SAFETY DATA SHEET

Preparation Date: 05/06/2015
Revision Date: 05/06/2015
Revision Number: G1

Product identifier

Product code: I1010
Product Name: IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS

Other means of identification

Synonyms:
Actomar
Diiodine
Eranol
IDO [French]
Iodio [Italian]
Vistarín

CAS #: 7553-56-2
RTECS #: NN1575000
Cl#: Not available

Recommended use of the chemical and restrictions on use

Recommended use:
Chemical intermediate.

Uses advised against
No information available

Supplier:
Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA  90248
(310) 516-8000

Order Online At: https://www.spectrumchemical.com

Emergency telephone number: Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - Dermal</td>
<td>Category 4</td>
</tr>
<tr>
<td>Acute toxicity - Inhalation (Gases)</td>
<td>Category 4</td>
</tr>
<tr>
<td>Acute toxicity - Inhalation (Dusts/Mists)</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Category 3</td>
</tr>
<tr>
<td>Specific target organ toxicity (repeated exposure)</td>
<td>Category 1</td>
</tr>
</tbody>
</table>

Label elements

Product code: I1010
Product name: IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS
Danger

Hazard statements
Causes severe skin burns and eye damage
Harmful in contact with skin
Harmful if inhaled
May cause respiratory irritation
Causes damage to organs through prolonged or repeated exposure

Precautionary Statements - Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product

Precautionary Statements - Response
Specific measures (see .? on this label)
Immediately call a POISON CENTER or doctor/physician
Specific treatment (see .? on this label)
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor/physician.
Call a POISON CENTER or doctor/physician if you feel unwell
Wash contaminated clothing before reuse
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. Call a POISON CENTER or doctor/physician if you feel unwell. Immediately call a POISON CENTER or doctor/physician.
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
<th>Trade Secret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product code: I1010</td>
<td>Product name: IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS</td>
<td>2 / 15</td>
<td></td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

First aid measures

General Advice: Poison information centers in each State capital city can provide additional assistance for scheduled poisons (13 1126).

Skin Contact: Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Get medical attention immediately. Call a physician or Poison Control Centre immediately.

Eye Contact: Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms

Severe skin and eye irritation or burns. May affect the liver. It may affect the kidneys. It may affect the thyroid. May cause hyperthyroidism or hypothyroidism. Hypothyroidism may result in goiter. Irritating to respiratory system. Dyspnea (Shortness of breath and difficulty breathing). Coughing. May cause pulmonary edema. Central nervous system effects. May cause digestive (gastrointestinal) tract irritation. May cause abdominal pain, nausea, vomiting, diarrhea. Thirst. Staining of lips, mouth, esophagus. May cause metallic taste. May affect the cardiovascular system.

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: The product is not flammable. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.

Unsuitable Extinguishing Media: No information available.

Specific hazards arising from the chemical

Hazardous Combustion Products: If it is involved in a fire, Hydrogen Iodide can be released

Specific hazards: No information available.
### Special Protective Actions for Firefighters

**Specific Methods:** No information available.

**Special Protective Equipment for Firefighters:** As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

### 6. ACCIDENTAL RELEASE MEASURES

#### Personal precautions, protective equipment and emergency procedures

**Personal Precautions:** Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Avoid breathing dust. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Prevent entry into waterways, sewers, basements or confined areas.

#### Methods and material for containment and cleaning up

**Methods for containment**

Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading. Prevent dust cloud.

**Methods for cleaning up**

Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

### 7. HANDLING AND STORAGE

#### Precautions for safe handling

**Technical Measures/Precautions:**

Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials. Remove all sources of ignition.

**Safe Handling Advice:**

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Do not breathe vapours/dust. Do not ingest. Keep away from combustible material. When using do not smoke. Use explosion-proof equipment. Use only in well-ventilated areas. Handle in accordance with good industrial hygiene and safety practice.

