6-tert-Butyl-2,4-xylenol

sc-262892

Material Safety Data Sheet

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

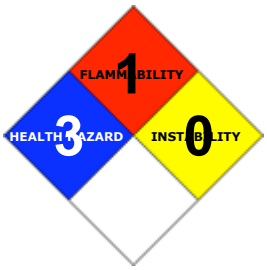
Section 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
6-tert-Butyl-2,4-xylenol

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
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(1–800-CHEMCALL) or call +613 9573 3112

SYNONYMS
C12-H18-O, "phenol, 2-(1, 1-dimethylethyl)-2, 4-dimethyl-", "2, 4-xylenol, 6-tert-butyl-", "6-tert-butyl-2, 4-xylenol", "2-tert-butyl-4, 6-dimethylphenol", "6-t-butyl-2, 4-dimethylphenol", "6-t-butyl-2, 4-xylenol", "2, 4-dimethylphenol-6-t-butylphenol", "2-(1, 1-dimethylethyl)-2, 4-dimethylphenol", "Antioxidant LA", "Antioxidant AO30", "Ionol K65", "Topanol A", "Produx 340", TBX, antioxidant

Section 2 – HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

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

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

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW
RISK
Causes burns.
Risk of serious damage to eyes.
Possible risk of irreversible effects.
Harmful by inhalation, in contact with skin and if swallowed.
Vapours may cause drowsiness and dizziness.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
■ The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.
■ Some phenol derivatives can cause damage to the digestive system.
If absorbed, profuse sweating, thirst, nausea, vomiting diarrhea, cyanosis, restlessness, stupor, low blood pressure, gasping, abdominal pain, anemia, convulsions, coma and lung swelling can happen followed by pneumonia.
■ 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.
EYE
■ The material can produce chemical burns to the eye following direct contact.
Vapors or mists may be extremely irritating.
■ If applied to the eyes, this material causes severe eye damage.
■ Some phenol derivatives may produce mild to severe eye irritation with redness, pain and blurred vision.
Permanent eye injury may occur; recovery may also be complete or partial.
SKIN
■ Skin contact with the material may be harmful; systemic effects may resultfollowing absorption.
■ The material can produce chemical burns following direct contactwith the skin.
■ Phenol and its derivatives can cause severe skin irritation if contact is maintained, and can be absorbed to the skin affecting the cardiovascular and central nervous system.
Effects include sweating, intense thirst, nausea and vomiting, diarrhea, cyanosis, restlessness, stupor, low blood pressure, hyperventilation, abdominal pain, anemia, convulsions, coma, lung swelling followed by pneumonia.
■ 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
■ If inhaled, this material can irritate the throat andlungs of some persons.
■ Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.
■ Inhalation of vapours may cause drowsiness and dizziness.
This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.
■ Inhalation hazard is increased at higher temperatures.
■ Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasm, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary edema.
■ If phenols are absorbed via the lungs, systemic effects may occur affecting the cardiovascular and nervous systems.
Inhalation can result in profuse perspiration, intense thirst, nausea, vomiting, diarrhea, cyanosis, restlessness, stupor, falling blood pressure, hyperventilation, abdominal pain, anemia, convulsions, coma, swelling and inflammation of the lung.

CHRONIC HEALTH EFFECTS
■ Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue.
Strong evidence exists that the substance may cause irreversible but non-lethal mutagenic effects following a single exposure.
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
Exposure to the material may cause concerns for human fertility, on the basis that similar materials provide some evidence of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occurring at around the same dose levels as other toxic effects, but which are not a secondary non-specific consequence of other toxic effects.
.
Long-term exposure to phenol derivatives can cause skin inflammation, loss of appetite and weight, weakness, muscle aches and pain, liver damage, dark urine, loss of nails, skin eruptions, diarrhea, nervous disorders with headache, salivation, fainting, discoloration of the skin and eyes, vertigo and mental disorders, and damage to the liver and kidneys.
Exposure to alkyl phenolics is associated with reduced sperm count andfertility in males.

Section 3 – COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
6-tert-butyl-2,4-dimethylphenol	1879–09–0	>98

Section 4 – FIRST AID MEASURES

SWALLOWED
■

- For advice, contact a Poisons Information Center or a doctor at once.
- Urgent hospital treatment is likely to be needed.

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:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly 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.

Inhalation of vapors or aerosols (mists, fumes) may cause lung edema. Corrosive substances may cause lung damage (e.g.

NOTES TO PHYSICIAN
■ for corrosives:
----------BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.

