



Owner C.H.O	DOC. NO. SOP	REV. 2	DATE 12/9/2019
DOC. TITLE SOP FOR COMMON INORGANIC ACIDS			

STANDARD OPERATING PROCEDURES (SOP) FOR WORKING WITH COMMON INORGANIC ACIDS AT AMHERST COLLEGE

General Information

Inorganic acids, also known as mineral acids, are very **corrosive** chemicals that are characterized by low pH. Inorganic Acids are used in various concentrations in both industrial and laboratory settings. The higher the concentration of the acid, the higher the risk it poses; lab personnel are, hence, encouraged to work with the lowest concentrations feasible.

Although there are many types of Inorganic Acids, this SOP is only applicable to the following commonly used ones:

Sulfuric Acid

Hydrochloric Acid

Phosphoric Acid

Boric Acid

Note that while Nitric Acid and Hydrofluoric acid might be commonly used inorganic acids, they have separate SOP's as they pose additional hazards not covered in this SOP

Personal Protective Equipment

When working with Inorganic Acids, the following Personal Protective Equipment (PPE) **must** be worn:

Splash goggles

Lab coat

Long pants

Close toed shoes

Nitrile gloves (Double gloving recommended; change gloves immediately upon contact)

No part of the body shall be exposed while working with these compounds

Safety Devices

Fume hood – always work with Inorganic Acids in a fume hood to prevent exposure by inhalation



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Environmental Health & Safety

Identify the location of all the appropriate safety devices in the room before beginning your procedure. Also, familiarize yourself with all the possible means of egress

Specific Health Hazards

Note that the exposure limits for these compounds are very low.

The OSHA Permissible Exposure Limit (PEL) for each compound is as follows:

Sulfuric Acid – 1mg/kg (0.0001%)

Hydrochloric Acid – 7mg/kg (0.0007%)

Phosphoric Acid – 1mg/kg (0.0001%)

Boric Acid – 2mg/kg –NIOSH (0.0002%)



Pictogram:

Hazards: Corrosive, Irritant

Routes of Entry

Inhalation, skin/eye contact, ingestion

If any part of your body comes in contact with Inorganic Acids, call the Amherst College Police Department at 413-542-2111. Also call this number if you begin to feel ill after working with or in the vicinity of these compounds

Inhalation

If inhaled, move to fresh air, and get help. If you begin to feel ill during/after working with Inorganic Acids, Call x2111 to report if you begin to feel ill.

Eye contact

Use eyewash to flush eyes with water for at least 15 minutes.

Skin Contact



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Wash skin with plenty of water for 15 minutes. Use safety shower, if needed.

Ingestion

Do not induce vomiting! Rinse mouth thoroughly; drink sips of water; call the Amherst College Police Department

Storage and Special handling / Use

Store in a tightly closed container in a cool, dry area that is well ventilated, such as an acid cabinet. Do not store on shelf.

Store away from bases, organic compounds, and metals.

Always store in a secondary container

Label all stock solutions of Inorganic Acids with the words: "danger" and "corrosive", along with the correct concentration.

If you have Inorganic Acids that you no longer need, please contact Jason Williams, x2736, for disposal

Special handling / Use

When diluting Inorganic Acids, always add acid to water, not water to acid!

Spill clean up

Never attempt to clean up a spill if you're not comfortable doing so.

Never attempt to clean up spills of:

-High concentrations of Inorganic Acid (3M or higher)– regardless of the volume

-more than 100ml – regardless of the concentration

Instead, contact the Amherst College Police Department

To clean up spills of less than 100ml and less than 3M, use the sodium bicarbonate in the spill kit to achieve a neutral pH; after the reaction stops, use a dustpan and brush to collect solid. Place sodium bicarbonate / inorganic acid mixture, along with clean-up materials in the Ziploc bag provided in the spill kit; label the bag with a properly filled out hazardous waste label and place it in a secondary container in the Satellite Accumulation Area. Do not dispose of in regular trash. Rinse the surface with water. Be sure



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to wear the appropriate Personal Protective Equipment while cleaning up the spill (see Personal Protective Equipment section of this SOP)

Contact Jason Williams (x2736) or call Amherst College Police Department (x2111)

Disposal

Disposable pipets, pipet tips, other disposable devices, such as gloves, that come in contact with Inorganic Acids, may be disposed of into the regular trash, provided that they are not grossly contaminated. If they are grossly contaminated, they shall be disposed of as hazardous waste in the solid hazardous waste container (provided that it is compatible with the other materials in the container)

High concentrations of Inorganic Acids shall be disposed of in a container by themselves.

All spill clean-up materials must be disposed of as hazardous waste

If you have Inorganic Acids that you no longer need, contact the Chemical Hygiene officer

Questions

Contact Jason Williams or Environmental Health and Safety if you have any questions about this SOP or these compounds.