

# MATERIAL SAFETY DATA SHEET



**Bayer MaterialScience**

**Bayer MaterialScience LLC**  
**Product Safety & Regulatory Affairs**  
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**USA**

## TRANSPORTATION EMERGENCY

CALL CHEMTREC: (800) 424-9300  
 INTERNATIONAL: (703) 527-3887

## NON-TRANSPORTATION

Bayer Emergency Phone: (412) 923-1800  
 Bayer Information Phone: (800) 662-2927

### 1. Product and Company Identification

**Product Name:** PFAZ 322  
**Material Number:** 3048318  
**Chemical Family:** Polyfunctional Aziridine  
**Chemical Name:** 1-Aziridinepropanoic acid, 2-methyl-,2-ethyl-2-((3-(2-methyl-1-aziridinyl)-1-oxopropoxy)methyl)-1,3- propanediyl ester  
**Synonyms:** Aziridine Polymer

### 2. Hazards Identification

#### Emergency Overview

**WARNING! Color:** Amber, Light **Form:** Liquid **Odor:** Slight, Amine.  
 Ground containers and equipment before transferring to avoid static sparks. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Toxic gases/fumes are given off during burning or thermal decomposition and may cause allergic skin and respiratory reaction. Causes respiratory tract irritation. May be harmful if inhaled. Causes skin irritation. May cause allergic skin reaction. Causes eye irritation. May be harmful if swallowed.

#### Potential Health Effects

**Primary Routes of Entry:** Skin Contact, Eye Contact, Ingestion, Inhalation  
**Medical Conditions Aggravated by Exposure:** Eyes, Skin disorders, Respiratory disorders, Skin Allergies

#### HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

##### Inhalation

##### **Acute Inhalation**

**For Product: PFAZ 322**

Causes respiratory tract irritation with symptoms of coughing, sore throat and runny nose.

##### **Chronic Inhalation**

**For Product: PFAZ 322**

Prolonged or repeated exposure may result in adverse respiratory effects including cough, tightness of chest and shortness of breath.

#### **Skin**

##### **Acute Skin**

###### **For Product: PFAZ 322**

Causes irritation with symptoms of reddening, itching, and swelling. May cause allergic skin reaction with symptoms of reddening, itching, swelling, and rash.

###### **For Component: Polyfunctional aziridine**

May cause slight irritation. May cause sensitization of susceptible persons.

##### **Chronic Skin**

###### **For Product: PFAZ 322**

Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization.

#### **Eye**

##### **Acute Eye**

###### **For Product: PFAZ 322**

Causes irritation with symptoms of reddening, tearing, stinging, and swelling.

###### **For Component: Polyfunctional aziridine**

Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause corneal injury.

##### **Chronic Eye**

###### **For Product: PFAZ 322**

Prolonged vapor contact may cause conjunctivitis.

#### **Ingestion**

##### **Acute Ingestion**

###### **For Product: PFAZ 322**

Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea.

###### **For Component: Polyfunctional aziridine**

Slightly toxic by ingestion.

#### **Carcinogenic Effects**

###### **For Product: PFAZ 322**

Monomeric aziridines (ethyleneimine and propyleneimine) used to produce polyfunctional aziridine crosslinkers have shown positive genotoxic activity in all animal and bacterial systems tested and are known animal carcinogens, with unknown relevance to humans. Animal and bacterial studies on the crosslinker show a similar pattern of genotoxicity. Bioavailability of the crosslinker is less than the monomer, however, care should be taken to avoid exposure.

#### **Carcinogenicity:**

No Carcinogenic substances as defined by IARC, NTP and/or OSHA

### **3. Composition/Information on Ingredients**

#### **Hazardous Components**

##### **Weight %**

>=95%

<=0.01%

##### **Components**

Polyfunctional aziridine

Aziridine, 2-methyl-

##### **CAS-No.**

64265-57-2

75-55-8

#### 4. First Aid Measures

##### Eye Contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Call a physician immediately.

##### Skin Contact

In case of skin contact, wash affected areas with soap and water. Immediately remove contaminated clothing and shoes. Get medical attention. Wash clothing and shoes before reuse.

##### Inhalation

If inhaled, remove to fresh air. If breathing is difficult, give oxygen. Get medical attention.

##### Ingestion

Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. Never give anything by mouth to an unconscious person.

#### 5. Fire-Fighting Measures

**Suitable Extinguishing Media:** All extinguishing media are suitable., water spray for large fires.

##### Special Fire Fighting Procedures

Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Use cold water spray to cool fire-exposed containers to minimize risk of rupture. Do not spray fire directly.

##### Unusual Fire/Explosion Hazards

Toxic and irritating gases/fumes may be given off during burning or thermal decomposition. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flashback.

#### 6. Accidental release measures

##### Spill and Leak Procedures

Cleanup personnel must use appropriate personal protective equipment. Evacuate and keep unnecessary people out of spill area. Remove all sources of ignition, including flames, heat, and sparks. Ventilate area to remove vapors or dust. Dike or dam spilled material and control further spillage, if possible. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Wash spill area with soap and water.

