MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

SRM Number: 1073b
MSDS Number: 1073b
SRM Name: Zinc Cyclohexanebutyrate

Date of Issue: 10 October 2006

MSDS Coordinator: Mario J. Cellarosi
Telephone: 301-975-6776
FAX: 301-926-4751
E-mail: SRMMSDS@nist.gov

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

Description: This Standard Reference Material (SRM) is primarily intended for use in the preparation of a standard of zinc in lubricating oils. SRM 1073b is essentially free from other metals. Each unit consists of 5 g of zinc cyclohexanebutyrate.

Substance: Zinc Cyclohexanebutyrate.

Other Designations: Cyclohexanebutanoic acid, zinc salt.

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component:	Zinc Cyclohexanebutyrate
CAS Number:	38582-18-2
EC Number (EINECS):	254-017-5
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: This material may irritate the skin, eyes, respiratory tract, and GI tract.

Physical Hazards: None documented for this material. Dust-air mixture may explode at high temperature. Container may shatter.

Potential Health Effects

Inhalation: This material may be irritating to the lungs and mucous membranes.

Skin Contact: This material may cause skin irritation, and may be absorbed through the skin.

Eye Contact: This material may cause eye irritation.

Ingestion: The toxicity of this material has not been fully investigated. Ingestion of this material may irritate the GI tract, causing abdominal pain, nausea, vomiting, and diarrhea. Some zinc compounds may interfere with the normal absorption of dietary copper.

Medical Conditions Aggravated by Exposure: As an irritant, this compound may aggravate disorders affecting the respiratory tract, skin, eyes, GI tract, or other target organs.

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

Note: EPA has determined that zinc and zinc compounds are not classifiable as to human carcinogenicity.

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 thermal decomposition 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 may produce carbon dioxide, carbon monoxide, and zinc 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 reclamation or 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: None established. Exposure limits for total nuisance dust:

ACGIH TLV-TWA: None established. Total dust, 10 mg/m^3; respirable dust, 3 mg/m^3

OSHA TLV-TWA: None established. Total 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: Zinc Cyclohexanebutyrate

Appearance and Odor: White powder

Relative Molecular Weight: 439.9

Molecular Formula: $C_{20}H_{34}O_4Zn$

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

Solvent Solubility: Soluble in xylene and 2-ethylhexanoic acid

Water Solubility: Insoluble

Boiling Point (°C): N/A

Melting Point (°C): 80 (176 ºF)

10. STABILITY AND REACTIVITY

Stability: __X__ Stable _____Unstable

Stable at normal temperature and pressure.

Conditions to Avoid: Dust generation; incompatible materials.

Incompatible Materials: Oxidizing agents, acids, or acid fumes.

Fire/Explosion Information: See “Section 5”.

Hazardous Decomposition: Thermal decomposition of this material may produce carbon dioxide, carbon monoxide, and zinc oxide.

Hazardous Polymerization: _____ Will Occur __X__ Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: __X__ Inhalation __X__ Skin __X__ Ingestion

Toxicity Data: Not available.

Target Organ(s): Respiratory tract, skin, eyes, GI tract.

Mutagen/Teratogen: This material is not known to be a mutagen, teratogen, or reproductive hazard, but its toxicity has not been fully investigated. Genotoxicity testing has yielded equivocal results for other zinc compounds.

Health Effects: See "Section 3".

12. ECOLOGICAL INFORMATION

Environmental Summary: The environmental effect of this material has 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): Regulated as Zinc Compounds (N982), no RQ.

SARA Title III Section 302: Not regulated.

SARA Title III Section 304: Not regulated.

SARA Title III Section 313: 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:

Hazardous Substances Data Bank (HSDB): Zinc Compounds.

Integrated Risk Information System (IRIS). Toxicological Review of Zinc and Compounds. July 2005.

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