

## 1. Material Identification

**Product Name** : Potassium arsenate

**Catalog Number** : io-2889

**CAS Number** : 7784-41-0

**Identified uses** : Laboratory chemicals, manufacture of chemical compounds

**Company** : IonZ

>> R&D Use only

## 2. Hazards Identification

### GHS Classification:

Flammable liquid ( category 2 )

Acute toxicity, oral (Category 3)

Acute toxicity, dermal (Category 3)

Acute toxicity, inhalation (Category 3)

Specific target organ toxicity, single exposure (Category 1)

### Pictogram(s)



### GHS Hazard Statements

>> H301 (100%): Toxic if swallowed [Danger Acute toxicity, oral]

>> H331 (100%): Toxic if inhaled [Danger Acute toxicity, inhalation]

>> H350 (100%): May cause cancer [Danger Carcinogenicity]

>> H400 (100%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (100%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

### Precautionary Statement Codes

>> P203, P261, P264, P270, P271, P273, P280, P301+P316, P304+P340, P316, P318, P321, P330, P391, P403+P233, P405, and P501

### Health Hazards:

>> Dust may irritate eyes. Ingestion or severe exposure by inhalation can cause burning of throat and mouth, abdominal pain, vomiting, diarrhea with hemorrhage, dehydration, jaundice, and collapse. (USCG, 1999)

### ERG 2024, Guide 151 (Potassium arsenate)

>> Highly toxic, may be fatal if inhaled, ingested or absorbed through skin.

>> Avoid any skin contact.

>> Fire may produce irritating, corrosive and/or toxic gases.

>> Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

>> Excerpt from ERG Guide 151 [Substances – Toxic (Non-Combustible)]:

>> Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Containers may explode when heated. Runoff may pollute waterways. (ERG, 2024)

#### ERG 2024, Guide 151 (Potassium arsenate)

- >> Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
- >> Containers may explode when heated.
- >> Runoff may pollute waterways.
- >> Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.

### 3. Composition/Information On Ingredients

**Chemical name** : Potassium arsenate  
**CAS Number** : 7784-41-0  
**Molecular Formula** :  $\text{AsH}_2\text{KO}_4$   
**Molecular Weight** : 180.0330 g/mol

### 4. First Aid Measures

#### First Aid:

- >> EYES: flush with water to remove dust.
- >> INGESTION: immediately induce evacuation of intestinal tract by inducing vomiting, giving gastric lavage and saline cathartic; see physician at once; consider possible development of arsenic poisoning. (USCG, 1999)

#### ERG 2024, Guide 151 (Potassium arsenate)

- >> General First Aid:
- >> Call 911 or emergency medical service.
- >> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.
- >> Move victim to fresh air if it can be done safely.
- >> Administer oxygen if breathing is difficult.
- >> If victim is not breathing:
- >> DO NOT perform mouth-to-mouth resuscitation; the victim may have ingested or inhaled the substance.
- >> If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).
- >> If no pulse detected or no respiratory medical device available, provide continuous compressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.
- >> Remove and isolate contaminated clothing and shoes.
- >> For minor skin contact, avoid spreading material on unaffected skin.
- >> In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.
- >> For severe burns, immediate medical attention is required.
- >> Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.
- >> Keep victim calm and warm.
- >> Keep victim under observation.
- >> For further assistance, contact your local Poison Control Center.
- >> Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.
- >> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

#### First Aid Measures

##### Inhalation First Aid

>> Fresh air, rest. Refer for medical attention.

#### **Skin First Aid**

>> Remove contaminated clothes. Rinse and then wash skin with water and soap. Seek medical attention if you feel unwell.

#### **Eye First Aid**

>> Rinse with plenty of water for several minutes (remove contact lenses if easily possible). Refer for medical attention.

#### **Ingestion First Aid**

>> Rinse mouth. Refer immediately for medical attention.