#### 7. Handling and Storage

##### Storage Temperature:

**minimum:** 1.67 °C (35 °F)  
**maximum:** 15.56 °C (60 °F)

##### Storage Period

24 Months: Recommended

### **Handling/Storage Precautions**

Do not get in eyes. Do not get on skin or clothing. Do not taste or swallow. Avoid inhalation of vapour or mist. Proper ventilation and appropriate personal protective equipment should be used when handling & processing this product. Store in a dry place away from excessive heat in original or similar containers. Containers should be kept tightly closed to prevent contamination. Ground and bond containers and equipment before transferring to avoid static sparks.

### **Further Info on Storage Conditions**

Do not expose to direct sunlight. Protect from freezing. Avoid acidic conditions. Avoid contact with moisture/water.

## **8. Exposure Controls / Personal Protection**

### **Aziridine, 2-methyl- (75-55-8)**

US. ACGIH Threshold Limit Values

Time Weighted Average (TWA): 2 ppm

US. ACGIH Threshold Limit Values

Skin designation: Can be absorbed through the skin.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

PEL: 2 ppm, 5 mg/m<sup>3</sup>

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Skin designation: Can be absorbed through the skin.

US. ACGIH Threshold Limit Values

Hazard Designation: Group A3 Confirmed animal carcinogen with unknown relevance to humans.

### **Industrial Hygiene/Ventilation Measures**

General dilution and local exhaust as necessary to control airborne vapors, mists, dusts and thermal decomposition products below appropriate airborne concentration standards/guidelines. Exhaust air may need to be cleaned by scrubbers or filters to reduce environmental contamination. Curing ovens must be ventilated to prevent the build up of explosive atmospheres and to prevent off gases from entering the work place.

### **Respiratory Protection**

A supplied air respirator with a full facepiece or hood that is operated in a positive pressure, pressure-demand, or continuous flow mode is mandatory during spray application or whenever airborne concentrations are unknown. An air purifying respirator with organic vapor cartridge may be worn in non-spray applications where airborne concentrations of aziridine monomer are known to be above the PEL or TLV but less than 10 times the PEL or TLV. Use fresh cartridge at the beginning of each work shift.

### **Hand Protection**

Permeation resistant gloves., Neoprene gloves, Butyl rubber gloves., Nitrile rubber gloves.

### **Eye Protection**

Chemical resistant goggles must be worn., Chemical safety goggles in combination with a full face shield if a splash hazard exists.

### **Skin and body protection**

Permeation resistant clothing and foot protection.

### **Additional Protective Measures**

Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product. Emergency showers and eye wash stations

should be available.

## 9. Physical and chemical properties

|                                   |                                                           |
|-----------------------------------|-----------------------------------------------------------|
| <b>Form:</b>                      | Liquid                                                    |
| <b>Color:</b>                     | Amber, Light                                              |
| <b>Odor:</b>                      | Slight, Amine                                             |
| <b>pH:</b>                        | 9 - 10                                                    |
| <b>Freezing Point:</b>            | < -5 °C (< 23 °F)                                         |
| <b>Boiling Point/Range:</b>       | Not Established                                           |
| <b>Flash Point:</b>               | 138 °C (280.4 °F) (Pensky-Martens Closed Cup (ASTM D-93)) |
| <b>Lower Explosion Limit:</b>     | Not Established                                           |
| <b>Upper Explosion Limit:</b>     | Not Established                                           |
| <b>Evaporation Rate:</b>          | Greater than 1                                            |
| <b>Vapor Pressure:</b>            | 0.00023 mmHg @ 20 °C (68 °F)                              |
| <b>Specific Gravity:</b>          | 1.10 @ 20 °C (68 °F)                                      |
| <b>Solubility in Water:</b>       | Partially soluble                                         |
| <b>Autoignition Temperature:</b>  | Not Established                                           |
| <b>Decomposition Temperature:</b> | Not established                                           |
| <b>Viscosity, Dynamic:</b>        | no data available                                         |
| <b>Viscosity, Kinematic:</b>      | no data available                                         |

## 10. Stability and Reactivity

### Hazardous Reactions

Exothermic reaction with strong acids.

### Stability

Stable under normal conditions.

### Materials to avoid

Oxidizing agents, Anhydrides, Acids, Water

### Conditions to avoid

Direct heating, dirt, chemical contamination, sunlight, UV or ionising radiation. Protect from freezing. Avoid acidic conditions. Avoid contact with moisture / water.

### Hazardous decomposition products

By Fire and Thermal Decomposition: Carbon oxides, nitrogen oxides (NO<sub>x</sub>), other aliphatic fragments which have not been determined

## 11. Toxicological Information

### Toxicity Data for PFAZ 322

#### Toxicity Note

Toxicity data is based on a similar product.

