1. PRODUCT AND COMPANY IDENTIFICATION

Product name: 4-Chloroaniline
Product Number: C22415
Brand: Aldrich
Supplier: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO  63103
USA
Telephone: +1 800-325-5832
Fax: +1 800-325-5052
Emergency Phone #: (314) 776-6555
Preparation Information: Sigma-Aldrich Corporation
Product Safety - Americas Region
1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Carcinogen, Toxic by inhalation., Toxic by ingestion, Toxic by skin absorption, Skin sensitiser

Target Organs
Blood, Central nervous system, Cardiovascular system.

GHS Classification
Acute toxicity, Dermal (Category 3)
Acute toxicity, Oral (Category 3)
Acute toxicity, Inhalation (Category 4)
Eye irritation (Category 2B)
Skin sensitization (Category 1)
Carcinogenicity (Category 1B)
Acute aquatic toxicity (Category 1)
Chronic aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Pictogram

Signal word: Danger

Hazard statement(s)
H301 + H311   Toxic if swallowed or in contact with skin
H317       May cause an allergic skin reaction.
H320     Causes eye irritation.
H332     Harmful if inhaled.
H350       May cause cancer.
H400     Very toxic to aquatic life.
H412     Harmful to aquatic life with long lasting effects.

Precautionary statement(s)
P201     Obtain special instructions before use.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

HMIS Classification
- Health hazard: 3
- Chronic Health Hazard: *
- Flammability: 1
- Physical hazards: 0

NFPA Rating
- Health hazard: 2
- Fire: 1
- Reactivity Hazard: 0

Potential Health Effects
- Inhalation: Toxic if inhaled. May cause respiratory tract irritation.
- Skin: Toxic if absorbed through skin. May cause skin irritation.
- Eyes: May cause eye irritation.
- Ingestion: Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula: C₆H₆ClN
Molecular Weight: 127.57 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Chloroaniline</td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>106-47-8</td>
</tr>
<tr>
<td>EC-No.</td>
<td>203-401-0</td>
</tr>
<tr>
<td>Index-No.</td>
<td>612-137-00-9</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

- General advice
  Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

- If inhaled
  If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

- In case of skin contact
  Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

- In case of eye contact
  Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

- If swallowed
  Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

- Conditions of flammability
  Not flammable or combustible.

- Suitable extinguishing media
  Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

- Special protective equipment for firefighters
  Wear self contained breathing apparatus for fire fighting if necessary.
Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx), Hydrogen chloride gas

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Light sensitive. Store under inert gas. Air sensitive.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Chloroaniline</td>
<td>106-47-8</td>
<td>TWA</td>
<td>5 ppm 19 mg/m3</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
</tbody>
</table>

Remarks
Skin contact does contribute to exposure.

TWA 2 ppm 8 mg/m3
USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

Skin contact does contribute to exposure.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Immersion protection
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 480 min
Material tested:Dermatril® (Aldrich Z677272, Size M)

Splash protection
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 30 min
Material tested: Dermatril® (Aldrich Z677272, Size M)
data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 873000, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Eye protection**
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin and body protection**
Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**
- Form: solid
- Colour: no data available

**Safety data**
- pH: 6.9 at 1.00000 g/l at 20.0 °C (68.0 °F)
- Melting point/freezing point: Melting point/range: 67 - 70 °C (153 - 158 °F) - lit.
- Boiling point: 232 °C (450 °F) - lit.
- Flash point: 120.0 °C (248.0 °F) - closed cup
- Ignition temperature: no data available
- Autoignition temperature: no data available
- Lower explosion limit: no data available
- Upper explosion limit: no data available
- Vapour pressure: 0.036 hPa (0.027 mmHg) at 26.0 °C (78.8 °F)  
0.4 hPa (0.3 mmHg) at 38.0 °C (100.4 °F)  
0.3 hPa (0.2 mmHg) at 25.0 °C (77.0 °F)
- Density: 1.14 g/cm³ at 100.00 °C (212.00 °F)
- Water solubility: 2 g/l
- Partition coefficient: log Pow: 2.12  
log Pow: 1.70
- Relative vapour density: no data available
- Odour: no data available
- Odour Threshold: no data available
- Evaporation rate: no data available

