

Material Safety Data Sheet

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Version 1.7

According to 91/155/EEC

1 - Product and Company Information

Product Name	TOLUENE, CHROMASOLV®, FOR HPLC, >=99.9%
Product Number	34866
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
TOLUENE	108-88-3	203-625-9	601-021-00-3

Formula	C7H8
Molecular Weight	92.14 AMU
Synonyms	Antisal 1a * Benzene, methyl- * CP 25 * Methacide * Methane, phenyl- * Methylbenzene * Methylbenzol * NCI-C07272 * Phenylmethane * RCRA waste number U220 * Tolueen (Dutch) * Toluen (Czech) * Toluene (ACGIH:OSHA) * Tolueno (Spanish) * Toluol * Toluolo (Italian) * Tolu-Sol

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Highly flammable. Harmful by inhalation.

4 - First Aid Measures

AFTER INHALATION

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

AFTER SKIN CONTACT

In case of contact, immediately wash skin with soap and copious amounts of water.

AFTER EYE CONTACT

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

AFTER INGESTION

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

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

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

SPECIAL RISKS

Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

Explosion Hazards: Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

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.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed. Keep away from heat, sparks, and open flame.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

GENERAL HYGIENE MEASURES

Remove and wash contaminated clothing promptly. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	100 MG/M3
Poland		NDSch	350 MG/M3
Poland		NDSP	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	94 mg/m3
		25 ppm

Remarks: H

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	190 mg/m3 50 ppm

Remarks: 4

Remarks: Y

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	94 mg/m3 25 ppm

Remarks: H

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level	200 mg/m3 50 ppm

Remarks: H

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	190 mg/m3 50 ppm

Remarks: M C H*

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	191 mg/m3 50 ppm
OEL	STEL	574 mg/m3 150 ppm

Remarks: Skin

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Liquid Color: Colorless	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	110.6 °C	760 mmHg
MP/MP Range	-93 °C	
Flash Point	4 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	N/A	
SG/Density	0.865 g/cm3	25 °C
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	

Evaporation Rate	N/A
Bulk Density	N/A
Decomposition Temp.	N/A
Solvent Content	N/A
Water Content	N/A
Surface Tension	N/A
Conductivity	N/A
Miscellaneous Data	N/A
Solubility	N/A

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: XS5250000

ACUTE TOXICITY

LDLO

Oral

Man

719 UL/KG

Remarks: Cardiac:Other changes. Lungs, Thorax, or

Respiration:Acute pulmonary edema. Liver:Other changes.

LDLO

Oral

Human

50 mg/kg

LD50

Oral

Rat

636 mg/kg

LC50

Inhalation

Rat

49,000 mg/m3

4H

LD50

Intraperitoneal

Rat

1332 MG/KG

LD50

Intravenous

Rat

1960 MG/KG

LC50

Inhalation
Mouse
400 ppm
24H

LD50
Intraperitoneal
Mouse
59 MG/KG

LD50
Subcutaneous
Mouse
2250 MG/KG

LD50
Skin
Rabbit
14100 UL/KG

LD50
Intraperitoneal
Guinea pig
500 MG/KG

LD50
Oral
Mammal
4000 mg/kg

LC50
Inhalation
Mammal
30,000 mg/m3

IRRITATION DATA

Eyes
Human
300 ppm

Skin
Rabbit
435 mg
Remarks: Mild irritation effect

Skin
Rabbit
500 mg
Remarks: Moderate irritation effect

Skin
Rabbit
20 mg
24H
Remarks: Moderate irritation effect

Eyes
Rabbit
0.87 mg
Remarks: Mild irritation effect

Eyes
Rabbit
2 mg
24H
Remarks: Severe irritation effect

Eyes
Rabbit
100 mg
30S
Remarks: Rinsed

SIGNS AND SYMPTOMS OF EXPOSURE

Exposure may cause: Lung irritation, chest pain, and edema which may be fatal. Inhalation studies on toluene have demonstrated the development of inflammatory and ulcerous lesions of the penis, prepuce, and scrotum in animals.

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes severe eye irritation.
Inhalation: Harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: Harmful if swallowed.

TARGET ORGAN INFORMATION

Liver. Kidneys. Brain. Bladder.

CONDITIONS AGGRAVATED BY EXPOSURE

May cause nervous system disturbances.

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

CHRONIC EXPOSURE - MUTAGEN

Rat
30 UMOL/L
Cell Type: liver
DNA damage

Rat
5400 UG/M3/16W-I
Inhalation
Cytogenetic analysis

Rat
9600 MG/KG
Subcutaneous
12D
Cytogenetic analysis

Mouse
200 MG/KG
Oral
Micronucleus test

Mouse
433 UG/KG

Intraperitoneal
24H
Micronucleus test

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 7280 MG/KG
Route of Application: Oral
Exposure Time: (6-19D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 1500 MG/M3/24H
Route of Application: Inhalation
Exposure Time: (1-8D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 1000 MG/M3/24H
Route of Application: Inhalation
Exposure Time: (7-14D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 800 MG/M3/6H
Route of Application: Inhalation
Exposure Time: (14-20D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Newborn: Behavioral.

Species: Mouse
Dose: 9 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetal death.

Species: Mouse
Dose: 15 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 30 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue).

Species: Mouse
Dose: 500 MG/M3/24H
Route of Application: Inhalation
Exposure Time: (6-13D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 1000 PPM/6H
Route of Application: Inhalation
Exposure Time: (2-17D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 400 PPM/7H
Route of Application: Inhalation
Exposure Time: (7-16D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Effects on Newborn: Biochemical and metabolic.

Species: Mouse
Dose: 200 PPM/7H
Route of Application: Inhalation
Exposure Time: (7-16D PREG)
Result: Specific Developmental Abnormalities: Urogenital system.

Species: Rabbit
Dose: 100 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-18D PREG)
Result: Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 9100 MG/KG
Route of Application: Oral
Exposure Time: (6-19D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Biochemical and metabolic.

Species: Rat
Dose: 16 ML/KG
Route of Application: Oral
Exposure Time: (6-21D PREG)
Result: Effects on Newborn: Physical.

Species: Rat
Dose: 6000 PPM/2H
Route of Application: Inhalation
Exposure Time: (5W-I)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Species: Rat
Dose: 2000 PPM/6H
Route of Application: Inhalation
Exposure Time: (7-17D PREG)
Result: Maternal Effects: Other effects. Effects on Newborn: Physical.

Species: Rat
Dose: 1200 PPM/6H
Route of Application: Inhalation
Exposure Time: (9-12D PREG)
Result: Effects on Newborn: Delayed effects.

Species: Rabbit
Dose: 1 GM/M3/24H
Route of Application: Inhalation
Exposure Time: (7-20D PREG)
Result: Effects on Fertility: Abortion.

Species: Hamster
Dose: 800 MG/M3/6H
Route of Application: Inhalation
Exposure Time: (6-11D PREG)
Result: Effects on Newborn: Behavioral.

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Algae
Species: *Chlorella vulgaris*
Time: 24 h
Value: 245 mg/l

Test Type: EC50 Algae
Species: *Selenastrum capricornutum* resp.
Time: 24 h
Value: 10 mg/l

Test Type: EC50 Daphnia
Species: *Daphnia magna*
Time: 24 h
Value: 8 mg/l

Test Type: LC50 Fish
Species: *Lepomis macrochirus* (Bluegill)
Time: 96 h
Value: 74 - 340 mg/l

Test Type: LC50 Fish
Species: *Onchorhynchus mykiss* (Rainbow trout)
Time: 96 h
Value: 7.63 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 1294
Class: 3
PG: II
Proper Shipping Name: Toluene

IMDG

UN#: 1294
Class: 3
PG: II

Proper Shipping Name: Toluene
Marine Pollutant: No
Severe Marine Pollutant: No

IATA

UN#: 1294
Class: 3
PG: II
Proper Shipping Name: Toluene
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 601-021-00-3
INDICATION OF DANGER: F Xn
Highly Flammable. Harmful.
R-PHRASES: 11 20
Highly flammable. Harmful by inhalation.
S-PHRASES: 16 25 29 33
Keep away from sources of ignition - no smoking. Avoid contact with eyes. Do not empty into drains. Take precautionary measures against static discharges.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 2

SWITZERLAND

SWISS POISON CLASS: 4

NORWAY

Labelling for organic solvents where the package is 1 liter or more.

YL-tall m3/l: 12957

YL-group: 5

Safety phrases: 38 42 210

In case of insufficient ventilation, wear suitable respiratory equipment. During fumigation/spraying wear suitable respiratory equipment. Use compressed air- or fresh air line breathing apparatus in confined spaces.

Declaration Number: 67076

16 - Other Information

WARRANTY

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 Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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