

Health and Safety Guide No. 64

ALDICARB HEALTH AND SAFETY GUIDE



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Health and Safety Guide No. 64

**ALDICARB
HEALTH AND
SAFETY GUIDE**

This is a companion volume to
Environmental Health Criteria 121: Aldicarb

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Programme on Chemical Safety
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INTRODUCTION

The Environmental Health Criteria (EHC) documents produced by the International Programme on Chemical Safety include an assessment of the effects on the environment and on human health of exposure to a chemical or combination of chemicals, or physical or biological agents. They also provide guidelines for setting exposure limits.

The purpose of a Health and Safety Guide is to facilitate the application of these guidelines in national chemical safety programmes. The first three sections of a Health and Safety Guide highlight the relevant technical information in the corresponding EHC. Section 4 includes advice on preventive and protective measures and emergency action; health workers should be thoroughly familiar with the medical information to ensure that they can act efficiently in an emergency. Within the Guide is a Summary of Chemical Safety Information which should be readily available, and should be clearly explained, to all who could come into contact with the chemical. The section on regulatory information has been extracted from the legal file of the International Register of Potentially Toxic Chemicals (IRPTC) and from other United Nations sources.

The target readership includes occupational health services, those in ministries, governmental agencies, industry, and trade unions who are involved in the safe use of chemicals and the avoidance of environmental health hazards, and those wanting more information on this topic. An attempt has been made to use only terms that will be familiar to the intended user. However, sections 1 and 2 inevitably contain some technical terms. A bibliography has been included for readers who require further background information.

Revision of the information in this Guide will take place in due course, and the eventual aim is to use standardized terminology. Comments on any difficulties encountered in using the Guide would be very helpful and should be addressed to:

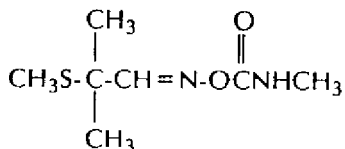
The Manager
International Programme on Chemical Safety
Division of Environmental Health
World Health Organization
1211 Geneva 27
Switzerland

**THE INFORMATION IN THIS GUIDE
SHOULD BE CONSIDERED AS A
STARTING POINT TO A COMPREHENSIVE
HEALTH AND SAFETY PROGRAMME**

1. PRODUCT IDENTITY AND USES

1.1 Identity

Common name: aldicarb
Molecular formula: C₇H₁₄N₂O₂S
Chemical structure:



Synonyms and common trade names:

Aldicarbe (French); carbamic acid, methyl-*O*-((2-methyl-2-(methylthio)propylidene)amino) deriv.; Carbanolate; ENT 27,093; 2-Methyl-2-(methylthio)propanal-*O*-((methylamino)carbonyl)oxime (C.A.); 2-Methyl-2-(methylthio)propionaldehyde-*O*-(methylcarbamoyl)oxime (IUPAC); NCI-CO8640; OMS-771; Propanal, 2-methyl-2-(methylthio)-*O*-((methylamino)carbonyl)oxime; Temik; Temik G; Temik M; Temik LD; Sentry; Temik 5G; Temik 10G; Temik 15G; Temik 150G; Union Carbide 21149; Union Carbide UC-21149

CAS registry number: 116-06-3

RTECS no. UE2275000

CAS chemical name: 2-methyl-2-(methylthio)propionaldehyde-*O*-(methylcarbamoyl)oxime

PRODUCT IDENTITY AND USES

Conversion factors: $1 \text{ ppm (v/v)} = 7.78 \text{ mg/m}^3$
 $1 \text{ mg/m}^3 = 0.129 \text{ ppm (v/v), in air (1 atm)}$
at 25°C

1.2 Physical and Chemical Properties

Aldicarb has a slight sulfur smell. It has a melting point of 100°C and a specific gravity of 1.195 at 25°C . It is soluble in water, sensitive to heat, and relatively unstable.

1.3 Analytical Methods

Analytical methods for aldicarb include thin-layer chromatography, gas chromatography (with various detectors, such as electron capture or flame ionization), and liquid chromatography. The preferred method for the determination of aldicarb and its major decomposition products is high-performance liquid chromatography with post-column derivatization and fluorescence detectors.

