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ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

1. Identification

1.1 GHS Product identifier

Arsenic, lump, 99.5%
Code A 2611

2. Hazard identification

2.1 Classification of the substance or mixture

Acute toxicity - Oral, Category 3

Acute toxicity - Inhalation, Category 3

Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Hazard statement(s)

Danger

H301 Toxic if swallowed

H331 Toxic if inhaled

H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

Response

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/02026

P321 Specific treatment (see ... on this label).

P330 Rinse mouth.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P311 Call a POISON CENTER/doctor/02026

P391 Collect spillage.

Storage

P405 Store locked up.

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents/container to ...

2.3 Other hazards which do not result in classification

none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Arsenic	Arsenic	7440-38-2	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Seek medical attention if you feel unwell.

In case of skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

In case of eye contact

Rinse with plenty of water (remove contact lenses if easily possible).

If swallowed

Rinse mouth. Refer immediately for medical attention.

4.2 Most important symptoms/effects, acute and delayed

Poisonous by inhalation of dust or by ingestion. Regardless of exposure route, symptoms in most cases are characteristic of severe gastritis or gastroenteritis. All chemical forms of arsenic eventually produce similar toxic effects. Symptoms may be delayed. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Minimum/Potential Fatal Human Dose

Fatal human dose 70-180 mg depending on weight. Estimated lethal dose for a 70 kg human as As (III).

Absorption, Distribution and Excretion

Normal values of arsenic in urine, ... vary from 0.013-0.046 mg/L, to 0.13 mg/L, to 0.25 mg/L. The urinary excretion, in mg/L, of elements that are freely eliminated by this route, such as ... arsenic, is at most 2.5-5 times the occupation exposure in mg/cu m of air. It is apparent that biological monitoring for arsenic by urinalysis would be of limited value in determining whether or not the NIOSH recommended standard ... was being met or exceeded.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

If material involved in fire: Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Use water in flooding quantities as fog. Use foam, dry chemical, or carbon dioxide. /Arsenic cmpd, liquid, NOS/

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Contain highly toxic arsenic trioxide and other forms of arsenic. Arsenic gas, the most dangerous form of arsenic, is produced upon contact with an acid or acid fumes. Behavior in Fire: Burns to produce dense white fumes of highly toxic arsenic trioxide. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers. Carefully collect remainder. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Solvent extraction with high molecular weight amines and quaternary ammonium compounds may be a promising technique for the removal of toxic elements like ... arsenic ... from industrial effluents.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong oxidants, acids, halogens and food and feedstuffs. Well closed. Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

5 mg/cu m (as As); NIOSH considers arsenic (inorganic cmpd, as As) to be a potential occupational carcinogen. /Arsenic (inorganic cmpd, as As)/

Recommended Exposure Limit: 15 Ceiling Limit: (0.002 mg/cu m). /Arsenic (inorganic cmpd, as As)/

NIOSH usually recommends that occupational exposures to carcinogens be limited to the lowest feasible concentration. /Arsenic (inorganic compounds, as As)/

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	powder
Colour	IT EXISTS IN THREE ALLOTROPIC FORMS, THE YELLOW (ALPHA), BLACK (BETA) AND GREY (GAMMA) FORMS
Odour	... Odorless ...
Melting point/ freezing point	817\°C
Boiling point or initial boiling point and boiling range	613\°C(lit.)
Flammability	Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame. Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	no data available
Flash point	Flammable gas
Auto-ignition temperature	180\°C
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	In water: insoluble
Partition coefficient n-octanol/water (log value)	no data available
Vapour pressure	0 mm Hg (approx) (NIOSH, 2016)
Density and/or relative density	5.727g/mL at 25\°C(lit.)
Relative vapour density	(air = 1): 2.7
Particle characteristics	no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

LOSES ITS LUSTER ON EXPOSURE TO AIR, FORMING A BLACK MODIFICATION + AS₂O₃

10.3 Possibility of hazardous reactions

CAN BE HEATED TO BURN IN AIR WITH BLuish FLAME, GIVING OFF AN ODOR OF GARLIC AND DENSE WHITE FUMES OF ARSENIC TRIOXIDE (AS₂O₃). The gas is heavier than air and may travel along the ground; distant ignition possible. As a result of flow, agitation, etc., electrostatic charges can be generated. ARSENIC reacts incandescently with bromine trifluoride, even at 10\°C [Mellor 2:113 1946-47]. Causes bromoazide to explode upon contact. Ignites if ground up together with solid potassium permanganate [Mellor 12:322 1946-47]. Is oxidized by sodium peroxide with incandescence [Mellor 2:490-93 1946-47]. A combination of finely divided arsenic with finely divided bromates (also chlorates and iodates) of barium, calcium, magnesium, potassium, sodium, or zinc can explode by heat, percussion, and friction [Mellor 2:310 1946-47]. Bromine pentafluoride reacts readily in the cold with arsenic. Ignition usually occurs. Reacts vigorously with fluorine at ordinary temperatures [Mellor 9:34 1946-47].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Arsine is formed when any inorganic arsenic bearing material is brought in contact with zinc and sulfuric acid.

10.6 Hazardous decomposition products

When arsenic is heated in air it will burn and form a white smoke consisting of arsenic trioxide (As₂O₃).

11. Toxicological information

Acute toxicity

Oral: LD₅₀ Rat oral 763 mg/kg

Inhalation: no data available

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

EPA: Confirmed human carcinogen. IARC: Carcinogenic to humans. NTP: Known to be a human carcinogen.

Reproductive toxicity

Inorganic arsenic Several studies have suggested that women who work in, or live near, metal smelters may have higher than normal spontaneous abortion rates, and their children may exhibit lower than normal birthweights. However, these studies are limited because they were designed to evaluate the effects of smelter pollutants in general, and are not specific for inorganic arsenic. Ingested inorganic arsenic can cross the placenta in humans, exposing the fetus to the chemical. Oral animal studies have reported inorganic arsenic at very high doses to be fetotoxic and to cause birth defects. Arsenic Human studies have indicated higher than expected spontaneous abortion rates in women in the microelectronics industry who were exposed to arsenic. However, these studies have several limitations, including small sample size and exposure to other chemicals in addition to arsenic.

STOT-single exposure
no data available
STOT-repeated exposure
no data available
Aspiration hazard
no data available

12. Ecological information

12.1 Toxicity
Toxicity to fish: no data available
Toxicity to daphnia and other aquatic invertebrates: no data available
Toxicity to algae: no data available
Toxicity to microorganisms: no data available
12.2 Persistence and degradability
no data available
12.3 Bioaccumulative potential
no data available
12.4 Mobility in soil
no data available
12.5 Other adverse effects
no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN1558

IMDG: UN1558

IATA: UN1558

14.2 UN Proper Shipping Name

ADR/RID: ARSENIC

IMDG: ARSENIC

IATA: ARSENIC

14.3 Transport hazard class(es)

ADR/RID: 6.1

IMDG: 6.1

IATA: 6.1

14.4 Packing group, if applicable

ADR/RID: II

IMDG: II

IATA: II

14.5 Environmental hazards

ADR/RID: yes

IMDG: yes

IATA: yes

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Arsenic	Arsenic	7440-38-2	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all

precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.

