

Figure 6. Step-by-step procedure for the production of Formvar substrates for electron microscope specimen grids (see Appendix 1 for details). *a*: place a microscope slide polished with a tissue in a warming oven. *b*: after warming, place the slide briefly in Formvar solution. *c*: remove the slide from the solution and drain on filter paper while holding vertically. *d*: cut the film free by scraping along the sides of the slide with a bamboo splint. Cut the film along the sharp edges with repeated strokes of the splint, making sure it is cut along both sides from the meniscus to the corners and along the bottom. Take special care to insure that corners are cut. *e*: float the film free by slowly immersing the slide into a water bath while holding it at a steep angle. (To help free the film from the slide, moisturize by holding it close to the mouth and breathing on it.) *Dotted lines* indicate an area of the bath shown enlarged in *f*. *S*: the slide held at the proper angle and pushed down in the direction indicated by the *down arrows*. *F*: the film floating free of the slide. The action is continued until the film is completely free.

dish or other receptacle should be ready—nearly full of the highest purity available distilled or deionized water. If dust is a problem, the surface should have been swept, either with filter paper or by overfilling to a positive meniscus and sweeping the surface with a straight edge (cardboard, polyethylene, Teflon, etc.). A small fluorescent lamp should be arranged so that the surface can be monitored for dust, and so that the support films may be conveniently examined for defects.

Hold the film side of the slide close to the mouth, and gently breathe on the film to help release it from the glass. While holding the slide at a steep angle to the water surface (about 45°) with the film side up, push it slowly straight down while watching to see if the film floats free. As soon as the bottom edge releases, continue pushing the slide down until the film floats completely free. At this point, as you pull the slide from the water, you must be very careful, for the surface tension will tend to pull the film back onto the slide. Alternatively, simply allow the slide to slip to the bottom of the dish.

Examine the film carefully. It should be uniform and silver or, even better, gray in color and show no other interference colors except along the edges. Discard any films that exhibit more than a hint of gold or other colors. Some of the problems and their possible causes that may be helpful in evaluating the films follow.

Horizontal bars. Usually caused by withdrawing the slide from the plastic solution too slowly. (Don't attempt to withdraw the slide smoothly. This will usually fail. Rather, just pull it out without hesitation, just as you would pick up something from a table.)

One or more dome-like interference bands, full slide width, and usually rather ragged. The slide was too cool when removed from the