We appreciate the response to this publication feature and welcome all contributions. Contributions may be sent to José A. Mascorro, our Technical Editor, at his e-mail address: jmascor@tulane.edu. José may also be reached at the Department of Structural and Cellular Biology, Tulane University Health Sciences Center, 1430 Tulane Ave., New Orleans, LA 70112 and Ph: (504) 584-2747 Fax: (504) 584-1687

Preparing Ultra-Smooth SEM Stud Surfaces

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Occasionally the need arises to prepare an ultra-smooth surface on an SEM stud to produce a featureless substrate for high resolution SEM studies. Polishing the surface or gluing a glass cover slip to the stud surface works to some extent. An easier alternative is to use aluminum foil on the stud, prepared as follows:

1. "Reynolds" aluminum foil seems smoothest and "regular" seems easiest to work with.
2. Burnishing. I've tried various things and they usually end up scratching the foil. To make sure it is absolutely smooth and flat, I carefully cut a strip that is a bit wider and longer than a stub.
   Place it on a clean surface; cover it with something very smooth weighing paper works well) and work over it with a finger tip to get it absolutely as flat as possible. Picking it up by the very edge with tweezers helps avoid wrinkles.
3. The smooth, flat piece is then transferred to a piece of double-stick scotch tape and once more pressed to the tape to get a very flat surface with no bubbles between foil and tape. This should be done on glass or a surface from which tape plus foil can then be carefully lifted.
4. The tape plus foil can then be applied to the stub - if it still looks nice, proceed to step five. If wrinkles or bumps have appeared, pull it up and try again. (You can put the tape directly on the stub and then apply the foil - However, I have found that it works best for me to have a nicely bonded duo of smooth tape and foil first).
5. Using weighing paper, again, press tape plus foil gently to the stub.
6. Finally, use a single-edge razor blade to trim off the excess foil and tape around the edge of the stub. You can apply a couple of tiny dabs of silver paste at several edge points if you want to make absolutely certain the foil is well connected electrically to the stub. I have gotten into the habit of making the strip of foil plus tape slightly narrower than stub diameter so that there is a small crescent of stub above and below the strip, simply as a way of telling top and bottom at a glance.
7. Additional note. For mounting an object with a convex (like my little larval shells) or irregular lower surface, aluminum foil can be gouged with a minuten insect pin before applying silver paste or paint to help achieve better contact and bonding.

As with everything, it just takes a bit of experimentation. . . .

...Submitted for Carole Hickman by Tina Carvalho.

Protection from Sulfur Hexafluoride Leaks

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I recently posted a question on the microscopy listserver about how to safely protect people in a microscope room from a leak of sulfur hexafluoride (SF_6). I am grateful for the valuable advice I received from the microscopy community, and I would like to briefly summarize what I have learned.

In many microscopy situations, the volume of SF_6 in use is relatively small, but safety still needs to be taken seriously. The material safety data sheets indicate that SF_6 is non-toxic under normal operating conditions, but does pose a danger as an asphyxiant, displacing the air necessary for breathing. SF_6 is heavier than air, so that if there is a leak, it will start filling a room from the floor up.

As a result of these properties, a minimum safety requirement is an oxygen sensor(s) mounted at floor level with an alarm and an emergency venting system for the room. The collective wisdom suggests a floor-level venting system that exhausts the SF_6 directly outside the building, and is not tied into any other exhaust system, as the best method. Since SF_6 is heavier than air, removing it through a shared exhaust system can run the risk of introducing it into other rooms as it leaves the building.

Naturally, the design of any safety system must be done in consultation with your local safety officer to ensure that it meets all safety codes. Symptoms of exposure and information on the decomposition of SF_6 under certain conditions are outlined in the MSDS, and are well worth reading.

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