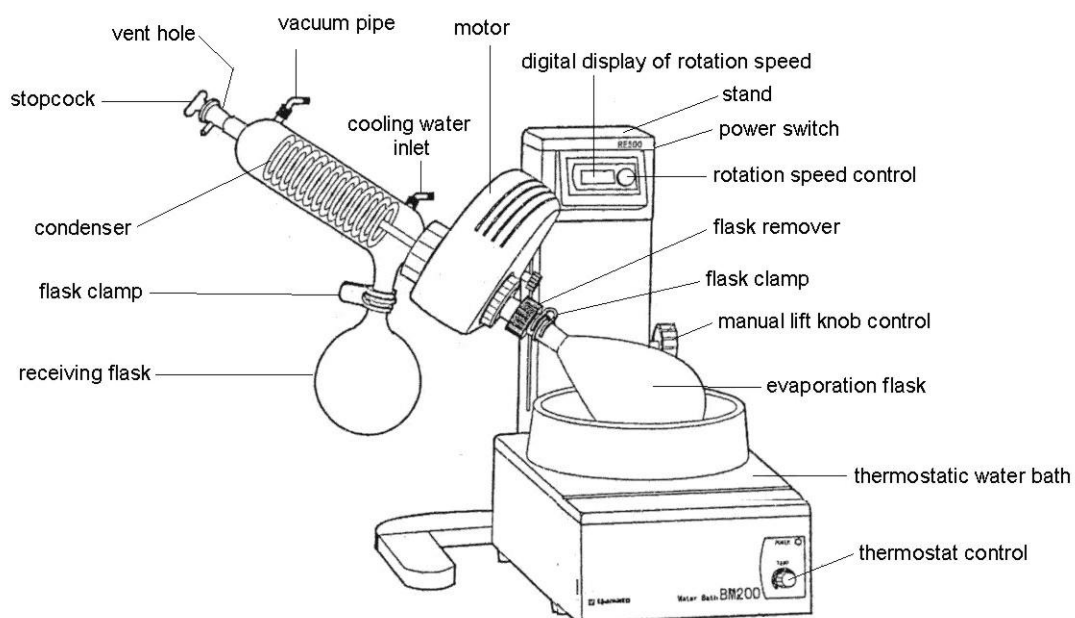


ROTARY EVAPORATION : THE "ROTOVAP" (quick link to video : [rotary evaporation](#))

The rotary evaporator or "rotovap" is an expensive piece of apparatus that needs to be used with great care. If you follow the instructions carefully, it is the fastest, most efficient and most environmentally friendly way of removing a volatile solvent from a non-volatile sample. It is standard equipment in a modern chemistry laboratory. The rotovap works by increasing the rate of evaporation of the solvent by (1) reducing the pressure to lower the solvent boiling point, (2) rotating the sample to increase the effective surface area and (3) heating the solution.

To use the rotovap, first make sure that the power is on (top right of the stand). Adjust the vertical position of the glass apparatus using manual lift knob control on the right side of the stand so there is plenty of space above the water bath. Check the temperature and level of the water bath. If more water is needed, top it up with **distilled water**, if it's too hot, let it cool or add a little ice.



Check the receiving flask for waste solvent - if it contains any liquid, remove it and empty it into the blue organic waste drum, if it's dirty, remove it and clean it by rinsing it out with a little acetone.

Turn the cooling water on to the condenser coils - a gentle flow is sufficient. Now turn on the vacuum. In some cases this will be a water aspirator (the tap needs to be on full) or it might be a PIAB system. Check the stopcock to make sure the hole is lined up with the vent hole (the stopcock has a blue mark on the knob of the tap indicating the side with the hole).

The sample solution to be evaporated is placed in a round bottom flask (no more than half full). This evaporation flask is carefully attached to the ground glass joint and secured with a clip (don't use grease). If the flask neck size doesn't match the joint on the rotary evaporator, then a reduction adaptor needs to be used. Start the flask rotating.

Place your finger or thumb over the vent hole and use it to control the vacuum. If the sample starts to boil to vigorously, release the pressure by removing your finger. Once the boiling has stopped, reapply your finger and repeat the process until the sample "calms down". If you carefully touch the flask with your fingers it should be cool due to the evaporation.

Once the solution is close the stopcock to generate a vacuum in the apparatus (but keep your hand on the tap and ready to adjust the tap in case the solution starts to boil vigorously) - now carefully lower the evaporation flask until the lower surface of the glass is just submerged into the water bath. If the solution boils vigorously, release the vacuum with the stopcock.

Once the flask is "stable" then you can remove your hand from the tap and leave the solution to evaporate. If evaporation is slow, then turn on the heat to the thermostatic water bath and adjust the heat accordingly - remember that the apparatus is under vacuum so the water bath does not need to be set at the normal boiling point of the solvent, 40-50°C is usually sufficient.

To remove the flask once evaporation is complete, using the manual lift knob to raise the apparatus out of the water bath then stop the rotation. Hold the evaporation flask with your right hand and release the vacuum with the stopcock with your left hand. Once the vacuum is released, carefully remove the flask. If it is stuck, unscrew the white flask remover to help push the flask off. Ask the TA if you are unsure. Only after the flask is removed should you turn off the water aspirator and the condenser water. Remember to empty to receiver flask of any waste solvent.