Letters to the Editor

Dear Don,

I have enjoyed reading the series of articles in your newsletter by Moxtek relating to "More Than One Ever Wanted To Know About X-ray Detectors" - the first six of the series by Dr. Mark Lund and the last by Dr. D. Clark Turner.

In the last of the series, "If I Know It's There, Why Can't I see It?", Dr. Turner mentioned three alternatives to get around the problem of detecting trace amounts of copper in an aluminum film, but did not mention a fourth alternate: analysis by WDS. Resolution and sensitivity with WDS is approximately 10 times better than with EDS, therefore WDS could easily detect 0.5-1.0% copper in aluminum. With WDS it is possible to analyze copper $L\alpha$ with excellent sensitivity, which means the accelerating voltage could be reduced to 10 keV or less (the copper L absorption edge is 0.953 keV). This confines the beam to the aluminum film and prevents X-ray production from the silicon substrate.

From Dr. Clark's article, some of your readers might infer that X-ray microanalysis using a scanning electron microscope is not an appropriate technique for solving this problem. In fact, with the proper instrumentation, this problem could be easily solved in the SEM lab.

Yours truly,
/s/ Joseph Carr
Microspec Corporation

Dear Don,

I would wanted to comment on the recent article in your publication "A Novel approach in Rembedding Thick Resin Sections for Ultramicrotomy". I have several observations from my own experience.

This technique also works for embedding paraffin sections that have unique features that need to be studied by EM. Scribe on the back of the slide (a diamond pen works well) the area to be re-embedded. Dissolve the mounting media for the coverslip (depending on how fresh the mounting media is, this may take several days of leaving the slide in Xylene). Glue the BEEM capsule over the area of interest (see comments below about other glue options). Re-hydrate the tissue from 100% ethanol to a buffered solution using the well created by the glued on BEEM capsule. Osmicate, dehydrate and embed (because of the thinness of the section, solution changes can be shortened).

Another option for gluing the BEEM capsule down is "super glue". Put a small amount on some glassine weighing paper and using the end opposite from the tip (you want to use the smoothest surface, not the one you cut with the razor blade), drag it through the glue and set it in place on the slide. After it dries it should be well sealed, although it may need a touch up if you were not generous with the glue. Fingernail polish works too (although I've never tried it with propylene oxide).

Our experience with the "pop off" technique led us to use harder plastics, e.g., epons or their equivalent, rather than Spurrs. The medium hardness or slightly harder worked better for us.

Another option for getting the block separated from the slide that avoids the annoying problem of pieces of glass adhering to the blockface is to avoid liquid N_2 and use heat. We would take our slide/block combination and place it slide down on an 80 degree F (approximate) hot plate for roughly 3-5 minutes. (Safety note: This makes everything HOT!). Grab the BEEM capsule as close to the slide as possible with one pair of pliers and grab the slide as close to the BEEM capsule as possible with another pair of pliers. Hold the slide steady and turn the BEEM capsule pliers 90 degrees so as to pull the tissue face of the BEEM capsule off the slide. We never had problems with the glass sticking and we almost always got the whole block face off except where the glue had been on the inside of the BEEM capsule.

Appropriate credit should go to Charles Bjore, a former coworker, who spent a good deal of time working out this technique for us.

Sincerely,
/s/ Doug Cromey
University of Arizona