

Material Safety Data Sheet

Karl Fischer Reagent

ACC# 40108

Section 1 - Chemical Product and Company Identification

MSDS Name: Karl Fischer Reagent

Catalog Numbers: SK3-1, SK3-4, SK3-500

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
109-86-4	2-Methoxyethanol	52.25	203-713-7
110-86-1	Pyridine	25.40	203-809-9
7553-56-2	Iodine	14.55	231-442-4
7446-09-5	Sulfur dioxide	7.80	231-195-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark brown liquid. Flash Point: 100 deg F.

Danger! Causes eye and skin burns. Corrosive. **Flammable liquid and vapor.** Sensitizer. May be harmful if absorbed through the skin. May cause severe respiratory and digestive tract irritation with possible burns. May form explosive peroxides. May cause central nervous system depression. May cause liver and kidney damage.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye: Causes eye burns. May cause blindness. May cause permanent corneal opacification. May cause chemical conjunctivitis and corneal damage.

Skin: Causes skin burns. May be absorbed through the skin in harmful amounts. May cause cyanosis of the extremities.

Ingestion: Causes gastrointestinal tract burns. May cause kidney damage. May cause liver damage. Ingestion of large amounts may cause CNS depression. May cause nausea, vomiting, and diarrhea, possibly with blood.

Inhalation: Causes chemical burns to the respiratory tract. May cause central nervous system effects including vertigo, anxiety, depression, muscle incoordination, and emotional instability. Exposure produces central nervous system depression. Aspiration may lead to pulmonary edema. Vapors may cause dizziness or suffocation. May cause burning sensation in the chest. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Chronic exposure to organic solvents has been associated with various neurotoxic effects including permanent brain and nervous system damage. Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause liver and kidney damage. May cause fetal effects.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Vaporizes easily at normal temperatures. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Containers may explode in the heat of a fire. Flammable liquid and vapor. May form explosive peroxides. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

Flash Point: 100e deg F (37.78 deg C)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Isolate area and deny entry. Place under an inert atmosphere. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Use only in a chemical fume hood. If peroxide formation is suspected, do not open or move container. Avoid contact with air and sunlight. Keep away from flames and other sources of high temperatures that may cause material to form vapors. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Unused chemicals should not be returned to the container. Do not distill since this removes peroxide-inhibitors.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry place. Do not store in direct sunlight. Store in a tightly closed container. Flammables-area. Regularly check inhibitor levels to maintain peroxide levels below 1%. Keep containers tightly closed. Do not break the seal on the container until it is needed. Label the container with the date it was first opened. Long-term storage is not recommended.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2-Methoxyethanol	5 ppm TWA; skin - potential for cutaneous absorption	0.1 ppm TWA; 0.3 mg/m ³ TWA 200 ppm IDLH	25 ppm TWA; 80 mg/m ³ TWA
Pyridine	1 ppm TWA	5 ppm TWA; 15 mg/m ³ TWA 1000 ppm IDLH	5 ppm TWA; 15 mg/m ³ TWA
Iodine	0.1 ppm Ceiling	2 ppm IDLH	0.1 ppm Ceiling; 1 mg/m ³ Ceiling
Sulfur dioxide	2 ppm TWA; 5 ppm STEL	2 ppm TWA; 5 mg/m ³ TWA 100 ppm IDLH	5 ppm TWA; 13 mg/m ³ TWA

OSHA Vacated PELs: 2-Methoxyethanol: 25 ppm TWA; 80 mg/m³ TWA Pyridine: 5 ppm TWA; 15 mg/m³ TWA Iodine: No OSHA Vacated PELs are listed for this chemical. Sulfur dioxide: 2 ppm TWA; 5 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: dark brown

Odor: disagreeable odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: >1.0

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Soluble.

Specific Gravity/Density:0.93

Molecular Formula:Not applicable.

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable. On long term storage, substances with similar functional groups form explosive peroxides. Explosive peroxides may form on concentration. Peroxides can be detonated by friction, impact, or heating. Tends to form explosive peroxides; especially when anhydrous. Peroxide formation may occur in containers that have been opened and remain in storage.

Conditions to Avoid: High temperatures, incompatible materials, ignition sources, exposure to air, excess heat, strong oxidants.

