MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
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SRM Number: 1060a
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SRM Name: Lithium Cyclohexanebutyrate

Date of Issue: 12 October 2006

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

Description: This Standard Reference Material (SRM) is intended primarily for use in preparing solutions of known lithium content in lubricating oils. Each unit consists of 5 g of material.

Substance: Lithium Cyclohexanebutyrate.

Other Designations: Cyclohexanebutoic acid, lithium salt; lithium 4-cyclohexanebutyrate.

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component:	Lithium Cyclohexanebutyrate
CAS Number:	62638-00-0
EC Number (EINECS):	263-664-2
Nominal Mass Fraction (%):	100
EC Classification:	Xi (Irritant); not classified in Annex I of Directive 67/548/EEC
EC Risk:	R22 (harmful if swallowed) R36/37/38 (irritating to eyes, respiratory system and skin)
EC Safety:	S23 (do not breathe fumes) S24/25 (avoid contact with skin and eyes) S45 (in case of accident or illness, see doctor; show label)

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0-4): Health = 1 Fire = 0 Reactivity = 0

Major Health Hazards: Irritating to the respiratory tract, skin, eyes, and GI tract.

Physical Hazards: Dust-air mixtures may explode.

Potential Health Effects

Inhalation: The toxicity of this material has not been fully investigated, but lithium compounds as a group and cyclohexanebutyric acid are both respiratory irritants.

Skin Contact: Contact with lithium compounds can cause irritation and burns. Cyclohexanebutyric acid also causes skin irritation.

Eye Contact: This material can cause burns and permanent damage to the eyes.

Ingestion: This material can irritate the GI tract, causing abdominal pain, nausea, vomiting, and diarrhea. High-level or prolonged exposure to lithium compounds may damage the kidneys, central nervous system, or other organs. Cyclohexanebutyric acid is also an irritant.

Medical Conditions Aggravated by Exposure: The toxicity of this lithium compound has not been fully investigated. As an irritant, it may aggravate disorders affecting the respiratory tract, skin, eyes, or other target organs. Lithium can aggravate a number of medical conditions including diabetes, hypothyroidism, and psoriasis.

Listed as a Carcinogen/ Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

4. First Aid Measures

Inhalation: Move the person to fresh air immediately. If not breathing, qualified medical personnel may start CPR or give oxygen if necessary. Get medical aid at once, and bring the container or label.

Skin Contact: Remove contaminated clothing and shoes. Flush affected skin with water for at least 15 minutes, then wash thoroughly with soap and water. If skin irritation persists, get medical aid and bring the container or label. Wash contaminated clothing before reusing.

Eye Contact: Remove contact lenses (if any). Do not allow victim to rub eyes or keep eyes closed. Flush eyes with large amounts of running water for at least 30 minutes, keeping eyelids open and raising lids to remove all chemical. Get medical aid at once, and bring the container or label.

Ingestion: Contact a poison control center immediately for instructions. Wash out mouth with water, but do not induce vomiting. Get medical aid at once, and bring the container or label.

5. Fire Fighting Measures

Fire and Explosion Hazards: This material is not believed to be a significant fire hazard under normal conditions. Dust-air mixtures may explode if an ignition source is present. Products of combustion may be toxic.

Extinguishing Media: Use extinguishing media appropriate to the surrounding fire, such as water spray, carbon dioxide, dry chemical, or foam. Cool containers from maximum distance using water spray.

Fire Fighting: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): N/A

Autoignition (°C): N/A

Lower Explosive Limit (LEL): N/A

Upper Explosive Limit (UEL): N/A

Flammability Class (OSHA): N/A

Products of Combustion: Thermal decomposition of this material can release carbon oxides and lithium oxide.

6. Accidental Release Measures

Occupational Release: Isolate the spill area and remove any sources of ignition. Cleanup personnel must wear personal protective equipment ("Section 8"). Sweep up material and place in a suitable container for proper disposal, using a method that does not generate dust. Provide ventilation.

Disposal: Refer to "Section 13", Disposal Considerations.

7. HANDLING AND STORAGE

Storage: Store this material in the original container at room temperature. Protect from moisture, heat, and physical damage, and isolate from incompatible materials.

