Standard Operating Procedure

Bismuth (powder)

*This is an SOP template and is not complete until: 1) lab specific information is entered into the box below 2) lab specific protocol/procedure is added to the protocol/procedure section and   
3) SOP has been signed and dated by the PI and relevant lab personnel.*

Print a copy and insert into your   
*Laboratory Safety Manual* and *Chemical Hygiene Plan*.   
Refer to instructions for assistance.

|  |  |
| --- | --- |
| **Department:** | Click here to enter text. |
| **Date SOP was written:** | Click here to enter a date. |
| **Date SOP was approved by PI/lab supervisor:** | Click here to enter a date. |
| **Principal Investigator:** | Click here to enter text. |
| **Internal Lab Safety Coordinator/Lab Manager:** | Click here to enter text. |
| **Lab Phone:** | Click here to enter text. |
| **Office Phone:** | Click here to enter text. |
| **Emergency Contact:** | Click here to enter text. |
| *(Name and Phone Number)* |
| **Location(s) covered by this SOP:** | Click here to enter text. |
| *(Building/Room Number)* |

**Type of SOP:** ☐ Process ☒Hazardous Chemical ☒ Hazardous Class

**Purpose**

Bismuth powder is used for inorganic synthesis. It is a pyrophoric chemical that should be used in a glove box or in air-free synthesis.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS#: 7440-69-9

Class: Pyrophoric

Molecular Formula: Bi

Form (physical state): Solid

Color: Silvery white to Grey

Boiling point: 1560° C

**Potential Hazards/Toxicity**

Bismuth powder is a pyrophoric chemical. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. The substance may be toxic to liver, cardiovascular system, upper respiratory tract, and pancreas. Repeated or prolonged exposure to the substance can produce target organs damage.

**Personal Protective Equipment (PPE)**

**Respirator Protection**

Bismuth powder should always be handled in a glove box filled with inert gas.

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by ORS and should contact occhealt@uga.edu. This is a UGA requirement described in more detail in the [UGA Respiratory Protection Plan](https://esd.uga.edu/sites/default/files/respiratoryprotection.pdf) and supported by the [Office of Research Occupational Health and Safety Program](https://research.uga.edu/ohsp/).

**Hand Protection**

Wear latex or nitrile gloves to prevent skin exposure. Use the glove box gloves and sleeves, or if this chemical is handled in a closed system in a certified fume hood, use appropriate chemical-resistant gloves.

**Eye Protection**

Safety glasses

**Skin and Body Protection**

A flame-resistant lab coat must be worn. Full-length pants or equivalent as well as closed-toe shoes must be worn.

**Hygiene Measures**

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling bismuth powder

**Engineering Controls**

Bismuth powder should be used in a glove box filled with inert gas, or in a closed system in a certified fume hood.

**First Aid Procedures**

**If inhaled**

Move person into fresh air. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. Get medical attention immediately.

**In case of skin contact**

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**In case of eye contact**

Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

**If swallowed**

Do NOT induce vomiting unless directed to do so by medical personnel. If victim is conscious and alert, rinse mouth with 2-4 cupful of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Special Handling and Storage Requirements**

**Precautions for safe handling** Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build-up of electrostatic charge.

Bismuth powder should only be used in a glove box filled with inert gas or in a sealed reaction container in a fume hood.

**Conditions for safe storage**

Bismuth powder should be stored in a glove box filled with inert gas. Or in a vial sealed with a septa and back filled with inert gas and then stored in a flammables cabinet.

**Spill and Accident Procedure**

**Chemical Spill Dial 911**

**24-7 On-Call Response to Research, Environment, Health or Safety Concerns Dial 2-5561 from a campus phone or 706-542-5561 from a non-campus line.**

**Spill** – Follow the procedures set out in the [UGA Chemical and Laboratory Safety Manual.](http://research.uga.edu/docs/units/safety/manuals/Chemical-Laboratory-Safety-Manual.pdf)

[If there are any chemical-specific protocols for responding to a spill, insert them here or mark “none”:]

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# **Medical Emergency Dial 911**

**Life Threatening Emergency, After Hours, Weekends and Holidays** – Dial **911** or the emergency phone numbers listed at the beginning of the UGA Chemical and Laboratory Safety Manual.

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Non-Life-Threatening Emergency** – Follow the instructions in the UGA Chemical and Laboratory Safety Manual.

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Decontamination/Waste Disposal Procedure**

**For general hazardous waste disposal procedures, see Appendix H of the UGA Chemical and Laboratory Safety Manual.**

**Chemical Specific Procedures: [to be inserted or marked as “none”]**

Contaminated instruments and benches should be decontaminated with soap and water. All waste and contaminated disposables should be disposed of as hazardous waste.

**Safety Data Sheet (SDS) Location**

UGA personnel can access Online SDS through a link in the upper left corner of the ESD home page (<https://esd.uga.edu>) and logging in by using their UGA email user name and password.

**Protocol/Procedure (Add lab specific Protocol/Procedure here)**

Click here to enter text.

**NOTE**

Any deviation from this SOP requires approval from PI.

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work with bismuth powder, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and access to the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last 12 months.

**Principal Investigator SOP Approval**

Print name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approval Date:

I have read and understand the content of this SOP:

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