OXFORD LAB FINE CHEM LLP

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Oxford
Range of
Laboratory Chemicals

MATERIAL SAFETY DATA SHEET

KARL FISCHER REAGENT

MSDS CAS: 109-86-4

Section 1: Chemical Product and Company Identification

Section 1: Chemical Product

Product Name: KARL FISCHER REAGENT
CAS#: 109-86-4
C.I. No.: Not available.
Synonym: N-L-alpha-Aspartyl-L-phenylalanine, 1-Methyl Ester
Chemical Name: Not available.
Chemical Formula: C18H36N4O11.H2SO4

Brand: OXFORD

Details Of The Supplier Of The Safety Data Sheet:

Company identification: **OXFORD LAB FINE CHEM LLP**
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Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Pyridine	110-86-1	13
{2-}Methoxyethanol	109-86-4	57.2
Sulfur dioxide		6.8
Iodine	7553-56-2	12.6
Diethanolamine	111-42-2	10.4

Section 2: Composition and Information on Ingredients (Continued)

Toxicological Data on Ingredients: **Pyridine: ORAL (LD50): Acute: 891 mg/kg [Rat]. 1500 mg/kg [Mouse]. DERMAL (LD50):Acute: 1121 mg/kg [Rabbit]. 2-Methoxyethanol: ORAL (LD50): Acute: 2370 mg/kg [Rat]. 2560 mg/kg [Mouse]. DERMAL (LD50): Acute: 1280 mg/kg [Rabbit]. VAPOR (LC50): Acute: 2121.3 ppm 4 hour(s) [Rat]. Sulfur dioxide: GAS (LC50): Acute: 1260 ppm 4 hour(s) [Rat]. Iodine: ORAL (LD50): Acute: 14000 mg/kg [Rat]. Diethanolamine: ORAL (LD50): Acute: 710 mg/kg Rat]. DERMAL (LD50): Acute: 12200 mg/kg [Rabbit]**

Section 3: Hazards Identification

Potential Acute Health Effects:

Extremely hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (corrosive, sensitizer, permeator). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:

Extremely hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (corrosive, sensitizer, permeator). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:

If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on

Section 4: First Aid Measures (Continued)

the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

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

Inhalation:

Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

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. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: **Not available.**

Section 5: Fire and Explosion Data

Flammability of the Product: **Flammable.**

Auto-Ignition Temperature: **The lowest known value is 285°C (545°F) (2-Methoxyethanol).**

Flash Points: **The lowest known value is CLOSED CUP: 20°C (68°F). (Setaflash). (Pyridine)**

Flammable Limits: **The greatest known range is LOWER: 1.8% UPPER: 14% (2-Methoxyethanol)**

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 open flames and sparks, of oxidizing materials. Non-flammable in presence of heat.**

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 to explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions:

SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use alcohol foam, water spray, fog .

Special Remarks on Fire Hazards: **Not available.**

Special Remarks on Explosion Hazards: **Not available.**

Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Flammable liquid. Corrosive liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep container dry. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment 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, reducing agents, combustible materials, organic materials, metals, alkalis, moisture.

Storage:

May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package. Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Section 8: Exposure Controls/Personal Protection (Continued)

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:

Splash goggles. F ull suit. Dust respirator. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Pyridine TWA: 5 (ppm) from ACGIH (TLV) TWA: 16 (mg/m3) from ACGIH 2-Methoxyethanol TWA: 5 (ppm) from ACGIH (TLV) SKIN TWA: 16 (mg/m3) from ACGIH Sulfur dioxide TWA: 2 STEL: 5 (ppm) from ACGIH (TLV) [1995] TWA: 5.2 STEL: 13 (mg/ m3) from ACGIH [1995] Iodine CEIL: 0.1 (ppm) from ACGIH (TLV) CEIL: 1 (mg/m3) from OSHA Diethanolamine TWA: 0.46 (ppm) from ACGIH (TLV) [1995] TWA: 2 (mg/m3) from ACGIH [1995]