**Conditions for safe storage, including any incompatibilities**

**Technical Measures/Storage Conditions:**

Keep away from heat and sources of ignition. Keep container tightly closed in a dry and well-ventilated place. Store away from incompatible materials. Do not store near combustible materials. Store in a segregated and approved area.

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**Product code:** I1010  
**Product name:** IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS
Incompatible Materials:
Oxidizing agents. Reducing agents. Metals. Incompatible with liquid chlorine, acetylene, hafnium powder, Tetraamine copper (II) sulfate + ethanol, acetaldehyde, ammonia, salt + ethanol, ammonium hydroxide, methyl alcohol, antimony powder, silver azide, lithium, potassium, polyacetylene, sodium, phosphorous, bromine pentafluoride, fluorine, trioxyn difluoride, oxygen difluoride, magnesium, finely divided (powdered) metals, organic solvents, natural rubber goods, neoprene, plastics (ABS, Acetal (Delrin), CPVC, Epoxy, Polypropylene, NORYL, PPS (Ryton)), zinc, aluminum, alkali metals, sulphur, ammonia, ammonia + potassium, ammonium hydroxide, ammonia solutions, Ammonia + Litium 1-heptynide, Bromine trifluoride, Bromine pentafluoride, Fluorine, Chlorine trifluoride, reducing agents, iron, ethanol + butadiene + mercuric oxide; ethanol + phosphorous; ethanol + methanol + HgO; foramide + pyridine + sulfur trioxide; formamide; halogens or interhalogens; mercuric oxide; metal carbides; oxygen; pyridine; sodium hydride, metal acetylides (cesium, copper (I), lithium, rubidium), Dipropyl mercury, Titanium (above 113 C.), Cesium Oxide (above 150 C.), various metal acetylides (barium, calcium, strontium, zirconium), various metal carbides.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
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</thead>
<tbody>
<tr>
<td>Iodine - 7553-56-2</td>
<td>0.1 ppm Ceiling</td>
<td>= 0.1 ppm Ceiling</td>
<td>= 0.1 ppm STEL aerosol and vapor</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>1 mg/m³ Ceiling</td>
<td>= 1 mg/m³ Ceiling</td>
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<td></td>
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</tbody>
</table>

Canada

<table>
<thead>
<tr>
<th>Components</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Ontario</th>
<th>Quebec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine - 7553-56-2</td>
<td>= 0.1 ppm Ceiling</td>
<td>= 0.01 ppm TWA aerosol, inhalable, and vapour</td>
<td>0.01 ppm TWA inhalable fraction and vapor</td>
<td>0.1 ppm Ceiling</td>
</tr>
<tr>
<td></td>
<td>= 1 mg/m³ Ceiling</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Australia and Mexico

<table>
<thead>
<tr>
<th>Components</th>
<th>Australia</th>
<th>Mexico</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Iodine 7553-56-2</td>
<td>None</td>
<td>= 0.1 ppm Peak</td>
<td>= 1 mg/m³ Peak</td>
</tr>
</tbody>
</table>

