

Reproducible preparation of well defined holey carbon films as support for electron microscopic specimens

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Holey carbon foils are used as a support in many areas of electron microscopic research. In material science such films are needed to observe pure objects without any distortions as necessary in HRTEM or during analytical work, e.g. for energy-loss spectroscopy. In biological science holey films are needed as support for the investigation of thin frozen hydrated suspensions of macromolecules. Such films can be prepared by a variety of methods but all of them suffer on the influence of some hardly controllable parameters such as air humidity or the short lifetime of the solutions from which the plastic films are prepared. Here an easy and reproducible method is presented using an improved version of the known glycerol emulsion in a Triafol[®]/ ethyl acetate solution. In conjunction with the essential use of hydrophobic glass slides holey foils were obtained with a very regular distribution of good shaped holes in two main dimension ranges, where the smaller ones are of about 1 μm and the bigger ones of 2 to 5 μm in diameter. After reinforcement by carbon evaporation and removal of the Triafol[®] grids were obtained on which especially the bigger holes are characterised by their flat edges without significant swelling towards the carbon film. In addition this method can easily be tuned to produce – in a certain range – holes of a predefined size.