**MATERIAL SAFETY DATA SHEET**

### SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** Hydriodic Acid 55-58% (unstabilized or stabilized with 1.5 MAX H$_3$PO$_2$).

**GENERAL USE:** Reducing agent, manufacture of inorganic iodides, pharmaceuticals, disinfectants. The 57% acid is also used for analytical purposes, such as methoxyl determinations.

**PRODUCT DESCRIPTION:**
- Colorless to Yellow fuming clear liquid (stabilized).
- Yellow to light red fuming clear liquid (unstabilized).

**Manufacturers Name:** Iofina Chemical

**ADDRESS (NUMBER, STREET, P.O. BOX):**
1025 Mary Laidley Drive

**TELEPHONE NUMBER FOR INFORMATION / customer service:**
1-859-356-8000

**DATE PREPARED:** 01/11/2008

**SUPERSEDES:** 05/11/2007

**ADDRESS (NUMBER, STREET, P.O. BOX):**
1025 Mary Laidley Drive

**TELEPHONE NUMBER FOR INFORMATION / customer service:**
1-859-356-8000

**CITY, STATE AND ZIP CODE:** Covington, KY 41017

**COUNTRY:** USA

**CHEMTEL 24-HOUR EMERGENCY TELEPHONE NUMBER:**
North America: 1-800-255-3924
International: +01-813-248-0585

**SECTION 2 - HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>% (by Weight)</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>Hazard Symbol</th>
<th>RISK PHRASES</th>
<th>(Full Text Section 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydriodic Acid</td>
<td>55-58%</td>
<td>10034-85-2</td>
<td>233-109</td>
<td>+C: Corrosive</td>
<td>R-20/21/22</td>
<td>R-34</td>
</tr>
<tr>
<td>Phosphinic Acid</td>
<td>≤1.5%</td>
<td>6303-21-5</td>
<td>228-601</td>
<td>+C: Corrosive</td>
<td>R-34</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION 3 - HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW**
This product MAY BE FATAL IF SWALLOWED OR INHALED. VAPORS CAUSE SEVERE IRRITATION TO SKIN, EYES, RESPIRATORY TRACT and mucous membranes and could cause severe burns to these tissues. Upon heating, toxic fumes are formed. Reacts violently with metal powders, antimony, ammonia, acetaldehyde, acetylene causing fire and explosion hazard. Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms of iodism 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. Always avoid contact with skin, eyes and mucous membranes.

**POTENTIAL HEALTH EFFECTS**

**INHALATION:** Inhalation may produce dyspnea, pleuritic chest pain, upper airway edema, pulmonary edema, hypoxemia, bronchospasm, pneumonitis, and persistent pulmonary function abnormalities. Airway hyperactivity has also been reported.

**SKIN:** Contact with substance may cause severe burns to skin and eyes. See Inhalation.

**EYES:** May cause severe burns to eyes.

**INGESTION:** Ingestion of acids may result in burns, gastrointestinal bleeding, gastritis, perforations, dilation, edema, necrosis, vomiting, stenosis, fistula, and duodenal/jejunal injury.

**CARCINOGENICITY**
- NTP? NO
- IARC MONOGRAPHS? NO
- OSHA REGULATED? NO

Cal. Prop. 65? NO
SECTION 4 - FIRST AID MEASURES

Use good personal hygiene practices. If skin contact should occur, material should be washed away with a mild soap and water. Wash hands and other exposed areas thoroughly before eating, drinking, smoking or using toilet facilities. Do not smoke, drink or eat in areas where this product is stored or handled. For extensive scale or contamination removal, the following precautions should be taken: the work area should be well-ventilated and access should be restricted, surface contaminants should be kept wet, plastic ground cover should be used to contain contaminants and facilitate clean-up, and high efficiency particulate respirators should be worn unless concentrations are not expected to exceed limits established. Suitable coveralls and gloves should be worn and contaminated protective equipment and clothing should be decontaminated or disposed of.

