

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

## 1 Identification

- **Product identifier**
- **Trade name:** Karl Fischer Reagent  
2 mg/ml
- **Article number:** SYN017
- **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 sherman@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

Flam. Liq. 2 H225 Highly flammable liquid and vapor.



GHS08 Health hazard

STOT SE 1 H370 Causes damage to organs.

STOT RE 1 H372 Causes damage to organs through prolonged or repeated exposure.



GHS05 Corrosion

Eye Dam. 1 H318 Causes serious eye damage.



GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Skin Irrit. 2 H315 Causes skin irritation.

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

(Contd. on page 2)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 1)

· **Hazard pictograms**



GHS02   GHS05   GHS07   GHS08

· **Signal word** *Danger*

· **Hazard-determining components of labeling:**

*Methanol (Methyl Alcohol)*  
*Sulfur Dioxide*  
*Iodine \*DEA regulated item*  
*Pyridine*

· **Hazard statements**

*Highly flammable liquid and vapor.*  
*Harmful if swallowed.*  
*Causes skin irritation.*  
*Causes serious eye damage.*  
*Causes damage to organs.*  
*Causes damage to organs through prolonged or repeated exposure.*

· **Precautionary statements**

*Keep away from heat/sparks/open flames/hot surfaces. - No smoking.*  
*Keep container tightly closed.*  
*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 dust/fume/gas/mist/vapors/spray.*  
*Wash thoroughly after handling.*  
*Do not eat, drink or smoke when using this product.*  
*Wear protective gloves/protective clothing/eye protection/face protection.*  
*If swallowed: Call a poison center/doctor if you feel unwell.*  
*If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.*  
*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.*  
*Get medical advice/attention if you feel unwell.*  
*Specific treatment (see on this label).*  
*Rinse mouth.*  
*If skin irritation occurs: Get medical advice/attention.*  
*Take off contaminated clothing and wash it before reuse.*  
*In case of fire: Use for extinction: CO2, powder or water spray.*  
*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 = 3*  
*Fire = 3*  
*Reactivity = 0*

(Contd. on page 3)

US

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 2)

· **HMIS-ratings (scale 0 - 4)**

HEALTH	3	Health = 3
FIRE	3	Fire = 3
REACTIVITY	1	Reactivity = 1

- **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 (Methyl Alcohol)	73.777%
CAS: 110-86-1	Pyridine	14.388%
CAS: 7553-56-2	Iodine *DEA regulated item	7.045%
CAS: 7446-09-5	Sulfur Dioxide	4.79%

### 4 First-aid measures

- **Description of first aid measures**
- **General information:**  
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:** 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.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**  
No further relevant information available.

### 5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, 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** No further relevant information available.
- **Advice for firefighters**
- **Protective equipment:** No special measures required.

US

(Contd. on page 4)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 3)

## 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.

- **Environmental precautions: 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 item 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:**

CAS: 67-56-1	Methanol (Methyl Alcohol)	530 ppm
CAS: 110-86-1	Pyridine	3 ppm
CAS: 7553-56-2	Iodine *DEA regulated item	0.1 ppm
CAS: 7446-09-5	Sulfur Dioxide	0.20 ppm

- **PAC-2:**

CAS: 67-56-1	Methanol (Methyl Alcohol)	2,100 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 ppm

- **PAC-3:**

CAS: 67-56-1	Methanol (Methyl Alcohol)	7200* ppm
CAS: 110-86-1	Pyridine	3600* ppm
CAS: 7553-56-2	Iodine *DEA regulated item	5 ppm
CAS: 7446-09-5	Sulfur Dioxide	30 ppm

## 7 Handling and storage

- **Handling:**

- **Precautions for safe handling** No special precautions are necessary if used correctly.

- **Information about protection against explosions and fires:**

Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

- **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.

(Contd. on page 5)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 4)

· **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 item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

**CAS: 67-56-1 Methanol (Methyl Alcohol)**

PEL Long-term value: 260 mg/m<sup>3</sup>, 200 ppm

REL Short-term value: 325 mg/m<sup>3</sup>, 250 ppm

Long-term value: 260 mg/m<sup>3</sup>, 200 ppm

Skin

TLV Short-term value: 328 mg/m<sup>3</sup>, 250 ppm

Long-term value: 262 mg/m<sup>3</sup>, 200 ppm

Skin; BEI

**CAS: 110-86-1 Pyridine**

PEL Long-term value: 15 mg/m<sup>3</sup>, 5 ppm

REL Long-term value: 15 mg/m<sup>3</sup>, 5 ppm

TLV Long-term value: 3.1 mg/m<sup>3</sup>, 1 ppm

**CAS: 7553-56-2 Iodine \*DEA regulated item**

PEL Ceiling limit value: 1 mg/m<sup>3</sup>, 0.1 ppm

REL Ceiling limit value: 1 mg/m<sup>3</sup>, 0.1 ppm

TLV Short-term value: 1 mg/m<sup>3</sup>, 0.1\*\* ppm

Long-term value: 0.1\* mg/m<sup>3</sup>, 0.01\* ppm

\*as inhalable fraction and vapor; \*\*vapor

**CAS: 7446-09-5 Sulfur Dioxide**

PEL Long-term value: 13 mg/m<sup>3</sup>, 5 ppm

REL Short-term value: 13 mg/m<sup>3</sup>, 5 ppm

Long-term value: 5 mg/m<sup>3</sup>, 2 ppm

TLV Short-term value: 0.65 mg/m<sup>3</sup>, 0.25 ppm

· **Ingredients with biological limit values:**

**CAS: 67-56-1 Methanol (Methyl Alcohol)**

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 skin.

Avoid contact with the eyes and skin.

(Contd. on page 6)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 5)

· **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

· **Body protection:** Protective work clothing

## 9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

<b>Form:</b>	Liquid
<b>Color:</b>	Dark brown
<b>Odor:</b>	Pyridine- Sulfur
<b>Odor threshold:</b>	Not determined.

· **pH-value:** Not determined.

· **Change in condition**

<b>Melting point/Melting range:</b>	Undetermined.
<b>Boiling point/Boiling range:</b>	64 °C (147.2 °F)

· **Flash point:** 11 °C (51.8 °F)

· **Flammability (solid, gaseous):** Not applicable.

· **Ignition temperature:** 455 °C (851 °F)

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Product is not selfigniting.

· **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

(Contd. on page 7)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 6)

<b>· Explosion limits:</b>	
<b>Lower:</b>	1.7 Vol %
<b>Upper:</b>	44 Vol %
<b>· Vapor pressure at 20 °C (68 °F):</b> 128 hPa (96 mm Hg)	
<b>· Density at 20 °C (68 °F):</b> 0.88719 g/cm <sup>3</sup> (7.4036 lbs/gal)	
<b>· Relative density</b> Not determined.	
<b>· Vapor density</b> Not determined.	
<b>· Evaporation rate</b> Not determined.	
<b>· Solubility in / Miscibility with Water:</b> Not miscible or difficult to mix.	
<b>· Partition coefficient (n-octanol/water):</b> Not determined.	
<b>· Viscosity:</b>	
<b>Dynamic:</b>	Not determined.
<b>Kinematic:</b>	Not determined.
<b>· Solvent content:</b>	
<b>Organic solvents:</b>	73.8 %
<b>VOC content:</b>	73.78 %
	654.5 g/l / 5.46 lb/gl
<b>· Solids content:</b> 7.0 %	
<b>· Other information</b> 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 values that are relevant for classification:**

### ATE (Acute Toxicity Estimate)

Oral	LD50	1,277-2,337 mg/kg (rat)
Dermal	LD50	5,198 mg/kg
Inhalative	LC50/4 h	24.3 mg/l

### CAS: 67-56-1 Methanol (Methyl Alcohol)

Oral	LD50	100 mg/kg (ATE)
Dermal	LD50	300 mg/kg (ATE)

(Contd. on page 8)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 7)

Inhalative	LC50/4 h	3 mg/l (ATE)
<b>CAS: 110-86-1 Pyridine</b>		
Oral	LD50	500 mg/kg (ATE)
Dermal	LD50	1,100 mg/kg (ATE)
Inhalative	LC50/4 h	11 mg/l (ATE)
<b>CAS: 7446-09-5 Sulfur Dioxide</b>		
Inhalative	LC50/4 h	3 mg/l (ATE)

· **Primary irritant effect:**

- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** 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:  
Harmful  
Irritant

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

CAS: 110-86-1	Pyridine	3
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.

## 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.

US

(Contd. on page 9)



# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 8)

## 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.

## 14 Transport information

<ul style="list-style-type: none"> <li>· <b>UN-Number</b></li> <li>· <b>DOT, IMDG, IATA</b></li> </ul>	UN1992
<ul style="list-style-type: none"> <li>· <b>UN proper shipping name</b></li> <li>· <b>DOT</b></li> <li>· <b>IMDG, IATA</b></li> </ul>	Flammable liquids, toxic, n.o.s. (Methanol, Pyridine, Sulfur dioxide) <b>FLAMMABLE LIQUID, TOXIC, N.O.S. (METHANOL, PYRIDINE, SULPHUR DIOXIDE)</b>
<ul style="list-style-type: none"> <li>· <b>Transport hazard class(es)</b></li> <li>· <b>DOT</b></li> </ul>	
<ul style="list-style-type: none"> <li>· <b>Class</b></li> <li>· <b>Label</b></li> </ul>	3 Flammable liquids 3,6.1
<ul style="list-style-type: none"> <li>· <b>IMDG, IATA</b></li> </ul>	
<ul style="list-style-type: none"> <li>· <b>Label</b></li> </ul>	3,6.1
<ul style="list-style-type: none"> <li>· <b>Packing group</b></li> <li>· <b>DOT, IMDG, IATA</b></li> </ul>	II
<ul style="list-style-type: none"> <li>· <b>Environmental hazards:</b></li> <li>· <b>Marine pollutant:</b></li> </ul>	No
<ul style="list-style-type: none"> <li>· <b>Special precautions for user</b></li> <li>· <b>Danger code (Kemler):</b></li> <li>· <b>EMS Number:</b></li> <li>· <b>Stowage Category</b></li> <li>· <b>Stowage Code</b></li> </ul>	Warning: Flammable liquids 330 F-E,S-D B SW2 Clear of living quarters.
<ul style="list-style-type: none"> <li>· <b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b></li> </ul>	Not applicable.

(Contd. on page 10)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 9)

· **UN "Model Regulation":** UN 1992 FLAMMABLE LIQUIDS, 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**
- **Sara**

- **Section 355 (extremely hazardous substances):**

CAS: 7446-09-5	Sulfur Dioxide
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- **Section 313 (Specific toxic chemical listings):**

CAS: 67-56-1	Methanol (Methyl Alcohol)
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CAS: 110-86-1	Pyridine
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- **TSCA (Toxic Substances Control Act):**

Methanol (Methyl Alcohol)
---------------------------

Pyridine
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Iodine *DEA regulated item
----------------------------

Sulfur Dioxide
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- **Proposition 65**

- **Chemicals known to cause cancer:**

CAS: 110-86-1	Pyridine
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- **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.
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- **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.
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- **Chemicals known to cause developmental toxicity:**

CAS: 67-56-1	Methanol (Methyl Alcohol)
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CAS: 7446-09-5	Sulfur Dioxide
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- **Carcinogenic categories**

- **EPA (Environmental Protection Agency)**

None of the ingredients is listed.
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- **TLV (Threshold Limit Value established by ACGIH)**

CAS: 110-86-1	Pyridine	
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A3

CAS: 7553-56-2	Iodine *DEA regulated item	
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A4

CAS: 7446-09-5	Sulfur Dioxide	
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A4

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.
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- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

(Contd. on page 11)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

Reviewed on 01/08/2018

**Trade name: Karl Fischer Reagent**  
2 mg/ml

(Contd. of page 10)

· **Hazard pictograms**



GHS02   GHS05   GHS07   GHS08

· **Signal word** *Danger*

· **Hazard-determining components of labeling:**

*Methanol (Methyl Alcohol)*  
*Sulfur Dioxide*  
*Iodine \*DEA regulated item*  
*Pyridine*

· **Hazard statements**

*Highly flammable liquid and vapor.*  
*Harmful if swallowed.*  
*Causes skin irritation.*  
*Causes serious eye damage.*  
*Causes damage to organs.*  
*Causes damage to organs through prolonged or repeated exposure.*

· **Precautionary statements**

*Keep away from heat/sparks/open flames/hot surfaces. - No smoking.*  
*Keep container tightly closed.*  
*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 dust/fume/gas/mist/vapors/spray.*  
*Wash thoroughly after handling.*  
*Do not eat, drink or smoke when using this product.*  
*Wear protective gloves/protective clothing/eye protection/face protection.*  
*If swallowed: Call a poison center/doctor if you feel unwell.*  
*If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.*  
*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.*  
*Get medical advice/attention if you feel unwell.*  
*Specific treatment (see on this label).*  
*Rinse mouth.*  
*If skin irritation occurs: Get medical advice/attention.*  
*Take off contaminated clothing and wash it before reuse.*  
*In case of fire: Use for extinction: CO2, powder or water spray.*  
*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.*

(Contd. on page 12)

# Safety Data Sheet

acc. to OSHA HCS

Printing date 01/08/2018

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**Trade name: Karl Fischer Reagent**  
**2 mg/ml**

(Contd. of page 11)

· **Contact:**

· **Date of preparation / last revision**

01-08-2018: review SDS for accuracy. STN

Creation date for SDS 01-20-2015. STN

01/08/2018 / -

· **Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

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

BEI: Biological Exposure Limit

Flam. Liq. 2: Flammable liquids – Category 2

Acute Tox. 4: Acute toxicity – Category 4

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Eye Dam. 1: Serious eye damage/eye irritation – Category 1

STOT SE 1: Specific target organ toxicity (single exposure) – Category 1

STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1