

Copper Etch – Operating Procedure

Updated on 03/14/2019 by IC

Warnings and Notes

- Copper Etch is a corrosive (it can burn your flesh, eyes, lungs, and mucous membranes) liquid.
- It contains Hydrochloric Acid and Ferric Chloride.
- You must read its SDS before you use it; the SDSs are available in the yellow binders located in the cleanroom, on the UNDF-Tools shared drive, and in the "Current Users" section of the website (udnf.udel.edu).
- Copper Etch may only be used in the wet bench labeled **Acids #1** in Bay 2 of the UDNF cleanroom.
- You must have a safety buddy to use Copper Etch. The safety buddy does not have to stand by you or wear the PPE listed in the next section. However, the safety buddy: (1) must be present in the cleanroom at all times while you use Copper Etch and while you clean up and (2) must check on you at least every 10 minutes.
- You must log into the "Chem - Copper Etch" tool in FOM before you start work and log out once you are done using the chemical. You must make reservations in advance in FOM.
- Identify the closest eye wash and safety shower before you start work.
- If Copper Etch gets on any area of your body you must rinse the exposed area with water for at least 15 minutes.
- You must report all chemical spills and exposures to UDNF staff.
- Copper Etch may be used only during staffed hours (typically 08:30-17:00, M-F while the University is open). Unstaffed hours will be announced via email and will be posted on the UNDF Calendar in FOM.
- You should expect to find the working area clean and dry and are required to leave the working area clean and dry. Please ask for staff

assistance as needed.

Emergency Procedures

- In case of **skin contact**: Flush the affected area(s) while removing all contaminated clothing with large amounts of water for at least 15 minutes. Seek immediate medical attention.
- In case of **eye contact**: Flush the affected eye(s) with large amounts of water for at least 15 minutes. Seek immediate medical attention.
- In case of **inhalation**: Remove the exposed person to fresh air – only if it is safe to do so. Seek medical attention for symptoms such as respiratory irritation, cough, or tightness of chest; please keep in mind that symptoms may be delayed.

Personal Protective Equipment and Tools

- In addition to the normal UDNF cleanroom suit, the following safety PPE must be worn when handling Copper Etch:
 - Chemical apron
 - Face shield
 - Chemical resistant gloves
- The PPE must be inspected before you start any work:
 - If the gloves have any cracks, tears, holes, etc. please do not use them; ask staff for a new pair of gloves.
 - If the apron is not completely dry, please do not use it; please notify staff.
- Only use TEFLON tweezers or the blue locking forceps when working with Copper Etch.

Use Procedure

- Identify your safety buddy.
- Inspect PPE; if anything is out of order with the PPE, please **STOP** and notify UDNF staff.
- Log into “Chem – Copper Etch” tool in FOM. Enter the name of your safety buddy in the “Comment” section on the pop up window.
- All beakers containing Copper Etch must be placed in the white secondary containment tray located in the fume hood.
- Use one of the pre-formatted labels available in the file folder in Bay 2 to write the name of the chemical(s), date and time, your name, and contact info. Place the note under the beaker that will contain Copper Etch.
- Bring a number of cleanroom wipers into the hood and separate them; you will need them to dry the chemically resistant gloves if they get wet and to clean up when you are done using the chemicals.
- Attach you sample(s) to the blue locking forceps and bring them into the fume hood.
- Put on the additional PPE in the following order:
 - Apron
 - Face shield
 - Chemical resistant gloves
- Fill a glass beaker with DI water for rinsing your sample(s).
- Pour Copper Etch into the clean, dry glass beaker that was placed onto the label you filled out previously.
- Place the bottle with the fresh chemical into the chemical cabinet located in front of the wet benches.
- Place the sample into the beaker containing Copper Etch.
- Start the timer.
- Remove the sample from the Copper Etch beaker and place into the DI water beaker for rinsing.
- Dry the sample with nitrogen.

Waste Disposal

- Remove the cap from the waste bottle.
- Rinse the funnel with water over the sink.
- Pour Copper Etch into the appropriate waste bottle using the funnel; do not overfill.
- **Note:** If you start a new waste bottle make sure it is dry on the inside and outside.
- Place the cap on the waste bottle.
- Rinse the funnel with water over the sink.

Cleanup and Final Steps

- Wash both beakers with DI water three times over the sink.
- Place the beakers in the designated location.
- Remove the label and dispose of it into the white “acid” trash can located in front of the wet bench.
- Wipe off any liquids from the bench, and dispose of the wipers into the white trash can located in front of the wet bench.
- Wash chemical resistant gloves with DI water over the sink.
- Dry the chemical resistant gloves with wipers, and dispose of the wipers into the white “acid” trash can located in front of the wet bench.
- Wipe off any liquids from the apron, and dispose of the wipers into the white trash can located in front of the wet bench.
- Dry the chemical resistant gloves with wipers, and dispose of the wipers into the white “acid” trash can located in front of the wet bench.
- Remove PPE in the following order:
 - Remove gloves and place them in the fume hood.
 - Remove face shield.
 - Remove apron.
- Log out of “Chem – Copper Etch” tool in FOM.