tralomethrin

Review Date: 09/01/2014

CAS #: 66841-25-6

Type	Synthetic pyrethroid insecticide
Controls	Fleas, ticks, ants, roaches and other insects.
Mode of Action	Presumed to have similar neurotoxic effect as other pyrethroid chemicals which delay the closing of the sodium channel (Reference 2).

Thurston County Review Summary:

On February 15, 2012 the EPA issued a product cancellation order for all tralomethrin products. Tralomethrin is rated high in hazard due to post-application risk following residential uses, products containing it fail Thurston County's pesticide review criteria.

MOBILITY

Property	Value	Reference	Value Rating
Water Solubility (mg/L)	0.08	1	Low
Soil Sorption (Kd=mL/g)	Value not found		
Organic Sorption (Koc=mL/g)	359,732	1	Low

Mobility Summary:

Tralomethrin is not soluble in water and is expected to bind very well to soil. The hazard for tralomethrin to move off the site of application (outside) with rain or irrigation water is rated low.

PERSISTENCE

Property	Value	Reference	Value Rating
Vapor Pressure (mm Hg)	0.0000000000005	2	High
Biotic or Aerobic Half-life (days)	3	1	Low
Photolysis Half-life (days)	<1 (water) <7 (soil)	1 and 2	Low
Terrestrial Field Test Half-life (days)	64-84 (in soil)	5	High
Hydrolysis Half-life (days)	Stable	1	High
Anaerobic Half-life (days)	<30	2	Moderate
Aquatic Field Test Half-life (days)	Value not found		

Persistence Summary:

Tralomethrin breaks down rapidly in the environment (half life is less than a week) to form deltamethrin which takes over a month to degrade to half of its original concentration (Reference 2). In the absence of light or oxygen, tralomethrin degrades more slowly. Overall, the persistence of tralomethrin and it's metabolite of concern (deltamethrin) is rated moderate in persistence (likely to take between 7 and 60 days to degrade to half of the applied concentration).

BIOACCUMULATION

Property	Value	Reference	Value Rating
Bioaccumulation Factor	Value not found		
Bioconcentration Factor	530 to 1,200	1 and 2	Moderate
Octanol/Water Partition Coefficient	log Kow = 5	1	High

Bioaccumulation Summary:

In animals tralomethrin is quickly metabolized to deltamethrin which is known to accumulate in fish tissue (Reference 2). The octanol/water partition coefficient of tralomethrin (log Kow = 5) also indicates that tralomethrin has a high potential to accumulate in fish or animal tissue. In rats, the majority of administered tralomethrin is eliminated within one day (Reference 2). In a bioconcentration study, fish were exposed to water treated with tralomethrin for 30 days and then moved to clean water for 20 days. In treated water, the fish accumulated tralomethrin in their tissue up to 920 times higher than the water concentration, but later eliminated over 80% of the chemical when moved to clean water. The hazard for bioaccumulation is rated moderate because animals rapidly eliminate it and, although there was some chemical accumulation in fish, they were able to eliminate it in clean water.

ACUTE WILDLIFE TOXICITY VALUES and Risk Assessment

Test Subject	Value	Reference	Toxicity Rating
Mammalian (LD50)	99 mg/kg	1	Moderate
Avian (LD50)	2,500 mg/kg	1	Low
Honey bee or insect (LD50)	0.13 ug/bee	1	High
Annelida -worms (LC50)	Value not found		
Fish (LC50)	0.0016 mg/L	1	Very high
Crustacean (LC50)	0.000034 mg/L	1	Very high
Mollusk (LC50)	Value not found		
Amphibian (LD50 or LC50)	Value not found		

Acute Toxicity Testing and Ecotoxicity Summary:

Single-dose toxicity testing indicates that tralomethrin is low in toxicity to birds, moderately toxic to terrestrial animals, highly toxic to bees and very higly toxic to fish and aquatic invertebrates (Reference 1).

ACUTE HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Risk Rating
Home applicator	Dermal + inhalation	0.0001 mg/kg/day	0.00003 mg/kg/day	3	2	Moderate
Adult outdoors after broadcast application	Dermal + inhalation	0.0001 mg/kg/day	0.0016 ug/kg/day	<1	2	High
Infant in home after application	Dermal + inhalation	0.0001 mg/kg/day	0.00038 ug/kg/day	<1	2	High
Child outdoors after broadcast application	Dermal + inhalation	0.0001 mg/kg/day	0.003 ug/kg/day	<1	2	High

Acute Toxicity Risk Assessment Summary:

Short-term exposures were compared to a dose of concern that was established from the lowest observeable adverse effect level (LOAEL) at a dose of 0.1mg/kg/day and a safety factor of 1,000 (10 for using a LOAEL, 10 for using an animal study for human exposures, and 10 for intraspecies variability).