Appropriate engineering controls

Engineering measures to reduce exposure: 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.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Goggles.
Skin and body protection: Long sleeved clothing. Chemical resistant apron. Gloves.
Respiratory protection: Respirator with combination filter for vapor/particulate. Be sure to use an approved/certified respirator or equivalent.
Hygiene measures: Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.
## 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical state:</strong></td>
<td>Solid</td>
</tr>
<tr>
<td><strong>Odor:</strong></td>
<td>Sharp. Characteristic</td>
</tr>
<tr>
<td><strong>Formula:</strong></td>
<td>I2</td>
</tr>
<tr>
<td><strong>Boiling point/range (°C/°F):</strong></td>
<td>184.4°C/363.9°F</td>
</tr>
<tr>
<td><strong>Specific gravity:</strong></td>
<td>4.93</td>
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<tr>
<td><strong>Evaporation rate:</strong></td>
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<tr>
<td><strong>Odor threshold (ppm):</strong></td>
<td>No information available</td>
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<tr>
<td><strong>Autoignition Temperature (°C/°F):</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Flash point (°C):</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Decomposition temperature (°C/°F):</strong></td>
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<tr>
<td><strong>Vapor pressure @ 20°C (kPa):</strong></td>
<td>0.04 @ 25 deg. C</td>
</tr>
<tr>
<td><strong>Vapor density:</strong></td>
<td>8.8</td>
</tr>
<tr>
<td><strong>Partition coefficient (n-octanol/water):</strong></td>
<td>2.49</td>
</tr>
<tr>
<td><strong>Appearance:</strong></td>
<td>Lustrous. Crystals</td>
</tr>
<tr>
<td><strong>Taste</strong></td>
<td>Sharp. acrid.</td>
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<tr>
<td><strong>Color:</strong></td>
<td>Dark purple. Violet. Bluish-black. Grayish-black.</td>
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<tr>
<td><strong>Molecular/Formula weight:</strong></td>
<td>253.81 g/mol</td>
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<td><strong>Flashpoint (°C/°F):</strong></td>
<td>No information available</td>
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<td><strong>Lower Explosion Limit (%):</strong></td>
<td>No information available</td>
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<tr>
<td><strong>Upper Explosion Limit (%):</strong></td>
<td>No information available</td>
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<td><strong>Melting point/range (°C/°F):</strong></td>
<td>113.7°C/236.7°F</td>
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<tr>
<td><strong>Bulk density:</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Density (g/cm³):</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>VOC content (g/L):</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Viscosity:</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Product code:</strong></td>
<td>I1010</td>
</tr>
<tr>
<td><strong>Product name:</strong></td>
<td>IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS</td>
</tr>
</tbody>
</table>

Product code: I1010  
Product name: IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS
9. PHYSICAL AND CHEMICAL PROPERTIES

Miscibility:
No information available

Solubility:
Practically insoluble in water
Soluble in Carbon tetrachloride
Soluble in Carbon Disulfide
Soluble in Chloroform
Soluble in cyclohexane: 2.719 g
Solubility in Carbon disulfide: 197g/kg @ 25°C
Solubility in methanol: 23g/ 100 mL @ 25°C
Solubility in alcohol: 20.5g/ 100 mL @ 15°C
Solubility in ether: 20.6g/ 100 mL @ 17°C
Solubility in Carbon tetrachloride: 19.2 g/kg @ 25°C
Solubility in Benzene: 164.0 g/kg @25°C
Solubility in Ethanol: 27.1g/kg @ 25°C
Solubility in n-hexane: 13.2 g/kg @ 25°C
Solubility in butan-2-ol: 97 g/kg @ 25°C
Solubility in ethyl acetate: 157g/kg @ 25°C
Solubility in toluene: 182.5 g/kg @ 25
Solubility in chloroform: 49.7 g/kg @ 25
Solubility in bromoethane: 14.6 g/ 100g @ 25
Solubility in n-heptane: 1.73g / 100g @ 25
Solubility in glycerol: 9.7g / 100g @ 25
Solubility in diethyl ether: 33.7g/ 100g @ 25
Solubility in carbon disulfide: 19.7g/ 100g @ 25

10. STABILITY AND REACTIVITY

Reactivity
Iodine reacts violently with Acetaldehyde, Dipropylmercury, Aluminum + and diethyl ether, Titanium (above 113 C.). Ignition on contact with bromine, bromine pentafluoride,... 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 carbides [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

