Hazardous Substance Fact Sheet

Common Name: BENZ(a)ANTHRACENE, 7,12-DIMETHYL-

Synonyms: 7,12 DMBA; 9,10-Dimethyl-1,2-Benzanthracene
Chemical Name: Benz[a]Anthracene, 7,12-Dimethyl-
Date: March 1999 Revision: August 2008

CAS Number: 57-97-6
RTK Substance Number: 0194
DOT Number: UN 3077

Description and Use
Benz(a)Anthracene, 7,12-Dimethyl- is a yellow to greenish-yellow, crystalline (sugar-like) solid or a yellow powder. It is used as a research chemical and in experimental medicine. It is present in Mineral Oils and Coal Tars and is a Polycyclic Aromatic Hydrocarbon (PAH).

Reasons for Citation
- Benz(a)Anthracene, 7,12-Dimethyl- is on the Right to Know Hazardous Substance List because it is cited by DOT, DEP and EPA.
- This chemical is on the Special Health Hazard Substance List.

SEE GLOSSARY ON PAGE 5.

FIRST AID

Eye Contact
- Immediately flush with large amounts of water for at least 15 minutes, lifting upper and lower lids. Remove contact lenses, if worn, while rinsing.

Skin Contact
- Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

Inhalation
- 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.

EMERGENCY NUMBERS
Poison Control: 1-800-222-1222
CHEMTREC: 1-800-424-9300
NJDEP Hotline: 1-877-927-6337
National Response Center: 1-800-424-8802

EMERGENCY RESPONDERS >>>> SEE BACK PAGE

Hazard Summary

<table>
<thead>
<tr>
<th>Hazard Rating</th>
<th>NJDOH</th>
<th>NFPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEALTH</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>FLAMMABILITY</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>REACTIVITY</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

CARCINOGEN AND TERATOGEN
COMBUSTIBLE
POISONOUS GASES ARE PRODUCED IN FIRE

Workplace Exposure Limits

OSHA: The legal airborne permissible exposure limit (PEL) is 0.2 mg/m³ (as Coal Tar Pitch Volatiles, Benzene-soluble fraction) averaged over an 8-hour workshift.

NIOSH: The recommended airborne exposure limit (REL) is 0.1 mg/m³ (as Coal Tar Pitch Volatiles, Cyclohexane-extractable fraction) averaged over a 10-hour workshift.

ACGIH: Recommends that exposure by all routes be controlled to levels as low as possible.

- Benz(a)Anthracene, 7,12-Dimethyl- may be a CARCINOGEN in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.
- It should be recognized that Benz(a)Anthracene, 7,12-Dimethyl- can be absorbed through your skin, thereby increasing your exposure.
Determining Your Exposure

- Read the product manufacturer’s Material Safety Data Sheet (MSDS) and the label to determine product ingredients and important safety and health information about the product mixture.
- For each individual hazardous ingredient, read the New Jersey Department of Health Hazardous Substance Fact Sheet, available on the RTK website (www.nj.gov/health/eoh/rtkweb) or in your facility’s RTK Central File or Hazard Communication Standard file.
- You have a right to this information under the New Jersey Worker and Community Right to Know Act, the Public Employees Occupational Safety and Health (PEOSH) Act if you are a public worker in New Jersey, and under the federal Occupational Safety and Health Act (OSHA) if you are a private worker.
- 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 concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and the PEOSH Hazard Communication Standard (N.J.A.C. 12:100-7) require employers to provide similar information and training to their employees.

Health Hazard Information

Acute Health Effects
The following acute (short-term) health effects may occur immediately or shortly after exposure to Benz(a)Anthracene, 7,12-Dimethyl-

- Contact can irritate and burn the skin and eyes.
- Inhaling Benz(a)Anthracene, 7,12-Dimethyl- 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 Benz(a)Anthracene, 7,12-Dimethyl- and can last for months or years:

Cancer Hazard
- Benz(a)Anthracene, 7,12-Dimethyl- may be a CARCINOGEN in humans since it has been shown to cause skin, lung, and mammary cancer in animals.
- Many scientists believe there is no safe level of exposure to a carcinogen.

Reproductive Hazard
- Benz(a)Anthracene, 7,12-Dimethyl- has caused CANCER in the offspring of animals exposed during pregnancy.
- There is limited evidence that Benz(a)Anthracene, 7,12-Dimethyl- may damage the male reproductive system (including decreasing the sperm count) and may affect fertility in animals.

Other Effects
- Benz(a)Anthracene, 7,12-Dimethyl- may damage the liver and kidneys.
- Repeated high exposure may cause anemia (low blood count).

Medical Testing

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

-Liver and kidney function tests
-Complete blood count

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 the OSHA Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020).

