

Oxidation Solution**BR664-4**

Version 1.1

Issuing date 02/28/2020

Revision Date 05/19/2020

Print Date 08/03/2021

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**Product information**

Trade name : Oxidation Solution

Number : 000000011429

Recommended use of the chemical and restrictions on use : Laboratory chemicals, Oxidation Reagent for DNA/RNA Synthesis

Manufacturer or supplier's details : Honeywell Specialty Chemicals Seelze GmbH
Wunstorfer Straße 40
Seelze, 30926

For further information, please contact: : 1-800-368-0050
+1-231-726-3171
(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : **Medical: 1-800-498-5701 or +1-303-389-1414**
Transportation (CHEMTREC): 1-800-424-9300 or +1-703-527-3887
In Japan: +(81)-345209637
: (24 hours/day, 7 days/week)

2. HAZARDS IDENTIFICATION**Classification of the substance or mixture**

Classification of the substance or mixture : Flammable liquids, Category 3
Acute toxicity, Category 4, Oral
Acute toxicity, Category 4, Inhalation
Acute toxicity, Category 4, Dermal
Skin irritation, Category 2
Eye irritation, Category 2A
Specific target organ toxicity - repeated exposure, Category 2, Thyroid
Short-term (acute) aquatic hazard, Category 3

GHS Label elements, including precautionary statements

Symbol(s)



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Signal word : Warning

Hazard statements : Flammable liquid and vapour.
Harmful if swallowed, in contact with skin or if inhaled.
Causes skin irritation.
Causes serious eye irritation.
May cause damage to organs through prolonged or repeated exposure.
Harmful to aquatic life.

Precautionary statements : **Prevention:**
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/ vapours/ spray.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Response:

IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Get medical advice/ attention if you feel unwell.
If skin irritation occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage:

Store in a well-ventilated place. Keep cool.

Disposal:

Dispose of contents/ container to an approved waste disposal plant.

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Mixture

Chemical name	CAS-No.	Concentration
Pyridine	110-86-1	88.70 %
Pyridine		
Water	7732-18-5	10.00 %
Water		
Iodine	7553-56-2	1.30 %
Iodine		

Note: Class 1

Note: Type 2 Monitoring Chemicals (Designated substances)

4. FIRST AID MEASURES

- Inhalation : Remove to fresh air.
If not breathing, give artificial respiration.
If breathing is difficult, give oxygen.
Use oxygen as required, provided a qualified operator is present.
Call a physician.
- Skin contact : Wash off immediately with plenty of water for at least 15 minutes.
Take off contaminated clothing and shoes immediately.
Wash contaminated clothing before re-use.
Call a physician.
- Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Call a physician.
- Ingestion : Do not induce vomiting without medical advice.
Never give anything by mouth to an unconscious person.
Call a physician.
- Notes to physician : Treat symptomatically.

5. FIREFIGHTING MEASURES

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- Suitable extinguishing media : Carbon dioxide (CO₂)
Dry chemical
Alcohol-resistant foam
Cool closed containers exposed to fire with water spray.
- Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire.
- Specific hazards during firefighting : Flammable.
Vapours may form explosive mixtures with air.
Vapours are heavier than air and may spread along floors.
Vapors may travel to areas away from work site before igniting/flashing back to vapor source.
In case of fire hazardous decomposition products may be produced such as:
Hydrogen cyanide (hydrocyanic acid)
Ammonia
Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), dense black smoke.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Wear personal protective equipment.
Immediately evacuate personnel to safe areas.
Keep people away from and upwind of spill/leak.
Ensure adequate ventilation.
Remove all sources of ignition.
Do not swallow.
Avoid breathing vapours, mist or gas.
Avoid contact with skin, eyes and clothing.
- Environmental precautions : Prevent further leakage or spillage if safe to do so.
Prevent product from entering drains.
Discharge into the environment must be avoided.
Do not flush into surface water or sanitary sewer system.
Do not allow run-off from fire fighting to enter drains or water courses.
- Methods and materials for containment and cleaning up : Ventilate the area.
No sparking tools should be used.
Use explosion-proof equipment.
Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13).

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7. HANDLING AND STORAGE**Handling**

Precautions for safe handling : Wear personal protective equipment.
Use only in well-ventilated areas.
Keep container tightly closed.
Do not smoke.
Do not swallow.
Avoid breathing vapours, mist or gas.
Avoid contact with skin, eyes and clothing.

