

Chemical Safety Data Sheet MSDS / SDS

4-chloro-o-toluidine SDS

Revision Date:2024-04-25 Revision Number:1

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

Product name: 4-chloro-o-toluidine
CAS: 95-69-2

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.
Uses advised against: none

Company Identification

Company: Chemicalbook.in
Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090
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SECTION 2: Hazards identification**Classification of the substance or mixture**

Acute toxicity - Category 3, Oral
Acute toxicity - Category 3, Dermal

Acute toxicity - Category 3, Inhalation
Germ cell mutagenicity, Category 2
Carcinogenicity, Category 1B
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

GHS 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
H341 Suspected of causing genetic defects
H350 May cause cancer
H410 Very toxic to aquatic life with long lasting effects

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.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P316 Get emergency medical help immediately.
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.
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.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	4-chloro-o-toluidine
Common names and synonyms:	4-chloro-o-toluidine
CAS number:	95-69-2
EC number:	202-441-6
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer immediately for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer immediately for medical attention.

Following eye contact

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

Following ingestion

Rinse mouth. Give one or two glasses of water to drink. Refer immediately for medical attention.

Most important symptoms/effects, acute and delayed

Inhalation, ingestion, or skin contact causes bluish tint in fingernails, lips, and ears. Headache, drowsiness, and nausea also occur. Contact with eyes causes irritation. (USCG, 1999)

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

Absorption, Distribution and Excretion

¹⁴C-labeled 4-chloro-o-toluidine, when orally admin to white rats, was degraded and eliminated primarily in urine along with radioactive metabolites. rate of absorption & degradation was slower than for chlordimeform.

SECTION 5: Firefighting measures

Suitable extinguishing media

Fire Extinguishing Agents: Water, dry chemical (USCG, 1999)

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic oxides of nitrogen and hydrochloric acid fumes may form. (USCG, 1999)

Special protective actions for fire-fighters

Use water spray, dry powder, carbon dioxide.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Sweep spilled substance into covered containers. Then store and dispose of according to local regulations. Do NOT let this chemical enter the environment.

Environmental precautions

Sweep spilled substance into covered containers. Then store and dispose of according to local regulations. Do NOT let this chemical enter the environment.

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

Precautions for safe handling

NO open flames. 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.

Conditions for safe storage, including any incompatibilities

Cool. Separated from food and feedstuffs. See Chemical Dangers. Well closed. Store in an area without drain or sewer access. Provision to contain effluent from fire extinguishing. PRECAUTIONS FOR "CARCINOGENS": Storage site should be as close as practical to lab in which carcinogens are to be used, so that only small quantities required for ... expt need to be carried. Carcinogens should be kept in only one section of cupboard, an explosion-proof refrigerator or freezer (depending on chemico-physical properties ...) that bears appropriate label. An inventory ... should be kept, showing quantity of carcinogen & date it was acquired ... Facilities for dispensing ... should be contiguous to storage area. Chemical Carcinogens

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

MAK: skin absorption (H); carcinogen category: 1; germ cell mutagen group: 3A

Biological limit values

no data available

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.

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

Eye/face protection

Wear face shield or eye protection in combination with breathing protection if powder.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	4-chloro-o-toluidine is a gray to white solid with a weak fishy odor. Sinks in water. Freezing point is 77°F. (USCG, 1999)
Colour:	Crystalline, fused, grayish-white solid (commercial product)
Odour:	no data available
Melting point/freezing point:	122°C(lit.)

Boiling point or initial boiling point and boiling range:	241°C(lit.)
Flammability:	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	38°C(lit.)
Auto-ignition temperature:	560°C
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	less than 1 mg/mL at 68° F (NTP, 1992)
Partition coefficient n-octanol/water:	2.27
Vapour pressure:	Pa at 25°C: 5.5
Density and/or relative density:	1.14
Relative vapour density:	(air = 1): 4.9
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes on burning. This produces toxic and corrosive fumes including hydrogen chloride and nitrogen oxides. Reacts violently

with chloroformic acid esters, strong oxidants, acid anhydrides, acids and acid chlorides.

Chemical stability

no data available

Possibility of hazardous reactions

4-CHLORO-O-TOLUIDINE is incompatible with acids, acid chlorides, acid anhydrides, chloroformates and strong oxidizing agents. (NTP, 1992). A halide- and amine-substituted aromatic compound. Amines are chemical bases. They neutralize acids to form salts plus water. These acid-base reactions are exothermic. The amount of heat that is evolved per mole of amine in a neutralization is largely independent of the strength of the amine as a base. Amines may be incompatible with isocyanates, halogenated organics, peroxides, phenols (acidic), epoxides, anhydrides, and acid halides. Flammable gaseous hydrogen is generated by amines in combination with strong reducing agents, such as hydrides.