Mixed Exposures
- More than light alcohol consumption can cause liver damage. Drinking alcohol may increase the liver damage caused by Benz(a)Anthracene, 7,12-Dimethyl-.
Workplace Controls and Practices

Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include: (1) enclosing chemical processes for severely irritating and corrosive chemicals, (2) using local exhaust ventilation for chemicals that may be harmful with a single exposure, and (3) using general ventilation to control exposures to skin and eye irritants. For further information on workplace controls, consult the NIOSH document on Control Banding at www.cdc.gov/niosh/topics/ctrlbanding/.

The following work practices are also recommended:

- Label process containers.
- Provide employees with hazard information and training.
- Monitor airborne chemical concentrations.
- Use engineering controls if concentrations exceed recommended exposure levels.
- Provide eye wash fountains and emergency showers.
- Wash or shower if skin comes in contact with a hazardous material.
- Always wash at the end of the workshift.
- Change into clean clothing if clothing becomes contaminated.
- Do not take contaminated clothing home.
- Get special training to wash contaminated clothing.
- Do not eat, smoke, or drink in areas where chemicals are being handled, processed or stored.
- Wash hands carefully before eating, smoking, drinking, applying cosmetics or using the toilet.

In addition, the following may be useful or required:

- Use a Class I, Type B, biological safety hood when mixing, handling, or preparing Benz(a)Anthracene, 7,12-Dimethyl.
- Use a vacuum or a wet method to reduce dust during cleanup. DO NOT DRY SWEEP.
- Use a high efficiency particulate air (HEPA) filter when vacuuming. Do not use a standard shop vacuum.

Personal Protective Equipment

The OSHA Personal Protective Equipment Standard (29 CFR 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.

Gloves and Clothing

- Avoid skin contact with Benz(a)Anthracene, 7,12-Dimethyl.

Wear personal protective equipment made from material that can not be permeated or degraded by this substance. Safety equipment suppliers and manufacturers can provide recommendations on the most protective glove and clothing material for your operation.

- Safety equipment manufacturers recommend Polyvinyl Alcohol, Silver Shield®/4H® and Viton for gloves and DuPont Tyvek®, or the equivalent, as a protective material for clothing.

Fire Hazards

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

- Benz(a)Anthracene, 7,12-Dimethyl- is a COMBUSTIBLE SOLID.
- Use dry chemical, CO₂, water spray or foam as extinguishing agents.
- POISONOUS GASES ARE PRODUCED IN FIRE, including Nitrogen Oxides and Sulfur Oxides.
- Use water spray to keep fire-exposed containers cool.
Spills and Emergencies

If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

If Benz(a)Anthracene, 7,12-Dimethyl- is spilled, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- Eliminate all ignition sources.
- Moisten spilled material first or use a HEPA-filter vacuum for clean-up and deposit into sealed containers.
- Ventilate and wash area after clean-up is complete.
- DO NOT wash into sewer.
- It may be necessary to contain and dispose of Benz(a)Anthracene, 7,12-Dimethyl- as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

Handling and Storage

Prior to working with Benz(a)Anthracene, 7,12-Dimethyl- you should be trained on its proper handling and storage.

- Benz(a)Anthracene, 7,12-Dimethyl- is not compatible with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); and STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE).
- Store in tightly closed containers in a cool, well-ventilated area away from LIGHT.
- Sources of ignition, such as smoking and open flames, are prohibited where Benz(a)Anthracene, 7,12-Dimethyl- is used, handled, or stored in a manner that could create a potential fire or explosion hazard.

Occupational Health Information Resources

The New Jersey Department of Health offers multiple services in occupational health. These services include providing informational resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations.

For more information, please contact:

New Jersey Department of Health
Right to Know
PO Box 368
Trenton, NJ 08625-0368
Phone: 609-984-2202
Fax: 609-984-7407
E-mail: rtk@doh.state.nj.us
Web address: http://www.nj.gov/health/eoh/rtkweb

The Right to Know Hazardous Substance Fact Sheets are not intended to be copied and sold for commercial purposes.
GLOSSARY

**ACGIH** is the American Conference of Governmental Industrial Hygienists. They publish guidelines called Threshold Limit Values (TLVs) for exposure to workplace chemicals.

**Acute Exposure Guideline Levels** (AEGLs) are established by the EPA. They describe the risk to humans resulting from once-in-a lifetime, or rare, exposure to airborne chemicals.

**Boiling point** is the temperature at which a substance can change its physical state from a liquid to a gas.

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

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

**CFR** is the Code of Federal Regulations, which are the regulations of the United States government.

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

A **corrosive** substance is a gas, liquid or solid that causes destruction of human skin or severe corrosion of 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.

