Section 1. Chemical Product and Company Identification

Common Name/Trade Name: Iodine

Manufacturer: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Commercial Name(s): Not available.

Synonym: Not available.

Chemical Name: Iodine

Chemical Family: Not available.

Chemical Formula: I2

Supplier: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>TWA (mg/m³)</th>
<th>STEL (mg/m³)</th>
<th>CEIL (mg/m³)</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Iodine</td>
<td>7553-56-2</td>
<td>1</td>
<td>0.1</td>
<td>1</td>
<td>100</td>
</tr>
</tbody>
</table>

Toxicological Data on Ingredients: Iodine: ORAL (LD50): Acute: 14000 mg/kg [Rat]. 22000 mg/kg [Mouse].

Section 3. Hazards Identification

Potential Acute Health Effects: Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive), of eye contact (corrosive). Slightly hazardous in case of skin contact (permeator). The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

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### Section 4. First Aid Measures

#### Eye Contact
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. **WARM** water **MUST** be used. Get medical attention immediately.

#### Skin Contact
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

#### Serious Skin Contact
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

#### Inhalation
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

#### Serious Inhalation
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious, or corrosive. Seek immediate medical attention.

#### Ingestion
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

#### Serious Ingestion
Not available.

### Section 5. Fire and Explosion Data

#### Flammability of the Product
Non-flammable.

#### Auto-Ignition Temperature
Not applicable.

#### Flash Points
Not applicable.

#### Flammable Limits
Not applicable.

#### Products of Combustion
Not available.

#### Fire Hazards in Presence of Various Substances
Not applicable.

#### Explosion Hazards in Presence of Various Substances
- Risks of explosion of the product in presence of mechanical impact: Not available.
- Risks of explosion of the product in presence of static charge: Not available.

#### Fire Fighting Media and Instructions
Not applicable.

#### Special Remarks on Fire Hazards
- Ignition on contact with bromine, chlorine trifluoride, ... metals (powdered) + water, aluminum-titanium alloys + heat, metal acetylides, nonmetals, sodium phosphinate. Incandescent reaction with cesium oxide (above 150 deg C), bromine trifluoride, metal acetylides or carbidcs [e.g. barium acetylide (above 122 deg C), calcium acetylide (above 305 deg C), strontium acetylide (above 182 deg C), zirconium acetylide (above 400 degC)]. Magnesium burns vigorously when heated with iodine vapor. Iodine unites with fluorine at ordinary temperature with a luminous flame

#### Special Remarks on Explosion Hazards
- Explosive reactions with iodine and: hafnium powder + heat; tetraamine copper (II) sulfate + ethanol; trioxyn difluoride; polyacetylene (at 113 deg. C); potassium; sodium; butadiene+ ethanol +mercuric oxide;
### Section 6. Accidental Release Measures

<table>
<thead>
<tr>
<th>Spill Type</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Spill</td>
<td>Use appropriate tools to put the spilled solid in a convenient waste disposal container.</td>
</tr>
<tr>
<td>Large Spill</td>
<td>Corrosive solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.</td>
</tr>
</tbody>
</table>

### Section 7. Handling and Storage

#### Precautions
- Keep container dry. Do not ingest. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, metals.

#### Storage
- Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 25°C (77°F).

### Section 8. Exposure Controls/Personal Protection

#### Engineering Controls
- Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

#### Personal Protection
- Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

#### Personal Protection in Case of a Large Spill
- Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

#### Exposure Limits
- STEL: 1 (mg/m³) from ACGIH (TLV) [United States]
- STEL: 0.1 (ppm) from ACGIH (TLV) [United States]
- TWA: 1 CEIL: 1 (mg/m³) from OSHA (PEL) [United States]
- TWA: 0.1 CEIL: 0.1 (ppm) from OSHA (PEL) [United States]
- STEL: 0.1 (ppm) [United Kingdom (UK)]
- STEL: 1.1 (mg/m³) [United Kingdom (UK)]

Consult local authorities for acceptable exposure limits.

### Section 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state and appearance</td>
<td>Solid.</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>253.81 g/mole</td>
</tr>
<tr>
<td>pH (1% soln/water)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>184.4°C (363.9°F)</td>
</tr>
<tr>
<td>Melting Point</td>
<td>113.7°C (236.7°F)</td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>4.93 (Water = 1)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Volatility</td>
<td>Not available.</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available.</td>
</tr>
<tr>
<td>Water/Oil Dist. Coeff.</td>
<td>The product is more soluble in oil; log(oil/water) = 2.5</td>
</tr>
<tr>
<td>Ionicity (in Water)</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

*Continued on Next Page*
Iodine

Dispersion Properties
See solubility in water, methanol, diethyl ether.

Solubility
Easily soluble in diethyl ether.
Soluble in methanol.
Very slightly soluble in cold water, hot water.

Section 10. Stability and Reactivity Data

Stability
The product is stable.

Instability Temperature
Not available.

Conditions of Instability
Heat, direct sunlight, incompatible materials

Incompatibility with various substances
Reactive with oxidizing agents, reducing agents, metals.

Corrosivity
Extremely corrosive in presence of steel, of stainless steel(304), of stainless steel(316).
Non-corrosive in presence of glass, of aluminum, of copper.

Special Remarks on Reactivity
Incompatible with liquid chlorine, acetaldehyde, ammonia, salt + ethanol, ammonium hydroxide, methyl alcohol, antimony, silver azide, lithium, potassium, sodium, phosphorous, bromine pentafluoride, fluorine, oxygen difluoride, magnesium, finely divided metals, organic solvents, rubber goods, plastics, zinc, aluminum, alkali metals, sulphur, ammonia solutions, Bromine trifluoride, reducing agents, iron, ethanol + butadiene; ethanol + phosphorous; ethanol + methanol + HgO; foramide + pyridine + sulfur trioxide; formamide; halogens or interhalogens; mercuric oxide; metal carbides; oxygen; pyridine; sodium hydride.

Violent reaction with iodine and aluminum + diethyl ether ... (and) titanium (above 113 deg C)

Special Remarks on Corrosivity
Corroses steel.

Polymerization
No corrosive effect on bronze

Section 11. Toxicological Information

Routes of Entry
Inhalation. Ingestion.

Toxicity to Animals
Acute oral toxicity (LD50): 14000 mg/kg [Rat].

Chronic Effects on Humans
Causes damage to the following organs: thyroid. 
May cause damage to the following organs: blood, kidneys, liver, skin, eyes.

Other Toxic Effects on Humans
Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. 
Hazardous in case of skin contact (corrosive), of eye contact (corrosive). 
Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals
Lowest Published Lethal Dose:
LDL [Human] - Route: Oral; Dose: 28 mg/kg
LCL [Rat] - Route: Inhalation; Dose: 137 ppm/1H

Special Remarks on Chronic Effects on Humans
May cause adverse reproductive effects (effects on new born).

Special Remarks on other Toxic Effects on Humans
Acute Potential Health Effects:
Skin: Corrosive action skin. Causes skin irritation and burns. It is corrosive and can cause penetrating lesions and brown staining. It can be absorbed by the skin.
Eyes: Causes eye irritation and burns. May cause conjunctivitis. Exposure to vapor can cause burning sensation in the eyes, tearing, inflammation of the eye lids. Exposure to high concentrations of vapor can cause Dendritic Keratitis in which the corneal epithelium is sloughed off.
Inhalation: Excessive inhalation of iodine vapors may cause respiratory tract, nasal, and mucous membrane irritation with possible burns. Symptoms may include coughing, tightness in the chest, burning sensations to the mucosal, tracheal, and pulmonary tissues, rhinitis, dyspnea/respiratory distress, coughing, sneezing, pulmonary edema, chemical pneumonitis, edema of the larynx and bronchi, pharyngitis, swelling of the parotid gland, and cachexia. High exposure may lead to lung disease and may also affect behavior/central nervous system (delirium, hallucination, depression, seizure, dizziness, headache, stupor, somnolence). 
Ingestion: Ingestion of large doses may cause irritation of mouth of the digestive tract with thirst, nausea, vomiting, abdominal pain, hypermotility, and diarrhea, staining of mouth, esophagus, lips, mucous membranes, metallic taste, abdominal pain, fever. It may also affect the cardiovascular system (tachycardia, hypotension, cardiovascular collapse), behavior/central nervous system(delirium, dizziness, headache, hallucinations, seizures,

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Iodine

Iodine depression, stupor, somnolence, muscle weakness). Death is rare following acute iodine ingestion. It is estimated that the mean lethal dose in an adult lies between 2 to 4 grams of free iodine. However, death from acute iodine poisoning may occur due to circulatory collapse, asphyxiation from glottic edema, pulmonary edema, aspiration pneumonia, and cyanosis.

Chronic Potential Health Effects:

Skin: May cause reddening of the skin, itching, acne-like eruption of the skin/skin rash, and skin allergies

Eyes: May cause eye irritation and conjunctivitis.

Ingestion: May cause a reversible reduction in thyroid function (hypothyroidism), nodular goiter, hyperthyroidism, thyrotoxicosis, metabolic disturbances, and may affect the blood (anemia), liver, urinary system/kidneys (kidney damage, hematuria, albuminuria, anuria). Other symptoms of chronic iodine poisoning (iodism) may include fever, rapid heartbeat, tremor, headache, delirium, stupor, insomnia, salivation, weight loss/loss of appetite, salivation, stomatitis, parotitis, diarrhea, gastric irritation, joint pain and swelling. Furthermore, chronic ingestion of iodides (in animals) during pregnancy has resulted in fetal deaths, severe goiter and cretinoid appearance of the newborn.

Inhalation: May cause disrupted thyroid activity (see ingestion), and chronic irritation of the throat, sneezing, nasal discharge, bronchitis, laryngitis, asthma. It may also affect behavior (see ingestion).

Iodine concentrates in the Thyroid during chronic exposure.

Section 12. Ecological Information

Ecotoxicity

Not available.

BOD5 and COD

Not available.

Products of Biodegradation

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation

The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation

Not available.

Section 13. Disposal Considerations

Waste Disposal

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14. Transport Information

DOT Classification

Class 8: Corrosive material

Identification

Corrosive Solid, n.o.s (Iodine) UNNA: 1759 PG: III

Special Provisions for Transport

Not available.

DOT (Pictograms)

CORROSIVE

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations

Illinois toxic substances disclosure to employee act: Iodine
Rhode Island RTK hazardous substances: Iodine
Pennsylvania RTK: Iodine
Minnesota: Iodine
Massachusetts RTK: Iodine
Massachusetts spill list: Iodine
New Jersey: Iodine
California Director’s List of Hazardous Substances: Iodine
TSCA 8(b) inventory: Iodine

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EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

<table>
<thead>
<tr>
<th>Other Regulation</th>
<th>WHMIS (Canada)</th>
<th>DSCL (EEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CLASS D-2A: Material causing other toxic effects (VERY TOXIC).</td>
<td>R38- Irritating to skin.</td>
</tr>
<tr>
<td></td>
<td>CLASS E: Corrosive solid.</td>
<td>R41- Risk of serious damage to eyes.</td>
</tr>
<tr>
<td></td>
<td>S2- Keep out of the reach of children.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S39- Wear eye/face protection.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S46- If swallowed, seek medical advice immediately and show this container or label.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HMIS (U.S.A.)</th>
<th>National Fire Protection Association (U.S.A.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Hazard</td>
<td>3</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>0</td>
</tr>
<tr>
<td>Reactivity</td>
<td>0</td>
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<td>Personal Protection</td>
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<thead>
<tr>
<th>WHMIS (Canada) (Pictograms)</th>
<th>National Fire Protection Association (U.S.A.) (Pictograms)</th>
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<tbody>
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<th>TDG (Canada) (Pictograms)</th>
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<th>ADR (Europe) (Pictograms)</th>
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<tbody>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves.</td>
</tr>
<tr>
<td>Synthetic apron.</td>
</tr>
<tr>
<td>Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.</td>
</tr>
<tr>
<td>Splash goggles.</td>
</tr>
</tbody>
</table>
Section 16. Other Information

MSDS Code: I3150

References: Not available.

Other Special Considerations: Not available.

Validated by Sonia Owen on 6/18/2003.
Verified by Sonia Owen.

CALL (310) 516-8000

Notice to Reader

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user’s responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.