chlorophacinone

Review Date: 02/27/2012

CAS #: 3691-35-8

Type	Rodenticide
Controls	Rodents, jackrabbits, and moles.
Mode of Action	Anticoagulant - interferes with the body's ability to clot blood.

Thurston County Review Summary:

The rodenticide active ingredient chlorophacinone is rated high in hazard and fails Thurston County's pesticide review criteria. Chlorophacinone is rated high in hazard to children, animals, or birds that eat bait products. There is also concern over secondary poisoning to animals that eat poisoned rodents. Chlorophacinone is not a mobile chemical but it is moderately persistent with a high hazard for bioaccumulation. Chlorophacinone toxicity testing indicates that it is a developmental toxicant which is also rated high in hazard.

MOBILITY

Property	Value	Reference	Value Rating
Water Solubility (mg/L)	13	2	Low
Soil Sorption (Kd=mL/g)	341	1	Low
Organic Sorption (Koc=mL/g)	43,411	1	Low

Mobility Summary:

Chlorophacinone is not very soluble in water and is expected to bind strongly to all soil types. The hazard of chemical mobility is rated low because it is not likely to move from the spot of application. Pelletized baits (instead of paraffinized blocks) are considered high in hazard for their potential to be moved by rodents to more accessible locations.

PERSISTENCE

Property	Value	Reference	Value Rating
Vapor Pressure (mm Hg)	0.0000036	1	Moderate
Biotic or Aerobic Half-life (days)	26 - 45	1	Moderate
Abiotic Half-life (days)	95	1	High
Terrestrial Field Test Half-life (days)	21 - 45	1	Moderate
Hydrolysis Half-life (days)	45	2	Moderate
Anaerobic Half-life (days)	Value not found		
Aquatic Field Test Half-life (days)	Value not found		

Persistence Summary:

The chemical chlorophacinone can be expected to degrade in the environment to half of its original concentration in less than 60 days (moderately persistent) - and can degrade even faster in sunlight. Bait products that are paraffinized (wax-like) will resist degradation and take much longer than 60 days for half of the bait to degrade.

BIOACCUMULATION

Property	Value	Reference	Value Rating
Bioaccumulation Factor	Value not found		
Bioconcentration Factor	Value not found		
Octanol/Water Partition Coefficient	log Kow = 1.98	2	Low

Bioaccumulation Summary:

Metabolism tests with chlotophacinone indicate that it is 90% eliminated from a rat's body within 48-hours following dosing. However, subchronic toxicity tests indicate that there is some retention and accumulation because non-lethal doses administered over 100 days resulted in animal deaths. So, although chlorophacinone is mostly eliminated in a short period, the overall rating for bioaccumulation potential is rated high because even at very low concentrations the accumulated chemical can result in death to the animal.

ACUTE WILDLIFE TOXICITY VALUES and Risk Assessment

Test Subject	Value	Reference	Value Rating
Mammalian (LD50)	3.15 mg/kg	1	High
Avian (LD50)	95 mg/kg	2	Moderate
Honey bee or insect (LD50)	11 ug/bee	2	Low
Annelida -worms (LC50)	Value not found		
Fish (LC50)	0.35 mg/L	2	High
Crustacean (LC50)	0.42 mg/L	2	High
Mollusk (LC50)	Value not found		
Amphibian (LD50 or LC50)	Value not found		

Acute Toxicity Testing and Ecotoxicity Summary:

Toxicity or death can be expected if birds or animals eat chlorophacinone baits, however, the risk to them is related to the availability of the bait products. Anchored, weather-resistant bait stations reduce the accessibility of bait to birds and larger animals and paraffinized blocks (instead of loose pellets) limit rodents' ability to move bait to accessible locations. Risk from secondary poisoning to animals that eat poisoned rodents is rated high in hazard although the testing was performed with baits that contain twice the amount of chlorophacinone as currently registered products (so the risk may be overestimated). Secondary poisoning to birds of prey is not known.

ACUTE HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Value Rating
Child eating 5 gram bait	Ingestion	0.005 mg/kg/day	0.025 mg/kg	<1	1	High
Short-term dermal exposures were not evaluated						
Short-term applicator exposures not evaluated						
Other short-term exposures were not evaluated						

Acute Toxicity Risk Assessment Summary:

The EPA calculated that the approximate size of a single bite of rodenticide bait would be about 5 grams. Risk to a child that eats 5 grams of bait containing chlorophacinone is above the EPA's level of concern and is rated high in hazard by Thurston County.

CHRONIC HUMAN TOXICITY HAZARDS

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	Not listed	- -	1 and 5	Data Gap
Mutagenicity	Value not reported	None noted	1	Low
Neurotoxicity - (NOAEL)	Value not found			
Endocrine Disruption	Not a known edocrine disruptor	- -	3 and 4	Low
Developmental Toxicity (NOAEL)	< 12.5 µg/kg/day	Ureter anomalies	1	High
Reproductive Toxicity (NOAEL)	Value not found	- -	- -	Data gap
Chronic Toxicity (NOAEL)	5 ug/kg/day	Increased coagulation time	1	Check risk

Chronic Toxicity Hazard Summary:

Toxicity testing requirements for chlorophacinone registration did not include an evaluation for carcinogenicity potential (because there were no food or crop uses proposed). The International Agency for the Research on Cancer also did not evaluate chlorophacinone for carcinogenic potential. Lack of a carcinogenicity evaluation is considered a data gap for this review. Developmental toxicity testing created toxicity to the fetuses at doses that were lower than the doses that caused maternal toxicity. Developmental toxicity without maternal toxicity is rated high in hazard. Chlorophacinone is not a known mutagen or endocrine disruptor.

CHRONIC HUMAN TOXICITY - Risk Assessment

Subject and Scenario	Route	Dose of Concern	Exposure	Margin of Safety	Reference	Value Rating
Long-term exposures were not evaluated						
Long-term exposures were not evaluated						
Long-term exposures were not evaluated						
Long-term exposures were not evaluated						

Chronic Toxicity Risk Assessment Summary:

Human risk assessments for long-term exposures were not required by the EPA and could not be located from another source.

Metabolites and Degradation Products:

Degradation chemicals include p-chlorophenyl acetic acid and o-phthalic acid (Reference 1).

Comments:

Chlorophacinone is not considered an eye or skin irritant (EPA Toxicity Category IV) and is not considered a skin sensitizer (Reference 1).

References

1. USEPA. Office of Prevention, Pesticides and Toxic Substances. Reregistration Eligibility Decision (RED) Rodenticide Cluster. July 1998.
2. International Union of Pure & Applied Chemistry. Pesticide Properties Database. chlorophacinone (Ref: LM 91). Accessed 2/16/2012. http://sitem.herts.ac.uk/aeru/iupac/
3. Scorecard - The Pollution Information Site. Health Effects / Endocrine Toxicants (Accessed 2/16/2012). http://www.scorecard.org/health-effects.
4. Illinois EPA. "Endocrine Disruptors Strategy". February, 1997.
5. International Agency for Research on Cancer. Agents Classified by the IARC Monographs, Volumes 1-102. (Accessed 2/16/2012). http://monographs.iarc.fr