**ERG** is the Emergency Response Guidebook. It is a guide for emergency responders for transportation emergencies involving hazardous substances.

**Emergency Response Planning Guideline** (ERPG) values are intended to provide estimates of concentration ranges where one reasonably might anticipate observing adverse effects.

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.

**IARC** is the International Agency for Research on Cancer, a scientific group.

**Ionization Potential** is the amount of energy needed to remove an electron from an atom or molecule. It is measured in electron volts.

**IRIS** is the Integrated Risk Information System database maintained by federal EPA. The database contains information on human health effects that may result from exposure to various chemicals in the environment.

**LEL or Lower Explosive Limit**, is the lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

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

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.

**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 federal Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

**PEOSHA** is the New Jersey Public Employees Occupational Safety and Health Act, which adopts and enforces health and safety standards in public workplaces.

**Permeated** is the movement of chemicals through protective materials.

**PIH** is a DOT designation for chemicals which are Poison Inhalation Hazards.

**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.

**STEL** is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

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

**UEL or Upper Explosive Limit** is the highest concentration in air above which there is too much fuel (gas or vapor) to begin a reaction or explosion.

**Vapor Density** is the ratio of the weight of a given volume of one gas to the weight of another (usually Hydrogen), at the same temperature and pressure.

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.
**Common Name:** BENZ(a)ANTHRACENE, 7,12-DIMETHYL-

**Synonyms:** 7,12 DMBA; 9,10-Dimethyl-1,2-Benzanthracene

**CAS No:** 57-97-6

**Molecular Formula:** C20H16

**RTK Substance No:** 0194

**Description:** Yellow to greenish-yellow, crystalline solid or yellow powder

---

**HAZARD DATA**

<table>
<thead>
<tr>
<th>Hazard Rating</th>
<th>Firefighting</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - Health</td>
<td>COMBUSTIBLE SOLID Use dry chemical, CO₂, water spray or foam as extinguishing agents.</td>
<td>Benz(a)Anthracene, 7,12-Dimethyl- is not compatible with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); and STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE).</td>
</tr>
<tr>
<td>2 - Fire</td>
<td>POISONOUS GASES ARE PRODUCED IN FIRE, including Nitrogen Oxides and Sulfur Oxides. Use water spray to keep fire-exposed containers cool.</td>
<td></td>
</tr>
<tr>
<td>0 - Reactivity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DOT#:** UN 3077

**ERG Guide #:** 171

**Hazard Class:** 9 (Environmentally Hazardous Material)

---

**PHYSICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor Threshold</td>
<td>Odorless</td>
</tr>
<tr>
<td>Flash Point</td>
<td>187°F (86°C)</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Melting Point</td>
<td>252° to 253°F (122° to 123°C)</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>256.4</td>
</tr>
</tbody>
</table>

---

**EXPOSURE LIMITS**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSHA</td>
<td>0.2 mg/m³, 8-hr TWA</td>
</tr>
<tr>
<td>NIOSH</td>
<td>0.1 mg/m³, 10-hr TWA</td>
</tr>
<tr>
<td>ACGIH</td>
<td>Lowest level possible</td>
</tr>
<tr>
<td>IDLH</td>
<td>80 mg/m³ (All the above are for Coal Tar Pitch Volatiles)</td>
</tr>
</tbody>
</table>

---

**PROTECTIVE EQUIPMENT**

<table>
<thead>
<tr>
<th>Item</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Polyvinyl Alcohol, Silver Shield®/4H® and Viton</td>
</tr>
<tr>
<td>Coveralls</td>
<td>DuPont Tyvek®</td>
</tr>
<tr>
<td>Respirator</td>
<td>&gt;0.1 mg/m³ (as Coal Tar Pitch Volatiles) - Supplied air</td>
</tr>
</tbody>
</table>

---

**HEALTH EFFECTS**

<table>
<thead>
<tr>
<th>Component</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>Irritation and burns</td>
</tr>
<tr>
<td>Skin</td>
<td>Irritation and burns</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Nose, throat and lung irritation with coughing, wheezing and shortness of breath</td>
</tr>
<tr>
<td>Chronic</td>
<td>Cancer (skin, lung, mammary) in animals</td>
</tr>
</tbody>
</table>

---

**FIRST AID AND DECONTAMINATION**

- **Removal:** Remove the person from exposure.
- **Flush:** Eyes with large amounts of water for at least 15 minutes. Remove contact lenses if worn.
- **Quickly:** Remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.
- **Begin:** Artificial respiration if breathing has stopped and CPR if necessary.
- **Transfer:** Promptly to a medical facility.