New Jersey Department of Health and Senior Services

HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **METHYL MERCURY DICYANDIAMIDE**

CAS Number: 502-39-6
DOT Number: UN 2777

RTK Substance number: 1276
Date: May 2000

HAZARD SUMMARY

* **Methyl Mercury Dicyandiamide** can affect you when breathed in and may be absorbed through the skin.
* **Methyl Mercury Dicyandiamide** is a TERATOGEN--HANDLE WITH EXTREME CAUTION.
* Contact can irritate and burn the skin and eyes with possible eye damage.
* Breathing **Methyl Mercury Dicyandiamide** can irritate the nose, throat and lungs causing coughing, wheezing and/or shortness of breath.
* Repeated contact can cause a skin allergy and make the skin turn gray.
* *Mercury poisoning* causes "shakes," irritability, sore gums, increased saliva, memory loss, metallic taste, personality changes and brain damage.
* **Methyl Mercury Dicyandiamide** may damage the kidneys.
* *CONSULT THE NEW JERSEY DEPARTMENT OF HEALTH AND SENIOR SERVICES HAZARDOUS SUBSTANCE FACT SHEET ON HYDROGEN CYANIDE.*

IDENTIFICATION

Methyl Mercury Dicyandiamide is a sand-like powder. It is used as an agricultural chemical in foreign countries. **Methyl Mercury Dicyandiamide** is no longer used or produced in the United States.

REASON FOR CITATION

* **Methyl Mercury Dicyandiamide** is on the Hazardous Substance List because it is regulated by OSHA and cited by ACGIH, DOT, NIOSH, DEP and EPA.
* This chemical is on the Special Health Hazard Substance List because it is a **TERATOGEN**.
* Definitions are provided on page 5.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information and training concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard, 1910.1200, requires private employers to provide similar training and information to their employees.

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.1020.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

The following exposure limits are for *alkyl Mercury compounds* (measured as *Mercury*):

OSHA: The legal airborne permissible exposure limit (PEL) is **0.01 mg/m^3** averaged over an 8-hour workshift and **0.04 mg/m^3**, not to be exceeded during any 15 minute work period.

NIOSH: The recommended airborne exposure limit is **0.01 mg/m^3** averaged over a 10-hour workshift and **0.03 mg/m^3**, not to be exceeded during any 15 minute work period.

ACGIH: The recommended airborne exposure limit is **0.01 mg/m^3** averaged over an 8-hour workshift and **0.03 mg/m^3** as a STEL (short term exposure limit).

The following exposure limits are for *Hydrogen Cyanide*:

OSHA: The legal airborne permissible exposure limit (PEL) is **11 mg/m^3** averaged over an 8-hour workshift.

NIOSH: The recommended airborne exposure limit is **5 mg/m^3**, which should not be exceeded at any time.

ACGIH: The recommended airborne exposure limit is **5 mg/m^3**, which should not be exceeded at any time.

* **Methyl Mercury Dicyandiamide** may be a teratogen in humans. All contact with this chemical should be reduced to the lowest possible level.

WAYS OF REDUCING EXPOSURE

* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly immediately after exposure to **Methyl Mercury Dicyandiamide** and at the end of the workshift.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of **Methyl Mercury Dicyandiamide** to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Methyl Mercury Dicyandiamide**:

* Contact can irritate and burn the skin and eyes with possible eye damage.
* Breathing **Methyl Mercury Dicyandiamide** can irritate the nose, throat and lungs causing coughing, wheezing and/or shortness of breath.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Methyl Mercury Dicyandiamide** and can last for months or years:

Cancer Hazard

* While **Methyl Mercury Dicyandiamide** has not been identified as a carcinogen, it should be HANDLED WITH CAUTION since several related *Methylmercuric compounds* are carcinogens.

Reproductive Hazard

* **Methyl Mercury Dicyandiamide** may be a TERATOGEN in humans since it has been shown to be a teratogen in animals.
* **Methyl Mercury Dicyandiamide** may decrease fertility in males and females.

