

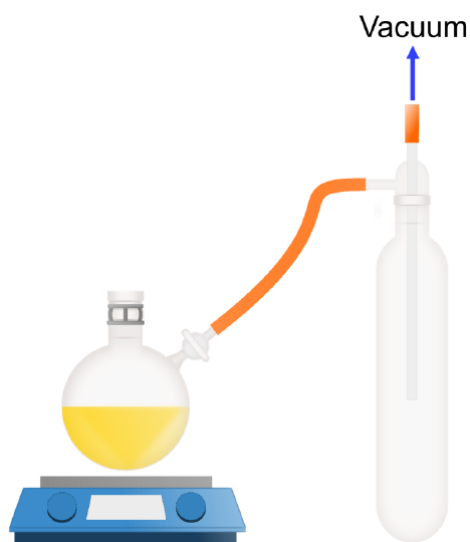
## 10: Removing Solvent

Schlenk lines allow solvents and other volatiles to be readily removed under vacuum without exposing the reaction vessel to atmospheric air and moisture. The low pressures offered by rotary vane vacuum pumps means that even high boiling solvents such as toluene can be removed at room temperature, which may be crucial for the isolation of temperature-sensitive compounds. When evaporating a small volume of solvent (>50 mL) or simply drying a compound under vacuum, the stopcock on the Schlenk flask is first closed, the stopcock on the Schlenk line is turned to vacuum, and then the stopcock on the Schlenk flask is slowly turned to vacuum, ensuring that the solution is adequately stirred to prevent bumping (i.e. rapid or uncontrolled bubbling/boiling).

A secondary external liquid nitrogen trap should be used when removing large volumes of solvents and is recommended when removing corrosive or reactive volatiles. Schlenk lines may also be equipped with a built-in  $^{\circ}\text{C}$  can instead be employed over liquid nitrogen to help prevent blockages in the external trap.

### Step 1

Close the stopcock on the Schlenk flask to seal the contents under inert gas then disconnect it from the Schlenk line hosing. Attach the flask to an external solvent trap, then connect the external trap to the Schlenk line hosing and place under vacuum.



Attaching an external trap to the Schlenk flask.

### Step 2

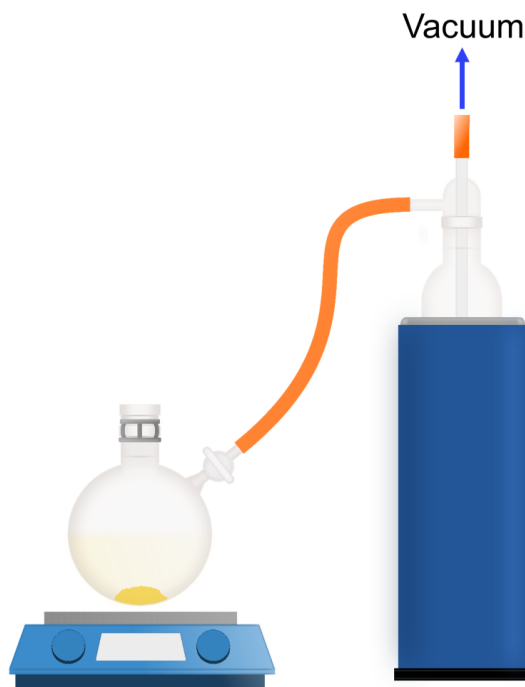
After a few minutes of being evacuated, carefully lower the external trap into a Dewar of liquid nitrogen. Slowly and partially open the stopcock on the Schlenk flask, ensuring that the solution is stirring to prevent bumping. It may be necessary to open the tap fully or use a warm water bath to fully remove all solvent or volatiles.



Removing solvent under vacuum.

### Step 3

Once all of the solvent has been removed, close the stopcock on the Schlenk flask followed by the Teflon tap or stopcock connecting the external trap to the Schlenk line. Disconnect the Schlenk flask from the external trap and then [cycle](#) it back onto the Schlenk line, slowly opening the stopcock when backfilling with inert gas. Disconnect the external trap from the Schlenk line hosing and remove it from the Dewar of liquid nitrogen. Allow the collected solvent to thaw before discarding the contents into an appropriate waste container.



Schlenk flask after removal of solvent.

This same approach can also be used to partially concentrate solutions *in vacuo* prior to crystallisation.

This page titled [10: Removing Solvent](#) is shared under a [CC BY-NC 4.0](#) license and was authored, remixed, and/or curated by [Andryj Borys](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.