SAFETY DATA SHEET

Honeywell
Burdick & Jackson™

Oxidation - T

BR663-2

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1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product information

Trade name	:	Oxidation - T
Number	:	000000011430
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 Eye irritation, Category 2A Carcinogenicity, Category 2 Specific target organ toxicity - single exposure, Category 3

GHS Label elements, including precautionary statements

Symbol(s) :

Signal word	:	Danger
Hazard statements	:	Highly flammable liquid and vapour.

Harmful if swallowed.
Causes serious eye irritation.
May cause respiratory irritation.
Suspected of causing cancer.

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.
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 eye irritation persists: Get medical advice/ attention.
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:
Dispose of contents/ container to an approved waste disposal plant.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Mixture

Chemical name	CAS-No.	Concentration
Tetrahydrofuran Tetrahydrofuran	109-99-9	78.00 %
Pyridine Pyridine	110-86-1	20.00 %
Water Water	7732-18-5	2.00 %
Iodine Iodine	7553-56-2	0.20 %

Note: Organic Solvents Class 2
Note: Substances Subject to be Notified Names
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.
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 (NOx), 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).

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
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)Provisional value.	09 2015	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

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.
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	:	ca. 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 hPa at 20 °C(68 °F)
Vapour density	:	ca. 2.5
Density	:	ca. 0.888 g/cm3 at 20 °C
Water solubility	:	Note: completely soluble
Ignition temperature	:	321 °C Note: Information regarding ignition temperature applies only to the solvent.

10. STABILITY AND REACTIVITY

Chemical stability	:	Stable under recommended storage conditions.
Possibility of hazardous reactions	:	Reacts with air to form peroxides. Hazardous polymerization 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. Oxidizing solids Oxidizing liquids
Hazardous decomposition	:	Peroxides

products	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 (NOx), dense black smoke.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	:	Acute toxicity estimate: 1,145.83 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: 55 mg/l Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate: 5,500 mg/kg 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: negative

Further 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 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.

13. DISPOSAL CONSIDERATIONS

WDPCL Waste Disposal and Public Cleansing Law : Specially Controlled Industrial Waste

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

15. REGULATORY INFORMATION

National regulatory information

Vessel Safety Law JP VSL	:	Flammable liquids (Article 2 and 3 of rules on shipping and storage of dangerous goods and its Attached Table 1)
Aviation Law JP AVL	:	Flammable liquid (Article 194 of The Enforcement Rules of Aviation Law and its Attached Table 1)
Fire Service Law JP FSL DS4	:	Type 1 petroleums 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 liquid Keep away from fire

Poisonous and Deleterious Substances Control Law	:	Not relevant

Other international regulations

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	:	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

none

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.

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