SAFETY DATA SHEET

1. Identification

Product identifier: Iodine (Iodine-Iodide) Volumetric Solution

Other means of identification
Product No.: 169

Recommended use and restriction on use
Recommended use: Not available.
Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer
Company Name: Avantor Performance Materials, Inc.
Address: 3477 Corporate Parkway, Suite 200
Center Valley, PA 18034
Telephone: Customer Service: 855-282-6867
Fax:
Contact Person: Environmental Health & Safety
e-mail: info@avantormaterials.com

Emergency telephone number:
24 Hour Emergency: 908-859-2151
Chemtrec: 800-424-9300

2. Hazard(s) identification

Hazard classification

Unknown toxicity
Acute toxicity, oral 0.599999 %
Acute toxicity, dermal 1 %
Acute toxicity, inhalation, vapor 100 %
Acute toxicity, inhalation, dust or mist 100 %

Environmental hazards
Acute hazards to the aquatic environment Category 3

Unknown toxicity
Chronic hazards to the aquatic environment 1 %

Label elements

Hazard symbol: No symbol
Signal word: No signal word.
Hazard statement: Harmful to aquatic life. Harmful to aquatic life.

Precautionary statement

Prevention: Avoid release to the environment.
Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical identity</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>Content in percent (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>POTASSIUM IODIDE</td>
<td></td>
<td>7681-11-0</td>
<td>1%</td>
</tr>
<tr>
<td>IODINE</td>
<td></td>
<td>7553-56-2</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion: Rinse mouth thoroughly. Call a POISON CENTER or doctor/physician if you feel unwell.

Inhalation: Move to fresh air. Get medical attention if symptoms persist.

Skin contact: Wash skin thoroughly with soap and water. Get medical attention if irritation persists after washing. Wash contaminated clothing before reuse.

Eye contact: Flush thoroughly with water. If irritation occurs, get medical assistance.

Most important symptoms/effects, acute and delayed

Symptoms: May cause irritation to skin, eyes, and respiratory tract.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically. Symptoms may be delayed.

5. Fire-fighting measures

General fire hazards: The product is non-combustible.

Suitable (and unsuitable) extinguishing media

- Suitable extinguishing media: Use fire-extinguishing media appropriate for surrounding materials.

- Unsuitable extinguishing media: None.

Specific hazards arising from the chemical: During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
### Special fire fighting procedures:
Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool. Cool containers exposed to flames with water until well after the fire is out.

### Special protective equipment for fire-fighters:
Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

### 6. Accidental release measures

<table>
<thead>
<tr>
<th>Personal precautions, protective equipment and emergency procedures:</th>
<th>Keep unauthorized personnel away. Use personal protective equipment. See Section 8 of the MSDS for Personal Protective Equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods and material for containment and cleaning up:</td>
<td>Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination.</td>
</tr>
<tr>
<td>Notification Procedures:</td>
<td>Inform authorities if large amounts are involved. Prevent runoff from entering drains, sewers, or streams.</td>
</tr>
<tr>
<td>Environmental precautions:</td>
<td>Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.</td>
</tr>
</tbody>
</table>

### 7. Handling and storage

| Precautions for safe handling: | Use personal protective equipment as required. Avoid contact with eyes, skin, and clothing. Avoid breathing mist or vapor. Wash hands thoroughly after handling. |
| Conditions for safe storage, including any incompatibilities: | Keep container tightly closed. Store in a cool, dry place. Store in a well-ventilated place. |
8. Exposure controls/personal protection

Control parameters

<table>
<thead>
<tr>
<th>Occupational exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical identity</strong></td>
</tr>
<tr>
<td>POTASSIUM IODIDE - Inhalable fraction and vapor.</td>
</tr>
<tr>
<td>POTASSIUM IODIDE - Particulate.</td>
</tr>
<tr>
<td>IODINE - Inhalable fraction and vapor.</td>
</tr>
<tr>
<td>IODINE - Vapor and aerosol.</td>
</tr>
<tr>
<td>IODINE</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Appropriate engineering controls

No data available.