### 10. STABILITY AND REACTIVITY
Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
no data available

Conditions to avoid
no data available

Materials to avoid
acids, Acid chlorides, Acid anhydrides, Chloroformates, Strong oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx), Hydrogen chloride gas
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity
Oral LD50
LD50 Oral - rat - male - 256.0 mg/kg

Inhalation LC50
LC50 Inhalation - rat - 4 h - 2,340 mg/m3

Dermal LD50
LD50 Dermal - rat - male - 455.0 mg/kg

Other information on acute toxicity
no data available

Skin corrosion/irritation
Skin - rabbit - No skin irritation

Serious eye damage/eye irritation
Eyes - rabbit - Mild eye irritation

Respiratory or skin sensitization
May cause sensitization by skin contact.

Germ cell mutagenicity
no data available

Carcinogenicity
This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (4-Chloroaniline)
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects

<table>
<thead>
<tr>
<th>Inhalation</th>
<th>Toxic if inhaled. May cause respiratory tract irritation.</th>
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<tr>
<td>Ingestion</td>
<td>Toxic if swallowed.</td>
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<tr>
<td>Skin</td>
<td>Toxic if absorbed through skin. May cause skin irritation.</td>
</tr>
<tr>
<td>Eyes</td>
<td>May cause eye irritation.</td>
</tr>
</tbody>
</table>

Signs and Symptoms of Exposure

May cause cyanosis., Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects
no data available

Additional Information
RTECS: BX0700000

12. ECOLOGICAL INFORMATION

Toxicity

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>LC50 - Lepomis macrochirus (Bluegill) - 1.8 - 3.2 mg/l - 96.0 h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LC50 - Oncorhynchus mykiss (rainbow trout) - 9.7 - 16 mg/l - 96.0 h</td>
</tr>
<tr>
<td></td>
<td>LC50 - Pimephales promelas (fathead minnow) - 7 - 18 mg/l - 96.0 h</td>
</tr>
<tr>
<td></td>
<td>LC50 - Danio rerio (zebra fish) - 33 mg/l - 96.0 h</td>
</tr>
<tr>
<td></td>
<td>LC50 - Leuciscus idus (Golden orfe) - 23 mg/l - 48.0 h</td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>EC50 - Daphnia magna (Water flea) - 0.04 - 0.06 mg/l - 48 h</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>EC50 - Desmodesmus subspicatus (green algae) - 2.20 - 6.30 mg/l - 72 h</td>
</tr>
</tbody>
</table>

Persistence and degradability

Biodegradability

aerobic

Result: > 90% - Readily biodegradable.

Bioaccumulative potential
no data available

Mobility in soil
no data available
PBT and vPvB assessment
no data available

Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2018 Class: 6.1 Packing group: II
Proper shipping name: Chloroanilines, solid
Reportable Quantity (RQ): 1000 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 2018 Class: 6.1 Packing group: II EMS-No: F-A, S-A
Proper shipping name: CHLOROANILINES, SOLID
Marine pollutant: No

IATA
UN number: 2018 Class: 6.1 Packing group: II
Proper shipping name: Chloroanilines, solid

15. REGULATORY INFORMATION

OSHA Hazards
Carcinogen, Toxic by inhalation., Toxic by ingestion, Toxic by skin absorption, Skin sensitiser

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
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<tr>
<td>106-47-8</td>
<td>2007-07-01</td>
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SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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New Jersey Right To Know Components

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</table>
California Prop. 65 Components
WARNING! This product contains a chemical known to the State of California to cause cancer.
4-Chloroaniline

CAS-No. 106-47-8
Revision Date 2007-09-28

16. OTHER INFORMATION

Further information
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