



# MATERIAL SAFETY DATA SHEET

## BAYER HEALTHCARE LLC

Animal Health Division  
12707 Shawnee Mission Parkway  
(West 63rd)  
Shawnee, KS 66216-1846

### TRANSPORTATION EMERGENCY

CALL CHEMTREC..... : (800) 424-9300  
INTERNATIONAL ..... : (703) 527-3887

### NON-TRANSPORTATION

BAYER EMERGENCY PHONE : (877) 258-2280  
BAYER INFORMATION PHONE: (800) 633-3796

## Section 1: Product and Company Identification

**Product Name:** CO-RAL Emulsifiable Livestock Insecticide  
**Material Number:** 8715176  
**Chemical Family:** Organophosphorus Insecticide  
**Chemical Name:** 0,0-Diethyl 0(3-chloro-4-methyl-2-oxo-(2H)-1- benzopyran-7-yl) phosphorothioate  
**Synonyms:** Coumaphos

## Section 2: Composition/Information on Ingredients

### HAZARDOUS INGREDIENTS

| <u>Ingredient Name/<br/>CAS Number</u>             | <u>Exposure Limits</u>  | <u>Concentration</u> |             |
|--|---|----------------------|-------------|
|  |   | <u>Min.</u>          | <u>Max.</u> |
| Polynuclear hydrocarbons<br>CAS# is a trade secret | <b>OSHA (PEL):</b><br><b>ACGIH (TLV):</b>                                       | 15%                  | 40%         |
| Coumaphos<br>56-72-4                               | <b>OSHA (PEL):</b><br>Not Established<br><b>ACGIH (TLV):</b><br>Not Established |                      | 12%         |

Naphthalene  
91-20-3

**OSHA (PEL):** 3% 7%  
10.00 ppm TWA  
50.00 mg/m<sup>3</sup> TWA  
**ACGIH (TLV):**  
10.00 ppm TWA  
52.00 mg/m<sup>3</sup> TWA  
15.00 ppm STEL  
79.00 mg/m<sup>3</sup> STEL

1-Butanol  
71-36-3

**OSHA (PEL):** 1% 5%  
100.00 ppm TWA  
300.00 mg/m<sup>3</sup> TWA  
**ACGIH (TLV):**  
50.00 ppm CEIL Skin  
152.00 mg/m<sup>3</sup> CEIL  
Skin

### Section 3: Hazards Identification

#### EMERGENCY OVERVIEW

**WARNING!** Toxic. Combustible. **Color:** Dark brown **Form:** Liquid **Odor:** Solvent  
Inhalation, skin absorption, or ingestion may cause inhibition of the enzyme cholinesterase. Inhalation may cause nausea or dizziness.

#### POTENTIAL HEALTH EFFECTS

**Route(s) of Entry:** Eye Contact, Inhalation, Skin Absorption, Skin Contact

#### HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

##### Inhalation Hazards

**Acute Inhalation Hazards:** May cause inhibition of the enzyme cholinesterase with symptoms of runny nose, tearing, tightness of chest, and wheezing. If poisoning is severe, symptoms of fatigue, nausea, vomiting, convulsions, low blood pressure, cardiac irregularities, and coma may occur. In extreme cases death may occur from respiratory failure. The onset of symptoms may be delayed up to 12 hours; however, complete symptomatic recovery of sublethal poisoning usually occurs within one week once the source of exposure is completely removed. Inhalation of the solvents may cause central nervous system depression with symptoms of nausea, lightheadedness, drowsiness, and dizziness.

##### Skin Hazards

**Acute Skin Hazards:** Skin absorption of the active ingredient in this product may cause inhibition of the enzyme cholinesterase with symptoms of increased sweating, muscle contractions, tearing and constricted pupils. If poisoning is severe, symptoms of fatigue, nausea, vomiting, convulsions, low blood pressure, cardiac irregularities, and coma may occur. In extreme cases death may occur from respiratory failure. The onset of symptoms may be delayed up to 12 hours however, complete symptomatic recovery of sublethal poisoning

usually occurs within one week once the source of exposure is completely removed. May cause slight irritation.

