# 2,3,4-Trimethylpentane

## sc-238296

**Material Safety Data Sheet**

| Hazard Alert Code Key: | EXTREME | HIGH | MODERATE | LOW |
|---|---|---|---|---|

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME**
2,3,4-Trimethylpentane

**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**
C8-H18, isooctane, "pentane, 2, 3, 4-trimethyl-", isobutyltrimethylmethane, "octane isomers", "aliphatic hydrocarbon solvent"

## Section 2 - HAZARDS IDENTIFICATION

**CHEMWATCH HAZARD RATINGS**

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

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

**CANADIAN WHMIS SYMBOLS**

**EMERGENCY OVERVIEW**

**RISK**

Irritating to skin.
HARMFUL - May cause lung damage if swallowed.
Highly flammable.
Vapours may cause drowsiness and dizziness.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**POTENTIAL HEALTH EFFECTS**

**ACUTE HEALTH EFFECTS**

**SWALLOWED**

■ Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result.
(ICSC13733).
■ Accidental ingestion of the material may be damaging to the health of the individual.
■ Isoparaffinic hydrocarbons cause temporary lethargy, weakness,inco-ordination and diarrhea.
■ Not a likely route of entry into the body in commercial or industrial environments.
The liquid may produce considerable gastrointestinal discomfort and be harmful or toxic if swallowed.

**EYE**

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

**SKIN**

■ This material can cause inflammation of the skin oncontact in some persons.
■ The material may accentuate any pre-existing dermatitis condition.
■ 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**

■ Inhalation of vapours may cause drowsiness and dizziness.
This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.
■ There is some evidence to suggest that the material can cause respiratory irritation in some persons.
The body's response to such irritation can cause further lung damage.
■ Inhalation of high concentrations of gas/vapor causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination.
■ Central nervous system (CNS) depression may include general discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness.
Serious poisonings may result in respiratory depression and may be fatal.
■ Nerve damage can be caused by some non-ring hydrocarbons.
Symptoms are temporary, and include weakness, tremors, increased saliva, some convulsions, excessive tears with discoloration and inco-ordination lasting up to 24 hours.
■ Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas.
Vapor is heavier than air and may displace and replace air in breathing zone, acting as a simple asphyxiant.
■ Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.

**CHRONIC HEALTH EFFECTS**

■ Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. [PATTYS].
Chronic exposure by inhalation may cause weakness, weight loss, anemia, nervousness, pains in the limbs, peripheral numbness, and paresthesias.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME | CAS RN | % |
|---|---|---|
| 2,3,4-trimethylpentane | 565-75-3 | >99 |

## Section 4 - FIRST AID MEASURES

**SWALLOWED**

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Avoid giving milk or oils.
- Avoid giving alcohol.
- If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

**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 contact occurs

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).

**INHALED**

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

**NOTES TO PHYSICIAN**

■ Any material aspirated during vomiting may produce lung injury. Therefore emesis should not be induced mechanically or pharmacologically.
For acute or short term repeated exposures to petroleum distillates or related hydrocarbons

- Primary threat to life, from pure petroleum distillate ingestion and/or inhalation, is respiratory failure.
- Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO2 50 mm Hg) should be intubated.

## Section 5 - FIRE FIGHTING MEASURES

| | |
|---|---|
| Vapor Pressure (mmHg) | 50.629 @ 37.7 |
| Upper Explosive Limit (%) | 6.0 |
| Specific Gravity (water=1) | 0.719 |
| Lower Explosive Limit (%) | 1.0 |

**EXTINGUISHING MEDIA**

- Foam.
- Dry chemical powder.

**FIRE FIGHTING**

- Alert Emergency Responders and tell them location and nature of hazard.
- May be violently or explosively reactive.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 500 metres in all directions.

**GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS**

- Liquid and vapor are highly flammable.
- Severe fire hazard when exposed to heat, flame and/or oxidizers.

Combustion products include carbon dioxide (CO2), other pyrolysis products typical of burning organic material.
Contains low boiling substance Closed containers may rupture due to pressure buildup under fire conditions.

**FIRE INCOMPATIBILITY**

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

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## 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**

- Containers, even those that have been emptied, may contain explosive vapours.
- Do NOT cut, drill, grind, weld or perform similar operations on or near containers.

Contains low boiling substance
Storage in sealed containers may result in pressure buildup causing violent rupture of containers not rated appropriately.

- Check for bulging containers.
- Vent periodically
- DO NOT allow clothing wet with material to stay in contact with skin
- Electrostatic discharge may be generated during pumping - this may result in fire.
- Ensure electrical continuity by bonding and grounding (earthing) all equipment.
- Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (<=1 m/sec until fill pipe submerged to twice its diameter, then <= 7 m/sec).
- Avoid splash filling.

