

# Acephate

sc-203800

Material Safety Data Sheet



The Power is Question

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

Acephate

### 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  
Outside the US & Canada: +800 2436 2255  
(1-800-CHEMCALL) or call +613 9573 3112

### SYNONYMS

C4-H10-N-O3-P-S, CH<sub>3</sub>SP(=O)(OCH<sub>3</sub>)NHCOCH<sub>3</sub>, "phosphoramidothioic acid, N-acetyl-, O, S-dimethyl ester", "acetylphosphoramidothioic acid O, S-dimethyl ester", "Chevron RE 12, 420", "O, S-dimethylacetylphosphoroamidothioate", N-(methoxy(methylthio)phosphinoyl)acetamide, "ENT 27822", "Orthene-755, 12420, 124120", "Ortho 124120", Ortran, Ortril, "organophosphorus pesticide/ insecticide"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

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

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



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Harmful if swallowed.

### 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.
- Considered an unlikely route of entry in commercial/industrial environments.
- Ingestion may produce nausea, vomiting, depressed appetite, abdominal cramps, and diarrhea.

##### EYE

- Although the material is not thought to be an irritant, direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with windburn).
- Direct eye contact can produce tears, eyelid twitches, pupil contraction, loss of focus, and blurred or dimmed vision. Dilation of the pupils occasionally occurs.

##### SKIN

- The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
- Toxic effects may result from skin absorption.
- There may be sweating and muscle twitches at site of contact. Reaction may be delayed by hours.

##### INHALED

- The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
- Poisoning due to cholinesterase inhibitors causes symptoms such as increased blood flow to the nose, watery discharge, chest discomfort, shortness of breath and wheezing. Other symptoms include increased production of tears, nausea and vomiting, diarrhea, stomach pain, involuntary passing of urine and stools, chest pain, breathing difficulty, low blood pressure, irregular heartbeat, loss of reflexes, twitching, visual disturbances, altered pupil size, convulsions, lung congestion, coma and heart failure.

##### CHRONIC HEALTH EFFECTS

- The material is considered to be harmful by all exposure routes.
- Principal routes of exposure are usually by skin contact/eye contact with the material and inhalation of vapor/spray mist. Repeated or prolonged exposures to cholinesterase inhibitors produce symptoms similar to acute effects. In addition workers exposed repeatedly to these substances may exhibit impaired memory and loss of concentration, severe depression and acute psychosis, irritability, confusion, apathy, emotional lability, speech difficulties, headache, spatial disorientation, delayed reaction times, sleepwalking, drowsiness or insomnia.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
acephate	30560-19-1	>98
impurities may include		
<a href="#">O,O,S-trimethyl phosphorodithioate</a>	2953-29-9	

## Section 4 - FIRST AID MEASURES

##### SWALLOWED

- If poisoning occurs, contact a doctor or Poisons Information Center. ■ If swallowed: · Contact a Poisons Information Center or a doctor at once. · If swallowed, activated charcoal may be advised.

##### 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 product comes in contact with skin: · Contact a Poisons Information Center or a doctor. · DO NOT allow clothing wet with product to remain in contact with skin, strip all contaminated clothing including boots.

## INHALED

· If dust is inhaled, remove from contaminated area. · Encourage patient to blow nose to ensure clear passage of breathing. · If irritation or discomfort persists seek medical attention. · If spray mist, vapor are inhaled, remove from contaminated area. · Contact a Poisons Information Center or a doctor at once.

## NOTES TO PHYSICIAN

· Most organophosphate compounds are rapidly well absorbed from the skin, conjunctiva, gastro-intestinal tract and lungs.  
· They are detoxified by Cytochrome P450-mediated monooxygenases in the liver but some metabolites are more toxic than parent compounds.

## Section 5 - FIRE FIGHTING MEASURES

Upper Explosive Limit (%):	Not available
Specific Gravity (water=1):	1.35
Lower Explosive Limit (%):	Not available
Relative Vapor Density (air=1):	Not available

## EXTINGUISHING MEDIA

· Water spray or fog.  
· Foam.  
Dry agent.  
Carbon dioxide.

## FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).

Cool fire exposed containers with water spray from a protected location.

DO NOT approach containers suspected to be hot.

If safe to do so, remove containers from path of fire.

Equipment should be thoroughly decontaminated after use.

## GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Pollutant.
  - Solid which exhibits difficult combustion or is difficult to ignite.
  - Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
- Combustion products include: carbon monoxide (CO), phosphorus oxides (POx), nitrogen oxides (NOx) and sulfur oxides (SOx).

