

PROVIDING SOLUTIONS:

Dehydrants for Electron Microscopy

There are 2 important qualities that a solvent used in the tissue processing protocol for TEM must have:

1. The solvent must have the ability to fully dehydrate – remove water – from cells.
2. It needs to be miscible with embedment resin of choice. Several organic solvents having these properties are used in the EM field with other associated characteristics, some positive, some negative, that affect their individual uses, they are: *Ethanol (ETOH)*, *Acetone*, *Acetonitrile*, and *Propylene Oxide (PO)*.

Ethanol (ETOH) 200 Proof (not denatured)

Advantages

1. Most widely used dehydrant and ubiquitous in an EM lab
2. Less hygroscopic than acetone or propylene oxide
3. Causes less lipid extraction than acetone or propylene oxide
4. Low volatility
5. Relatively non-toxic with no carcinogenic effects

Disadvantages

1. Least miscible with resins
2. Lack of high miscibility with resin may necessitate the use of a transitional solvent such as PO
3. Any slight residual ETOH affects block hardness/polymerization

Acetone

Two types of acetone are generally used in the dehydration process: Acetone, reagent grade, which is used for the steps when 50–95% solutions are used, and Acetone, glass distilled, for the 100% step and for infiltration solutions.

Advantages

1. Good miscibility with resins
2. Very good water scavenger
3. Slight residual acetone does not affect block hardness/polymerization

Disadvantages

1. High volatility
2. Strong lipid solvent
3. Quite hygroscopic
4. Irritant to skin, mucous membranes

Acetonitrile

Advantages

1. Very low volatility
2. Non-carcinogenic
3. Good miscibility with resins
4. May be used as a substitute for PO
5. Not a strong lipid extractor

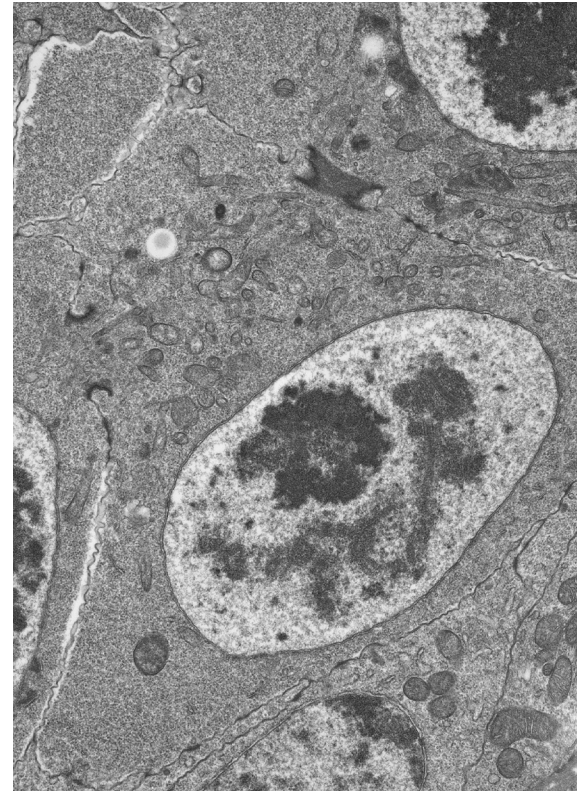
Propylene Oxide

Advantages

1. Excellent miscibility with resin
2. Very good final dehydrant/transitional solvent
3. Provides the best infiltration

Disadvantages

1. Very strong lipid extractor
2. Extremely volatile
3. Very hygroscopic



Transmission electron microscope image of synaptonemal complex in nuclei of *Drosophila germarium* cell.

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EMS Catalog supplies mentioned

Cat. No.

Solvents

Ethanol	15056
Acetone, Reagent	10014
Acetone, Glass Distilled	10016
Acetonitrile	10020
Propylene Oxide	20401