

2,4,6-Trimethylaniline

sc-238366



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

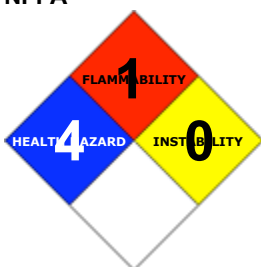
PRODUCT NAME

2,4,6-Trimethylaniline

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY:

ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS

C9-H13-N, "aniline, 2, 4, 6-trimethyl-", aminomesitylene, 2-amino-mesitylene, "1-amino-2, 4, 6-trimethylbenzene", "2-amino-1, 3, 5-trimethylbenzene", "benzenamine, 2, 4, 6-trimethyl-", mesidine, mesitylamine, "mesitylene, 2-amino-", mezidine, "2, 4, 6-trimethylbenzenamine"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	1	
Toxicity:	4	
Body Contact:	3	
Reactivity:	1	
Chronic:	2	

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4



CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Very toxic by inhalation.
Danger of cumulative effects.
May cause SENSITISATION by skin contact.
Limited evidence of a carcinogenic effect.
Toxic in contact with skin and if swallowed.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

- Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.
- The substance and/or its metabolites may bind to hemoglobin inhibiting normal uptake of oxygen. This condition, known as "methemoglobinemia", is a form of oxygen starvation (anoxia).

EYE

- There is some evidence to suggest that this material can cause eye irritation and damage in some persons.

SKIN

- Skin contact with the material may produce toxic effects; systemic effects may result following absorption.
- There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

- The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of vapors, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

CHRONIC HEALTH EFFECTS

- Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems. There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment. Skin contact with the material is more likely to cause a sensitization reaction in some persons compared to the general population. Most arylamines are powerful poisons to the blood-making system. High chronic doses cause congestion of the spleen and tumor formation. Repeated exposure may result in the narrowing of peripheral vision, an increase in the size of the blind spot and a decrease in photosensitivity. Rats fed 4000 mg/kg for 78 weeks, showed liver tumours and tumours of the endocrine system.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
2,4,6-trimethylaniline	88-05-1	>98

Section 4 - FIRST AID MEASURES

SWALLOWED

· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. · Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

EYE

- If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN

- If skin or hair contact occurs: · Quickly but gently, wipe material off skin with a dry, clean cloth. · Immediately remove all contaminated clothing, including footwear.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN

- The material may induce methemoglobinemia following exposure.
- Initial attention should be directed at oxygen delivery and assisted ventilation if necessary. Hyperbaric oxygen has not demonstrated substantial benefits.
- Hypotension should respond to Trendelenburg's position and intravenous fluids; otherwise dopamine may be needed.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not available.
Upper Explosive Limit (%):	Not available
Specific Gravity (water=1):	0.963
Lower Explosive Limit (%):	Not available

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
 - Slight fire hazard when exposed to heat or flame.
- Combustion products include: carbon dioxide (CO₂), nitrogen oxides (NO_x), other pyrolysis products typical of burning organic material. May emit poisonous fumes.

FIRE INCOMPATIBILITY

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

- Glasses:
Chemical goggles.
- Gloves:
- Respirator:
Type A Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- DO NOT allow clothing wet with material to stay in contact with skin.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

RECOMMENDED STORAGE METHODS

- Glass container.
- Lined metal can, Lined metal pail/drum
- Plastic pail.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- 2,4,6-trimethylaniline: CAS:88-05-1

PERSONAL PROTECTION



RESPIRATOR

Type A Filter of sufficient capacity

Consult your EHS staff for recommendations

EYE

- Safety glasses with side shields.
- Chemical goggles.

HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

NOTE: The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.

· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.

· Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER

- Overalls.
- Eyewash unit.

ENGINEERING CONTROLS

- Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.

Does not mix with water.

Floats on water.

Toxic or noxious vapours/gas.