Other Long-Term Effects

* Repeated skin contact can make the skin turn gray.
* **Methyl Mercury Dicyandiamide** can cause a skin allergy. If allergy develops, very low future exposure can cause itching and a skin rash.
* Exposure can cause a brown staining in the eyes and may affect peripheral vision (the ability to see to the side).
* High or repeated exposure can cause *Mercury poisoning*. *Mercury poisoning* causes "shakes" (often with shaky handwriting), irritability, sore gums and increased saliva. Other changes may include memory loss, extreme shyness, weakness, poor appetite, "pins and needles" feeling, and metallic taste. Serious personality changes and brain damage can occur, especially if exposure continues.
* *Mercury* accumulates in the body with repeated exposure. It can take months or years for the body to get rid of excess *Mercury*.
* **Methyl Mercury Dicyandiamide** may damage the kidneys.

MEDICAL

Medical Testing

Before first exposure and every 6 to 12 months after, a complete medical history and exam is strongly recommended, with:

* Exam of the nervous system, including handwriting.
* Routine urine test (UA).
* Urine test for *Mercury* (should be less than **0.02 mg/liter**).
* Eye exam.

If symptoms develop or overexposure is suspected, the following are recommended:

* Evaluation by a qualified allergist, including careful exposure history and special testing, may help diagnose skin allergy.
* Consider nerve conduction tests, urinary enzyme tests and neurobehavioral testing.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.1020.

Mixed Exposures

* Creams to whiten or bleach skin may contain *Mercury*; if so, their use increases risk. A high fish diet, especially of marine predatory (fish-eating) fish, may increase blood *Mercury*.

Conditions Made Worse by Exposure

* Persons allergic to *Mercury* may also react to *Mercurochrome* or *Merthiolate*, which contain *Mercury.*

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

* Where possible, automatically transfer **Methyl Mercury Dicyandiamide** from drums or other storage containers to process containers.
* Work surfaces should be cleaned thoroughly on a routine basis.

Good **WORK PRACTICES** can help to reduce hazardous exposures. The following work practices are recommended:

* Workers whose clothing has been contaminated by **Methyl Mercury Dicyandiamide** should change into clean clothing promptly.
* Do not take contaminated work clothes home. Family members could be exposed.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to **Methyl Mercury Dicyandiamide**.
* Eye wash fountains should be provided in the immediate work area for emergency use.
* If there is the possibility of skin exposure, emergency shower facilities should be provided.
* On skin contact with **Methyl Mercury Dicyandiamide**, immediately wash or shower to remove the chemical. At the end of the workshift, wash any areas of the body that may have contacted **Methyl Mercury Dicyandiamide**, whether or not known skin contact has occurred.
* Do not eat, smoke, or drink where **Methyl Mercury Dicyandiamide** is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating, drinking, smoking, or using the toilet.
* For clean-up use a specialized charcoal-filtered vacuum or suction pump to avoid generating *Mercury vapor*. Care should be taken not to disturb spilled material.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

OSHA 1910.132 requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

* Avoid skin contact with **Methyl Mercury Dicyandiamide**. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* There is no quantitative information available at the present time on what types of gloves or chemical protective clothing offer protection from permeation or degredation by *Mercury* and it compounds.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

* Wear impact resistant eye protection with side shields or goggles.
* Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

* For field applications check with your supervisor and your safety equipment supplier regarding the appropriate respiratory equipment.
* Where the potential exists for exposure over **0.01 mg/m^3** (as *Mercury*), use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

* Where the potential exists for exposure over **5 mg/m^3** (as *Hydrogen Cyanide*), use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.
* Exposure to **2 mg/m^3** (as *Mercury*) is immediately dangerous to life and health. If the possibility of exposure above **2 mg/m^3** (as *Mercury*) exists, use a MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in a pressure-demand or other positive-pressure mode.

QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. This may be a problem for children or people who are already ill.

Q: Don't all chemicals cause cancer?
A: No. Most chemicals tested by scientists are not cancer-causing.

Q: Should I be concerned if a chemical causes cancer in animals?
A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.

Q: But don't they test animals using much higher levels of a chemical than people usually are exposed to?
A: Yes. That's so effects can be seen more clearly using fewer animals. But high doses alone don't cause cancer unless it's a cancer agent. In fact, a chemical that causes cancer in animals at high doses could cause cancer in humans exposed to low doses.

Q: Can men as well as women be affected by chemicals that cause reproductive system damage?
A: Yes. Some chemicals reduce potency or fertility in both men and women. Some damage sperm and eggs, possibly leading to birth defects.

