

# hydramethylnon

Review Date: 12/05/2011

CAS #: 67485-29-4

Type	Insecticide
Controls	Ants, cockroaches, termites and other insects.
Mode of Action	Slow acting stomach poison.

**Thurston County Review Summary:**

Hydramethylnon is rated high in hazard and products containing it as an active ingredient fail Thurston County's pesticide review criteria. Hydramethylnon is rated high in hazard because it is classified as a possible human carcinogen by the EPA. Potential long-term exposures to birds and small animals are also rated high in hazard for the risk of reproductive toxicity.

## MOBILITY

Property	Value	Reference	Value Rating
Water Solubility (mg/L)	0.006	2	Low
Soil Sorption (Kd=mL/g)	1,039	1	Low
Organic Sorption (Koc=mL/g)	217,442	1	Low

**Mobility Summary:**

Hydramethylnon is not soluble in water and adheres very strongly to soil with or without organic matter. The risk of hydramethylnon to move off the site of application with rain or irrigation water is rated low.

## PERSISTENCE

Property	Value	Reference	Value Rating
Vapor Pressure (mm Hg)	0.00000002	1	High
Biotic or Aerobic Half-life (days)	385	1	High
Abiotic Half-life (days)	Value not found		
Terrestrial Field Test Half-life (days)	3 to 55	1	Low to moderate
Hydrolysis Half-life (days)	Stable	1	High
Anaerobic Half-life (days)	Value not found		
Aquatic Field Test Half-life (days)	<1 (photodegradation)	1	Low

**Persistence Summary:**

Sunlight will rapidly break down hydramethylnon but if it is in a shaded area then it degrades slowly. Based on its slow rate of degradation in soil and the reliance upon sunlight for rapid degradation, hydramethylnon is conservatively rated high in hazard for chemical persistence.

## BIOACCUMULATION

Property	Value	Reference	Value Rating
Bioaccumulation Factor	Value not found		
Bioconcentration Factor	780 to 1900	1	Moderate
Octanol/Water Partition Coefficient	log Kow = 4.45	1	Moderate

**Bioaccumulation Summary:**

The octanol/water partition coefficient for hydramethylnon indicates that there is a moderate hazard for it to accumulate in fish or animal tissue. Fish bioconcentration studies have shown that there is some accumulation in tissue with moderate depuration (48% to 68% of the chemical is flushed from the body of a fish when it is moved to clean water for 14 days). In rat metabolism testing, hydramethylnon was excreted unchanged in the feces (85% to 98%) within 7 days. The overall rating for chemical bioaccumulation is moderate because of the potential to accumulate in fish although there appears to be a low potential for accumulation in animals.

# ACUTE WILDLIFE TOXICITY VALUES and Risk Assessment

Test Subject	Value	Reference	Value Rating
Mammalian (LD50)	817 mg/kg	1	Moderate
Avian (LD50)	1,825 mg/kg	1	Moderate
Honey bee or insect (LD50)	30 ug/bee	2	Low
Annelida -worms (LC50)	Value not found		
Fish (LC50)	0.16 mg/L	2	High
Crustacean (LC50)	1.14 mg/L	2	High
Mollusk (LC50)	Value not found		
Amphibian (LD50 or LC50)	Value not found		

## Acute Toxicity Testing and Ecotoxicity Summary:

Without specific reproductive toxicity data for birds, and assuming that birds may be as reproductively sensitive as mammals, the EPA believes that exposures to hydramethylnon baits may pose a reproductive toxicity risk to both birds and small animals (Reference 1). The risk of toxicity to birds and small animals from exposures to hydramethylnon at labelled application rates is rated high in hazard.

# ACUTE HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Value Rating
Adult hand applying granular bait to 5,000 sq ft	Dermal (skin)	2.5 mg/kg/day	0.003 mg/kg/day	830	1	Low
Adult applying gel bait by syringe	Dermal	2.5 mg/kg/day	0.38 mg/kg/day	6.6	1	Moderate
Child's potential exposure to treated lawn	Dermal	2.5 mg/kg/day	0.32 mg/kg/day	7.8	1	Moderate
Adult's potential exposure to gel product	Dermal	2.5 mg/kg/day	0.46 mg/kg/day	5.4	1	Moderate

## Acute Toxicity Risk Assessment Summary:

The EPA concluded that there was no appropriate toxicity attributed to a single oral exposure to hydramethylnon so risk from short-term oral exposures were not required (Reference 1). The EPA also waived the requirement for a risk assessment for hydramethylnon inhalation exposures due to expected product uses and low inhalation toxicity.

