



# Right to Know Hazardous Substance Fact Sheet

Common Name: **2-ACETYLAMINOFLUORENE**

Synonyms: AAF; 2-Fluorenylacetamide

Chemical Name: Acetamide, N-9H-Fluoren-2-yl-

Date: June 2007

Revision: October 2016

CAS Number: 53-96-3

RTK Substance Number: 0010

DOT Number: None

## Description and Use

**2-Acetylaminofluorene** is a tan powder or crystalline (sand-like) solid. It was developed for use as a pesticide but is only used in laboratory research.

## Reason for Citation

- ▶ **2-Acetylaminofluorene** is on the Right to Know Hazardous Substance List because it is cited by OSHA, NIOSH, NTP, 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 cool water for at least 15 minutes, occasionally lifting upper and lower lids. Remove contact lenses, if worn, while rinsing. Medical attention is necessary.

### Skin Contact

- ▶ Remove contaminated clothing. Wash contaminated skin with soap and water.

### Inhalation

- ▶ Remove the person from exposure.

## 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

Hazard Rating	NJDHSS	NFPA
HEALTH	-	2
FLAMMABILITY	-	0
REACTIVITY	-	0
CARCINOGEN COMBUSTIBLE SOLID, BUT DOES NOT READILY IGNITE POISONOUS GASES ARE PRODUCED IN FIRE		

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

- ▶ **2-Acetylaminofluorene** can affect you when inhaled and by passing through your skin.
- ▶ **2-Acetylaminofluorene** is a CARCINOGEN--HANDLE WITH EXTREME CAUTION.
- ▶ **2-Acetylaminofluorene** has not been tested for other chronic (long-term) health effects.

## Workplace Exposure Limits

OSHA: No exposure limits have been established by OSHA for **2-Acetylaminofluorene**. Please refer to the OSHA **2-Acetylaminofluorene** Standard (29 CFR 1910.1014).

NIOSH: Recommends that exposure to occupational carcinogens be limited to the lowest feasible concentration.

- ▶ **2-Acetylaminofluorene** is a PROBABLE 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.
- ▶ As **2-Acetylaminofluorene** is absorbed through your skin, contact should be eliminated.

## 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 Program website (<http://nj.gov/health/workplacehealthandsafety/right-to-know/>) 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 and the PEOSH Hazard Communication Standard (N.J.A.C. 12:100-7) 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) requires private employers to provide similar information and training to their employees.

This Fact Sheet is a summary of available information regarding the 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 **2-Acetylaminofluorene**:

- ▶ No acute (short-term) health effects are known at this time.

### Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **2-Acetylaminofluorene** and can last for months or years:

### Cancer Hazard

- ▶ **2-Acetylaminofluorene** is a PROBABLE CARCINOGEN in humans. There is some evidence that it causes bladder, kidney and liver cancer in animals.
- ▶ Many scientists believe there is no safe level of exposure to a carcinogen.
- ▶ **2-Acetylaminofluorene** is a MUTAGEN. It may cause genetic changes.

### Reproductive Hazard

- ▶ There is limited evidence that **2-Acetylaminofluorene** is a teratogen in animals. Until further testing has been done, it should be treated as a possible teratogen in humans.

### Other Effects

- ▶ **2-Acetylaminofluorene** has not been tested for other chronic (long-term) health effects.

## Medical

### Medical Testing

Before beginning employment and at regular times after that, (at least annually), the following is recommended:

- ▶ Urine cytology (a special test for abnormal cells in the urine)

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).

## 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/](http://www.cdc.gov/niosh/topics/ctrlbanding/).

The following work practices are also recommended:

- ▶ Label process containers.
- ▶ Provide employees with information and training concerning their hazards.
- ▶ 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.
- ▶ Special training is required 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:

- ▶ Specific engineering controls are required for this chemical by OSHA. Refer to the OSHA **2-Acetylaminofluorene** Standard (29 CFR 1910.1014).
- ▶ A Class I, Type B, biological safety hood should be used when mixing, handling, or preparing **2-Acetylaminofluorene**.
- ▶ Use a vacuum or a wet method to reduce dust during clean-up. DO NOT DRY SWEEP.
- ▶ When vacuuming, a high efficiency particulate air (HEPA) filter should be used, not 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 **2-Acetylaminofluorene**. Wear personal protective equipment made from material which cannot be permeated and/or degraded by this substance. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
- ▶ All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

#### Eye Protection

- ▶ Eye protection is included in the recommended respiratory protection.
- ▶ Contact lenses should not be worn when working with this substance.

#### 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 the OSHA Respiratory Protection Standard (29 CFR 1910.134).

- ▶ At any exposure level, use a NIOSH approved supplied-air respirator with a full facepiece operated in 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.

