

Material Safety Data Sheet Tertiary-Butylamine



**VINATI
ORGANICS
LIMITED**

Revision date : 1st June 2017

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1. Identification

Product identifier used on the label

Tertiary-Butylamine

Molecular Formula: C₄H₁₁N

Details of the supplier of the safety data sheet

Company:

Vinati Organics Limited

Parinee Crescenzo, 11th floor, 1102,
"G" Block, Plot no. C-38 & C-39, Bandra-Kurla Complex,
Bandra (East) Mumbai -51, Maharashtra, India

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Other means of identification

Chemical family: amine, aliphatic

Synonyms: T-Butylamine

Use: Only to be used as intermediate

2. Hazards Identification

According to Hazardous Products Regulations (HPR) (SOR/2015-17)

Classification of the product

Flam. Liq.	2	Flammable liquids
Acute Tox.	3 (Inhalation - vapour)	Acute toxicity
Acute Tox.	4 (oral)	Acute toxicity
Skin Corr./Irrit.	1A	Skin corrosion/irritation
Eye Dam./Irrit.	1	Serious eye damage/eye irritation
Aquatic Acute	3	Hazardous to the aquatic environment - acute
Aquatic Chronic	3	Hazardous to the aquatic environment - chronic

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Label elements

Pictogram:



Signal Word:

Danger

Hazard Statement:

H225	Highly flammable liquid and vapour.
H331	Toxic if inhaled.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H402	Harmful to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243	Take precautionary measures against static discharge.
P260	Do not breathe mist or vapour.
P273	Avoid release to the environment.
P260	Do not breathe dust or mist.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P264	Wash with plenty of water and soap thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P242	Use only non-sparking tools.
P240	Ground/bond container and receiving equipment.

Precautionary Statements (Response):

P310	Immediately call a POISON CENTER or doctor/physician.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P303 + P361 + P352	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Wash with plenty of soap and water.
P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P370 + P378	In case of fire: Use water spray, dry powder or foam for extinction.

Precautionary Statements (Storage):

P403 + P235	Store in a well-ventilated place. Keep cool.
P233	Keep container tightly closed.
P405	Store locked up.

Precautionary Statements (Disposal):

P501	Dispose of contents/container to hazardous or special waste collection point.
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Hazards not otherwise classified

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

3. Composition / Information on Ingredients

According to Hazardous Products Regulations (HPR) (SOR/2015-17)

<u>CAS Number</u>	<u>Weight %</u>	<u>Chemical name</u>
75-64-9	>= 99.5 - <= 99.9%	Tertiary-butylamine

According to Controlled Products Regulations (CPR) (SOR/88-66)

<u>CAS Number</u>	<u>Weight %</u>	<u>Chemical name</u>
75-64-9	>= 60.0 - <= 100.0%	Tertiary-butylamine

4. First-Aid Measures

Description of first aid measures

General advice:

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention. Immediately administer a corticosteroid from a controlled/metered dose inhaler.

If on skin:

Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

If in eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

If swallowed:

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: Overexposure may cause:, dyspnea, coughing

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote. Medical monitoring for at least 24 hours.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
water spray, dry powder, foam

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
nitrogen oxides, carbon oxides

The substances/groups of substances mentioned can be released in case of fire. Under certain conditions in case of fire other hazardous combustion products may be generated.

Advice for fire-fighters

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. Accidental release measures

Further accidental release measures:

Shut off or stop source of leak. An explosive atmosphere can be formed in the case of a spillage. If large amounts are released contact the fire service.

Personal precautions, protective equipment and emergency procedures

Breathing protection required. Avoid contact with the skin, eyes and clothing.

Environmental precautions

Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

For large amounts: Pump off product.

For residues: Pick up with suitable absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr). Dispose of absorbed material in accordance with regulations.

Cleaning operations should be carried out only while wearing breathing apparatus. Clean contaminated floors and objects thoroughly with water and detergents, observing environmental regulations. Collect waste in suitable containers, which can be labeled and sealed. Incinerate or take to a special waste disposal site in accordance with local authority regulations.

7. Handling and Storage

Precautions for safe handling

Ensure thorough ventilation of stores and work areas. Sealed containers should be protected against heat as this results in pressure build-up. Handle in accordance with good industrial hygiene and safety practice. When using do not eat, drink or smoke. Hands and/or face should be washed before breaks and at the end of the shift.

