody>
</table>

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European Union
<table>
<thead>
<tr>
<th>Country</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>2</td>
</tr>
<tr>
<td>Germany(AGS)</td>
<td></td>
</tr>
<tr>
<td>Germany(DFG)</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>2</td>
</tr>
<tr>
<td>Italy</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>0.5</td>
</tr>
<tr>
<td>Spain</td>
<td>2</td>
</tr>
<tr>
<td>Sweden</td>
<td>1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>2 inhalable aerosol</td>
</tr>
<tr>
<td>The Netherlands</td>
<td></td>
</tr>
<tr>
<td>USA-NIOSH</td>
<td>2(1)</td>
</tr>
<tr>
<td>USA-OSHA</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td></td>
</tr>
</tbody>
</table>

Remark
- Canada-Québec : (1) Ceiling value
- USA0NIOSH : (1) ceiling limit value

Source: Based on GESTIS International Limit Values Database

8.1.2 Biological limit value
N/A

8.1.3 Exposure limits at intended use
N/A

8.1.4 DNEL/PNEC-values
The DNEL for potassium hydroxide for long-term inhalation(local effect) for workers is 1.0 mg/m³.

8.1.5 Risk management measures according to used control banding approach
N/A

8.2 Exposure controls

8.2.1 Appropriate engineering controls:
- Ensure adequate ventilation.
- Apply technical measures to comply with the occupational exposure limits.

8.2.2 Personal protection equipment:

8.2.2.1 Eye and face protection:
- Wear chemical resistant goggles.
- Face shield if risk on splashes.

8.2.2.2 Skin protection:

Hand protection:
- Impervious gloves
- Suitable material: PVC, Neoprene, Natural rubber, Butyl rubber
- Unsuitable material: Leather

Body protection:
- Corrosionproof clothing.
- Suitable material: PVC, Neoprene, Natural rubber, Butyl rubber

Other protection:
- Hygiene measures:
- Eye wash bottles or eye wash stations in compliance with applicable standards.
- Take off contaminated clothing and shoes immediately.
- Handle in accordance with good industrial hygiene and safety practice.

8.2.2.3 Respiratory protection:
- In the case of dust or aerosol formation use respirator with an approved filter.
- Recommended Filter type: P2

8.2.2.4 Thermal hazards: N/A
8.2.3 Environmental exposure controls:
- Dispose of rinse water in accordance with local and national regulations.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Appearance at 20°C and 101.3 hPa</td>
<td>Physical state: solid, Colour: white,</td>
</tr>
<tr>
<td>2) odour</td>
<td>Odourless</td>
</tr>
<tr>
<td>3) odour threshold</td>
<td>N/A</td>
</tr>
<tr>
<td>4) pH</td>
<td>N/A</td>
</tr>
<tr>
<td>5) Melting/freezing point</td>
<td>The melting point: 406°C.</td>
</tr>
<tr>
<td>6) Boiling point</td>
<td>The boiling point: 1327°C at 1013 hPa</td>
</tr>
<tr>
<td>7) Flash point</td>
<td>N/A</td>
</tr>
<tr>
<td>8) Evaporation rate</td>
<td>N/A</td>
</tr>
<tr>
<td>9) Flammability</td>
<td>Inorganic oxides in which the inorganic element is in its highest possible oxidation state are incapable of further reaction with oxygen and can thus be designated as non-flammable (Endpoint Specific Guidance Chapter R.7A, p. 123)</td>
</tr>
<tr>
<td>10) Upper/lower flammability or explosive limits</td>
<td>N/A</td>
</tr>
<tr>
<td>11) Vapour pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>12) Vapour density</td>
<td>N/A</td>
</tr>
<tr>
<td>13) Relative density</td>
<td>2.044 g/cm³ at 20°C</td>
</tr>
<tr>
<td>14) Water solubility</td>
<td>KOH is readily soluble. Solubility: 121g/100g water at 25°C</td>
</tr>
<tr>
<td>15) Partition coefficient: n-octanol-water</td>
<td>N/A</td>
</tr>
<tr>
<td>16) Auto-ignition temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>17) Decomposition temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>18) Viscosity</td>
<td>N/A</td>
</tr>
<tr>
<td>19) Explosive properties</td>
<td>N/A</td>
</tr>
<tr>
<td>20) Granulometry</td>
<td>Potassium hydroxide is mainly manufactured as a solution but solid KOH is also placed on the market. The particle size of pearls and flakes is very large and therefore there will be virtually no particles &lt; 100 μm.</td>
</tr>
</tbody>
</table>

