Safety Data Sheet

1. Product and Company Identification

Product Name:	**Iodine**
Product Use(s):	Industrial applications for use in other substances, derivatives and mixtures
Manufacturer/Seller:	IodiTech® Inc.
Address:	951 N. Topping Ave. Kansas City, MO, 64120 USA
Emergency Telephone:	Chemtrec 800.424.9300
E-mail:	Info@ioditech.com

2. Hazards Identification

Target Organs

Thyroid, Kidney, Endocrine system, Skin, Eyes, Reproductive system, Central nervous system

GHS Classification

Acute toxicity, Inhalation	(Category 4)
Acute toxicity, Dermal	(Category 4)
Skin corrosion/irritation	(Category 2)
Serious eye damage/eye irritation	(Category 2A)
Specific target organ toxicity - Single exposure - Respiratory System	(Category 3)
Specific target organ toxicity - Repeated exposure – Oral, Thyroid	(Category 1)
Acute aquatic toxicity	(Category 1)

GHS Label elements, including precautionary statements

Signal Word: Danger

Pictogram

Hazard statement(s)

H312 + H332	Harmful in contact with skin or if inhaled
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H372	Causes damage to organs (Thyroid) through prolonged or repeated exposure if swallowed.
H400	Very toxic to aquatic life.

Precautionary statement(s)

P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash thoroughly after handling.
P270	Do not eat, drink, or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves and clothing/ eye protection/face protection.
P304 + P340	IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
P312	Call a poison center/doctor if you feel unwell.
P302 + 350	IF ON SKIN: Gently wash with plenty of soap and water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2. Hazards Identification (Continued)

P307 + P311	If exposed: Call poison center/doctor.
P332 + P313	If skin irritation occurs: get medical advice/attention.
P337 + P313	If eye irritation persist: get medical advice/attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.

HMIS Classification

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical hazards:	1

Potential Health Effects

Inhalation:	Toxic if inhaled. Causes respiratory tract irritation.
Skin:	Causes skin irritation.
Eyes:	Causes eye irritation.
Ingestion:	Harmful if swallowed.

3. Composition Information

Chemical Name: Iodine
Chemical Formula: I_2
Molecular weight: 253.81 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
7553-56-2	231-442-4	053-001-00-3	≥ 99.8% w/w

OSHA PEL: 0.1 ppm, 1 mg/m^3 Ceiling
ACGIH TLV: 0.1 ppm, 1 mg/m^3 Ceiling

4. First Aid Measures

General Advice
Move out of dangerous area. Consult a physician. Show this safety data sheet to the attending doctor.

Inhalation
Move victim to fresh air. Seek medical attention if breathing is distressed. If not breathing administer artificial respiration.

Skin Contact
Wash exposed area thoroughly with soap and water. Seek medical attention if irritation persists.

Eye Contact
Immediately flush eyes with water for 5 minutes. Remove contact lenses, if present, and flush eyes with water for an additional 10 minutes. Seek medical attention if irritation persists.

Ingestion
DO NOT induce vomiting. Thoroughly rinse mouth with water. Drink a large amount of water. Consult a physician.

5. Firefighting Measures

Extinguishing Media
Water, Alcohol-resistant Foam, Dry-Chemical, or Carbon Dioxide (CO_2)

Special Hazards
May produce toxic hydrogen iodide fumes. May make fire more intense.

Advice for Firefighters
Wear self-contained breathing apparatus, if possible.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Hydrogen iodide

Additional Information
Use of water is acceptable to cool unopened containers

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6. Accidental Release Measures (Continued)

Environmental precautions
Release into the environment must be avoided. Prevent further release of material if conditions are safe. Do not let product enter drains.

Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

Reference to other sections
For disposal see section 13

7. Handling and Storage

Precautions for safe handling
Avoid contact with skin and eyes. Safety glasses/goggles and chemical resistant gloves must be worn. Wash hands thoroughly, immediately before and after use. Avoid the use waterless hand cleaners and sanitizers.

Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of heat and ignition.

Conditions for safe storage
Insure containers are securely closed. Store in well-ventilated, cool, dry location. Protect from heat, light, and moisture. Do NOT reuse containers.

8. Exposure Controls and Personal Protection

Components	CAS-No.	Value	Control Parameters	Basis (Vapor and Aerosol)
Iodine	7553-56-2	CEIL	0.100000 ppm 1.000000 mg/m^3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	0.100000 ppm 1.000000 mg/m^3	USA. ACGIH Threshold Limit Values (TLV)
		STEL	0.100000 ppm 1.000000 mg/m^3	USA. ACGIH Threshold Limit Values (TLV)

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) 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).

Hand protection
Handle with chemical resistant gloves based on nitrile, neoprene, or rubber construction. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Safety glasses with side-shields conforming to ANSI Z87.1. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Specific engineering controls
Use adequate ventilation from mechanical source to control airborne dust exposure.

9. Physical and Chemical Properties

Appearance
Form: Solid **Color:** Black-Violet

Safety data

pH: 5.4

9. Physical and Chemical Properties (Continued)

Melting point/freezing point:	113.6 °C (236.5 °F) @ 1013 *hPa* - lit.
Boiling point:	184.4 °C (363.9 °F) @ 1013 *hPa* – lit.
Flash point:	Not applicable
Ignition temperature:	No data available
Decomposition temperature:	No data available
Flammability:	No data available
Auto-ignition temperature:	Not applicable
Lower Explosion Limit(UEL):	No data available
Upper Explosion Limit(LEL):	No data available
Vapor pressure:	0.41 *hPa* (0.31 mmHg) at 25 °C (77 °F)
Density:	4.930 g/cm^3
Water solubility:	0.3 g/L at 25 °C (77 °F) - slightly soluble
Partition coefficient n-octanol/water:	*log* Kow (Pow): 2.49 at 20 °C (68 °F)
Relative vapor density:	8.76 - (Air = 1.0) data available
Odor:	Pungent
Odor Threshold:	No data available
Evaporation rate:	No data available
Viscosity:	Not applicable

10. Stability and Reactivity Data

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
No data available

Conditions to avoid
No data available

Materials to avoid
Rubber, Plastics, Iron and iron salts., Sulphur compounds, Ammonia, Magnesium, Zinc, Aluminum, Metals, Alkalis, Antimony salts, Arsenites, bromides, chlorides, iodides, thiocyanates, ferrous salts, hypophosphites, morphine salts, oils, creosote, phosphates, tannins, tartrates.
Mixing iodine, antimony, and ammonia resulted in an explosion. A violent reaction occurs between iodine and acetaldehyde, acetylene, acetaldehyde, strong oxidizing agents.

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions - Hydrogen iodide.
Other decomposition products - No data available

11. Toxicology Information

Acute toxicity

Oral LD50	LD50 Oral - Rat - 14,000 mg/kg Remarks: Diarrhea
Inhalation LC50	LC50 Inhalation - Rat - 4 h - > 4.588 mg/L Remarks: Cough Respiratory disorder
Dermal LC50	LC50 Dermal - Rat - male - 1,425 mg/kg

Skin corrosion/irritation
Skin - reconstructed human epidermis (RhE) - Moderate skin irritation

Serious eye damage/eye irritation
Moderate eye irritation

Respiratory or skin sensitization
Mouse-Does not cause skin sensitization. - OECD Test Guideline 429.

Germ cell mutagenicity
Genotoxicity in vitro - Hamster - Embryo – negative
Genotoxicity in vivo - Mouse - male and female - Intraperitoneal – negative

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

11. Toxicology Information (Continued)

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Reproductive toxicity No data available

Teratogenicity No data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
Inhalation - May cause respiratory irritation.

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
No data available

Aspiration hazard No data available

Potential health effects

Inhalation: Toxic if inhaled. Causes respiratory tract irritation.

Ingestion: May be harmful if swallowed.

Skin: Causes skin irritation.