## **5. Fire Fighting Measures**

>> Excerpt from ERG Guide 151 [Substances – Toxic (Non-Combustible)]:

>> SMALL FIRE: Dry chemical, CO2 or water spray.

>> LARGE FIRE: Water spray, fog or regular foam. If it can be done safely, move undamaged containers away from the area around the fire. Dike runoff from fire control for later disposal. Avoid aiming straight or solid streams directly onto the product.

>> FIRE INVOLVING TANKS, RAIL TANK CARS OR HIGHWAY TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Do not get water inside containers. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks in direct contact with flames. For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn. (ERG, 2024)

>> In case of fire in the surroundings, use appropriate extinguishing media.

## **6. Accidental Release Measures**

### **Isolation and Evacuation:**

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 151 [Substances – Toxic (Non-Combustible)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> SPILL: Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

### **Evacuation: ERG 2024, Guide 151 (Potassium arsenate)**

>> Immediate precautionary measure

>> Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> Spill

>> For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> Fire

>> If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

### **Spillage Disposal:**

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Vacuum with specialist equipment or carefully sweep into containers. Carefully collect remainder. Then store and dispose of according to local regulations.

## Accidental Release Measures

### Public Safety: ERG 2024, Guide 151 (Potassium arsenate)

- >> CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- >> Keep unauthorized personnel away.
- >> Stay upwind, uphill and/or upstream.

### Spill or Leak: ERG 2024, Guide 151 (Potassium arsenate)

- >> Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- >> Stop leak if you can do it without risk.
- >> Prevent entry into waterways, sewers, basements or confined areas.
- >> Cover with plastic sheet to prevent spreading.
- >> Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- >> DO NOT GET WATER INSIDE CONTAINERS.
- >> For solids, prevent dust cloud and avoid inhalation of dust.

## 7. Handling And Storage

### Safe Storage:

- >> Provision to contain effluent from fire extinguishing. Separated from acids and food and feedstuffs. Well closed. Dry. Do NOT store or transport in containers made from metal. Store in an area without drain or sewer access.

### Storage Conditions:

- >> Protect container against physical damage. Store in well ventilated area away from food or food products and combustible materials. /Inorganic arsenic compd/

## 8. Exposure Control/ Personal Protection

- >> 0.01 [mg/m<sup>3</sup>], as As

- >> 0.01 [mg/m<sup>3</sup>], as As

- >> (as As): 0.01 mg/m

### EU-OEL

- >> (inhalable fraction): 0.01 mg/m

### MAK (Maximale Arbeitsplatz Konzentration)

- >> skin absorption (H); carcinogen category: 1; germ cell mutagen group: 3A.

### Emergency Response: ERG 2024, Guide 151 (Potassium arsenate)

- >> Small Fire
- >> Dry chemical, CO<sub>2</sub> or water spray.
- >> Large Fire
- >> Water spray, fog or regular foam.
- >> If it can be done safely, move undamaged containers away from the area around the fire.
- >> Dike runoff from fire control for later disposal.
- >> Avoid aiming straight or solid streams directly onto the product.
- >> Fire Involving Tanks, Rail Tank Cars or Highway Tanks
- >> Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- >> Do not get water inside containers.

- >> Cool containers with flooding quantities of water until well after fire is out.
- >> Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- >> ALWAYS stay away from tanks in direct contact with flames.
- >> For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### Inhalation Risk:

- >> A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

### Effects of Short Term Exposure:

- >> The substance is irritating to the eyes and respiratory tract. Ingestion could cause effects on the gastrointestinal tract. This may result in severe gastroenteritis, loss of fluids and electrolytes, cardiac disorders and shock. Exposure far above the OEL could cause death. The effects may be delayed. Medical observation is indicated.

### Effects of Long Term Exposure:

- >> The substance may have effects on the skin, mucous membranes, peripheral nervous system, bone marrow and liver. This may result in pigmentation disorders, hyperkeratosis, perforation of the nasal septum, neuropathy, anaemia and liver impairment. This substance is carcinogenic to humans. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

### Acceptable Daily Intakes:

An estimate of the amount of a chemical in food or drinking water that can be consumed daily over a lifetime without presenting an appreciable risk to health. It is usually expressed as milligrams of the substance per kilogram of body weight per day and applies to chemicals such as food additives, pesticide residues and veterinary drugs.

- >> WHO= 0.002 mg/kg /Inorganic arsenic compd, as As; from table/

### Exposure Prevention

- >> PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!

### Inhalation Prevention

- >> Use closed system, ventilation or breathing protection.

### Skin Prevention

- >> Protective gloves. Protective clothing.

### Eye Prevention

- >> Wear face shield or eye protection in combination with breathing protection.

### Ingestion Prevention

- >> Do not eat, drink, or smoke during work. Wash hands before eating.

### Exposure Control and Personal Protection

#### Protective Clothing: ERG 2024, Guide 151 (Potassium arsenate)

- >> Wear positive pressure self-contained breathing apparatus (SCBA).
- >> Wear chemical protective clothing that is specifically recommended by the manufacturer when there is NO RISK OF FIRE.
- >> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

### Exposure Summary

- >> Biological Exposure Indices (BEI) [ACGIH] – Inorganic arsenic plus methylated metabolites in urine = 35 ug As/L; end of workweek;

## 9. Physical And Chemical Properties

### Molecular Weight:

- >> 180.033

### Exact Mass:

>> 179.880610

---

**Physical Description:**

>> Potassium arsenate appears as a colorless crystalline solid. Soluble in water and denser than water. Toxic by ingestion and inhalation. An irritant.

>> COLOURLESS OR WHITE CRYSTALS OR POWDER.

---

**Color/Form:**

>> Colorless crystals or white, crystalline mass or powder

---

**Odor:**

>> Odorless

---

**Melting Point:**

>> 550 °F (USCG, 1999)

>> 288 °C

---

**Solubility:**

>> Sol in 5.5 parts cold water. Very soluble in hot water.

>> Solubility in water, g/100ml at 6 °C: 19 (good)

---

**Density:**

>> 2.8 at 68 °F (USCG, 1999) – Denser than water; will sink

>> 2.9 g/cm<sup>3</sup>

---

**Decomposition:**

>> When heated to decomposition it emits toxic fumes of arsenic.

---

**Refractive Index:**

>> Index of refraction: 1.518

## 10. Stability And Reactivity

>> Soluble in water.

## 11. Toxicological Information

---

**Toxicity Summary:**

>> Arsenic and its metabolites disrupt ATP production through several mechanisms. At the level of the citric acid cycle, arsenic inhibits pyruvate dehydrogenase and by competing with phosphate it uncouples oxidative phosphorylation, thus inhibiting energy-linked reduction of NAD<sup>+</sup>, mitochondrial respiration, and ATP synthesis. Hydrogen peroxide production is also increased, which might form reactive oxygen species and oxidative stress. Arsenic's carcinogenicity is influenced by the arsenical binding of tubulin, which results in aneuploidy, polyploidy and mitotic arrests. The binding of other arsenic protein targets may also cause altered DNA repair enzyme activity, altered DNA methylation patterns and cell proliferation. (T1, A17)

---

**Evidence for Carcinogenicity:**

Evidence that this chemical does or may cause cancer. The information here is collected from various sources by the Hazardous Substances Data Bank (HSDB).

>> Classification of carcinogenicity: 1) evidence in humans: sufficient; 2) evidence in animals: limited. Overall summary evaluation of carcinogenic risk to humans is Group 1: Carcinogenic to humans. NOTE: This evaluation applies to the group of chemicals as a whole and not necessarily to all individual chemicals within the group. /Arsenic and arsenic compounds/

---

**Carcinogen Classification:**

This section provides the International Agency for Research on Cancer (IARC) Carcinogenic Classification and related monograph links. In the IARC Carcinogenic classification, chemicals are categorized into four groups: Group 1 (carcinogenic to humans), Group 2A (probably carcinogenic to humans), Group 2B (possibly carcinogenic to humans), and Group 3 (not classifiable as to its carcinogenicity to humans).

