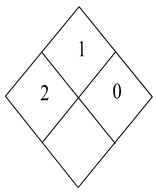
MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION



PRODUCT NAME(S): AMV 540; K-PAM® HL; Metam Potassium Manufacturing Use Concentrate
CHEMICAL NAME: Potassium N–methyldithiocarbamate solution
GENERAL USE: Soil Fumigant
PRODUCT DESCRIPTION: Yellow to light yellow-green liquid with the possibility of an amine and a sulfur odor.
EPA REGISTRATION NUMBER(s): 5481-483; 5481-484
HEALTH CANADA REGISTRATION NUMBER(s): None
MSDS NUMBER: 279_9
CURRENT REVISION DATE: 26 October, 2010

MANUFACTURER:
AMVAC CHEMICAL CORPORATION
4100 E. Washington Blvd.
Los Angeles, CA 90023-4406
Ph: 323-264-3910
FAX: 323-268-1028

EMERGENCY TELEPHONE NUMBERS:
MANUFACTURER: 323-264-3910
TRANSPORTATION (24 HOURS)
CHEMTREC: 800-424-9300
OTHER (24 HOURS)
AMVAC: 323-264-3910

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	WT %	CAS No.
Potassium N–methyldithiocarbamate (Metam Potassium)	54%	137-41-7
Other Ingredients	46%	

Ingredients not precisely identified are proprietary or nonhazardous.
Values are not product specifications.

OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)

COMPONENT	HAZARD	OSHA PEL*	ACGIH TLV*
NONE			

* Exposure Limits 8 hrs. TWA (ppm)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

DANGER! Dilution with water or with acids may generate poisonous gases (Methyl isothiocyanate (MITC) or Hydrogen sulfide) or flammable gases (Carbon disulfide and Monomethylamine). WARNING: Product is corrosive to skin. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Harmful if swallowed. Harmful if inhaled. Harmful if absorbed through the skin. Irritating to eyes, nose and throat. Do not get on skin or clothing. Avoid breathing vapor or spray mist. Do not get in eyes.

Toxic to fish. Do not contaminate water bodies.

POTENTIAL HEALTH EFFECTS

ROUTE(S) OF ENTRY: Skin contact, inhalation, ingestion, and eye contact with the liquid product. As a result of use of the product, applicators and other persons present in the area of the application can be exposed to MITC and/or hydrogen sulfide. These chemicals can be evolved as gases from the soil of an application. MITC has a garlic like odor and can be very irritating to the eyes. Hydrogen sulfide has a rotten egg odor and can be very offensive. If either odor is detected near an application of K-PAM®, notify the applicator of the problem and take appropriate measures to minimize/avoid exposure. The nose becomes deadened to a hydrogen sulfide odor, so not being able to detect the odor any longer does not mean the exposure has ended.

SIGNS OF ACUTE OVEREXPOSURE: Overexposure to K-PAM® as sold may result in damage to the skin, skin irritation, excessive salivation, sweating, fatigue, weakness, nausea, headache, dizziness, eye, nose, throat and respiratory tract irritation. In addition, dilution to use levels results in the release of methyl isothiocyanate (MITC) and/or hydrogen sulfide. Overexposure to MITC may result in strong skin and eye irritation, running nose, dizziness, cramps, nausea, vomiting, and mild to severe disturbances of the nervous system. Overexposure to hydrogen sulfide may result in severe irritation to the eyes and mucous membranes. In addition, exposure may result in headache, dizziness, excitement, staggering gait, diarrhea, difficult or painful urination, difficult breathing, chronic pulmonary edema, coma and death.

SIGNS OF CHRONIC OVEREXPOSURE: Same as above, plus conjunctivitis, photophobia, and blurred vision. In addition, laboratory studies have shown that exposure to the active ingredient, followed by ingestion of alcohol, may cause an adverse reaction, including low blood pressure, rapid heart beat, and flushing of the skin. Consumption of alcohol during and after exposure to this product should be avoided.

OTHER POTENTIAL HEALTH EFFECTS: Laboratory studies with a similar compound, Metam Sodium, have shown some developmental and carcinogenic effects in laboratory animals. Exposure monitoring studies conducted during agricultural applications of Metam Sodium have shown that human exposure is extremely low; therefore, any potential risk to humans from exposure to any Metam salt solutions is considered minimal.

3. HAZARDS IDENTIFICATION, cont'd

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Impaired pulmonary function and preexisting eye problems may be aggravated. Preexisting skin diseases may also be aggravated by exposure to the decomposition products.

Care should be exercised and all label instructions should be followed in the handling of Metam potassium (K-PAM®) solutions.

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4. FIRST AID MEASURES

EYES: Immediately flush the eyes with copious amounts of clear, cool running water for a minimum of 15 minutes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eyes and lids with water. Contact a physician immediately. If there will be a delay in getting medical attention, rinse the eyes for at least another 15 minutes.

INHALATION: Remove victim to fresh air. If breathing has ceased, clear the victim's airway and start mouth-to-mouth artificial respiration. If breathing is difficult, give oxygen. Contact a physician immediately.

INGESTION: Immediately dilute the swallowed product by giving large quantities of water, but do not induce vomiting. If vomiting occurs, give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Never give anything by mouth to an unconscious person. Contact a physician immediately.

SKIN: Immediately flush all affected areas with large amounts of clear water for at least 15 minutes. Remove contaminated clothing. Do not attempt to neutralize with chemical agents. Wash clothing before reuse. If skin irritation develops, contact a physician immediately.

NOTE TO PHYSICIANS: Treat symptomatically. Contact your local, state, or national poison control center for further information.

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5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash Point: > 200˚F (TCC)
Autoignition Temperature: Not determined
Flammable Limits:
Lower flammable limit: Not determined
Upper flammable limit: Not determined

EXPLOSIVITY:

Mechanical Impact:	Not determined. Not expected to be sensitive to mechanical impact.
Static Discharge:	Not determined
Rate of Burning:	Not determined
Explosive Power:	Not determined

5. FIRE FIGHTING MEASURES, cont'd

HAZARDOUS COMBUSTION PRODUCTS: This product will release toxic fumes of methylisothiocyanate (MITC) and hydrogen sulfide, as well as nitrogen oxides, when heated to decomposition or diluted with water.

EXTINGUISHING MEDIA: This product is water-based and is not flammable. Base extinguisher media on surrounding materials. **NOTE:** Dilution with water or exposure to high heat may cause generation of flammable and toxic fumes. See **Chemical Stability** information in SECTION 10.

FIRE FIGHTING INSTRUCTIONS: Evacuate nonessential personnel from the area. Wear self-contained breathing apparatus and impervious clothing. Clean all clothing before reuse.

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6. ACCIDENTAL RELEASE MEASURES

GENERAL: Use adequate ventilation and appropriate personal protective equipment (PPE, Section 8). Contact with moisture in the soil can generate the flammable and toxic gases MITC and Hydrogen sulfide. Keep bystanders upwind and away from the spill.

SMALL SPILL: Cover with absorbent (clay, sawdust, straw, kitty litter, etc.), to absorb the liquid. Sweep into an open drum. Clean the area with common powdered household detergent and a stiff brush and just enough water to make a slurry. Absorb and sweep into the same open drum. Rinse with water, absorb, and add to the waste drum. Close the drum and dispose of properly.

LARGE SPILL: Dike the spill to prevent contamination of local water sources. Siphon the majority of the liquid into drums for use or disposal, depending on the circumstances. Clean the area as described for a small spill.

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7. HANDLING AND STORAGE

HANDLING: Prevent skin contact. Do not breathe fumes. Wear appropriate personal protective equipment. Wash thoroughly and change clothes after handling. See product label for more detailed handling procedures.

STORAGE: Do not contaminate water, food or feed by storage or disposal. Store product in a cool, dry, locked place out of reach of children. Do not store below 32˚F. Product crystallizes at lower temperatures. See label for specific instructions.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: A well-ventilated area is recommended for handling Potassium N–methyldithiocarbamate (K-PAM®). Use of mechanical or local exhaust systems is recommended.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION, cont'd

RESPIRATORY PROTECTION: A properly FIT-TESTED NIOSH/MSHA approved respirator fitted with organic vapor cartridges may be required when working with this product. If ventilation is poor, or a rotten egg odor (Hydrogen sulfide) is detected, an air-supplied respirator is required. Specific use regulations are listed on the label.