Safe Handling Precautions: Wear a dust mask or respirator. Avoid contact or wash after handling.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

ACGIH TLV-TWA: None established. Total nuisance dust, 10 mg/m^3; respirable dust, 3 mg/m^3
OSHA TLV-TWA: None established. Total nuisance dust, 15 mg/m^3; respirable dust, 5 mg/m^3
UK WEL: None established. Total inhalable dust, 10 mg/m^3; respirable dust, 4 mg/m^3

Ventilation: Use local or general exhaust to keep employee exposures below limits. Local exhaust ventilation is preferred because it can control contaminant emissions at the source, preventing dispersion into the general work area. Refer to the ACGIH document *Industrial Ventilation, a Manual of Recommended Practices*.

Respirator: If necessary, refer to the NIOSH document *Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84* for selection and use of respirators certified by NIOSH.

Eye Protection: Use chemical safety goggles where dusting or splashing of solutions may occur. See OSHA standard (29 CFR 1910.133) or European Standard EN166. The employer should provide an emergency eye wash fountain and safety shower in the immediate work area.

Personal Protection: Wear appropriate gloves and protective clothing to prevent contact with skin.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component: Lithium Cyclohexanebutyrate

Appearance and Odor: White crystalline solid, odorless

Relative Molecular Weight: 176.18

Molecular Formula: $C_{10}H_{17}O_2Li$

Density (g/cm^3): N/A

Solvent Solubility: Soluble in xylene

Water Solubility: Negligible

Boiling Point (°C): N/A

Melting Point (°C): 229 (444 ºF)

10. STABILITY AND REACTIVITY

Stability: __X__ Stable _____Unstable

Stable at normal temperature and pressure.

Conditions to Avoid: Dust generation; heat or flame; incompatible materials.

Incompatible Materials: Strong oxidizers, strong acids.

Fire/Explosion Information: See Section 5.

Hazardous Decomposition: Thermal decomposition of this material can release carbon oxides and lithium oxide.

Hazardous Polymerization: _____ Will Occur __X__ Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: __X__ Inhalation __X__ Skin __X__ Ingestion

Toxicity Data (Lithium):

Rabbit, subcutaneous, LD_{Lo}: 4 g/kg
Mouse, intraperitoneal, LD_{50}: 1 g/kg
Dog, intravenous, LD_{Lo}: 325 mg/kg

Target Organ(s): Respiratory tract, skin, eyes, GI tract, kidneys, central nervous system.

Mutagen/Teratogen: Lithium can induce birth defects in mice, but only at extremely high doses that humans would not normally encounter. Some studies suggest that lithium is associated with a slight risk of fetal heart defects in humans. Lithium may also reduce sperm motility in humans.

Health Effects: See "Section 3".

12. ECOLOGICAL INFORMATION

Environmental Summary: The environmental effects of lithium and its compounds have not been fully investigated. No relevant ecotoxicity data were found.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of container and unused contents in accordance with federal, state, and local requirements, which vary according to location. Although this material is not a listed RCRA hazardous waste, it may exhibit one or more characteristics of a hazardous waste and thus requires appropriate analysis to determine specific disposal requirements. Processing, use, or contamination of this product may change the waste management options.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated

SARA Title III Section 302: Not regulated.

SARA Title III Section 304: Not regulated.

SARA Title III Section 313: Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	Yes
CHRONIC:	No
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

STATE REGULATIONS

California Proposition 65: Not regulated.

CANADIAN REGULATIONS

WHMIS Classification: Not provided for this material.

EUROPEAN REGULATIONS

EU/EC Classification: Xi (Irritant); not classified in Annex I of Directive 67/548/EEC.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed.

TSCA 12(b), Export Notification: Not listed.

16. OTHER INFORMATION

Sources:

Amdur, M.O., et al.; *Casarett and Doull's Toxicology: The Basic Science of Poisons*; 4th Ed.; McGraw-Hill: New York (1993).

Hazardous Substances Data Bank (HSDB): Lithium Compounds.

U.S. National Institute for Occupational Safety and Health, *NIOSH Pocket Guide to Chemical Hazards*, September 2005 Ed. DHHS (NIOSH) Publication No. 2005-151.