>> 1, carcinogenic to humans. (L135)

---

**Health Effects:**

>> Arsenic poisoning can lead to death from multi-system organ failure, probably from necrotic cell death, not apoptosis. Arsenic is also a known carcinogen, especially in skin, liver, bladder and lung cancers. (T1, L20)

---

**Exposure Routes:**

>> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

>> Oral (L2) ; inhalation (L2); dermal (L2)

---

**Inhalation Exposure**

>> Cough. Sore throat.

---

**Eye Exposure**

>> Redness. Pain.

---

**Ingestion Exposure**

>> Abdominal pain. Burning sensation in the throat and chest. Vomiting. Diarrhoea. Headache. Weakness. Shock or collapse.

>> Exposure to lower levels of arsenic can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of burn (T1).

---

**Adverse Effects:**

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Neurotoxin – Sensorimotor

>> Occupational hepatotoxin – Secondary hepatotoxins: the potential for toxic effect in the occupational setting is based on cases of poisoning by human ingestion or animal experimentation.

>> Aplastic anemia – The presence of increased methemoglobin in the blood; the compound is classified as primary toxic effect.

>> Reproductive Toxin – A chemical that is toxic to the reproductive system, including defects in the progeny and injury to male or female reproductive function. Reproductive toxicity includes developmental effects. See Guidelines for Reproductive Toxicity Risk Assessment.

>> IARC Carcinogen – Class 1: International Agency for Research on Cancer classifies chemicals as established human carcinogens.

>> NTP Carcinogen – Known to be a human carcinogen.

>> ACGIH Carcinogen – Confirmed Human.

---

**Toxicity Data:**

>> LD50: 14 mg/kg (Oral, Rat) (T62)

---

**Minimum Risk Level:**

The minimal risk level (MRL) is an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health

>> Acute Oral: 0.005 mg/kg/day (L134) Chronic Oral: 0.0003 mg/kg/day (L134) Chronic Inhalation: 0.01 mg/m<sup>3</sup> (L134)

---

**Treatment:**

Treatment when exposed to toxin

>> Arsenic poisoning can be treated by chelation therapy, using chelating agents such as dimercaprol, EDTA or DMSA. Charcoal tablets may also be used for less severe cases. In addition, maintaining a diet high in sulfur helps eliminate arsenic from the body. (L20)

---

**Interactions:**

>> GROWTH OF PORIA MONTICOLA WAS COMPLETELY INHIBITED BY 0.0025 MOLAR POTASSIUM ARSENATE, BUT WAS PROGRESSIVELY LESS INHIBITED AS PHOSPHATE CONTENT OF MEDIUM WAS INCR & WAS STIMULATED AT 0.04 MOLAR POTASSIUM ARSENATE WHEN 0.16 MOLAR MONOBASIC POTASSIUM PHOSPHATE WAS ADDED.

---

**Human Toxicity Excerpts:**

>> HIGHLY TOXIC BY INGESTION & INHALATION; STRONG IRRITANT.



#### Non-Human Toxicity Values:

>> LD50 Rat oral 14.0 mg/kg

## 12. Ecological Information

#### ICSC Environmental Data:

>> The substance is toxic to aquatic organisms. This substance does enter the environment under normal use. Great care, however, should be taken to avoid any additional release, for example through inappropriate disposal.

## 13. Disposal Considerations

#### Spillage Disposal

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Vacuum with specialist equipment or carefully sweep into containers. Carefully collect remainder. Then store and dispose of according to local regulations.

