

1,2,4,5-Tetramethylbenzene

sc-237706



The Power to Question

Material Safety Data Sheet

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

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

1,2,4,5-Tetramethylbenzene

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

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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

C10-H14, C6H2(CH3)4, "benzene, 1, 2, 4, 5-tetramethyl-sym", Durol

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

| | Min | Max |
|---------------|-----|-----|
| Flammability: | 3 | |
| Toxicity: | 2 | |
| Body Contact: | 0 | |
| Reactivity: | 1 | |
| Chronic: | 0 | |

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



CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Highly flammable.

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ The material has NOT been classified as "harmful by ingestion".

This is because of the lack of corroborating animal or human evidence.

EYE

■ Although the material is not thought to be an irritant, direct contact with the eye may cause transient discomfort characterized by tearing or conjunctival redness (as with windburn).

Slight abrasive damage may also result.

SKIN

■ The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models).

Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

■ 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 dusts, or fume, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

■ Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.

■ The acute toxicity of inhaled alkylbenzenes is best described by central nervous system depression.

As a rule, these compounds may also act as general anaesthetics.

■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

CHRONIC HEALTH EFFECTS

■ Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified using animal models); nevertheless exposure by all routes should be minimized as a matter of course.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME | CAS RN | % |
|----------------------------|---------|-----|
| 1,2,4,5-tetramethylbenzene | 95-93-2 | >98 |

Section 4 - FIRST AID MEASURES

SWALLOWED

· Immediately give a glass of water. · First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh 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: · Flush skin and hair with running water (and soap if available). · Seek medical attention in event of irritation.

INHALED

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

NOTES TO PHYSICIAN

■ Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

| | |
|-----------------------------|-----------------|
| Vapor Pressure (mmHg): | 159.763 @ 140 C |
| Upper Explosive Limit (%): | Not available. |
| Specific Gravity (water=1): | 0.84 (molten) |
| Lower Explosive Limit (%): | Not available. |

EXTINGUISHING MEDIA

■ For SMALL FIRES:

Dry chemical, CO₂, water spray or foam.

For LARGE FIRES:

Water-spray, fog or foam.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 1000 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Flammable solid which burns and propagates flame easily, even when partly wetted with water.
 - Any source of ignition, i.e. friction, heat, sparks or flame, may cause fire or explosion.
- Combustion products include: carbon dioxide (CO₂), other pyrolysis products typical of burning organic material.

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-P Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- DO NOT touch or walk through spilled material.

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

- Avoid all personal contact, including inhalation.
 - Wear protective clothing when risk of overexposure occurs.
- Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
- Do NOT cut, drill, grind or weld such containers.
 - In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

RECOMMENDED STORAGE METHODS

■ For low viscosity materials and solids: 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.

STORAGE REQUIREMENTS

■ FOR MINOR QUANTITIES:

- Store in an indoor fireproof cabinet or in a room of noncombustible construction
- Provide adequate portable fire-extinguishers in or near the storage area.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

| Source | Material | TWA ppm | TWA mg/m ³ | STEL ppm | STEL mg/m ³ | Peak ppm | Peak mg/m ³ | TWA F/CC | Notes |
|---|---|---------|-----------------------|----------|------------------------|----------|------------------------|----------|-------------------------------------|
| Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English) | 1,2,4,5-tetramethylbenzene (Particulates Not Otherwise Classified (PNOC)) | | 10 | | | | | | |
| US ACGIH Threshold Limit Values (TLV) | 1,2,4,5-tetramethylbenzene (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles) | | 10 | | | | | | See Appendix B current TLV/BEI Book |
| US ACGIH Threshold Limit Values (TLV) | 1,2,4,5-tetramethylbenzene (Particles (Insoluble or Poorly Soluble) [NOS] Respirable particles) | | 3 | | | | | | See Appendix B current TLV/BEI Book |
| Canada - Nova Scotia Occupational Exposure Limits | 1,2,4,5-tetramethylbenzene (Particles (Insoluble or Poorly Soluble) [NOS] Respirable particles) | | 3 | | | | | | See Appendix B current TLV/BEI Book |
| US - Washington Permissible exposure limits of air contaminants | 1,2,4,5-tetramethylbenzene (Particulates not otherwise regulated - Total particulate) | | 10 | | 20 | | | | |
| US - Washington Permissible exposure limits of air contaminants | 1,2,4,5-tetramethylbenzene (Particulates not otherwise regulated - Respirable fraction) | | 5 | | 10 | | | | |
| Canada - Nova Scotia Occupational Exposure Limits | 1,2,4,5-tetramethylbenzene (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles) | | 10 | | | | | | See Appendix B current TLV/BEI Book |

ENDOELTABLE

PERSONAL PROTECTION



RESPIRATOR

·Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

EYE

- Safety glasses with side shields
- Chemical goggles.

