

READ THE ENTIRE LABEL BEFORE USING THIS PRODUCT.

USE ONLY IN ACCORDANCE WITH INSTRUCTIONS.

KEEP OUT OF REACH OF CHILDREN

STOPMOS 1 G

INGREDIENTS

Temephos.....1%
Other ingredients99%

STOPMOS is a nonsystemic organophosphorus insecticide used to control mosquito, midge, and black fly larvae. It contains as its active ingredient, Temephos.

STOPMOS is used in lakes, ponds, and wetlands. It also may be used to control fleas on dogs and cats and to control lice on humans.

STOPMOS is a General Use Pesticide (GUP). STOPMOS has slightly toxic compounds (EPA toxicity class III) that carry the Signal Word WARNING on their labels despite the relatively low toxicity of the technical compound.

STOPMOS is also available in up to 50% emulsifiable concentrates.

Trade Names Of Other Firms: Trade names for products containing Temephos include Abat, Abate, Abathion, Acibate, Biothion, Bithion, Difenntos, Ecopro, Nimitox, and Swebate. The compound may also be found in mixed formulations with other insecticides including trichlorfon.

What is STOPMOS and how does it work?

STOPMOS is a nonsystemic organophosphorus insecticide.

Key Benefits of STOPMOS:

1. Provides non-invasive control of mosquito larvae.
2. Easy to handle and apply

PRECAUTIONS

Harmful if swallowed, inhaled or absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Avoid

breathing spray mist. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove contaminated clothing and wash before reuse. Keep children or pets away from treated area until dry.

SYMPTOMS OF POISONING

Irritation on skin or eyes.

MEDICAL TREATMENT

No specific antidote is available. Treatment is symptomatic.

FIRST AID

If on skin, remove contaminated clothes. Rinse and then rinse skin immediately with plenty of water and soap for 15-20 minutes. Call a poison control centre or doctor for treatment advice.

If inhaled, move person for fresh air. If person is not breathing, call for an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control centre or doctor for further treatment advice.

If in eyes, first hold eye open and rinse with plenty of water for 15-20 minutes (remove contact lenses if easily possible). Call poison control center or doctor for treatment advice.

If ingested, call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do NOT induce vomiting unless told to do so by poison control center or doctor. Do not give anything to an unconscious person.

DIRECTIONS OF USE

One per cent STOPMOS granules are applied to containers using a calibrated plastic spoon to administer a dosage of 1 ppm. This dosage has been found to be effective for 8-12 weeks, especially in porous earthen jars, under normal water use patterns. Although resistance to temephos in *Ae. aegypti* and *Ae. albopictus* populations has not been reported from the South-East Asia Region, the susceptibility level of *Aedes* mosquitoes should be monitored regularly in order to ensure the effective use of the insecticide.

DISPOSAL METHODS

Do not dispose of undiluted chemicals on site. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush, or puncture and bury empty containers in a local authority landfill. If no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers and product should not be burnt.

STORAGE CONDITION

Store in the closed, original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight. Store in a locked room or place away from children, animals, food, feedstuffs, seed and fertilizers. Triple or preferably pressure rinse containers before disposal. Add rinsing to spray tank.

For More Details including effects on environment email contact@ivorychem.com with Subject "STOPMOS 1 G DETAILS"

More Details:

TOXICOLOGICAL EFFECTS

- **Acute toxicity:** Typical of other organophosphate insecticides, temephos inhibits the action of the group of enzymes called cholinesterases. These enzymes are most important in the nervous system, the brain, and the musculoskeletal systems in controlling nerve signal transmission. Symptoms of acute exposure are similar to other organophosphates and may include nausea, salivation, headache, loss of muscle coordination, and difficulty breathing [8]. Temephos produces signs and symptoms typical of cholinesterase inhibition at moderate levels of exposure, but mortality does not occur unless very large doses of the compound are administered [2,8]. Reported oral LD50 values of temephos range from 1226 to 13,000 mg/kg in rats [2,13], and 460 to 4700 mg/kg in mice. The LD50 for a 2% powder formulation of temephos in dogs and cats is greater than 5000 mg/kg for both species. Temephos may potentiate (greatly increase) the observed toxicity of malathion when used in combination with it at very high doses [2].
- **Chronic toxicity:** Rats, rabbits, guinea pigs, and chickens fed temephos at doses of approximately 20 mg/kg/day for extended periods showed no clinical effects [2]. Dogs tolerated 3 to 4 mg/kg/day for an extended period although there was a slight decrease in cholinesterase activity in the blood and the brain [2]. Severe effects were seen in dogs given 14 mg/kg/day for an extended period, and 15.3 mg/kg/day produced leg weakness in chickens over a 30-day period [2]. As noted under