Short-term (1-7 days) and intermediate-term (1 week to several months) dermal exposures were evaluated based on a dermal toxicity study which established a No Observeable Adverse Effect Level (NOAEL) at 250 mg/kg/day and a safety factor of 100.

The potential exposures to adult applicators (both residential and occupational) of granular bait products are rated low in hazard (exposures are less than 10% of the dose of concern). Potential exposures to applicators of gel baits were calculated to be between 10% and 50% of the dose of concern and are rated moderate in hazard (due to the potential to get gel onto a major portion of the hands). Potential exposures to a child playing in treated plants or lawn is rated moderate in hazard. Potential skin exposures to adults contacting applied gel baits is also rated moderate in hazard. All other post-application exposures were rated low in hazard.

# CHRONIC HUMAN TOXICITY HAZARDS

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	Group C	Possible human carcinogen	1	High
Mutagenicity	Up to 90 mg/kg/day	No mutagenic findings	1	Low
Neurotoxicity - (NOAEL)	EPA waived neurotoxicity testing requirement	- -	1	Low
Endocrine Disruption	1.66 mg/kg/day	Testicular atrophy +	1	High
Developmental Toxicity (NOAEL)	10 mg/kg/day	Increase of rudimentary structures +	1	Check risk
Reproductive Toxicity (NOAEL)	1.66 mg/kg/day	Male toxicity but no offspring toxicity	1	Moderate
Chronic Toxicity (NOAEL)	1 mg/kg/day	Diarrhea, mucoid stools	1	Check risk

## Chronic Toxicity Hazard Summary:

The EPA classifies hydramethylnon as a Group C chemical (possible human carcinogen) which is rated high in hazard by Thurston County's pesticide review criteria. Reproductive toxicity was observed in the male parent (testicular toxicity) but there was no toxicity observed in the offspring. Since testing produced reproductive toxicity, but did not indicate an increased sensitivity to offspring, the reproductive toxicity hazard is rated moderate (because the risk assessment section for hydramethylnon will further evaluate the potential for this hazard). In developmental toxicity testing, maternal toxicity was observed without fetal toxicity. Hydramethylnon is not considered mutagenic and there were no indications of neurotoxicity.

# CHRONIC HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Value Rating
Long-term risk assessments were not performed						
Long-term risk assessments were not performed						
Long-term risk assessments were not performed						
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## Chronic Toxicity Risk Assessment Summary:

Risk from exposures through drinking water was not assessed by the EPA because it is believed that use patterns, and the physical and chemical properties of hydramethylnon (insoluble in water, volatile, etc.), will limit its impact on water resources (Reference 1). The EPA stated that long-term exposures are not expected from the use patterns of hydramethylnon products, so they did not perform any long-term exposure risk assessments.

## Metabolites and Degradation Products:

Photodegradation chemicals include (4H-pyrimido [2-1,c]as-triazio-4-one-1,6,7,8-tetrahydro-7,7-dimethyl 3-[p-(tri-fluoromethyl)-styryl] at 25.2% and 1,5-bis(alpha, alpha, alpha-tri-fluoro-ptoly)-1,4-pentadien-3-one at 28.0% (Reference 1).

## Comments:

Hydramethylnon is considered a moderate eye irritant (EPA Toxicity Category III) but not considered a skin irritant (EPA Toxicity Category IV) or a skin sensitizer (Reference 1).

## References

1. USEPA. Office of Pesticides, Prevention and Toxic Substances. EPA 738-R-98-023. Reregistration Eligibility Decision Hydramethylnon. List B CASE 2585. December 1998.
2. International Union of Pure & Applied Chemistry. Pesticide Properties Database. hydramethylnon (Ref: BAS 3151). Accessed 12/6/2011. <http://sitem.herts.ac.uk/aeru/iupac/>