#### Disposal Methods

>> SRP: At the time of review, criteria for land treatment or burial (sanitary landfill) disposal practices are subject to significant revision. Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices.

>> Chemical Treatability of Arsenic; Concentration Process: Chemical Precipitation; Chemical Classification: Metal; Scale of Study: Pilot Scale; Type of Wastewater Used: Domestic Wastewater + Pure Compound; Results of Study: 5ppm @ 4gpm @ pH= 7.0. Iron system-90% reduction; low lime system-80% reduction; high lime system-76% reduction; (3 coagulant systems were used; Iron system used 45 ppm as Fe of  $\text{Fe}_2(\text{SO}_4)_3$  @ pH= 6.0. Low lime system used 20 ppm Fe of  $\text{Fe}_2(\text{SO}_4)_3$  and 260 ppm of CaO @ pH= 10.0. High lime system used 600 ppm of CaO @ pH= 11.5. Chemical coagulation was followed by multimedia filtration). /Arsenic cmpd/

>> Chemical Treatability of Arsenic; Concentration Process: Chemical Precipitation; Chemical Classification: Metal; Scale of Study: Full Scale Continuous Flow; Type of Wastewater Used: Domestic Wastewater; Results of Study: Effluent character (ppb): 2.5, 56% reduction with lime; 3.3, 24% reduction with lime; (lime dose of 350-400 ppm as calcium oxide @ pH= 11.3). /Arsenic cmpd/

>> Storage: To convert the gas-cleaning residues obtained during the metallurgical processing of arsenic-containing ores into a portable and less water-soluble form, the metals are precipitated as hydroxides by using an excess of lime water and the arsenic is precipitated as calcium arsenate and calcium arsenite. This "arsenic sludge" is recycled, on the one hand, in order not to lose the valuable metals, and on the other, in order to reduce the problem of arsenic sludge disposal. The following storage possibilities are available today for arsenic residues that cannot be recycled immediately or at all: special dumps sealed against the penetration of ground water, surface water and rain water; galleries in abandoned salt mines; concrete silos. In any case the sludge must be dewatered beforehand until it is compact. Recommendable methods: Precipitation, solidification, landfill. Not recommendable: Thermal destruction, discharge to sewer. Peer-review: Soluble arsenic cmpd should be converted to the insoluble sulfide before solidification. (Peer-review conclusions of an IRPTC expert consultation (May 1985)) /Arsenates and arsenites/

## 14. Transport Information

#### DOT

Potassium arsenate

6.1

UN Pack Group: II

Reportable Quantity of 1 lb or 0

#### IATA



Potassium arsenate  
6.1,  
UN Pack Group: II

## 15. Regulatory Information

### Federal Drinking Water Standards:

Federal drinking water standards (e.g. maximum containment level (MCL)) for this chemical. These standards are legally enforceable.

>> 10 ug/L /Arsenic/

### Clean Water Act Requirements:

The Clean Water Act (CWA) of 1972 establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under CWA, the U.S. Environmental Protection Agency (EPA) developed the Toxic Pollutant List (40 CFR Part 401.15) and the Priority Pollutant List (40 CFR Part 423, Appendix A). These lists are to be used by EPA and States to develop the Effluent Guidelines regulations and ensure water quality criteria and standards.

>> Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.

### Regulatory Information

#### The Australian Inventory of Industrial Chemicals

>> Chemical: Arsenic acid (H<sub>3</sub>AsO<sub>4</sub>), monopotassium salt

#### REACH Restricted Substance

>> Restricted substance: Potassium dihydrogenarsenate

>> EC: 232-065-8

## 16. Other Information

### Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> When heated to decomposition it emits toxic fumes of arsenic.

### Other Safety Information

#### Chemical Assessment

>> IMAP assessments – Pentavalent arsenate salts: Human health tier II assessment

>> Evaluation – Water soluble arsenic compounds

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. lonz is not responsible for any damages resulting from handling or contact with the product incorrectly."