**Section 1 - IDENTIFICATION**

**Manufacturer Information**
MATHESON TRI-GAS, INC.
150 Allen Road, Suite 302
Basking Ridge, NJ 07920

General Information: 1-800-416-2505
Emergency #: 1-800-424-9300 (CHEMTREC)
Outside the US: 703-527-3887 (Call collect)

**Product Identifier:** Arsine

**Trade Names/Synonyms**
Arsenic trihydride; Arsenic hydride; Arsenic hydride (AsH3); Arseniuretted hydrogen; Arsenous hydride; Hydrogen arsenide; AsH3

**Chemical Family**
inorganic, gas, hydrides

**Product Use**
industrial

**Restrictions on Use**
None known.

**Section 2 - HAZARDS IDENTIFICATION**

**GHS Classification**
Flammable gas, Category 1
Gas under pressure, Liquefied gas
Acute Toxicity (Inhalation), Category 1
Carcinogenicity, Category 1A
Specific Target Organ Toxicity - Single Exposure, Category 1 (cardiovascular system, central nervous system, circulatory system, kidneys, liver, and respiratory system)
Specific Target Organ Toxicity - Repeated Exposure, Category 1 (circulatory system)
Hazardous to the Aquatic Environment - Acute Hazard, Category 1
Hazardous to the Aquatic Environment - Chronic Hazard, Category 1

**GHS LABEL ELEMENTS**

**Signal Word**
DANGER

**Hazard Statement(s)**
Extremely flammable gas
Contains gas under pressure; may explode if heated
Fatal if inhaled
May cause cancer
Causes damage to cardiovascular system, central nervous system, circulatory system, kidneys, liver, and respiratory system. 
Causes damage to circulatory system through prolonged or repeated exposure. 
Very toxic to aquatic life with long lasting effects

**Precautionary Statement(s)**

**Prevention**
Keep away from heat, sparks, open flame, and hot surfaces - No smoking. Do not breathe gas. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Use only outdoors or in a well-ventilated area.
Wear respiratory protection. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Avoid release to the environment.

**Response**
IF exposed: Call a POISON CENTER or doctor/physician. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. Collect spillage.

**Storage**
Store in a well-ventilated place. Protect from sunlight. Keep container tightly closed. Store locked up.

**Disposal**
Dispose in accordance with all applicable regulations.

**Other Hazards which do not Result in Classification**
May cause frostbite upon sudden release of liquefied gas.

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**Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS**

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7784-42-1</td>
<td>Arsine</td>
<td>100</td>
</tr>
</tbody>
</table>

**Component Related Regulatory Information**
This product may be regulated, have exposure limits or other information identified as the following: Arsenic compounds, n.o.s., Arsenic, inorganic compounds.

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**Section 4 - FIRST AID MEASURES**

**Inhalation**
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention. Do not attempt rescue in confined spaces without adequate protective gear and proper training.

**Skin**
If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

**Eyes**
Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**Ingestion**
If a large amount is swallowed, get medical attention.

**Note to Physicians**
For inhalation, consider oxygen.

**Symptoms: Immediate**
frostbite, cardiovascular system damage, central nervous system damage, circulatory system damage, kidney damage, liver damage, respiratory system damage
Symptoms: Delayed
circulatory system damage, cancer

* * *Section 5 - FIRE FIGHTING MEASURES* * *

See Section 9 for Flammability Properties

Specific Hazards Arising from the Chemical
Severe fire hazard. Moderate explosion hazard. The gas is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Gas/air mixtures are explosive. Containers may rupture or explode if exposed to heat.

Extinguishing Media
regular dry chemical, carbon dioxide, water spray, alcohol resistant foam
Large fires: water spray or fog, alcohol-resistant foam

Unsuitable Extinguishing Media
None known.

Protective Equipment and Precautions for Firefighters
Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Fire Fighting Measures
Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Hazardous Combustion Products
Combustion: arsenic, arsenic compounds
Light: arsenic

* * *Section 6 - ACCIDENTAL RELEASE MEASURES* * *

Personal Precautions
Wear personal protective clothing and equipment, see Section 8.

Environmental Precautions
Avoid release to the environment. Keep out of water supplies and sewers.

Methods for Containment
Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Reduce vapors with water spray.

Cleanup Methods
Stop leak if safe to do so - Prevent entry into waterways, drains, or confined areas. Eliminate all ignition sources if safe to do so. All equipment used when handling the product must be grounded. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Damaged cylinders should be handled only by specialists.