**Eye Hazards**

**Acute Eye Hazards:** May cause slight irritation.

**Ingestion Hazards**

**Acute Ingestion Hazards:** May cause inhibition of the enzyme cholinesterase with symptoms of vomiting, diarrhea, abdominal cramping, dizziness and sweating. If poisoning is severe, symptoms of fatigue, convulsions, low blood pressure, cardiac irregularities, loss of reflexes and coma may occur. In extreme cases death may occur from respiratory failure. The onset of symptoms may be delayed up to 12 hours however, complete symptomatic recovery of sublethal poisoning usually occurs within one week once the source of exposure is completely removed.

**General Effects of Exposure**

**Chronic Effects of Exposure:** Cholinesterase inhibition sometimes persists for weeks, thus repeated exposure to small amounts of this material may result in unexpected cholinesterase depression. Exposure to this product may produce severe symptoms of cholinesterase inhibition in a previously exposed person. Prolonged contact with this product may cause defatting of the skin due to the solvent component in the product. Chronic exposure to organic solvents has been associated with various neurotoxic effects including permanent brain and nervous system damage.

**Carcinogenic Components:**

**NTP:** None

**IARC:** None

**OSHA:** None

**Medical Conditions Aggravated by Exposure:** Eye disorders, Skin disorders, Kidney disorders, Liver disorders

**Section 4: First Aid Measures**

**First Aid for Eye:** Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Get medical attention if irritation develops or persists.

**First Aid for Skin:** In case of skin contact, wash affected areas with soap and water. Contact a physician if irritation develops.

**First Aid for Inhalation:** If inhaled, remove to fresh air. If breathing is difficult, give oxygen. Call a physician immediately.

**First Aid for Ingestion:** Contact a physician or Poison Control Center. If ingested, do not induce vomiting unless directed to do so by medical personnel.

**Note to Physician:** If symptoms of organophosphate poisoning are present, the

administration of atropine sulfate is indicated. In mild cases, start treatment by giving 1-2 mg of atropine sulfate intravenously every 15 minutes until signs of atropinization appear (dry mouth, flushing, and dilated pupils if pupils were originally pinpoint). In severe cases, start treatment by giving 2-4 mg intravenously every 5-10 minutes until fully atropinized. At first signs of pulmonary edema, place patient in oxygen tent and treat symptomatically. In case of human or animal poisoning, please contact the poison control center at (800) 414-0244. Please also notify Bayer at (877) 258-2280.

### Section 5: Fire Fighting Measures

**Flash Point:** > 185 °F Tagliabue Open Cup (ASTM D-1310)

**Flammable Limits:**

**Upper Explosion Limit (UEL %):** Not Established

**Lower Explosion Limit (LEL %):** Not Established

**Extinguishing Media:**

**Suitable:** Water, Carbon Dioxide, Dry Chemical

**Special Fire Fighting Procedures:**

Use cold water spray to cool fire-exposed containers to minimize risk of rupture. Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Do not allow fire fighting water to enter sewer, surface waters, or ground water systems. Equipment and materials used in fighting pesticide fires may become contaminated.

### Section 6: Accidental Release Measures

**Spill or Leak Procedures:** Use appropriate personal protective equipment during clean up. Dike or dam spilled material and control further spillage, if possible. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Scrub contaminated area with detergent and bleach solution. Wash spill area with water.

### Section 7: Handling and Storage

**Storage Temperature:**  
**Maximum:** 87 °F

**Shelf Life:** Not Established

**Special Sensitivity:** Avoid extreme heat. Avoid contact with moisture/water.

**Handling/Storage Precautions:** Store in a dry place in original or waterproof containers. Store in an area designated specifically for pesticides. Store separate from food products.

