

Section 1 – Chemical Product and Company Identification

MSDS Name: Lithium t-butoxide in tetrahydrofuran

Chemical Family: Alkali Metal Alkoxide

Use of the substance: Industrial Manufacturing

Company: Optima Chemicals Group, LLC
200 Willacoochee Hwy.
Douglas, Georgia 31535
Telephone (912) 384-5101 FAX (912) 384-6330
Emergencies: Telephone (912) 384-5101

Section 2 – Hazards Identification

Hazards:

In contact with water releases flammable gases, which can ignite spontaneously.

Highly flammable liquid and vapor.

Causes severe skin burns and eye damage.

May cause respiratory irritation.

NFPA Rating: Health: 3 Flammability: 3 Reactivity: 2 Special: W

Precautionary Statements:

Wear chemical splash goggles with a face shield, rubber gloves and rubber clothing.

Keep away from heat/sparks/open flame – No smoking.

Keep Container tightly closed.

Ground/bound container and receiving equipment.

Use explosion-proof electrical, ventilation and lighting equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dust or mist.

Wash thoroughly after handling.

Avoid breathing vapors.

Use only outdoors or in well-ventilated area.

In case of fire, use dry chemical for extinction. Do not use water or Carbon Dioxide.

Section 3 – Composition, Information on Ingredients

<u>CAS #</u>	<u>EC#</u>	<u>Chemical Name</u>	<u>Wt.%</u>
1907-33-1	217-611-5	Lithium t-butoxide	17-23
75-65-0	200-889-7	tert-Buty alcohol	0.3-4
109-99-9	203-726-8	Tetrahydrofuran	88-97

Section 4 – First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, lifting upper and lower lids. See a medical doctor or ophthalmologist immediately.

Skin: Quickly wipe off as much as possible, then immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and/or shoes. Thoroughly wash with soap and water, and seek medical attention.

Ingestion: Quickly wipe material from the mouth, and rinse mouth out with plenty of water. Dilute with 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Seek medical attention.

Inhalation: Remove from exposure, to fresh air immediately. If breathing discomfort occurs and persists, seek medical attention. If not breathing give artificial respiration, and seek medical attention.

Notes to Medical Doctor: This product has a high ph and is corrosive to eyes, skin and mucous membranes. . Consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Careful gastric lavage with an endotracheal tube in place should be considered. Observation may be warranted. Treatment is controlled removal of exposure with symptomatic and supportive care.

Section 5 – Fire Fighting Measures

Flammable Limits: Upper: 11.8% (THF) Lower: 2% (THF)

General Hazard: Flammable liquid. Reacts violently with water to give off flammable fumes and corrosive dust.

Fire Extinguishing Agents Recommended: Do not use water or carbon dioxide. Use dry chemical.

Hazardous Combustion Products: Lithium hydroxide, carbon dioxide, carbon monoxide.

Special Fire fighting Procedures: Wear self-contained breathing apparatus and protective clothing (approved for firefighting) to protect against heat, products of combustion and oxygen deficiency.. Do not breathe smoke, gases or vapors generated.

Autoignition temperature: Not applicable.

Flashpoint: -20°C (-8°F)

Sensitivity to Static Discharge: Yes

Sensitivity to Impact: None

Section 6 – Accidental Release Measures

Remove all sources of ignition. Do not use water in the initial phases of clean up. Contain spill with absorbent. Transfer to approved transport container and clean up spillage with an Absorbent. Dispose of waste according to local, state and Federal laws and regulations. Before cleanup measures begin, review the entire MSDS with particular attention to Section 3, and Section 8.

Section 7 - Handling and Storage

Handling: Use in a closed system under argon or nitrogen. Do not get in eyes, on skin or clothing. Do not breathe vapors or mist.

Storage: Store in cool, dry place. Store in tightly closed container. Keep away from sources of ignition, water, air, acids and oxidizing agents.

Section 8 – Exposure Controls, Personal Protection

Exposure Limits:

Tetrahydrofuran; PEL (OSHA) – 200 ppm, TWA (ACGIH) – 200 ppm, STEL/Ceiling (ACGIH) – 250 ppm.

T-butyl alcohol, hydrolysis product and impurity; PEL (OSHA) – 100 ppm, TWA (ACGIH) – 100 ppm.

Engineering Controls: Use in closed system under argon or nitrogen. If personal contact can occur, use local exhaust ventilation (explosion proof), to keep airborne concentrations below exposure limits.

Eyes and Face: Wear chemical splash goggles with a face shield.

Skin: Wear rubber gloves and rubber protective clothing.

Respiratory: When engineering controls are not adequate, wear a NIOSH/MSHA respirator approved for protection against organic vapors and mists.

Work Hygienic Practices: Quick-drench eyewash and safety shower.

Section 9 – Physical and Chemical Properties

Appearance and Odor: liquid, colorless to yellow; solvent odor of tetrahydrofuran.

Melting Point: -35°C (-26°F)

Boiling Point: 66°C (THF)

Flash Point: -20°C (-8°F)

Vapor Density: Air=1 (2)

pH: Reacts vigorously with water to give > 12 Percent Volatile 77-83

Vapor Pressure: 162.1 mm Hg at 20°C (THF), 31mm Hg @ 20°C (tert-butyl alcohol)

Specific Gravity 0.886 g/ml

Evaporation Rate: 8 THF

Water Solubility: Exothermic reaction to form basic lithium hydroxide and Tertiary butanol.