* * *Section 7 - HANDLING AND STORAGE* * *

Handling Procedures
Safety Data Sheet

Material Name: Arsine

Storage Procedures
Store and handle in accordance with all current regulations and standards. Store in a tightly closed container. Compressed gases can present significant safety hazards. Store in a cool, dry place. Store in a well-ventilated area. Protect from physical damage. Store below 52°C. Avoid heat, flames, sparks and other sources of ignition. Cylinders should be stored upright (with valve protection cap in place). Keep dry. Avoid direct sunlight. Store cylinders away from heavily trafficked areas and emergency exits. For additional and specific safe practices consult the following Compressed Gas Association (CGA) publications: P-1 “Safe Handling of Compressed Gases in Cylinders”, AV-1 “Safe Handling and Storage of Compressed Gases”, and “Compressed Handbook”. Grounding and bonding required. Use non-sparking tools and equipment. Subject to storage and handling regulations: U.S. OSHA 29 CFR 1910.101. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355 Part B). See original container for storage recommendations. Keep separated from incompatible substances.

Incompatibilities acids, combustible materials, halogens, oxidizing materials

**Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

Component Exposure Limits
Arsine (7784-42-1)

ACGIH: 0.005 ppm TWA
OSHA (Final): 0.05 ppm TWA; 0.2 mg/m3 TWA
OSHA (Vacated): 0.05 ppm TWA; 0.2 mg/m3 TWA
NIOSH: 0.002 mg/m3 Ceiling (15 min)

Component Biological Limit Values
There are no biological limit values for any of this product's components.

IDLH
3 ppm

Engineering Controls
Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits. All energized electrical equipment must be designed in accordance with the electrical classification of the area (e.g., Class I, Division I).

PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face
For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Protective Clothing
For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

Glove Recommendations
Wear chemical resistant, insulated gloves.

Respiratory Protection
The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
At any detectable concentration -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

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<thead>
<tr>
<th>Physical State:</th>
<th>Gas</th>
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<tbody>
<tr>
<td>Color:</td>
<td>colorless</td>
</tr>
<tr>
<td>Odor:</td>
<td>garlic odor</td>
</tr>
<tr>
<td>pH:</td>
<td>Not available</td>
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<tr>
<td>Boiling Point:</td>
<td>-63 °C</td>
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<tr>
<td>Decomposition:</td>
<td>300 °C</td>
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<tr>
<td>LEL:</td>
<td>4.5 %</td>
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<tr>
<td>Vapor Pressure:</td>
<td>11362 mmHg @ 21.1 °C</td>
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<tr>
<td>Specific Gravity (water=1):</td>
<td>1.689 @ -55 °C</td>
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<tr>
<td>Log KOW:</td>
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<tr>
<td>Viscosity:</td>
<td>101.325 kPa @ 0 °C</td>
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<tr>
<td>Molecular Formula:</td>
<td>As-H3</td>
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</table>

Solvent Solubility
- Soluble: benzene, chloroform

**Section 10 - STABILITY AND REACTIVITY**

**Chemical Stability**
May decompose explosively when heated above 300 °C. Avoid contact with light.

**Conditions to Avoid**
- Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

**Possibility of Hazardous Reactions**
Will not polymerize.

**Incompatible Materials**
- acids, combustible materials, halogens, oxidizing materials

**Hazardous Decomposition**
- Combustion: arsenic, arsenic compounds
- Light: arsenic
Acute and Chronic Toxicity

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

**Arsine (7784-42-1)**

Inhalation LC50 Rat 16.2 ppm 4 h

**RTECS Acute Toxicity (selected)**

The components of this material have been reviewed, and RTECS publishes the following endpoints:

**Arsine (7784-42-1)**

- **Inhalation**: 0.1 mg/m3/15 minute(s) Inhalation Mouse LC50; 0.5 mg/m3/2 minute(s) Inhalation Mouse LC50; 17.2 ppm/2 hour Inhalation Mouse LC50; 250 mg/m3/10 minute(s) Inhalation Mouse LC50; 0.05 gm/m3/2 hour Inhalation Mouse LC50; 390 mg/m3/10 minute(s) Inhalation Rat LC50; 0.3 mg/m3/15 minute(s) Inhalation Rat LC50; 45 ppm/4 hour Inhalation Rat LC50; 178 ppm/1 hour Inhalation Rat LC50; 240 ppm/30 minute(s) Inhalation Rat LC50; 120 ppm/10 minute(s) Inhalation Rat LC50

  - **Oral**: potential occupational carcinogen

**Acute Toxicity Level**

**Arsine (7784-42-1)**

- Highly Toxic: inhalation

**Immediate Effects**

- frostbite, cardiovascular system damage, central nervous system damage, circulatory system damage, kidney damage, liver damage, respiratory system damage

**Delayed Effects**

- circulatory system damage, cancer

**Irritation/Corrosivity Data**

No animal testing data available for skin or eyes.

