

Purifying a Liquid by Distillation

One of the best ways to purify a liquid is by distillation. By boiling the liquid and then condensing and collecting the vapor, any solid impurities or liquid impurities with a higher boiling point will be left behind.

Procedure:

- To purify a liquid by distillation, first place the liquid you want to distill in a conical vial or small round bottom flask with a spin vane or spin bar.
- Then add a Hickman still, followed by a reflux condenser (with tubing attached as described in "Refluxing a Reaction"). Securing it with a clamp on the Hickman still on top of your stirrer-hot plate in the hood (don't use any yellow clips – they will melt).
- Insulate the vial or flask and the neck of the Hickman still (below the wide part) with aluminum foil (fold it so that you can observe the liquid when needed).
- Turn on the water, the stirrer, and the heat on your stirrer-hot plate and begin to heat the liquid. As the liquid begins to evaporate and eventually boil, the vapor rises up the column until it hits the cool glassware above the neck of the still. It then drips down and collects in the neck.
- When the neck is full, remove the cap and transfer the purified liquid to a tared (preweighed) vial or test tube using a pipet. Make sure to replace the cap on the Hickman still (or the vapors will escape rather than condensing).
- When no more liquid seems to be condensing or the vial or flask is dry, turn off the heat and let the system begin to cool. Make sure not to continue heating the system after all the liquid is gone – now that there is no boiling liquid, there is nothing to keep the temperature from rising as high as the hot plate, and you can bake the impurities onto the glassware, making it difficult to clean. You may also cause a conical vial to crack.