Safety Data Sheet

* * * Section 1 - Chemical Product and Company Identification * * *

Product Identifier:

Arsenic Acid Solution

Chemical Name

Arsenic Acid Solution

Recommended Use

Various Industrial Applications

Manufacturer Information

MINERAL RESEARCH & DEVELOPMENT
5910 Pharr Mill Road
Harrisburg, NC 28075

Phone: 704-454-4811
FAX: 704-454-7390
CHEMTREC: (800) 424-9300
US and Canadian Shipping Only- 1-703-527-3887

General Comments

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

* * * Section 2 – Hazard Identification * * *

GHS Classification

Hazardous to aquatic environment – Acute, Category 1
Hazardous to aquatic environment – Chronic, Category 1
Carcinogenicity, Category 1A
Skin Corrosion/Irritation, Category 1A
Acute toxicity - Oral, Category 3
Acute toxicity - Inhalation, Category 3

GHS Label Elements

Symbol(s)

Signal Word

Danger

Hazard Statements

Toxic if swallowed.
Toxic if inhaled.
Causes severe skin burns and eye damage.

May cause cancer.
Very toxic to aquatic life.
Very toxic to aquatic life with long lasting effects.

Precautionary Statements

Prevention

Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Avoid breathing dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product. Avoid release to the environment.

Response

IF exposed or concerned: Get medical advice/attention.

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.

IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.

IF INHALED: If inhaled, remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

IF SWALLOWED: Rinse mouth. Do not induce vomiting. Immediately call a POISON CENTER or doctor/physician.

Storage

Store in a well-ventilated place. Keep container tightly closed. Store locked Up.

Disposal

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
7778-39-4	Arsenic acid	65-80
7732-18-5	Water	20-35

Component Information/Information on Non-Hazardous Components

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication) and the Canadian Workplace Hazardous Materials Information System (WHMIS).

* * * Section 4 - First Aid Measures * * *

Description of Necessary Measures

Eyes Contact

IF IN EYES: Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.

Skin Contact

IF ON SKIN (or hair): For skin contact, wash immediately with soap and water. If irritation persists get medical attention.

Ingestion

IF SWALLOWED: If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting.

Inhalation

IF INHALED: If inhaled, immediately remove the affected person to fresh air. If the affected person is not breathing, apply artificial respiration. If irritation persists get medical attention.

First Aid: Notes to Physician

Provide general supportive measures and treat symptomatically.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

Does not burn, but may act as an oxidizing agent, and may cause spontaneous ignition of combustible materials. Contact with active metals such as arsenic, iron, aluminum, and zinc may emit highly toxic fumes of arsenic including arsine. Contact with metals may evolve flammable hydrogen gas.

Hazardous Combustion Products

Combustion products may include toxic fumes of arsenic, including arsine.

Extinguishing Media

Dry chemical, foam, carbon dioxide, water fog.

Fire Fighting Equipment/Instructions

Fire fighters should wear full-face, self-contained breathing apparatus.

NFPA Ratings: Health: 3 **Fire:** 1 **Reactivity:** 1
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

Stop the flow of material, if this is without risk. Wear appropriate protective equipment and clothing during clean up. Eliminate ignition sources. Keep upwind and out of low areas. Contain discharge by booming on water or diking on ground. Absorb/adsorb residual materials and clean up with non-sparking tools. Prevent entry into sewers, drains, underground or confined spaces, water intakes and waterways.

Clean-Up Procedures

Absorb spill with inert material. Shovel material into appropriate container for disposal. Sweep up or gather material and place in appropriate container for disposal. Wash spill area thoroughly. Wear appropriate protective equipment during cleanup.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

Keep upwind of the spilled material and isolate exposure. Wear appropriate personal protective equipment. Follow all Local, State, Federal and Provincial regulations for disposal.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Do not get this material in your eyes, on your skin, or on your clothing. Do not inhale vapors or mists of this product. Use this product with adequate ventilation. Wash thoroughly after handling. Keep this product from heat, sparks, or open flame.

Storage Procedures

Store in a cool, dry, well-ventilated area. Do not handle or store near an open flame, heat or other sources of ignition.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Arsenic acid (7778-39-4)

ACGIH:	0.01 mg/m3 TWA (related to Arsenic, elemental) 0.01 mg/m3 TWA (except arsine) (related to Arsenic, inorganic compounds)
OSHA:	as As: 5 ug/m3 TWA action level; 10 ug/m3 TWA; Cancer hazard (see 29 CFR 1910.1018) (related to Inorganic arsenic)
NIOSH:	NIOSH Potential Occupational Carcinogen - see Appendix A (organic compounds have no established exposure limit) (related to Arsenic (inorganic compounds)) C 0.002 mg/m3 (15 min) (related to Arsenic (inorganic compounds))

Engineering Controls

Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapors or mists generated from the handling of this product.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses; chemical goggles (if splashing is possible).

Personal Protective Equipment: Skin

Use impervious gloves.

Personal Protective Equipment: Respiratory

If ventilation is not sufficient to effectively prevent buildup of vapors or mists, appropriate approved NIOSH respiratory protection must be provided (i.e. air-purifying respirator with an acid-gas cartridge). Respirators should be selected by and used under the direction of a trained health and safety professional following the requirements found in OSHA's respirator standard (29 CFR 1901.134) and ANSI's standard for respiratory protection (Z88.2-1992), applicable U.S. regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. A written respiratory protection program, including provisions for medical certification, training, fit-testing, exposure assessments, maintenance, inspection, cleaning, and convenient, sanitary storage, must be implemented.

Personal Protective Equipment: General

Eyewash fountains and emergency showers are required.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Colorless to pale yellow	**Odor:**	Not available
Physical State:	Liquid	**Odor Threshold:**	Not Applicable
Vapor Pressure:	Not available	**pH:**	<1
Vapor Density:	Not available	**Specific Gravity:**	Not available
Boiling Point / Boiling Range:	Not available	**Evaporation Rate:**	Not available
Melting Point / Freezing Point:	Not available / Not available	**Relative Density:**	Not available
Solubility (H_2O):	Not available	**Auto-ignition Temperature:**	Not available
Flash Point:	Not Flammable	**Decomposition Temperature:**	Not available
Upper Flammable Limit (UFL):	Not Applicable	**Lower Flammable Limit (LFL):**	Not Applicable
Viscosity:	Not available	**Partition Coefficient (n-octanol / water):**	Not available
Flammability:	Not available		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Chemical Stability: Conditions to Avoid

Keep away from heat, sparks, or open flame. Contact with metals.

Incompatibility

This product may react with certain metals to evolve flammable hydrogen and/or highly toxic fumes of arsenic compounds.

Hazardous Decomposition

Combustion products may include toxic fumes of arsenic, including arsine.

Hazardous Polymerization

Will not occur.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

Exposure to arsenic compounds results in hyperpigmentation of the skin and hyperkeratoses of the skin as well as dermatitis of both primary irritation and sensitization types. Acute overexposure can cause central and/or peripheral nervous system disorders, and damage to the blood forming organs and liver. Acute inhalation has resulted in irritation of the upper respiratory tract, even leading to ulceration and perforation of the nasal septum. Symptoms of acute arsenic poisoning include burning lips, constriction of the throat, abdominal pain, severe nausea, projectile vomiting, and profuse diarrhea. Other toxic effects on the liver, blood-forming organs, central and peripheral nervous systems and cardiovascular system may appear.

Component Analysis - LD50/LC50

Arsenic acid (7778-39-4)

Oral LD50 Rat : 48 mg/kg

Oral LD50 Rat : 763 mg/kg

Oral LD50 Mouse : 145 mg/kg (related to Arsenic)

Information on Likely Routes of Exposure

Inhalation

Inhalation of vapors, mists, sprays or dry form of this product can cause severe irritation to the respiratory system. Symptoms may include coughing, shortness of breath. Neurological changes have been reported after inorganic arsenic inhalation and may include peripheral neuropathy of sensory and motor neurons resulting in numbness, loss of reflex and muscle weakness. Encephalopathy resulting in hallucinations, agitation, emotional changes and memory loss may linger after arsenic exposure.

Ingestion

This product may be harmful if swallowed. If swallowed, this product can cause severe irritation of the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.

Skin Contact

This product is irritating to the skin. Symptoms include redness, itching, and pain.

