Rotary evaporator

(I) What we have:

We currently have 5 rotovaps:

- Two rotovaps in RMD409/410 with cold finger/ immersion chillers –30 (–40 ℃ on a good day).
    - Both are in the centermost fume hoods for smelly, volatile, and potentially explosive stuffs.
- Two rotovaps in RMD414 with coiled condensers at 2 ℃ for general purposes.
    - One has a base trap for acidic mixtures and a liquid nitrogen trap.
- One rotovap is located in the RMD423 fume hood with coiled condensers 2 ℃ for general purposes and also has a base trap for acidic mixtures and a liquid nitrogen trap.

(II) Before using the rotovaps:

- All users need to have proper training before starting any task. Contact Aaron and Katherine if you need a training.
- It's important to roughly know what you have in your flask! (What kind of solvent? Boiling point? What compounds? Any smell? Are they explosive?)
- Based on what you have in the flask, choose the appropriate rotovap to use (see section I)

(III) General procedure:

(1) Check the cold condensers! If there is any ice forming inside, don't use the rotovap and let Aaron or Katherine know.

(2) Check the condenser temperature (see section I).

(3) Check if the condenser is oriented vertically (Figure 1, right). If the condenser is leaning forward (Figure 1, left), solvent will get into the spinning mechanism. The O-rings are solvent resistant, but this can shorten the lifetime.

Figure 1. A condenser in a bad position (left) and a good position (right)

(4) Make sure the water bath is at least half full (use only DI water to refill).

(5) Attach the bump trap and your flask.

(6) Start the pump.

(7) Slowly increase vacuum (decrease pressure) until there is a steady **drip** coming off the condenser. A **stream** of condensing solvent will admit more solvent to the pump.

(8) Once the solvent has been removed, vent the rotovap, turn off the vacuum pump, and the water bath.

(9) Remove your sample and empty the solvent collecting flask! Make sure the rotovap and the surrounding area is clean when you've finished using it.

(IV) Rotovaping acidic mixture (containing HCl, Acetic acid, etc.):

Repeat steps (1) to (5) in section III.

(6) Turn the valve on the condenser (Figure 2) to "**base trap**". Close valve A and open valve B on the "central station" to "**base trap**" (Figure 3).

Figure 2. Valve on the condenser at the "closed" position.

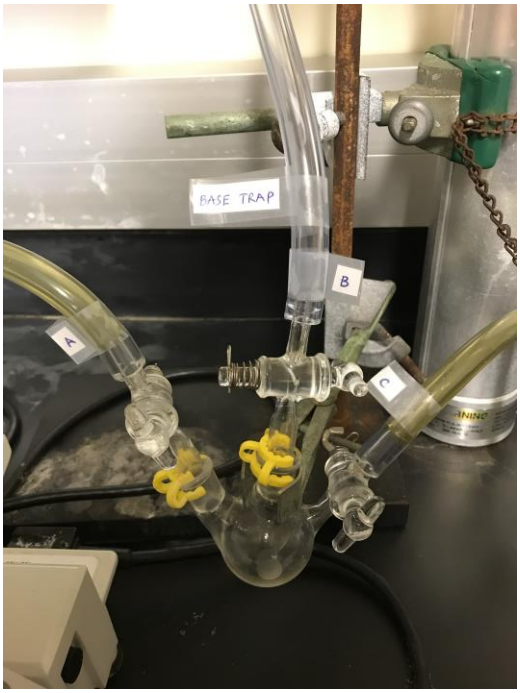

Figure 3. The "central station" at general purpose working position.

(7) Turn on the vacuum pump and fill liquid nitrogen to the dewar. Slowly increase vacuum (decrease pressure) until there is a steady **drip** coming off the condenser. A **stream** of condensing solvent will admit more solvent to the pump.

(8) Once the solvent has been removed, close valve C on the central station (Figure 3). Vent the rotovap. Take your sample out.

(9) Leave the vacuum pump on. Take the cold trap out of liquid nitrogen, let it warm up and then open valve C to vent the trap. Turn off the pump. Never vent the trap when it's still under vacuum in liquid nitrogen!

(10) Empty the solvent in the collecting flask and the cold trap.

(11) Open valve A. Close valve B.

(V) Precautions and troubleshootings:

(1) In case of solvent spills in the water bath, please change the water, clean it with soap, and then let it dry, or at least inform Aaron or Katherine. Do not be ashamed, accidents happen. Be responsible or the baths may corrode.

(2) If you break any of the parts, please inform Katherine or Aaron so that they can try to fix the problem.

(3) Please make sure that you are in the lab or around when you are evaporating solvents

(4) Please remember to turn off the chiller and the water bath heater if you are the last one leaving the lab.

(5) If you rotovap or smell some odorous compound, or see some solid depositing on the condenser, simply clean the condenser by rotovaping 200 mL of clean acetone and then clean the collecting flask with some extra acetone. If that does not work, let Aaron or Katherine know.