- Do NOT use compressed air for filling discharging or handling operations.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

**RECOMMENDED STORAGE METHODS**

Glass container.

Packing as supplied by manufacturer. Plastic containers may only be used if approved for flammable liquid.

- For low viscosity materials (i) Drums and jerricans must be of the non-removable head type. (ii) Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C)

**STORAGE REQUIREMENTS**

- Store in original containers in approved flame-proof area.
- No smoking, naked lights, heat or ignition sources.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE CONTROLS**

| Source | Material | TWA ppm | TWA mg/m³ | STEL ppm | STEL mg/m³ | Peak ppm | Peak mg/m³ | TWA F/CC | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Canada - British Columbia Occupational Exposure Limits | 2,3,4-trimethylpentane (Octane, all isomers) | 300 | | | | | | | |
| US - Minnesota Permissible Exposure Limits (PELs) | 2,3,4-trimethylpentane (Octane) | 300 | 1450 | 375 | 1800 | | | | |
| Canada - Alberta Occupational Exposure Limits | 2,3,4-trimethylpentane (Octane, all isomers) | 300 | 1400 | | | | | | |
| US ACGIH Threshold Limit Values (TLV) | 2,3,4-trimethylpentane (Octane - All isomers) | 300 | | | | | | | TLV Basis upper respiratory tract irritation |
| US NIOSH Recommended Exposure Limits (RELs) | 2,3,4-trimethylpentane (Octane) | 75 | 350 | | | 385 | 1800 | | (Ceiling ([15-minute])) |
| US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants | 2,3,4-trimethylpentane (Octane) | 500 | 2350 | | | | | | |
| US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants | 2,3,4-trimethylpentane (Octane) | 300 | 1450 | 375 | 1800 | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants | 2,3,4-trimethylpentane (Octane) | 300 | 1450 | 375 | 1800 | |
| US - California Permissible Exposure Limits for Chemical Contaminants | 2,3,4-trimethylpentane (Octane) | 300 | 1,450 | 375 | 1800 | |
| US - Idaho - Limits for Air Contaminants | 2,3,4-trimethylpentane (Octane) | 500 | 2350 | | | |
| US OSHA Permissible Exposure Levels (PELs) - Table Z1 | 2,3,4-trimethylpentane (Octane) | 500 | 2350 | | | |
| US - Alaska Limits for Air Contaminants | 2,3,4-trimethylpentane (Octane) | 300 | 1450 | 375 | 1800 | |
| US - Oregon Permissible Exposure Limits (Z-1) | 2,3,4-trimethylpentane (Octane) | 400 | 1,900 | | | Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. |
| Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits | 2,3,4-trimethylpentane (Octane, all isomers) | 300 | | 375 | | |
| Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances | 2,3,4-trimethylpentane (Octane) | 300 | 1,450 | 375 | 1,800 | |
| US - Washington Permissible exposure limits of air contaminants | 2,3,4-trimethylpentane (Octane) | 300 | | 375 | | |
| US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants | 2,3,4-trimethylpentane (Octane) | 500 | 2350 | | | |
| Canada - Quebec Permissible Exposure Values for | 2,3,4-trimethylpentane (Octane) | 300 | 1400 | 375 | 1750 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Airborne Contaminants (English) | | | | | | | |
| Canada - Prince Edward Island Occupational Exposure Limits | 2,3,4-trimethylpentane (Octane - All isomers) | 300 | | | | | TLV Basis upper respiratory tract irritation |
| Canada - Northwest Territories Occupational Exposure Limits (English) | 2,3,4-trimethylpentane (Octane) | 300 | 1402 | 375 | 1752 | | |
| Canada - Nova Scotia Occupational Exposure Limits | 2,3,4-trimethylpentane (Octane - All isomers) | 300 | | | | | TLV Basis upper respiratory tract irritation |

**PERSONAL PROTECTION**




**RESPIRATOR**

•Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 1432000 & 1492001, ANSI Z88 or national equivalent)

**EYE**

- Safety glasses with side shields.
- Chemical goggles.

**HANDS/FEET**

Wear chemical protective gloves, eg. PVC.

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

- 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.

