

Oxidation-A**BR666-2**

Version 1.1

Issuing date 02/28/2020

Revision Date 02/28/2020

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

Trade name : Oxidation-A

Number : 000000011426

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 2
Acute toxicity, Category 4, Oral
Skin irritation, Category 2
Eye irritation, Category 2A
Carcinogenicity, Category 2
Specific target organ toxicity - single exposure, Category 3
Short-term (acute) aquatic hazard, Category 3

GHS Label elements, including precautionary statements

Symbol(s)

:



Signal word

: Danger

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Hazard statements : Highly flammable liquid and vapour.
Harmful if swallowed.
Causes skin irritation.
Causes serious eye irritation.
May cause respiratory irritation.
Suspected of causing cancer.
Harmful to aquatic life.

Precautionary statements : **Prevention:**
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.
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.
Avoid breathing 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.

IF exposed or concerned: Get medical advice/ attention.

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 container tightly closed.
Keep cool.

Store locked up.

Disposal:

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Mixture

Chemical name	CAS-No.	Concentration
Tetrahydrofuran	109-99-9	67.20 %
Tetrahydrofuran		
Pyridine	110-86-1	21.40 %
Pyridine		
Water	7732-18-5	10.90 %
Water		
Iodine	7553-56-2	0.50 %
Iodine		

Note: Organic Solvents Class 2

Note: Class 1

Note: Type 2 Monitoring Chemicals (Designated substances)

Note: Type III Monitoring Chemicals

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.

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Call a physician.

Notes to physician : Treat symptomatically.

5. FIREFIGHTING MEASURES

- 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 : Extremely 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.

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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).

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.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
Tetrahydrofuran Tetrahydrofuran	109-99-9	TL : Threshold limits	(50 ppm)	04 2009	ISHL:Industrial Safety and Health Law OEL
		SKIN_DES : Skin designation:	Can be absorbed through the skin.	09 2015	Japan Society for Occupational Health:Japan Society for Occupational Health allowable concentration recommendation value
		TWA : Time weighted average	148 mg/m3 (50 ppm)	05 2016	Japan Society for Occupational Health:Japan Society for Occupational Health allowable concentration recommendation value
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 recommendation value

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		TWA : Time weighted average	1 mg/m3 (0.1 ppm)	04 2007	Japan Society for Occupational Health: Japan Society for Occupational Health allowable concentration recommendation value
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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
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.

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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 : red

Odour : ether-like

pH : Note: Not applicable

Melting point/range : -108.5 °C

Boiling point/boiling range : 66 °C

Flash point : 5 °F (-15 °C)
Method: closed cup

Lower explosion limit : 2 %(V)

Upper explosion limit : 11.8 %(V)

Vapour pressure : 189.32 hPa

Vapour density : 2.5
Note: (Air = 1.0)

Density : 0.935 g/cm³ at 20 °C
0.929 g/cm³ at 25 °C

Water solubility : Note: completely soluble

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Ignition temperature : 321 °C

Decomposition temperature : Note: no data available

10. STABILITY AND REACTIVITY

Chemical stability : Stable under recommended storage conditions.

Possibility of hazardous reactions : Reacts with air to form peroxides.
Hazardous polymerisation does not occur.

Conditions to avoid : Heat, flames and sparks.
Keep away from direct sunlight.
Protect from exposure to air/oxygen (peroxide formation).
Protect against light.

Incompatible materials to avoid : Strong acids and strong bases
Strong oxidizing agents
May form explosive peroxides.
May attack many plastics, rubbers and coatings.

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

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity : Acute toxicity estimate: 1,197.21 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: 51.4 mg/l
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: 5,140.19 mg/kg

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Method: Calculation method

Skin irritation
Tetrahydrofuran: Species: Rabbit
Result: Irritating to skin.

Iodine

: Species: reconstructed human epidermis (RhE)
Result: Irritating to skin.Eye irritation
Tetrahydrofuran: Species: Rabbit
Result: Irritating to eyes.

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: negativeFurther information
Tetrahydrofuran: Note:
Confirmed animal carcinogen with unknown relevance to humans.

Pyridine

: Note:
Confirmed animal carcinogen with unknown relevance to humans.**12. ECOLOGICAL INFORMATION**Toxicity to fish
Tetrahydrofuran: LC50: 2,160 mg/l
Exposure time: 96 h
Species: Pimephales promelas (fathead minnow)LC50: 2,820 mg/l
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Species: *Leuciscus idus* (Golden orfe)

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

Toxicity to bacteria

Tetrahydrofuran

: LC50: > 580 mg/l
Exposure time: 16 h
Species: Bacteria

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 : Specially Controlled Industrial Waste
Public Cleansing Law

Disposal methods : In accordance with local and national regulations.

14. TRANSPORT INFORMATION**ADR**

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

(TETRAHYDROFURAN, PYRIDINE)

Class : 3
Packing group : II
Classification Code : F1
Hazard Identification Number : 33
Labels : 3

Special Provision 640D

IATA

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

Class : 3
Packing group : II
Labels : 3
Packing instruction (cargo aircraft) : 364
Packing instruction (passenger aircraft) : 353
Packing instruction (passenger aircraft) : Y341

IMDG

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

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

Marine pollutant : no

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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 : Type 1 petroleums
JP FSL DS4 : Flammable liquids
II

Component : Tetrahydrofuran 109-99-9
: Pyridine 110-86-1

Fire Service Law : Group 4 Flammable liquids
Type 1 petroleums
Hazardous rank II
Water soluble
Keep away from fire

Japan. ISHL Class 2 Organic Solvents : Listed
Tetrahydrofuran 109-99-9

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
Tetrahydrofuran 109-99-9
Pyridine 110-86-1

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
Tetrahydrofuran 109-99-9
Pyridine 110-86-1
Iodine 7553-56-2
Poisonous and Deleterious Substances Control Law : Not relevant

Other international regulations

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Notification status

US. Toxic Substances
Control Act : On TSCA Inventory

Australia. Industrial Chemical
(Notification and
Assessment) Act : On the inventory, or in compliance with the inventory

Canada. Canadian
Environmental Protection Act
(CEPA). Domestic
Substances List (DSL) : All components of this product are on the Canadian DSL

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

Korea. Existing Chemicals
Inventory (KECI) : On the inventory, or in compliance with the inventory

Philippines. The Toxic
Substances and Hazardous
and Nuclear Waste Control
Act : On the inventory, or in compliance with the inventory

China. Inventory of Existing
Chemical Substances
(IECSC) : On the inventory, or in compliance with the inventory

New Zealand. Inventory of
Chemicals (NZIoC), as
published by ERMA New
Zealand : On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

	HMIS III	NFPA
Health hazard	: 2*	2
Flammability	: 3	3
Physical Hazard	: 1	
Instability	:	1

* - Chronic health hazard

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

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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