Individual protection measures, such as personal protective equipment

General information: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Eye/face protection: Use eye protection.

Skin protection

Hand protection: Wear protective gloves.

Other: Wear suitable protective clothing.

Respiratory protection: In case of inadequate ventilation use suitable respirator.

Hygiene measures: Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned.
9. Physical and chemical properties

Appearance

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Form</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Red brown</td>
</tr>
<tr>
<td>Odor</td>
<td>Pungent</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available.</td>
</tr>
<tr>
<td>pH</td>
<td>No data available.</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>0 °C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>100 °C</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No data available.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available.</td>
</tr>
</tbody>
</table>

Upper/lower limit on flammability or explosive limits

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability limit - upper (%)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flammability limit - lower (%)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Explosive limit - upper (%)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Explosive limit - lower (%)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No data available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.0 (20 °C)</td>
</tr>
</tbody>
</table>

Solubility(ies)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solubility in water</td>
<td>Completely Soluble</td>
</tr>
<tr>
<td>Solubility (other)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available.</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Material is stable under normal conditions.

Possibility of hazardous reactions: Hazardous polymerization does not occur.

Conditions to avoid: Contact with incompatible materials.

Incompatible materials: Strong oxidizing agents.

Hazardous decomposition products: By heating and fire, toxic vapors/gases may be formed.

11. Toxicological information

Information on likely routes of exposure

<table>
<thead>
<tr>
<th>Route</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingestion</td>
<td>May cause irritation of the gastrointestinal tract.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Spray mists may cause respiratory tract irritation.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>May cause irritation.</td>
</tr>
</tbody>
</table>
Eye contact: May cause temporary eye irritation.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: No data available.

Specified substance(s):
IODINE
LD 50 (Rat): 14 g/kg
LDLo (Human): 28 mg/kg

Dermal
Product: No data available.

Inhalation
Product: No data available.

Repeated dose toxicity
Product: No data available.

Skin corrosion/irritation
Product: May cause skin irritation.

Serious eye damage/eye irritation
Product: May irritate eyes.

Respiratory or skin sensitization
Product: Not a skin sensitizer.

Carcinogenicity
Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogenic components identified

No carcinogenic components identified

Germ cell mutagenicity

In vitro
Product: No mutagenic components identified

In vivo
Product: No mutagenic components identified

Reproductive toxicity
Product: No components toxic to reproduction

Specific target organ toxicity - single exposure
Product: No data available.

Specific target organ toxicity - repeated exposure
Product: No data available.

Aspiration hazard
Product: Not classified

Other effects: None known.
12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No data available.

Specified substance(s):
- POTASSIUM IODIDE: LC 50 (Rainbow trout, donaldson trout (Oncorhynchus mykiss), 96 h): 896 mg/l Mortality
- IODINE: LC 50 (Guppy (Poecilia reticulata), 24 h): 3 mg/l Mortality
  LC 50 (Rainbow trout, donaldson trout (Oncorhynchus mykiss), 96 h): 0.48 - 0.58 mg/l Mortality

Aquatic invertebrates
Product: No data available.

Specified substance(s):
- POTASSIUM IODIDE: LC 50 (Zebra mussel (Dreissena polymorpha), 24 h): 220 - 313 mg/l Mortality
- IODINE: LC 50 (Water flea (Daphnia magna), 96 h): 0.51 - 0.68 mg/l Mortality

Chronic hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic invertebrates
Product: No data available.

Toxicity to Aquatic Plants
Product: No data available.

Persistence and degradability

Biodegradation
Product: There are no data on the degradability of this product.

BOD/COD ratio
Product: No data available.

Bioaccumulative potential

Bioconcentration factor (BCF)
Product: No data available on bioaccumulation.