Incompatibilities with Other Materials: Acid anhydrides, strong acids, strong bases, strong oxidizing agents, water, metal oxides, metals, oils, halogens, interhalogens.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide, hydrogen iodide, iodine.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 109-86-4: KL5775000

CAS# 110-86-1: UR8400000

CAS# 7553-56-2: NN1575000

CAS# 7446-09-5: WS4550000

LD50/LC50:

CAS# 109-86-4:

Draize test, rabbit, eye: 97 mg;

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 483 mg/24H Mild;

Inhalation, mouse: LC50 = 1480 ppm/7H;

Inhalation, rat: LC50 = 1500 ppm/7H;

Oral, mouse: LD50 = 2560 mg/kg;

Oral, mouse: LD50 = 2800 mg/kg;

Oral, rabbit: LD50 = 890 mg/kg;

Oral, rabbit: LD50 = 890 mg/kg;

Oral, rat: LD50 = 2370 mg/kg;

Oral, rat: LD50 = 2460 mg/kg;

Skin, rabbit: LD50 = 1280 mg/kg;

Skin, rabbit: LD50 = 2000 mg/kg;

CAS# 110-86-1:

Dermal, guinea pig: LD50 = 1 gm/kg;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = 28500 mg/m³/1H;

Oral, mouse: LD50 = 1500 mg/kg;

Oral, rat: LD50 = 891 mg/kg;

Skin, rabbit: LD50 = 1121 mg/kg;

CAS# 7553-56-2:

Oral, mouse: LD50 = 22 gm/kg;

Oral, mouse: LD50 = 1000 mg/kg;

Oral, rabbit: LD50 = 10 gm/kg;

Oral, rat: LD50 = 14 gm/kg;

CAS# 7446-09-5:

Draize test, rabbit, eye: 6 ppm/32D Mild;

Inhalation, mouse: LC50 = 3000 ppm/30M;

Inhalation, rat: LC50 = 2520 ppm/1H;

Inhalation, rat: LC50 = 2168 mg/m³;

Carcinogenicity:

CAS# 109-86-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 110-86-1:

ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans

California: carcinogen, initial date 5/17/02 CAS# 7553-56-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7446-09-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: NIOSH recommends that 2-methoxyethanol be regarded as having the potential to cause adverse reproductive effects in workers, including teratogenesis in the offspring of exposed pregnant females.

Teratogenicity: No information found.

Reproductive Effects: CAS# 7553-56-2: Oral, Rat, TDLo=1100 mg/kg, effects on newborn vitality. Oral, Rabbit, TDLo= 15 mg/kg, effects on newborn growth and vitality.

Neurotoxicity: No information found.

Mutagenicity: CAS# 110-86-1: Mutation in microorganisms, Bacteria, Salmonella typhimurium = 6 mmol/l/2H.

Other Studies: CAS# 110-86-1: Standard Draize Test, Skin-Rabbit = 500 mg/24 H (Mild)

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	FLAMMABLE LIQUIDS, N.O.S.	No information available.
Hazard Class:	3	
UN Number:	UN1993	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 109-86-4 is listed on the TSCA inventory.
 CAS# 110-86-1 is listed on the TSCA inventory.
 CAS# 7553-56-2 is listed on the TSCA inventory.
 CAS# 7446-09-5 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 110-86-1: Effective 10/4/82; Sunset 10/4/92

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 110-86-1: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 7446-09-5: 500 lb TPQ

SARA Codes

CAS # 109-86-4: acute, chronic, flammable. CAS # 110-86-1: acute, chronic, flammable. CAS # 7553-56-2: acute, chronic, flammable.
 CAS # 7446-09-5: acute, sudden release of pressure.

Section 313

This material contains 2-Methoxyethanol (CAS# 109-86-4, 52 25%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373. This material contains Pyridine (CAS# 110-86-1, 25 40%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 109-86-4 (listed as Glycol ethers) is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

CAS# 7446-09-5 is considered highly hazardous by OSHA.

STATE

CAS# 109-86-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
 CAS# 110-86-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
 CAS# 7553-56-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
 CAS# 7446-09-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains 2-Methoxyethanol, a chemical known to the state of California to cause male reproductive toxicity.
 WARNING: This product contains Pyridine, a chemical known to the state of California to cause cancer. WARNING: This product contains 2-Methoxyethanol, a chemical known to the state of California to cause developmental reproductive toxicity.
 California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 10 Flammable.
 R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
 R 60 May impair fertility.
 R 61 May cause harm to the unborn child.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
 S 28 After contact with skin, wash immediately with...
 S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
 S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)

CAS# 109-86-4: 1

CAS# 110-86-1: 2

CAS# 7553-56-2: 1

CAS# 7446-09-5: 1

Canada - DSL/NDSL

CAS# 109-86-4 is listed on Canada's DSL List.

CAS# 110-86-1 is listed on Canada's DSL List.

CAS# 7553-56-2 is listed on Canada's DSL List.

CAS# 7446-09-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B3, E.

Canadian Ingredient Disclosure List

CAS# 109-86-4 is listed on the Canadian Ingredient Disclosure List.

CAS# 110-86-1 is listed on the Canadian Ingredient Disclosure List.

CAS# 7553-56-2 is listed on the Canadian Ingredient Disclosure List.

CAS# 7446-09-5 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information**MSDS Creation Date:** 12/12/1997**Revision #8 Date:** 7/23/2002

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.