Printing date 05/15/2024 Reviewed on 05/15/2024

1 Identification

· Product identifier

· Trade name: Karl Fischer Reagent

Single Stable

· Article number: K3000

· Details of the supplier of the safety data sheet

· Manufacturer/Supplier: Aqua Solutions, Inc. 6913 Highway 225 DEER PARK, TX 77536 USA 800-256-2586

· Information department:

Technical Coordinator

Sherman Nelson shermann@aquasolutions.org

Technical Coordinator

Sherman Nelson shermann@aquasolutions.org

Emergency telephone number: Chemtrec: 800-424-9300 Canutec: 613-996-6666



2 Hazard(s) identification

· Classification of the substance or mixture



GHS02 Flame

Flammable Liquids 3 H226 Flammable liquid and vapor.



GHS06 Skull and crossbones

Acute Toxicity - Inhalation 3 H331 Toxic if inhaled.



GHS08 Health hazard

Carcinogenicity 2 H351 Suspected of causing cancer.

Toxic to Reproduction 1B H360 May damage fertility or the unborn child.

Specific Target Organ Toxicity - Repeated Exposure 1 H372 Causes damage to organs through prolonged or repeated exposure.



GHS05 Corrosion

Skin Corrosion 1A H314 Causes severe skin burns and eye damage.

Eye Damage 1 H318 Causes serious eye damage.



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Acute Toxicity - Oral 4

H302 Harmful if swallowed.

Acute Toxicity - Dermal 4

H312 Harmful in contact with skin.

- · Label elements
- · GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
- · Hazard pictograms









GHS05

GHS06

- · Signal word Danger
- · Hazard-determining components of labeling:

Ethylene Glycol Monomethyl Ether

Iodine *DEA regulated item

Pyridine

Sulfur Dioxide

· Hazard statements

Flammable liquid and vapor.

Harmful if swallowed or in contact with skin.

Toxic if inhaled.

Causes severe skin burns and eye damage.

Suspected of causing cancer.

May damage fertility or the unborn child.

Causes damage to organs through prolonged or repeated exposure.

· Precautionary statements

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dusts or mists.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

If swallowed: Call a poison center/doctor if you feel unwell.

If swallowed: Rinse mouth. Do NOT induce vomiting.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a poison center/doctor.

IF exposed or concerned: Get medical advice/attention.

Specific treatment (see on this label).

Get medical advice/attention if you feel unwell.

Take off contaminated clothing and wash it before reuse.

Wash contaminated clothing before reuse.

In case of fire: Use CO2, powder or water spray to extinguish.

Store in a well-ventilated place. Keep container tightly closed.

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Trade name: Karl Fischer Reagent Single Stable

(Contd. of page 2)

Store in a well-ventilated place. Keep cool.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

- · Classification system:
- · NFPA ratings (scale 0 4)



Health = 2Fire = 2

Reactivity = 0

· HMIS-ratings (scale 0 - 4)



2 Health = 2Fire = 2

- · Other hazards
- · Results of PBT and vPvB assessment
- · **PBT**: Not applicable.
- · vPvB: Not applicable.

3 Composition/information on ingredients

- · Chemical characterization: Mixtures
- · Description: Mixture of the substances listed below with nonhazardous additions.

	· Dangerous components:		
Ethyl		Ethylene Glycol Monomethyl Ether	56.5%
	CAS: 110-86-1	Pyridine	23.0%
	CAS: 7553-56-2	Iodine *DEA regulated item	12.5%
	CAS: 7446-09-5	Sulfur Dioxide	8.0%

4 First-aid measures

- · Description of first aid measures
- · General information:

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours

Remove breathing apparatus only after contaminated clothing have been completely removed.

In case of irregular breathing or respiratory arrest provide artificial respiration.

· After inhalation:

Supply fresh air or oxygen; call for doctor.

In case of unconsciousness place patient stably in side position for transportation.

- · After skin contact: Immediately wash with water and soap and rinse thoroughly.
- · After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- · After swallowing:

Immediately call a doctor.

