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

1.1 Product identifiers

   Product name: Phenol

   Product Number: P5566
   Brand: Sigma-Aldrich
   Index-No.: 604-001-00-00-2
   REACH No.: 01-2119471329-32-XXXX
   CAS-No.: 108-95-2

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

   Identified uses: Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

   Company: Sigma-Aldrich Inc.
   3050 SPRUCE ST
   ST. LOUIS MO  63103
   UNITED STATES
   Telephone: +1 314 771-5765
   Fax: +1 800 325-5052

1.4 Emergency telephone

   Emergency Phone #: 800-424-9300 CHEMTREC (USA) +1-703-
   527-3887 CHEMTREC (International) 24
   Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

   Classification according to Regulation (EC) No 1272/2008
   Acute toxicity, Oral (Category 3), H301
   Acute toxicity, Inhalation (Category 3), H331
   Acute toxicity, Dermal (Category 3), H311
   Skin corrosion (Sub-category 1B), H314
   Serious eye damage (Category 1), H318
   Germ cell mutagenicity (Category 2), H341
   Specific target organ toxicity - repeated exposure (Category 2), Nervous system, Kidney,
   Liver, Skin, H373
   Long-term (chronic) aquatic hazard (Category 2), H411

   For the full text of the H-Statements mentioned in this Section, see Section 16.
2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram

Signal word Danger

Hazard statement(s)
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.
H314 Causes severe skin burns and eye damage.
H341 Suspected of causing genetic defects.
H373 May cause damage to organs (Nervous system, Kidney, Liver, Skin) through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard Statements none

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Vesicant., Rapidly absorbed through skin.

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms: Hydroxybenzene

Formula: C₆H₆O
Molecular weight: 94,11 g/mol
CAS-No.: 108-95-2
EC-No.: 203-632-7
Index-No.: 604-001-00-2

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; Muta. 2; STOT RE 2; Aquatic Chronic 2; H301, H331, H311, H314, H318, H341,</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>
SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aider needs to protect himself. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact
After contact with skin: rinse out with polyethylene glycol 400 or a mixture of polyethylene glycol 300/ethanol 2:1 and wash with plenty of water. If neither is available wash with plenty of water. Immediately take off contaminated clothing. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

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
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating. Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Work under hood. Do not inhale substance/mixture. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Recommended storage temperature 2 - 8 °C
Handle and store under inert gas. Light sensitive.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.
SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Viton®
Minimum layer thickness: 0,7 mm
Break through time: 480 min
Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Splash contact
Material: Viton®
Minimum layer thickness: 0,7 mm
Break through time: 480 min
Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when dusts/vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.
SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Appearance</td>
<td>Form: solid</td>
</tr>
<tr>
<td>b) Odor</td>
<td>Stinging</td>
</tr>
<tr>
<td>c) Odor Threshold</td>
<td>0,005 ppm</td>
</tr>
<tr>
<td>d) pH</td>
<td>6,0</td>
</tr>
<tr>
<td>e) Melting point/freezing point</td>
<td>Melting point/range: 38 - 43 °C</td>
</tr>
<tr>
<td>f) Initial boiling point and boiling range</td>
<td>181,8 °C at 1.013 hPa</td>
</tr>
<tr>
<td>g) Flash point</td>
<td>79,0 °C - closed cup</td>
</tr>
<tr>
<td>h) Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>i) Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>j) Upper/lower flammability or explosive limits</td>
<td>Upper explosion limit: 9,5 %(V)</td>
</tr>
<tr>
<td></td>
<td>Lower explosion limit: 1,3 %(V)</td>
</tr>
<tr>
<td>k) Vapor pressure</td>
<td>0,53 hPa at 20,0 °C</td>
</tr>
<tr>
<td>l) Vapor density</td>
<td>3,2 at 20 °C - (Air = 1.0)</td>
</tr>
<tr>
<td>m) Relative density</td>
<td>1,13 g/cm3 at 25 °C</td>
</tr>
<tr>
<td>n) Water solubility</td>
<td>87 g/l at 25 °C</td>
</tr>
<tr>
<td>o) Partition coefficient: n-octanol/water</td>
<td>log Pow: 1,47 at 30 °C - (ECHA), Bioaccumulation is not expected.</td>
</tr>
<tr>
<td>p) Autoignition temperature</td>
<td>715 °C</td>
</tr>
<tr>
<td></td>
<td>at 1.013 hPa</td>
</tr>
<tr>
<td>q) Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>r) Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>s) Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>t) Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>9.2 Other safety information</td>
<td></td>
</tr>
<tr>
<td>Surface tension</td>
<td>38,2 mN/m at 50,0 °C</td>
</tr>
<tr>
<td>Relative vapor density</td>
<td>3,2 at 20 °C - (Air = 1.0)</td>
</tr>
</tbody>
</table>