## FIRE INCOMPATIBILITY

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

## PERSONAL PROTECTION

Glasses:  
Safety Glasses.  
Chemical goggles.  
Full face- shield.  
Gloves:  
Respirator:  
Particulate

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Clean up all spills immediately Environmental hazard - contain spillage.
- Avoid breathing vapors and contact with skin and eyes.  
Wear protective clothing, gloves, safety glasses and dust respirator.  
Use dry clean up procedures and avoid generating dust.  
Place spilled material in clean, dry, sealable, labelled container.  
Wash spill area with detergent and water.

### MAJOR SPILLS

- DO NOT touch the spill material and Restrict access to area.
- Clear area of personnel Pollutant - contain spillage.  
Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
  - Prevent, by any means available, spillage from entering drains or water courses.
  - Consider evacuation (or protect in place).
- No smoking, naked lights or ignition sources. Increase ventilation.  
Stop leak if safe to do so.

Contain spill with sand, earth or vermiculite.  
Collect recoverable product into labelled containers for recycling.  
Collect residues and seal in labelled drums for disposal.  
Wash area down with large quantity of water and prevent runoff into drains.  
After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.  
If contamination of drains or waterways occurs, advise emergency services.

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- Use good occupational work practice. Observe manufacturer's storing and handling recommendations.
  - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- Avoid all personal contact, including inhalation.  
Wear protective clothing when risk of exposure occurs.
- Avoid smoking, naked lights, heat or ignition sources.
- Use in a well-ventilated area.  
Avoid contact with incompatible materials.  
DO NOT spray directly on humans, exposed food or food utensils.  
When handling, DO NOT eat, drink or smoke.  
Avoid physical damage to containers.  
Always wash hands with soap and water after handling. Work clothes should be laundered separately.  
Launder contaminated clothing before re-use.

### RECOMMENDED STORAGE METHODS

- Packaging as recommended by manufacturer.
  - Check that containers are clearly labeled.
- Plastic container.  
Polyethylene or polypropylene container.  
Steel drum with plastic liner.

### STORAGE REQUIREMENTS

- Observe manufacturer's storing and handling recommendations.
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry place.  
Store in a well-ventilated area.
- No smoking, naked lights, heat or ignition sources.
- Store away from incompatible materials.  
Isolate from NON-pesticides.  
Store away from foodstuff containers.  
Protect containers against physical damage.  
Check regularly for spills and leaks.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

The following materials had no OELs on our records

- acephate: CAS:30560-19-1
- O,O,S-trimethyl phosphorodithioate: CAS:2953-29-9

### PERSONAL PROTECTION



### RESPIRATOR

Particulate  
Consult your EHS staff for recommendations

### EYE

- Safety glasses with side shields.
- Chemical goggles.
- Full face shield.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their

removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

#### HANDS/FEET

- DO NOT handle directly. Wear gloves and use scoop / tongs / tools.
  - Barrier cream and Elbow length PVC gloves.
  - Safety footwear or Rubber boots or · PVC boots.
- NOTE: Contaminated leather items, such as shoes, belts and watchbands should be removed and destroyed.

#### ENGINEERING CONTROLS

- Use in a well ventilated area, preferably outdoors.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Solid.

Mixes with water.

State	Divided solid	Molecular Weight	183.18
Melting Range (°F)	197.6- 199.4	Boiling Range (°F)	Not available
Solubility in water (g/L)	Miscible	Flash Point (°F)	Not available
pH (1% solution)	Not available	Decomposition Temp (°F)	Not available
pH (as supplied)	Not applicable	Autoignition Temp (°F)	Not available
Vapor Pressure (mmHg)	1.995 mPa,24C	Upper Explosive Limit (%)	Not available
Specific Gravity (water=1)	1.35	Lower Explosive Limit (%)	Not available
Relative Vapor Density (air=1)	Not available	Volatile Component (%vol)	Not available
Evaporation Rate	Not available		

### APPEARANCE

White hygroscopic crystalline solid; mixes with water (790 g/l, 20 C). Solubilities (g/l, 20 C): acetone 151, ethanol >100, ethyl acetate 35, benzene 16, hexane 0.1. Stable to hydrolysis: DT50 (40 C) 60 h (pH 9), 710 h (pH 3).

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

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

### STORAGE INCOMPATIBILITY

- Segregate from strong alkalis.

Avoid contamination of water, foodstuffs, feed or seed.

A number of phosphate and thiophosphate esters are of limited thermal stability and undergo highly exothermic self-accelerating decomposition reactions which may be catalyzed by impurities. The potential hazards can be reduced by appropriate thermal control measures.

<\p>.

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

## Section 11 - TOXICOLOGICAL INFORMATION

ACEPHATE

### TOXICITY AND IRRITATION

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

ACEPHATE:

TOXICITY	IRRITATION
Oral (rat) LD50: 700 mg/kg	Skin (rabbit): non-irritating
Oral (rat) LD50: 945 mg/kg (male) *	
Oral (rat) LD50: 866 mg/kg (female)*	
Inhalation (?) LC50: >15 mg/l *	
Dermal (rat) LD50: >2500 mg/kg	

Oral (mouse) LD50: 233 mg/kg

Dermal (rabbit) LD50: 2000 mg/kg

Dermal (rabbit) LD50: >2000 mg/kg \*

Oral (chicken) LD50: 800 mg/kg

Oral (duck) LD50: 350 mg/kg

Oral (wild bird) LD50: 140 mg/kg

ADI: 0.03 mg/kg

Toxicity Class WHO III;EPA III

NOEL: In a 2 year feeding trial, dogs showed depression of cholinesterase at

100 mg/kg diet (maximum dose level) but no other significant effects; rats

showed depression of cholinesterase but no effect on weight gain or

pathological effects at 30 mg/kg diet. \*

No teratogenic, mutagenic or carcinogenic effects observed \*

Non-sensitising to guinea pig skin. \*

Human fibroblast mutagen

Reproductive effector in mice

■ [ \* The Pesticides Manual, Incorporating The Agrochemicals Handbook, 10th Edition, Editor Clive Tomlin, 1994, British Crop Protection Council].

## TOXICITY

## IRRITATION

### O,O,S-TRIMETHYL PHOSPHORODITHIOATE:

Oral (rat) LD50: 15 mg/kg

Nil Reported

Oral (mouse) LD50: 1850 mg/kg

#### ■ For dithiophosphate alkyl esters and their (zinc) salts:

Acute toxicity: Dithiophosphate alkyl esters consist of a phosphorodithioic acid structure with alkyl ester substituent groups. The alkyl groups are saturated hydrocarbon chains that vary in length and extent of branching. While corrosive to tissue the esters demonstrate a low concern for acute systemic toxicity. Data on acute mammalian toxicity of zinc dialkyldithiophosphates in highly refined lubricant base oil also indicate a low concern for acute toxicity. Commercial oil-based samples of the zinc dialkyldithiophosphate category have been tested for acute oral toxicity. The acute oral LD50 for these studies in rats ranged from 2000-3500 mg/kg. Clinical signs observed following treatment included diarrhea, lethargy, reduced food consumption, and staining about the nose and eye. Ptosis, piloerection, ataxia and salivation were occasionally observed. The incidence and severity of these symptoms were proportional to the dose. In many cases the effects were found to be reversible during observation week 2. Necropsy findings were few in number. Lung congestion, gastrointestinal irritation and a reduction in body fat were observed in some animals.

Acute dermal toxicity and irritation studies using the ester on experimental animals resulted in severe dermal irritation and corrosivity. There is minimal opportunity of human exposure to the chemicals in this category. Dithiophosphate alkyl esters exhibit extreme corrosive properties on skin.

Commercial oil-based samples of

the zinc dialkyldithiophosphate category have been tested for acute dermal toxicity. The acute dermal LD50s for these studies in rabbits were greater than 2000 mg/kg (limit tests). No treatment-related mortality was observed at doses ranging from 2000-8000 mg/kg. Dermal application of the test materials to abraded skin for 24 hours typically produced moderate-to-severe erythema and edema, which in some cases persisted through the 14-day observation period. Clinical signs included varying degrees of reduced food consumption, weight loss, diarrhea, lethargy, ataxia, ptosis, motor incoordination and/or loss of righting reflex. There were no remarkable gross necropsy observations. Overall, the acute dermal LD50 for these substances were greater than 2000 mg/kg indicative of a relatively low order of lethal toxicity. Zinc dialkyldithiophosphates are high molecular weight components (average > 500 gm/mol), which generally accepted that the molecular weight limit for passive transport across biological membranes. Thus, upon exposure it is unlikely that significant amounts of these components will be absorbed for systemic distribution. In addition, these materials have a low water solubility that further inhibits absorption and distribution in the mammalian system.

The negligible vapor pressure and high viscosity at ambient temperature indicates that these materials are unlikely to represent an inhalation exposure under conditions of use

Repeat dose toxicity: Data from several repeated-dose toxicity studies using commercial samples of zinc dialkyldithiophosphates in highly refined lubricant base oil has been reviewed. Repeated dermal exposure to experimental animals resulted in moderate-to-severe dermal irritation, behavioral distress, body weight loss and emaciation, reduction in hematological parameters and adverse effects on male reproductive organs. These effects were observed across several members of the category with carbon chain lengths ranging from C4-8. There was no evidence that the incremental increase in carbon chain length or molecular weight could be correlated with significant changes in toxicity parameters.