Drink copious amounts of water and provide fresh air. Immediately call a doctor.

- · Information for doctor:
- · Most important symptoms and effects, both acute and delayed No further relevant information available.

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(Contd. of page 3)

· Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- · Extinguishing media
- · Suitable extinguishing agents:

CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

· Special hazards arising from the substance or mixture

During heating or in case of fire poisonous gases are produced.

- · Advice for firefighters
- · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures

Mount respiratory protective device.

Wear protective equipment. Keep unprotected persons away.

· Environmental precautions:

Do not allow product to reach sewage system or any water course.

Inform respective authorities in case of seepage into water course or sewage system.

Dilute with plenty of water.

Do not allow to enter sewers/ surface or ground water.

· Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Use neutralizing agent.

Dispose contaminated material as waste according to section 13.

Ensure adequate ventilation.

· Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

· Protective Action Criteria for Chemicals

PAC-1:		
	Ethylene Glycol Monomethyl Ether	0.3 ppm
CAS: 110-86-1	Pyridine	<i>3 ppm</i>
CAS: 7553-56-2	Iodine *DEA regulated item	0.1 ppm
CAS: 7446-09-5	Sulfur Dioxide	0.20 ppn
PAC-2:		
	Ethylene Glycol Monomethyl Ether	14 ppm
CAS: 110-86-1	Pyridine	19 ppm
CAS: 7553-56-2	Iodine *DEA regulated item	0.5 ppm
CAS: 7446-09-5	Sulfur Dioxide	0.75 ppr
PAC-3:		
	Ethylene Glycol Monomethyl Ether	2000* ppn
CAS: 110-86-1	Pyridine	3600* ppr
CAS: 7553-56-2	Iodine *DEA regulated item	5 ppm

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 CAS: 7446-09-5
 Sulfur Dioxide
 (Contd. of page 4)

 30 ppm

7 Handling and storage

- · Handling:
- · Precautions for safe handling

Ensure good ventilation/exhaustion at the workplace.

Open and handle receptacle with care.

Prevent formation of aerosols.

· Information about protection against explosions and fires:

Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

Keep respiratory protective device available.

- · Conditions for safe storage, including any incompatibilities
- · Storage:
- · Requirements to be met by storerooms and receptacles: No special requirements.
- · Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- · Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- · Additional information about design of technical systems: No further data; see section 7.
- · Control parameters

· Control parameters					
· Components with limit values that require monitoring at the workplace:					
Ethyler	ne Glycol Monomethyl Ether				
PEL	PEL Long-term value: 80 mg/m³, 25 ppm Skin				
REL	Long-term value: 0.3 mg/m³, 0.1 ppm Skin				
TLV Long-term value: 0.1 ppm Skin; BEI					
WEEL	Skin; B				
CAS: 1	110-86-1 Pyridine				
PEL	Long-term value: 15 mg/m³, 5 ppm				
REL	Long-term value: 15 mg/m³, 5 ppm				
TLV	Long-term value: 1 ppm				
	A3				
CAS: 7	CAS: 7553-56-2 Iodine *DEA regulated item				
PEL	PEL Ceiling limit value: 1 mg/m³, 0.1 ppm				
REL	Ceiling limit value: 1 mg/m³, 0.1 ppm				
TLV	TLV Long-term value: 0.01* mg/m³, 0.01* ppm *inh. fraction+vapor; Skin, A4				

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CAS: 7446-09-5 Sulfur Dioxide

PEL Long-term value: 13 mg/m³, 5 ppm

REL Short-term value: 13 mg/m³, 5 ppm

Long-term value: 5 mg/m³, 2 ppm

TLV Short-term value: 0.25 ppm

A4

· Ingredients with biological limit values:

Ethylene Glycol Monomethyl Ether

BEI 1 mg/g creatinine

LD50 Intraperitoneal: urine

Time: end of shift at end of workweek

LD50: 2-Methoxyacetic acid

- · Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- · General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

· Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· Eye protection:



Tightly sealed goggles

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· Body protection: Protective work clothing

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Information on basic physical and c	hemical properties
General Information	
Appearance:	
Form:	Liquid
Color:	Dark brown
Odor: Odor threshold:	Pungent Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	-10 °C (14 °F)
Flash point:	38 °C (100.4 °F)
Flammability (solid, gaseous):	Flammable.
Auto igniting:	310 °C (590 °F)
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product is not explosive. However, formation of explosive air/vape mixtures are possible.
Explosion limits:	
Lower:	1.7 Vol %
Upper:	20.6 Vol %
Vapor pressure at 20 $^{\circ}C$ (68 $^{\circ}F$):	20 hPa (15 mm Hg)
Density at 20 °C (68 °F):	0.93 g/cm³ (7.76085 lbs/gal)
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.
Partition coefficient (n-octanol/wate	er): Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Solvent content:	
Organic solvents:	56.5 %
VOC content:	56.50 %
	525.5 g/l / 4.39 lb/gal
Solids content:	12.5 %

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· Other information

No further relevant information available.

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- · Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- · Information on toxicological effects
- · Acute toxicity:

· LD/LC50	· LD/LC50 values that are relevant for classification:		
ATE (Acua	ATE (Acute Toxicity Estimate)		
Oral	LD50	543 mg/kg	
Dermal	LD50	1,196 mg/kg	
Inhalative	LC50/4h	6.42 mg/l	

- · Primary irritant effect:
- · on the skin: Strong caustic effect on skin and mucous membranes.
- · on the eye:

Strong caustic effect.

Strong irritant with the danger of severe eye injury.

- · Sensitization: No sensitizing effects known.
- · Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations: Toxic

Harmful

Corrosive

Irritant

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

· Carcinogenic categories

· IARC (International Agency for Research on Cancer)	
CAS: 110-86-1 Pyridine	2B
CAS: 7446-09-5 Sulfur Dioxide	3
· NTP (National Toxicology Program)	
None of the ingredients is listed.	
· OSHA-Ca (Occupational Safety & Health Administration)	
None of the ingredients is listed.	

US

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12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- · Persistence and degradability No further relevant information available.
- · Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- · Mobility in soil No further relevant information available.
- · Additional ecological information:
- · General notes:

Water hazard class 2 (Self-assessment): hazardous for water

Do not allow product to reach ground water, water course or sewage system.

 ${\it Must not reach bodies of water or drainage ditch undiluted or unneutralized.}$

Danger to drinking water if even small quantities leak into the ground.

- · Results of PBT and vPvB assessment
- · **PBT**: Not applicable.
- · vPvB: Not applicable.
- · Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- · Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

7	100		•	C .	
12	91	ransport		mma	រលោក

· UN-Number	
· DOT, IMDG, IATA	UN1993

· UN proper shipping name

Flammable liquids, n.o.s. (Pyridine, Ethylene Glycol Monomethyl

· IMDG, IATA FLAMMABLE LIQUID, N.O.S. (Pyridine, Ethylene Glycol Monomethyl Ether)

- · Transport hazard class(es)
- $\cdot DOT$



Class 3 Flammable liquids

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	(Contd. of page
Label	3
IMDG, IATA	
<u>w</u>	
3	
Class	3 Flammable liquids
Label	3
Packing group	
DOT, IMDG, IATA	III
Environmental hazards:	
Marine pollutant:	No
Special precautions for user	Warning: Flammable liquids
Hazard identification number (Kemler code)	
EMS Number: Stowage Category	F-E, <u>S-E</u> A
	П
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
	To appricate.
Transport/Additional information:	
DOT Quantity limitations	On passenger aircraft/rail: 5 L
Quantity timuations	On cargo aircraft only: 60 L
IMDG	
Limited quantities (LQ)	1L
Excepted quantities (EQ)	Code: E2
	Maximum net quantity per inner packaging: 30 ml
	Maximum net quantity per outer packaging: 500 ml
UN "Model Regulation":	UN 1993 FLAMMABLE LIQUID, N.O.S. (PYRIDIN
	ETHYLENE GLYCOL MONOMETHYL ETHER), 3, III

15 Regulatory information

Iodine *DEA regulated item

- $\cdot \textit{Safety, health and environmental regulations/legislation specific for the substance or \textit{mixture}}$ No further relevant information available.

· Sara				
· Section 355 (extremely hazardous substances):				
CAS: 7446-09-3	Sulfur Dioxide			
· Section 313 (Sp	ecific toxic chemical listings):			
	Ethylene Glycol Monomethyl Ether			
CAS: 110-86-1	Pyridine			
· TSCA (Toxic S	ubstances Control Act):			
Ethylene Glyco	Monomethyl Ether	ACTIVE		
Pyridine		ACTIVE		

(Contd. on page 11)

ACTIVE

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Sulfur Dioxide		(Contd. of page 10) ACTIVE
· Hazardous Air F	Pollutants	
None of the ingredients is listed.		
· Proposition 65		
· Chemicals know	n to cause cancer:	
CAS: 110-86-1	Pyridine	
· Chemicals know	n to cause reproductive toxicity for females:	
None of the ingre	edients is listed.	
· Chemicals know	n to cause reproductive toxicity for males:	
Ethylene Glycol	Monomethyl Ether	
· Chemicals know	· Chemicals known to cause developmental toxicity:	
	Ethylene Glycol Monomethyl Ether	
CAS: 7446-09-5	Sulfur Dioxide	
· Carcinogenic ca	tegories	
· EPA (Environm	ental Protection Agency)	
None of the ingre	edients is listed.	
· TLV (Threshold Limit Value)		
CAS: 110-86-1	Pyridine	A3
CAS: 7553-56-2	Iodine *DEA regulated item	A4
CAS: 7446-09-5	Sulfur Dioxide	A4
· NIOSH-Ca (Nat	ional Institute for Occupational Safety and Health)	

- · GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
- · Hazard pictograms





None of the ingredients is listed.





GHS02

GHS05

GHS06

GHS08

· Signal word Danger

· Hazard-determining components of labeling:

Ethylene Glycol Monomethyl Ether

Iodine *DEA regulated item

Pyridine

Sulfur Dioxide

· Hazard statements

Flammable liquid and vapor.

Harmful if swallowed or in contact with skin.

Toxic if inhaled.

Causes severe skin burns and eye damage.

Suspected of causing cancer.

May damage fertility or the unborn child.

Causes damage to organs through prolonged or repeated exposure.

· Precautionary statements

Obtain special instructions before use.

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Do not handle until all safety precautions have been read and understood.

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dusts or mists.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

If swallowed: Call a poison center/doctor if you feel unwell.

If swallowed: Rinse mouth. Do NOT induce vomiting.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a poison center/doctor.

IF exposed or concerned: Get medical advice/attention.

Specific treatment (see on this label).

Get medical advice/attention if you feel unwell.

Take off contaminated clothing and wash it before reuse.

Wash contaminated clothing before reuse.

In case of fire: Use CO2, powder or water spray to extinguish.

Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- · Department issuing SDS: Environment protection department.
- · Contact:

Date of Preparation / Last Revision:

· Date of preparation / last revision

Revision 1.2, 05/15/2024: Reviewed SDS for accuracy. MH/STN

Creation date for SDS 07-24-2018. STN

05/15/2024

· Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA)

VOC: Volatile Organic Compounds (USA, EU)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative

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NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit

Flammable Liquids 3: Flammable liquids – Category 3
Acute Toxicity - Oral 4: Acute toxicity – Category 4
Acute Toxicity - Inhalation 3: Acute toxicity – Category 3
Skin Corrosion 1A: Skin corrosion/irritation – Category 1A
Eye Damage 1: Serious eye damage/eye irritation – Category 1

Carcinogenicity 2: Carcinogenicity – Category 2

Toxic to Reproduction 1B: Reproductive toxicity – Category 1B

Specific Target Organ Toxicity - Repeated Exposure 1: Specific target organ toxicity (repeated exposure) – Category 1

* Data compared to the previous version altered.

TIC