Protection against fire and explosion:

Vapours may form explosive mixture with air. Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy.

Conditions for safe storage, including any incompatibilities

Further information on storage conditions: Keep container tightly closed in a cool, well-ventilated place.

Storage stability:

Storage temperature: ≤ 35 °C

Storage duration: 24 Months

From the data on storage duration in this safety data sheet no agreed statement regarding the warrantee of application properties can be deduced.

8. Exposure Controls/Personal Protection

No occupational exposure limits known.

Personal protective equipment

Respiratory protection:

Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator as needed.

Hand protection:

Chemical resistant protective gloves

Eye protection:

Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:

Do not breathe vapour/spray. Avoid contact with the skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice. Wearing of closed work clothing is required additionally to the stated personal protection equipment. Take off immediately all contaminated clothing. Store work clothing separately.

9. Physical and Chemical Properties

Form:	liquid	
Odour:	amine-like	
Odour threshold:	Not determined since toxic by inhalation.	
Colour:	colourless	
pH value:	12.1 (100 g/l, 20 °C)	(other)
	Literature data.	
Melting point:	-68 - -67.5 °C	(other)
	Literature data.	
Boiling point:	45.2 °C (1,013 hPa)	(other)
	Literature data.	
Flash point:	-38 °C	(other)
	Literature data.	
Flammability:	Highly flammable.	(other)
Lower explosion limit:	1.7 %(V) (100 °C)	
	Literature data.	
Upper explosion limit:	For liquids not relevant for classification and labelling.	

Autoignition:	380 °C Literature data.	
Vapour pressure:	300 hPa (20 °C) 1300 hPa (50 °C)	
Density:	0.7008 g/cm3 (15 °C) Literature data. 0.6958 g/cm3 (20 °C) Literature data. 0.6871 g/cm3 (24 °C)	(other) (other) (pycnometer)
Relative density:	0.6919 - 0.6951 (20 °C)	(other)
Partitioning coefficient n-octanol/water (log Pow):	0.4 (25 °C) Literature data.	(measured)
Self-ignition temperature:	not self-igniting	
Thermal decomposition:	No decomposition if stored and handled as prescribed/indicated.	
Viscosity, dynamic:	0.477 mPa.s (20 °C) The value was determined by calculation from the detected kinematic viscosity.	(calculated (from kinematic viscosity))
Viscosity, kinematic:	0.687 mm2/s (20 °C)	(DIN 51562)
Solubility in water:	1,000 g/l (25 °C)	
Miscibility with water:	miscible in all proportions	
Solubility (qualitative):	miscible solvent(s): alcohols, ether,	
Molar mass:	73.14 g/mol	
Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.	

10. Stability and Reactivity

Reactivity

Vapours may form explosive mixture with air.

Oxidizing properties:

not fire-propagating (other)

Formation of Remarks:

flammable gases:

Forms no flammable gases in the presence of water.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

Strong exothermic reaction with acids.

Avoid all sources of ignition: heat, sparks, open flame.

Incompatible materials

oxidizing agents

Hazardous decomposition products

Decomposition products:

Thermal decomposition products: carbon oxides, nitrogen oxides

Thermal decomposition:

No decomposition if stored and handled as prescribed/indicated.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Of moderate toxicity after single ingestion. Of pronounced toxicity after short-term inhalation.

Oral

Type of value: LD50

Species: rat (male/female)

Value: approx. 464 mg/kg (OECD Guideline 401)

An aqueous solution was tested.

Inhalation

Type of value: LC50

Species: rat (male)

Value: 3.8 mg/l

Exposure time: 4 h

The vapour was tested.

Assessment other acute effects

Assessment of STOT single:

The available information is not sufficient for evaluation.

Irritation / corrosion

Assessment of irritating effects: Highly corrosive! Damages skin and eyes.

Skin

Species: rabbit

Result: Corrosive.

Method: OECD Guideline 404

Eye

Species: rabbit

Result: strongly corrosive

Sensitization

Assessment of sensitization: Study scientifically not justified.

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: No reliable data was available concerning repeated dose toxicity.

Genetic toxicity

Assessment of mutagenicity: The substance was not mutagenic in bacteria.

Carcinogenicity

Assessment of carcinogenicity: No data available concerning carcinogenic effects.

Reproductive toxicity

Assessment of reproduction toxicity: No data available.