carcinogenicity, a reduction in liver weights was noted in a study on rats fed small doses of temephos over a 2-year period. In another study of rabbits, findings of minor pathological changes in the liver at doses of 10 mg/kg/day were noted, but were not found at a dose of 1 mg/kg/day [2]. No other effects on organs have been reported. Thus, while the LD50 values for acute toxicity indicate that the compound is relatively nontoxic or only slightly toxic, the compound has the potential to cause significant toxic effects (depression of the activity of the enzyme cholinesterase in the blood and the brain) in mammals exposed over long periods of time. Temephos was used in cisterns and other potable water sources in some locations in the U.S. and in the West Indies for the control of mosquito larvae. Subsequent tests on the residents that had used the water sources showed no observable effects in the exposed individuals [2]. Humans ingested 256 mg/person/day for 5 days and 64 mg/person/day (equivalent to 0.91 mg/kg/day) for 4 weeks without any symptoms or detectable effects on blood cholinesterase activity [2].

- **Reproductive effects:** Neither of two studies of rats fed small amounts of temephos showed any reproductive difficulties in the test animals. The maximum dose (25 mg/kg/day) had no effect on the number of litters, litter size, or viability in the young, and produced no congenital defects in the offspring. The concentration of temephos in the diet of the test animals was, however, sufficient to produce cholinesterase inhibition and some toxic symptoms [2]. Low oral doses of temephos of up to 2.5 mg/kg administered in feed over 1 1/2 years caused no reproductive effects in sheep or in their offspring [2]. These data indicate that temephos does not cause reproductive toxicity.
- **Teratogenic effects:** There were no birth defects noted in the offspring of pregnant rabbits fed temephos in two separate studies utilizing different formulations of temephos, a 2% formulation and a 90% formulation. In both studies, maternal toxicity and depression of cholinesterase activity occurred during the study [97]. These data suggest that temephos poses little teratogenic risk.
- **Mutagenic effects:** The potential of a commercial product containing temephos (Abate) to cause mutations

was tested on several strains of bacteria. Though the conclusion of the study was that the compound was not mutagenic, weakly mutagenic effects were noted in one of the strains. Additional tests on rabbits and on other strains of bacteria have shown the compound to be nonmutagenic [8,97].

- **Carcinogenic effects:** Only one study of the carcinogenic potential of temephos has been conducted with rats. The rats were fed doses of the compound over a 2-year interval. No tumors or cancer related changes were noted in the test animals at 15 mg/kg/day, the highest dose used [8,97]. During the study the rats experienced a reduction in liver weight at the lowest dose of 0.5 mg/kg/day [8,97]. These data suggest that temephos is not carcinogenic.
- **Organ toxicity:** Animal studies indicate that target organs include the nervous system and liver.
- **Fate in humans and animals:** In general, organophosphate insecticides are readily absorbed through the lungs, skin, and digestive tract [8]. A single oral dose of temephos reached peak concentration in the bloodstream of rats between 5 and 10 hours after it was administered [2], and was eliminated with a half-life of 10 hours. Some of the compound was also found in the digestive tract and some in fat in mammals. Most of the compound is eliminated unchanged through the feces and urine, though some breakdown products have been detected [2].

