

Filtering a Solid from a Solution

Filtration is the means by which solids are separated from liquids. The liquid that comes through is called the filtrate. The force which pulls the liquid through the filter can either be gravity or vacuum. We will usually use vacuum filtration. When doing so, it is important to use a filter flask with a spout on the side – such flasks are heavier and designed to withstand a vacuum. Also, pay attention to whether the solid or the filtrate will contain the product.

Procedure:

- To filter a solution, bring the solution, your Hirsch funnel, a 25 ml filter flask, and a small filter paper (from the box on my desk) to the pump area.
- Clamp the flask next to the pump and attach the vacuum tube to the flask. Make sure that the bottom valve is open (pointing down) and the top valve is open (pointing sideways).
- Turn the pump on by the switch. Then close the top valve by turning it to the left (the only way it will go).
- Swirl the solution and dump it into the Hirsch funnel as quickly as possible without spilling. Scrape out any solid that didn't go in with a spatula; there is usually not a good liquid to rinse with. Make sure that you don't add more volume than the filter flask will hold – it will get sucked into the tubing.
- When all of the liquid has gone through, open the top valve to break the vacuum - don't leave the pump running once the liquid has gone through as it will start evaporating the liquid and may get into the pump if the ice trap gets full.
- After breaking the vacuum, turn the pump off by the switch. Never turn the pump off while it is still under a vacuum – the oil can be sucked up into the motor.
- Disconnect the filter flask from the hose and remove it from the clamp. If you are going to weigh the solid, make sure to give it some time to dry, as small amounts of solvent remaining can change your mass quite a bit.