**RTECS Irritation**

The components of this material have been reviewed and RTECS publishes no data as of the date on this document.

**Target Organs**

**Arsine (7784-42-1)**

- blood

**Respiratory Sensitizer**

No data available.

**Dermal Sensitizer**

No data available.
Carcinogenicity
Component Carcinogenicity
Arsine (7784-42-1)
   ACGIH: A1 - Confirmed Human Carcinogen (related to Arsenic, inorganic compounds)
   IARC: Supplement 7 [1987] (Group 1 (carcinogenic to humans))
   DFG: Category 1 (causes cancer in man, related to Arsenic, inorganic compounds)
   OSHA: see 29 CFR 1910.1018 (except Arsine, related to Arsenic, inorganic compounds)
   NTP: Known Human Carcinogen (related to Arsenic, inorganic compounds)

RTECS Mutagenic
   The components of this material have been reviewed, and RTECS publishes data for one or more components.

Reproductive Effects Data
   No data available.

Tumorigenic Data
   Arsenic compounds have been characterized as tumorigenic.

RTECS Tumorigenic
   The components of this material have been reviewed, and RTECS publishes data for one or more components.

Specific Target Organ Toxicity - Single Exposure
   cardiovascular system, central nervous system, circulatory system, kidneys, liver, respiratory system

Specific Target Organ Toxicity - Repeated Exposure
   circulatory system

Aspiration Hazard
   Not applicable.

Medical Conditions Aggravated by Exposure
   None known.

** *Section 12 - ECOLOGICAL INFORMATION* **

Ecotoxicity
   Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. There is no data for the substance itself, however, it is Annex VI CLP classified.

Component Analysis - Aquatic Toxicity
   No LOLI ecotoxicity data are available for this product's components.

Persistence and Degradability
   No data available.

Bioaccumulative Potential
   No data available.

Mobility in Environmental Media
   No data available.

** *Section 13 - DISPOSAL CONSIDERATIONS* **

Disposal Methods
   Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. D003. D004. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 5.0 mg/L.

Component Waste Numbers
   The U.S. EPA has not published waste numbers for this product's components.

** *Section 14 - TRANSPORT INFORMATION* **

US DOT Information
   Shipping Name: Arsine
Material Name: Arsine

UN/NA #: UN2188  Hazard Class: 2.3
Required Label(s): 2.3, 2.1
Additional Info.: Toxic-Inhalation Hazard Zone A

IMDG Information
Shipping Name: Arsine
UN #: UN2188  Hazard Class: 2.3
Required Label(s): 2.3, 2.1

** *Section 15 - REGULATORY INFORMATION* **

Component Analysis
U.S. Federal Regulations
This material contains one or more of the following chemicals required to be identified under SARA Section 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.
Arsine (7784-42-1)

| SARA 302:  | 100 lb TPQ |
| SARA 304:  | 100 lb EPCRA RQ |
| SARA 313:  | 0.1 % de minimis concentration (related to Arsenic, inorganic compounds) |
| OSHA (safety):  | 100 lb TQ |

SARA 311/312 Hazardous Categories

Acute Health: Yes  Chronic Health: Yes  Fire: Yes  Pressure: Yes  Reactive: Yes

U.S. State Regulations
The following components appear on one or more of the following state hazardous substances lists:

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<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
</tr>
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<tbody>
<tr>
<td>Arsine</td>
<td>7784-42-1</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>US</th>
<th>CA</th>
<th>EU</th>
<th>AU</th>
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<th>KR</th>
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<tbody>
<tr>
<td>Arsine</td>
<td>7784-42-1</td>
<td>Yes</td>
<td>DSL</td>
<td>EIN</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

** *Section 16 - OTHER INFORMATION* **

NFPA Ratings: Health: 4  Fire: 4  Reactivity: 2
Hazard Scale: 0 = Minimal  1 = Slight  2 = Moderate  3 = Serious  4 = Severe
Key / Legend
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Farenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Other Information
Matheson Tri-Gas, Inc. makes no express or implied warranties, guarantees or representations regarding the product or the information herein, including but not limited to any implied warranty or merchantability or fitness for use. Matheson Tri-Gas, Inc. shall not be liable for any personal injury, property or other damages of any nature, whether compensatory, consequential, exemplary, or otherwise, resulting from any publication, use or reliance upon the information herein.

End of Sheet 00244364