## Section 8: Exposure Controls/Personal Protection

### Personal Protection Equipment

|  |  |
|--|--|
| <b>Eye Protection Requirements:</b>    | Chemical safety goggles or glasses.  |
| <b>Skin Protection Requirements:</b>   | Gloves, long sleeved shirts and pants.   |
| <b>Ventilation Requirements:</b>       | Use local and general exhaust ventilation to control levels of exposure.   |
| <b>Respirator Requirements:</b>        | A NIOSH approved air purifying respirator with organic vapor cartridges and particulate prefilter can be used to minimize exposure.  |
| <b>Medical Surveillance:</b>           | Plasma and/or red blood cell cholinesterase activity can be used to detect excessive absorption of organophosphates. A pre-exposure baseline value should be established for best comparisons. If significant cholinesterase depression occurs, no further exposure should be allowed until cholinesterase values return to normal. Clinical management should be directed at decontamination followed by antidotal therapy with atropine and pralidoxime. |
| <b>Additional Protective Measures:</b> | Emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of this product. Follow all label instructions. Launder clothing separately after use. Employees should wash their hands and face before eating, drinking, or using tobacco products.  |

## Section 9: Physical and Chemical Properties

|                                |                 |
|--------------------------------|-----------------|
| <b>Physical Form:</b>          | Liquid          |
| <b>Color:</b>                  | Dark brown      |
| <b>Odor:</b>                   | Solvent         |
| <b>Boiling Point:</b>          | Not Established |
| <b>Melting/Freezing Point:</b> | < 10 °F         |
| <b>Solubility in Water:</b>    | Emulsifies      |
| <b>Specific Gravity:</b>       | 1.026 @ 25 °C   |
| <b>Bulk Density:</b>           | Not Established |
| <b>Vapor Pressure:</b>         | Not Established |

## Section 10: Stability and Reactivity

|                                  |                         |
|----------------------------------|-------------------------|
| <b>Stability:</b>                | Stable                  |
| <b>Hazardous Polymerization:</b> | Will not occur          |
| <b>Substances to Avoid:</b>      | Oxidizing agents, Bases |
| <b>Conditions to Avoid:</b>      | None known.             |

**Decomposition Products:** Carbon monoxide, Carbon Dioxide, Phosphorus Pentoxide, Hydrogen chloride, Sulfur dioxide

### Section 11: Toxicological Information

#### Toxicity Data for CO-RAL Emulsifiable Livestock Insecticide

**Acute oral toxicity:** LD50 = 50 mg/kg bw (Female Rat)

LD50 = 244 mg/kg bw (Male Rat)

**Acute dermal toxicity:** LD50 = > 3,000 mg/kg bw (Rabbit)

**Acute inhalation toxicity:** 795 mg/m<sup>3</sup>, 4 hrs, (Rat)

**Eye Irritation:** Slightly irritating (Rabbit)

**Skin Irritation:** Slightly irritating (Rabbit)

**Sensitization:** Non-sensitizer

#### Toxicity Data for Coumaphos

**Acute oral toxicity:** LD50 = 17 mg/kg bw (Female Rat)

LD50 = > 240 mg/kg bw (Male Rat)

**Acute dermal toxicity:** LD50 = > 2,000 mg/kg bw (Rabbit)

**Acute inhalation toxicity:** 0.34 - 1.08 mg/L, 1 hrs, dust/particulate (Rat)

**Eye Irritation:** Slightly irritating (Rabbit)

**Skin Irritation:** Slightly irritating (Rabbit)

**Sensitization:** Non-sensitizer dermal (Guinea pig)

**Repeated Dose Toxicity:** In dermal toxicity studies, rats were administered the active ingredient, technical grade coumaphos, for 6 hours/day for a total of 17-18 applications over a 3-week period. Doses tested ranged from 0.1 to 100 mg/kg. Effects observed included clinical signs of toxicity and cholinesterase inhibition. The overall no-observed-effect level (NOEL) from these studies was 0.5 mg/kg based on cholinesterase inhibition. In another dermal toxicity study, rats were administered technical grade coumaphos at doses of 2.5, 5.0, 10, 20, or 50 mg/kg. Doses were applied once/day for 6 hours/day, on either 2 or 5 consecutive days. No treatment-related clinical signs of toxicity were observed following exposure. The NOELs based on cholinesterase inhibition were 20 and 5 mg/kg for the 2-day and 5-day exposures, respectively.