HANDS/FEET

- 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, AS/NZS 2161.1 or national equivalent).

· 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, AS/NZS 2161.10.1 or national equivalent) 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, AS/NZS 2161.10.1 or national equivalent) 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.

Wear physical protective gloves, eg. leather.

OTHER

· Overalls.

· Eyewash unit.

· Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.

· For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

ENGINEERING CONTROLS

■ For large scale or continuous use:

· Spark-free, earthed ventilation system, venting directly to the outside and separate from usual ventilation systems

· Provide dust collectors with explosion vents.

· Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.

· Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Does not mix with water.

Floats on water.

| | | | |
|---------------------------|----------------|--------------------------------|-----------------|
| State | DIVIDED SOLID | Molecular Weight | 134.24 |
| Melting Range (°F) | 171- 174 | Viscosity | Not Applicable |
| Boiling Range (°F) | 385- 387 | Solubility in water (g/L) | Immiscible |
| Flash Point (°F) | 165(C.O.C.) | pH (1% solution) | Not applicable. |
| Decomposition Temp (°F) | Not Available | pH (as supplied) | Not applicable |
| Autoignition Temp (°F) | Not available. | Vapor Pressure (mmHg) | 159.763 @ 140 C |
| Upper Explosive Limit (%) | Not available. | Specific Gravity (water=1) | 0.84 (molten) |
| Lower Explosive Limit (%) | Not available. | Relative Vapor Density (air=1) | 4.6 |
| Volatile Component (%vol) | 100 (sublimes) | Evaporation Rate | Not available |

APPEARANCE

Colourless or white crystals with slight camphor-like odour; does not mix with water. Soluble in alcohol, ether and benzene. Sublimes and is volatile with steam.

log Kow 4-4.24

| Material | Value |
|----------|-------|
|----------|-------|

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

· Presence of incompatible materials.

· Product is considered stable.

STORAGE INCOMPATIBILITY

■ For alkyl aromatics:

The alkyl side chain of aromatic rings can undergo oxidation by several mechanisms. The most common and dominant one is the attack by oxidation at benzylic carbon as the intermediate formed is stabilised by resonance structure of the ring.

· Following reaction with oxygen and under the influence of sunlight, a hydroperoxide at the alpha-position to the aromatic ring, is the primary oxidation product formed (provided a hydrogen atom is initially available at this position) - this product is often short-lived but may be stable dependent on the nature of the aromatic substitution; a secondary C-H bond is more easily attacked than a primary C-H bond whilst a tertiary C-H bond is even more susceptible to attack by oxygen

· Monoalkylbenzenes may subsequently form monocarboxylic acids; alkyl naphthalenes mainly produce the corresponding naphthalene

carboxylic acids.

- Oxidation in the presence of transition metal salts not only accelerates but also selectively decomposes the hydroperoxides.
 - Hock-rearrangement by the influence of strong acids converts the hydroperoxides to hemiacetals. Peresters formed from the hydroperoxides undergo Criegee rearrangement easily.
 - Alkali metals accelerate the oxidation while CO₂ as co-oxidant enhances the selectivity.
 - Microwave conditions give improved yields of the oxidation products.
 - Photo-oxidation products may occur following reaction with hydroxyl radicals and NO_x - these may be components of photochemical smogs.
- Oxidation of Alkylaromatics: T.S.S Rao and Shubhra Awasthi: E-Journal of Chemistry Vol 4, No. 1, pp 1-13 January 2007.
- Vigorous reactions, sometimes amounting to explosions, can result from the contact between aromatic rings and strong oxidizing agents.
 - Aromatics can react exothermically with bases and with diazo compounds.

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

Section 11 - TOXICOLOGICAL INFORMATION

1,2,4,5-tetramethylbenzene

TOXICITY AND IRRITATION

1,2,4,5-TETRAMETHYLBENZENE:

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

TOXICITY

IRRITATION

Oral (rat) LD50: 6989 mg/kg

Nil
Reported

Section 12 - ECOLOGICAL INFORMATION

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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

Avoid release to the environment.

