



Endless Possibilities ...

## Epoxy Resins

Epoxy resins are the most commonly used embedment resins for routine ultrastructural transmission electron microscopy. The gold standard, Epon 812, is no longer produced but several similar resins such as EMbed 812, Araldite, and Spurr's have very good sectioning, contrast and beam stability, qualities that are required in a EM resin. Tissues that are to be used for immunocytochemical studies are typically embedded in acrylic resins such as LR White and Lowicryl, or Glyco-methacrylate a water miscible resin.

To obtain these desirable qualities in an epoxy resin it is necessary to combine a variety of components, flexibilizers, plasticizers, and hardeners, each with specific attributes, to obtain a final product that fits individual needs. Each major resin mixture can be tailored for hardness. *For Example:* When using EMbed 812's DDSA : NMA ratio, increasing the NMA produces harder blocks. Even the complete resin mixtures can be combined, EMbed – Araldite and EMbed-Spurr's, to suit specific requirements.

It is important to note that within each of these major resins there is a component which is called a hardener, such as NMA in EMbed 812. This "hardener" is not to be confused with the more common 2-part epoxy's hardener found in hardware stores which serves as the initiator or accelerator for polymerization. The components of the major resins will not polymerize until their accelerator is added such as DMP-30 for EMbed or DMAE for Spurr's.

## Handy Hints

- Use disposable labware so everything that comes in contact with the resin can be cured overnight at 70°C and therefore rendered safe for disposal.
- The beaker should be sufficiently larger than the total volume to be made to facilitate mixing.
- Before replacing the container's cap, use a lab wipe, wet with acetone, to wipe off excess resin from container's threads so the cap is removable for next use.

## Mixing Epoxy Resins

**NOTE:** All of the resins are viscous so volumetric measurement is problematic and favors gravimetric measurement.

1. Place a disposable beaker on a top-loading balance and tare its weight. **NOTE:** *It is helpful to put a lab wipe over the balance platen to catch any rogue drops that might escape the container making sure it does not interfere with the balances operation.*
2. Add individual components, except the accelerator, in their recommended proportions.
3. Remove and mix using a tongue depressor by gently folding to avoid creating air bubbles.
4. When all mixing lines are gone place back on the balance, tare, and using a pipette add the accelerator- mix as before.

# Kirsch notes

## Mixing Epoxy Resin

### EMS Catalog Supplies Mentioned

#### KITS:

EMbed 812 – Catalog #14120

Araldite EMbed 812 – Catalog #13940

Spurr's – Catalog #14300

Lowicryl K4M – Catalog #14330

Glyco-Methacrylate – Catalog #14200

LR White (Medium Grade) – Catalog #14380

Araldite 6005 – Catalog #13920