SECTION 10: Stability and reactivity

10.1 Reactivity

Forms explosive mixtures with air on intense heating. A range from approx. 15 Kelvin below the flash point is to be rated as critical.
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature). Contains the following stabilizer(s):
- Hypophosphorous acid (0,15 %)

10.3 Possibility of hazardous reactions
No data available.

10.4 Conditions to avoid
- Strong heating.

10.5 Incompatible materials
- rubber, various plastics, various alloys, various metals, Strong oxidizing agents

10.6 Hazardous decomposition products
- Hazardous decomposition products formed under fire conditions.
- Carbon oxides
- Other decomposition products - No data available
- In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

**Acute toxicity**
- No data available
- LD50 Dermal - Rat - female - 660 mg/kg
  (OECD Test Guideline 402)

**Skin corrosion/irritation**
- Skin - In vitro study
- Result: Causes burns.
  (OECD Test Guideline 431)

**Serious eye damage/eye irritation**
- Eyes - Rabbit
- Result: Corrosive
  (OECD Test Guideline 405)
- Causes serious eye damage. Risk of blindness!

**Respiratory or skin sensitization**
- Sensitisation test: - Guinea pig
- Result: negative
  Remarks: (IUCLID)

**Germ cell mutagenicity**
- Suspected of causing genetic defects.
- Mutagenicity (mammal cell test): chromosome aberration.
- Chinese hamster ovary cells
- Result: positive
- Mutagenicity (mammal cell test): micronucleus.
Chinese hamster ovary cells
Result: positive

**Carcinogenicity**
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**Reproductive toxicity**
No data available

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
May cause damage to organs through prolonged or repeated exposure. - Nervous system, Kidney, Liver, Skin

**Aspiration hazard**
No data available

**Additional Information**
RTECS: Not available

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Circulatory collapse, tachypnea, paralysis, Convulsions, Coma., necrosis of mouth and G.I. Tract, Jaundice, respiratory failure, cardiac arrest
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

---

**SECTION 12: Ecological information**

**12.1 Toxicity**

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>flow-through test LC50 - Onchorhynchus clarki - 8,9 mg/l - 96 h (US-EPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>static test EC50 - Ceriodaphnia dubia (water flea) - 3,1 mg/l - 48 h (US-EPA)</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>static test EC50 - Pseudokirchneriella subcapitata (algae) - 61,1 mg/l - 96 h (US-EPA)</td>
</tr>
<tr>
<td>Toxicity to bacteria</td>
<td>static test IC50 - microorganisms - 21 mg/l - 24 h (ECHA)</td>
</tr>
</tbody>
</table>

**12.2 Persistence and degradability**

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>aerobic - Exposure time 100 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result: 62 % - Readily biodegradable.</td>
<td>(OECD Test Guideline 301C)</td>
</tr>
</tbody>
</table>
12.3 Bioaccumulative potential

Bioaccumulation: Danio rerio (zebra fish) - 5 h at 25 °C - 2 mg/l (Phenol)

Bioconcentration factor (BCF): 17.5 (OECD Test Guideline 305)

Remarks: Does not bioaccumulate.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

14.1 UN number

ADR/RID: 1671  IMDG: 1671  IATA: 1671

14.2 UN proper shipping name

ADR/RID: PHENOL, SOLID  IMDG: PHENOL, SOLID  IATA: Phenol, solid

14.3 Transport hazard class(es)

ADR/RID: 6.1  IMDG: 6.1  IATA: 6.1

14.4 Packaging group

ADR/RID: II  IMDG: II  IATA: II

14.5 Environmental hazards

ADR/RID: yes  IMDG Marine pollutant: yes  IATA: no

14.6 Special precautions for user

No data available

SECTION 15: Regulatory information

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

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.
Other regulations
Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment
For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H301 Toxic if swallowed.
H301 + H311 + Toxic if swallowed, in contact with skin or if inhaled.
H311 Toxic in contact with skin.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H331 Toxic if inhaled.
H341 Suspected of causing genetic defects.
H373 May cause damage to organs (/$/*_2ORGAN_REPEAT/$/) through prolonged or repeated exposure.
H318 Toxic to aquatic life with long lasting effects.

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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