**Resin preparation**

Spurr

##### Caution

Components of this embedding media, especially vinylcyclohexene dioxide, may be carcinogenic and proper precautions should be employed. The low viscosity of this embedding medium (60 cps) provides exceptional penetration quality for embedding of tissues, minerals and other dense structures. It is less viscous than Araldite 502, Epon 812, or Maraglas 655 and has been used successfully with a wide range of both biological and mineral specimens. The embedments are easily sectioned, or may be used to prepare mineral specimens for polishing, or for any type of electronic potting. Endosperm with a high lipid content, tissues with hard lignified walls and highly vacuolated parenchymatous tissues of ripe fruit are a few examples of tissues of which have been embedded.

##### Procedure

The embedding medium is prepared by gravimetrically adding the components singly into a flask. The composition which is recommended is as follows:

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| **Ingredients** | **Mass (g)** |
| Vinylcyclohexene dioxide | 10 |
| Diglycidyl ether of Polyproplyeneglycol D.E.R. 736 | 6.3 |
| Nonenyl succinic anhydride | 26 |
| Dimethylaminoethanol D.M.A.E. | 0.4 |

DO NOT STIR VIGOROUSLY (use stir magnet)

Variations in these compositions can be obtained from reference below. Exact weight should be used for optimum performance. It is generally desirable to add the dimethylaminoethanol catalyst last after gentle mixing of the previous components. Should bubbles form, they may be drawn off with a gentle vacuum applied to the mixing container.

##### Dehydration

Graded series of dehydrating fluids, ie: acetone, alcohol, etc.

##### Infiltration and cure

The embedding medium may be kept for several months in a deep freeze if protected from dust and atmospheric moisture. Too long a storage delay at ambient conditions may result in partial polymerization, which interferes with infiltration because of the viscosity increase. Embedding is preferably done with oven-dry gelatin capsules. Standard cure is 8 or more hours at 70oC in an oven. If the complete embedding medium is over 24 hours old, an hour or two less may be required.

##### Trimming and polishing of embedments

The block faces are hydrophobic and are not wetted easily by distilled water during sectioning. The sections are tough under electron beam and can be used without supporting membrane or a 200 mesh grid. No noticeable effect of the electron transmission of the background plastic is observed with electron dense stains.

##### References

Spurr, A.R., *A low-viscosity epoxy resin embedding medium for electron microscopy*, Journal of Ultrastructure Research, [26(1-2):31-43 (1969)](http://dx.doi.org/10.1016/S0022-5320%2869%2990033-1)

Epon/Araldite mix

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| --- | --- | --- |
| **Ingredient** | **Volume (ml)** | **Mass (g)** |
| Epon | 25 | 31 |
| DDSA | 55 | 57 |
| Aral 6005 | 15 | 17.6 |
| DBP | 2 | 1.9 |
| Total | 97 | 107.5 |
| DMP-30 | 1 drop per ml | 0.9 drops per g |

1. Mix thoroughly all ingredients (except DMP-30) for about 10 minutes.
2. Place resin in vacuum for 10 minutes.
3. Resin can be stored in the freezer in a tightly sealed container. To use the resin, allow it to reach room temperature to avoid condensation.
4. When ready for infiltration and embedding, add DMP-30 to resin and mix thoroughly. Then place in vacuum for 10 minutes.

Spurr-Epon mix

Good for microwave sample preparation.

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| **Ingredients for Spurr** | **Mass (g)** |
| NSA | 26 |
| ERL 4206 | 10 |
| DER 736 | 6 |
| DMAE | 0.27 g / 28 drops |

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| **Ingredients for Epon** | **Mass (g)** |
| Epon 812 | 25 |
| DDSA | 13 |
| NMA | 12 |
| DMP 30 | 0.77 g / 36 drops |

1. Mix all the ingredients except the two catalysts (DMA and DMP 30).
2. Then add the two catalysts (using a glass pipette measure by drops) and mix thoroughly again.