

# Laboratory Safety Bulletin

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Location: Essex Hall / B-37 • Hours: 8:30 am to 4:30 pm (M-F)

## DESIGNATED SUBSTANCE: ARSENIC

### What is so amazing about Arsenic?

Arsenic in its pure metal form looks grey in color and is odorless. It has been known for centuries to be a secret poison. *The most notable murder in history by arsenic was that of Napoleon Bonaparte.* Arsenic occurs as an element of the earth's crust. Arsenic is combined with other elements such as oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Inorganic arsenic is considered to be the most toxic to human health.



Exposure to higher than average levels of arsenic happen mainly in workplaces, near or in hazardous waste sites, and areas with high levels of naturally occurring arsenic in soil, rocks, and water. Some organic and inorganic arsenic compounds occur at the ppm level in seafood especially shellfish and are consider not toxic at such a trace level.

Industries that use inorganic arsenic and its compounds include wood preservation, glass production, nonferrous metal alloys, production of agricultural pesticides and electronic semiconductor manufacturing. Inorganic arsenic is also found in coke oven emissions associated with the smelter industry.

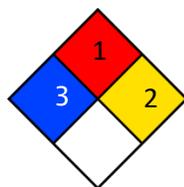
Arsenic isn't all that bad. Arsenic trioxide is known for being effective to treat acute myelogenous leukemia. The results of this "little poison" on the treatment of leukemia are amazing and subsequently this compound was reaproved for use in the United States by the FDA in September 2000.

### Hazard Classification – Arsenic

#### WHMIS



#### NFPA



Health: 3  
Flammability: 1  
Reactivity: 2  
Specific:

### How can Arsenic affect your body?



Physical symptoms due to arsenic exposure can include nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet. Arsenic at the levels that are normally found in drinking water and soils is not considered to be acutely toxic. However, exposure to high levels over a long time (years) may result in adverse health effects such as thickening and discoloration of the skin. Spotted melanosis (picture left) is a very common symptom of arsenic poisoning and usually is noticed within two months of poisoning. Health Canada considers arsenic as a human cancer-causing agent

if consuming or drinking water with very high concentrations of arsenic over a lifetime. Arsenic may cause skin cancer and tumors of the liver, kidneys, bladder, prostate and lungs.

Exposure to arsenic poisoning (arsenocosis) has been experienced in Bangladesh through arsenic contaminated drinking water by an estimated 80 million people.

## How do you work safely with **Arsenic**?

At all times wear a lab coat, safety goggles and gloves such as latex or nitrile. Breathing arsenic dust will have harmful effects on your body and may even result in death. Always work with arsenic inside of a fume hood or glove box. Avoid generating dust from arsenic powder. However, keep in mind that finer consistency solids such as non-salts can be blown around by fume hood air currents. Therefore, any work surface that may become contaminated such as fume hood surfaces, weighing tables, or countertops must be **protected with absorbent paper and/or wet-wiped on a regular basis**. If paper becomes contaminated, fold the paper from the outer edges into the middle, put it into a plastic bag, label the bag as arsenic-contaminated waste and bring to the Chemical Control Centre for disposal. To avoid airborne exposure, avoid dry sweeping and brushing, or use of compressed air to blow surfaces clean. If a fume hood is not available, work with a respirator. Arsenic mixtures with solvents can seep through your skin and can also cause arsenic poisoning.

Any specimens or ethnographic objects known or suspected to contain arsenic should never be touched with bare skin.

*To minimize the exposure to arsenic maintain a balanced diet and avoid overindulgence of shellfish.*

### First Aid Procedures:

**Skin & Eye Contact:** Flush the infected area with copious amounts of water for at least 15 minutes. Seek medical attention immediately.

**Ingestion:** Rinse the victim's mouth with water for at least 5 minutes. **NEVER INDUCE VOMITTING.** Seek medical attention immediately.

**Inhalation:** Remove the victim to fresh air. If breathing is difficult, trained personnel may give the victim oxygen. Get medical attention.

### Where do you store **Arsenic** and its empty containers?

Always store arsenic in the original manufacturer's container in a cool dry place and keep the lids tightly closed. Keep the quantities stored as small as possible. Keep away from incompatibles such as oxidizing agents, acids, moisture, and sources of ignition. Empty containers pose a fire risk. The empty containers should be stored in a separate storage area or returned to the Chemical Control Centre for disposal.

### What happens if **Arsenic** is spilled?

Evacuate the area. Obtain and wear the proper protective equipment including self-contained breathing apparatus (if trained), rubber boots and heavy rubber gloves. Sweep-up material into a bag, avoid generating dust and place inside of a plastic pail for disposal. Ventilate the area and wash spill area with water.

This lab safety bulletin is not a complete source on the safe handling of arsenic at the University of Windsor. You should always check the SDS of your arsenic containing product at [www.uwindsor.ca/msds](http://www.uwindsor.ca/msds) before you work.

For more information on arsenic please visit the Chemical Control Centre's University of Windsor Designated Substance Program at [www.uwindsor.ca/cc](http://www.uwindsor.ca/cc) or by phone (ext. 3523).

For more information on spills please see the University of Windsor's Spill Response Manual at [www.uwindsor.ca/cc](http://www.uwindsor.ca/cc).

### References:

1. *Arsenic, 99.999% Pieces*, Material Safety Data Sheet, Sigma-Aldrich, Aldrich – 202657, Oakville ON 2006.
2. Cheminfo, *Chemical Profile - Arsenic*, Canadian Centre for Occupational Health and Safety, Hamilton ON 2004.
3. *Hazardous Materials Spill Response Guidelines*, Chemical Control Centre, University of Windsor ON 2008.