1.4 Production and Uses

Aldicarb, a systemic oxime carbamate pesticide, is effective against a variety of insects, mites, and nematodes. It is sold commercially only in granular form. The commercial formulation, Temik, is marketed as granules containing 5, 10, or 15% active ingredient. Aldicarb is currently registered for use on a variety of crops, including cotton, sugar beet, sugarcane, citrus fruits, potatoes, sweet potatoes, peanuts, beans (dried beans), soybeans, pecans, and ornamental plants. Home and garden use is not permitted in many countries.

2. SUMMARY AND EVALUATION

2.1 Exposure

The general population may be exposed to aldicarb primarily through the ingestion of contaminated water and foods. Aldicarb levels ranging from 1 to over 50 μg have been detected in shallow wells. The compound can persist in ground water for several years. Aldicarb and its oxidative metabolites have been found at levels of more than 1 mg/kg in raw potatoes. Maximum residue levels in controlled field trials and upper 95 percentile levels in a market basket survey conducted in the USA were reported to be 0.82 mg/kg and 0.0677 mg/kg, respectively. The illegal use of aldicarb on farm products, such as cucumbers and watermelons, has resulted in levels high enough to produce toxic symptoms in humans. Levels ranging from 0.01 to 6.3 mg/kg were found in contaminated watermelons during an outbreak of illness associated with the ingestion of the watermelons. Two separate episodes of poisoning resulting from the consumption of aldicarb-contaminated cucumbers (6.6–10.7 mg/kg) have been reported. All cases of occupational exposure to aldicarb have been the result of either its improper application or the inadequate use of protective equipment.

2.2 Uptake, Metabolism, and Excretion

Aldicarb is efficiently absorbed from the gastrointestinal tract and, to a lesser extent, through the skin. It could be readily absorbed via the respiratory tract, if present in the form of a dust. It is distributed to all tissues, and has been found in those of the developing rat fetus. It is metabolically transformed to the sulfoxide and the sulfone (both of which are toxic), and is detoxified by hydrolysis to oximes and nitriles. The excretion of aldicarb and its metabolites is rapid, and primarily occurs via the urine. A small amount is excreted with the bile and, consequently, undergoes enterohepatic recycling. Aldicarb does not accumulate in the body as a result of long-term exposure. The inhibition of cholinesterase activity *in vitro* by aldicarb is spontaneously reversible, with a half-life of between 30 and 40 min.

SUMMARY AND EVALUATION

2.3 Effects on Organisms in the Environment

When aldicarb granules are fully incorporated into the soil to a depth of 5 cm, as recommended by the manufacturer, there is a minimal hazard for birds and small mammals. Kills of up to 600 songbirds have been reported as a result of the application of the granules on the soil surface. Birds can be killed after ingestion of a single granule. Small mammals would be similarly at risk from surface aldicarb.

There is no indication that aquatic organisms have been killed through aldicarb poisoning, despite its relatively high potential toxicity. Use in areas where periodic torrential rainfall is likely, causing substantial runoff of both water and surface soil, could contaminate drainage ditches, but this is unlikely to kill fish or water invertebrates.

2.4 Effects on Animals

Aldicarb is a potent inhibitor of cholinesterases, and has a high acute toxicity, with rat oral LD₅₀ values ranging from 0.3 to 0.9 mg/kg body weight. Recovery from its cholinergic effects *in vitro* is spontaneous, with a half-life of between 30 and 40 min.

Several studies have been conducted to examine the short-term effects of aldicarb and its metabolites. The results indicate that the toxicity of aldicarb is not cumulative at dose levels associated with significant cholinesterase inhibition.

The results of long-term studies have shown that aldicarb administered in the diet at levels of up to 0.1 mg/kg per day is not toxic for rats or dogs.

Data on the long-term effects of aldicarb on cholinesterase activity at dose levels >0.01 mg/kg per day are not available. However, no-observed-effect levels (NOELs) of 0.125 and 0.8 mg/kg per day have been established for the sulfoxide and sulfone metabolites of aldicarb, respectively. There is no evidence that aldicarb produces delayed paralysis, as reported for some organophosphates.

The carcinogenicity of aldicarb has been tested in two animal species with lifetime exposure. There is no substantial evidence indicating that aldicarb is carcinogenic, mutagenic, teratogenic, or immunotoxic.

SUMMARY AND EVALUATION

2.5 Effects on Human Beings

Poisoning may affect the respiratory and central nervous systems, and may cause death. Signs and symptoms of aldicarb intoxication include dizziness, salivation, excessive sweating, nausea, epigastric cramps, vomiting, diarrhoea, bronchial secretion, blurred vision, nonreactive contracted pupils, skeletal muscle stiffness, dyspnoea, and muscular fasciculations. Because the carbamylated enzyme is unstable, and its reactivation is relatively rapid compared with that of the phosphorylated enzyme, these symptoms are generally not severe and usually subside spontaneously within 6 h of exposure, unless death intervenes. Nonfatal poisoning in humans is rapidly reversible, and recovery is aided by the administration of atropine.

No conclusive evidence of aldicarb-related health problems is evident in the limited epidemiological data available.

3. CONCLUSIONS AND RECOMMENDATIONS

Aldicarb exhibits a high acute toxicity. Absorption through the respiratory tract would be rapid, if the compound were present in the form of a dust. Poisoning may affect the respiratory and central nervous systems, and may cause death. Aldicarb induces toxicity via cholinesterase inhibition. It is readily absorbed via ingestion or dermal exposure and is distributed throughout all tissues. It is eliminated primarily in the urine within 24 h following exposure. The inhibition of cholinesterase activity by aldicarb is rapidly reversible, unless death intervenes. Accumulation of aldicarb in body tissues is unlikely. There is no substantial evidence that aldicarb is carcinogenic, mutagenic, teratogenic, or immunotoxic.

Handling and application of aldicarb should be undertaken only by trained operators, using all safety guidelines and safety devices.

4. HUMAN HEALTH HAZARDS, PREVENTION AND PROTECTION, EMERGENCY ACTION

4.1 Main Human Health Hazards, Prevention and Protection, First Aid

Aldicarb is a carbamate ester. It induces toxicity via cholinesterase inhibition, and has a high acute toxicity. However, the carbamylated enzyme is unstable and inhibition is reversible. Recovery occurs within 6 h, except where death intervenes. The human health hazards associated with certain types of exposure to aldicarb, together with preventive and protective measures and first-aid recommendations, are listed in the Summary of Chemical Safety Information (section 6).

4.1.1 Advice to physicians

4.1.1.1 Treatment of acute poisoning

All cases of poisoning resulting from aldicarb exposure should be dealt with as an emergency and the patient should be hospitalized as quickly as possible. The treatment is based on:

- minimizing the absorption;
- general supportive treatment;
- specific pharmacological treatment.

(i) Minimizing the absorption

When dermal exposure has occurred, decontamination procedures should include the removal of contaminated clothing, and washing of the skin with alkaline soap or with a sodium bicarbonate solution. Extensive eye irrigation with water or saline should also be performed. In the case of ingestion, vomiting can be induced; if the patient is conscious, ipecacuanha syrup (10–30 ml) should be administered, followed by 200 ml of water. Gastric lavage (with the addition of bicarbonate solution or activated charcoal) can also be performed, particularly in unconscious patients, taking care to prevent aspiration of fluids into lungs (i.e., only after a tracheal tube has been put in place).

HUMAN HEALTH HAZARDS, PREVENTION AND PROTECTION, EMERGENCY ACTION

(ii) *General supportive treatment*

Artificial respiration (via a tracheal tube) should be started at the first sign of respiratory failure, and should be maintained for as long as necessary. Cautious administration of fluids and general supportive and symptomatic pharmacological treatment are advised, together with absolute rest.

(iii) *Specific pharmacological treatment*

Atropine should be given, beginning with 2 mg iv, repeated at 15–30 min intervals. The dose and frequency of atropine treatment vary from case to case, but should maintain the patient fully atropinized (dilated pupils, dry mouth, skin flushing, etc.). The use of oximes is contraindicated. In general, recovery is complete within 6 h; if illness continues longer, the possibility of another diagnostic evaluation should be considered. In some cases, diazepam therapy, together with atropine, is also recommended.

4.1.2 *Health surveillance advice*

There appears to be little need for concern over the cumulative effects of aldicarb exposure. No specific health surveillance procedures are recommended.