Eye Contact

Contact with the eyes can cause severe irritation or burning of eyes.

Immediate Effects

Eye irritation and respiratory irritation.

Delayed Effects

Chronic arsenic intoxication by ingestion is characterized by weakness, anorexia, gastrointestinal disturbances, impairment of cognitive function, peripheral neuropathy, and skin disorders. Liver damage has also been observed in animals after both ingestion and inhalation of arsenic compounds.

Medical Conditions Aggravated by Exposure

Pre-existing eye, skin and/or respiratory tract conditions.

Irritation/Corrosivity Data

Respiratory tract irritation, skin irritation, eye irritation

Respiratory Sensitization

No data available.

Dermal Sensitization

No data available for the mixture

Germ Cell Mutagenicity

Exposure to arsenic compounds has been reported to induce chromosomal breaks in cultured human leukocytes.

Carcinogenicity

Inorganic arsenic (includes the metallic form) has been shown to cause skin and lung cancer, lymphatic cancer and dermatitis in humans on long term occupational exposure.

Component Carcinogenicity

Arsenic acid (7778-39-4)

ACGIH:	A1- confirmed human carcinogen (related to Arsenic, elemental) A1- confirmed human carcinogen (except arsine, as As) (related to Arsenic, inorganic compounds)
OSHA:	as As: 5 ug/m3 TWA action level; 10 ug/m3 TWA; Cancer hazard (see 29 CFR 1910.1018) (related to Inorganic arsenic)
NIOSH:	occupational carcinogen (related to Arsenic (inorganic compounds))
NTP:	Known Carcinogen (related to Arsenic, inorganic compounds) (Select Carcinogen)

IARC: Supplement 7, 1987; Monograph 23, 1980; (This evaluation applies to the group of compounds as a whole and not necessarily to all individual compounds within the group) (related to Arsenic)
Supplement 7, 1987; Monograph 23, 1980; (This evaluation applies to the group of compounds as a whole and not necessarily to all individual compounds within the group) (related to Arsenic compounds, n.o.s.) (Group 1 (carcinogenic to humans))

Reproductive Toxicity

Teratogenic effects of soluble arsenic compounds administered intravenously or intraperitoneal at high doses have been demonstrated in hamsters, rats and mice.

Specific Target Organ Toxicity - Single Exposure

No information available.

Specific Target Organ Toxicity - Repeated Exposure

No information available.

Aspiration Hazard

No information available.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

No information available.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Environmental Fate

No information available.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

General Product Information

This product contains a component identified as hazardous under 40 CFR 261.24.

Arsenic acid (7778-39-4)

RCRA: waste number P010
waste number D004; regulatory level = 5.0 mg/L (related to Arsenic)

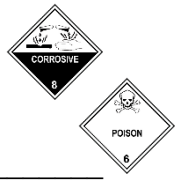
Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations. Wastes should be tested using appropriate TCLP analysis to determine applicable waste numbers.

* * * Section 14 - Transportation Information * * *

US DOT Information

Shipping Name: Corrosive Liquids, Toxic, n.o.s. (Contains: Arsenic)
Hazard Class: 8 (6.1)
UN/NA #: UN2922
Packing Group: II



Required Label(s): CORROSIVE, POISON
Emergency Response Guide: #154
Additional Info.: The Reportable Quantity for arsenic acid is 1 lbs.(0.454 kg). For shipments, in a single container exceeding the RQ for arsenic acid, RQ must appear in the proper shipping name.

Canada Transportation of Dangerous Goods Information

Shipping Name: CORROSIVE LIQUIDS, TOXIC (Contains: Arsenic)
Hazard Class: 8 (6.1)
UN/NA #: UN2922
Packing Group: II

IMGD

Shipping Name: Corrosive Liquids, Toxic, n.o.s. (Contains: Arsenic)
Hazard Class: 8 (6.1)
UN/NA #: UN2922
Packing Group: II
Required Label(s): CORROSIVE, POISON
EMS Number: F-A, S-A, S-B

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Arsenic Acid (7778-39-4)

SARA 313: form R reporting required for 0.1% de minimis concentration (related to Arsenic)
form R reporting required for 0.1% de minimis concentration; Chemical Category N020 (related to Arsenic, inorganic compounds)
CERCLA: final RQ = 1 pound (0.454 kg)
CERCLA statutory RQ is 1 pound (0.454 kg); no RQ is being assigned to the generic or broad class (related to Arsenic compounds, n.o.s.)

