SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

Version: 1.0

Creation Date: Aug 20, 2017

Revision Date: Aug 20, 2017

1.Identification

1.1GHS Product identifier

Product name	m-Toluidine

1.2Other means of identification

Product number	-
Other names	3-Toluidine

1.3Recommended use of the chemical and restrictions on use

Identified uses	For industry use only. Intermediates
Uses advised against	no data available

2.Hazard identification

2.1Classification of the substance or mixture

Acute toxicity - Oral, Category 3

Acute toxicity - Dermal, Category 3

Acute toxicity - Inhalation, Category 3

Specific target organ toxicity – repeated exposure, Category 2

Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

2.2GHS label elements, including precautionary statements

Pictogram(s)	

Signal word	Danger
Hazard statement(s)	H301 Toxic if swallowed H311 Toxic in contact with skin H331 Toxic if inhaled H373 May cause damage to organs through prolonged or repeated exposure H400 Very toxic to aquatic life
Precautionary statement(s)	
Prevention	P264 Wash ... thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P280 Wear protective gloves/protective clothing/eye protection/face protection. P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P271 Use only outdoors or in a well-ventilated area. P260 Do not breathe dust/fume/gas/mist/vapours/spray. P273 Avoid release to the environment.
Response	P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/… P321 Specific treatment (see ... on this label). P330 Rinse mouth. P302+P352 IF ON SKIN: Wash with plenty of water/... P312 Call a POISON CENTER/doctor/…if you feel unwell. P361+P364 Take off immediately all contaminated clothing and wash it before reuse. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P311 Call a POISON CENTER/doctor/… P314 Get medical advice/attention if you feel unwell. P391 Collect spillage.
Storage	P405 Store locked up. P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal	P501 Dispose of contents/container to ...

2.3Other hazards which do not result in classification

none

3.Composition/information on ingredients

3.1Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
m-Toluidine	m-Toluidine	108-44-1	none	100%

4.First-aid measures

4.1Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer immediately for medical attention.

In case of skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer immediately for medical attention.

In case of eye contact

Rinse with plenty of water (remove contact lenses if easily possible). Refer immediately for medical attention.

If swallowed

Rinse mouth. Refer immediately for medical attention.

4.2Most important symptoms/effects, acute and delayed

Absorption of toxic quantities by any route causes cyanosis (blue discoloroation of lips, nails, skin); nausea, vomiting, and coma may follow. Repeated inhalation of low concentrations may cause pallor, low-grade secondary anemia, fatigability, and loss of appetite. Contact with eyes causes irritation. (USCG, 1999)

4.3Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Aniline and related compounds/

5.Fire-fighting measures

5.1Extinguishing media

Suitable extinguishing media

To fight fire, use foam, carbon dioxide, dry chemical.

5.2Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic oxides of nitrogen and flammable vapors may form in fire. (USCG, 1999)

5.3Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6.Accidental release measures

6.1Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2Environmental precautions

Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3Methods and materials for containment and cleaning up

Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place.

7.Handling and storage

7.1Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2Conditions for safe storage, including any incompatibilities

Provision to contain effluent from fire extinguishing. Separated from strong oxidants, strong acids and food and feedstuffs. Well closed. Ventilation along the floor. Keep in the dark. Store in an area without drain or sewer access./Store/ separated from strong oxidants, strong acids, food and feedstuffs. Cool. Dry. Well closed. Ventilation along the floor.

8.Exposure controls/personal protection

8.1Control parameters

Occupational Exposure limit values

NIOSH questioned whether the PEL proposed for m-toluidine [TWA 2 ppm (skin)] was adequate to protect workers from recognized health hazards.