ECOLOGICAL EFFECTS

- **Effects on birds:** Tests with various wildlife species indicate that the compound is highly toxic to some bird species and moderately toxic to others. The LD50 of temephos ranges from 18.9 mg/kg in the California quail to 240 mg/kg in the chukar partridge [15]. The LD50 values in other bird species studied (Japanese quail, pheasant, and rock dove) were between 35 mg/kg and 85 mg/kg [15]. Mallards fed diets containing moderate amounts of temephos showed no changes in reproduction except in the frequency of egg-laying [98].
- **Effects on aquatic organisms:** Temephos shows a wide range of toxicity to aquatic organisms, depending on the formulation. Generally, the technical grade compound (tech) is

moderately toxic and the emulsifiable concentrate (ec) and wettable powder (wp) formulations are highly to very highly toxic. The most sensitive species of fish is the rainbow trout with a temephos LD50 ranging from 0.16 mg/L (ec) to 3.49 mg/L (tech) [16]. Other 96-hour LD50 values are reported as: coho salmon 0.35 mg/L (ec), largemouth bass 1.44 mg/L (ec), channel catfish 3.23 mg/L (ec) to >10 mg/L (tech), bluegill sunfish 1.14 mg/L (ec) to 21.8 mg/L (tech), and Atlantic salmon 6.7 mg/L (ec) to 21 mg/L (tech) [6,8,13,16]. Freshwater aquatic invertebrates such as amphipods are very highly susceptible to temephos, as are some marine invertebrates such as mysids. The 96-hour LD50 of temephos in *Gammarus lacustris* is 0.08 mg/kg, and in stoneflies is 0.01 to 0.03 mg/kg [6,8,16]. Because the compound is an insecticide and is used effectively to control the aquatic larval stages of mosquitoes, black flies, and midges, its high toxicity to these organisms is not surprising. The product Abate 4E (46% emulsifiable concentrate) is very highly toxic to saltwater species such as the pink shrimp (LC50=0.005 mg/L) and the Eastern oyster (LC50=0.019 mg/L) [8]. The compound is nearly nontoxic to the bull frog with an LD50 of greater than 2000 mg/kg [8]. Temephos has the potential to accumulate in aquatic organisms. The bluegill sunfish accumulated 2300 times the concentration present in the water. Nearly 75% of the compound was eliminated from the fish after exposure ended [8].

- **Effects on other organisms:** The compound is highly toxic to bees, with a direct contact LC50 of 1.55 ug/bee [13].

ENVIRONMENTAL FATE

- **Breakdown in soil and groundwater:** There is little information available about the fate and behavior of temephos in the environment. Based on its very low solubility in water, it would probably have a high affinity for soil. Based on this, a half-life of 30 days has been estimated [19], indicating a low to moderate persistence.
- **Breakdown in water:** Weekly application of temephos at twice the normal application rates on pond water resulted in the rapid disappearance of the compound from the water and from the sediments [6]. At even higher application rates to pond water there

were still only traces of the compound detected 1 week after application. Temephos will be photolyzed in water [8]. Temephos was sprayed over an intertidal mangrove community in Florida. Between 15% and 70% of the sprayed amount reaching the leaf surface entered the water below the trees. Additional amounts were washed into the water during rainfall. Pesticide residues were detected in the water 2 hours but not 4 hours after application, indicating a very short persistence in the water. However, in simulated tide pools the compound persisted for up to 4 days. It also persisted in oysters for 2 days after application [99]. Temephos has low persistence in water.

- **Breakdown in vegetation:** Breakdown in plants is very slow.

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PHYSICAL PROPERTIES AND GUIDELINES

PHYSICAL PROPERTIES

- **Appearance:** Temephos is a solid at room temperature and is composed of colorless crystals. As a liquid, it is brown and viscous [13].
- **Chemical Name:** O,O'-(thiodi-4,1-phenylene)bis(O,O-dimethyl phosphorothioate) [13]
- **CAS Number:** 3383-96-8
- **Molecular Weight:** 466.46
- **Water Solubility:** 0.001 mg/L [13]
- **Solubility in Other Solvents:** s. in common organic solvents; i.s. in hexane and methylcyclohexane [13]
- **Melting Point:** 30-30.5 C [13]
- **Vapor Pressure:** Not Available
- **Partition Coefficient:** 4.9538 [13]
- **Adsorption Coefficient:** 100,000 (estimated) [19]

EXPOSURE GUIDELINES

- **ADI:** Not Available
- **MCL:** Not Available
- **RfD:** 0.02 mg/kg/day [53]
- **PEL:** Not Available
- **HA:** Not Available
- **TLV:** 10 mg/m³ total dust; 5 mg/m³ respirable fraction (8-hour) [47]