Eyes: Causes eye irritation.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms of exposure include: skin rash, running nose, headache and irritation of the mucous membrane. For severe cases the skin may show pimples, boils, hives, blisters and black and blue spots. Iodides are readily diffused across the placenta. Neonatal deaths from respiratory distress secondary to goiter have been reported. Iodides have been known to cause drug-induced fevers, which are usually of short duration.

Synergistic effects No data available

12. Ecological Information

Toxicity

Toxicity to Fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 1.7 mg/l - 96.0 h
Toxicity to Daphnia and other Aquatic Invertebrates	EC50 - Daphnia magna (Water flea) - 0.2 mg/l - 48 h
Toxicity to Algae	Growth inhibition EC50 - Desmodesmus subspicatus (green algae) - 0.13 mg/l – 72 h Method: OECD Test Guideline 201

Persistence and degradability
Expected to completely degrade under typical circumstances under U.S. EPA standards.

Bioaccumulative potential No data available

Mobility in soil No data available

PBT and vPvB assessment No data available

Other adverse effects
Very toxic to aquatic life.
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal

Under applicable U.S. Environmental Protection Agency regulations this material is considered to be environmentally hazardous in regards to waste disposal.
Follow all local, municipal, U.S. state, and U.S. federal regulations if in the United States of America.
For other countries consult your local, area, and/or country regulatory authority as applicable to a hazardous product.

14. Transportation and Shipping

DOT (US)

UN number: 3495 Class: 8 (6.1) Packing group: III
Proper shipping name: Iodine
Reportable Quantity (RQ):
Marine pollutant: No
Poison Inhalation Hazard: No

14. Transportation and Shipping (Continued)

IMO

Follow current IMDG Code for proper transportation guidelines.

IATA

Follow current IATA Regulations for proper transportation guidelines.

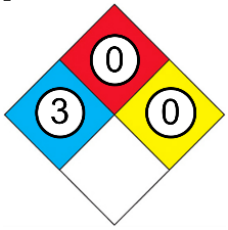
15. Regulatory Information

CERCLA Sec. 103 RQ#	NO	**EHS 302 TPQ**	NO
RCRA Sec. 261.33	NO	**TSCA Listed?**	NO
SARA Sec. 261.33 RQ#	NO	**EPA Special Hazard**	NO
SARA 312 Name List	NO	**CA Prop 65**	NO
SARA 313 Name List	NO	**REACH Listed?**	YES

16. Other Information

The information contained herein is believed to be accurate, but does not purport to be all inclusive and shall be used only as a guide. The information provide in this document is based on current available data and is applicable to the product with regard to appropriate safety precautions. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof. IodiTech® Inc. assumes no responsibility for injuries from the use of the product described above.

NFPA Rating



RESOURCES:

United States Environmental Protection Agency
United States Occupational Health and Safety Administration
United States Department of Transportation
United State Drug Enforcement Administration
United Nations "Transport of Dangerous Goods" 17th Edition, 2011
International Maritime "Dangerous Goods Code"
International Air Transportation Association "Dangerous Goods Regulation"

TERMINOLOGY:

ACGIH	American Conference of Governmental Industrial Hygienists	**RCRA**	Resource Conservation and Recovery Act
CA	State of California, U.S.A.	**REACH**	Registration, Evaluation, Authorization and Restriction of Chemicals
CAS	Chemical Abstract Services	**SARA**	Superfund And Reauthorization Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	**TLV**	Threshold Limit Value
EHS	Environmental Health and Safety	**TPQ**	Threshold Planning Quantity
HEPA	High Efficiency Particulate Air	**TSCA**	Toxic Substances Control Act
LEL	Lower Explosive Limit	**UEL**	Upper Explosive Limit
LD_{50}	Lethal dose for 50% of population	**UN**	United Nations
IMO	International Maritime Organization	**IATA**	International Air Transport Association
NIOSHA	National Institute of Occupational Safety and Health	**EPA**	Environmental Protection Agency
OSHA	Occupational Safety and Health Administration	**DoT**	Department of Transportation
PEL	Permissible Exposure Limits	**STEL**	Short Term Exposure Limit
CEIL	Ceiling Value	**TWA**	Time-Weighted Average