

COATING TEM GRIDS WITH FORMVAR

Materials needed:

- Grids: either new grids or cleaned “used” grids are employed. “Used” grids are cleaned in acetone in a sonicating water bath (3X, 2 min sonication pulses with changes of acetone in between). Place the cleaned grids on filter paper to dry before coating.
- New microscope slides
- Ethanol
- Large & jeweler’s forceps
- 0.37% Formvar: this is made by mixing equal amounts of *new* 0.25% and 0.5% Formvar in ethylene dichloride in a clean, wide mouth bottle with an air-tight cap.
- Razor blades
- D-H₂O
- Large bowl for holding water
- Parafilm
- Drying chamber to dry slides: this can be simply made by covering a small inverted dry beaker under a larger inverted beaker.

Formvar is a transparent plastic that is used as a structural support film, which is coated on grids. The Formvar holds and stabilizes thin sections for transmission electron microscopy. The plastic Butvar may substitute for Formvar.

1. Wash a glass microscope slide in 95% or 100% EtOH. Dry the slide. If one is using brand new, high-quality cleaned slides, treatment with EtOH is not needed. Be sure that any slide is completely clean and dry. Place the slides in a warm oven if needed.
2. Using large forceps, dip a microscope slide slide perpendicularly into the Formvar solution and hold it in the solution for 20 seconds.
3. Lift the slide out of the Formvar solution and hold it above the Formvar solution in the bottle for 30seconds so that it dries in the vapor of ethylene chloride.
4. Place the slide in the drying chamber and allow it to air dry (several minutes to 2 hours) in the drying chamber.
5. Fill the large bowl with D-H₂O and heat it up in the microwave for ~2min (you want it warm, but not too hot to touch). Or, simply use warm tap water.
6. Score the Formvar film on the slide by running a razor blade along the edges of the slide.
7. Breathe onto the slide for a few seconds.

8. Slowly dip the microscope slide into the D-H₂O. You “SHOULD” see the Formvar film float onto the surface of the water. A small lamp next to the bowl will help show the reflection of the Formvar film on the water.
9. Using your jeweler’s forceps carefully place your grids shiny side down onto the floating Formvar film. Cover the film with grids but leave a space that is at least ½ the diameter of a grid between each grid . If you accidentally drop a grid upside down or on top of another grid do not try to fix it or you will probably destroy the film.
10. Cut a slice of parafilm slightly larger than the film of formvar, bend it into a “U” shape and roll it across the Formvar film containing the grids (not too fast, not too slow...). Lift the parafilm and the grids with the Formvar film will stick to the parafilm. Trim off the excess parafilm and allow it to air dry in a petri dish. When all the water has dried the grids are ready for use. Grids are good for years once they are dry.

Special hints: If the Formvar does not come off the slide, try another brand of slides. Or, using a cotton cloth like a tee shirt or dress shirt, wipe the slide before dipping into the Formvar solution. Finally, Formvar coating does not do well in humid conditions. In the summer, be sure to coat grids in a well-air conditioned room.