State	Liquid	Molecular Weight	135.21
Melting Range (°F)	-5 - -2	Viscosity	Not Available
Boiling Range (°F)	451.4	Solubility in water (g/L)	Immiscible
Flash Point (°F)	204.8	pH (1% solution)	Not applicable.
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available.	Vapour Pressure (mmHG)	Not available.
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	0.963
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	>1
Volatile Component (%vol)	Not available.	Evaporation Rate	Not available

APPEARANCE

Rose-coloured liquid with an amine odour; does not mix with water.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

STORAGE INCOMPATIBILITY

- Many arylamines (aromatic amines such as aniline, N-ethylaniline, o-toluidine, xylydine etc. and their mixtures) are hypergolic (ignite spontaneously) with red fuming nitric acid. When the amines are dissolved in triethylamine, ignition occurs at -60 deg. C. or less.
- Various metal oxides and their salts may promote ignition of amine-red fuming nitric acid systems. Soluble materials such as copper(I) oxide, ammonium metavanadate are effective; insoluble materials such as copper(II) oxide, iron(II) oxide, potassium dichromate are also effective.
- Avoid oxidizing agents, acids, acid chlorides, acid anhydrides.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

2,4,6-TRIMETHYLANILINE

TOXICITY AND IRRITATION

2,4,6-TRIMETHYLANILINE:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (rat) LD50: 743 mg/kg	Skin (rabbit): 20 mg/24h - Moderate
Oral (mouse) LD50: 590 mg/kg	Eye (rabbit): 20 mg/24h - Moderate

Inhalation (mouse) LC50: 290 mg/m³/2h

Subcutaneous (Rabbit) LD: 0.22 mg/kg

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's edema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.

2,4,6-trimethylaniline and its chloride:

In a rat study 2,4,6-trimethylaniline induced methaemoglobinaemia, an indicator of the formation of an N-hydroxylated metabolite. Formation of N-hydroxylated metabolites and conjugates thereof is considered to be an important step in the mechanism of activation for various carcinogenic aromatic amines

Animal bioassays

1. Mouse feeding studies (18 months): Experimental groups consisted of 25 male and 25 female Albino CD-1 mice. Low-dose and high-dose mice were fed 500 and 1,000 mg of 2,4,6-trimethylaniline hydrochloride/kg of diet, respectively, for three months. Low-dose and high-dose mice were then fed adjusted doses of 300 or 600 mg of 2,4,6-trimethylaniline hydrochloride/kg of diet, respectively, for another 15 months. Incidences of hepatomas in male mice were 0/14 in simultaneous controls, 7/99 in pooled controls, 5/15 in lowdose mice (p<0.05; p values by Fisher's exact test relative to matched controls except where noted), and 9/13 in high-dose mice (p<0.025). Among female mice the incidences of hepatomas in these same groups were 1/15, 1/102, 1/12, and 12/16 (p<0.025), respectively. Vascular tumors were also increased in high-dose males. The respective vascular tumor incidences were 2/14, 5/99, 1/15, and 4/13 (p<0.025). The authors concluded that 2,4,6-trimethylaniline was an effective carcinogen in male and female mice. IARC (1982) noted that the poor survival and the scant detail in the reporting make evaluation of the study difficult.

2. Male rat feeding study (18 months): Two groups of 25 low-dose and high-dose male CD rats were fed 250 and 500 mg of 2,4,6-trimethylaniline hydrochloride/kg of diet, respectively, for three months. Low-dose and high-dose rats were then fed adjusted doses of 125 or 250 mg of 2,4,6-trimethylaniline hydrochloride/kg of diet, respectively, for another 15 months. Significantly increased incidences of liver neoplasms (both hepatocellular carcinomas and cholangiocarcinomas), adenomas and adenocarcinomas of the lung, and stomach tumors were observed. The corresponding incidences in matched controls, pooled controls, low-dose rats, and high-dose rats were 0/16, 2/111, 4/20 (p<0.025 when compared with pooled controls only), and 8/21 (p<0.025) for liver tumors; 0/16, 2/111, 5/20 (p<0.05), and 8/21 (p<0.025) for lung tumors, and 0/16, 2/111, 0/20, and 3/21 (p<0.05 when compared with pooled controls only) for stomach tumors. The authors concluded that 2,4,6-trimethylaniline was an effective carcinogen in male rats. IARC (1982) noted the poor survival of the control group and the inadequate reporting of the data.