### 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).

- ▶ **2-Acetylaminofluorene** may burn, but does not readily ignite.
- ▶ Use dry chemical, CO<sub>2</sub>, water spray or alcohol-resistant foam.
- ▶ POISONOUS GASES ARE PRODUCED IN FIRE, including *Nitrogen 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 **2-Acetylaminofluorene** is spilled, take the following steps:

- ▶ Evacuate personnel and secure and control entrance to the area.
- ▶ Eliminate all ignition sources.
- ▶ Cover with dry lime, sand or soda ash, and place in covered containers for disposal.
- ▶ Ventilate and wash area after clean-up is complete.
- ▶ It may be necessary to contain and dispose of **2-Acetylaminofluorene** 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 **2-Acetylaminofluorene** you should be trained on its proper handling and storage.

- ▶ A regulated, marked area should be established where **2-Acetylaminofluorene** is handled, used, or stored, as required by the OSHA **2-Acetylaminofluorene** Standard (29 CFR 1910.1014).
- ▶ **2-Acetylaminofluorene** is not compatible with CYANIDES; STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE); STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); ACID ANHYDRIDES; and OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE).
- ▶ Sources of ignition, such as smoking and open flames, are prohibited where **2-Acetylaminofluorene** 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, 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.

**For more information, please contact:**

New Jersey Department of Health  
Right to Know Program  
PO Box 368  
Trenton, NJ 08625-0368  
Phone: 609-984-2202  
Fax: 609-984-7407  
E-mail: [rtk@doh.nj.gov](mailto:rtk@doh.nj.gov)  
Web address:  
<http://nj.gov/health/workplacehealthandsafety/right-to-know/>

***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.

**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 assigned by the Chemical Abstracts Service to identify 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.

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 of the federal EPA that classifies chemicals according to their cancer-causing potential.

**LEL** or **Lower Explosive Limit** is the lowest concentration in air below which there is not enough fuel (gas or vapor) to continue an explosion.

**mg/m<sup>3</sup>** 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.

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

**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. PEOSH 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.

Chemical Name: **2-ACETYLAMINOFLUORENE**

Synonyms: AAF; 2-Fluorenylacetamide

CAS No: 53-96-3

Molecular Formula: C<sub>15</sub>H<sub>13</sub>NO

RTK Substance No: 0010

Description: Tan powder or crystalline solid

**HAZARD DATA**

<b>Hazard Rating</b>	<b>Firefighting</b>	<b>Reactivity</b>
<b>2 - Health</b> <b>0 - Fire</b> <b>0 - Reactivity</b>  <b>DOT#:</b> N/A <b>ERG Guide #:</b> N/A <b>Hazard Class:</b> N/A	- <b>2-Acetylaminofluorene</b> is considered a combustible solid, but does not readily ignite. - Use dry chemical, CO <sub>2</sub> , water spray or alcohol-resistant foam. - POISONOUS GASES ARE PRODUCED IN FIRE, including <i>Nitrogen Oxides</i> . - Use water spray to keep fire-exposed containers cool.	- <b>2-Acetylaminofluorene</b> is not compatible with CYANIDES; STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); ACID ANHYDRIDES; OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); and STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE).

**SPILLS/LEAKS**

**Isolation Distance:** 25 meter (75 feet)

- Dampen solid spills with water before collection.
- Collect spilled material using a wet method or a vacuum with a HEPA filter.

**PHYSICAL PROPERTIES**

**Flash Point:** 531 °F (277 °C)  
**Boiling Point:** 577 °F (303 °C)  
**LEL:** No Information  
**UEL:** No Information  
**Vapor Density:** No Information  
**Vapor Pressure:** 0.0000287 mm Hg at 25 °F (estimated)  
**Water Solubility:** Insoluble  
**Melting Point:** 381 °F (194 °C)  
**Ionization Potential:** No Information

**EXPOSURE LIMITS**

**OSHA:** Refer to 29 CFR 1910.1014  
**NIOSH:** Recommends that exposure to occupational carcinogens be limited to the lowest feasible concentration.  
**ACGIH:** N/A  
**IDLH LEVEL:** N/A  
**PAC LEVELS:** PAC-1 = 1.2 mg/m<sup>3</sup>; PAC-2 = 14 mg/m<sup>3</sup>; PAC-3 = 480 mg/m<sup>3</sup>

**PROTECTIVE EQUIPMENT**

**Gloves:** Chemical-resistant gloves (e.g. Nitrile)  
**Coverall:** Protective clothing to prevent skin contact  
**Boot:** Protective boots to prevent skin contact  
**Respirator:** Supplied Air

**HEALTH EFFECTS**

**Eyes:** Irritation  
**Inhalation:** Nose, throat and lung irritation.  
**Skin:** May cause skin irritation.  
**Chronic:** Carcinogen (bladder, kidney and liver) in animals.

**FIRST AID AND DECONTAMINATION**

**Remove** the person from exposure.  
**Flush** eyes with large amounts of water for at least 15 minutes. Remove contact lenses, if worn, while rinsing.  
**Remove** contaminated clothing. Wash contaminated skin with soap and water.  
**Begin** respirator support if breathing becomes difficult.