**Standard Operating Procedure**

|  |  |  |
| --- | --- | --- |
| **Chemical name/class:** | **Sulfuric Acid** | **CAS #: 7664-93-9** |
| **PI:** |  | **Date:** |
| **Building:** |  | **Room #:** |

1. **Circumstances of Use:**

***This SOP must be customized for each lab using Sulfuric Acid. Use this section to describe the circumstances of use, including concentration and quantity as well as identification of a designated work area.***

2. **Potential Hazards:**

 Explosions may occur if sulfuric acid comes in contact with many metals, carbides, chlorates, perchlorates, permanganates, bases, and reducing agents.

 Concentrated sulfuric acid is stable, but may violently react with water, inorganic substances, and many organic compounds due to its powerful dehydrating, oxidizing, and sulfonating properties.

 Sulfuric acid is noncombustible, but can cause finely divided combustible substances to ignite.

 Sulfuric acid (especially dilute) reacts with most metals to produce hydrogen gas which is flammable and potentially explosive.

 Concentrated sulfuric acid is highly corrosive and can cause severe burns upon skin contact or permanent loss of vision upon eye contact. Dilute sulfuric acid is still a skin and eye irritant, but health effects are usually not as severe.

 Chronic exposure to sulfuric acid mist may lead to bronchitis, skin lesions, conjunctivitis, and erosion of teeth.

 The OSHA Permissible Exposure Limit (PEL) is 1.0 mg/m3 over an 8 hour period.

 For more information, refer to *Prudent Practices in the Laboratory* (National Academies Press):

[http://www.nap.edu/openbook.php?record\_id=4911&page=400](http://www.nap.edu/openbook.php?record_id=4911&amp;page=400)

3. **Engineering Controls:**

 An eyewash unit must be available in the immediate work area for any work with corrosive materials.

 If large quantities of corrosives will be used, a safety shower will also be necessary. Contact EHS at 704-687-1111 for a determination of the need for a safety shower if there is not one available.

 Sulfuric acid must be handled in a chemical fume hood if there is any potential for inhalation exposure (including if mists are generated either mechanically or from vapor).

4. **Work Practice Controls:**

 When diluting, the acid should always be added to water slowly, in small amounts.

 Purchase sulfuric acid in the smallest containers that are practical for lab use.

 Purchase in shatter-resistant containers if available (such as PVC-coated glass).

 Work with the smallest practicable amount and lowest practicable concentration.

 Once work with sulfuric acid is complete, decontaminate the area by wiping it down with soap and water

5. **Personal protective equipment (PPE):**

Wear a buttoned lab coat, safety goggles, and chemical-resistant gloves for any work with sulfuric acid. Sulfuric acid

penetrates standard nitrile laboratory gloves in 5 minutes or less. If chemical-resistant gloves are not available, wear double nitrile laboratory gloves and change gloves immediately after a splash occurs.

6. **Transportation and Storage:**

 **Group III – Oxidizing Acid**

 Store away from incompatibles, including organic materials, reducing agents, combustibles, metals, acids, carbides, chlorates, perchlorates, permanganates, bases, and moisture.

 Store in well-ventilated areas with secondary containment, such as a non-reactive plastic bin.

 Store below eye level.

 Store away from metal (unless the metal has a corrosion-proof coating), and do not store under the sink.

 Avoid storing on the floor. If storing on the floor is necessary, use secondary containment.

 Transport corrosives in secondary containment, preferably a polyethylene or other non-reactive acid/solvent bottle carrier.

7. **Waste Disposal:**

Handle and store corrosive wastes following the guidelines above while accumulating wastes and awaiting chemical waste pickup. Waste must be disposed of following your laboratory-specific procedures and the requirements of UNC Charlotte’s Laboratory Chemical Waste Management Practices <http://safety.uncc.edu/laboratory-and-research-safety/hazardous-universal-waste>

8. **Exposures/Unintended contact:**

 For eye or skin contact, flush exposed eyes or skin with water for at least 15 minutes (lifting upper and lower lids occasionally) and remove contaminated clothing. Seek medical attention if needed at the Student Health Center, or Emergency Department, as appropriate.

 If ingested, seek medical attention immediately.

 If large amounts of sulfuric acid mists are inhaled, move the person to fresh air and seek medical attention immediately.

 Call 911 from a campus phone or 704-687-2200 from any phone to request assistance if needed.

Contact the Student Health Center at 704-687-7400 for medical advice on occupational chemical exposures. For an actual chemical exposure, complete the work-related injury or illness report found at: <https://safety.uncc.edu/services/workers-compensation>

9. **Spill Procedure:**

**Small spills:** (<200 ml) contained in the fume hood, neutralize the spill by gradually adding alkaline material (sodium carbonate, lime) from the edges of the spill towards the center. Test the pH of the spilled material and continue neutralizing until the pH reaches the 6-9 range. Absorb with an **inert** material (vermiculite, dry sand). **Do NOT use combustible materials, such as saw dust, to absorb sulfuric acid spills!**

Place materials in a chemical waste container and dispose of appropriately. Appropriate chemical resistant gloves should be used when cleaning up a spill due to possible prolonged glove contact with sulfuric acid. After spill has been completely absorbed, wipe contaminated area down with a soap and water solution.

On the UNC Charlotte campus, “large” spills of hazardous materials must be referred to the Campus Police by calling

911 from a campus phone or 704-687-2200 from any phone.

10. **Training of personnel:**

All personnel are required to complete the UNC Charlotte EHS Laboratory Environment Training Checklist. This checklist includes an introduction to general chemical safety as well as review of the laboratory specific safety plan. Furthermore, all personnel shall read and fully adhere to this SOP when handling the chemical.

**“I have read and understand this SOP. I agree to fully adhere to its requirements.”**

|  |  |  |  |
| --- | --- | --- | --- |
| **Last** | **First** | **UNC Charlotte ID** | **Signature** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |