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Material Safety Data Sheet

Piperazine anhydrous MSDS

Section 1: Chemical Product and Company Identification

Product Name: Piperazine, anhydrous

CAS#: 110-85-0

Synonym: Antiren, Dispermine, Lumbrical, Piperazidine;

Chemical Name: Piperazine

Chemical Formula: C₄H₁₀N₂

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Section 2: Composition and Information on Ingredients

Composition:

Name	CAS # %	By Weight
Piperazine, anhydrous	110-85-0	100

Toxicological Data on Ingredients: Piperazine, anhydrous: ORAL (LD50): Acute: 1900 mg/kg [Rat]. 600 mg/kg [Mouse]. DUST (LC50): Acute: 5400 mg/m² 2 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of eye contact (irritant). Hazardous in case of skin contact (irritant, sensitizer), of ingestion, of inhalation (lung sensitizer). Slightly hazardous in case of skin contact (corrosive), of eye contact (corrosive), . The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung

damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching.

Potential Chronic Health Effects:

Slightly hazardous in case of skin contact (sensitizer), of inhalation (lung irritant, lung sensitizer). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL

TOXICITY: Not available. The substance may be toxic to lungs, upper respiratory tract, skin. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation.

WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 454.97°C (850.9°F)

Flash Points: OPEN CUP: 107°C (224.6°F).

Flammable Limits: LOWER: 1.6% UPPER: 12.5%

Products of Combustion: These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂...).

Fire Hazards in Presence of Various Substances:

Slightly flammable to flammable in presence of heat, of oxidizing materials. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.

Fire Fighting Media and Instructions:

SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:

It may burn, but does not ignite readily. When heated to decomposition it emits highly toxic fumes. As with most organic solids, fire is possible at elevated temperatures.

Special Remarks on Explosion Hazards: Containers may explode when heated.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:

Corrosive solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal.

Section 7: Handling and Storage

Precautions:

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Never add water to this product. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area. Sensitive to light. Store in light-resistant containers. Hygroscopic.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles. Synthetic apron. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Deliquescent crystals solid.)

Odor: Characteristic. Amine like. Ammoniacal.

Taste: Saline.

Molecular Weight: 86.14 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 146°C (294.8°F)

Melting Point: 106°C (222.8°F)

Critical Temperature: Not available.

Specific Gravity: 1.1 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: 3 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: The product is more soluble in water; $\log(\text{oil/water}) = -1.2$

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Easily soluble in cold water. Insoluble in diethyl ether. Freely soluble in glycerol, and glycols.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials, moisture/moist air

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Sensitive to light. Hygroscopic; keep container tightly closed. Also incompatible with acid chlorides, acid anhydrides, dicyanofurazan.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.

Acute oral toxicity (LD50): 600 mg/kg [Mouse]. Acute toxicity of the dust (LC50): 5400 mg/m³ 2 hours [Mouse].

Chronic Effects on Humans: May cause damage to the following organs: lungs, upper respiratory tract, skin.

Other Toxic Effects on Humans:

Hazardous in case of skin contact (irritant, sensitizer), of ingestion, of inhalation (lung sensitizer). Slightly hazardous in case of skin contact (corrosive), of eye contact (corrosive), .

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes skin irritation and possible burns. Eyes: Eye contact can cause severe irritation or burns. Inhalation: May cause respiratory tract irritation (irritation of bronchial tubes, lungs) wheezing, severe hacking cough, and shortness of breath (dypnea). Inhalation of high concentrations can affect behavior/central nervous system, and vision and cause weakness, reduced coordination, and balance, lethargy, tremors, trigger seizures (epileptic attacks), and blurred vision. It can also interfere with the ability of the blood to carry oxygen (a condition called methemoglobinemia). This can cause headaches, dizziness, nausea, and a bluish color to the skin and lips. Ingestion: It can cause digestive tract irritation with possible burns, nausea, vomiting, clonic spasms, diarrhea. It can cause vague ocular disturbances, urticaria, and affect behavior/central nervous system with symptoms similar to those of acute inhalation as well as euphoria, inability to think clearly, and/or hallucinations, dropping of objects, loss of consciousness, dysarthria, apraxia, dysphagia, vertigo. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may cause skin allergy (rash with itching). Inhalation: Prolonged or repeated inhalation may cause lung allergy or asthma(wheezing, chest tightness).

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Piperazine UNNA: 2579 PG: III

Special Provisions for Transport: Not available

Section 15: Other Regulatory Information

Federal and State Regulations:

Pennsylvania RTK: Piperazine, anhydrous Massachusetts RTK: Piperazine, anhydrous Massachusetts spill list: Piperazine, anhydrous New Jersey: Piperazine, anhydrous TSCA 8(b) inventory: Piperazine, anhydrous

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS E: Corrosive solid.

DSCL (EEC):

R34- Causes burns. R42/43- May cause sensitization by inhalation and skin contact. R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S22- Do not breathe dust. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39- Wear suitable protective clothing, gloves and eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 0

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Synthetic apron. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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