INHALATION: Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method 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. Administer oxygen if breathing is difficult.

EYES: Immediately flush with running water for at least 20 minutes. Seek Medical Attention!

SKIN: Remove contaminated clothing, wash exposed area with copious amounts of water. A physician should examine the area if irritation or pain persists.

INGESTION: Seek medical assistance immediately. Do Not Induce Vomiting!

SECTION 5 - FIRE FIGHTING MEASURES

GENERAL HAZARDS: When heated to decomposition, it emits highly toxic fumes of hydrogen iodide. Decomposes by light; fumes in moist air.

EXTINGUISHING MEDIA: Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

FIRE FIGHTING PROCEDURES: Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Cool all affected containers with flooding quantities of water. Do not apply water to point of leak in tank car or container. Apply water from as far a distance as possible. Do not use water on material itself. If large quantities of combustibles are involved, use water in flooding quantities as spray and fog. Use water spray to knock-down vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Substance may decompose upon heating to produce corrosive and/or toxic fumes.

HAZARDOUS COMBUSTION PRODUCTS:
Hydrogen Iodide Gas, Hydriodic Acid Vapor.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Keep material out of water sources and sewers. Attempt to stop leak if without undue personnel hazard. Use water spray to knock-down vapors. Do not use water on material itself.

SECTION 7 - HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>HAZARDOUS COMPONENTS</th>
<th>NIOSH</th>
<th>ACGIH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA ppm</td>
<td>TWA mg/m3</td>
</tr>
<tr>
<td>Hydriodic Acid</td>
<td>0.1</td>
<td>NA</td>
</tr>
<tr>
<td>Phosphinic Acid</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
PERSONAL PROTECTION

RESPIRATORY PROTECTION: Wear positive pressure self-contained breathing apparatus or a half face vapor mask and/or use a mechanical fume hood.

PROTECTIVE GLOVES: Wear chemically impervious gloves, neoprene or rubber. An apron is also required.

EYE PROTECTION: Wear chemically protective splash goggles and/or a full face shield.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Wear positive pressure self-contained breathing apparatus. Wear appropriate chemical protective clothing. Selection should follow the OSHA Personal Protective Equipment Standard 29 CFR 1910 subpart 1 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

WORK / HYGIENIC PRACTICES: Handle in accordance with good industrial hygiene practices. Wash hands frequently and at the end of the work day.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR
Colorless to Yellow fuming clear liquid (stabilized). Yellow to light red fuming clear liquid (unstabilized). With a pungent acrid odor.

VAPOR PRESSURE
NA

PH
<1.0

SPECIFIC GRAVITY (WATER = 1)
1.66-1.72@20°C

BOILING POINT / BOILING RANGE
<127°C

SOLUBILITY IN WATER
Complete

FLASH POINT
NA

VISCOSITY
NA

FLAMMABLE LIMITS
LEL: NA
UEL: NA

VAPOR DENSITY (AIR = 1)
NA

AUTOIGNITION TEMPERATURE
NA

EVAPORATION RATE (WATER = 1)
NA

SECTION 10 - STABILITY AND REACTIVITY

STABILITY
Stable

UNSTABLE:
Darkens on exposure to light.

CONDITIONS TO AVOID:
Unstabilized material is air sensitive and darkens on exposure to light and air.

INCOMPATIBILITY (MATERIALS TO AVOID):
Reacts rapidly and exothermically with bases.
Reacts with active metals in the presence of moisture, including such structural metals as aluminum and iron, to release hydrogen, a flammable gas.
Reacts with cyanide compounds to release gaseous hydrogen cyanide.
Reacts with oxidizing agents to give iodine (when passed through fuming nitric acid, each bubble produces iodine attended by a flash of red flame).

HAZARDOUS DECOMPOSITION OR BYPRODUCTS:
Iodine fumes, Hydriodic Acid vapors, Hydrogen Iodide gas.

