Electron Microscopy Centre

Title: **Preparations of Support Films for TEM Grids**

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Author: **X. Yang**

NOTE: The Chemicals used for TEM grid support films are restricted to the specific EM users who have had prior training in proper use, handling and storage. **Handle solutions and cast the films in a fume hood. Wear lab coat, eye protection and latex gloves as**

Introduction

In general, 200-400 mesh (lines/in) grids are used in TEM experiments. Most EM grids are made of copper because it is non-ferromagnetic and thus minimally distorts the

4. If the TEM grids are not clean after above procedures, put the grids into boiled 1% NaOH solution for 5 min., rinse off the chemical using distiller water and dehydrate with 100% alcohol.

Preparation of plastic films

1. Collodion support film

1.1. Prepare a concentration of 2% collodion in amyl acetate solution.

1.2. Place a drop of the collodion solution on the surface of distiller water and allow it to spread out and dry.

1.3. Use tweezers to pick up the film and discard it properly. This process will remove any dust floating on the water surface. Repeat the process twice or more if necessary.

1.4. In a **vibration free** environment, place a drop of the collodion solution on the surface of distiller water and allow it to spread out and dry. This leaves a thin layer of plastic on the water surface

Note: If thicker film is desired, user could add one or two more drops of collodion drops after the first drop is well spread and dried.

Note: This method tends to produce thicker and more uneven films compared to

2.1.

3.3. Remove dust from a glass microscope slide with velin tissue, and drop into the pioloform solution. Cover the top of the container, open tap and drain solution into the stock bottle for re-use.

3.4. Leave the slide to dry with the cover on, thus maintaining the chloroform atmosphere within the container.

3.5. Score 2mm from the slide edge with a stout scalpel blade, breathe on the film and lower into a beaker of distilled water at an angle of 45°. The film should flow on the water.

3.6. Place acetone-cleaned grids, matt side down onto the film, separating each by 3mm.

3.7. Cut a piece of 'Yellow Pages' (with text printing on both sides to allow even uptake of water) and leave until the whole paper is wet. Remove the grids gently from the surface with forceps.

3.8. For slot grids, remove from the surface of the water when 3mm has been wetted.

3.9. Set the grids aside in a dust free place to dry before use.

Preparation of carbon films

Carbon-Formvar films can be easily converted into carbon-only films by dissolving away the plastic. The carbon-plastic films are placed plastic-side down onto a piece of filter paper soaked in a solvent which dissolves the plastic. After a few hours, the grids are moved to a dry piece of filter paper and allowed to air dry.

Another method for preparing pure-carbon films is to evaporate a layer of carbon directly onto the surface of a freshly-cleaved piece of mica. The carbon is then floated off onto water and transferred to EM grids in one of two ways:

- TEM grids can be brought up through the water from below the film or- the film may be carefully lowered onto grids, situated beneath the water surface on a piece of wire mesh, by slowing removing the water from the vessel.