Printing date 06/03/2024 Reviewed on 06/03/2024

1 Identification

· Product identifier

· Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

· Article number: UC016

· Details of the supplier of the safety data sheet

· Manufacturer/Supplier: Aqua Solutions, Inc. 6913 Highway 225 DEER PARK, TX 77536 USA800-256-2586

· Information department:

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 2

H225 Highly flammable liquid and vapor.



GHS06 Skull and crossbones

Acute Toxicity - Oral 3 H301 Toxic if swallowed.

Acute Toxicity - Dermal 3 H311 Toxic in contact with skin.

Acute Toxicity - Inhalation 3 H331 Toxic if inhaled.



GHS08 Health hazard

H351 Suspected of causing cancer. Carcinogenicity 2

Specific Target Organ Toxicity - Single Exposure 1 H370 Causes damage to the central nervous system and

the visual organs.

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.

H318 Causes serious eye damage. Eye Damage 1

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





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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(Contd. of page 1)

· Hazard pictograms









GHS02

GHS05 GHS06

· Signal word Danger

· Hazard-determining components of labeling:

Methanol

Iodine *DEA regulated item

Pyridine

Sulfur Dioxide

· Hazard statements

Highly flammable liquid and vapor.

Toxic if swallowed, in contact with skin or if inhaled.

Causes severe skin burns and eye damage.

Suspected of causing cancer.

Causes damage to the central nervous system and the visual organs.

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: Immediately call a poison center/doctor.

Specific treatment (see on this label).

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.

IF exposed or concerned: Get medical advice/attention.

Call a poison center/doctor if you feel unwell.

Get medical advice/attention if you feel unwell.

Take off immediately all contaminated clothing and wash it 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.

(Contd. on page 3)

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(Contd. of page 2)

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



Health = 3 Fire = 3Reactivity = 0

· HMIS-ratings (scale 0 - 4)



- · 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:					
CAS: 67-56-1	Methanol	73.526%			
CAS: 110-86-1	Pyridine	14.645%			
CAS: 7553-56-2	Iodine *DEA regulated item	7.041%			
CAS: 7446-09-5	Sulfur Dioxide	4.788%			

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 after the accident.

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:

Do not induce vomiting; immediately call for medical help.

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.

(Contd. on page 4)

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(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.

- · For safety reasons unsuitable extinguishing agents: Water with full jet
- · 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.

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

530 ppm
3 ррт
0.1 ppm
0.20 ppm
2,100 ppm
19 ppm
0.5 ppm
0.75 ppm
7200* ppm
3600* ppm
5 ppm

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

 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: Store in a cool location.
- · Information about storage in one common storage facility: Not required.
- · Further information about storage conditions:

Keep receptacle tightly sealed.

Store in cool, dry conditions in well sealed receptacles.

· Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

TLV Long-term value: 0.01* mg/m³, 0.01* ppm *inh. fraction+vapor; Skin, A4

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

· Cont	rol parameters				
· Com	· Components with limit values that require monitoring at the workplace:				
CAS:	67-56-1 Methanol				
PEL	Long-term value: 260 mg/m³, 200 ppm				
REL	Short-term value: 325 mg/m³, 250 ppm Long-term value: 260 mg/m³, 200 ppm Skin				
TLV	Short-term value: 250 ppm Long-term value: 200 ppm Skin; BEI				
CAS:	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:	7553-56-2 Iodine *DEA regulated item				
PEL	Ceiling limit value: 1 mg/m³, 0.1 ppm				
REL	Ceiling limit value: 1 mg/m³, 0.1 ppm				

(Contd. on page 6)

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(Contd. of page 5)

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:

CAS: 67-56-1 Methanol

BEI 15 mg/L

LD50 Intraperitoneal: urine

Time: end of shift

LD50: Methanol (background, nonspecific)

- · 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

(Contd. on page 7)

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

· Body protection: Protective work clothing

(Contd. of page 6)

Information on basic physical and c	hemical properties
General Information	nemeat properties
Appearance:	
Form:	Liquid
Color:	Dark brown
Odor:	Pyridine-sulfur
Odor threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	64 °C (147.2 °F)
Flash point:	11 °C (51.8 °F)
Flammability (solid, gaseous):	Highly flammable.
Auto igniting:	455 °C (851 °F)
Decomposition temperature:	Not determined.
Ignition temperature:	Product is not selfigniting.
Danger of explosion:	Product is not explosive. However, formation of explosive air/vap mixtures are possible.
Explosion limits:	
Lower:	1.7 Vol %
Upper:	44 Vol %
Vapor pressure at 20 °C (68 °F):	128 hPa (96 mm Hg)
Density at 20 °C (68 °F):	$0.88766 \ g/cm^3 \ (7.40752 \ lbs/gal)$
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Not miscible or difficult to mix.
Partition coefficient (n-octanol/wate	r): Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Solvent content:	
Organic solvents:	73.5 %
VOC content:	73.53 %
	652.7 g/l / 5.45 lb/gal
Solids content:	7.0 %

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(Contd. of page 7)

· 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	128 mg/kg				
Dermal	LD50	378 mg/kg				
Inhalative	LC50/4h	3.27 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

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	2 <i>B</i>
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.	

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(Contd. of page 8)

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.

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.

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· UN-Number	
· DOT, IMDG, IATA	UN1992

· UN proper shipping name

**POT Flammable liquids, toxic, n.o.s. (Methanol, Pyridine, Sulfur Dioxide)

• IMDG, IATA FLAMMABLE LIQUID, TOXIC, N.O.S. (Methanol, Pyridine, Sulfur Dioxide)

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



· Class 3 Flammable liquids

(Contd. on page 10)

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(Contd. of page 9) · Label 3, 6.1 \cdot *IMDG* · Class 3 Flammable liquids · Label 3/6.1 \cdot IATA · Class 3 Flammable liquids · Label 3 (6.1) · Packing group · DOT, IMDG, IATA II· Environmental hazards: · Marine pollutant: No · Special precautions for user Warning: Flammable liquids · Hazard identification number (Kemler code): 30 · EMS Number: F-E,S-D· Stowage Category · Stowage Code SW2 Clear of living quarters. · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable. · UN "Model Regulation": UN 1992 FLAMMABLE LIQUID, TOXIC, N.O.S. (METHANOL, PYRIDINE, SULFUR DIOXIDE), 3 (6.1), II

15 Regulatory information

· Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

No further relev • Sara	vant information available.					
· Section 355 (ex	· Section 355 (extremely hazardous substances):					
CAS: 7446-09	5 Sulfur Dioxide					
· Section 313 (S _I	pecific toxic chemical listings):					
CAS: 67-56-1	Methanol					
CAS: 110-86-1	Pyridine					
· TSCA (Toxic S	ubstances Control Act):					
Methanol		ACTIVE				
Pyridine		ACTIVE				
Iodine *DEA re	egulated item	ACTIVE				
Sulfur Dioxide		ACTIVE				

(Contd. on page 11)

Printing date 06/03/2024 Reviewed on 06/03/2024

Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(Contd. of page 10)

· Hazardous Air Pollutants

CAS: 67-56-1 Methanol

· Proposition 65

· Chemicals known to cause cancer:

CAS: 110-86-1 Pyridine

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

CAS: 67-56-1 Methanol
CAS: 7446-09-5 Sulfur Dioxide

· Carcinogenic categories

· EPA (Environmental Protection Agency)

None of the ingredients 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 (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

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









GHS02

GHS05

GHS06

· Signal word Danger

· Hazard-determining components of labeling:

Methanol

Iodine *DEA regulated item

Pyridine

Sulfur Dioxide

· Hazard statements

Highly flammable liquid and vapor.

Toxic if swallowed, in contact with skin or if inhaled.

Causes severe skin burns and eye damage.

Suspected of causing cancer.

Causes damage to the central nervous system and the visual organs.

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.

(Contd. on page 12)

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(Contd. of page 11)

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: Immediately call a poison center/doctor.

Specific treatment (see on this label).

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.

IF exposed or concerned: Get medical advice/attention.

Call a poison center/doctor if you feel unwell.

Get medical advice/attention if you feel unwell.

Take off immediately all contaminated clothing and wash it 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, 06/03/2024: Reviewed SDS for accuracy. MH/STN

Creation date for SDS 12-18-2014. STN

06/03/2024

· Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

 ${\it IATA: International Air Transport Association}$

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

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

(Contd. on page 13)

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Trade name: Sulfur Dioxide-Iodine (Karl Fischer Reagent)

(Contd. of page 12)

BEI: Biological Exposure Limit

Flammable Liquids 2: Flammable liquids – Category 2
Acute Toxicity - Oral 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

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

* Data compared to the previous version altered.

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