9.2 Other information
N/A

10. Stability and Reactivity

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

10.2 Chemical stability
- Stable under recommended storage conditions

10.3 Possibility of hazardous reactions
- Gives of hydrogen by reaction with metals.
- Exothermic reaction with strong acids.
- Reacts violently with water.

**10.4 Conditions to avoid:**
- Unstable on exposure to air.
- Freezing

**10.5 Incompatible materials:**
- Keep away from: heat sources, oxidizing agents, acids, highly flammable materials, halogens, organic materials
- Keep away from: lead, aluminium, copper, tin, zinc, bronze

**10.6 Hazardous decomposition products:**
- Absorbs the atmospheric CO2
- Hydrogen : reacts with (some) metals and their compounds: release of highly flammable gas

**11. Toxicological information:**

**Acute toxicity:**

<table>
<thead>
<tr>
<th>Type of Toxicity</th>
<th>Dose</th>
<th>Species</th>
<th>Method</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute oral toxicity</td>
<td>LD50</td>
<td>rat</td>
<td>conventional method, Up-and-down method</td>
<td>According to the REACH Regulation, acute toxicity testing does not generally need to be conducted if the substance is classified as corrosive to the. Potassium hydroxide is a corrosive substance at concentrations.</td>
</tr>
<tr>
<td>Acute inhalative toxicity</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute dermal toxicity</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Irritation/Corrosivity:**

- **Skin:** the concentration limit for corrosivity is considered to be 2%.
- **Eye:**
  - 5% / 5 min.: extremely irritant and corrosive.
  - 1% / 5 min.: irritant; 1% / 24 hr.: irritant.
  - 0.5% / 24 hr.: marginal.
  - 0.1% / 24 hr.: negative (Johnson, 1975).
- Corrosive substance at a concentration > or = 5% concentration range for eye/skin irritation of KOH is 0.5 % ≤ C < 2%

**Irritation to respiratory tract:**

<table>
<thead>
<tr>
<th>Method</th>
<th>Results</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study type: self-reporting of symptoms</td>
<td>Subjects in the highest group of current caustic exposure reported increased prevalence of work related wheeze (Prevalence ratio = 1.8; 95%; CI: 1.0-3.1) and rhinitis (Prevalence ratio = 1.6; 95%; CI: 1.1-2.4), but did not have measurable changes in lung function.</td>
<td>2 (reliable with restrictions) key study Test material (IUPAC name): sodium hydroxide (read-across)</td>
</tr>
<tr>
<td>Type of population: occupational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endpoint addressed: respiratory irritation</td>
<td>There were no significant differences in FEV1 between caustic exposure groups, but those in the highest two exposure groups had significantly increased FVC. There were no differences in these results when these analyses were restricted to those who had ever worked in the production jobs.</td>
<td></td>
</tr>
</tbody>
</table>
Sensitization:

<table>
<thead>
<tr>
<th>Dose</th>
<th>Species</th>
<th>Method</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>not sensitizing</td>
<td>guinea pig</td>
<td>Landsteiner and Jacobs method</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Existing animal data and lack of human cases support no classification for sensitization</td>
</tr>
<tr>
<td>Respiratory system</td>
<td>N/A</td>
<td></td>
<td>No information available.</td>
</tr>
</tbody>
</table>

**Repeated dose toxicity:**

Oral, Inhalation and Dermal: N/A  
Reason: study scientifically unjustified

The introductory sections to Annexes VII-X point at a specific adaptation to the standard information requirements as in vivo testing shall be avoided with corrosive substances at concentration/dose levels causing corrosivity.