**Carcinogenicity:** (Rat) oral, No carcinogenic effects observed at the doses tested.

(Mouse) oral, No carcinogenic effects observed at the doses tested.

**Mutagenicity:** No mutagenic effects were determined in various in vivo and in vitro

tests.

**Developmental  
Toxicity/Teratogenicity:**

(Female Rat) oral, NOAEL (fetotoxicity) = 5 mg/kg bw, NOAEL (teratogen) = 25 mg/kg bw, No Teratogenic effects observed at doses tested.

(Female Rabbit) oral, NOAEL (fetotoxicity) = 2 mg/kg bw, NOAEL (teratogen) = 18 mg/kg bw, No Teratogenic effects observed at doses tested.

**Toxicity to  
Reproduction/Fertility:**

(Rat) oral, Two generation study, In a reproduction study using rats, technical grade coumaphos was administered for 2 generations at dietary concentrations of 1, 5 or 25 ppm. There were no compound-related effects on adult reproductive or litter parameters. At concentrations of 5 ppm and greater, parental cholinesterase activities were inhibited. The NOELs for parental and reproductive effects were 1 and 25 ppm, respectively.

**Neurotoxicity:**

In an acute oral study, hens revealed no evidence of neurotoxicity when treated with the active ingredient at dose levels up to and including 185 mg/kg (highest dose tested). In a 3 month study in which hens received the active ingredient daily at oral doses of 3, 9 or 18 mg/kg, there was no evidence of delayed neurotoxicity. In a 13 week neurotoxicity study, technical grade trichlorfon was administered to rats at dietary concentrations of 100, 500 and 2500 ppm. Effects observed at the high-dose included decreased body weights, decreased feed consumption, perianal stains, urine stains, slightly uncoordinated righting response, reduced levels of activity, and cholinesterase inhibition (erythrocyte, plasma and brain). Microscopic examinations revealed minimal degeneration of myelin in the dorsal and ventral root fibers in cervical and lumbar regions of the spinal cord without degeneration of the axon. All clinical signs and neurobehavioral effects are ascribed to cholinergic neurotoxicity, occurring at exposure levels that produced substantial inhibition of cholinesterase activity. The minimal micropathologic findings at the high-dose are not ascribed to inhibition of cholinesterase activity. The NOEL for neurotoxicity was 500 ppm based on cholinergic effects and neuropathology. The overall NOEL was 100 ppm based on cholinesterase inhibition.

**Section 12: Ecological Information**

**Ecological Data for** CO-RAL Emulsifiable Livestock Insecticide

**Ecological Note:**

This compound has been thoroughly evaluated for ecological effects. Bayer will provide a summary of specific data upon written request. As with any pesticide, this product should be used according to label directions and should be kept out of streams, lakes and other aquatic habitats of concern.

**Section 13: Disposal Considerations**

**Waste Disposal Method:**

Follow container label instructions for disposal of wastes generated

during use in compliance with the FIFRA product label. In other situations, bury in an EPA approved landfill or burn in an incinerator approved for pesticide destruction. Do not reuse container.

#### Section 14: Transportation Information

**Technical shipping name:** Contains Coumaphos; Naphthalene;

#### RSPA/DOT Regulated Components:

| <u>Component(s)/<br/>CAS Number</u> | <u>RQ.</u> | <u>Concentration</u> |             |
|-------------------------------------|------------|----------------------|-------------|
|                                     |            | <u>Min.</u>          | <u>Max.</u> |
| Coumaphos<br>56-72-4                | 10 lb      | 10%                  | 30%         |
| Naphthalene<br>91-20-3              | 100 lb     | 3%                   | 7%          |