SARA 311/312: **Acute Health:** Yes **Chronic Health:** Yes **Fire:** No **Pressure:** No **Reactive:** No

Federal Insecticide, Fungicide, and Rodenticide Act

This product is subject to regulation under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and is therefore exempt from the Toxic Substances Control Act (TSCA) Inventory listing requirements. This product is registered as a restricted use pesticide.

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Arsenic acid	7778-39-4	DOT regulated marine pollutant

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Arsenic acid ([1] related to Arsenic)	7778-39-4	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]	Yes[1]

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 - WHMIS IDL

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which fall under WHMIS criteria specified in the Controlled Products Regulations and present above the threshold limits listed on the IDL. The following component is listed on the IDL;

Component	CAS #	Minimum Concentration
Arsenic Acid	7778-39-4	0.1% item 129 (65)`~0.1% item 130 (266) (related to Arsenic, elemental)

WHMIS Classification

C, D2B

Additional Regulatory Information

A: General Product Information

No additional information available.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	NDSL	EINECS	AU	MITI	PH	KR	ELINCS	CN
Water	7732-18-5	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes
Arsenic acid [(1)]	7778-39-4	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes

[(1)] related to Arsenic, elemental

* * * Section 16 - Other Information * * *

Summary of Changes

New SDS: 09/12/2014 v1.0; Revised 04/01/2015 v1.5

Key / Legend

ACGIH = American Conference of Governmental Industrial Hygienists; **AU** = Australia; **BOD** - Biochemical Oxygen Demand; **C** - Celsius; **CA** - Canada; **CAS** = Chemical Abstracts Service; **CERCLA** = Comprehensive Environmental Response, Compensation, and Liability Act; **CFR** = Code of Federal Regulations; **CN** = China; **CPR** = Controlled Products Regulations; **DOT** = Department of Transportation; **DSL** = Domestic Substances List; **EINECS** = European Inventory of Existing Commercial Chemical Substances; **ELINCS** = European List of Notified Chemical Substances; **EmS** = Emergency Response Procedures for Ships Carrying Dangerous Goods; **EPA** = Environmental Protection Agency; **EU** = European Union; **F** - Fahrenheit; **HEPA** = High Efficiency Particulate Air; **HMIS** = Hazardous Material Information System; **HPV** – High Production Volume Chemical (EU); **IARC** = International Agency for Research on Cancer; **IATA** = International Air Transport Association; **ICL** – In Commerce List (Canada); **IDL** - Ingredient Disclosure List; **IDLH** - Immediately Dangerous to Life and Health; **JP** = Japan; **KR** = Korea; **LEL** - Lower Explosive Limit; **MITI** = Japan Ministry of International Trade and Industry;

mg/Kg = milligrams per Kilogram; **mg/L** = milligrams per Liter; **mg/m^3** = milligrams per Cubic Meter; **MSHA** = Mine Safety and Health Administration; **NA** = Not Applicable or Not Available; **NFPA** = National Fire Protection Association; **NIOSH** = National Institute for Occupational Safety and Health; **NJTSR** = New Jersey Trade Secret Registry; **NDSL** = Non-Domestic Substances Inventory; **NTP** = National Toxicology Program; **NZ** = New Zealand; **OSHA** = Occupational Safety and Health Administration; **PH** = Philippines; **RCRA** = Resource Conversation & Recovery Act; **RQ** = Reportable Quantity; **SARA** = Superfund Amendments and Reauthorization Act; **STEL** = Short Term Exposure Limit; **TDG** = Transport Dangerous Goods; **TSCA** = Toxic Substances Control Act; **TWA** - Time Weighted Average; **UEL** - Upper Explosive Limit; **US** - United States; **WHMIS** = Workplace Hazardous Materials Information System.

Other Information

Disclaimer: Supplier gives no warranty of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser will make his own tests to determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental and/or consequential property damage arising out of the use of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights. Read the Safety Data Sheet before handling product.

End of Sheet CSI-208