Biological limit values

no data available

8.2Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. 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. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9.Physical and chemical properties

Physical state	Colorless oily liquid
Colour	Colorless to light yellow liquid
Odour	Aromatic, amine-like odor
Melting point/ freezing point	-30°C
Boiling point or initial boiling point and boiling range	203-204°C
Flammability	Class IIIA Combustible Liquid: Fl.P. at or above 60° C and below 93.33° C.Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	no data available
Flash point	86°C

Auto-ignition temperature	481.67° C (USCG, 1999)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	3.306 mPa-sec at 25° C
Solubility	In water:0.2 g/100 mL (20 °C)
Partition coefficient n-octanol/water (log value)	log Kow = 1.40
Vapour pressure	0.278mmHg at 25° C
Density and/or relative density	0.989
Relative vapour density	3.90 (Air = 1)
Particle characteristics	no data available

10.Stability and reactivity

10.1Reactivity

no data available

10.2Chemical stability

Stable under recommended storage conditions.

10.3Possibility of hazardous reactions

Flammable when exposed to heat or flame.As a result of flow, agitation, etc., electrostatic charges can be generated.M-TOLUIDINE neutralizes acids in exothermic reactions to form salts plus water. May be incompatible with isocyanates, halogenated organics, peroxides, phenols (acidic), epoxides, anhydrides, and acid halides. May generate hydrogen, a flammable gas, in combination with strong reducing agents such as hydrides. Can react vigorously with oxidizing reagents. Emits toxic fumes of oxides of nitrogen when heated to decomposition [Lewis, 3rd ed., 1993, p. 1253].

10.4Conditions to avoid

no data available

10.5Incompatible materials

Can react vigorously on contact with oxidizing materials.

10.6Hazardous decomposition products

When heated to decomposition it emits highly toxic fumes of /nitroxides/.

11.Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 450 mg/kg
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

A4; Not classifiable as a human carcinogen.

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12.Ecological information

12.1Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: LC50; Species: Daphnia magna (water flea); Conditions: static; Concentration: 0.73 mg/L for 24 hr
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2Persistence and degradability

AEROBIC: 3-Aminotoluene, present at 100 mg/L, reached 0% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(1). In other screening tests, 3-aminotoluene was found to be readily biodegradable(2-4). In one test, 74% of theoretical BOD was achieved in 7.5 days with an activated sludge inoculum acclimated to aniline(2). In another, 97.7% degradation occurred in 5 days with an activated sludge inoculum(3). Complete degradation of 3-aminotoluene was obtained within 8 days with a soil inoculum(4). The half-life of 3-aminotoluene in natural water from ponds and rivers in which the microbial populations were increased 10- to 100-fold by filtration and nutrient addition was 4 hours(5). 3-Aminotoluene, present at 2 mg/L, reached 50% of its theoretical BOD in 5 days using water from the Songhua River in China as an inoculum(6).

12.3Bioaccumulative potential

An estimated BCF of 3.9 was calculated for 3-aminotoluene(SRC), using a log Kow of 1.40(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4Mobility in soil

The mean Koc of 3-aminotoluene in 4 silt loam soils was 44 over a pH range of 6.1 to 7.5(1). According to a classification scheme(2), this Koc value suggests that 3-aminotoluene is expected to have very high mobility in soil. The pKa of 3-aminotoluene is 4.69(3), indicating that this compound will partially exist in cation form in the environment and cations generally adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(4). Aromatic amines are expected to bind strongly to humus or organic matter in soils due to the high reactivity of the aromatic amino group(5,6), suggesting that mobility of the neutral species may be much lower in some soils(SRC).

12.5Other adverse effects

no data available

13.Disposal considerations

13.1Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14.Transport information

14.1UN Number

ADR/RID: UN1708	IMDG: UN1708	IATA: UN1708

14.2UN Proper Shipping Name

ADR/RID: TOLUIDINES, LIQUID

IMDG: TOLUIDINES, LIQUID
IATA: TOLUIDINES, LIQUID

14.3Transport hazard class(es)

ADR/RID: 6.1	IMDG: 6.1	IATA: 6.1

14.4Packing group, if applicable

ADR/RID: II	IMDG: II	IATA: II

14.5Environmental hazards

ADR/RID: yes	IMDG: yes	IATA: yes

14.6Special precautions for user

no data available

14.7Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15.Regulatory information

15.1Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
m-Toluidine	m-Toluidine	108-44-1	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.

Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Not Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.

16.Other information

Information on revision

Creation Date	Aug 20, 2017
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Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/