Flammability: water reactive material in flammable liquid solvents.

Autoignition Temperature: Not available

Viscosity: Not available

Decomposition Temperature: Not available

Explosive Properties: Not explosive

Oxidizing Properties: Not an oxidizer

Molecular Weight: 80.05

Section 10 – Stability and Reactivity

Stability: Stable.

Hazardous Polymerization: Does not polymerize

Incompatibility: Heat, fire, air, water, acids and oxidizing chemicals

Hazardous Decomposition Products: Borane/boron oxides. Liberates flammable/explosive hydrogen gas.

Conditions to Avoid: Water, heat, sparks, open flame.

Section 11 – Toxicological Information

Eyes: No data available for the product. Lithium t- Butoxide: Corrosive

Skin: No data available for the product. Lithium t- Butoxide: Corrosive

Ingestion: No data available for the product. Lithium T butoxide: Oral LD₅₀ = 1682 mg/kg (mouse), t-butanol, hydrolysis product and impurity: oral LD₅₀=2743 mg/kg (rat), THF: LD₅₀=1650mg/kg.

Inhalation: No data available for the product. THF: Inhalation LC₅₀ = 21,000 ppm, 3 hr. (rat), Lithium t- Butoxide : corrosive, t-butanol, hydrolysis product and impurity inhalation LC₅₀ > 10000 ppm (rat)

Acute Effects: No data available for the product. Extremely reactive and corrosive to skin, eyes (may cause blindness), mucous membranes and upper respiratory tract. THF, Inhalation of vapors may cause dizziness, nausea, anesthesia, numbness, burning sensation and motor weakness in fingers and toes, incoordination, and headache.

Chronic Effects from Overexposure: No data available for the product. Tetrahydrofuran: Repeated or prolonged exposure may cause signs of central nervous system depression and respiratory irritation.

Sensitization: No

Carcinogenicity: No listed by IARC, NTP, OSHA, ACGIH, or EH40.

Mutagenicity: No data available for the product. THF: Negative results in bacterial mutagenicity tests with and without metabolic activation.

Reproductive Toxicity: No data available for the product. THF: One animal study suggests that THF does not cause effects at doses which are not maternally toxic.

Section 12 – Ecological Information

Ecotoxicological Information:

Environmental toxicity testing of the product has not been conducted.

THF: 96 hr. LC₅₀ = 2160 mg/l (fathead minnow) [Handbook of Env. Data on Org. Chem., 4th Ed 2001]. 24 hr. EC₅₀ = 5.93 g/l (Daphnia magna) [AQUIRE 2003]. 48 hr LC₅₀ = 2820; 2930m g/l (orfe)) [Handbook of Env. Data on Org. Chem., 4th Ed],

Chemical Fate Information:

No data available for the product. Lithium t-butoxide reacts violently with water to form lithium hydroxide and t-butanol.

THF: THF is expected to volatilize from both water and soil and leach into groundwater. It will not photodegrade or adsorb to sediment. Limited evidence suggests it may biodegrade. Based on a relatively low Kow (0.47), it is not expected to bioconcentrate.

T-butanol- is expected to readily volatilize with both water and soil. It is not expected to absorb to sediment or bioconcentrate in aquatic organisms. It is expected to be very mobile in soil (estimated KOC of 36.9) and may leach to ground water. It is expected to biodegrade in both soil and groundwater. An estimated bioconcentration factor of 1.08 indicates a very low tendency to bioaccumulate.

Section 13 – Disposal Considerations

Dispose of in accordance with federal, state, and local regulations.

Section 14 – Transport Information

DOT Shipping: flammable liquid, corrosive, N.O.S. (lithium t-butoxide in tetrahydrofuran), 3, flammable liquid, (8, corrosive) UN2924, PG II.

Labels: Flammable, corrosive.

Custom Tariff No: 2905.14.1000

Marine Pollutant: No

PIH: Not designated Poison Inhalation Hazard by USDOT.

Section 15 – Regulatory Information

United States:

Section 311 Hazard Category (40CFR 370): Reactive; fire hazard, immediate (acute); health hazard.

Section 313 Reportable Ingredients (40 CFR 372): tertiary butanol is a reportable substance.

Section 302 Extremely Hazardous Substances (40 CFR 355): Not listed.

CERCLA Hazardous Substance (40 CFR 302.4): Tetrahydrofuran has a reportable quantity of 1000 pounds.

TSCA Sec 12B Export Notification: Tetrahydrofuran is subject to these requirements.

TSCA Inventory Status (40 CFR 710): Listed

Canada:

Product Identification No.: 2924

WHMIS: Hazard Classification – Class B, Division 2 (Flammable liquid), Class B, Division 6 (Reactive Flammable Materials/Flammable gas on contact with water), Class D, division 2B (toxic material with chronic effects), Class E, (Corrosive), Ingredient Disclosure List: Tetrahydrofuran and t-butanol are listed.

Section 16 – Additional Information

Creation Date: 02/01/2010

This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

This information is believed to be accurate and represents the best information currently available to Optima Chemical Group LLC. However, we make no warranty of merchantability, express or implied, with respect to such information and assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.