

Cellulose Acetate Replicating Film

Product No. 44840, 44841, 44842, 44847, 44848, 44854, 44856, 44858

Cellulose acetate film is an excellent material for making replicas of all types of surfaces using a two stage process. It is flexible, durable, and self supporting with good dimensional stability. It has excellent film formation properties yet is easily separated from the surface being replicated. Cellulose Acetate is easily dissolved in acetone (preferred) or methyl acetate. The resolving power of this system is between 50 and 100Å as a result of actual measurement. This replica material is for observation under the electron microscope but is also excellent as a replication material for observation using an optical microscope or the naked eye.

Stage 1: Steps for Making Plastic Negative Replicas

1. Cut film larger than the surface area to be replicated.
2. Several drops of acetone are placed and spread on the specimen surface.
3. Before the Acetone evaporates the film is placed on still wet surface from one end so that there is no bubble formation. Allow surface tension forces to pull the film down against the specimen; no pressure is required and allowed to dry. As an alternative one surface of the replication film may be softened with solvent and then laid on the specimen surface. Make sure that no air bubbles are trapped during this procedure.(see note 1)
4. The solvent evaporates completely in about 10 minutes.
5. When dry, the replica is carefully stripped off the specimen by picking it up with tweezers or scotch tape.

Stage 2: Steps for Making Positive Shadow Casting Replicas

The technique of shadow-casting consists of depositing by vacuum evaporation a layer of electron dense material on the specimen at an angle. Due to shadowing some areas are more electron transparent than others giving the impression of illumination by oblique light when viewed by a TEM

1. First stage replica is taped to a glass microscope slide, structure side up, with scotch tape.
2. This is then placed into a vacuum evaporator and shadow cast with the desired material (see note 2) at the desired low angle and direction. It is then reinforced by coating with Carbon at an angle of 90 degrees to the surface. Some prefer to perform the Carbon coating first followed by the shadow layer.
3. Prepare washing device by placing filter paper or wire mesh in Petri dish and completely wetting with solvent, then cover.
4. Cut 2 – 3mm squares from shadowed and coated replica with a razor blade or scalpel. Digest the Cellulose Acetate negative by carefully placing these, acetate side down, on TEM grids and then place the grids on the wetted filter paper or wire mesh in the Petri dish, then cover. Add solvent as necessary to keep wet. Move grids several times to a clean area of paper. Acetate will be completely removed in less than an hour.
5. Remove grids from dish and allow to dry before placing in TEM for examination.

Notes

1. If the surface to be replicated is contaminated with foreign substances or to insure absolutely clean replicas, the surface should be cleaned by making several blank replicas to remove this contamination. This is especially true on etched surfaces of metal where corrosive materials are often found. 3-5 of these discarded replicas may be necessary.
2. The choice of shadowing material is made according to the magnification to be used when viewing in the electron microscope. If the magnification is less than 3000x, Chromium, Palladium, or Germanium is used. When more than 3000x Platinum-Palladium alloy, Platinum, Iridium or Platinum-Iridium is used.

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