**Standard Operating Procedure**

**Piranha Solution**





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| **Chemical name, CAS:** | **Piranha Solution**  |
| **PI:** |  | **Date:** |  |
| **Building:** |  | **Lab #:** |  |

1. **Material Use:**

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| Piranha solution is a mixture of sulfuric acid and 30% hydrogen peroxide (usually in a 3:1 ratio) used commonly to remove organic residues, particularly in microfabrication laboratories. |

1. **Potential Hazards:**

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| Skin or eye exposure to piranha solution will cause serious burns. Inhalation of corrosive piranha solution vapor can be destructive to mucosal membranes and the respiratory tract. Piranha solutions are extremely oxidizing and may react explosively with incompatible materials especially organics.  |

1. **Engineering Controls:**

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| * All work must be conducted in a **laboratory hood** labelled: “DANGER, Piranha Solution”
* Do not store any organic materials (e.g. solvents) or other incompatible chemicals in the lab hood while working with piranha solution.
* Access to an eyewash and safety shower must be readily available.
* Laboratory hood sash height should be kept low to minimize escaping fumes and provide protection from splashes.
* The lab personnel must have easy access to a telephone (landline or cell phone).
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1. **Work Practice Controls:**

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| * Substitute a safer chemical whenever possible. NEVER use piranha solution for routine glass cleaning.
* Ensure that you have all the PPE required for handling piranha solution.
* **Do not leave any skin exposed** when handing piranha solution.
* **Never work alone**, and inform others in the immediate area when you are working with piranha solution.
* Prepare piranha solution immediately prior to using by slowly adding hydrogen peroxide to the sulfuric acid.
* Ensure only **rinsed and dried substrates** are inserted into piranha solution.
* Always use secondary containment when pouring or transferring piranha solution.
* Lab emergency contact information must be readily available.
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1. **Personal protective equipment (PPE):**

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| Lab Coat | Chemical Resistant Apron | Splash Goggles | Face Shield | Gloves | Long Pants/Closed-toe Shoes |

1. **Storage:**

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| * Store piranha solution only in **pyrex glass or PTFE/Teflon containers.**
* **Do not use air tight/capped containers.** Containers must be stored using a vented cap to prevent explosion.
* Allow piranha solution to cool before transferring to another container.
* Store compounds in containers clearly labeled with contents. Keep containers in secondary containment.
* Keep containers tightly closed and store in a dry, cool, dark, well ventilated location.
* Separate from all other chemicals.
* **Never store piranha solution for long periods of time.**
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1. **Waste Disposal:**

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| * Dispose of waste materials in a solid hazardous waste container.
* Include contaminated wipes, gloves, or clothing in solid waste containers. Do not put in regular trash.
* Piranha solution waste **must be stored in a vented container**. Call EHS for a vented lid or container.
* **Do not mix piranha solution with any other wastes. Clearly label waste.**
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1. **What to do if exposed:**

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| **If inhaled**Remove to fresh air. If not breathing, give artificial respiration. Avoid mouth contact. If breathing is difficult, give oxygen. Seek medical attention immediately (Call 911).**In case of skin contact**Immediately flush skin with plenty of water for at least 15 minutes while removing any contaminated clothing and shoes. Seek medical attention immediately (Call 911). **In case of eye contact**Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Seek medical attention immediately (Call 911). |

1. **Spill Procedure:**

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| **Incidental (small) spill**: Call x-3316 and notify EHS personnel for assistance.**Large spill**: Call x-3316 and notify EHS personnel for assistance. |

1. **Training and medical monitoring of personnel:**

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| * **Hazardous Waste Generator Training,** **Laboratory Safety Training, and Piranha Solution Training** with EHS.
* **Lab Specific Training** provided by supervisor that covers: safety expectations, PPE use and storage, SOPs, and emergency response.
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**I have read and understand this SOP. I agree to fully adhere to its requirements.**

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| **Last** | **First** | **CWID** | **Signature** | **Date** |
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