Q: Who is at the greatest risk from reproductive hazards?
A: Pregnant women are at greatest risk from chemicals that harm the developing fetus. However, chemicals may affect the ability to have children, so both men and women of childbearing age are at high risk.

Q: Should I be concerned if a chemical is a teratogen in animals?
A: Yes. Although some chemicals may affect humans differently than they affect animals, damage to animals suggests that similar damage can occur in humans.

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The New Jersey Department of Health and Senior Services, Occupational Health Service, offers multiple services in occupational health. These include: Right to Know Information Resources, Public Presentations, General References, Industrial Hygiene Information, Surveys and Investigations, and Medical Evaluation. Consult another Fact Sheet for a more detailed description of these services or call (609) 984-2202.

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DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is assigned by the Chemical Abstracts Service to identify a specific chemical.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

HHAG is the Human Health Assessment Group of the federal EPA.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A **miscible** substance is a liquid or gas that will evenly dissolve in another.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NAERG is the North American Emergency Response Guidebook. It was jointly developed by Transport Canada, the United States Department of Transportation and the Secretariat of Communications and Transportation of Mexico. It is a guide for first responders to quickly identify the specific or generic hazards of material involved in a transportation incident, and to protect themselves and the general public during the initial response phase of the incident.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the Public Employees Occupational Safety and Health Act, a state law which sets PELs for New Jersey public employees.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

>>>>>>>>>>>>>>>>> EMERGENCY INFORMATION <<<<<<<<<<<<<<<<<

Common Name: **METHYL MERCURY DICYANDIAMIDE**
DOT Number: **UN 2777**
NAERG Code: **151**
CAS Number: **502-39-6**

Hazard rating	NJDHSS	NFPA
FLAMMABILITY	0	-
REACTIVITY	0	-
POISONOUS GASES ARE PRODUCED IN FIRE CONTAINERS MAY EXPLODE IN FIRE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

* Extinguish fire using an agent suitable for type of surrounding fire. **Methyl Mercury Dicyandiamide** itself does not burn.
* POISONOUS GASES ARE PRODUCED IN FIRE, including *Hydrogen Cyanide*, *Nitrogen Oxides* and *Mercury vapor*.
* CONTAINERS MAY EXPLODE IN FIRE.
* Use water spray to keep fire-exposed containers cool.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If **Methyl Mercury Dicyandiamide** is spilled, take the following steps:

* Evacuate persons not wearing protective equipment from area of spill until clean-up is complete.
* Spills should be collected with special *Mercury vapor* suppressants or special vacuums. Kits specific for clean-up of *Mercury* spills are available.
* Ventilate and wash area after clean-up is complete.
* It may be necessary to contain and dispose of **Methyl Mercury Dicyandiamide** as a HAZARDOUS WASTE. Contact your Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.
* If employees are required to clean-up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable.

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FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEP HOTLINE: (609) 292-7172

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HANDLING AND STORAGE

* Prior to working with **Methyl Mercury Dicyandiamide** you should be trained on its proper handling and storage.
* **Methyl Mercury Dicyandiamide** is not compatible with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); METHYL MERCURY; and STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC).
* Store in tightly closed containers in a cool, well-ventilated area away from LIGHT.

FIRST AID

In NJ, for POISON INFORMATION call 1-800-764-7661

Eye Contact

* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention immediately.

Skin Contact

* Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

Breathing

* Remove the person from exposure.
* Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
* Transfer promptly to a medical facility.

Antidotes and Special Procedures

* Use *Amyl Nitrate* capsules if symptoms develop. All area employees should be trained regularly in emergency treatment of *Cyanide* poisoning and in CPR. A *Cyanide* antidote kit MUST be rapidly available and ingredients replaced every 1 to 2 years to ensure freshness.

PHYSICAL DATA

Vapor Pressure: 6.5 X 10^{-5} mm Hg at 95^{o}F (35^{o}C)
Water Solubility: Slightly soluble

OTHER COMMONLY USED NAMES

Chemical Name:

Mercury, (3-Cyanoguanidino)-Methyl

Other Names:

Pandrinox; Agrosol

NEW JERSEY DEPARTMENT OF HEALTH AND SENIOR SERVICES
Right to Know Program
PO Box 368, Trenton, NJ 08625-0368
(609) 984-2202
