

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.2
Creation Date: July 15, 2019
Revision Date: August 08, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name o-Toluidine

1.2 Other means of identification

Product number CAZO111418
Other names o-Toluidin; 2-methylbenzenamine; ortho-methyl aniline

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.
Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.
Address 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou
Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175
Service hours 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Acute toxicity - Category 3, Oral
Eye irritation, Category 2
Acute toxicity - Category 3, Inhalation
Carcinogenicity, Category 1B
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H301 Toxic if swallowed
H319 Causes serious eye irritation
H331 Toxic if inhaled
H350 May cause cancer
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/hearing protection/...
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P203 Obtain, read and follow all safety instructions before use.
P273 Avoid release to the environment.

Response	P301+P316 IF SWALLOWED: Get emergency medical help immediately. P321 Specific treatment (see ... on this label). P330 Rinse mouth. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P316 Get emergency medical help immediately. P318 IF exposed or concerned, get medical advice. 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 an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
o-Toluidine	o-toluidine	95-53-4	202-429-0	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

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

Following skin contact

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

Following eye contact

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

Following ingestion

Rinse mouth. Refer immediately for medical attention.

4.2 Most important symptoms/effects, acute and delayed

Absorption of toxic quantities by any route causes cyanosis (blue discoloration 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)

4.3 Indication 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

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use dry chemical, carbon dioxide, or alcohol foam extinguishers. Vapors are heavier than air and will collect in low areas. Vapors may travel long distances to ignition sources and flashback. Vapors in confined areas may explode when exposed to fire. Containers may explode in fire. Storage containers and parts of containers may rocket great distances, in many directions. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors or shows any signs of deforming), withdraw immediately to a secure position ... The only respirators recommended for fire fighting are self-contained breathing apparatuses that have full facepieces and are operated in a pressure-demand or other positive-pressure mode.

5.2 Specific hazards arising from the chemical

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

5.3 Special protective actions for fire-fighters

Use water spray, foam, powder, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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.

6.2 Environmental 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.

6.3 Methods and materials for containment and cleaning up

PRECAUTIONS FOR "CARCINOGENS": A high-efficiency particulate arrestor (HEPA) or charcoal filters can be used to minimize amt of carcinogen in exhausted air ventilated safety cabinets, lab hoods, glove boxes or animal rooms ... Filter housing that is designed so that used filters can be transferred into plastic bag without contaminating maintenance staff is avail commercially. Filters should be placed in plastic bags immediately after removal ... The plastic bag should be sealed immediately ... The sealed bag should be labelled properly ... Waste liquids ... should be placed or collected in proper containers for disposal. The lid should be secured & the bottles properly labelled. Once filled, bottles should be placed in plastic bag, so that outer surface ... is not contaminated ... The plastic bag should also be sealed & labelled. ... Broken glassware ... should be decontaminated by solvent extraction, by chemical destruction, or in specially designed incinerators. Chemical Carcinogens

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames. Above 85°C use a closed system and ventilation. Prevent build-up of electrostatic charges (e.g., by grounding). Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions 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. Before entering confined space where this chemical may be present, check to make sure that an explosive concentration does not exist. o-Toluidine must be stored to avoid contact with strong oxidizers (such as chlorine, bromine, and fluorine) because violent reactions occur. Store in tightly closed containers in a cool, well-ventilated area away from heat. Sources of ignition, such as smoking and open flames, are prohibited where o-toluidine is used, handled, or stored in a manner that could create a potential fire or explosion hazard. A regulated, marked area should be established where this chemical is handled, used, or stored ...

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 2 ppm as TWA; (skin); A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued. EU-OEL: 0.5 mg/m³, 0.1 ppm as TWA; (skin). MAK: skin absorption (H); carcinogen category: 1; germ cell mutagen group: 3A

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

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

Eye/face protection

Wear safety goggles.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state

Liquid.

Colour

Light yellow becoming reddish brown on exposure to air and light.

Odour

Aromatic aniline-like odor

Melting point/freezing point

-24.4 °C. Remarks: Alpha form.; -16.3 °C. Remarks: Beta form.

Boiling point or initial boiling point and boiling range 200.2 °C. Atm. press.: 1 013 hPa.

Flammability	Class IIIA Combustible Liquid: Fl.P. at or above 140°F and below 200°F.
Lower and upper explosion limit/flammability limit	Lower flammable limit: 1.5% by volume, upper limit not determined
Flash point	85 °C. Atm. press.: 1 013 hPa.
Auto-ignition temperature	480 °C. Atm. press.: 1 atm. Remarks: The value is assumed to be taken under normal atmospheric conditions.
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	g cm ⁻¹ s ⁻¹ (dyn) = 0.038. Temperature: 25.0°C. Remarks: Mussell et al. (1912).; g cm ⁻¹ s ⁻¹ (dyn) = 0.034. Temperature: 25.0°C. Remarks: Angelescu et al. (1936).; cm ² s ⁻¹ (kin) = 0.012. Temperature: 20°C. Remarks: Dreisbach (1955).
Solubility	Partially miscible with water
Partition coefficient n-octanol/water	log Pow = 1.4. Temperature: 24.5 °C.
Vapour pressure	47.6 Pa. Temperature: 25 °C. Remarks: Mean of Antoine and Grain method.
Density and/or relative density	0.998 g/cm ³ . Temperature: 20 °C.
Relative vapour density	3.7 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

NIOSH considers o-toluidine to be a potential occupational carcinogen. Decomposes on heating and on burning. This produces toxic fumes including nitrogen oxides. Reacts with strong oxidants and strong acids. Attacks some forms of plastic.

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

Flammable when exposed to heat or flame. As a result of flow, agitation, etc., electrostatic charges can be generated. 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. Flammable gaseous hydrogen may be generated in combination with strong reducing agents, such as hydrides. Emits very toxic oxides of nitrogen when heated to decomposition. Undergoes a hypergolic reaction with red fuming nitric acid [Kit and Evered, 1960, p. 239, 242].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Hypergolic reaction with red fuming nitric acid. Can react with oxidizing materials.

10.6 Hazardous decomposition products

When heated to decomposition, it emits toxic fumes of hydrochloric acid and nitrogen oxides.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 - rat (male) - 750 mg/kg bw.
- Inhalation: LC50 - rat (male) - 862 ppm.
- Dermal: LD50 - rabbit (male) - 3 250 mg/kg bw.

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

There is sufficient evidence in humans for the carcinogenicity of ortho-toluidine. There is sufficient evidence in experimental animals for the carcinogenicity of ortho-toluidine. Overall evaluation ortho-Toluidine is carcinogenic to humans (Group 1).

Reproductive toxicity

Limited information regarding the reproductive or developmental effects of inhaled or ingested o-toluidine was located. One Russian study

reported an increased frequency of tumors in offspring of mice injected with o-toluidine during gestation.

STOT-single exposure

The substance is severely irritating to the eyes. The substance may cause effects on the blood. This may result in the formation of methaemoglobin. The effects may be delayed. Medical observation is indicated. See Notes.

STOT-repeated exposure

This substance is carcinogenic to humans. May cause genetic damage in humans.

Aspiration hazard

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly on spraying.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - *Poecilia reticulata* - 81.3 mg/L - 14 d.
- Toxicity to daphnia and other aquatic invertebrates: LC50 - *Daphnia magna* - 0.52 mg/L - 48 h.
- Toxicity to algae: EC50 - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 30.9 mg/L - 72 h.
- Toxicity to microorganisms: EC50 - *Tetrahymena pyriformis* - 155 mg/L - 40 h.

12.2 Persistence and degradability

AEROBIC: Biodegradation results of 2-aminotoluene showed: 100% degradation in 6 hr using an activated sludge inoculum(1); 56% of theoretical BOD utilized in 5 days with a sewage seed(2); 100% of theoretical BOD in 8 days using an activated sludge inoculum acclimated to aniline(3); 97.7% removal in 5 days with activated sludge(4). Using activated sludge from the wastewater treatment plant used to treat effluent known to contain 2-aminotoluene, 92% chemical oxygen demand removal was obtained in a 24 hr incubation with the chemical(5). 2-Aminotoluene, present at 100 mg/L, reached 65% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L and the Japanese MITI test(6). Complete degradation was obtained in 64 days with a soil inoculum(7). Six laboratories obtained >90% degradation of 2-aminotoluene in 7 days in two screening tests designed to simulate surface waters and polluted river water(8). 500 ppm of 2-aminotoluene completely degraded in 3 days in a Chernozem soil, leaving degradation products that persisted for over 90 days(9). Approximately 90% of 2-aminotoluene was degraded in 15 days under aerobic conditions using an inoculum prepared from water samples collected from a polluted river; less than 20% degradation was observed in 15 days using an inoculum prepared from water samples collected from a non-polluted river(10). 2-Aminotoluene, present at 2 mg/L, reached 41% of its theoretical BOD in 5 days using water from the Songhua River in China as an inoculum(11). The mean biodegradation rate constant and half-life measured for 50 ug/L 2-aminotoluene in a sludge inoculum were 8.8X10⁻⁶/sec and 22 hours, respectively(12). These data indicate that biodegradation of 2-aminotoluene will be an important environmental fate process(SRC).

12.3 Bioaccumulative potential

An estimated BCF of 3.5 was calculated for 2-aminotoluene(SRC), using a log Kow of 1.32(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).

12.4 Mobility in soil

The measured partition coefficient between sediment and water for 2-aminotoluene ranged from 40 to 250(1). According to a classification scheme(2), these Koc values suggest that 2-aminotoluene is expected to have very high to moderate mobility in soil. A group of investigators found the movement of toluidines through clay (montmorillonite) was not inhibited by sorption(3). The pKa of 2-aminotoluene is 4.44(4), indicating that this compound will exist partially in the cation form in the environment and cations generally adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(5). Aromatic amines are expected to bind strongly to humus or organic matter in soils due to the high reactivity of the aromatic amino group(6,7), suggesting that mobility may be much lower in some soils(SRC).

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal 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.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1708 (For reference only, please check.) IMDG: UN1708 (For reference only, please check.) IATA: UN1708 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: TOLUIDINES, LIQUID (For reference only, please check.)

IMDG: TOLUIDINES, LIQUID (For reference only, please check.)

IATA: TOLUIDINES, LIQUID (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.)

IMDG: 6.1 (For reference only, please check.)

IATA: 6.1 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: II (For reference only, please check.) IMDG: II (For reference only, please check.) IATA: II (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: Yes

IMDG: Yes

IATA: Yes

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

Chemical name	Common names and synonyms	CAS number	EC number
o-toluidine	o-toluidine	95-53-4	202-429-0
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			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019
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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/>

Other Information

Depending on the degree of exposure, periodic medical examination is suggested. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available. The odour warning when the exposure limit value is exceeded is

insufficient.Do NOT take working clothes home.See ICSCs 0342 and 0343.

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

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