Refer to special instructions/ safety data sheets.

Ecotoxicity

| Ingredient | Persistence: Water/Soil | Persistence: Air | Bioaccumulation | Mobility |
|----------------------------|----------------------------|----------------------|-----------------|----------|
| 1,2,4,5-tetramethylbenzene | HIGH | No Data Available | LOW | MED |

GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles

Name / EHS TRN A1a A1b A1 A2 B1 B2 C1 C2 C3 D1 D2 D3 E1 E2 E3 Cas No / RTECS No _____
Alkyl 300 310 0 2 NR 0 (3) 0 0 1 1 1 Fp 2 benzene 6 distillat ion bottoms / CAS:95- 93- 2 /

Legend: EHS=EHS Number (EHS=GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships)
NRT=Net Register Tonnage, A1a=Bioaccumulation log Pow, A1b=Bioaccumulation BCF, A1=Bioaccumulation, A2=Biodegradation, B1=Acuteaquatic toxicity LC/ECIC50 (mg/l), B2=Chronic aquatic toxicity NOEC (mg/l), C1=Acute mammalian oral toxicity LD50 (mg/kg), C2=Acute mammalian dermal toxicity LD50 (mg/kg), C3=Acute mammalian inhalation toxicity LC50 (mg/kg), D1=Skin irritation & corrosion, D2=Eye irritation & corrosion, D3=Long-term health effects, E1=Tainting, E2=Physical effects on wildlife & benthic habitats, E3=Interference with coastal amenities, For column A2: R=Readily biodegradable, NR=Not readily biodegradable. For column D3: C=Carcinogen, M=Mutagenic, R=Reprotoxic, S=Sensitising, A=Aspiration hazard, T=Target organ systemic toxicity, L=Lung injury, N=Neurotoxic, I=Immunotoxic. For column E1: NT=Not tainting (tested), T=Tainting test positive. For column E2: Fp=Persistent floater, F=Floater, S=Sinking substances. The numerical scales start from 0 (no hazard), while higher numbers reflect increasing hazard. (GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships)

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Ignitability characteristic: use EPA hazardous waste number D001 (waste code I)

Disposal Instructions

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

| 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. 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.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

Section 14 - TRANSPORTATION INFORMATION



DOT:

Symbols: None Hazard class or Division: 4.1

Identification Numbers: UN1325 PG: III

Label Codes: 4.1 Special provisions: A1, IB8,

IP3, T1,

TP33

Packaging: Exceptions: 151 Packaging: Non- bulk: 213

Packaging: Exceptions: 151 Quantity limitations: 25 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 100 kg Vessel stowage: Location: B

aircraft only:

Vessel stowage: Other: None

Hazardous materials descriptions and proper shipping names:

Flammable solids, organic, n.o.s.

Air Transport IATA:

UN/ID Number: 1325 Packing Group: III

Special provisions: A3

Cargo Only

Packing Instructions: 449 Maximum Qty/Pack: 100 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: Y443 Maximum Qty/Pack: 25 kg

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: 446 Maximum Qty/Pack: 10 kg

Shipping Name: FLAMMABLE SOLID, ORGANIC, N.O.S. *(CONTAINS

1,2,4,5-TETRAMETHYLBENZENE)

Maritime Transport IMDG:

IMDG Class: 4.1 IMDG Subrisk: None

UN Number: 1325 Packing Group: III

EMS Number: F-A,S-G Special provisions: 223 274 915

Limited Quantities: 5 kg Marine Pollutant: Yes

Shipping Name: FLAMMABLE SOLID, ORGANIC, N.O.S.(contains 1,2,4,5-tetramethylbenzene)

Section 15 - REGULATORY INFORMATION

1,2,4,5-tetramethylbenzene (CAS: 95-93-2) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)", "International Council of Chemical Associations (ICCA) - High Production Volume List", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA High Production Volume Chemicals 1994 List of Additions", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

■ Inhalation may produce health damage*.

* (limited evidence).

Denmark Advisory list for selfclassification of dangerous substances

Substance CAS Suggested codes 1, 2, 4, 5- tetramethylbenzene 95- 93- 2 N; R50/53

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■ 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.

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