**Carcinogenicity:** N/A  
Reason: exposure considerations

Justification: Potassium hydroxide did not induce mutagenicity in in vitro and in vivo studies. Moreover, systemic carcinogenicity is not expected to occur because potassium hydroxide is not expected to be systemically available in the body under normal handling and use conditions. Finally, no suitable studies are available to assess the risk on local carcinogenic effects.

**Mutagenicity:**

In vitro data: N/A  
Reason: study technically not feasible

Justification: In vitro genetic toxicity tests indicated no evidence of mutagenic activity. Furthermore KOH is not expected to be systemically available in the body under normal handling and use conditions and for this reason additional testing is considered unnecessary (EU RAR, 2007; section 4.1.2.6, page 72). According to the REACH Regulation, further mutagenicity studies shall be considered in case of a positive result (column 2, Annexes VII, VIII). Therefore, further testing for mutagenicity is not relevant for NaOH.SIAR

In vivo data: N/A  
Reason: study scientifically unjustified

Justification: In vivo genetic toxicity tests indicated no evidence for a mutagenic activity for NaOH. Furthermore KOH is not expected to be systemically available in the body under normal handling and use conditions and for this reason additional testing is considered unnecessary.

**Toxicity for reproduction:**

Effects on fertility; N/A  
Reason: exposure considerations

Justification: Potassium hydroxide is not expected to be systemically available in the body under normal handling and use conditions and for this reason it can be stated that the substance will not reach the foetus nor male and female reproductive organs. It can be concluded that a specific study to determine the developmental toxicity or reproduction toxicity of KOH is not necessary.

Developmental toxicity: N/A  
Reason: exposure considerations

Justification: Potassium hydroxide is not expected to be systemically available in the body under normal handling and use conditions and for this reason it can be stated that the substance will not reach the foetus nor male and female reproductive organs. It can be concluded that a specific study to determine the developmental toxicity or teratogenicity of KOH is not necessary.

12. Ecological information

12.1 Toxicity:

12.1.1 Aquatic compartment (including sediment)
Short-term toxicity to fish: N/A
Reason: other justification
Justification: Potassium hydroxide is a strong alkaline substance that dissociates completely in water to K+ and OH- (OECD SIAR potassium hydroxide, 2002). Therefore, the only possible effect would result from the pH effect. KOH added to any test medium will directly affect the pH and while at the same time the pH in tests needs to be controlled within a given range. Therefore a standard test with KOH cannot be conducted.

Long-term toxicity to fish: N/A
Reason: study technically not feasible
Justification: Potassium hydroxide is a strong alkaline substance that dissociates completely in water to K+ and OH- (OECD SIAR 2002). Therefore, the only possible effect would result from the pH effect. However pH will remain within environmentally expected ranges. No valid long-term toxicity studies in fish are available. Despite of this, there is no need for further testing with KOH, as all available tests with NaOH resulted in a rather small range of toxicity values (chronic toxicity test > or = 25 mg/L) and there are sufficient data on pH ranges that are tolerated by major taxonomic groups (EU RAR, 2007, section 3.2.1.1.4, page 30).

Aquatic invertebrates
Short-term toxicity to aquatic invertebrates: N/A
Reason: other justification
Justification: Potassium hydroxide is a strong alkaline substance that dissociates completely in water to K+ and OH- (OECD SIAR potassium hydroxide, 2002). Therefore, the only possible effect would result from the pH effect. However pH will remain between environmentally expected ranges.

Long-term toxicity to aquatic invertebrates: N/A
Reason: study technically not feasible
Justification: Potassium hydroxide is a strong alkaline substance that dissociates completely in water to K+ and OH- (OECD SIAR potassium hydroxide, 2002. Similar as NaOH, EU RAR 2007). Therefore, the only possible effect would result from the pH effect. However pH will remain within environmentally expected ranges.

Algae and aquatic plants: N/A
Information requirement: Growth inhibition study with algae / cyanobacteria
Reason: study scientifically unjustified
Justification: Potassium hydroxide is a strong alkaline substance that dissociates completely in water to K+ and OH- (OECD SIAR potassium hydroxide, 2002). Therefore, the only possible effect would result from the pH effect. However pH will remain within environmentally expected ranges.

Sediment organisms: N/A
Reason: other justification
Justification: High water solubility and low vapour pressure indicate that potassium hydroxide will be found predominantly in aquatic environment. Potassium hydroxide is a strong alkaline substance that dissociates completely in water to K+ and OH-. This implies that if potassium hydroxide is emitted to surface water, sorption to particulate matter or sediment will be negligible (OECD SIAR potassium hydroxide, 2002).

12.1.2 Terrestrial compartment
Toxicity to soil macro-organisms: N/A
Information requirement: Toxicity to soil macro-organisms except arthropods
Reason: exposure considerations
Justification: Terrestrial toxicity and toxicity to soil macro-organisms can be waived on the basis of exposure (exposure based waiving): Potassium hydroxide is expected to remain in the water phase due to high water solubility and low octanol-water partitioning coefficient.

Toxicity to terrestrial plants: N/A
Reason: exposure consideration
Justification: Sediment / terrestrial toxicity can be waived on the basis of exposure (exposure based waiving): potassium hydroxide is expected to remain in the water phase due to high water solubility
and low octanol-water partitioning coefficient.

**Toxicity to soil micro-organisms:** N/A  
**Reason:** exposure considerations  
**Justification:** Sediment / terrestrial toxicity can be waived on the basis of exposure (exposure based waiving): potassium hydroxide is expected to remain in the water phase due to high water solubility and low octanol-water partitioning coefficient.

**12.1.3 Atmospheric compartment:** N/A  
**Reason:** study scientifically unjustified  
**Justification:** If emitted to soil, sorption to soil particles will be negligible. Depending on the buffer capacity of the soil, OH- will be neutralised in the soil pore water or the pH may increase. There is no direct exposure of soil to KOH based on the available uses. In addition, no indirect exposure via air is expected as it rapidly neutralizes in air.

**12.1.4 Microbiological activity in sewage treatment systems**  
**Toxicity to aquatic micro-organisms:** N/A  
**Reason:** exposure considerations  
**Justification:** Waste water from KOH production sites is coming from the salt electrolyses and is an inorganic wastewater stream. For this reason it is not feasible to treat it biologically. Therefore, wastewater streams from KOH production sites will normally not be treated in biological waste water treatment plants (WWTPs). Direct discharging of KOH solutions into municipal wastewater must be avoided unless neutralization is carried out. KOH may be used beneficially, however, for pH control of acid wastewater streams that are treated in biological WWTPs (EU RAR, 2007). Consequently, the pH of the influent of a municipal wastewater treatment plant is neutral and therefore, there is no exposure to the biological activity.

**12.1.5 Non compartment specific effects relevant for the food chain (secondary poisoning)**  
**Toxicity to birds:** N/A  
**Reason:** exposure considerations  
**Justification:** Terrestrial toxicity / toxicity to birds can be waived on the basis of exposure (exposure based waiving): potassium hydroxide is expected to remain in the water phase due to high water solubility, low vapour pressure and negligible sorption. Moreover, atmospheric emissions as aerosols are rapidly neutralized by carbon dioxide as occurs with sodium hydroxide (Cooper, 1979; USEPA, 1988) or other bases and the salts will be washed out by rain.

**12.2 Persistence and degradability**

**12.2.1 Degradation**

**12.2.1.1 Abiotic degradation**  
**Hydrolysis:** N/A  
**Reason:** study scientifically unjustified  
**Justification:** Potassium hydroxide is a strong alkaline substance that dissociates completely and rapidly in water to K+ and OH-. Therefore hydrolysis is not applicable, nor relevant for potassium hydroxide.

**Phototransformation/photolysis:** N/A  
**Reason:** study scientifically unjustified  
**Justification:** As stated in the OECD SIAR for potassium hydroxide (2002), photodegradation/phototransformation is not applicable due to its high water solubility and low vapour pressure: KOH will be found predominantly in aquatic environment.

**12.2.2 Biodegradation**

**12.2.2.1 Biodegradation in water and in soil:** N/A  
**Reason:** study scientifically unjustified  
**According to the REACH Regulation, the study does not need to be conducted if the substance is inorganic (Annex VII, column 2 adaption).**

**12.3 Bioaccumulative potential**  
**Aquatic bioaccumulation:** N/A  
**Reason:** study scientifically unjustified
Justification: According to the REACH Regulation, the study does not need to be conducted if the substance has a low potential for bioaccumulation (Annex IX, Column 2 adaptation). Potassium hydroxide is a strong alkaline substance that dissociates completely in water to K+ and OH-. Considering its high water solubility, potassium hydroxide is not expected to bioconcentrate in organisms. Log Pow is not applicable for an inorganic compound that dissociates. Considering its high water solubility, potassium hydroxide is not expected to bioconcentrate in organisms. Log Pow is not applicable for an inorganic compound which dissociates (OECD SIAR potassium hydroxide, 2002).

12.4 Mobility in soil

12.4.1 Environmental distribution
Adsorption/desorption: N/A
Reason: study scientifically unjustified
Justification: According to the REACH Regulation, the study does not need to be conducted if based on the physico-chemical properties the substance can be expected to have a low potential for adsorption (Annex VIII, Column 2 adaptation). Potassium hydroxide is very soluble in water and dissociates completely to K+ and OH-. If emitted to surface water, sorption to particulate matter and sediment will be negligible.

12.4.1.2 Summary and discussion of environmental distribution
Potassium hydroxide is readily soluble in water and dissociates completely to K+ and OH-. If emitted to surface water, sorption to particulate matter and sediment will be negligible.

12.5 Results of PBT and vPvB assessment

Persistence Assessment
KOH will rapidly dissolve and dissociate in water. Therefore, KOH does not fulfill the P criterion.

Bioaccumulation Assessment
Bioaccumulation is not relevant for KOH, therefore, KOH does not meet the B criterion of the PBT criteria.

Toxicity Assessment
Although LC50 values for aquatic organisms could not be reliably measured (see waiving statements in section 7), the lowest reported LC50 for freshwater and marine organisms suggests to be above the cut-off value of 0.1 mg/L. Therefore, KOH does not meet the T criterion in the PBT assessment.

Summary and overall Conclusions on PBT or vPvB Properties
KOH does not fulfill the criteria for persistence, bioaccumulation and toxicity. Therefore, KOH is not considered a PBT or a vPvB substance (cfr. EU RAR on NaOH, 2007).

12.6 Other adverse effects:
N/A

13. Disposal considerations

13.1 Waste treatment methods

13.1.1 Product / Packaging disposal:
Waste codes / waste designations according to EWC / AVV:
Provisions relating to waste:
- Waste material code
- Waste material code (Flanders): 302
- Hazardous waste (91/689/EEC)
Packaging/Container:
- Waste material code packaging
Contaminated packing:
- Where possible recycling is preferred to disposal or incineration
- Clean container with water
- In accordance with local and national regulations.

13.1.2 Waste treatment-relevant information:
- Dilute with plenty of water.
- Remove for physico-chemical treatment: neutralisation with pH control
- In accordance with local and national regulations.

14. Transport Information

14.1 Land transport (ADR/RID):
UN-No.: 1813 for solid
Proper shipping name: POTASSIUM HYDROXIDE, SOLID
Class: 8
Classification Code:
Packing group: II
Hazard label(s): DANGER LABEL TANKS: 8, DANGER LABEL PACKAGES: 8
Environmental Hazard: Not applicable
Special provision(s): Not applicable

