

WARNING NOTICE: The experiments described in these materials are potentially hazardous and require a high level of safety training, special facilities and equipment, and supervision by appropriate individuals. You bear the sole responsibility, liability, and risk for the implementation of such safety procedures and measures. MIT shall have no responsibility, liability, or risk for the content or implementation of any of the material presented. [Legal Notices](#)

7.7. Guide to Growing a Single Crystal

Overview:

As you may discover, growing single crystals takes patience as well as an artful hand. Crystallizations can be very sensitive to temperature and minor disturbances. Therefore, you will be encouraged to try several different temperatures, using otherwise identical conditions, and to always find a quiet undisturbed location to promote crystal growth. Here are some tried and true tips to get you started.

Option #1

- Sometimes nice crystals will grow simply by cooling your solution. You can also try supersaturating a solution by heating it until all of the material dissolves, then allowing it to cool down slowly.

Option #2

- 1) Find a solvent that your compound is soluble in, and make a saturated solution.
- 2) If necessary, perform a filtration to remove insoluble impurities. For such small scales, a good filter can be made by plugging a disposable Pasteur pipet with glass wool (or even a bit of Kimwipe), then filling (about an inch) with a filtering aid such as Celite. Moisten the Celite with fresh solvent, then filter your solution by forcing it through the pipet with a pipet bulb.
- 3) Find another solvent, in which your compound is NOT soluble (or only slightly soluble), and which is miscible and less dense than the first solvent.
- 4) Carefully layer the second solvent onto the saturated solution in a small vial. You may see some turbidity at the interface. Your crystals should grow along this interface.

Option #3

- Another option is to place the saturated solution in a small vial that sits inside another larger vial. Add the second solvent to the outer vial and cap. The second solvent should slowly diffuse into the saturated solution, and crystals should appear! To slow the process even further, place the diffusion set-up in the fridge.

Solvent systems to try:

CH_2Cl_2 /ether or pentane

toluene/ether or pentane

CHCl_3 /*n*-heptane

THF/ether or pentane

water/methanol