SAFETY DATA SHEET

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

1.1 Product identifiers

Product name : m-Toluidine
Product Number : 511218
Brand : Aldrich
Index-No. : 612-024-00-4
CAS-No. : 108-44-1

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

Identified uses : Laboratory chemicals, Synthesis 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

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

- Flammable liquids (Category 4), H227
- Acute toxicity, Oral (Category 3), H301
- Acute toxicity, Inhalation (Category 3), H331
- Acute toxicity, Dermal (Category 3), H311
- Specific target organ toxicity - repeated exposure (Category 2), H373
- Short-term (acute) aquatic hazard (Category 1), H400
- Long-term (chronic) aquatic hazard (Category 1), H410

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

2.2 GHS Label elements, including precautionary statements
2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Syonyms: 3-Methylaniline

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>m-toluidine</td>
<td>Flam. Liq. 4; Acute Tox. 3;</td>
<td>&lt;= 100%</td>
</tr>
</tbody>
</table>

Aldrich - 511218
STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H227, H301, H331, H311, H373, H400, H410 M-Factor - Aquatic Acute: 10

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

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. 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
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Call an 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.

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
Carbon dioxide (CO2) Foam 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
Nitrogen oxides (NOx)
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. Suppress (knock down) gases/vapors/mists with a water spray jet. 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: Do not breathe vapors, aerosols. 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 with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4  **Reference to other sections**  
For disposal see section 13.

### SECTION 7: Handling and storage

7.1  **Precautions for safe handling**  
**Advice on safe handling**  
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

**Advice on protection against fire and explosion**  
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

**Hygiene measures**  
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.

7.2  **Conditions for safe storage, including any incompatibilities**  
**Storage conditions**  
Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

**Storage class**  
Storage class (TRGS 510): 6.1A: Combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials
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

<table>
<thead>
<tr>
<th>Ingredients with workplace control parameters</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>m-toluidine</td>
<td>108-44-1</td>
<td>TWA</td>
<td>2 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Remarks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Not classifiable as a human carcinogen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Danger of cutaneous absorption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>2 ppm 9 mg/m3</td>
<td>USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PEL</td>
<td>2 ppm 9 mg/m3</td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
</tbody>
</table>

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). Safety glasses

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: butyl-rubber
Minimum layer thickness: 0.7 mm

Aldrich - 511218
Break through time: 30 min
Material tested: Butoject® (KCL 898)

**Body Protection**
protective clothing

**Respiratory protection**
required when 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.

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**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: liquid</td>
</tr>
<tr>
<td></td>
<td>Color: light yellow</td>
</tr>
<tr>
<td>b) Odor</td>
<td>No data available</td>
</tr>
<tr>
<td>c) Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>d) pH</td>
<td>9.3 at 100 g/l</td>
</tr>
<tr>
<td>e) Melting point/freezing point</td>
<td>Melting point: -31 °C (-24 °F)</td>
</tr>
<tr>
<td>f) Initial boiling point and boiling range</td>
<td>203 - 204 °C 397 - 399 °F - lit.</td>
</tr>
<tr>
<td>g) Flash point</td>
<td>86 °C (187 °F) - 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: 6.6 %(V)</td>
</tr>
<tr>
<td></td>
<td>Lower explosion limit: 1.1 %(V)</td>
</tr>
<tr>
<td>k) Vapor pressure</td>
<td>67 hPa at 68 °C (154 °F)</td>
</tr>
<tr>
<td></td>
<td>1 hPa at 41 °C (106 °F)</td>
</tr>
<tr>
<td>l) Vapor density</td>
<td>4.29</td>
</tr>
<tr>
<td>m) Density</td>
<td>0.999 g/cm³ at 25 °C (77 °F) - lit.</td>
</tr>
<tr>
<td></td>
<td>Relative density: 0.9920 °C</td>
</tr>
<tr>
<td>n) Water solubility</td>
<td>15 g/l at 20 °C (68 °F) - completely soluble</td>
</tr>
<tr>
<td>o) Partition coefficient: n-octanol/water</td>
<td>log Pow: 1.4 at 25 °C (77 °F) - Bioaccumulation is not expected.</td>
</tr>
<tr>
<td>p) Autoignition temperature</td>
<td>480 °C (896 °F) at 1,013 hPa</td>
</tr>
<tr>
<td>q) Decomposition temperature</td>
<td>No data available</td>
</tr>
</tbody>
</table>

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The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada
r) Viscosity 3.9 mm²/s at 20 °C (68 °F)
s) Explosive properties No data available
t) Oxidizing properties none

9.2 Other safety information

Dissociation constant 4.69 at 25 °C (77 °F)
4.8 at 20 °C (68 °F)
Relative vapor density 4.29