Advice on protection against fire and explosion : Keep away from fire, sparks and heated surfaces.
Take precautionary measures against static discharges.
Ensure all equipment is electrically grounded before beginning transfer operations.
Keep product and empty container away from heat and sources of ignition.
No sparking tools should be used.
Use explosion-proof equipment.
No smoking.

Storage

Conditions for safe storage, including any incompatibilities : Store in area designed for storage of flammable liquids.
Protect from physical damage.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep away from heat and sources of ignition.
Keep away from direct sunlight.
Store away from incompatible substances.
Container hazardous when empty.
Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Components	CAS-No.	Value	Control parameters	Update	Basis
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Iodine Iodine	7553-56- 2	TWA : Time weighted average	1 mg/m3 (0.1 ppm)	04 2007	Japan Society for Occupational Health:Japan Society for Occupational Health allowable concentration recommendatio n value
		TWA : Time weighted average	1 mg/m3 (0.1 ppm)	04 2007	Japan Society for Occupational Health:Japan Society for Occupational Health allowable concentration recommendatio n value

Appropriate engineering controls

Use with local exhaust ventilation.

Prevent vapour buildup by providing adequate ventilation during and after use.

Individual protection measures, such as personal protective equipment

- Respiratory protection : In case of insufficient ventilation wear suitable respiratory equipment.
For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
Use NIOSH approved respiratory protection.
- Hand protection : Solvent-resistant gloves
Gloves must be inspected prior to use.
Replace when worn.
- Eye protection : Do not wear contact lenses.
Wear as appropriate:
Safety glasses with side-shields
If splashes are likely to occur, wear:
Goggles or face shield, giving complete protection to eyes
- Skin and body protection : Wear as appropriate:
Solvent-resistant apron

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	Flame retardant antistatic protective clothing. If splashes are likely to occur, wear: Protective suit
Hygiene measures	: When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Keep working clothes separately. Remove and wash contaminated clothing before re-use. Do not swallow. Avoid breathing vapours, mist or gas. Avoid contact with skin, eyes and clothing.
Protective measures	: Ensure that eyewash stations and safety showers are close to the workstation location.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	: liquid, clear
Colour	: colourless to yellowish
Odour	: strong pungent
pH	: Note: Not applicable
Melting point/range	: -42.2 °C Note: The physical data is that of the main component.
Boiling point/boiling range	: 115.25 °C at 1,013 hPa Note: The physical data is that of the main component.
Flash point	: 81 °F (27 °C) Method: closed cup
Evaporation rate	: Note: no data available
Lower explosion limit	: 1.8 %(V) Note: The physical data is that of the main component.
Upper explosion limit	: 12.4 %(V) Note: The physical data is that of the main component.

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Vapour pressure	: 21.3 hPa at 20 °C(68 °F) Note: The physical data is that of the main component.
Vapour density	: 2.7 Note: (Air = 1.0), The physical data is that of the main component.
Density	: 0.983 g/cm ³ at 20 °C Note: The physical data is that of the main component.
Water solubility	: Note: completely soluble
Partition coefficient: n-octanol/water	: Note: no data available
Ignition temperature	: 482 °C Method: The physical data is that of the main component.
Decomposition temperature	: Note: no data available
Viscosity, dynamic	: Note: no data available
Viscosity, kinematic	: Note: no data available

10. STABILITY AND REACTIVITY

Chemical stability	: Stable under recommended storage conditions.
Possibility of hazardous reactions	: Hazardous polymerisation does not occur. Forms highly explosive by-product with Trifluoromethyl hypofluorite in reactions where used as an acid receptor.
Conditions to avoid	: Heat, flames and sparks. Keep away from direct sunlight.
Incompatible materials to avoid	: Strong oxidizing agents Strong acids Acid chlorides

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Chloroformates
Fluorine
May attack many plastics, rubbers and coatings.

Hazardous decomposition products : In case of fire hazardous decomposition products may be produced such as:
Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), dense black smoke.
Hydrogen cyanide (hydrocyanic acid)
Ammonia

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity : Acute toxicity estimate: 563.7 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: 12.22 mg/l
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: 1,226.26 mg/kg
Method: Calculation method

Skin irritation
Iodine : Species: reconstructed human epidermis (RhE)
Result: Irritating to skin.

Eye irritation
Pyridine : Species: Rabbit
Result: Irritating to eyes.