4.2 **Explosion and Fire Hazards**

4.2.1 *Explosion hazards*

The explosion hazard posed by aldicarb is negligible.

4.2.2 *Fire hazards*

Aldicarb is also considered a negligible fire hazard. It is non-flammable and is difficult to ignite, but may burn if exposed to flames.

4.2.3 *Prevention*

Aldicarb should be kept away from open flames.

HUMAN HEALTH HAZARDS, PREVENTION AND PROTECTION, EMERGENCY ACTION

4.2.4 *Extinguishing agents*

Move the container of aldicarb from the fire area, if possible, and fight the fire from the maximum distance, using agents suitable for the type of surrounding fire. In case of small fires, use dry chemical powder, carbon dioxide, water spray, or standard foam. For larger fires, use water spray, fog, or standard foam. Thermal decomposition products may include toxic oxides of nitrogen, sulfur, and carbon. Avoid breathing toxic dusts and fumes from burning material.

4.3 Storage

Store aldicarb indoors in an isolated, well-ventilated, clean, dry, cool area (not above 46 °C). Store away from incompatible substances, such as highly alkaline materials. Aldicarb should be stored in a manner that will preclude mixing with water, because the resultant solution may be seriously hazardous. Do not store near food, animal feed, or other items intended for human or animal consumption. Make certain that the storage area is inaccessible to children.

4.4 Transport

The product must always be transported in vehicles marked for this purpose, in properly labelled approved containers and packages. Do not transport with food or animal feed or items intended for human or animal consumption. Transport vehicles must be equipped with first-aid equipment and items required to handle accidental spills/leakages, etc.

4.5 Spillage

In case of spillage during storage or transport, isolate the affected area, cover the spills with a sweeping compound, and post danger signs. Cover the area with suitable sheets, transfer spoiled material in reclaim containers for disposal. Decontaminate the area with 5% sodium hydroxide solution. Use all personal protective devices for handling spills. All tools and equipment should be decontaminated, rinsed, and dried. All clothing should be laundered.

HUMAN HEALTH HAZARDS, PREVENTION AND PROTECTION, EMERGENCY ACTION

4.6 Disposal

Disposal of aldicarb should be in accordance with the recommended procedures for the disposal and storage of pesticides and pesticide containers (40 Code of Federal Regulations 165, USA). Product residues and sorbent media can be packaged in 17H epoxy-lined drums and disposed of at an approved landfill site. Alternatively, they can be destroyed in a high temperature incineration unit with effluent gas scrubbing equipment.

5. HAZARDS FOR THE ENVIRONMENT AND THEIR PREVENTION

Aldicarb is oxidized fairly rapidly to the sulfoxide. In some soils, 48% of the parent compound was converted to the sulfoxide seven days after application. It is oxidized much more slowly to the sulfone. Hydrolysis of the carbamate ester groups, which inactivates the pesticide, is pH-dependent, with half-lives in distilled water varying from a few minutes, at a pH of 12, to 560 days, at a pH of 6.0. Half lives in surface soils ranged from approximately 0.5 to 3 months and, in the saturated zone, from 0.4 to 36 months. Hydrolysis of aldicarb is somewhat slower than that of either the sulfoxide or the sulfone.

The greatest leaching occurs in sandy soils with a low organic matter content, particularly where the water table is high. Persistence, carry-over, and leaching vary with the type of soil and the environmental conditions. Drainage aquifers and local, shallow wells have been contaminated with aldicarb sulfoxide and sulfone. Levels have generally ranged between 1 and 50 $\mu\text{g/litre}$, but levels of approximately 500 $\mu\text{g/litre}$ have been recorded. Laboratory measurements of the biotic and abiotic breakdown of aldicarb have varied and have led to extrapolations radically different from field observations. Field data on the breakdown of aldicarb are more reliable estimates of its fate.

As aldicarb is systemic in plants, residues may occur in foods. Residue levels greater than 1 mg/kg have been reported in raw potatoes. In the USA, where the tolerance level for potatoes is 1 mg/kg, residue levels of up to 0.82 mg/kg have been reported from controlled field trials. An upper 95 percentile level of 0.43 mg/kg has been estimated from field trial data, and upper 95 percentile levels of up to 0.0677 mg/kg have been determined in raw potatoes from a market basket survey.