Chemical stability
Stability: Stable under recommended storage conditions

Possibility of Hazardous Reactions: Hazardous polymerization does not occur


Product code: I1010  Product name: IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS
**Incompatible Materials:**
Oxidizing agents. Reducing agents. Metals. Incompatible with liquid chlorine, acetylene, hafnium powder, Tetraamine copper (II) sulfate + ethanol, acetaldehyde, ammonia, salt + ethanol, ammonium hydroxide, methyl alcohol, antimony powder, silver azide, lithium, potassium, polyacetylene, sodium, phosphorous, bromine pentafluoride, fluorine, trioxygen difluoride, oxygen difluoride, magnesium, finely divided (powdered) metals, organic solvents, natural rubber goods, neoprene, plastics (ABS, Acetal (Delrin), CPVC, Epoxy, Polypropylene, NORYL, PPS (Ryton)), zinc, aluminum, alkali metals, sulphur, ammonia, ammonia + potassium, ammonium hydroxide, ammonia solutions, Ammonia + Litium 1-heptynide, Bromine trifluoride, Bromine pentafluoride, Fluorine, Chlorine trifluoride, reducing agents, iron, ethanol + butadiene + mercuric oxide; ethanol + phosphorous; ethanol + methanol + HgO; formamide + pyrindine + sulfur trioxide; formamide; halogens or interhalogens; mercuric oxide; metal carbides; oxygen; pyridine; sodium hydride, metal acetylides (cesium, copper (I), lithium, rubidium), Dipropyl mercury, Titanium (above 113 C.), Cesium Oxide (above 150 C.), various metal acetylides (barium, calcium, strontium, zirconium), various metal carbides.

**Hazardous decomposition products:** Hydrogen iodide. Iodine vapour.

**Other Information**

**Corrosivity:**
Extremely corrosive in the presence of stainless steel (316)
Extremely corrosive in the presence of stainless steal (304)
Extremely corrosive in presence of copper
No corrosive effect on Aluminum
No corrosive effect on Bronze

**Special Remarks on Corrosivity:** No corrosion data on brass

### 11. TOXICOLOGICAL INFORMATION

**Information on likely routes of exposure**

**Principal Routes of Exposure:**
Ingestion. Inhalation. Skin.

**Acute Toxicity**

**Component Information**

**Iodine - 7553-56-2**

LD50/oral/rat = 14 g/kg Oral LD50 Rat
LD50/oral/mouse = 1000 mg/kg (RTECS)
22000 mg/kg (Hazardous Substance Data Bank)
LD50/dermal/rat = No information available
LD50/dermal/rabbit = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/rabbit = No information available
Other LD50 or LC50 information = 10000 mg/kg LD50 Oral Rabbit
137 ppm 1h LCL inhalation Rat

**Product Information**

LD50/oral/rat =
VALUE- Acute Tox Oral = 14000mg/kg

**Product code:** I1010  **Product name:** IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS
LD50/oral/mouse = Value - Acute Tox Oral = 1000mg/kg

LD50/dermal/rabbit
VALUE-Acute Tox Dermal = No information available

LD50/dermal/rat
VALUE - Acute Tox Dermal = 14000mg/kg

LC50/inhalation/rat
VALUE-Vapor = No information available
VALUE-Gas = No information available
VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse
VALUE-Vapor = No information available
VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

Symptoms

Skin Contact: Corrosive. Causes skin irritation. Causes skin burns. It can cause brown stains on the skin. It is corrosive and cause penetrating lesions.

Eye Contact: Causes severe eye irritation and possible 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 may cause corneal damage (Dendritic Keratitis in which the corneal epithelium is sloughed off).

Inhalation Low hazard during normal industrial handling. Excessive inhalation of iodine vapors may cause respiratory tract, nasal, and mucous membrane irritation. Symptoms may include coughing, tightness in the chest, 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, 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.

Aspiration hazard No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure
Chronic Toxicity

May cause reddening of the skin, itching, acne-like eruption of the skin/skin rash, and skin allergies.
Prolonged or repeated exposure may cause eye irritation and conjunctivitis.
Prolonged or repeated 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.
Prolonged or repeated 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.