HAZARDOUS POLYMERIZATION
Will not occur.

CONDITIONS TO AVOID:
Unstabilized material is air sensitive and darkens on exposure to light and air.

SECTION 11 - TOXICOLOGICAL INFORMATION

Hazardous Components

<table>
<thead>
<tr>
<th>Hazardous Component</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>LD50 of Ingredient</th>
<th>LC50 of Ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydriodic Acid</td>
<td>10034-85-2, 233-109-9</td>
<td></td>
<td>0.1 ppm oral (Rat)</td>
<td>May affect functioning of thyroid.</td>
</tr>
<tr>
<td>Phosphinic Acid</td>
<td>6303-21-5, 228-601-5</td>
<td></td>
<td></td>
<td>O.1ppm inhalation (Species not specified).</td>
</tr>
</tbody>
</table>

SECTION 12 - ECOLOGICAL INFORMATION

Do not allow product to reach ground water, watercourse or sewage system. Danger to drinking water if even small quantities leak into ground water. Do not allow material to be released to the environment without proper governmental permits. Environmental fate: Unknown

SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Ensure that collection, transport, treatment, and disposal of waste product, containers and rinsate complies with all applicable laws and regulations. It is the responsibility of the product user or owner to determine at the time of disposal, whether the product is regulated as a hazardous waste.
PRODUCT NAME: Hydriodic Acid 55-58% (unstabilized or stabilized with 1.5 MAX H₃PO₄).
Hydrogen Iodide in Water, Azeotrope

Date: 01/11/2008

SECTION 14 - TRANSPORT INFORMATION

PROPER SHIPPING NAME: Hydriodic Acid

DOT HAZARD CLASS / Pack Group: 8/PGII
REFERENCE: 49 CFR
UN / NA IDENTIFICATION NUMBER: UN-1787
LABEL: Corrosive
HAZARD SYMBOLS:

IATA HAZARD CLASS / Pack Group: Class 8/PGII
IMDG HAZARD CLASS: Class 8
RID/ADR Dangerous Goods Code: 60
UN TDG Class / Pack Group: UN1787, 8, PGII
Hazard Identification Number (HIN): 80

Note: Transportation information provided is for reference only. Client is urged to consult CFR 49 parts 100 - 177, IMDG, IATA, EU, United Nations TDG, and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

SECTION 15 - REGULATORY INFORMATION

TSCA (USA - Toxic Substance Control Act) Listed
SARA TITLE III (USA - Superfund Amendments and Reauthorization Act) Not Reportable

313 REPORTABLE INGREDIENTS: Not Reportable.

CERCLA (USA - Comprehensive Response Compensation and Liability Act) RQ=None
California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986 Not Listed

CPR (Canadian Controlled Products Regulations) Listed
IDL (Canadian Ingredient Disclosure List) Listed

DSL / NDSL (Canadian Domestic Substances List / Non-Domestic Substances List) Listed
EINECS (European Inventory of Existing Commercial Chemical Substances) Listed

WGK Water Quality Index: Unknown

RISK PHRASES: SAFETY PHRASES:

+S36,37,39: Wear suitable protective clothing, gloves and eye/face protection.
+S38: Keep out of the reach of children.
+S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
+S27: In case of contact with skin, wash immediately with plenty of water and soap.
+S28: If swallowed, immediately call a POISON CENTER or your doctor.
+S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

SECTION 16 - OTHER INFORMATION

HMIS HAZARD RATINGS
HEALTH: FLAMMABILITY: REACTIVITY: PERSONAL PROTECTIVE EQUIPMENT:
3 0 1 4
0 = INSIGNIFICANT
1 = SLIGHT
2 = MODERATE
3 = HIGH
4 = EXTREME

REVISION SUMMARY:
Revision 01/11/2008 includes E.U. hazards information and supersedes previous 05/11/2007 issue.

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The information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.