# **Standard Operating Procedure (SOP) Title: Nochromix bath**

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| Assessor: | Joshua Linfoot | | | Location of work: | MSRH 502 |
| Principal Investigator: | | | Prof Alan Spivey | | |
| Date of approval: | | 13/09/2021 | | Date for review: | 13/09/2022 |

## **Justifying the hazards:**

Nochromix is a safer alternative to highly toxic dichromate–based cleaning solutions. Nochromix powder dissolved in sulfuric acid is used for cleaning of glassware. Its corrosive effects can occur not only on the skin and eyes, but also in the respiratory tract and, in the case of ingestion, in the gastrointestinal tract as well.

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| Identify hazards with specific risk assessments and a College or a departmental approval process | | | |
| [Ionising radiation sources](https://www.imperial.ac.uk/safety/safety-by-topic/laboratory-safety/) |  | [Biological sources](https://www.imperial.ac.uk/safety/safety-by-topic/laboratory-safety/) (microorganisms, human/animal tissues, plants) |  |
| [Class 3R, 3B or 4 Lasers](https://imperiallondon.sharepoint.com/sites/fons/faculty/safety/lasers/SitePages/laserhome.aspx) |  | [Offsite work](http://www.imperial.ac.uk/safety/safety-by-topic/off-site-working/) |  |
| Confirm if [Lone working](https://www.imperial.ac.uk/safety/safety-by-topic/lone-working/) is permitted with this SOP?  If it is permitted, describe the control measures for lone workers: | | | |

## **Preparing for the SOP:**

* **DON’T** start work without wearing a suitable PPE.
* **DO** decant concentrated acids in the fume hood.
* **DON’T** tightlyclose containers of the solution.
* **DON’T** mix silver salts with the nochromix solution
* **DO** clean glassware before placing it in the nochromix bath.

## **Procedure:**

# **Before the procedure:**

1. Wear appropriate PPE before starting any work with concentrated acids and acid solutions.
2. Work in a fume hood where possible. Refer to SOP for Fume hood and Acids.
3. Read and familiarize yourself with the Safety Data Sheets (SDS) for each of the hazardous materials that you will be using.

# **Procedure:**

#### Nochromix bath preparation:

* Prepare a HDPE (high density polyethylene) container with sulfuric acid. Pour acid in the container in the fume hood.
* Add nochromix powder to the sulfuric acid in proportion of 2 sachets (150 – 200 g) to 2.5 L concentrated sulfuric acid.
* Allow for dissolution. The solution will remain active for 7 days. After this fresh powder should be added.
* Attach a hazard warning label to storage container. ALWAYS LEAVE CONTAINER VENTED - sulfur oxide and oxygen are by-product gases that may be released and will cause a dangerous build-up of pressure in an airtight container.

#### Cleaning glassware

1. Pre-clean glassware of organic materials and metals/ salts. These can react violently and contaminate the solution.
2. Place the glassware inside the HDPE net containers.
3. Turn on water.
4. Wear full PPE: Nitrile gloves, lab coat, apron, sleeves, safety specs, facemask, Ansell barrier gloves (white).
5. Remove the lid from the bath. Place the net container into nochromix bath, ensuring all parts are wetted.
6. Rinse gloves under running water, ensure no drops of nochromix are on the sink top.
7. Replace nochromix bath lid.
8. Thoroughly rinse table and sink. Test pH of the sink and bench top surface with the pH indicator strips (should be pH 6-7).
9. Remove the gloves and let them dry.
10. Turn off water.
11. Remove PPE and fill in the sign in sheet.

#### Removing glassware from bath

1. Turn on water.
2. Put on full PPE: Nitrile gloves, lab coat, apron, sleeves, safety specs, facemask, Ansell barrier gloves (white).
3. Remove lid from the bath.
4. Remove the net container allowing the solution to drain while holding over the bath, ensure internal parts of glassware are empty.
5. Place HDPE container with glassware into MiliQ water rinse bath.
6. Replace nochromix bath lid.
7. Remove the glassware from the net container and rinse under MiliQ water ensuring no nochromix remains. Take care that all parts of tubes and frits are well rinsed.
8. Thoroughly rinse table and sink. Test pH of the sink and bench top surface with the pH indicator strips (should be pH 6-7).
9. Remove the gloves and let them dry.
10. Turn off water.
11. Remove PPE and remove the input from the sign in sheet.