Oral administration caused significant gastric irritation and related gastrointestinal disturbances, signs of distress but with no evidence of adverse effects on male reproductive organs.

Reproductive toxicity: An epidemiological study on workers exposed to oil-based zinc dialkyldithiophosphates (range C4-8) in an additive manufacturing plant revealed no adverse effects on worker reproductive health. Review of the available information underscores the similarity of clinical and pathological findings in repeated-dose dermal toxicity studies with C4-10 zinc dialkyldithiophosphates, as well as the absence of reproduction and developmental toxicity and the lack of untoward findings in a human epidemiological investigation. Reproductive organ effects, following dermal application,

have been observed in male rabbits; these are attributed to the stress associated with the severe dermal responses to the test material, rather than direct a systemic response to the test materials. Changes in male reproductive organs in the rabbit have been observed when other irritating substances are applied to the skin at dose levels that cause skin lesions. Thus, dermal irritation alone, or in combination with the accompanying weight loss and stress, is thought to play a role in the reproductive organ response to repeated cutaneous application of zinc dialkyldithiophosphates.

Mutagenicity: Findings indicate that commercial samples of zinc dialkyldithiophosphates in highly refined lubricant base oil have a small potential for inducing genetic toxicity. In vitro bacterial gene mutation assays, in vitro mammalian gene mutation assays, or in vivo chromosomal aberration assays have been conducted. Frequencies of reverse mutations in bacteria were not significantly changed after exposure to the zinc dialkyldithiophosphates. In vitro mutation studies in mammalian cells indicate that the zinc dialkyldithiophosphates do not consistently display mutagenic activity in the absence of metabolic activation, however, upon biotransformation, these materials showed mutagenic activity. The findings in bacterial and mammalian cells did not vary in proportion to the alkyl chain length or any other physicochemical parameter.

The results of the studies performed in the absence of hepatic microsome activation were inconsistent, but in general indicating that zinc dialkyldithiophosphates have mutagenic potential (3 studies negative, 3 studies positive in the absence of metabolic activation). However, the weight of evidence (2 studies positive, 1 study negative) indicates that metabolic activation of zinc dialkyldithiophosphates by induced hepatic microsomal enzymes results in a significant increase in the mutagenic potential of this class of chemical substances.

## CARCINOGEN

ACEPHATE	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	IRIS, OPP-CAN
ORGANOPHOSPHATE PESTICIDES	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	P65-MC

## Section 12 - ECOLOGICAL INFORMATION

No data

### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
acephate	HIGH		LOW	HIGH
O,O,S-trimethyl phosphorodithioate	HIGH		LOW	HIGH

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.  
 † Recycle wherever possible. Consult manufacturer for recycling options.  
 Consult Waste Management Authority for disposal.  
 Bury or incinerate residue at an approved site.  
 Decontaminate empty containers.  
 DO NOT discharge into sewer or waterways.  
 Puncture containers to prevent re-use.

## Section 14 - TRANSPORTATION INFORMATION

### Air Transport IATA:

ICAO/IATA Class: None ICAO/IATA Subrisk: None  
 UN/ID Number: None Packing Group: -  
 ERG Code: - Special provisions: None  
 Cargo Only  
 Packing Instructions: -  
 Maximum Qty/Pack: - Passenger and Cargo  
 Passenger and Cargo Packing Instructions: -

Maximum Qty/Pack: - Passenger and Cargo Limited Quantity  
Passenger and Cargo Limited Quantity Packing Instructions: -  
Maximum Qty/Pack: -  
Shipping Name: INSECTICIDE, SOLID OR LIQUID, SEE 3.6.1.8  
NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IMDG

## Section 15 - REGULATORY INFORMATION

**acephate (CAS: 30560-19-1) is found on the following regulatory lists;**

"Canada - Saskatchewan Environmental Persistent or Chronic Hazardous Substances", "US - Massachusetts Oil & Hazardous Material List", "US EPA Carcinogens Listing", "US EPCRA Section 313 Chemical List", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act"

### Regulations for ingredients

**O,O,S-trimethyl phosphorodithioate (CAS: 2953-29-9) is found on the following regulatory lists;**

"US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified"

## Section 16 - OTHER INFORMATION

### LIMITED EVIDENCE

- Inhalation and/or skin contact may produce health damage\*.
- Cumulative effects may result following exposure\*.
- May produce discomfort of the eyes\*.

\* (limited evidence).

*Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.*

- 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](http://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.

*This document is copyright. Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from CHEMWATCH. TEL (+61 3) 9572 4700.*

Issue Date: Feb-19-2008

Print Date: Nov-25-2010