Teratogenicity

Assessment of teratogenicity: No data available.

Other Information

development of pulmonary edema

Symptoms of Exposure

Overexposure may cause:., dyspnea, coughing

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

Acutely harmful for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish

LC50 (96 h) 270 mg/l, *Salmo gairdneri*, syn. *O. mykiss*

The study was carried out in hard water. The statement of the toxic effect relates to the analytically determined concentration. Literature data.

LC50 (96 h) 28 mg/l, *Salmo gairdneri*, syn. *O. mykiss*

The study was carried out in soft water. The statement of the toxic effect relates to the analytically determined concentration. Literature data.

Aquatic invertebrates

EC50 (24 h) 136 mg/l, *Daphnia magna*

The statement of the toxic effect relates to the analytically determined concentration. Literature data.

Aquatic plants

EC50 (96 h) 16 mg/l, Selenastrum capricornutum (Growth Inhibition Test)
The statement of the toxic effect relates to the analytically determined concentration. Literature data.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms

OECD Guideline 209 activated sludge, industrial/EC20 (30 min): > 1,000 mg/l

Nominal concentration. The product will cause changes in the pH value of the test system. The result refers to an unneutralized sample.

DIN 38412 Part 8 bacterium/EC10 (16 h): 72 mg/l

After neutralization, it is no longer toxic. The details of the toxic effect relate to the nominal concentration. The product will cause changes in the pH value of the test system. The result refers to an unneutralized sample.

Persistence and degradability

Assessment biodegradation and elimination (H₂O)

Not readily biodegradable (by OECD criteria). Moderately/partially eliminated from water. The product is biodegradable after extended adaptation.

Elimination information

0 % BOD of the ThOD (28 d) (OECD 301C; ISO 9408; 92/69/EEC, C.4-F) (aerobic, Inoculum conforming to MITI requirements (OECD 301C))

44 % DOC reduction (28 d) (OECD Guideline 302 B) (activated sludge, industrial)

Assessment of stability in water

In contact with water the substance will hydrolyse slowly.

Information on Stability in Water

(Hydrolysis) $t_{1/2} > 365$ d (25 °C), (pH 7)

Bioaccumulative potential

Assessment bioaccumulation potential

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Mobility in soil

Assessment transport between environmental compartments

The substance will not evaporate into the atmosphere from the water surface.
Adsorption to solid soil phase is not expected.

Additional information

Other ecotoxicological advice:

Due to the pH-value of the product, neutralization is generally required before discharging sewage into treatment plants. Do not release untreated into natural waters.

13. Disposal considerations

Waste disposal of substance:

Incinerate or dispose of in a licensed facility. Observe all local regulations.

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Container disposal:

Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

14. Transport Information

Land transport

TDG

Hazard class: 8
Packing group: II
ID number: UN 2734
Hazard label: 8, 3
Proper shipping name: AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. (contains TERTIARY-BUTYLAMINE)

Sea transport

IMDG

Hazard class: 8
Packing group: II
ID number: UN 2734
Hazard label: 8, 3
Marine pollutant: NO
Proper shipping name: AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. (contains TERTIARY-BUTYLAMINE)

Air transport

IATA/ICAO

Hazard class: 8
Packing group: II
ID number: UN 2734
Hazard label: 8, 3
Proper shipping name: AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. (contains TERTIARY-BUTYLAMINE)

15. Regulatory Information

Federal Regulations

Registration status:

Chemical DSL, CA released / listed

According to Controlled Products Regulations (CPR) (SOR/88-66)

WHMIS classification:

B2: Flammable Liquid

D1B: Materials Causing Immediate and Serious Toxic Effects - Toxic material

D2B: Materials Causing Other Toxic Effects - Toxic material



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E: Corrosive material



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.

Assessment of the hazard classes according to UN GHS criteria (most recent version):

Flam. Liq.	2	Flammable liquids
Aquatic Acute	3	Hazardous to the aquatic environment - acute
Aquatic Chronic	3	Hazardous to the aquatic environment - chronic
Skin Corr./Irrit.	1A	Skin corrosion/irritation
Acute Tox.	4 (oral)	Acute toxicity
Acute Tox.	3 (Inhalation - vapour)	Acute toxicity
Eye Dam./Irrit.	1	Serious eye damage/eye irritation

16. Other Information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing MSDS: Product safety department.

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