#### Freight Class

**Bulk:** Insecticides, N.O.I. (NMFC 102120)  
**Package:** Insecticides, N.O.I. (NMFC 102120)

#### Domestic Surface Transportation (DOT)

**Proper Shipping Name:** Organophosphorus Pesticides, Liquid, Toxic  
**Hazard Class or Division:** 6.1  
**UN/NA Number:** UN3018  
**Packing Group:** II  
**Additional Description:** Marine Pollutant  
**Requirements:**  
**Hazardous Substance:**  
**Product RQ**  
**Lbs:** 85 lb  
**Hazard Label(s):** Toxic  
**Hazard Placard(s):** Toxic  
**DOT Postnote:** \* Only bulk packages (greater than 119 gallons) are regulated as Marine Pollutants when shipped by highway or rail (See 49 CFR 171.4 (c)).

#### Marine Transportation (IMO / IMDG)

**Proper Shipping Name:** Organophosphorus Pesticides, Liquid, Toxic  
**Hazard Class Division** 6.1  
**Number:**  
**UN Number:** UN3018  
**Packaging Group:** II  
**Hazard Label(s):** Toxic, Marine Pollutant (Mark)  
**Hazard Placard(s):** Toxic, Marine Pollutant

#### Air Transportation (ICAO / IATA)

**Proper Shipping Name:** Organophosphorus Pesticides, Liquid, Toxic  
**Hazard Class Division** 6.1  
**Number:**  
**UN Number:** UN3018  
**Packing Group:** II



**Hazard Label(s):** Toxic  
**Radioactive?:** Non-Radioactive  
**Passenger Air - Max. Qty.:** 55 Liters  
**Passenger Packing Instruction:** 609  
**Cargo Air - Max. Qty.:** 60 Liters  
**Cargo Air Packing Instruction:** 611

**Section 15: Regulatory Information**

**United States Federal Regulations**

**OSHA Hazcom Standard Rating:** Hazardous

**TSCA Inventory List:** This product is excluded from TSCA Regulation under FIFRA Section 3 (2)(B)(ii) when used as a pesticide.

**FIFRA Status:** This product is registered with the EPA under FIFRA.

**CERCLA Hazardous Substance:**

| <u>Component(s)</u> | <u>Reportable Quantity</u> |
|---------------------|----------------------------|
| Coumaphos           | 10 lb                      |
| Naphthalene         | 100 lb                     |
| Butanol             | 5,000 lb                   |

**SARA Title III**

**SARA Section 302 Extremely Hazardous Substances:**

| <u>Component(s)/<br/>CAS Number</u> | <u>Concentration</u> |             |
|-------------------------------------|----------------------|-------------|
|                                     | <u>Min.</u>          | <u>Max.</u> |
| Coumaphos<br>56-72-4                | 10%                  | 30%         |

**SARA Section 311/312 Hazard Categories:** Immediate Health Hazard, Delayed Health Hazard, Fire Hazard

**SARA Section 313 Toxic Chemicals:**

| <u>Component(s)/<br/>CAS Number</u> | <u>Reporting<br/>Threshold</u> | <u>Concentration</u> |             |
|-------------------------------------|--------------------------------|----------------------|-------------|
|                                     |                                | <u>Min.</u>          | <u>Max.</u> |
| Exempt                              |                                |                      |             |

**RCRA Status:** If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

**State Right-to-Know Information**

Component(s)/  
CAS Number

State Code

Concentration  
Min.      Max.

State Code Translation Table

**Section 16: Other Information**

**NFPA 704M Rating**

|                     |   |
|---------------------|---|
| <b>Health</b>       | 2 |
| <b>Flammability</b> | 2 |
| <b>Reactivity</b>   | 0 |
| <b>Other</b>        |   |

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

BAYER HEALTHCARE LLC's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by BAYER HEALTHCARE LLC as a customer service.

Contact:            John Sheehan  
Phone:              (913) 268-2570  
MSDS Number: R18324  
Version Date:    10/13/2005  
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|| Indicates Relevant Change Made.