None of the available studies have indicated substantial ecological or abiotic effects resulting from the proper use of aldicarb and there have not been any significant reports of the introduction of aldicarb or its metabolites into the food chain. The toxic effects of aldicarb on wildlife and soil microorganisms appear to be minimal.

Contamination of soil and water should be avoided by using proper methods of storage, transport, handling, application, and waste disposal.

HAZARDS FOR THE ENVIRONMENT AND THEIR PREVENTION

To avoid ground water contamination, aldicarb should not be applied in areas with a well-drained soil and a high water table, shallow aquifers, or aquifers unprotected by an overlying impervious layer. To avoid the poisoning of wildlife, granules should be completely incorporated into the soil, as recommended by the manufacturer.

6. SUMMARY OF CHEMICAL SAFETY INFORMATION

This summary should be easily available to all health workers concerned with, and users of, aldicarb. It should be displayed at, or near, entrances to areas where there is potential exposure to aldicarb, and on processing equipment and containers. The summary should be translated into the appropriate language(s). All persons potentially exposed to the chemical should also have the instructions in the summary clearly explained.

Space is available for insertion of the National Occupational Exposure Limit, the address and telephone number of the National Poison Control Centre, and local trade names.

SUMMARY OF CHEMICAL SAFETY INFORMATION

Aldicarb ($C_7H_{14}N_2O_2S$)

PHYSICAL PROPERTIES

Relative molecular mass 190.3
 Physical state white crystalline solid
 with slight sulfur odour

Melting point ($^{\circ}C$) 100
 Boiling point($^{\circ}C$) not found; decomposes
 above $100^{\circ}C$

Specific gravity ($20/25^{\circ}C$) 1.195
 Vapour pressure ($25^{\circ}C$) 1×10^{-4} mmHg
 Solubility (w/w at $20^{\circ}C$):

| | |
|------------|------|
| water | 0.6% |
| acetone | 40% |
| chloroform | 35% |
| toluene | 10% |

Log octanol/water
 partition coefficient 1.359

OTHER CHARACTERISTICS

stable (except to strong alkali);
 noncorrosive to metal and plastics;
 nonflammable; do not mix with water;
 resultant solution may be seriously
 hazardous

| ROUTE | HEALTH HAZARDS | PREVENTION AND PROTECTION | FIRST AID |
|------------|--|---|--|
| INHALATION | Cholinesterase inhibition symptoms, including blurred vision, fatigue, headache, vertigo, weakness, inability to concentrate, pupillary constriction, muscle fasciculations or tremors, nausea, dyspnoea, vomiting, diarrhoea, excessive sweating, tearing, salivation, bradycardia, pulmonary oedema, convulsions, bronchoconstriction, and coma; death may occur as a result of respiratory arrest, paralysis of respiratory muscles, and/or intense bronchoconstriction | Avoid exposure by using ventilation, local exhaust, or breathing protection | Remove from exposure area to fresh air; if breathing has stopped give artificial respiration; administer oxygen; keep affected person warm and at rest; treat symptomatically and supportively; seek medical attention immediately; if available, administer atropine sulfate (0.4–2.0 mg) as soon as possible |
| SKIN | Dermal adsorption may produce systemic symptoms of cholinesterase inhibition, as described under inhalation | Avoid exposure; wear protective clothing and gloves | Remove contaminated clothing, wash contaminated area with soap and water; treat respiratory difficulty with artificial respiration and oxygen; observe patient for at least 24 h; alcohol can be used to remove final traces of aldicarb from skin; if available, administer atropine sulfate (0.4–2.0 mg) as soon as possible |