#### Acute Oral Toxicity

LD50: > 2,000 mg/kg (rat)

#### Skin Irritation

rabbit, Slightly irritating

**Eye Irritation**

rabbit, Severely irritating

**Sensitization**

dermal: sensitizer (guinea pig, Magnusson/Kligmann (Maximization Test))

**Mutagenicity**

Genetic Toxicity in Vitro:

Ames: positive (Salmonella typhimurium)

**Toxicity Data for Polyfunctional aziridine****Acute Inhalation Toxicity**

LC50: 252 mg/m<sup>3</sup>, aerosol, 4 h (rat, Male/Female)

**Mutagenicity**

Genetic Toxicity in Vitro:

Chromosome aberration test: positive (Chinese hamster V79 cell line, Metabolic Activation: with/without)

Genetic Toxicity in Vivo:

Micronucleus Assay: positive (mouse, male, intraperitoneal)

**Toxicity Data for Aziridine, 2-methyl-****Acute Oral Toxicity**

LD50: 19 mg/kg (Rat)

**Acute Inhalation Toxicity**

LClo: 500 ppm, 4 hrs (Rat)

**Acute dermal toxicity**

LD50: 43 mg/kg (Guinea pig)

**Eye Irritation**

rabbit, Severely irritating

**Mutagenicity**

Genetic Toxicity in Vitro:

Ames: positive (Salmonella typhimurium, Metabolic Activation: with/without)

In vitro tests have shown mutagenic effects.

Genetic Toxicity in Vivo:

Unscheduled DNA synthesis: positive (mouse, )

Drosophila SLRL test: (Drosophila melanogaster)

**Carcinogenicity**

Rat, Male/Female, oral, 28 weeks, daily

positive

**12. Ecological Information****Ecological Data for Aziridine, 2-methyl-****Bioaccumulation**

Does not bioaccumulate.

### 13. Disposal considerations

#### Waste Disposal Method

Waste disposal should be in accordance with existing federal, state and local environmental control laws.

#### Empty Container Precautions

Recondition or dispose of empty container in accordance with governmental regulations. Do not reuse empty container without proper cleaning. Label precautions also apply to this container when empty. Empty containers retain product residue (dust, liquid, vapor and/or gases) and can be dangerous.

### 14. Transportation information

#### Land transport (DOT)

**Proper Shipping Name:** Environmentally hazardous substances, liquid, n.o.s. (contains Aziridine, 2-methyl-)  
**Hazard Class or Division:** 9  
**UN/NA Number:** UN3082  
**Packaging Group:** III  
**Hazard Label(s):** Class 9

#### RSPA/DOT Regulated Components:

Aziridine, 2-methyl-

**Reportable Quantity:** 10,000 lb

#### Sea transport (IMDG)

**Proper Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains Aziridine, 2-methyl-)  
**Hazard Class or Division:** 9  
**UN-No:** UN3082  
**Packaging Group:** III  
**Hazard Label(s):** Miscellaneous

#### Air transport (ICAO/IATA)

**Proper Shipping Name:** Environmentally hazardous substance, liquid, n.o.s. (contains Aziridine, 2-methyl-)  
**Hazard Class or Division:** 9  
**UN-No:** UN3082  
**Packaging Group:** III  
**Hazard Label(s):** Miscellaneous

#### **Additional Transportation Information**

When in individual containers of less than the Product RQ, this material ships as non-regulated.

### 15. Regulatory Information

#### United States Federal Regulations

**OSHA Hazcom Standard Rating:** Hazardous

**US. Toxic Substances Control Act:** Listed on the TSCA Inventory.

**US. EPA CERCLA Hazardous Substances (40 CFR 302):**

**Components**

None

**SARA Section 311/312 Hazard Categories:**

Acute Health Hazard, Chronic Health Hazard, Reactivity Hazard

**US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):**

**Components**

None

**US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:**

**Components**

None

**US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):**

If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

**State Right-To-Know Information**

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

**Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:**

| <u>Weight %</u> | <u>Components</u>        | <u>CAS-No.</u> |
|-----------------|--------------------------|----------------|
| >=95%           | Polyfunctional aziridine | 64265-57-2     |

**Pennsylvania Right to Know Special Hazard Substance List:**

| <u>Weight %</u> | <u>Components</u>    | <u>CAS-No.</u> |
|-----------------|----------------------|----------------|
| <=0.01%         | Aziridine, 2-methyl- | 75-55-8        |

**California Prop. 65:**

**Warning! This product contains chemical(s) known to the State of California to be Carcinogenic.**

| <u>Weight %</u> | <u>Components</u>    | <u>CAS-No.</u> |
|-----------------|----------------------|----------------|
| <=0.01%         | Aziridine, 2-methyl- | 75-55-8        |

**16. Other Information**

**NFPA 704M Rating**

|                     |   |
|---------------------|---|
| <b>Health</b>       | 3 |
| <b>Flammability</b> | 1 |
| <b>Reactivity</b>   | 1 |
| <b>Other</b>        |   |

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme



**HMIS Rating**

|                        |    |
|------------------------|----|
| <b>Health</b>          | 3* |
| <b>Flammability</b>    | 1  |
| <b>Physical Hazard</b> | 1  |

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

\* = Chronic Health Hazard

Bayer MaterialScience LLC's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact Person: Product Safety Department  
Telephone: (412) 777-2835  
MSDS Number: R302983  
Version Date: 01/18/2005  
Report Version: 1.1

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