Conditions to avoid

no data available

Incompatible materials

no data available

Hazardous decomposition products

no data available

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

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

Evaluation: There is sufficient evidence for the carcinogenicity of para-chloro-ortho-toluidine hydrochloride in experimental animals. There is limited evidence for the carcinogenicity of para-chloro-ortho-toluidine in humans. In formulating the overall evaluation, the Working Group took note of the fact that any salt of para-chloro-orthotoluidine with a strong acid can be expected to behave chemically in a manner similar to the hydrochloride salt in solution and in vivo. Overall evaluation: para-Chloro-ortho-toluidine and its strong acid salts are probably carcinogenic to humans (Group 2A).

Reproductive toxicity

no data available

STOT-single exposure

May cause mechanical irritation to the skin, respiratory tract and eyes (as a solid). The substance may cause effects on the bladder. This may result in haemorrhagic inflammation. 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

May cause heritable genetic damage to human germ cells.

Aspiration hazard

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

5 ppm of ¹⁴C labeled 4-chloro-o-toluidine was added to soil (pH 7.5, and organic matter, sand, silt, and clay contents of 3.4, 36.6, 28.2, and 35.2%, respectively); nearly 20% of the added 4-chloro-o-toluidine was metabolized to CO₂ over a period of 40 days under aerobic conditions(1). Evolution of CO₂ from the ring-labelled compound gives evidence for biologically mediated ring cleavage. Autoclaved soil control samples with added 4-chloro-o-toluidine did not produce CO₂(1). Incubation of 4-chloro-o-toluidine with aniline oxidase or L-3 peroxidase obtained from the soil fungus *Geotrichum candidum* resulted in the formation of 2,2'-dimethyl-4,4'-dichloroazobenzene through polymerizing transformations of the original compound(2). 4-Chloro-o-toluidine from a petrochemical industrial process wastewater at an initial concentration of 110 mg/l with activated sludge as an inoculum and a one day acclimation period gave 16% removal by measuring COD(Mn) and 7% removal of TOC after a 24 hour period under aerobic conditions(3). This compound was considered to be non-biodegradable using this test(3). Gas chromatography however, used to measure biodegradation during this same 24 hour period, showed better degradability of 4-chloro-o-toluidine suggesting that structural breakdown of this compound occurs prior to oxidation of carbon into carbon dioxide(3). 0% biodegradation of 4-chloro-o-toluidine was shown via BOD in a 2 week experiment using activated sludge as an inoculum and with 4-chloro-o-toluidine present at 100 mg/ml(4).

Bioaccumulative potential

Bioconcentration of 4-chloro-o-toluidine was measured in carp over a 6 week time period. At concentrations of 0.34 mg/ml and 0.034 mg/ml 4-chloro-o-toluidine, BCF values of 7.7-12 and <35 respectively, were reported(1). These values suggest that bioconcentration of 4-chloro-o-toluidine in aquatic organisms is not an important fate process for this compound(SRC).

Mobility in soil

The K_{oc} for 4-chloro-o-toluidine was estimated as 410(SRC), using a recommended regression-derived equation(1) and an estimated log K_{ow} of 2.27(2,SRC). According to a suggested classification scheme(3), this estimated K_{oc} value suggests that 4-chloro-o-toluidine has moderate mobility in soil(SRC). ¹⁴C labelled 4-chloro-o-toluidine was added to autoclaved soil (pH 7.5, and organic matter, sand, silt, and clay contents of 3.4, 36.6, 28.2, and 35.2%, respectively) and incubated for several weeks; 12.2% of the radioactive label was removed as volatiles, 25% was recovered in a Soxhlet extract, and 55.1% of the radioactive label was obtained after Soxhlet extraction using Bleidner distillation (bound residue fraction)(4). This suggests that a significant portion of

the 4-chloro-o-toluidine is bound strongly by this soil(4). Over a 24 hour time period, 34% of applied 4-chloro-o-toluidine was found in the bound residue fraction(5). Binding due to the high reactivity of the aromatic amino group to humus or soil organic matter rather than to clay particles is proposed as a reason for the soil binding ability of anilines(4,5). Low adsorption is observed at a neutral pH with pure clay minerals or soils for substituted anilines(5).

Other adverse effects

no data available

SECTION 13: Disposal considerations

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

UN Number

ADR/RID: UN2239 (For reference only, please check.)

IMDG: UN2239 (For reference only, please check.)

IATA: UN2239 (For reference only, please check.)

UN Proper Shipping Name

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

IMDG: CHLOROTOLUIDINES, SOLID (For reference only, please check.)

IATA: CHLOROTOLUIDINES, SOLID (For reference only, please check.)

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.)

Packing group, if applicable

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

Environmental hazards

ADR/RID: Yes
IMDG: Yes
IATA: Yes

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

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

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Not Listed.

(PICCS)

Not Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Not Listed.

Korea Existing Chemicals List (KECL)

Not Listed.

SECTION 16: Other information

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. Do NOT take working clothes home. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available.

Disclaimer: 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. We as supplier shall not be held liable for any