SUMMARY OF CHEMICAL SAFETY INFORMATION

| ROUTE | HEALTH HAZARDS | PREVENTION AND PROTECTION | FIRST AID |
|-----------|---|---|--|
| EYES | Miosis or mydriasis, blurring or dimness of vision, tearing, ciliary muscle spasm, loss of accommodation, and ocular pain; systemic symptoms of cholinesterase inhibition (as described under inhalation) may occur | Wear safety goggles, if there is a possibility of eye contact | Irrigate eyes with water or saline solution for at least 10 min; treat respiratory difficulty with artificial respiration and oxygen; observe patient for at least 24–36 h; seek medical attention immediately |
| INGESTION | Gastrointestinal effects of nausea, abdominal cramps, vomiting, and diarrhoea, within 45 min of ingestion; absorption from gastrointestinal tract may produce systemic effects of cholinesterase inhibition (as described under inhalation) | Do not eat, drink, or smoke, when handling the compound | Induce vomiting in conscious patients with syrup of Ipecac, or mechanically; if vomiting has not occurred within 15 min, or if consciousness level declines, empty stomach by gastric lavage; follow emesis or lavage by suspension of activated charcoal in water; establish and maintain airway; treat respiratory difficulty with artificial respiration and oxygen; observe patient for at least 24 h; if available, atropine should be administered at 0.4–2.0 mg, as soon as possible; do not give oximes, amphylline, phenothiazines, reserpine, furosemide, or ethacrynic acid |

| SPILLAGE | STORAGE | FIRE AND EXPLOSION |
|--|---|---|
| <p>Do not get dust or granules on skin or in eyes; do not inhale dust; sweep or shovel up spilled material and place in clean, dry container; decontaminate area using prescribed decontaminating solution, caustic soda solution, or lime; decontaminate all tools and equipment; remove any contaminated clothing, launder all clothing</p> | <p>Store indoors in isolated, well-ventilated, clean, dry, cool area; store away from incompatible substances; do not store near food, animal feed, or other items intended for human or animal consumption</p> | <p>Negligible fire hazard when exposed to heat or flame; however, the organic formulation will burn, and fire may cause the release of inorganic formulation from a container, in effect, producing a spill</p> |
| WASTE DISPOSAL | | NATIONAL INFORMATION |
| <p>Disposal should be in accordance with the recommended procedures for the disposal and storage of pesticides and pesticide containers (40 CFR 165); product residues and sorbent media may be packaged in 17H epoxy-lined drums and disposed of at an approved landfill site, or destroyed in a high-temperature incinerator with gas-effluent scrubbing equipment</p> | | |

7. CURRENT REGULATIONS, GUIDELINES, AND STANDARDS

The information given in this section has been extracted from the International Register of Potentially Toxic Chemicals (IRPTC) legal file. A full reference to the original national document from which the information was extracted can be obtained from IRPTC. When no effective date appears in the IRPTC legal file, the year of the reference from which the data are taken is indicated by (r).

The reader should be aware that regulatory decisions about chemicals taken in a certain country can only be fully understood in the framework of the legislation of that country. Furthermore, the regulations and guidelines of all countries are subject to change and should always be verified with appropriate regulatory authorities before application.

7.1 Exposure Limit Values

Some exposure limit values are given in the table on pages 26-27.

7.2 Specific Restrictions

Legislation in Belize (1985(r)) and the USSR (1986(r)) prohibits the use of aldicarb as a pesticide, owing to its high toxicity and potential adverse environmental effects. The sale and use of aldicarb are restricted by legislation in most countries.

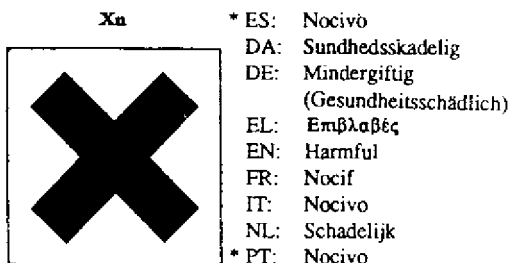
7.3 Labelling, Packaging, and Transport

The International Air Transport Association (IATA) has classified aldicarb as a Class 6.1 poison. Solids containing aldicarb concentrations equal to, or greater than, 1% active ingredient should carry a "poison" label. Solids or liquids containing less than 1% active ingredient should carry a "harmful" label. Aldicarb is packed according to Packing Group I, II, or III, depending on the concentration. During transport by air (single or combination packagings), plastic, metal, earthenware, or glass containers can be used as the inner shell; boxes (wooden or fibreboard), drums (plastic, steel, aluminium, or plywood), or jerricans (plastic or steel) are required as the outer shell. The maximum package size is 100 kg for shipment by cargo aircraft and 25 kg for shipment by passenger aircraft and rail. During shipment by water, aldicarb may be stowed on the deck or under the deck, preferably the latter. The storage facility must be

CURRENT REGULATIONS, GUIDELINES, AND STANDARDS

bounded by permanent steel decks, bulkheads, or vessel shell, and equipped with ventilation.

