

# calcium acid methanearsonate (CAMA)

Review Date: 5/10/2010

CAS #: 5902-95-4

Type	Selective contact herbicide
Controls	Post-emergent weed control in lawns and fields
Mode of Action	Interferes with ATP production and cell division.

## Thurston County Review Summary:

All uses of calcium acid methanearsonate (CAMA) in herbicides were not re-registered in the EPA's August 2006 review due to the high risk that organic arsenical pesticides pose. All uses of CAMA were canceled as of September 30, 2009. CAMA is rated high in hazard for persistence, toxicity to non-target organisms, toxicity to adult applicators, and to people interacting (playing or working) in treated vegetation. Herbicides containing CAMA as an active ingredient fail the County review criteria.

## MOBILITY

Property	Value	Reference	Rating
Solubility (mg/L)	1,040,000	2	High
Soil Sorption (Kd=mL/g)	37	1	Moderate
Organic Sorption (Koc=mL/g)	1,680	2	Moderate

### Mobility Summary:

CAMA is a salt of monomethyl methanearsonate (MMA) which CAMA dissociates in water. The mobility of MSMA is based on the chemical properties of MMA, which adheres moderately to soils with or without organic matter. The risk for mobility is rated as moderate.

## PERSISTENCE

Property	Value	Reference	Rating
Vapor Pressure (mm Hg)	Not found		
Biotic or Aerobic Half-life (days)	240	1	High
Abiotic Half-life (days)	Not found		
Terrestrial Field Test Half-life (days)	Not found		
Hydrolysis Half-life (days)	35	2	Moderate
Anaerobic Half-life (days)	Not determined	1	High
Aquatic Field Test Half-life (days)	Not found		

### Persistence Summary:

CAMA is rated as high in hazard for persistence.

## BIOACCUMULATION

Property	Value	Reference	Rating
Bioaccumulation Factor	Not found		
Bioconcentration Factor	Not found		
Octanol/Water Partition Coefficient	Not found		

### Bioaccumulation Summary:

Bioaccumulation potential could not be found and is considered a data gap for this review.

# ACUTE TOXICITY

Test Subject	Value	Reference	Rating
Mammalian (LD50)	>5,000 mg/kg	1	Low
Avian (LD50)	Not found		
Honey bee or insect (LD50)	Not found		
Annelida -worms (LC50)	Not found		
Fish (LC50)	Not found		
Crustacean (LC50)	Not found		
Mollusk (LC50)	Not found		
Amphibian (LD50 or LC50)	Not found		

## Acute Toxicity Summary:

Risk assessments for small animals and birds exposed to CAMA following herbicide applications to non-crop areas and to turf by ingesting a diet of insects or plants exceed the EPA's level of concern and are considered high in hazard.

# ACUTE TOXICITY - Risk Assessment

Subject and Scenario	Dose of Concern	Exposure	Margin of Safety	Route	Reference	Rating
Residential handler and applicator	10 mg/kg/day	7.1 mg/kg/day	1.4 or more	Skin absorption	1	High
Toddler object and hand-to-mouth in treated turf	0.07 mg/kg/day	> 0.07 mg/kg/day	None	Ingestion	1	High
Occupational applicator and handler	10 mg/kg/day	1.7 mg/kg/day	5.8	Skin absorption	1	Moderate
Adult contact with treated turf was not calculated						

## Acute Toxicity Risk Assessment Summary

Assessments to evaluate potential exposures to treated turf include: skin absorption, hand-to-mouth and object-to-mouth activities, and incidental soil ingestion for toddlers. At an application rate of 4.4 pounds of active ingredient per acre (4.4# ai/a) the potential exposure exceeds the EPA's calculated dose of concern, at 3.7 # ai/a the exposure could reach the dose of concern, and at the rate of 2.2# ai/a the exposure could be over half of the dose of concern. All of these potential exposures to toddlers interacting with CAMA treated turf are rated as high in hazard by the County's review criteria.

Potential exposures to residential applicators that mix and load CAMA containing herbicide can reach over half of the calculated dose of concern. These potential exposures are also rated high in hazard. Occupational handlers and applicators that wear the protective equipment listed on the label can potentially have an exposure that is rated as moderate in hazard (about six times less than the dose of concern).

# CHRONIC TOXICITY

Property	Value	Adverse Effect	Reference	Rating
Carcinogenicity	"no evidence for carcinogenicity"	--	1	Low
Mutagenicity	Not found			
Neurotoxicity - (NOAEL)	Not found			
Endocrine Disruption	"no evidence of endocrine disruption"	--	1	Low
Developmental Toxicity (NOAEL)	--	"no increased susceptibility"	1	Low
Reproductive Toxicity (NOAEL)	--	"no increased susceptibility"	1	Low
Chronic Toxicity (NOAEL)	3.2 mg/kg/day	histopathology of thyroid and G.I. tract	1	Check risk

## Chronic Toxicity Summary:

There was very little data available for long-term exposure toxicity testing. CAMA is not considered a carcinogen and there is no evidence that suggests that it is a reproductive or developmental toxicant.

# CHRONIC TOXICITY - Risk Assessment

Subject and Scenario	Dose of Concern	Exposure	Margin of Safety	Route	Reference	Rating
Long-term exposure to treated plants isn't expected						
Child (1-2 years) drinking treated water	0.03 mg/kg/day	0.004 mg/kg/day	7.5	Ingestion	1	Moderate
Infant drinking treated water	0.03 mg/kg/day	0.0088 mg/kg/day	3.4	Ingestion	1	Moderate
Dietary exposures were not evaluated						

## Chronic Toxicity Risk Assessment Summary:

Long-term exposures to CAMA was based on the potential of people drinking water that was contaminated from runoff after a turf grass application. These potential exposures are rated as moderate in hazard (three to seven times less than the dose of concern).

Exposures to CAMA through contact with treated vegetation from residential / recreational herbicide treatments are not expected to be long-term and risk assessments were not calculated.

## Degradation Products:

The metabolite arsenic is classified as a human carcinogen. Other metabolites include volatile alkylarsines and carbon dioxide.

## Comments:

Calcium acid methanearsonate is a moderate eye irritant (EPA category III), a slight skin irritant (EPA category IV) and is not considered a skin sensitizer (Reference 1).

## References

1. USEPA. Revised Reregistration Eligibility Decision for MSMA, DSMA, CAMA, and Cacodylic Acid. August 10, 2006.
2. Scorecard - The Pollution Information Site. Health Effects (Accessed 5/10/2010). <http://www.scorecard.org/health-effects/>