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.
Odor: Pungent. (Strong.)
Taste: Not available.
Molecular Weight: 582.58 g/mole
Color: Brown. (Dark.)
pH (1% soln/water): Basic.
Boiling Point: The lowest known value is 115.3°C (239.5°F) (Pyridine). Weighted average: 122.39°C (252.3°F)
Melting Point: May start to solidify at -42°C (-43.6°F) based on data for: Pyridine. Weighted average: -77.12°C (-106.8°F)
Critical Temperature: Not available.
Specific Gravity: Weighted average: 1.12 (Water = 1)
Vapor Pressure: The highest known value is 14 mm of Hg (@ 20°C) (Pyridine). Weighted average: 7.64 mm of Hg (@ 20°C)
Vapor Density: The highest known value is 2.73 (Air = 1) (Pyridine). Weighted average: 2.64 (Air = 1)
Volatility: Not available.
Odor Threshold: The highest known value is 2.4 ppm (2-Methoxyethanol) Weighted average: 2.08 ppm
Water/Oil Dist. Coeff.: Not available.
Ionicity (in Water): Not available.
Dispersion Properties: See solubility in water, methanol, diethyl ether.
Solubility: Easily soluble in cold water, hot water. Soluble in methanol, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.
Instability Temperature: Not available.
Conditions of Instability: Not available.
Incompatibility with various substances: Highly reactive with oxidizing agents. Reactive with reducing agents, combustible materials, organic materials, metals, alkalis, moisture.
Corrosivity: Corrosive in presence of aluminum, of zinc, of copper. Slightly corrosive to corrosive in presence of steel, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.
Special Remarks on Reactivity: Not available.
Special Remarks on Corrosivity: Not available.
Polymerization: No

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.
Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 710 mg/kg [Rat]. (Diethanolamine). Acute dermal toxicity (LD50): 1121 mg/kg [Rabbit]. (Pyridine). Acute toxicity of the gas (LC50): 1260 ppm 4 hour(s) [Rat]. (Sulfur dioxide). Acute toxicity of the vapor (LC50): 2121.3 ppm 4 hour(s) [Rat]. (2-Methoxyethanol).
Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.
Other Toxic Effects on Humans: Extremely hazardous in case of skin contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (corrosive, sensitizer, permeator).
Special Remarks on Toxicity to Animals: Not available.
Special Remarks on Chronic Effects on Humans: Animal: embryotoxic, induces sterility; decrease of sperm count. Passes through the placental barrier in animal. (2-Methoxyethanol)
Special Remarks on other Toxic Effects on Humans: Not available.

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.

Section 12: Ecological Information (Continued)

Toxicity of the Products of Biodegradation: The products of degradation are more toxic as the original product.
Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

Land transport (ADR-RID)

General information : Not regulated.

Sea transport (IMDG) [English only]

General information : Not regulated.

Air transport (ICAO-IATA) [English only]

General information : Not regulated.

Section 15: Other Regulatory Information

Federal and State Regulations: California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: 2-Methoxyethanol California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: 2-Methoxyethanol California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: 2-Methoxyethanol Pennsylvania RTK: Pyridine; 2-Methoxyethanol; Sulfur dioxide; Iodine; Diethanolamine Massachusetts RTK: Pyridine; 2-Methoxyethanol; Sulfur dioxide; Iodine; Diethanolamine TSCA 8(b) inventory: Pyridine; 2- Methoxyethanol; Sulfur dioxide; Iodine; Diethanolamine SARA 313 toxic chemical notification and release reporting: Pyridine; Diethanolamine CERCLA: Hazardous substances.: Pyridine; 2-Methoxyethanol; Sulfur dioxide; Diethanolamine;

Section 15: Other Regulatory Information (Continued)

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
Other Classifications:
WHMIS (Canada): CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).
DSCL (EEC): R41- R11- Highly flammable. R20- Harmful by inhalation. R35- Causes severe burns. R43- May cause sensitization by skin contact.
HMIS (U.S.A.):
Health Hazard: 2
Fire Hazard: 3
Reactivity: 0
Personal Protection:
National Fire Protection Association (U.S.A.):
Health: 2
Flammability: 2
Reactivity: 0
Specific hazard:
Protective Equipment: Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16 - Additional Information

References: Not available.

Other Special Considerations: Not available.

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