#### Cleaning reference and counter electrodes

* Put on full PPE: Nitrile gloves, lab coat, apron, sleeves, safety specs, facemask, Ansell barrier gloves (white).
* Use a small beaker filled with Nochromix solution placed in a larger empty beaker and on a separate tray.
* Label the larger beaker and leave in the sink area.

## **Disposal:**

Transfer to the plastic drum and dispose of as hazardous waste.

## **Personal Protective Equipment (PPE):**

Lab coat, nitrile gloves, chemical resistant apron, chemical resistant sleeves, facemask, Ansell barrier gloves (white).

## **Risk Analysis of SOP and emergency procedures:**

(In addition to [Safe Lab Practice](https://imperiallondon.sharepoint.com/sites/fons/faculty/safety/SitePages/Basic%20Laboratory%20Rules%20for%20All%20Laboratories%20in%20FoNS.aspx))

### **Always remember to include fire associated risks and control measures where appropriate**

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| Hazard | Raw risks | Current control measures | Residual risk  (Low/Med/High) |
| Acid | Spillage: Respiratory burn, eye and skin burns, property damage | Use concentrated acids in a fume hood.  A safety shower and eyewash must be available, accessible and regularly tested when working with corrosive liquids.  Always wear PPE when handling acids.  Label container with acids and acid solutions, do not leave them unattended.  Return the stock bottles to the storage cabinets immediately after use. | Med |
| Glassware and glass parts | Cuts and splinters from broken glass | Visually inspect glassware for cracks and other defects before and after use. If glassware is damaged, arrange for repair or dispose of. | Low |
| Nochromix powder | Inhalation, skin and eye burns | Prepare bath in well ventilated area or for small volumes – inside the fume hood.  Wear full PPE.  Immediately clean up spillages using the local spill kit. | Low |

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| **Additional control measures to minimise residual risks** | **Implementation date** |
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| **Who may be harmed** | |
| Staff / students | Cleaners / Engineers |
| Supporting staff | Others (specify): |

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| **Emergency procedures** – describe the response(s) required by the user and lab members |
| **Skin exposure:** Rinse affected skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical attention.  **Eye exposure:** Splashes may cause tissue destruction. Wash eyes for at least 15 minutes in eye/face wash, lifting the upper and lower eyelids occasionally (ask for assistance). Seek medical attention immediately.  **Small spills:** Do not attempt clean up if you feel unsure of your ability to do so or if you perceive the risk to be greater than normal laboratory operations. Cover spill with sodium carbonate or bicarbonate (or relevant absorbent such as Trivorex). When reaction stops, pickup with damp sponge or paper towels (wearing PPE). Rinse the affected area with water. Test liquid with pH paper.  **Large Spills:** Notify others in area of spill. Turn off ignition sources in area. Evacuate area and do not allow entry to the area. Contact FoNS Safety team (07872850018 or 07566950899). Respiratory protection required for clean-up. The procedure will be risk assessed in conjunction with the Department and external contractors prior to commencing.  Clear up **broken glass** using dustpan and brush, tweezers or other suitable equipment to prevent exposure to the glass then place into the appropriate waste bin (clean or contaminated glassware).  If anyone is injured while using the equipment contact first aider.  If any **cuts or exposures** to hazardous substances, ensure affected area is held under running water for at least 15 mins and the wound is encouraged to bleed, ask for first aid assistance. If water is not available use alcohol free wipe from the First Aid Kit and dress the wound. Seek further medical attention if required.  **Nochromix powder spill** – No dry sweeping is allowed. Collect spilled powder using wet paper towel and dispose of as hazardous waste. |

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| Recommended trainings and records: |
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| List of individuals competent to demonstrate safe work practice and train others (level 1 trainers): | Names of those that have been trained and can work unsupervised (level 2) and date training completed: |
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