SKIN PROTECTION: Chemical resistant gloves, body covering clothing that has long sleeves and long pants, and chemical resistant shoes or boots, are required to prevent skin contamination. A chemical resistant apron may be required under certain circumstances. Wear clean clothes daily. Wash well with soap and water after handling this product. See the label for more specific instructions.

EYE PROTECTION: Safety glasses should be worn whenever working with chemicals. Face-sealing goggles and a faceshield (or full-face respirators) are required whenever there is a chance of splashing or misting.

OTHER PROTECTION: An eyewash station and a safety shower should be located in close proximity to the work area.

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9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
APPEARANCE:	Yellow to light yellow-green liquid.
ODOR:	Essentially odorless to fairly strong odor of amine or sulfur.
BOILING POINT:	112˚C/234˚F
FREEZING/MELTING POINT:	Not available
VAPOR PRESSURE (mm/Hg):	24 mm Hg @ 25˚C
VAPOR DENSITY:	Not available
SPECIFIC GRAVITY:	1.27 g/mL @ 20˚C/4˚C(68˚F/39˚F)
BULK DENSITY:	10.6 lb/gal
EVAPORATION RATE:	1.0 as compared to water.
PERCENT VOLATILE BY VOL:	46% (@ 100˚C)
SOLUBILITY IN WATER:	Miscible
pH:	9.0 - 11.5
PARTITION COEFFICIENT (W/O):	Not applicable

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10. STABILITY AND REACTIVITY

CHEMICAL STABILITY (Conditions to avoid): Metam Potassium decomposes, when diluted with water, to methyl isothiocyanate (MITC, a lachrymator and moderate poison) and/or to hydrogen sulfide (a highly poisonous gas). It can also decompose to carbon disulfide and monomethylamine (both highly flammable). Use the solution promptly after mixing. Do not allow the solution to stand. As originally packaged, it is stable under normal storage conditions for 2 years.

10. STABILITY AND REACTIVITY, cont'd

INCOMPATIBILITY: This product is incompatible with additional water and strong aqueous acids. In addition, it is corrosive to copper, brass, and zinc, and may soften and/or discolor iron.

HAZARDOUS DECOMPOSITION PRODUCTS: When treated with water or heated to decomposition, this product will give off toxic fumes of methyl isothiocyanate (MITC), hydrogen sulfide, sulfur oxides, and nitrogen oxides.

HAZARDOUS POLYMERIZATION: This product will not polymerize.

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11. TOXICOLOGICAL INFORMATION

GENERAL: Information has been included for the product, a similar product and for two potential decomposition products in order to help potential users to have a clearer idea of the hazards associated with this product.

Toxicological Category	Specific Application	Metam Potassium (Product)	MITC (Decomposition)	Hydrogen sulfide (Decomposition)
INGESTION	Oral LD_{50} (rat):	630 mg/kg	55-220 mg/kg	
INHALATION	Inhalation LC_{50} (rat)	2.28 mg/L (for Metam Sodium)	1.9 mg/L air (1 hr)	444 ppm
DERMAL	Skin LD_{50} (rabbit)	>1000 mg/kg	33 - 202 mg/kg	
IRRITATION	Eye (rabbit) Skin (rabbit)	Corrosive Corrosive	Corrosive Corrosive	Corrosive No information
OTHER	Skin sensitization (guinea pig)	Probable sensitizer	Sensitizer	No Information

TERATOGENICITY: Laboratory studies on a similar product, Metam Sodium, have shown some developmental effects in laboratory animals.

MUTAGENICITY: Laboratory studies on a similar product, Metam Sodium, have shown some evidence of mutagenicity in vitro, but no conclusive evidence in vivo.

CARCINOGENICITY: Laboratory studies on a similar compound, Metam Sodium, have shown some carcinogenic effects in laboratory animals.

REPRODUCTIVE TOXICITY: Laboratory studies on a similar product, Metam Sodium, have shown no evidence of reproductive toxicity in laboratory animals.

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: No information is available.

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12. ECOLOGICAL INFORMATION

GENERAL: This product is toxic to fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

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13. DISPOSAL CONSIDERATIONS

PESTICIDE DISPOSAL: Do not contaminate water, food or feed by disposal. Wastes resulting from the use of this product may be disposed on site by use according to the label or at an approved waste disposal facility. Be sure to check with the appropriate Federal, State and local authorities to determine the current regulations for your area.

CONTAINER DISPOSAL: Triple rinse (or equivalent). Consult the label for the proper procedure for rinsing. The rinsed container should be punctured and disposed in a sanitary landfill, or by incineration, or, if allowed by State and local authorities, by burning. If the container is burned stay out of the smoke. Be sure to check with the appropriate Federal, State and local authorities to determine the current regulations for your area.

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14. TRANSPORTATION INFORMATION

DOT CLASS*:	8
UN NUMBER:	UN3266
IMDG CLASS (Sea):	8
MARINE POLLUTANT:	Yes
IATA (Air):	8
PACKING GROUP:	III
HAZARD LABEL(s):	CORROSIVE
ADR CLASS (Road):	Not listed in ADR
PROPER SHIPPING NAME(s):	Corrosive liquid, basic, inorganic, n.o.s.(Potassium N–methyldithiocarbamate 54%)
REPORTABLE QUANTITY:	No

PACKAGING

GENERAL DESCRIPTION: Bulk; 275 gallon tote bin

* The classification of this product is based on the fact that the mist criteria found in 49CFR§173.132(b)(3) will not be met and therefore the LC_{50} is not applicable.

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15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: These products are registered under EPA/FIFRA Regulations. It is a violation of Federal Law to use these products in any manner inconsistent with their labeling. Read and follow all label directions. These products are excluded from listing requirements under EPA/TSCA.

15. REGULATORY INFORMATION, cont'd

CANADIAN REGULATIONS: These products are not registered in Canada..

SARA TITLE III DATA

Section 311 & 312 Hazard Categories:

Immediate Health Hazard:	Yes
Delayed Health Hazard:	Yes
Fire Hazard:	No
Reactive Hazard:	No
Sudden Pressure Release Hazard:	No

Section 302 Extremely Hazardous Substances: None

Section 313 Toxic Chemicals:

Potassium N–methyldithiocarbamate (CAS No. 137-41-7) - 54%

CERCLA Reportable Quantity (RQ): None

STATE REGULATIONS:

CALIFORNIA (Proposition 65): None

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16. OTHER INFORMATION

MSDS STATUS:

Date This Revision: 26 October, 2010
Date Previous Revision: 8 September, 2008
Person Responsible for Preparation: Gary A. Braden

REASONS FOR REVISION: Annual Review. Updates were made in sections 6 and 14 to reflect current knowledge.

DISCLAIMER: This information is provided for the limited guidance to the user. While AMVAC believes that the information is, as of the date hereof, reliable, it is the user's responsibility to determine the suitability of the information for its purposes. The user is advised not to construe the information as absolutely complete since additional information may be necessary or desirable when particular, exceptional, or variable conditions or circumstances exist (like combinations with other materials), or because of applicable regulations. No express or implied warranty of merchantability or fitness for a particular purpose or otherwise is made hereunder with respect to the information or the product to which the information relates.

ABBREVIATIONS:

ACGIH	-	American Conference of Governmental Industrial Hygienists
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
DOT	-	Department of Transportation
EPA	-	Environmental Protection Agency
FIFRA	-	Federal Insecticide, Fungicide, and Rodenticide Act
IARC	-	International Agency for Research on Cancer
IATA	-	International Air Transport Association
IMDG	-	International Maritime Dangerous Goods
NTP	-	National Toxicology Program
OSHA	-	Occupational Safety and Health Agency
SARA	-	Superfund Amendments and Reauthorization Act
TSCA	-	Toxic Substances Control Act