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.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Risk of explosion/exothermic reaction with:
Nitric acid
Mineral acids

10.4 Conditions to avoid
Strong heating.

10.5 Incompatible materials
Various plastics

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - 922 mg/kg
Remarks: (ECHA)
Symptoms: Nausea, Vomiting
LC50 Inhalation - 4 h - 3 mg/l - vapor

Inhalation: No data available
LD50 Dermal - 300 mg/kg
Dermal: No data available
No data available
Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 24 h
Remarks: (ECHA)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
Remarks: (ECHA)

Respiratory or skin sensitization
Local lymph node assay (LLNA) - Mouse
Result: negative
(OECD Test Guideline 429)

Germ cell mutagenicity
Test Type: Ames test
Test system: Escherichia coli/Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Carcinogenicity
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.
NTP: No ingredient 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 on OSHA’s list of regulated carcinogens.

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.
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Aspiration hazard
No data available

11.2 Additional Information
Repeated dose toxicity - Rat - male and female - Oral - 42 Days - LOAEL (Lowest observed adverse effect level) - 30 mg/kg
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.

**Systemic effects:**

After absorption:

- confusion
- Dizziness
- ataxia (impaired locomotor coordination)
- Headache
- CNS disorders
- Risk of methaemoglobin formation.
- impaired vision and hearing defect
- cardiovascular disorders
- Cardiac irregularities
- Coma

Symptoms may be delayed.

Danger of cumulative effects.

Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

---

**SECTION 12: Ecological information**

**12.1 Toxicity**

Toxicity to daphnia and other aquatic invertebrates

 statically test LC50 - Daphnia magna (Water flea) - 0.73 mg/l - 48 h

Remarks: (ECHA)

Toxicity to algae

 statically test ErC50 - Pseudokirchneriella subcapitata - 53.11 mg/l - 72 h

(OECD Test Guideline 201)

Toxicity to bacteria

 statically test EC50 - activated sludge - 1,572 mg/l - 3 h

(OECD Test Guideline 209)

Toxicity to fish (Chronic toxicity)

flow-through test NOEC - Oryzias latipes - 0.6 mg/l - 35 d

(OECD Test Guideline 210)

Remarks: (in analogy to similar products)
The value is given in analogy to the following substances: p-toluidine

**12.2 Persistence and degradability**

Biodegradability

 aerobic - Exposure time 28 d

Result: 64 - 84 % - Readily biodegradable.
12.3 **Bioaccumulative potential**

Bioaccumulation: Cyprinus carpio (Carp) - 28 d
- 0.1 mg/l (m-toluidine)

Bioconcentration factor (BCF): \(< 1.3\)

(OECD Test Guideline 305C)

12.4 **Mobility in soil**

No data available

12.5 **Results of PBT and vPvB assessment**

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 **Endocrine disrupting properties**

No data available

12.7 **Other adverse effects**

Discharge into the environment must be avoided.

---

**SECTION 13: Disposal considerations**

**13.1 Waste treatment methods**

**Product**

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See [www.retrologistik.com](http://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**

**DOT (US)**

<table>
<thead>
<tr>
<th>UN number</th>
<th>Class</th>
<th>Packing group</th>
<th>Proportioning name</th>
<th>Reportable Quantity (RQ)</th>
<th>Marine pollutant</th>
<th>Poison Inhalation Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1708</td>
<td>6.1</td>
<td>II</td>
<td>Toluidines, liquid</td>
<td>yes</td>
<td>yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**IMDG**

<table>
<thead>
<tr>
<th>UN number</th>
<th>Class</th>
<th>Packing group</th>
<th>Proportioning name</th>
<th>Marine pollutant</th>
<th>Marine pollutant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1708</td>
<td>6.1</td>
<td>II</td>
<td>TOLUIDINES, LIQUID</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

**IATA**

<table>
<thead>
<tr>
<th>UN number</th>
<th>Class</th>
<th>Packing group</th>
<th>Proportioning name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1708</td>
<td>6.1</td>
<td>II</td>
<td>Toluidines, liquid</td>
</tr>
</tbody>
</table>

**EMS-No:** F-A, S-A

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**SECTION 15: Regulatory information**
**SARA 302 Components**
This material does not contain any components with a section 302 EHS TPQ.

**SARA 313 Components**
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>m-toluidine</td>
<td>108-44-1</td>
<td>1993-02-16</td>
</tr>
</tbody>
</table>

**Pennsylvania Right To Know Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>m-toluidine</td>
<td>108-44-1</td>
<td>1993-02-16</td>
</tr>
</tbody>
</table>

---

**SECTION 16: Other information**

**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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Version: 6.10       Revision Date: 01/25/2023       Print Date: 08/12/2023