3. Male rat feeding study (2 years): Fifty male Sprague-Dawley rats were fed an unspecified amount of 2,4,6-trimethylaniline for two years. Seven experimental animals developed cholangiocarcinomas, while 2/111 control animals developed cholangiocarcinomas. Several older studies have reported the occurrence of various tumors, including a hepatoma and pituitary tumors in rats fed 4000 mg of 2,4,6-trimethylaniline/kg; pulmonary adenomas in mice and a liver tumor in a single rat fed 844 mg (= 4200 mg/kg assuming lifetime average body weight of 200g) of 2,4,6-trimethylaniline. The latter tumor was categorized histologically as a slow-growing, but metastatic, "minimal deviation hepatoma".

Mutagenicity: In one study trimethylaniline was not mutagenic in Salmonella typhimurium

In further short-term genotoxicity tests 2,4,6-trimethylaniline was weakly mutagenic in Salmonella typhimurium, mutagenic in the wing spot test in Drosophila melanogaster, and mutagenic in the 6-thioguanine resistance test in cultured fibroblasts. The authors concluded that genotoxicity seems to be a general property of aniline

derivatives. A close structural analogue, 2,4,5-trimethylaniline, has also been shown to induce liver tumors in mice and rats, and is listed as "causing cancer" under Proposition 65. Other substituted anilines have also been shown to induce tumors in animals.

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

Lacrimation, somnolence, stomach bleeding recorded.

CARCINOGEN

ANILINE, 2,4,6-TRIMETHYL-	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	P65-CAND
---------------------------	--	--------------	----------

Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
2,4,6-trimethylaniline	HIGH		LOW	MED

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Puncture containers to prevent re-use and bury at an authorized landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols: None Hazard class or Division: 6.1

Identification Numbers: UN2810 PG: II

Label Codes: 6.1 Special provisions: IB2, T11, TP2, TP13, TP27

Packaging: Exceptions: 153 Packaging: Non- bulk: 202

Packaging: Exceptions: 153 Quantity limitations: 5 L

Passenger aircraft/rail:

Quantity Limitations: Cargo 60 L Vessel stowage: Location: B aircraft only:

Vessel stowage: Other: 40

Hazardous materials descriptions and proper shipping names:

Toxic, liquids, organic, n.o.s.

Air Transport IATA:

ICAO/IATA Class: 6.1 ICAO/IATA Subrisk: None

UN/ID Number: 2810 Packing Group: II

Special provisions: A3

Cargo Only

Packing Instructions: 611 Maximum Qty/Pack: 60 L

Passenger and Cargo Passenger and Cargo

Packing Instructions: 609 Maximum Qty/Pack: 5 L

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: Y609 Maximum Qty/Pack: 1 L
Shipping Name: TOXIC LIQUID, ORGANIC, N.O.S. *(CONTAINS 2,4,
6-TRIMETHYLANILINE)

Maritime Transport IMDG:

IMDG Class: 6.1 IMDG Subrisk: None
UN Number: 2810 Packing Group: II
EMS Number: F-A , S-A Special provisions: 274
Limited Quantities: 100 ml
Shipping Name: TOXIC LIQUID, ORGANIC, N.O.S.

Section 15 - REGULATORY INFORMATION

2,4,6-trimethylaniline (CAS: 88-05-1) is found on the following regulatory lists;

"Canada Non-Domestic Substances List (NDSL)", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "US - Massachusetts Oil & Hazardous Material List", "US - New Jersey Right to Know Hazardous Substances", "US - Pennsylvania - Hazardous Substance List", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US SARA Section 302 Extremely Hazardous Substances", "US Toxic Substances Control Act (TSCA) - Inventory"

Section 16 - OTHER INFORMATION

ND

Substance CAS Suggested codes 2, 4, 6- trimethylaniline 88- 05- 1

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

This document is copyright. Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from CHEMWATCH. TEL (+61 3) 9572 4700.

Issue Date: Nov-21-2009

Print Date: Jan-15-2011