1. Product and Company Identification

Product Codes:	40-4330-XX
Product Name:	Oxidizing Solution
Product Use:	For Research Use Only
Manufacturer Information	
Company Name:	Glen Research LLC 22825 Davis Drive, #100 Sterling, VA 20164 USA
Phone Number:	+1-703-437-6191
Web Site Address:	www.glenresearch.com
Email Address:	msds@glenres.com
Information in case of emergency	Chemtrec, 800-424-9300; Outside USA +1-703-527-3887

2. Hazards Identification

Pictograms:

Signal Words: Danger

GHS Hazard Statements

H225: Highly Flammable Liquid and Vapor.
H302: Harmful if swallowed, in contact with skin.
H314: Causes severe skin burns and eye damage.
H335: May cause respiratory irritation.

GHS Precautionary Statements

P103: Read label before use.
P210: Keep away from heat/sparks/open flames/hot surfaces – No Smoking.
P233: Keep container tightly closed.
P260: Avoid breathing fumes or vapors.
P270: Do not eat, drink or smoke when using this product.
P271: Use only in a well ventilated area.
P280: Wear protective gloves / protective clothing / eye protection / face protection.

GHS Response Statements

P301+330: IF SWALLOWED: Rinse mouth with water.
P302+350: IF ON SKIN: Gently wash with soap and water.
P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so - continue rinsing.
P306+360: IF ON CLOTHING: Rinse contaminated clothing and skin immediately with plenty of water before removing clothes.
P312: Call a POISON CENTER or doctor/physician if you fell unwell.
P362: Take off contaminated clothing and wash before use.

GHS Storage and Disposal Phrases

P403+233: Store in a well-ventilated place. Keep container tightly closed.
P501: Dispose of contents / container in a safe way in accordance with all federal, state and local regulations.

Emergency Overview

Flammable Liquid, Target organ effect, Harmful by ingestion, Harmful by skin absorption, Irritant, Skin sensitizer.
May form Explosive Peroxides,

Target Organs

Kidney, Liver, Central Nervous System, Thyroid, Endocrine system, Reproductive system

3. Composition/Information on Ingredients

Product Name	CAS #	EC-No	Concentration	M.W.	Formula
Tetrahydrofuran	109-99-9	203-726-8	70%	72.1 g/mol	C_4H_8O
Pyridine	110-86-1	203-809-9	20%	79.1 g/mol	C_5H_5N
Iodine	7553-56-2	231-442-4	5.1g/L	253.8 g/mol	I_2
Water	7732-18-5	231-791-2	10%	18.02 g/mol	H_2O

4. First Aid Measures

Emergency and First Aid Procedures

If inhaled:

Remove to fresh air.
If not breathing, give artificial respiration. Get medical attention.

In case of skin contact:

Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Wash clothing before reuse. Get medical attention.

If swallowed:

Rinse mouth with water. Do not induce vomiting. Get medical attention.

If in contact with eyes:

Rinse cautiously with water for several minutes. Remove contact lenses if present and safe to do so. Continue rinsing. Get medical attention.

Signs and Symptoms of Exposure

Acute exposure: Severe headache, Marked decrease in white blood cell count, Redness and inflammation of the eyes and eyelids, Coughing, Sneezing, Difficult breathing, Central Nervous System depression, , anesthetic effects.

Treatment

Treat symptomatically and supportively.

5. Fire Fighting Measures

Suitable Extinguishing Media

Use a Class A Extinguisher (Dry chemical, carbon dioxide, water or foam). For large fires, apply water from as far away as possible. Use very large quantities of water applied as mist or spray. Cool all affected containers with flooding quantities of water.

Special protective equipment for fire fighters

Wear self-contained breathing apparatus (SCBA) for fire fighting if necessary.
Wear protective clothing to prevent contact with skin and eyes.

Flammable Properties and Hazards

Highly flammable liquid and vapor. Vapor may travel distances to sources of ignition.

6. Accidental Release Measures

Personal Precautions

Avoid breathing vapors. Evacuate personnel to safe areas.

Protective equipment

Use personal protective equipment. Avoid contact with skin, eyes, and clothing.

Emergency procedures

Remove all sources of ignition. Vapors may travel distances to sources of ignition. Ensure adequate ventilation.

Methods and Material for containment and cleaning up.

Absorb spillage with sand, absorbent pads. Do not let product enter the drain. Wear impermeable gloves, safety glasses and a lab coat when cleaning up the spill. Dispose of absorbent and spillage in compliance with local and state regulations.

7. Handling and Storage

Precautions To Be Taken in Handling

Handle using safe laboratory practices. Avoid all direct contact. Use explosion proof equipment. Keep

away from sources of ignition – No Smoking. Take measures to prevent the build up of electrostatic charges.

Recommended Storage

Controlled room temperature.

Precautions To Be Taken in Storing

Keep container tightly closed. Store in well-ventilated place.

Other Precautions

Protect from sunlight.

8. Exposure Controls/Personal Protection

Product Name	CAS #	OSHA PEL (TWA)	ACGIH TLV	OSHA (STEL)
Tetrahydrofuran	109-99-9	200 ppm	50 ppm	250 ppm
Pyridine	110-86-1	5 ppm	1 ppm	N/A
Iodine	7553-56-2	0.1ppm	N/A	N/A
Water	7732-18-5	N/A	N/A	N/A

Engineering Controls (Ventilation etc.)

Local exhaust ventilation is usually sufficient.

Respiratory Equipment (Specify Type)

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Eye Protection

Safety glasses with side shields. Wear splash resistant goggles or face shield if splashes are likely to occur.