Sensitization: No information available

Mutagenic Effects: No information available

Carcinogenic effects: Not considered carcinogenic

<table>
<thead>
<tr>
<th>Components</th>
<th>ACGIH - Carcinogens</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA HCS - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
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</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>A4 Not Classifiable as a Human Carcinogen</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Reproductive toxicity No data is available

Reproductive Effects: No information available

Developmental Effects: May cause adverse developmental effects
Exposure to excessive amounts of iodine during pregnancy is capable of producing fetal hypothyroidism, severe goiter or cretinism in the offspring

Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure Respiratory Tract.
STOT - repeated exposure Causes damage to organs through prolonged or repeated exposure if swallowed. Thyroid.
Target Organs: Thyroid. Respiratory system. Skin. Eyes. Central nervous system.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: No information available

Mobility: No information available

Product code: I1010 Product name: IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS
13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
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<td>Iodine</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
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</tbody>
</table>

14. TRANSPORT INFORMATION

DOT
UN-No: UN3495
Proper Shipping Name: Iodine
Hazard Class: 8
Subsidiary Risk: 6.1
Packing Group: III
ERG No: 154
Marine Pollutant: No data available
DOT RQ (lbs): No information available
Symbol(s): +

TDG (Canada)
UN-No: UN3495
Proper Shipping Name: Iodine
Hazard Class: 8
Subsidiary Risk: (6.1)
Packing Group: III
Description: No information available

ADR
UN-No: UN3495
Proper Shipping Name: Iodine
Hazard Class: 8
Packing Group: III
Subsidiary Risk: 6.1
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG
UN-No: UN3495
Proper Shipping Name: Iodine
Hazard Class: 8
Subsidiary Risk: 6.1
Packing Group: III
Description: No information available
IMDG Page: No information available

Product code: I1010  Product name: IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS
14. TRANSPORT INFORMATION

Marine Pollutant: No information available
EMS: F-A
MFAG: No information available
Maximum Quantity: No information available

RID
UN-No: UN3495
Proper Shipping Name: Iodine
Hazard Class: 8
Subsidiary Risk: 6.1
Packing Group: III
Classification Code: No information available
Description: No information available

ICAO
UN-No: UN3495
Proper Shipping Name: Iodine
Hazard Class: 8
Subsidiary Risk: 6.1
Packing Group: III
Description: No information available

IATA
UN-No: UN3495
Proper Shipping Name: Iodine
Hazard Class: 8
Subsidiary Risk: 6.1
Packing Group: III
ERG Code: 8P
Description: No information available

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>KOREA KECL</th>
<th>Philippines (PICCS)</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>Present</td>
<td>Present KE-21023</td>
<td>Present</td>
<td>Not present</td>
<td>Present</td>
<td>Present</td>
<td>Present 231-442-4</td>
</tr>
</tbody>
</table>

U.S. Regulations

Iodine

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: 1026
Pennsylvania RTK: Present
Minnesota - Hazardous Substance List: Present
California Directors List of Hazardous Substances: Present


Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

Product code: I1010
Product name: IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS

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CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

U.S. TSCA

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Canada

WHMIS hazard class:
D2A Very toxic materials
E Corrosive material

Iodine
D2A E

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>Present</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>CEPA Schedule I - Toxic Substances</th>
<th>CEPA - 2010 Greenhouse Gases Subject to Manditory Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

EU Classification

R-phrase(s)
R50 - Very toxic to aquatic organisms.
R20/21 - Harmful by inhalation and in contact with skin.

S -phrase(s)
S2 - Keep out of the reach of children.
S23 - Do not breathe gas/fumes/vapor/spray.
S25 - Avoid contact with eyes.
S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.

<table>
<thead>
<tr>
<th>Components</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
</tr>
</thead>
</table>

Product code: I1010  
**Product name:** IODINE, SUBLIMED, CRYSTAL, REAGENT, ACS
The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
Xn - Harmful.
N - Dangerous for the environment.

16. OTHER INFORMATION

Preparation Date: 05/06/2015
Revision Date: 05/06/2015
Prepared by: Sonia Owen

Disclaimer: All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) 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 SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. 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 SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet