

MATERIAL SAFETY DATA SHEET

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Version 1.6

Section 1 - Product and Company Information

Product Name TERT-BUTANOL, REAGENTPLUS, >=99.3%
(TEBOL 99)
Product Number B85927
Brand ALDRICH

Company Sigma-Aldrich
Street Address 3050 Spruce Street
City, State, Zip, Country SAINT LOUIS MO 63103 US
Technical Phone: 314 771 5765
Emergency Phone: 414 273 3850 Ext. 5996
Fax: 800 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
2-METHYL-2-PROPANOL	75-65-0	Yes

Formula C4H10O
Synonyms Alcool butylique tertiaire (French) * Arconol *
t-Butanol * tert-Butanol * Butanol tertiaire
(French) * tert-Butyl alcohol (OSHA) * t-Butyl
hydroxide * 1,1-Dimethylethanol * Methanol,
trimethyl- * 2-Methyl-2-propanol *
2-Methylpropan-2-ol * NCI-C55367 * 2-Propanol,
2-methyl- * Trimethylcarbinol * Trimethyl methanol
RTECS Number: E01925000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Harmful.
Harmful by inhalation. Risk of serious damage to eyes.
Target organ(s): Central nervous system. Kidneys.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 3
REACTIVITY: 0

NFPA RATING

HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS

Flammable Hazards: Yes

EXPLOSION HAZARDS

Vapor may travel considerable distance to source of ignition and flash back. Container explosion can occur under fire conditions. In advanced or massive fires the area should be evacuated and the fire should be fought from a remote explosion-resistant location.

FLASH POINT

51.8 °F 11 °C Method: closed cup

EXPLOSION LIMITS

Lower: 2.4 % Upper: 8 %

AUTOIGNITION TEMP

480 °C

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam. Use water spray to cool fire-exposed containers. Unsuitable: Water may be effective for cooling, but may not effect extinguishment.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Flammable liquid. Vapor may travel considerable distance to source of ignition and flash back. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Saturated Vapor Conc.	N/A	
SG/Density	0.79 g/cm ³	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	< 0.1 %	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	51.8 °F 11 °C	Method: closed cup
Explosion Limits	Lower: 2.4 % Upper: 8 %	
Flammability	N/A	
Autoignition Temp	480 °C	
Refractive Index	1.387	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents Copper, Copper alloys, Alkali metals, Aluminum.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Peroxides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes severe eye irritation.

Inhalation: Harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.

Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Central nervous system. Kidneys. Liver. Bladder. Thyroid.

SIGNS AND SYMPTOMS OF EXPOSURE

Can cause CNS depression. Exposure can cause: Gastrointestinal disturbances. Drying, cracking, or irritation of the skin.

TOXICITY DATA

Oral

Rat

2743 mg/kg

LD50

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Lungs, Thorax, or Respiration:Respiratory depression. Gastrointestinal:Other changes.

Inhalation

Rat

> 10,000 ppm

LC50

Remarks: Behavioral:Ataxia. Lungs, Thorax, or Respiration:Dyspnea. Lungs, Thorax, or Respiration:Pulmonary emboli.

Intraperitoneal

Mouse

399 MG/KG

LD50

Remarks: Liver:Other changes.

Intravenous

Mouse

1538 MG/KG

LD50

Oral

Rabbit

3559 mg/kg

LD50

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Corneal damage. Cardiac:Pulse rate. Lungs, Thorax, or Respiration:Dyspnea.

Skin

Rabbit

> 2000 mg/kg

LD50

Remarks: Skin and Appendages:Skin: After systemic exposure: Dermatitis, other

IRRITATION DATA

Skin

Rabbit

0.5 ml

24H

Remarks: Mild irritation effect

Eyes

Rabbit

0.1 ml

24H

Remarks: Severe irritation effect

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Species: Rat

Route of Application: Oral

Dose: 146 GM/KG

Exposure Time: 2Y

Frequency: C
Result: Tumorigenic:Neoplastic by RTECS criteria. Kidney,
Ureter, Bladder:Kidney tumors.

Species: Mouse
Route of Application: Oral
Dose: 1540 GM/KG
Exposure Time: 2Y
Frequency: C
Result: Tumorigenic:Neoplastic by RTECS criteria.
Endocrine:Thyroid tumors.

NTP CARCINOGEN LIST

Rating: Some evidence.
Species: Mouse/rat
Route: Drinking

ACGIH CARCINOGEN LIST

Rating: A4

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 2000 PPM/7H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death,
e.g., stunted fetus).

Species: Rat
Dose: 3500 PPM/7H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal
system.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Result: Overexposure may cause reproductive disorder(s) based on
tests with laboratory animals.

Species: Mouse
Dose: 103 GM/KG
Route of Application: Oral
Exposure Time: (6-20D PREG)
Result: Effects on Newborn: Stillbirth. Effects on Newborn:
Growth statistics (e.g., reduced weight gain).

Species: Mouse
Dose: 135 GM/KG
Route of Application: Oral
Exposure Time: (6-20D PREG)
Result: Effects on Newborn: Live birth index (# fetuses per
litter; measured after birth).

Species: Mouse
Dose: 20240 MG/KG
Route of Application: Oral
Exposure Time: (6-18D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g.,
dead and/or resorbed implants per total number of implants).

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 6,140 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 933 mg/l

Test Type: IC50 Algae
Time: 72 h
Value: > 1,000 mg/l

ELIMINATION

Elimination: 99.9 %

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Butanols
UN#: 1120
Class: 3
Packing Group: Packing Group II
Hazard Label: Flammable liquid
PIH: Not PIH

IATA

Proper Shipping Name: Butanols
IATA UN Number: 1120
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: F Xn
Indication of Danger: Highly Flammable. Harmful.
R: 11 20
Risk Statements: Highly flammable. Harmful by inhalation.
S: 9 16
Safety Statements: Keep container in a well-ventilated place.
Keep away from sources of ignition - no smoking.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable (USA) Highly Flammable (EU).
Harmful.

Risk Statements: Harmful by inhalation. Risk of serious damage to eyes.

Safety Statements: Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear eye/face protection.

US Statements: Target organ(s): Central nervous system. Kidneys.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

DEMINIMIS: 1 %

NOTES: This product is subject to SARA section 313 reporting requirements.

TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: 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.

DSL: Yes

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.