14.2 Inland water ways transport (ADN):
UN-No.: 1813 for solid
Proper Shipping Name: POTASSIUM HYDROXIDE, SOLID
Class: 8
Classification Code:
Packing group: II
Environmental Hazardous: Not applicable
Hazard Label(s): DANGER LABEL TANKS: 8, DANGER LABEL PACKAGES: 8
Special provision(s):
EmS number: F-A, S-B
Labels: 8 CORROSIVE

14.3 Sea transport (IMDG Code):
UN-No.: 1813 for solid
Proper Shipping Name: POTASSIUM HYDROXIDE, SOLID
Class/es: 8
Packing group: II
Marine Pollutant: no
Special provision(s): Not applicable

14.4 Air transport (ICAO-TI/IATA-DGR):
UN-No.: 1813 for solid
Proper Shipping Name: POTASSIUM HYDROXIDE, SOLID
Class(es): 8
Packing group: if applicable: II
Special provisions: if documentation relevant
Labels: CORROSIVE
Solid: Passenger and cargo aircraft: limited quantity Y814 (5 kg per package),
814 (15 kg per package)
Cargo aircraft only: 816 (50 kg per package)

14.5 Additional information:
Limited quantities (LQ):
When substances and their packaging meet the conditions established by ADR/RID/ADNR in chapter 3.4, only the following prescriptions shall be complied with: each package shall display a diamond-shaped figure with the following inscription:
- ‘UN 1814’ or, in the case of different goods with different identification numbers
- within a single package:
- the letters ‘LQ’
15. Regulatory Information

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

15.1.1 EU regulations Authorisations and/or restrictions on use:
Authorisations: N/A
Restrictions on use: N/A

Other EU regulations:
Informations according 1999/13/EC about limitation of emissions of volatile organic compounds (VOC-guideline):

15.1.2 National regulations (Germany)
Restrictions of occupation:
Störfallverordnung (12. BImSchV):
Wassergefährdungsklasse (water hazard class):
Technische Anleitung Luft (TA-Luft):

15.2 Chemical Safety Assessment:
Chemical Safety Assessment has been carried out by the consortium, for potassium hydroxide.

16. Other Information

16.1 Indication of changes
Initial date: Dec.01.2010
Revision date:              Version: 1.0

16.2 Abbreviations and acronyms:
N/A: Not Applicable
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
STOT: Specific target organ toxicity
DNEL: Derived No Effect Level
PNEC: Predicted No Effect Concentration

16.3 Key literature references and sources for data
De Schamphelaere KAC, Heijerick DG and Janssen CR (2003). Development and Validation of Biotic Ligand Models for Predicting Chronic Zinc Toxicity to Fish, Daphnids and Algae (Final report of ILZRO project ZEH+ WA-01). Laboratory of Environmental Toxicology and Aquatic Ecology, Ghent University, Belgium (Sponsor: International Lead and Zinc Research Organization, ILZRO, Research Triangle Park, North Carolina, United States).
**16.4 Classification for mixtures and used evaluation method according to regulation (EC) 1207/2008 [CLP]:**

<table>
<thead>
<tr>
<th>Classification according to Regulation (EC) Nr. 1272/2008</th>
<th>Classification procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Tox; category 4</td>
<td>On basis of test data</td>
</tr>
<tr>
<td>Skin corrosive; category 1A</td>
<td>On basis of test data</td>
</tr>
<tr>
<td>Corrosive to metals; category 1</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**16.5 Relevant R-, H- and EUH-phrases (number and full text):**

- **R22** Harmful if swallowed
- **R35** Causes severe skin burns
- **R290** May be corrosive to metals
- **R302** Harmful if swallowed
- **R314** Causes severe skin burns and eye damage
- **P260** Do not breathe dust/fume/gas/mist/vapours/spray.
- **P280** Wear protective gloves/protective clothing/eye protection/face protection.
- **P303 + P361 + P353** IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing.

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Rinse skin with water/shower.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.

S1/2 - keep locked up and out of reach of children
S26 - in case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.
S45 - in case of accident or if you feel unwell, seek medical advice immediately
(show the label where possible)

16.6 Training advice:
N/A

16.7 Further information:
N/A

Annex to extended safety data sheet(eSDS)