

## MATERIAL SAFETY DATA SHEET

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Version 1.6

## Section 1 - Product and Company Information

Product Name O-TOLUIDINE  
Product Number T1406  
Brand SIGMA

Company Sigma-Aldrich  
Address 3050 Spruce Street  
SAINT LOUIS MO 63103 US

Technical Phone: 800-325-5832  
Fax: 800-325-5052  
Emergency Phone: 314-776-6555

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
O-TOLUIDINE	95-53-4	Yes

Formula C7H9N  
Synonyms 1-Amino-2-methylbenzene \* 2-Amino-1-methylbenzene  
\* o-Aminotoluene \* 2-Aminotoluene \* Aniline,  
2-methyl- \* Benzenamine, 2-methyl- (9CI) \* C.I.  
37077 \* 1-Methyl-2-aminobenzene \*  
2-Methyl-1-aminobenzene \* o-Methylaniline \*  
2-Methylaniline \* o-Methylbenzenamine \*  
2-Methylbenzenamine \* RCRA waste number U328 \*  
o-Toluidin (Czech) \* 2-Toluidine \* o-Toluidine  
(ACGIH:OSHA) \* o-Toluidyna (Polish) \* o-Tolylamine

RTECS Number: XU2975000

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Toxic. Dangerous for the environment.  
May cause cancer. Also toxic by inhalation and if swallowed. Risk  
of serious damage to eyes. Very toxic to aquatic organisms.  
Combustible. Target organ(s): Bladder. Kidneys. Calif. Prop. 65  
carcinogen.

## HMIS RATING

HEALTH: 2\*  
FLAMMABILITY: 2  
REACTIVITY: 1

## NFPA RATING

HEALTH: 2  
FLAMMABILITY: 2  
REACTIVITY: 1

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

## Section 4 - First Aid Measures

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### ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

### INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

### DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

### EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

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## Section 5 - Fire Fighting Measures

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### FLASH POINT

185 °F 85 °C Method: closed cup

### EXPLOSION LIMITS

Lower: 1.5 %

### AUTOIGNITION TEMP

482 °C

### FLAMMABILITY

N/A

### EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

### FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.  
Specific Hazard(s): Combustible liquid. Emits toxic fumes under fire conditions.

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## Section 6 - Accidental Release Measures

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### PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

### METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

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## Section 7 - Handling and Storage

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### HANDLING



Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	Log Kow: 1.32	
Decomposition Temp.	N/A	
Flash Point	185 °F 85 °C	Method: closed cup
Explosion Limits	Lower: 1.5 %	
Flammability	N/A	
Autoignition Temp	482 °C	
Refractive Index	1.572	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:Slightly.	
	Other Solvents: ALCOHOL, ETHER	

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Conditions to Avoid: Air.

Materials to Avoid: Strong oxidizing agents, Strong acids.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes severe eye irritation.

Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. Toxic if inhaled.

Ingestion: Toxic if swallowed.

### TARGET ORGAN(S) OR SYSTEM(S)

Blood. Bladder. Kidneys.

### SIGNS AND SYMPTOMS OF EXPOSURE

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.

### TOXICITY DATA

Oral

Rat

670 mg/kg

LD50

Remarks: Blood:Methemoglobinemia-Carboxyhemoglobin.  
Blood:Pigmented or nucleated red blood cells. Blood:Normocytic anemia.

Inhalation

Rat

862 ppm

LC50

Remarks: Behavioral:Somnolence (general depressed activity).  
Behavioral:Tremor. Lungs, Thorax, or Respiration:Cyanosis.

Oral

Mouse

520 mg/kg

LD50

Remarks: Blood:Normocytic anemia. Blood:Pigmented or nucleated red blood cells. Blood:Methemoglobinemia-Carboxyhemoglobin.

Intraperitoneal

Mouse

150 MG/KG

LD50

Oral

Rabbit

840 mg/kg

LD50

Remarks: Blood:Normocytic anemia. Blood:Pigmented or nucleated red blood cells. Blood:Methemoglobinemia-Carboxyhemoglobin.

Skin

Rabbit

3250 UL/KG

LD50

Oral

Mammal

1700 mg/kg

LD50

#### IRRITATION DATA

Skin

Rabbit

10 mg

24H

Remarks: Open irritation test

Skin

Rabbit

500 mg

24H

Remarks: Mild irritation effect

Eyes

Rabbit

0.75 mg

24H

Remarks: Severe irritation effect

#### CHRONIC EXPOSURE - CARCINOGEN

Result: Found positive for carcinogenicity in EPA Genetox

program. 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.

Species: Rat  
Route of Application: Oral  
Dose: 109 GM/KG  
Exposure Time: 2Y  
Frequency: C  
Result: Tumorigenic:Neoplastic by RTECS criteria. Blood:Tumors.

Species: Mouse  
Route of Application: Subcutaneous  
Result: Tumorigenic Effects: Uterine tumors.  
Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors.

Species: Rabbit  
Route of Application: Subcutaneous  
Dose: 840 MG/KG  
Exposure Time: 14W  
Frequency: I  
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Kidney, Ureter, Bladder:Tumors.

Species: Rat  
Route of Application: Oral  
Dose: 7250 MG/KG  
Exposure Time: 23W  
Frequency: C  
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Kidney, Ureter, Bladder:Tumors.

#### IARC CARCINOGEN LIST

Rating: Group 2A Group 2A

Rating: Group 2B

#### NTP CARCINOGEN LIST

Rating: Anticipated to be a carcinogen.

#### CHRONIC EXPOSURE - MUTAGEN

Species: Human  
Dose: 2 MMOL/L  
Cell Type: lymphocyte  
Mutation test: Micronucleus test

Species: Human  
Dose: 300 MG/L (+S9)  
Cell Type: lymphocyte  
Mutation test: Mutation in microorganisms

Species: Human  
Dose: 50 UL/L  
Cell Type: HeLa cell  
Mutation test: Unscheduled DNA synthesis

Species: Human  
Dose: 4 MMOL/L  
Cell Type: HeLa cell

Mutation test: DNA inhibition

Species: Human  
Dose: 200 UMOL/L  
Cell Type: lymphocyte  
Mutation test: Sister chromatid exchange

Species: Human  
Dose: 450 MG/L  
Cell Type: lymphocyte  
Mutation test: Mutation in mammalian somatic cells.

Species: Rat  
Dose: 319 MG/L  
Cell Type: liver  
Mutation test: DNA damage

Species: Rat  
Dose: 1 MMOL/L  
Cell Type: liver  
Mutation test: Unscheduled DNA synthesis

Species: Rat  
Dose: 300 MG/KG  
Cell Type: S. typhimurium  
Mutation test: Body fluid assay

Species: Rat  
Dose: 400 MG/KG  
Cell Type: ovary  
Mutation test: Body fluid assay

Species: Rat  
Dose: 175 MG/L  
Cell Type: liver  
Mutation test: Cytogenetic analysis

Species: Rat  
Dose: 21800 UG/L  
Cell Type: liver  
Mutation test: Sister chromatid exchange

Species: Mouse  
Dose: 12500 UG/L (+S9)  
Cell Type: lymphocyte  
Mutation test: Mutation in microorganisms

Species: Mouse  
Dose: 250 MG/L (+S9)  
Cell Type: Embryo  
Mutation test: Mutation in microorganisms

Species: Mouse  
Dose: 500 MG/L  
Cell Type: Embryo  
Mutation test: Morphological transformation.

Species: Mouse  
Route: Intraperitoneal  
Dose: 100 MG/KG  
Mutation test: DNA damage

Species: Mouse  
Route: Oral  
Dose: 600 MG/KG  
Mutation test: DNA damage

Species: Mouse  
Route: Intraperitoneal  
Dose: 20 GM/KG  
Mutation test: DNA inhibition

Species: Mouse  
Route: Oral  
Dose: 200 MG/KG  
Mutation test: DNA inhibition

Species: Mouse  
Dose: 10 MG/L  
Cell Type: lymphocyte  
Mutation test: Mutation in mammalian somatic cells.

Species: Hamster  
Dose: 100 MG/L  
Cell Type: Embryo  
Mutation test: Morphological transformation.

Species: Hamster  
Dose: 20 MMOL/L  
Cell Type: ovary  
Mutation test: DNA damage

Species: Hamster  
Dose: 12 MG/L  
Cell Type: liver  
Mutation test: Cytogenetic analysis

Species: Hamster  
Dose: 1 GM/L  
Cell Type: lung  
Mutation test: Cytogenetic analysis

Species: Hamster  
Dose: 250 MG/L  
Cell Type: ovary  
Mutation test: Cytogenetic analysis

Species: Hamster  
Route: Intraperitoneal  
Dose: 200 MG/KG  
Mutation test: Sister chromatid exchange

Species: Hamster  
Route: Oral  
Dose: 200 MG/KG  
Mutation test: Sister chromatid exchange

Species: Hamster  
Dose: 125 MG/L  
Cell Type: ovary  
Mutation test: Sister chromatid exchange

Species: Hamster  
Dose: 2500 UMOL/L

Cell Type: lung  
Mutation test: Sister chromatid exchange

Species: Hamster  
Dose: 60 MG/L  
Cell Type: liver  
Mutation test: SLN

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat  
Dose: 9520 MG/KG  
Route of Application: Skin  
Exposure Time: (17W MALE)  
Result: Effects on Newborn: Physical. Paternal Effects:  
Spermatogenesis (including genetic material, sperm  
morphology, motility, and count).

Species: Rat  
Dose: 9520 MG/KG  
Route of Application: Skin  
Exposure Time: (17W PRE)  
Result: Effects on Newborn: Physical. Maternal Effects:  
Menstrual cycle changes or disorders. Effects on Newborn: Growth  
statistics (e.g., reduced weight gain).

Species: Rat  
Dose: 952 MG/KG  
Route of Application: Skin  
Exposure Time: (17W PRE)  
Result: Maternal Effects: Ovaries, fallopian tubes. Maternal  
Effects: Menstrual cycle changes or disorders.

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#### Section 12 - Ecological Information

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##### ACUTE ECOTOXICITY TESTS

Test Type: EC50 Daphnia  
Species: Daphnia magna  
Time: 48 h  
Value: 0.310 - 0.860 mg/l

Test Type: EC50 Algae  
Species: Scenedesmus subspicatus  
Time: 72 h  
Value: 3.9 mg/l

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#### Section 13 - Disposal Considerations

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##### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose  
of this material. This combustible material may be burned in a  
chemical incinerator equipped with an afterburner and scrubber.  
Observe all federal, state, and local environmental regulations.

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#### Section 14 - Transport Information

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##### DOT

Proper Shipping Name: Toluidines [liquid]  
UN#: 1708  
Class: 6.1  
Packing Group: Packing Group II

Hazard Label: Toxic substances.  
PIH: Not PIH

IATA

Proper Shipping Name: TOLUIDINES, LIQUID  
IATA UN Number: 1708  
Hazard Class: 6.1  
Packing Group: II

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Section 15 - Regulatory Information

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EU DIRECTIVES CLASSIFICATION

Symbol of Danger: T-N  
Indication of Danger: Toxic. Dangerous for the environment.  
R: 45-23/25-36-50  
Risk Statements: May cause cancer. Also toxic by inhalation and if swallowed. Irritating to eyes. Very toxic to aquatic organisms.  
S: 53-45-61  
Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic. Dangerous for the environment.  
Risk Statements: May cause cancer. Also toxic by inhalation and if swallowed. Risk of serious damage to eyes. Very toxic to aquatic organisms.  
Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid release to the environment. Refer to special instructions/safety data sheets.  
US Statements: Combustible. Target organ(s): Bladder. Kidneys.  
Calif. Prop. 65 carcinogen.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes  
DEMINIMIS: 0.1 %  
NOTES: This product is subject to SARA section 313 reporting requirements.  
TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s) known to the state of California to cause cancer. This product is or contains chemical(s) known to the state of California to cause cancer.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.  
DSL: Yes  
NDSL: No

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

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