The European Economic Community legislation lists aldicarb as a "dangerous substance" at quantities greater than 100 kg. The label should be as follows:

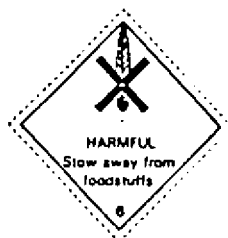


The label must read:

Harmful by inhalation or ingestion - avoid contact with skin.

Quantities less than 100 kg require labelling as a "toxic substance".

The United Nations Committee of Experts on the Transport of Dangerous Goods classifies aldicarb as a poisonous substance (Class 6.1). Aldicarb solids containing concentrations equal to, or greater than, 15% active ingredient carry a "poison" label and be packaged according to the regulations applicable to Packing Group I. Solids containing between 1 and 15% active ingredient should carry a "poison" label and be packaged according to Packing Group II regulations. Solids or liquids containing less than 1% active ingredient should carry a "harmful" label and be packaged according to Packing Group III regulations (1986(r)). The following labels are recommended by this organization:



CURRENT REGULATIONS, GUIDELINES, AND STANDARDS

EXPOSURE LIMIT VALUES

| Medium | Specification | Country | Exposure limit description | Value | Effective date |
|----------------|---------------|---------|--|---|-------------------|
| WATER | Drinking- | USA | Maximum contaminant level goal (MCLG) | 0.009 mg/litre (proposed) for water quality | 1985 |
| FOOD AND WATER | | USA | Reference dose (formerly ADI) | 0.2 µg/kg per day | July 25, 1990 (r) |
| FOOD | | FAO/WHO | Acceptable daily intake | 0.005 mg/kg (ADI)- | 1983 (r) |
| FOOD/FEED | | FAO/WHO | Maximum residue level (MRL) | 0.05mg/kg 20 mg/kg 2mg/kg 1mg/kg 1mg/kg 0.5mg/kg 0.5mg/kg 0.5mg/kg 0.2mg/kg 0.2mg/kg 0.1mg/kg | 1983 |
| | | | - maize - maize forage (dry) - maize fodder (dry) - potatoes - sugar beet leaves - bananas - pecans - sorghum fodder - citrus fruits - sorghum - dry beans | | |

FOOD/FEED
(continued)

FAO/WHO

Maximum residue level (MRL)

- onions
- coffee beans
- sweet potatoes
- peanuts
- sugar beets
- soybeans
- carcass meat
- milk

1983

- 0.05 mg/kg
- 0.1 mg/kg
- 0.1 mg/kg
- 0.05 mg/kg
- 0.05 mg/kg
- 0.02 mg/kg
- 0.01 mg/kg
- 0.001 mg/kg

FOOD

Selected plant products

Brazil

Allowable level (AL)

0.02-1 mg/day

1984 (r)

Canada

Maximum residue level (MRL)

1978

Kenya

Maximum level (MXL)

1978

- cottonseed

0.1 mg/kg

Sweden

Maximum tolerated concentration (MTC)

1985

- citrus fruits

0.2 mg/kg

USA

Allowable residue level (ARL)

1982 (r)

Plant/animal products

0.002-1 mg/kg

CURRENT REGULATIONS, GUIDELINES, AND STANDARDS

7.4 Other Measures

United States legislation requires that a release of aldicarb equal to, or greater than, the portable quantity (1 lb) for this substance, be immediately reported to the local emergency planning committee, the state emergency response commission, and the National Response Center.

7.5 Waste Disposal

European Economic Community legislation on waste disposal requires that Member States should take the necessary steps to prevent the introduction of aldicarb and its metabolites into the environment, and to limit the consequences of any accidental introduction into the environment.

Waste disposal methods require that waste containing aldicarb should be incinerated in a unit with effluent gas scrubbing (IRPTC, 1990). United States legislation requires that the disposal of aldicarb should conform with the recommended procedures for the disposal and storage of pesticides and pesticide containers, as set forth in 40 CFR 165. Product residues and sorbent media should be packaged in 17H epoxy-lined drums and disposed of at an EPA-approved landfill site or destroyed by high-temperature incineration.

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