For acute or short term repeated exposures to phenols/ cresols:

- Phenol is absorbed rapidly through lungs and skin. [Massive skin contact may result in collapse and death]*
- [Ingestion may result in ulceration of upper respiratory tract; perforation of esophagus and/or stomach, with attendant complications, may occur. Esophageal stricture may occur.]*

Section 5 – FIRE FIGHTING MEASURES

Vapor Pressure (mmHg):	19.952 (130 C)
Upper Explosive Limit (%):	Not available.
Specific Gravity (water=1):	0.917
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 (CO_2), nitrogen oxides (NOx), other pyrolysis products typical of burning

organic material.
May emit corrosive 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:
Full face- shield.
Gloves:
Respirator:
Type A-P Filter of sufficient capacity

Section 6 – ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
■

- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.

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
■

- 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.

STORAGE REQUIREMENTS
■

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

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
US – Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	6-tert-butyl-2,4-dimethylphenol (Cresol, all isomers)	5	22						
US – Washington Permissible exposure limits of air contaminants	6-tert-butyl-2,4-dimethylphenol (Cresol (all isomers))	5		10					

US OSHA Permissible Exposure Levels (PELs) – Table Z1	6-tert-butyl-2,4-dimethylphenol (Cresol, all isomers)	5	22
US – Idaho – Limits for Air Contaminants	6-tert-butyl-2,4-dimethylphenol (Cresol, all isomers)	5	22

PERSONAL PROTECTION




RESPIRATOR
Type A-P Filter of sufficient capacity
Consult your EHS staff for recommendations
EYE
■

- Chemical goggles.
- Full face shield.

HANDS/FEET
■ Wear chemical protective gloves, eg. PVC.

- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

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.

- Neoprene gloves

OTHER
■

- Overalls.
- PVC Apron.

ENGINEERING CONTROLS
■ General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in special circumstances.

Section 9 – PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Corrosive.

State	LIQUID	Molecular Weight	178.27
Melting Range (°F)	61- 73	Viscosity	Not Available
Boiling Range (°F)	480- 482	Solubility in water (g/L)	Partly Miscible
Flash Point (°F)	208	pH (1% solution)	Not applicable.
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable

Autoignition Temp (°F)	797	Vapor Pressure (mmHg)	19.952 (130 C)
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	0.917
Lower Explosive Limit (%)	Not available.	Relative Vapor Density (air=1)	>1
Volatile Component (%vol)	Not applicable.	Evaporation Rate	Not applicable
Gas group	IIA		

APPEARANCE
Colourless liquid or off-white to yellow powder with a slight cresylic odour; does not mix well with water (150 mg/l, 25 C). Soluble in methanol, ethanol, toluene and most other hydrocarbon solvents.

Section 10 – CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY
■

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

STORAGE INCOMPATIBILITY
■

- Phenols are incompatible with strong reducing substances such as hydrides, nitrides, alkali metals, and sulfides.
- Avoid use of aluminium, copper and brass alloys in storage and process equipment.
- Heat is generated by the acid-base reaction between phenols and bases.
- Phenols are sulfonated very readily (for example, by concentrated sulfuric acid at room temperature), these reactions generate heat.
- Phenols are nitrated very rapidly, even by dilute nitric acid.
- Nitrated phenols often explode when heated. Many of them form metal salts that tend toward detonation by rather mild shock.

Avoid reaction with oxidizing agents.

- Dangerous goods of other classes.

Segregate oleum, nitric acid and chlorosulfonic acid. Segregate from foodstuffs and grain.

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

Section 11 – TOXICOLOGICAL INFORMATION

6-tert-butyl-2,4-dimethylphenol

TOXICITY AND IRRITATION
6-TERT-BUTYL-2,4-DIMETHYLPHENOL:
■ unless otherwise specified data extracted from RTECS – Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (Rat) LDLo: 1400 mg/kg	Eye: SEVERE *
Oral (Rabbit) LDLo: 55 mg/kg	
Dermal (Rabbit) LDLo: 17 mg/kg	
Oral (Guinea pig) LDLo: 420 mg/kg	
Dermal (Guinea pig) LDLo: 7100 mg/kg	