Potential exposures to an adult homeowner performing a residential application of tralomethrin insecticides is rated moderate in hazard because the calculated exposure is more than 10% of the dose of concern, but less than 50% of the dose of concern (Reference 2).

Potential exposures to an infant following a home application is rated high in hazard because the calculated exposure is more than the dose of concern (Reference 2). Potential exposures to adults or infants that are working or playing in an area after a broadcast application by a professional applicator are also rated high in hazard because their calculated exposures are more than the dose of concern (Reference 2).

CHRONIC HUMAN TOXICITY HAZARDS

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	Group C (IARC) Group D (EPA)	Not classifiable to human carcinogenicity	4	Low
Mutagenicity	Value not provided	Increased mutant frequency in unacceptable study	2	Low
Neurotoxicity - (NOAEL)	0.1 mg/kg/day (LOEL)	Exaggerated reflexes, etc.	2	Check risk
Endocrine Disruption	Not listed	- -	3	N/A
Developmental Toxicity (NOAEL)	3 mg/kg/day	Neonatal fatality	2	Low
Reproductive Toxicity (NOAEL)	12 mg/kg/day	No chemical related reproductive effects	2	Low
Chronic Toxicity (NOAEL)	0.75 mg/kg/day (LOEL)	Dermititis	2	Check risk

Chronic Toxicity Hazard Summary:

Tralomethrin testing indicated genotoxic (mutagenic) potential in a L5I 78Y mouse lymphoma assay in the presence of metabolic activation (Reference 2). The California Department of Pesticide Registration reported that the mutagenicity test results were not confirmed in an independent assay and considered the study unacceptable and unusable as an EPA FIFRA guideline study (Reference 2). Seven other mutagenicity tests did not indicate mutagenicity potential. Developmental toxicity in the form of decreased pup weight was observed at the highest doses tested and maternal toxicity and toxicity to weanlings were observed at the lowest dose tested (Reference 2). Reproductive and developmental toxicity testing did not indicate that infants or developing fetuses are more susceptible to the toxic effects of tralomethrin. Tralomethrin is quickly metabolized to deltamethrin in animals which is not considered carcinogenic and tralomethrin is not classifiable as a human carcinogen (References 2 and 4). There were no studies evaluating the potential for endocrine disruption found in a literature search.

CHRONIC HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Risk Rating
Long-term exposures are not expected						
Long-term exposures are not expected						
Long-term exposures are not expected						
Long-term exposures are not expected						

Chronic Toxicity Risk Assessment Summary:

Long-term (life-long) exposures to home applicators and to children and adults contacting applied tralomethrin are not expected and were not evaluated. Seasonal exposures to tralomethrin are not expected from residential applications made by a homeowner or from a pest control operator, so the EPA did not evaluate a long-term risk assessment for residential applicators.

Metabolites and Degradation Products:

Tralomethrin degrades to deltamethrin which is further degraded to decamethrin and phenoxybenzoic acid (References 1 and 2). Deltamethrin is also registered as a synthetic pyrethroid insecticide active ingredient.

Comments:

Tralomethrin is an eye irritant (EPA Toxicity Category II) and a mild skin irritant (EPA Toxicity Category IV) Reference 2.

References

1. International Union of Pure & Applied Chemistry. Pesticide Properties Database. Tralomethrin (Ref: OMS 3048). Date accessed 12/17/2013.
2. California Environmental Protection Agency. Health Assessment Section, Medical Toxicology Branch, Department of Pesticide Regulation. Tralomethrin, Risk Characterization Document - Volume I. January 4, 1996.
3. Illinois Environmental Protection Agency. "Endocrine Disruptors Strategy" February 1997.
4. International Agency for Research on Cancer. Agents Classified by the IARC Monographs, Volumes 1-102. (Accessed 12/26/2013). Http://monographs.iarc.fr
5. TOXNET, Toxicology Data Network. Hazardous Substance Database - Tralomethrin. Complete Update on 10/10/2001