Partition coefficient n-octanol / water (log Kow)
Product: No data available.

Specified substance(s):
- IODINE: Log Kow: 2.49

Mobility in soil:
The product is water soluble and may spread in water systems.

Other adverse effects:
Harmful to aquatic organisms.

13. Disposal considerations
Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws.

Contaminated packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT
- UN number: UN 3495
- UN proper shipping name: Iodine
- Transport hazard class(es): 8, 6.1
- Label(s): 8, 6.1
- Packing group: III
- Marine Pollutant: No

IMDG
- UN number: UN 3495
- UN proper shipping name: IODINE
- Transport hazard class(es): 8, 6.1
- Label(s): 8, 6.1
- EmS No.: F-A, S-B
- Packing group: III
- Marine Pollutant: No

IATA
- UN number: UN 3495
- Proper Shipping Name: Iodine
- Transport hazard class(es): 8, 6.1
- Label(s): 8, 6.1
- Marine Pollutant: No
- Packing group: III

15. Regulatory information

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):
None present or none present in regulated quantities.

Superfund amendments and reauthorization act of 1986 (SARA)

Hazard categories
Not listed.

SARA 302 Extremely hazardous substance
None present or none present in regulated quantities.

SARA 304 Emergency release notification
None present or none present in regulated quantities.
SARA 311/312 Hazardous chemical

<table>
<thead>
<tr>
<th>Chemical identity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>POTASSIUM IODIDE</td>
<td>500 lbs</td>
</tr>
<tr>
<td>IODINE</td>
<td>500 lbs</td>
</tr>
</tbody>
</table>

SARA 313 (TRI reporting)
None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)
None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
None present or none present in regulated quantities.

US state regulations

US. California Proposition 65
No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act
No ingredient regulated by NJ Right-to-Know Law present.

US. Massachusetts RTK - Substance List
No ingredient regulated by MA Right-to-Know Law present.

US. Pennsylvania RTK - Hazardous Substances
No ingredient regulated by PA Right-to-Know Law present.

US. Rhode Island RTK
No ingredient regulated by RI Right-to-Know Law present.

Inventory Status:

<table>
<thead>
<tr>
<th>Australia AICS:</th>
<th>On or in compliance with the inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada DSL Inventory List:</td>
<td>On or in compliance with the inventory</td>
</tr>
<tr>
<td>EU EINECS List:</td>
<td>On or in compliance with the inventory</td>
</tr>
<tr>
<td>EU ELINCS List:</td>
<td>Not in compliance with the inventory.</td>
</tr>
<tr>
<td>Japan (ENCS) List:</td>
<td>Not in compliance with the inventory.</td>
</tr>
<tr>
<td>EU No Longer Polymers List:</td>
<td>Not in compliance with the inventory.</td>
</tr>
<tr>
<td>China Inv. Existing Chemical Substances:</td>
<td>On or in compliance with the inventory</td>
</tr>
<tr>
<td>Korea Existing Chemicals Inv. (KECI):</td>
<td>On or in compliance with the inventory</td>
</tr>
<tr>
<td>Canada NDSL Inventory:</td>
<td>On or in compliance with the inventory</td>
</tr>
<tr>
<td>Philippines PICCS:</td>
<td>On or in compliance with the inventory</td>
</tr>
<tr>
<td>US TSCA Inventory:</td>
<td>On or in compliance with the inventory</td>
</tr>
<tr>
<td>New Zealand Inventory of Chemicals:</td>
<td>On or in compliance with the inventory</td>
</tr>
<tr>
<td>Japan ISHL Listing:</td>
<td>On or in compliance with the inventory</td>
</tr>
<tr>
<td>Japan Pharmacopoeia Listing:</td>
<td>Not in compliance with the inventory.</td>
</tr>
</tbody>
</table>

16. Other information, including date of preparation or last revision

NFPA Hazard ID

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
Disclaimer:

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