Pyridine : Test Method: Ames test
Result: negative

: Test Method: Chromosome aberration test in vitro
Cell type: Chinese Hamster Ovary Cells
Result: negative

: Test Method: Cell Transformation Test
Result: negative

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Further information

Pyridine

: Note:

Confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL INFORMATION

Toxicity to fish

Pyridine

: flow-through test

LC50: 99 mg/l

Exposure time: 96 h

Species: Pimephales promelas (fathead minnow)

Iodine

: LC50: 1.67 mg/l

Exposure time: 96 h

Species: Oncorhynchus mykiss (rainbow trout)

Toxicity to daphnia and other aquatic invertebrates

Pyridine

: EC50: 320 mg/l

Exposure time: 48 h

Species: Daphnia magna (Water flea)

Method: OECD Test Guideline 202

Iodine

: LC50: 0.55 mg/l

Exposure time: 48 h

Species: Daphnia magna (Water flea)

Toxicity to algae

Iodine

: Growth inhibition

EC50: 0.13 mg/l

Exposure time: 72 h

Species: Desmodesmus subspicatus (green algae)

Method: OECD Test Guideline 201

Additional ecological information

Pyridine

: Harmful to aquatic organisms.

Iodine

: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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13. DISPOSAL CONSIDERATIONS

- WDPCCL Waste Disposal and Public Cleansing Law : Specially Controlled Industrial Waste
- Disposal methods : In accordance with local and national regulations.
- Disposal methods : Dispose according to legal requirements.
- Packaging : Legal requirements are to be considered in regard of reuse or disposal of used packaging materials

14. TRANSPORT INFORMATION**ADR**

- UN/ID No. : UN 1993
- Description of the goods : FLAMMABLE LIQUID, N.O.S.

(PYRIDINE)

- Class : 3
- Packing group : III
- Classification Code : F1
- Labels : 3

Special Provision 640E

IATA

- UN/ID No. : UN 1993
- Description of the goods : Flammable liquid, n.o.s.
(Pyridine)

- Class : 3
- Packing group : III
- Labels : 3
- Packing instruction (cargo aircraft) : 366
- Packing instruction (passenger aircraft) : 355
- Packing instruction (passenger aircraft) : Y344

IMDG

- UN/ID No. : UN 1993
- Description of the goods : FLAMMABLE LIQUID, N.O.S.
(PYRIDINE)
- Class : 3

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Packing group : III
Labels : 3
EmS Number 1 : F-E
EmS Number 2 : S-E

Marine pollutant : no

15. REGULATORY INFORMATION**National regulatory information**

Vessel Safety Law : Flammable liquids (Article 2 and 3 of rules on shipping and storage of dangerous goods and its Attached Table 1)
JP VSL

Aviation Law : Flammable liquid (Article 194 of The Enforcement Rules of Aviation Law and its Attached Table 1)
JP AVL

Fire Service Law : Group 4 Flammable liquids
Type 2 petroleums
Hazardous rank III
Water soluble
Keep away from fire

Japan. ISHL Hazardous Substances Labeling Requirements (ISHL Art. 57, Enforcement Order Art. 18, Enforcement Rule Art. 30 & 31, as amended through 6 April 2018) : Listed
Pyridine 110-86-1
Iodine 7553-56-2

Japan. SDS and Risk Assessment Requirements (ISHL Art. 57-2 and 57-3, Enforcement Order Art. 18-2, Enforcement Rule Art. 34-2 and 34-2-2), as amended : Listed
Pyridine 110-86-1
Iodine 7553-56-2

Poisonous and Deleterious Substances Control Law : Not relevant

Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the : Class I Designated Chemical Substances
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Pyridine 110-86-1

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Management Thereof

Other international regulations**Notification status**US. Toxic Substances : On TSCA Inventory
Control ActAustralia. Industrial Chemical : On the inventory, or in compliance with the inventory
(Notification and
Assessment) ActCanada. Canadian : All components of this product are on the Canadian DSL
Environmental Protection Act
(CEPA). Domestic
Substances List (DSL)

Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory

Korea. Existing Chemicals : On the inventory, or in compliance with the inventory
Inventory (KECI)Philippines. The Toxic : On the inventory, or in compliance with the inventory
Substances and Hazardous
and Nuclear Waste Control
ActChina. Inventory of Existing : On the inventory, or in compliance with the inventory
Chemical Substances
(IECSC)New Zealand. Inventory of : On the inventory, or in compliance with the inventory
Chemicals (NZIoC), as
published by ERMA New
Zealand**16. OTHER INFORMATION**

	HMIS III	NFPA
Health hazard	: 2*	2
Flammability	: 3	3
Physical Hazard	: 0	
Instability	:	0

* - Chronic health hazard

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Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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Prepared by Honeywell Performance Materials and Technologies Product Stewardship Group