Protective Gloves

Impermeable, chemically resistant gloves.

Other Protective Clothing

Lab coat, chemical resistant lab coat, protective chemical suit, based on risk assessment of activities.

Work/Hygienic/Maintenance Practices

Wash hands after handling. Do not eat, drink, or smoke when using this product.

9. Physical and Chemical Properties

Physical State:	[ ] Gas [X] Liquid [ ] Solid
Appearance:	Liquid, dark red
Odor:	Sweet, ether-like odor
Odor Threshold:	No data
pH:	No data
Melting Point:	No data
Initial Boiling Point and Boiling Range:	No data
Flash Point:	No data
Specific Gravity:	0.93/mL
Evaporation Rate:	No data
Flammability:	Highly flammable
Explosive Limits:	LEL: No data UEL: No data
Vapor Pressure (vs. Air or mm Hg):	No data
Vapor Density (vs. Air = 1):	No data
Solubility in Water:	No data
Partition Coefficient (n-octanol/water):	Log Pow: No data
Auto-ignition Temperature:	No data
Decomposition Temperature:	No data
Viscosity:	No data
Percent Volatile:	No data

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10. Stability and Reactivity

Reactivity
Stable material, hazardous polymerization will not occur.
Chemical Stability: **Unstable [ ]** **Stable [X]**
Possibility of Hazardous Reactions:
Vapors may form explosive mixture with air.
Conditions To Avoid - Instability
Heat, flames, and sparks. Extremes of temperature and direct sunlight.
Incompatibility - Materials To Avoid
Oxidizing agents, Oxygen. May attack plastics, rubber, and coatings.
Hazardous Decomposition or Byproducts
Oxides of carbon and nitrogen. Contains BHT stabilizer

11. Toxicological Information

Route(s) of Entry:
Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes
Acute Toxicity
No data
Skin corrosion/irritation
Severe irritant
Serious eye damage/ eye irritation
Serious eye damage
Respiratory or skin sensitization
No data available
Germ Cell mutagenicity
No data available

Carcinogenicity

Product Name	CAS #	NTP	IARC	OSHA
Tetrahydrofuran	109-99-9	Not listed	Not listed	Not listed
Pyridine	110-86-1	Not listed	Group 3	Not listed
Iodine	7553-56-2	Not listed	Not listed	Not listed

Confirmed animal carcinogen with unknown relevance to humans (Tetrahydrofuran).

Reproductive toxicity
No data available
Specific target organ toxicity – single exposure (GHS)
May cause respiratory irritation
Specific target organ toxicity – repeated exposure (GHS)
No data available
Aspiration hazard
No
Medical Conditions Generally Aggravated By Exposure
No data available.

To the best of our knowledge, the toxicological properties of this substance have not been investigated. This product should be handled with the usual care when dealing with chemicals.

12. Ecological Information

Ecotoxicity
Pimephales promelas (fathead minnow) 96-hour LC50 2,160mg/L (Tetrahydrofuran)
Pimephales promelas (fathead minnow) 96-hour LC50 93.8 mg/L (Pyridine)
Oncorhynchus mykiss (rainbow trout) 96-hour 1.7 mg/L (Iodine)
Persistence and degradability
No data available

Bioaccumulative potential

Bioaccumulation of tetrahydrofuran is not anticipated.

Mobility in soil

No data available

Other adverse effects

No data available

13. Disposal Considerations

Waste Disposal Method

Observe all federal, state and local regulations. For Contaminated Packaging - dispose of in compliance with regulations. Contact a licensed professional waste disposal service for proper disposal. Burn in a chemical incinerator equipped with afterburner and scrubber.

14. Transport Information

LAND TRANSPORT (49CFR)

UN Number – UN1993, Class 3, Packing Group II
Proper Shipping Name: Flammable Liquid N.O.S. (Tetrahydrofuran, Pyridine Solution)
Reportable Quantity (RQ) 1000 lbs
Marine Pollutant: No
Poison Inhalation Hazard (PIH): No

AIR TRANSPORT (ICAO/IATA)

UN Number – UN1993, Class 3, Packing Group II
Proper Shipping Name: Flammable Liquid N.O.S. (Tetrahydrofuran, Pyridine Solution)

MARINE TRANSPORT (IMDG/IMO)

UN Number – UN1993, Class 3, Packing Group II, EMS-No: F-E, S-E
Proper Shipping Name: Flammable Liquid N.O.S. (Tetrahydrofuran, Pyridine Solution)
Marine Pollutant: No

15. Regulatory Information

SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

Pyridine	110-86-1

SARA 311/312

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right to Know Components

Tetrahydrofuran	109-99-9
Pyridine	110-86-1
Iodine	7553-56-2

Pennsylvania Right to Know Components

Tetrahydrofuran	109-99-9
Pyridine	110-86-1
Iodine	7553-56-2

New Jersey Right to Know Components

Tetrahydrofuran	109-99-9
Pyridine	110-86-1
Iodine	7553-56-2

California Prop. 65 Components

Warning! This product contains a chemical known to the State of California to cause cancer.

Pyridine	110-86-1

16. Other Information

For all other inquiries about this product contact Glen Research at 1-800-327-GLEN or 1-703-437-6191.

The information provided herein is based on sources believed to be reliable as of December 11, 2020 and

pertains only to the material designated. Glen Research Corporation makes no warranty or representation to its completeness, accuracy or currency. This material is intended for use by persons with the pertinent technical skills, and at their discretion and risk. It is the responsibility of the user to determine the product's suitability for its intended use, the product's safe use and the product's proper disposal. Disposal of hazardous material may be subject to federal, state or local regulations.

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