- Neoprene rubber gloves

**OTHER**

- Overalls.
- PVC Apron.
- 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**

CARE Use of a quantity of this material in confined space or poorly ventilated area, where rapid build up of concentrated atmosphere may occur, could require increased ventilation and/or protective gear.
For flammable liquids and flammable gases, local exhaust ventilation or a process enclosure ventilation system may be required. Ventilation equipment should be explosion-resistant.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL PROPERTIES**

Liquid.
Does not mix with water.
Floats on water.

| | | | |
|---|---|---|---|
| State | Liquid | Molecular Weight | 114.23 |
| Melting Range (°F) | -166 | Viscosity | Not Available |
| Boiling Range (°F) | 235- 237 | Solubility in water (g/L) | Immiscible |
| Flash Point (°F) | 41 | pH (1% solution) | Not applicable. |
| Decomposition Temp (°F) | Not Available | pH (as supplied) | Not applicable |
| Autoignition Temp (°F) | Not available | Vapor Pressure (mmHg) | 50.629 @ 37.7 |
| Upper Explosive Limit (%) | 6.0 | Specific Gravity (water=1) | 0.719 |
| Lower Explosive Limit (%) | 1.0 | Relative Vapor Density (air=1) | 3.9 |
| Volatile Component (%vol) | 100 | Evaporation Rate | >1 BuAc=1 |
| Gas group | IIA | | |

**APPEARANCE**

Thin, highly flammable liquid; floats on water. Odor similar to gasoline. Soluble in alcohol, aromatic and aliphatic hydrocarbons, chloroform, ether, carbon tetrachloride, DMF, and oils (except castor oil).

log Kow 4.09

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

## Section 10 - CHEMICAL STABILITY

**CONDITIONS CONTRIBUTING TO INSTABILITY**

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

**STORAGE INCOMPATIBILITY**

¦ Avoid reaction with oxidizing agents.
n-Octane/ iso-octane

- reacts violently with strong oxidisers, dinitrogen tetraoxide
- is incompatible with sulfuric acid, nitric acid, caustics, aliphatic amines, isocyanates
- attacks some plastics, rubber and coatings
- may generate electrostatic charges on agitation or flow, due to low conductivity.

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

## Section 11 - TOXICOLOGICAL INFORMATION

2,3,4-trimethylpentane

**TOXICITY AND IRRITATION**
**2,3,4-TRIMETHYLPENTANE**

No significant acute toxicological data identified in literature search.
as octane CAS 111-65-9

## Section 12 - ECOLOGICAL INFORMATION

Very 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.

**GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles**

| Name / Cas No / RTECS No | EHS | TRN | A1a | A1b | A1 | A2 | B1 | B2 | C1 | C2 | C3 | D1 | D2 | D3 | E1 | E2 | E3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Octane / CAS:565 - 75- 3 / | 1072 | 538 | 5 | | 5 | (R) | 4 | NI | (0) | (0) | 0 | 0 | 0 | A | | FE | 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=Acutemammalian 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=Lunginjury, 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. 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.
- 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: | 3 |
| Identification Numbers: | UN1262 | PG: | II |
| Label Codes: | 3 | Special provisions: | IB2, T4, TP1 |
| Packaging: Exceptions: | 150 | Packaging: Non-bulk: | 202 |
| Packaging: Exceptions: | 150 | Quantity limitations: Passenger aircraft/rail: | 5 L |
| Quantity Limitations: Cargo aircraft only: | 60 L | Vessel stowage: Location: | B |
| Vessel stowage: Other: | None | | |

Hazardous materials descriptions and proper shipping names:
Octanes

**Air Transport IATA:**

| | | | |
|---|---|---|---|
| UN/ID Number: | 1262 | Packing Group: | II |
| Special provisions: | None | | |
| Cargo Only | | | |
| Packing Instructions: | 364 | Maximum Qty/Pack: | 60 L |
| Passenger and Cargo | | Passenger and Cargo | |
| Packing Instructions: | Y341 | Maximum Qty/Pack: | 5 L |
| Passenger and Cargo Limited Quantity | | Passenger and Cargo Limited Quantity | |
| Packing Instructions: | 353 | Maximum Qty/Pack: | 1 L |

Shipping Name: OCTANES

**Maritime Transport IMDG:**

| | | | |
|---|---|---|---|
| IMDG Class: | 3 | IMDG Subrisk: | None |
| UN Number: | 1262 | Packing Group: | II |
| EMS Number: | F-E,S-E | Special provisions: | None |
| Limited Quantities: | 1 L | Marine Pollutant: | Yes |

Shipping Name: OCTANES

## Section 15 - REGULATORY INFORMATION

**2,3,4-trimethylpentane (CAS: 565-75-3) is found on the following regulatory lists;**
"Canada Non-Domestic Substances List (NDSL)","US - Washington Dangerous waste constituents list","US -Texas Air Monitoring Comparison Values for Evaluating Carbonyls","US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

## Section 16 - OTHER INFORMATION

**LIMITED EVIDENCE**

■ Inhalation and/or ingestion may produce health damage*.
■ Cumulative effects may result following exposure*.
■ May produce discomfort of the respiratory system*.
■ Repeated exposure potentially causes skin dryness and cracking*.
* (limited evidence).

*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.



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