■ For hindered phenols:
Acute oral and dermal toxicity data are available for all but two of the substances in the group. The data show that acute toxicity of these substances is low.
Mutagenicity. Data from bacterial reverse mutation assays and in vitro and in vivo chromosome aberration studies were reviewed. All assays, with and without metabolic activation, were negative. The weight of evidence for mutagenic potential for this category indicates these substances are not mutagenic.
In Vitro Chromosome Aberration Studies. In vitro chromosome aberration studies are available for several members All except 2,6-di-tert-butyl-p-cresol were negative
In Vivo Chromosome Aberration Studies. In vivo studies evaluating chromosome damage are available for six of the hindered phenols. All in vivo evaluations were negative.
Repeated Dose Toxicity. Repeated dose toxicity data of approximately three months (90-day, 12- and 13-week) are available for most of the substances in this group. The liver was the target organ in rats for almost all of the substances with subchronic toxicity data in that species. Other target organs included thyroid and kidney and mesenteric lymph nodes. NOAELs in rats ranged from 100 ppm (approximately 5 mg/kg/day) to 10,000 ppm (500 mg/kg/day
Carcinogenicity: Data is available for 2,6-di-tert-butyl-p-cresol (128–37–0); and 4,4'-thiobis-6-(t-butyl-m-cresol) (96–69–5). Liver adenomas were reported for 2,6-di-tert-butyl-p-cresol (128–37–0) and a NOAEL was established for the study at 25 mg/kg/day. 4,4'-Thiobis-6-(t-butyl-m-cresol) (96–69–5) was not carcinogenic in rats or mice, but the

kidney was identified as a target organ in female rats.
Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
Exposure to alkyl phenolics is associated with reduced sperm count andfertility in males.
* DuPont

CARCINOGEN

	US – Rhode Island Hazardous Substance List	IARC	
VPVB_(VERY~	US – Maine Chemicals of High Concern List	Carcinogen	
VPVB_(VERY~	US – Maine Chemicals of High Concern List	Carcinogen	CA Prop 65; IARC; NTP 11th ROC

SKIN

6-tert-butyl-2,4-dimethylphenol	US – Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants – Skin	Skin Designation	X
6-tert-butyl-2,4-dimethylphenol	US – Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants – Skin	Skin Designation	X
6-tert-butyl-2,4-dimethylphenol	US – Washington Permissible exposure limits of air contaminants – Skin	Skin	X
6-tert-butyl-2,4-dimethylphenol	US – Tennessee Occupational Exposure Limits – Limits For Air Contaminants – Skin	Skin Designation	X
6-tert-butyl-2,4-dimethylphenol	US – Minnesota Permissible Exposure Limits (PELs) – Skin	Skin Designation	X
6-tert-butyl-2,4-dimethylphenol	US – Hawaii Air Contaminant Limits – Skin Designation	Skin Designation	X
6-tert-butyl-2,4-dimethylphenol	US OSHA Permissible Exposure Levels (PELs) – Skin	Skin Designation	X

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
6-tert-butyl-2,4-dimethylphenol	HIGH		LOW	MED

Section 13 – DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions
A. General Product Information
Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)
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.
- 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:	8
Identification Numbers:	UN3145	PG:	III
Label Codes:	8	Special provisions:	IB3, T7, TP1, TP28
Packaging: Exceptions:	154	Packaging: Non-bulk:	203
Packaging: Exceptions:	154	Quantity limitations: Passenger aircraft/rail:	5 L
Quantity Limitations: Cargo aircraft only:	60 L	Vessel stowage: Location:	A
Vessel stowage: Other:	None		

Hazardous materials descriptions and proper shipping names:
Alkylphenols, liquid, n.o.s. (including C2-C12 homologues)
Air Transport IATA:

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	None
UN/ID Number:	3145	Packing Group:	III
Special provisions:	A3		
Cargo Only			
Packing Instructions:	60 L	Maximum Qty/Pack:	5 L
Passenger and Cargo		Passenger and Cargo	
Packing Instructions:	856	Maximum Qty/Pack:	852
Passenger and Cargo Limited Quantity		Passenger and Cargo Limited Quantity	
Packing Instructions:	1 L	Maximum Qty/Pack:	Y841

Shipping Name: ALKYLPHENOLS, LIQUID, N.O.S. 3145(CONTAINS 6-TERT-BUTYL-2,4-DIMETHYLPHENOL)
Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	None
UN Number:	3145	Packing Group:	III
EMS Number:	F-A , S-B	Special provisions:	223
Limited Quantities:	5 L	Marine Pollutant:	Yes

Shipping Name: ALKYLPHENOLS, LIQUID, N.O.S. (including C2-C12 homologues) (contains 6-tert-butyl-2,4-dimethylphenol)

Section 15 – REGULATORY INFORMATION

6-tert-butyl-2,4-dimethylphenol (CAS: 1879–09–0) is found on the following regulatory lists;
"Canada Domestic Substances List (DSL)","OECD Representative List of High Production Volume (HPV) Chemicals","US EPA Master Testing List – Index I Chemicals Listed","US Toxic Substances Control Act (TSCA) – Inventory"

Section 16 – OTHER INFORMATION

ND

Substance	CAS	Suggested codes	
6- tert- butyl- 2, 4- dimethylphenol	1879- 09- 0		Mut3; R68 Xn; R22 R43 Xi; R38 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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